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electromechanical
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pneumatics
process control
sealing & shielding





Hydraulic Cartridge Systems

Threaded Cartridge Valves and Integrated Hydraulic Products



Parker

ENGINEERING YOUR SUCCESS.

Presenting...



We would like to take this opportunity to welcome you to the new Hydraulic Cartridge Systems catalog. Catalog HY15-3501 represents our entire published product offering. This catalog is intended to replace all previous Hydraulic Cartridge Systems (HCS) catalogs. You will find many changes to this catalog in content and format. Here are a few highlights of what you will find:

- **Complete Product Offering Including:**
  - **Check Valves**
  - **Shuttle Valves**
  - **Load/Motor Controls**
  - **Flow Controls**
  - **Pressure Controls**
  - **Logic Elements**
  - **Directional Controls**
  - **Manual Valves**
  - **Solenoid Valves**
  - **Proportional Valves**

We at the Hydraulic Cartridge Systems Division hope you find this catalog useful and want to thank you for turning to Parker Hannifin for your integrated hydraulic needs.



WARNING - USER RESPONSIBILITY

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

OFFER OF SALE

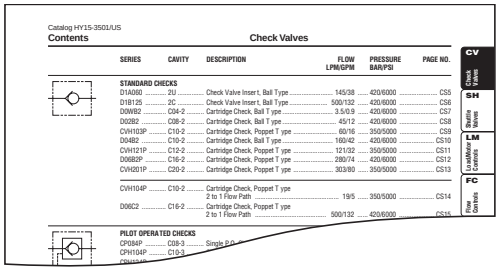
The items described in this document are hereby offered for sale by Parker-Hannifin Corporation, its subsidiaries or its authorized distributor. This offer and its accepteance are governed by the provisions stated in the detailed "Offer of Sale" elsewhere in this document.

PLEASE READ

How to use this catalog...

• Product Index

Each product tab has it's own product index for that particular section. Basic product specifications are shown along with catalog page numbers and product symbols. Further detail can be found on the specific catalog pages.

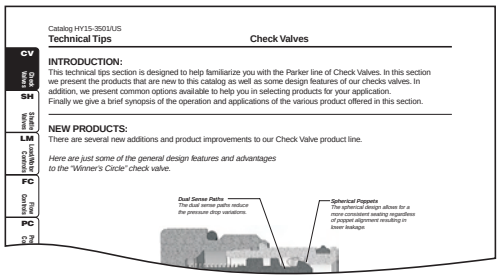

Catalog HY15-3501/US
Contents
Check Valves

SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
STANDARD CHECKS					
D1A060	2U	Check Valve Insert, Ball Type	145/38	420/6000	CS5
D1B125	2C	Check Valve Insert, Ball Type	500/132	420/6000	CS6
D0W82	C04-2	Cartridge Check, Ball T ype	3.5/0.9	420/6000	CS7
D02B2	C08-2	Cartridge Check, Ball T ype	45/12	420/6000	CS8
CVH103P	C10-2	Cartridge Check, Poppet T ype	60/16	350/5000	CS9
D04B2	C10-2	Cartridge Check, Ball T ype	160/42	420/6000	CS10
CVH121P	C12-2	Cartridge Check, Poppet T ype	121/32	350/5000	CS11
D06B2P	C16-2	Cartridge Check, Poppet T ype	280/74	420/6000	CS12
CVH201P	C20-2	Cartridge Check, Poppet T ype	303/80	350/5000	CS13
CVH104P	C10-2	Cartridge Check, Poppet T ype 2 to 1 Flow Path	19/5	350/5000	CS14
D06C2	C16-2	Cartridge Check, Poppet T ype 2 to 1 Flow Path	500/132	420/6000	CS15
PILOT OPERATED CHECKS					
CP084P	C08-3	Single P.O.			
CPH104P	C10-3				

CV Check Valves · SH Shuttle Valves · LM Load/Motor Controls · FC Flow Controls

• Technical Tips

At the beginning of each product section, we have a series of **Technical Tip** pages. These pages describe, in detail, the application and operational parameters of our cartridge valves. If you have any application or specification questions that cannot be answered by this section, please contact your local Parker representative or give us a call.


Catalog HY15-3501/US
Technical Tips
Check Valves

INTRODUCTION:
This technical tips section is designed to help familiarize you with the Parker line of Check Valves. In this section we present the products that are new to this catalog as well as some design features of our checks valves. In addition, we present common options available to help you in selecting products for your application. Finally we give a brief synopsis of the operation and applications of the various product offered in this section.

NEW PRODUCTS:
There are several new additions and product improvements to our Check Valve product line.

Here are just some of the general design features and advantages to the "Winner's Circle" check valve.

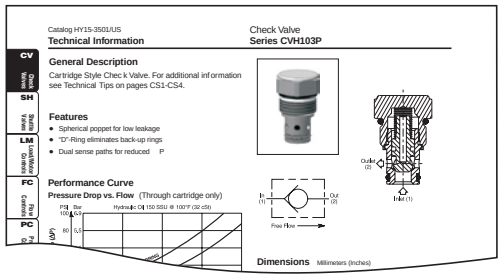
Dual Sense Paths
The dual sense paths reduce the pressure drop variations.

Spherical Poppets
The spherical design allows for a more consistent seating regardless of poppet alignment resulting in lower leakage.

CV Check Valves · SH Shuttle Valves · LM Load/Motor Controls · FC Flow Controls · PC Pressure Controls

• Product Pages

The individual product catalog pages detail fully the product specifications and operating parameters of each valve. Additionally, dimensional information, as well as a complete model code for ordering product is shown.


Catalog HY15-3501/US
Technical Information
Check Valve
Series CVH103P

General Description
Cartridge Style Chec k Valve. For additional information see Technical Tips on pages CS1-CS4.

Features
- Spherical poppet for low leakage
- "D"-Ring eliminates back-up rings
- Dual sense paths for reduced P

Performance Curve
Pressure Drop vs. Flow (Through cartridge only)

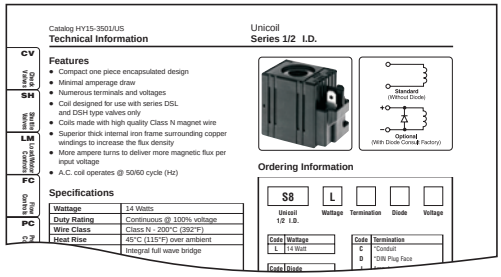
Hydraulic Oil 150 SSU @ 100°F (32 cSt)

Dimensions Millimeters (Inches)

CV Check Valves · SH Shuttle Valves · LM Load/Motor Controls · FC Flow Controls · PC Pressure Controls

• Coil and Body

There are 2 sections in this catalog that assist you in selecting the proper valve body or solenoid coil for your particular application. Also, the cavity details are shown for all Parker and Sterling cavities currently in use.


Catalog HY15-3501/US
Technical Information
Unicoil
Series 1/2 I.D.

Features
- Compact one piece encapsulated design
- Minimal amperage draw
- Numerous terminals and voltages
- Coil designed for use with series DSL and DSH type valves only
- Coils made with high quality Class N magnet wire
- Superior thick internal iron frame surrounding copper windings to increase the flux density
- More ampere turns to deliver more magnetic flux per input voltage
- A.C. coil operates @ 50/60 cycle (Hz)

Standard (Without Diode)
Optional (With Diode Correct Factory)

Ordering Information

S8 — Unicoil 1/2 I.D. · L — Wattage · Termination · Diode · Voltage

Code	Wattage
L	14 Watt

Code	Termination
C	*Conduit
D	*DIN Plug Face

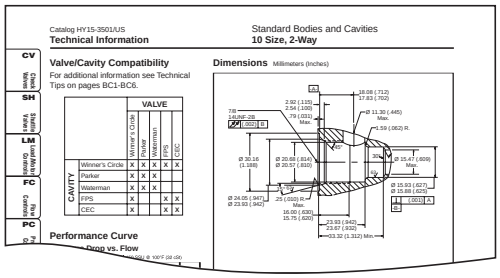
Specifications

Wattage	14 Watts
Duty Rating	Continuous @ 100% voltage
Wire Class	Class N - 200°C (392°F)
Heat Rise	45°C (115°F) over ambient
	Integral full wave bridge

CV Check Valves · SH Shuttle Valves · LM Load/Motor Controls · FC Flow Controls · PC Pressure Controls

• Technical Data

The Technical Data section outlines various hydraulic guidelines such as ratings, torques, limitations in use, seals, and hydraulic fluid/filtration information.


Catalog HY15-3501/US
Technical Information
Standard Bodies and Cavities
10 Size, 2-Way

Valve/Cavity Compatibility
For additional information see Technical Tips on pages BC1-BC6.

CAVITY	VALVE: Winner's Circle	Parker	Waterman	FPS	CEC
Winner's Circle	X	X	X	X	X
Parker	X	X	X		
Waterman	X	X	X		
FPS	X			X	X
CEC	X			X	X

Dimensions Millimeters (Inches)

Performance Curve
Drop vs. Flow

CV Check Valves · SH Shuttle Valves · LM Load/Motor Controls · FC Flow Controls · PC Pressure Controls

• Phase-Out/Legacy Products

See www.parker.com/hcs/legacy.pdf

Check Valves	CV1-CV39
Shuttle Valves	SH1-SH15
Load and Motor Control Valves	LM1-LM38
Flow Control Valves	FC1-FC50
Pressure Control Valves	PC1-PC102
Logic Element Valves	LE1-LE31
Directional Control Valves	DC1-DC20
Manual Valves	MV1-MV16
Solenoid Valves	SV1-SV112
Proportional Valves	PV1-PV64
Coils and Electronics	CE1-CE25
Bodies and Cavities	BC1-BC68
Technical Data	TD1-TD4

The HCSD Story . . .

The Hydraulic Cartridge Systems Division (HCSD), headquartered in Lincolnshire, Illinois, was “born” as a Parker manufacturing division on July 1st, 2000. Through several acquisitions, Parker has assembled a line-up of respected cartridge valve manufacturers, including; Sterling Hydraulics, Waterman Hydraulics, Fluid Power Systems (FPS), Gresen, and CEC. Through this assembly of products, Parker’s product offering is now one of the most extensive in the industry.

The objective and mission of HCSD:

“The Hydraulic Cartridge Systems Division of Parker Hannifin is a world leader in the manufacture of hydraulic cartridge products and integrated systems. We will provide the best quality and value to our Customers by delivering Premier Customer Service, rapid application support, advanced technology products, and value-based engineering solutions.”

The division currently has four locations, each providing various aspects of cartridge valve manufacturing, assembly, test, as well as manifold machining and other secondary operations. Each location is supported by a local management team, along with an experienced and well-trained work force. Parker believes the best in efficient manufacturing and Premier Customer Service cannot be achieved unless the process of continuous improvement is in place. We are continuously measuring our progress to exceed the expectation of the market through Kaizen events, Lean initiatives, 5 “S” quality programs, and other continuous improvement programs.

Lincolnshire operations . . .



The division headquarters is located in Lincolnshire, Illinois, which is approximately 15 miles north of Chicago, and a 20 minute drive north of O’Hare airport. This location houses many of the primary division functions such as Marketing, Product Management, Engineering, Customer Service, Accounting, Quality Engineering, and Research & Development. In addition to the office headquarters, the 85,000 sq. ft. building features a newly remodeled plant space for the assembly and test of cartridge valves and manifold products. With its experienced, dedicated work force, Parker is proud to present Lincolnshire as the assembly and test home for the new Winner’s Circle product line. This location serves as the primary contact point for customers, distributors, and Parker sales representatives.



Chanhassen operations . . .

The Chanhassen operation is housed in a new state-of-the-art, 32,000 sq. ft. facility, located 10 miles west of Minneapolis. This facility demonstrates Parker's commitment to growth, as it is equipped with many new machining centers for the production of manifolds, line bodies, and cartridge components. Many of the new machines are connected by a common pallet system allowing for nearly unlimited machine runs, reduced set-up time, and flexible scheduling. We machine most of our own manifolds!

Chanhassen is also the home of the Parker-HCSD "Speed Shop" as well as the IHC application specialist team. The "Speed Shop" is our resource to assist customers and distributors in the initial development of manifold and system solutions. A team of experienced application specialists dedicated to the specification and design of steel and aluminum Integrated Hydraulic Circuit systems (IHC's) lead this process. At the heart of the "Speed Shop" is the machining center, assembly area, and test bench, all dedicated solely to the production of prototype manifolds.

Elk Grove Village operations . . .



The Elk Grove Village location is just minutes from Chicago's O'Hare airport. This location has assembly and test operations for CMB's (Customer Manifold Blocks) as well as solenoid and proportional valves in a 43,000 sq. ft. facility. Formerly, the Sterling Hydraulics USA headquarters, it boasts horizontally integrated manufacturing, including solenoid tube welding, and aluminum manifold machining. Additionally, a very qualified staff handles the warehousing and distribution of U.K. manufactured pressure and flow control cartridges.



Monterrey operations . . .

The Monterrey cartridge valve assembly and test operations are housed in a well-equipped modern manufacturing facility, just 2 hours west of McAllen, Texas. Parker began operations in this new facility in 1998. This location focuses primarily on the assembly and test of cartridge valves. IHD actually shares this facility with other Parker divisions in order to maximize the efficiency of the assembly and support processes.

All Parker facilities are ISO 9000 registered, ensuring complete customer satisfaction.

The HCSDE Story . . .

With its developments in integrated hydraulic products, Parker has decided to penetrate the expanding European market by creating a focused resource with engineering and manufacturing capability for both cartridge valves and manifold systems. This division is named Hydraulic Cartridge Systems Division-Europe based in Crewkerne - England.

This allows Parker to take advantage of its strengths in product offerings and truly provide OEM's with "one stop shopping". With the vast resources of its many divisions available, Parker has the unique ability to adapt other Parker products within speciality manifolds, beyond just the integration of valve products.

Our objectives and development are linked directly with HCSD and are in line with our Global Hydraulics Group goals. HCSDE have three locations, with its headquarters in Crewkerne, a manifold production facility in Boras - Sweden, and the volume cartridge production facility in Chomutov. - Czech Republic. The following is a brief review of each location:

Crewkerne operations . . .



The Crewkerne operation is the headquarters for Hydraulic Cartridge Systems Division-Europe. This facility houses a complete machine shop well equipped to accommodate a large variety of turning, grinding, and milling operations to support complete cartridge valve manufacturing. Also, the Crewkerne facility has a complete Assembly and Test operation with automated assembly and testing in selected cells. Recent investments have improved efficiency which has allowed capacity to grow to over 1,500,000 valves per year. The following activities are supported from this location:

- ❑ Customer Service
- ❑ Product and Technical Support
- ❑ Manifold Systems
- ❑ Quality Assurance Systems
- ❑ Manufacturing Support
- ❑ Finance
- ❑ Purchasing
- ❑ Marketing
- ❑ Engineering Support for Cartridge Valves

Boras operations . . .



The manifold systems “team” is located in Boras Sweden, 30 miles East of Gothenburg. This “team” focuses on the production on integrated hydraulic circuits which are incorporated into mobile systems. By working closely with the Mobile Controls Division (M.C.D.) we are also able to take full advantage of Parker’s unique spool valve product offering, and systems engineering expertise. Boras also has a prototype Speed Shop capability, and provides local manifold design and production support for the Nordic region. Manifold system application engineering and manufacturing capability is also available at several other Parker Sales locations throughout Europe. Parker can provide both standard circuit and custom-engineered hydraulic solutions. Each facility uses compatible CAD / CAM packages to enable the resource to be shared whilst keeping the application engineering close to our customers.



Chomutov operations . . .

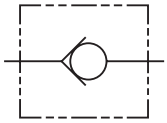
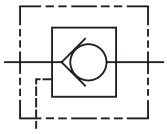
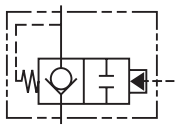
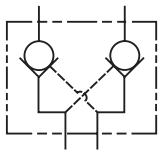
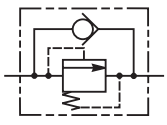
The Chomutov cartridge valve and simple Manifold system assembly and test operation is located in a brand new manufacturing facility, 50 miles north of Prague in the city of Chomutov - Czech Republic. The facility is based on LEAN manufacturing techniques Such as Value Stream Mapping, “Point-of-Use” Inventory, Kanban controls, 5S, Visual factory, Small batch flow, Balanced work flow etc. and is operated using fully equipped “cells” which are dedicated to specific product “families” with each one having a “state-of-the-art” test stand with manual or automated electronic controls and quick change-over fixtures.

Products are distributed to customers’ throughout Europe via the Cartridge Valve Distribution Center (C.V.D.C) in conjunction with the United Parcel Service (U.P.S.)

All Parker facilities are ISO 9000 registered, ensuring complete customer satisfaction.

Contents

Check Valves

	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
	**STANDARD CHECKS**					
	D1A060	2U	Check Valve Insert, Ball Type	145/38	420/6000	CV5
	D1B125	2C	Check Valve Insert, Ball Type	500/132	420/6000	CV6
	D0WB2	CAV0W-2	Cartridge Check, Ball Type	3.5/0.9	420/6000	CV7
	D02B2	C08-2	Cartridge Check, Ball Type	45/12	420/6000	CV8
	CVH081P	C08-2	Cartridge Check, Poppet Type	38/10	350/5000	CV9
	CVH103P	C10-2	Cartridge Check, Poppet Type	60/16	350/5000	CV10
	D04B2	C10-2	Cartridge Check, Ball Type	160/42	420/6000	CV11
	CVH121P	C12-2	Cartridge Check, Poppet Type	121/32	350/5000	CV12
	D06B2P	C16-2	Cartridge Check, Poppet Type	280/74	420/6000	CV13
	CVH161P	C16-2	Cartridge Check, Poppet Type	226/60	350/5000	CV14
	CVH201P	C20-2	Cartridge Check, Poppet Type	303/80	350/5000	CV15
	CVH104P	C10-2	Cartridge Check, Poppet Type 2 to 1 Flow Path	19/5	350/5000	CV16
	D06C2	C16-2	Cartridge Check, Poppet Type 2 to 1 Flow Path	500/132	420/6000	CV17
	**PILOT OPERATED CHECKS**					
	CP084P	C08-3	Single P.O. Check, Pilot on Port 1	19/5	207/3000	CV18
	CPH104P	C10-3	Single P.O. Check, Pilot on Port 1	30/8	350/5000	CV19
	CPH124P	C12-3	Single P.O. Check, Pilot on Port 1	75/20	350/5000	CV20
	PP02SP		Single P.O. Check Package, Steel Body	40/11	420/6000*	CV21-CV22
	PP04SP		Single P.O. Check Package, Steel Body	135/36	420/6000*	CV23-CV24
	PP06SP		Single P.O. Check Package, Steel Body	340/90	420/6000*	CV25-CV26
	D4A020	53-1	Single P.O. Check, Pilot on Port 3	30/8	420/6000	CV27
	D4A040	68-1	Single P.O. Check, Pilot on Port 3	60/16	420/6000	CV28
	D2K1	T11A	Single P.O. Check, Pilot on Port 3	70/19	350/5000	CV29
	D3B125	3C	Single P.O. Check, Pilot on Port 3	150/40	420/6000	CV30
	CPC101P	C10-3	Pilot to Close Check, Pilot on Port 3	20/5	420/6000	CV31
	**DUAL PILOT OPERATED CHECKS**					
	CPD084P	C08-4	Dual P.O. Check Cartridge	19/5	207/3000	CV32
	PP02DP		Dual P.O. Check Package, Steel Body	40/11	420/6000*	CV33-CV34
	PP04DP		Dual P.O. Check Package, Steel Body	135/36	420/6000*	CV35-CV36
	PP06DP		Dual P.O. Check Package, Steel Body	340/90	420/6000*	CV37-CV38
	**CHECK WITH RELIEF**					
	D04F2	C10-2	Check With Thermal Relief, Relieving Port 2 to 1	130/40	420/6000	CV39

**Rated to 207 Bar/3000 PSI with Aluminum Body.*

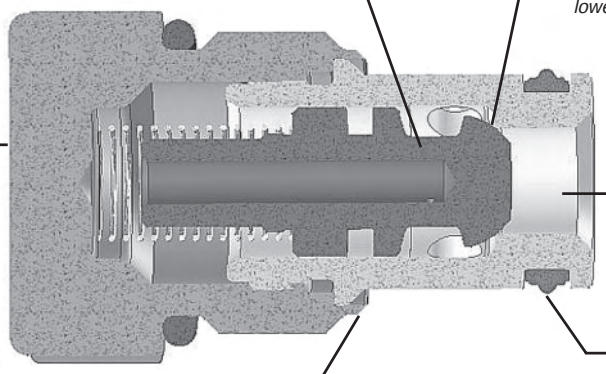
INTRODUCTION:

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Finally we give a brief synopsis of the operation and applications of the various product offered in this section.

NEW PRODUCTS:

There are several new additions and product improvements to our Check Valve product line.

Here are just some of the general design features and advantages to the "Winner's Circle" check valve.



Dual Sense Paths
The dual sense paths reduce the pressure drop variations.

Spherical Poppets
The spherical design allows for a more consistent seating regardless of poppet alignment resulting in lower leakage.

Yellow Zinc Coating
Steel adapters are coated with yellow zinc di-chromate for protection from salt spray.

Hardened Seat
Seats are hardened to reduce the degredation of the seating area and increase life.

"D"-Ring
Standard 4301 Polyurethane seal eliminates the need for backup rings providing easier manifold installation. (For more information see the Technical Data Section.)

Crimp Design
Fold over crimp provides secure holding and eliminates the need for adhesive.

COMMON OPTIONS:

Since check valves and shuttles are fairly simple components, there are very few options. Here are the standard options you will find.

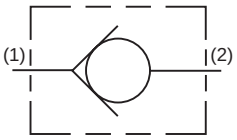
Seals: The Winner's Circle products feature a standard 4301 Polyurethane "D"-Ring. The "D"-Ring eliminates the need for backup rings. The majority of the products are available in Nitrile or Fluorocarbon Seals. You should match the seal compatibility to the temperature and fluid being used in your application.

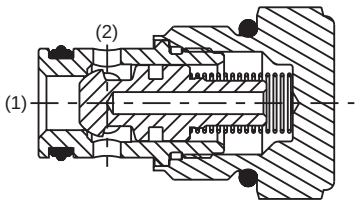
Crack Pressure: Parker offers a number of standard crack pressure options for each valve. Check the model code pages for these options. The crack pressure is defined as the minimum amount of pressure that is needed to unseat the poppet. In pilot operated check applications, you may want to go with a slightly higher cracking pressure to keep the piston weight, friction, and drag from accidently unseating the poppet.

Pilot Piston Seal: On the pilot piston style pilot operated check valves, Parker offers the option to place a seal on the piston to reduce the leakage across the piston. ***Note:*** Sealing the pilot piston does not decrease the leakage across the poppet. In other words, if you are trying to reduce the leakage from the actuator port, sealing the piston will not help. While most applications do not require a seal on the piston, it can be advantageous in applications with very small pump flows where the lost fluid would have a high impact on actuator speed.

PRODUCT TYPES / APPLICATIONS

Check Valve - Poppet Type

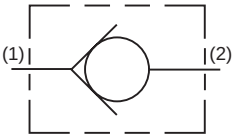


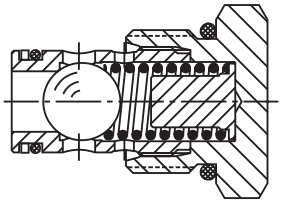


Check valves are poppet style elements that allow free flow in one direction while preventing flow in the reverse direction. They can be used to isolate portions of a hydraulic circuit or to provide a free flow path around a restrictive valve.

OPERATION - Pressure on the inlet (port 1) of the check valve creates a force against the poppet, pushing it off its seat and permitting free flow to port 2. Reverse flow through the check is blocked by the poppet.

Check Valve - Ball Type

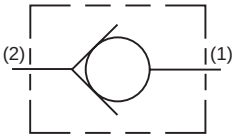


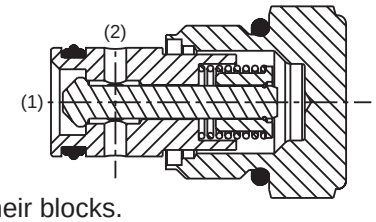


Ball type check valves are check valves that use a hardened steel ball to seal against the valve seat as opposed to a poppet. They are simple in their design and provide low leakage over the life of the system.

OPERATION - Pressure on the inlet (port 1) of the check valve creates a force on the steel ball pushing it off of it's seat and permitting free flow to port 2. Reverse flow through the check is blocked by the steel ball on the seat.

Side to Nose Check Valve

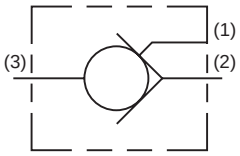




Side to nose check valves are a special type of check valve where the free flow path is from the side of the cartridge valve to the nose. They functionally are the same as the standard check valve. Side to nose check valves are occasionally used by manifold designers to simply the flow path design of their blocks.

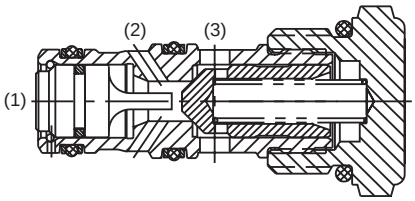
OPERATION - Pressure on the inlet (port 2) of the check valve creates a force against the poppet, pushing it off its seat and permitting free flow to port 1. Reverse flow through the check is blocked by the poppet.

Pilot Operated Check Valve

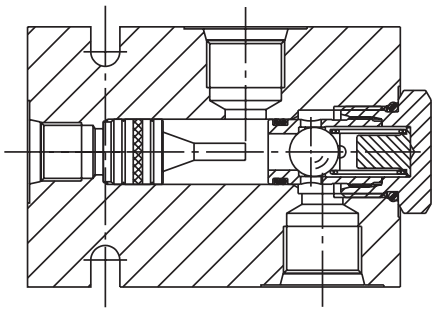


Pilot operated check valves (also referred to as P.O. check valves), are check valves which can be opened by an external pilot pressure. Thus, P.O. checks, block flow in one direction, like standard check valves, but can be released once an adequate pilot pressure is applied. Free flow is allowed in the reverse direction. P.O. checks are often used to positively lock a dual acting cylinder. There are two types of pilot operated check valves; threaded cartridge style and pilot piston style. These valves work best when used in conjunction with a control valve that vents the valve ports to tank when centered.

Cartridge Style P.O. Check Valve

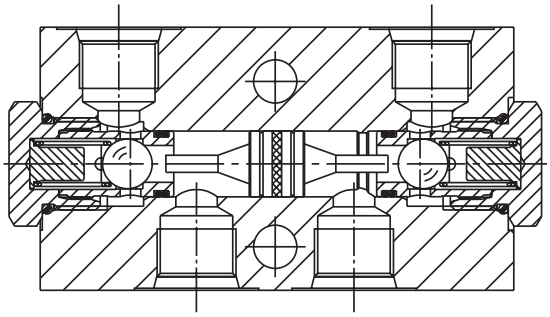


Single Pilot Piston Style P.O. Check Valve

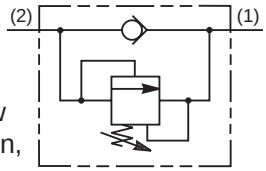


OPERATION - In the absence of adequate pilot pressure, the poppet remains seated preventing flow from the actuator port (port 3) to the valve port (port 2). Once adequate pilot pressure is applied at the pilot port (port 1), the internal pilot piston unseats the check poppet permitting flow from port 3 to port 2. The amount of pressure needed at port 1 to unseat the check valve is determined by the pilot ratio of the pilot piston to the poppet seat diameter. If you have a pilot operated check valve with a 3:1 ratio pilot piston, then you would need a pilot pressure at port 1 that is 1/3 of the pressure being checked at port 3 plus the spring. For example, if you had 3000 psi on port 3 and a 5 psi spring and a 3:1 pilot ratio, it would take 1002 psi [(3000 psi + 5 psi) / 3)] to release the check valve. Free flow is permitted from the valve port (port 2) to the cylinder port (port 3).

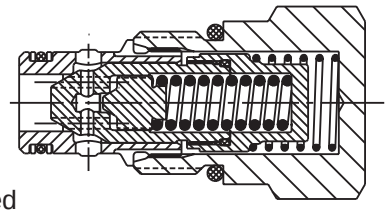
Dual Pilot Piston Style P.O. Check Valve



Check Valve With Thermal Relief



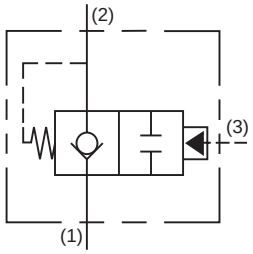
The check valve with thermal relief performs the same function as a standard check valve. It allows free flow in one direction. In the opposite direction, it performs as a normal check valve preventing flow, while also venting excess pressure caused by the thermal expansion of fluid. This type of valve can be used with an external pilot piston to provide a pilot operated valve that will vent trapped pressure due to thermal expansion. These valves work best when used in conjunction with a control valve that vents the valve ports to tank when centered.

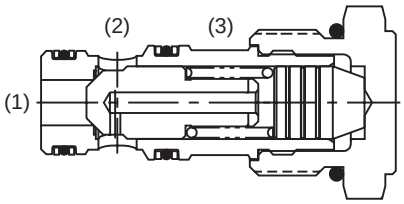


OPERATION - The check valve is a guided poppet design. As the pressure on the inlet exceeds the spring rate, the poppet is pushed off of its seat allowing flow to pass. Once the pressure on the inlet side drops below the spring force, the spring then pushes the poppet back on its seat blocking flow from the outlet to the inlet of the check valve. If the pressure on the outlet side of the check valve (when it is in a load holding function) rises (through thermal expansion), the direct acting relief will vent the excess pressure caused by the thermal expansion to the inlet side of the check.

Pilot to Close Check

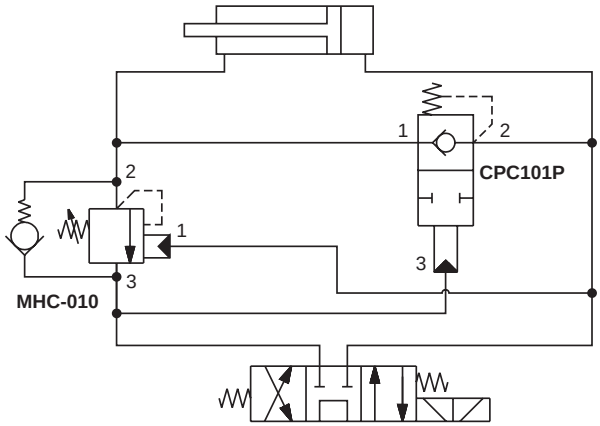
Pilot to close check valves are unique 2 way valves that act as a check valve, allowing free flow in one direction and blocking flow from the opposite direction. When an external pilot pressure is applied, flow is blocked from both directions.





These products are ideal for regeneration circuits. See sample diagram shown.

OPERATION - In the absence of adequate pilot pressure, the valve functions as a simple check valve, allowing free flow from port 1 to port 2. When adequate pilot pressure at port 3 is applied, the pilot piston holds the poppet closed, blocking flow in both directions.



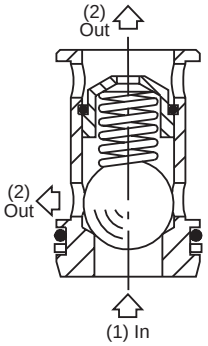
General Description

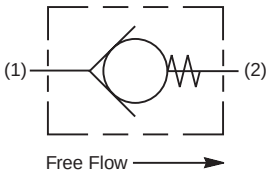
Ball Type, Check Valve Insert. For additional information see Technical Tips on pages CV1-CV4.

Features

- For inserting inside manifold blocks
- High flow capacity
- Minimal leakage - less than 3 drops/min.
- Simple construction - extremely cost effective
- Range of cracking pressures available
- Good contamination tolerance
- All external parts zinc plated

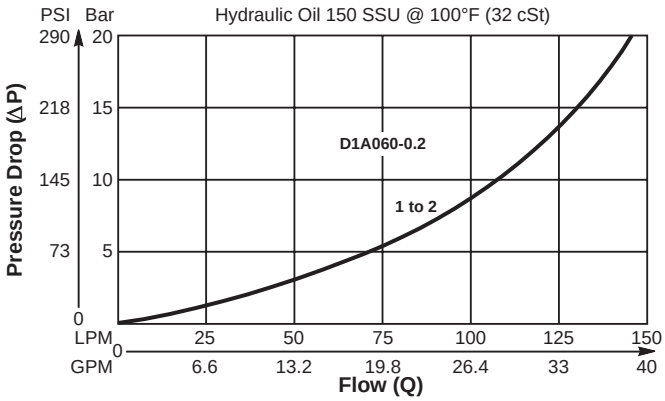




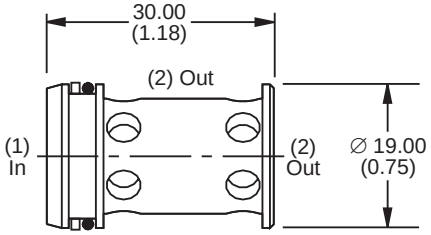


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	145 LPM (38 GPM)
Nominal Flow @ 7 Bar (100 PSI)	90 LPM (24 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Cartridge Material	Steel operating parts, hardened steel ball.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.085 kg (.19 lbs.)
Cavity	2U (See BC Section for more details)

Ordering Information

D1A060 – [ ] [ ]

Check Valve Insert | Cracking Pressure | Seals

Code	Cracking Pressure
0.2	0.2 Bar (3 PSI) Std.
1.0	1.0 Bar (15 PSI)
2.0	2.0 Bar (30 PSI)
3.0	3.0 Bar (45 PSI)
5.0	5.0 Bar (72 PSI)
7.0	7.0 Bar (100 PSI)
10.0	10.0 Bar (145 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30019N-1)
V	Fluorocarbon / (SK30019V-1)

Order Bodies Separately

LB10 [ ] [ ]

Line Body | Porting | Body Material

Code	Porting
205	1/2″ BSP
220	1/2″ SAE

Code	Body Material
S	Steel

General Description

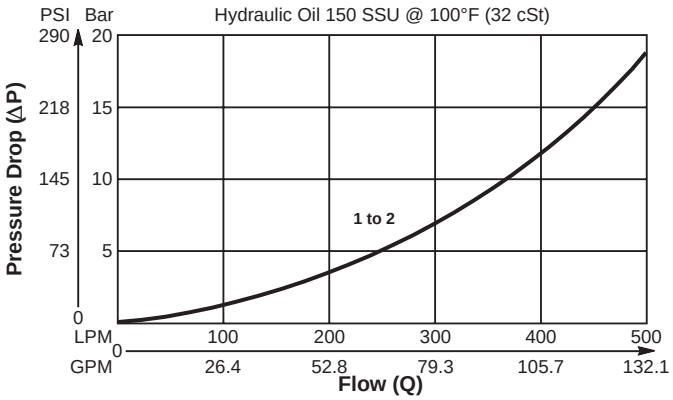
Poppet Type, Check Valve Insert. For additional information see Technical Tips on pages CV1-CV4.

Features

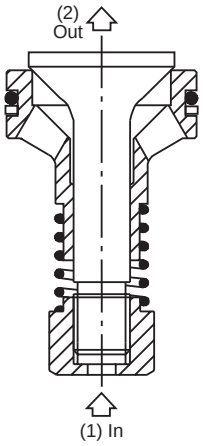
- For inserting inside manifold blocks
- High flow capacity
- Minimal leakage - less than 3 drops/min.
- Simple construction - extremely cost effective
- Range of cracking pressures available
- Good contamination tolerance
- All external parts zinc plated

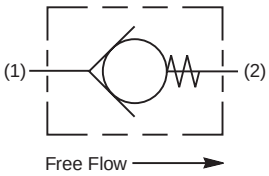
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)

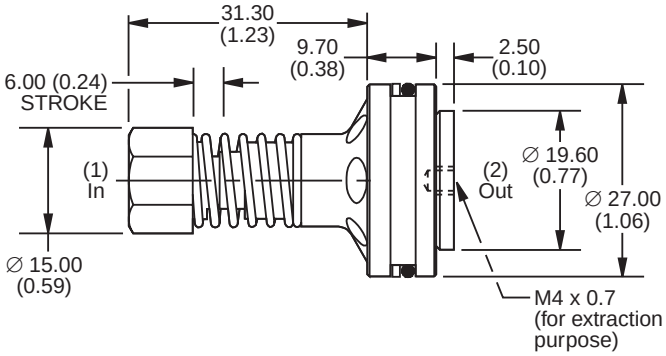








Dimensions Millimeters (Inches)



Specifications

Rated Flow	500 LPM (132 GPM)
Nominal Flow @ 7 Bar (100 PSI)	300 LPM (79 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Cartridge Material	Steel operating parts, hardened steel poppet.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.06 kg (.13 lbs.)
Cavity	2C (See BC Section for more details)

Ordering Information

D1B125 – [ ] [ ]

Check Valve Insert | Cracking Pressure | Seals

Code	Cracking Pressure
0.0	0 Bar (0 PSI)
0.1	0.1 Bar (1.5 PSI)
0.2	0.2 Bar (3 PSI)
1.0	1.0 Bar (15 PSI) Std.
2.0	2.0 Bar (30 PSI)
3.0	3.0 Bar (45 PSI)
5.0	5.0 Bar (72 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30014N-1)
V	Fluorocarbon / (SK30014V-1)

Order Bodies Separately

LB10 [ ] [ ]

Line Body | Porting | Body Material

Code	Porting
210	1″ BSP
212	1″ SAE

Code	Body Material
S	Steel

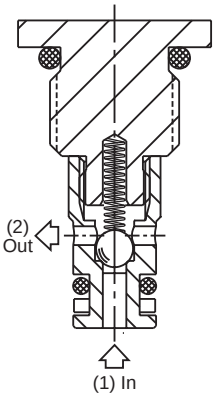
General Description

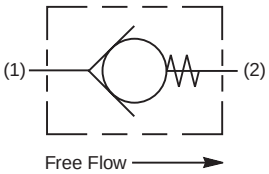
Miniature Ball Type Check Valve. For additional information see Technical Tips on pages CV1-CV4.

Features

- Low leakage - less than 3 drops/min.
- Ball type construction for cost effective design
- Extremely compact
- Good contamination tolerance
- All external parts zinc plated

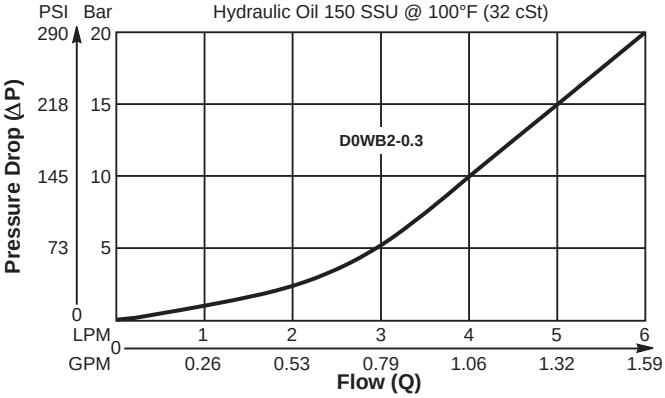






Performance Curve

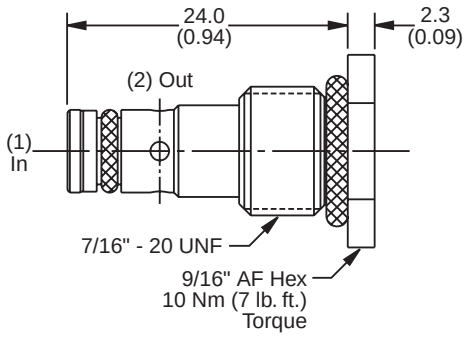
Pressure Drop vs. Flow (Through cartridge only)



Specifications

Rated Flow	6 LPM (1.6 GPM)
Nominal Flow @ 7 Bar (100 PSI)	3.5 LPM (0.9 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Cartridge Material	Steel operating parts, hardened steel ball.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.012 kg (.026 lbs.)
Cavity	CAV0W-2 (See BC Section for more details)

Dimensions Millimeters (Inches)



Ordering Information

D0WB2	–		
Check Valve		Cracking Pressure	Seals

Code	Cracking Pressure
0.3	0.3 Bar (4 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30519N-1)
V	Fluorocarbon / (SK30519V-1)

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
795	1/4″ SAE
796	1/4″ BSP

Code	Body Material
A	Aluminum
S	Steel

General Description

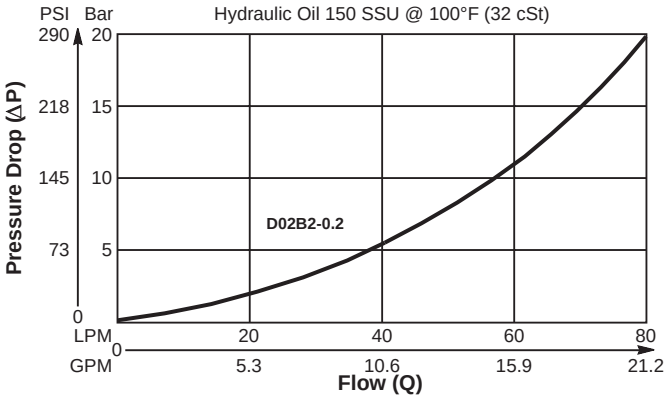
Ball Type Check Valve. For additional information see Technical Tips on pages CV1-CV4.

Features

- Low leakage - less than 3 drops/min.
- Ball type construction for cost effective design
- Single and dual pilot pistons available to create pilot to open check
- Range of cracking pressures available - up to 25 Bar (362 PSI)
- Good contamination tolerance
- All external parts zinc plated

Performance Curve

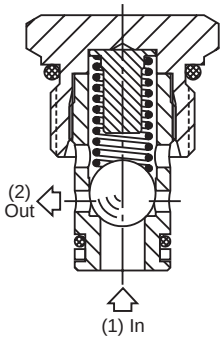
Pressure Drop vs. Flow (Through cartridge only)

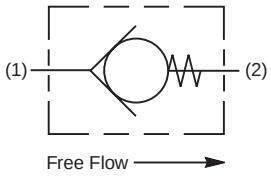


Specifications

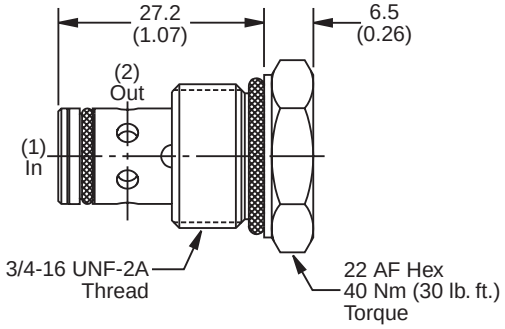
Rated Flow	80 LPM (21 GPM)
Nominal Flow @ 7 Bar (100 PSI)	45 LPM (12 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Cartridge Material	Steel operating parts, hardened steel ball.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.05 kg (.11 lbs.)
Cavity	C08-2 (See BC Section for more details)







Dimensions Millimeters (Inches)



Ordering Information

D02B2 — [ ] [ ] — [ ] [ ]

Ball Type Check Valve	Cracking Pressure	Seals	Body Material	Port Size

Code	Cracking Pressure
0.0	0.0 Bar (0 PSI)
0.2	0.2 Bar (3 PSI) Std.
1.0	1.0 Bar (15 PSI)
1.5	1.5 Bar (22 PSI)
2.1	2.1 Bar (30 PSI)
2.5	2.5 Bar (36 PSI)
3.4	3.4 Bar (50 PSI)
4.0	4.0 Bar (58 PSI)
6.0	6.0 Bar (87 PSI)
6.9	6.9 Bar (100 PSI)
10.0	10.0 Bar (145 PSI)
17.0	17.0 Bar (247 PSI)
20.0	20.0 Bar (290 PSI)
25.0	25.0 Bar (362 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30515N-1)
V	Fluorocarbon / (SK30515V-1)

Code	Body Material
Omit	Steel
A	Aluminum

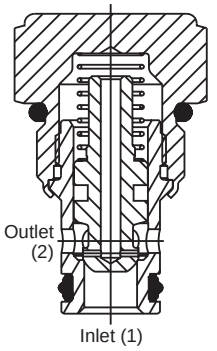
Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-2-*4P)
6P	3/8″ NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8″ BSPG	(B08-2-*6B)

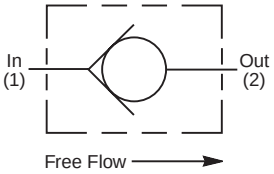
**** Add "A" for aluminum, omit for steel.***

General Description

Cartridge Style Check Valve. For additional information see Technical Tips on pages CV1-CV4.





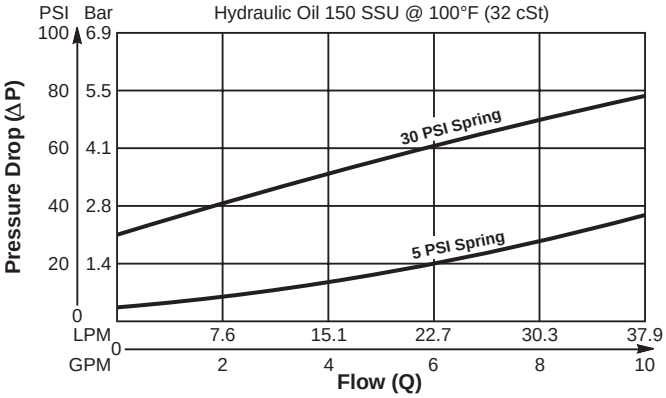


Features

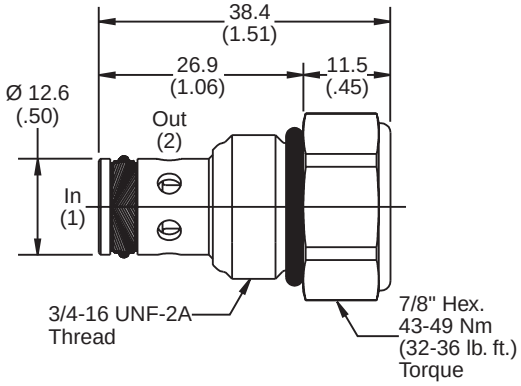
- Spherical poppet for low leakage
- "D"-Ring eliminates back-up rings
- Dual sense paths for reduced ΔP
- All external parts zinc plated

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	38 LPM (10 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	2 drops/min. (.13 cc/min.) at 350 Bar (5000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C ("D" Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.10 kg (0.2 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

Ordering Information

CVH081P			—		
08 Size Check Valve	Cracking Pressure	Seals		Body Material	Port Size

Code	Cracking Pressure
Omit	0.3 Bar (5 PSI)
10	0.7 Bar (10 PSI)
30	2.1 Bar (30 PSI)
65	4.5 Bar (65 PSI)
100	6.9 Bar (100 PSI)
150	10.4 Bar (150 PSI)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK08-2)
N	Nitrile / (SK08-2N)
V	Fluorocarbon / (SK08-2V)

Code	Body Material
Omit	Steel
A	Aluminum

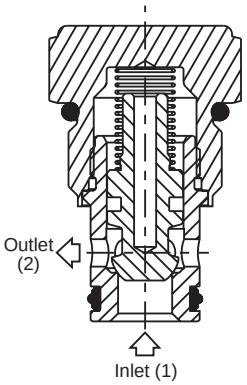
Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4" NPTF	(B08-2-*4P)
6P	3/8" NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8" BSPG	(B08-2-*6B)

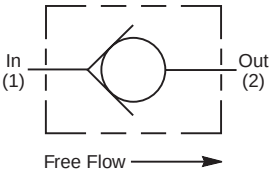
**** Add "A" for aluminum, omit for steel.***

General Description

Cartridge Style Check Valve. For additional information see Technical Tips on pages CV1-CV4.





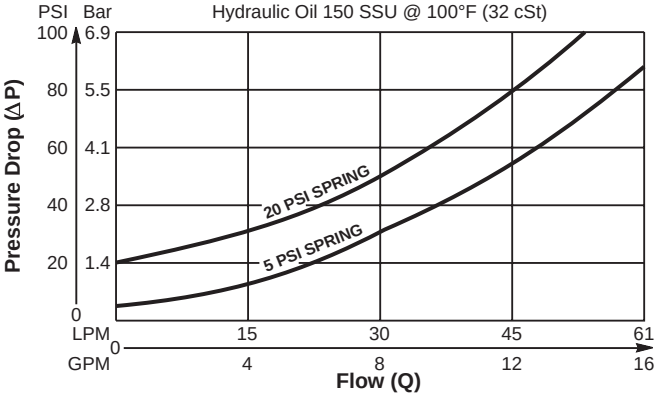


Features

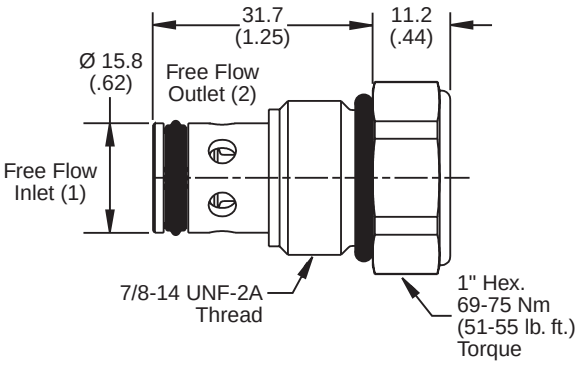
- Spherical poppet for low leakage
- "D"-Ring eliminates back-up rings
- Dual sense paths for reduced ΔP
- All external parts zinc plated

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	60 LPM (16 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	2 drops/min. (.13 cc/min.) at 350 Bar (5000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C ("D" Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.09 kg (0.2 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

Ordering Information

CVH103P			—		
10 Size Check Valve	Cracking Pressure	Seals		Body Material	Port Size

Code	Cracking Pressure
Omit	0.3 Bar (5 PSI)
20	1.4 Bar (20 PSI)
50	3.5 Bar (50 PSI)
65	4.5 Bar (65 PSI)
80	5.5 Bar (80 PSI)
100	6.9 Bar (100 PSI)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK10-2)
N	Nitrile / (SK10-2N)
V	Fluorocarbon / (SK10-2V)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

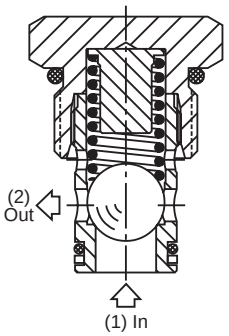
General Description

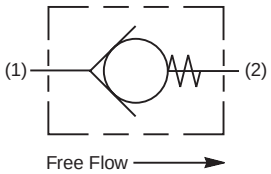
Ball Type Check Valve. For additional information see Technical Tips on pages CV1-CV4.

Features

- Low leakage - less than 3 drops/min.
- Ball type construction for cost effective design
- Single and dual pilot pistons available to create pilot to open check
- Range of cracking pressures available
- Good contamination tolerance
- All external parts zinc plated

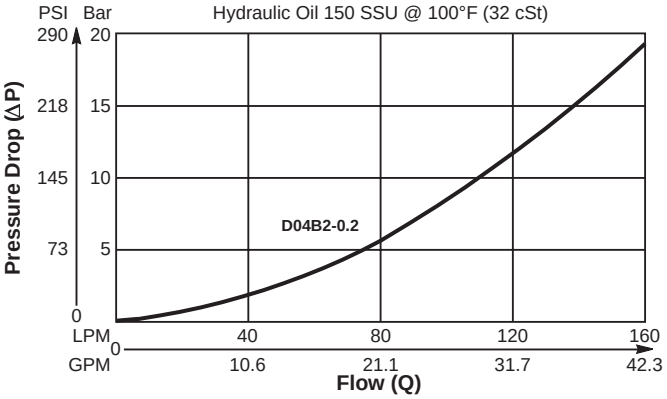






Performance Curve

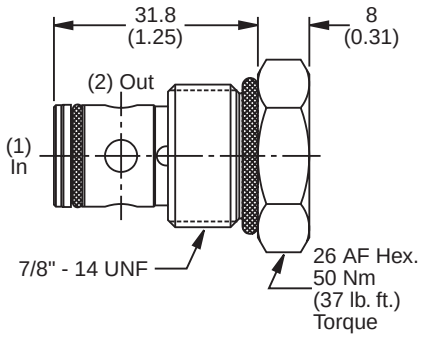
Pressure Drop vs. Flow (Through cartridge only)



Specifications

Rated Flow	160 LPM (42 GPM)
Nominal Flow @ 7 Bar (100 PSI)	90 LPM (24 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	3 drops/min.
Cartridge Material	Steel operating parts, hardened steel ball.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.08 kg (.18 lbs.)
Cavity	C10-2 (See BC Section for more details)

Dimensions Millimeters (Inches)



Ordering Information

D04B2 – [ ] [ ] – [ ] [ ]

Ball Type Check Valve	Cracking Pressure	Seals	Body Material	Port Size

Code	Cracking Pressure
0.0	0.0 Bar (0 PSI)
0.2	0.2 Bar (3 PSI) Std.
1.0	1.0 Bar (15 PSI)
2.1	2.1 Bar (30 PSI)
3.4	3.4 Bar (50 PSI)
6.9	6.9 Bar (100 PSI)
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (217 PSI)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30516N-1)
V	Fluorocarbon / (SK30516V-1)

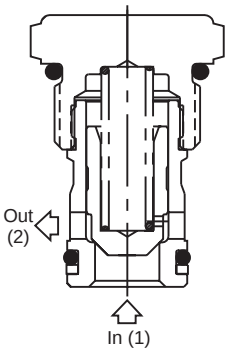
Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

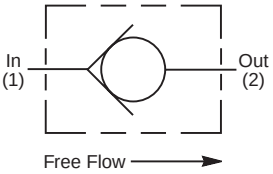
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

Cartridge Style Check Valve. For additional information see Technical Tips on pages CV1-CV4.





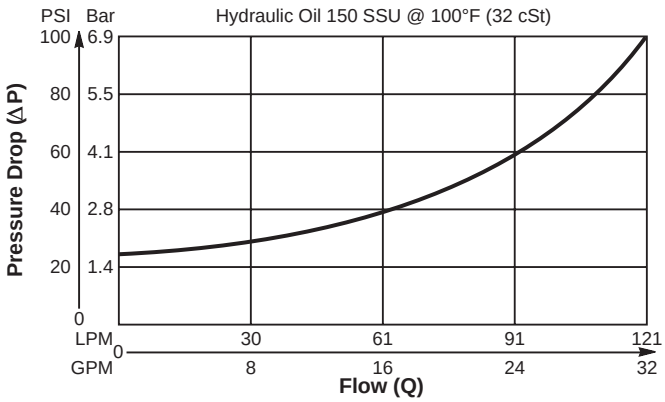


Features

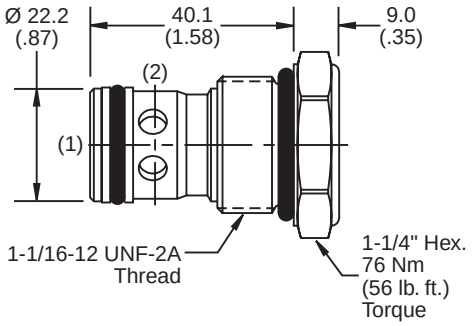
- Hardened, precision ground parts for durability
- Fully guided poppet for smooth operation
- All external parts zinc plated

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	121 LPM (32 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) at 350 Bar (5000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.30 lbs.)
Cavity	C12-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT12-2F

Ordering Information

CVH121P			—		
12 Size Check Valve	Cracking Pressure	Seals		Body Material	Port Size

Code	Cracking Pressure
Omit	1.7 Bar (25 PSI)
65	4.5 Bar (65 PSI)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
Omit	Nitrile / (SK12-2)
V	Fluorocarbon / (SK12-2V)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
12P	3/4″ NPTF	(B12-2-*12P)
8T	SAE-8	(B12-2-*8T)
12T	SAE-12	(B12-2-*12T)
12B	3/4″ BSPG	(B12-2-*12B)

Add "A" for aluminum, omit for steel.

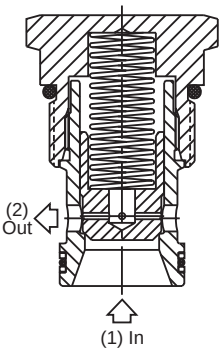
General Description

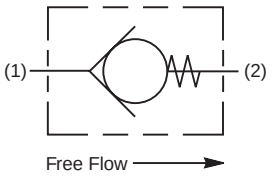
Poppet Type Check Valve. For additional information see Technical Tips on pages CV1-CV4.

Features

- Extra low pressure drop capability for systems up to 250 Bar
- Poppet type construction for minimal leakage - less than 3 drops/min.
- Hardened poppet for maximum durability
- Good contamination tolerance
- All external parts zinc plated

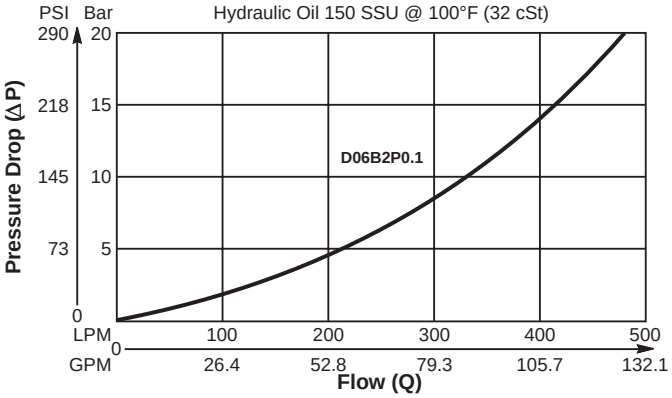






Performance Curve

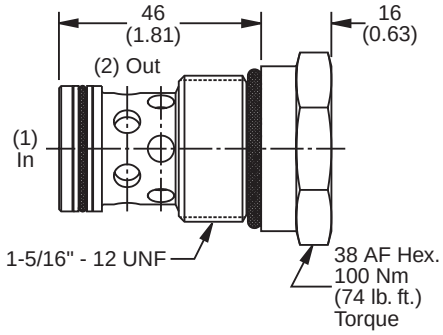
Pressure Drop vs. Flow (Through cartridge only)



Specifications

Rated Flow	500 LPM (132 GPM)
Nominal Flow @ 7 Bar (100 PSI)	280 LPM (74 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Cartridge Material	Steel operating parts, hardened steel poppet.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.27 kg (.60 lbs.)
Cavity	C16-2 (See BC Section for more details)

Dimensions Millimeters (Inches)



Ordering Information

D06B2P — [ ] [ ] — [ ] [ ]

16 Size Check Valve | **Cracking Pressure** | **Seals** | **Body Material** | **Port Size**

Code	Cracking Pressure
0.0	0.0 Bar (0 PSI)
0.1	0.1 Bar (1.5 PSI) Std.
1.0	1.0 Bar (15 PSI)
2.1	2.1 Bar (30 PSI)
3.4	3.4 Bar (50 PSI)
4.1	4.1 Bar (60 PSI)
7.5	7.5 Bar (109 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30507N-1)
V	Fluorocarbon / (SK30507V-1)

Code	Body Material
Omit	Steel
A	Aluminum

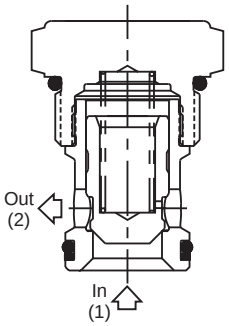
Code	Port Size	Body Part No.
Omit	Cartridge Only	
12P	3/4″ NPTF	(B16-2-*12P)
16P	1″ NPTF	(B16-2-*16P)
8T	SAE-8	(B16-2-*8T)
12T	SAE-12	(B16-2-*12T)
16T	SAE-16	(B16-2-*16T)
12B	3/4″ BSPG	(B16-2-12B)†
16B	1″ BSPG	(B16-2-*16B)

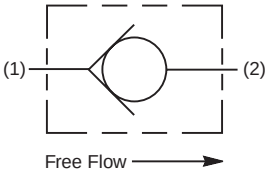
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

Cartridge Style Check Valve.
For additional information see Technical Tips on pages CV1-CV4.





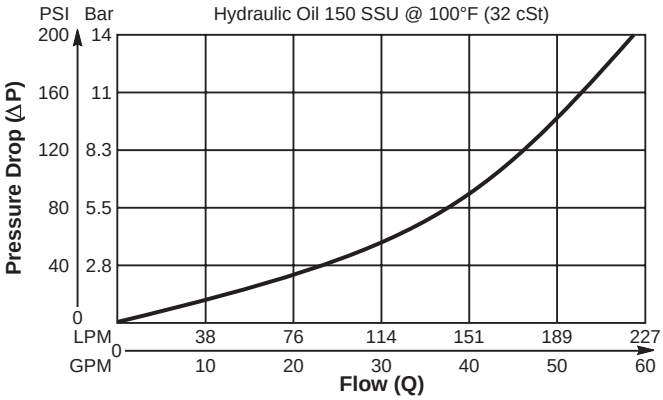


Features

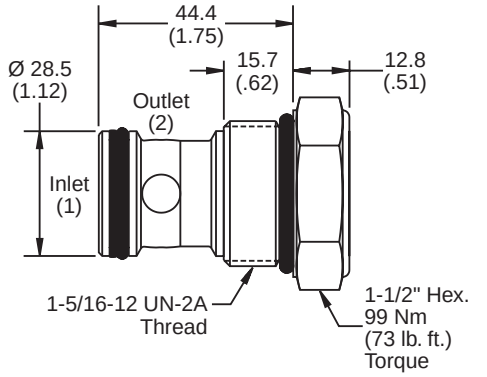
- Hardened, precision ground parts for durability
- Fully guided poppet for smooth operation
- All external parts zinc plated

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	225 LPM (60 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) at 350 Bar (5000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.27 kg (0.6 lbs.)
Cavity	C16-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT16-2F

Ordering Information

CVH161P			—		
16 Size Check Valve	Cracking Pressure	Seals		Body Material	Port Size

Code	Cracking Pressure
Omit	0.3 Bar (5 PSI)
20	1.4 Bar (20 PSI)
65	4.5 Bar (65 PSI)
125	8.6 Bar (125 PSI)
175	12.1 Bar (175 PSI)

Code	Seals / Kit No.
Omit	Nitrile / (SK16-2)
V	Fluorocarbon / (SK16-2V)

Code	Body Material
Omit	Steel
A	Aluminum

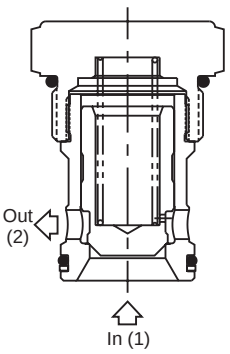
Code	Port Size	Body Part No.
Omit	Cartridge Only	
12P	3/4″ NPTF	(B16-2-*12P)
16P	1″ NPTF	(B16-2-*16P)
8T	SAE-8	(B16-2-*8T)
12T	SAE-12	(B16-2-*12T)
16T	SAE-16	(B16-2-*16T)
12B	3/4″ BSPG	(B16-2-12B)†
16B	1″ BSPG	(B16-2-*16B)

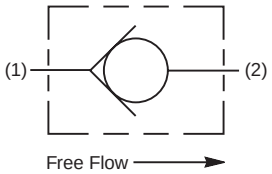
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

Cartridge Style Check Valve.
For additional information see Technical Tips on pages CV1-CV4.





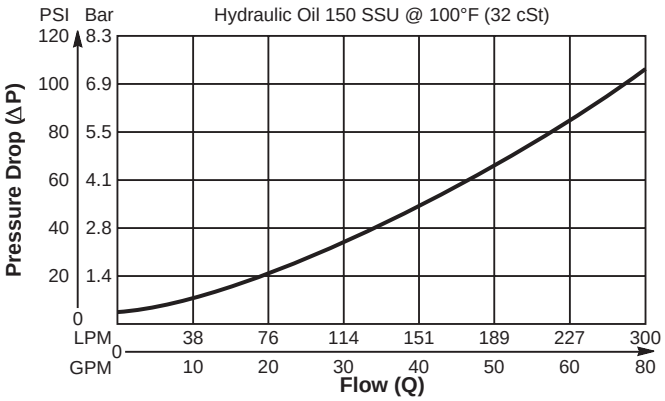


Features

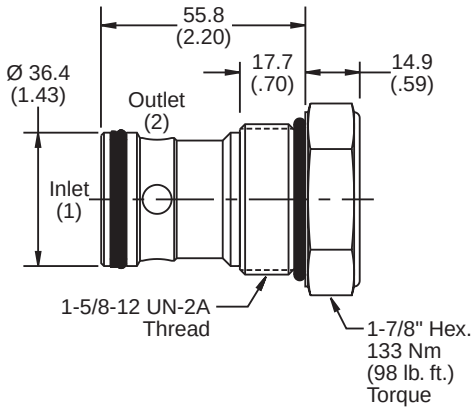
- Hardened, precision ground parts for durability
- Fully guided poppet for smooth operation
- All external parts zinc plated

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	303 LPM (80 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) at 350 Bar (5000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.27 kg (0.6 lbs.)
Cavity	C20-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT20-2F

Ordering Information

CVH201P			—		
20 Size Check Valve	Cracking Pressure	Seals		Body Material	Port Size

Code	Cracking Pressure
Omit	0.3 Bar (5 PSI)
20	1.4 Bar (20 PSI)
65	4.5 Bar (65 PSI)

Code	Body Material
Omit	Steel

Code	Seals / Kit No.
Omit	Nitrile / (SK20-2)
V	Fluorocarbon / (SK20-2V)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
20T	SAE-20	(B20-2-20T)
20B	1-1/4″ BSPG	(B20-2-20B)

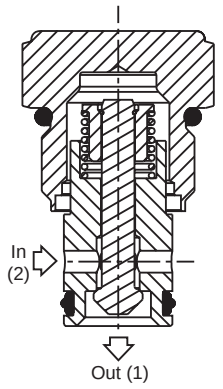
General Description

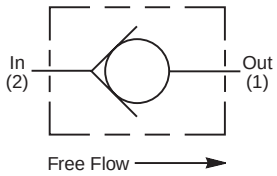
Side to Nose Style Check Valve. For additional information see Technical Tips on pages CV1-CV4.

Features

- Hardened, precision ground parts for durability
- Fully guided poppet for smooth operation
- Size to nose design for ease in manifold design
- All external parts zinc plated

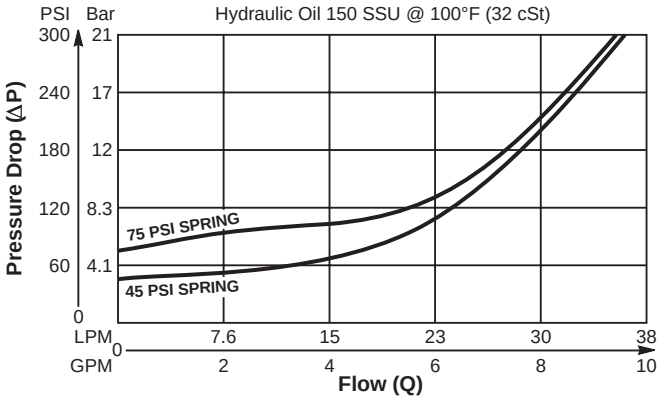




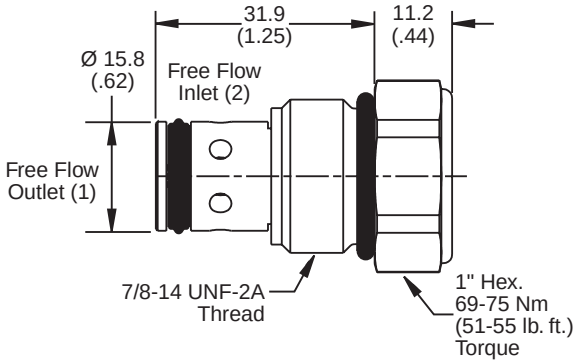


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	34 LPM (9 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	2 drops/min. (.13 cc/min.) at 350 Bar (5000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C ("D"-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.08 kg (.18 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

Ordering Information

CVH104P			—		
10 Size Side to Nose Check Valve	Cracking Pressure	Seals		Body Material	Port Size

Code	Cracking Pressure
Omit	3.1 Bar (45 PSI)
75	5.2 Bar (75 PSI)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
Omit	"D"-Ring / (SK10-2)
N	Nitrile / (SK10-2N)
V	Fluorocarbon / (SK10-2V)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4" NPTF	(B10-2-*4P)
6P	3/8" NPTF	(B10-2-*6P)
8P	1/2" NPTF	(B10-2-*8P)
T8P	1/2" NPTF	(B10-2-T8P)†
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8" BSPG	(B10-2-6B)†

** Add "A" for aluminum, omit for steel.*
† Steel body only.

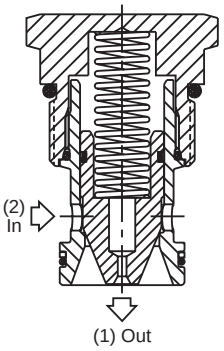
General Description

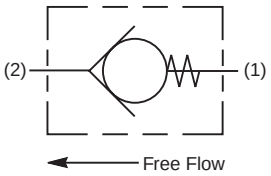
Poppet Type Check Valve. For additional information see Technical Tips on pages CV1-CV4.

Features

- High flow capacity
- Poppet type construction for minimal leakage - less than 3 drops/min.
- Hardened poppet for maximum durability
- Good contamination tolerance
- All external parts zinc plated

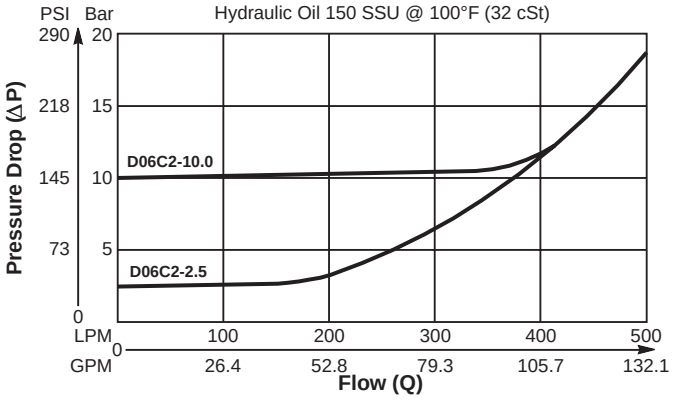




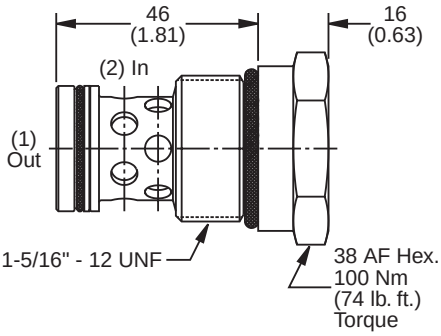


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	500 LPM (132 GPM)
Nominal Flow @ 7 Bar (100 PSI)	300 LPM (79 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Cartridge Material	Steel operating parts, hardened steel poppet.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.26 kg (.57 lbs.)
Cavity	C16-2 (See BC Section for more details)

Ordering Information

D06C2	–			–		
16 Size Check Valve		Cracking Pressure	Seals		Body Material	Port Size

Code	Cracking Pressure
2.5	2.5 Bar (36 PSI) Std.
3.4	3.4 Bar (50 PSI)
6.9	6.9 Bar (100 PSI)
10.0	10.0 Bar (145 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30514N-1)
V	Fluorocarbon / (SK30514V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
12P	3/4″ NPTF	(B16-2-*12P)
16P	1″ NPTF	(B16-2-*16P)
8T	SAE-8	(B16-2-*8T)
12T	SAE-12	(B16-2-*12T)
16T	SAE-16	(B16-2-*16T)
12B	3/4″ BSPG	(B16-2-12B)†
16B	1″ BSPG	(B16-2-*16B)

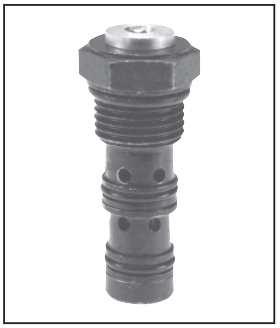
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

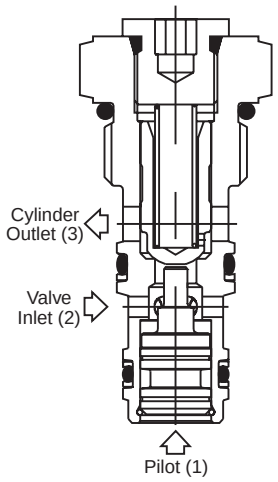
General Description

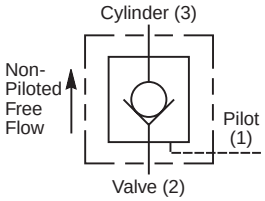
Cartridge Style Pilot Operated Check Valve. For additional information see Technical Tips on pages CV1-CV4.

Features

- Hardened, precision ground parts for durability
- Internal pilot position simplifies manifold design
- All external parts zinc plated

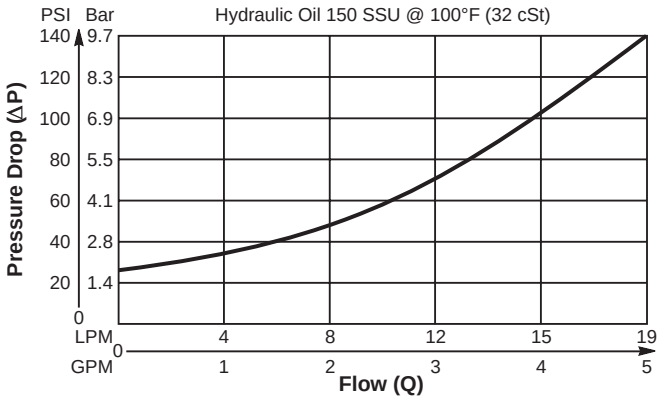






Performance Curve

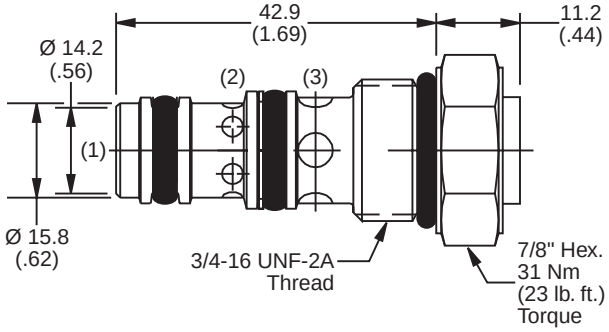
Pressure Drop vs. Flow (Through cartridge only)



Specifications

Rated Flow	19 LPM (5 GPM)
Maximum Inlet Pressure	207 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) at 207 Bar (3000 PSI)
Pilot Ratio	3:1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.05 kg (.11 lbs.)
Cavity	C08-3 (See BC Section for more details)
Form Tool	Rougher NFT08-3R Finisher NFT08-3F

Dimensions Millimeters (Inches)



Ordering Information

CP084P			—		
08 Size P.O. Check Valve	Cracking Pressure	Seals		Body Material	Port Size

Code	Cracking Pressure
Omit	1.7 Bar (25 PSI)
85	5.9 Bar (85 PSI)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
Omit	Nitrile / (SK08-3N)
V	Fluorocarbon / (SK08-3V)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-3-*4P)
4T	SAE-4	(B08-3-*4T)
6T	SAE-6	(B08-3-*6T)
6B	3/8″ BSPG	(B08-3-*6B)

**** Add "A" for aluminum, omit for steel.***

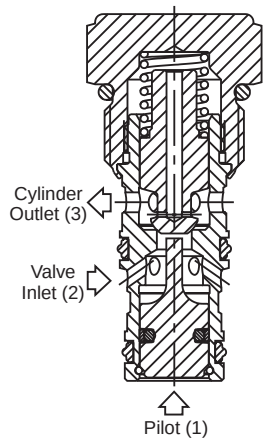
General Description

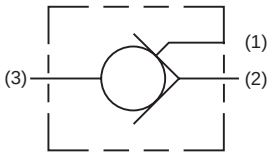
Cartridge Style Pilot Operated Check Valve. For additional information see Technical Tips on pages CV1-CV4.

Features

- Hardened, precision ground parts for durability
- Internal pilot position simplifies manifold design
- All external parts have yellow zinc dichromate. This coating is ideal for salt spray applications.

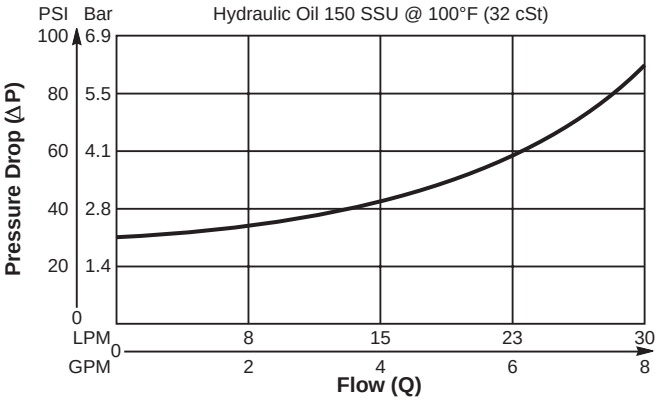




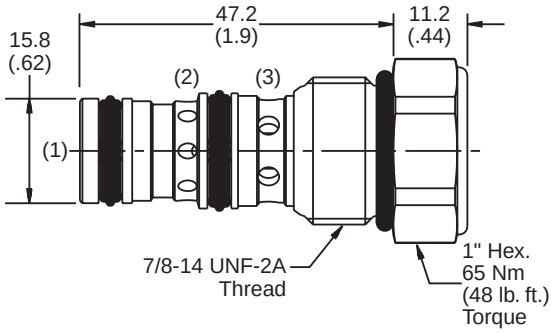


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	30 LPM (8 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) at 350 Bar (5000 PSI)
Pilot Ratio	3:1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.09 kg (0.2 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

Ordering Information

CPH104P			—		
10 Size P.O. Check Valve	Cracking Pressure	Seals		Body Material	Port Size

Code	Cracking Pressure
15	1.0 Bar (15 PSI)
Omit	2.1 Bar (31 PSI)
50	3.5 Bar (50 PSI)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
Omit	Nitrile / (SK10-3N)
V	Fluorocarbon / (SK10-3V)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8B)

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

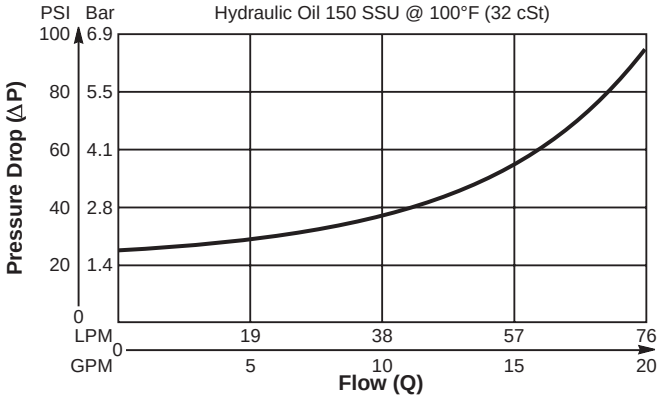
Cartridge Style Pilot Operated Check Valve. For additional information see Technical Tips on pages CV1-CV4.

Features

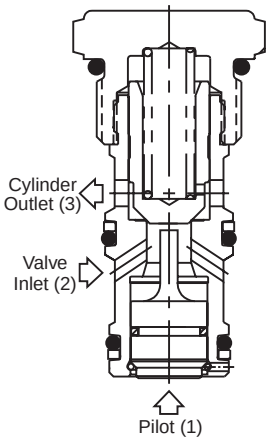
- Hardened, precision ground parts for durability
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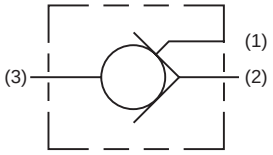
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)

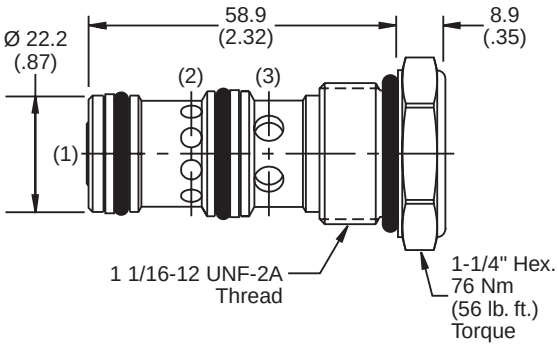








Dimensions Millimeters (Inches)



Specifications

Rated Flow	75 LPM (20 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) at 350 Bar (5000 PSI)
Pilot Ratio	3:1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	0.2 kg (.44 lbs.)
Cavity	C12-3 (See BC Section for more details)
Form Tool	Rougher NFT12-3R Finisher NFT12-3F

Ordering Information

CPH124P			—		
12 Size P.O. Check Valve	Cracking Pressure	Seals		Body Material	Port Size

Code	Cracking Pressure
Omit	1.7 Bar (25 PSI)

Code	Body Material
Omit	Steel
A	Aluminum

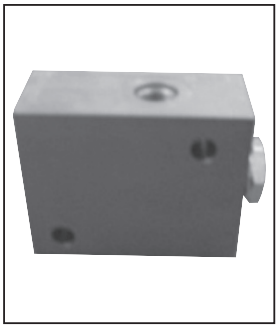
Code	Seals / Kit No.
Omit	Nitrile / (SK12-3)
V	Fluorocarbon / (SK12-3V)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
8T	SAE-8	(B12-3-*8T)
12T	SAE-12	(B12-3-*12T)
8B	1/2" BSPG	(B12-3-8B)†

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

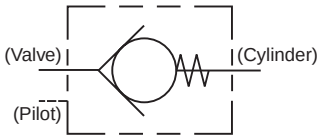
General Description

Single Pilot Operated Check Valve Package.
For additional information see Technical Tips on pages CV1-CV4.



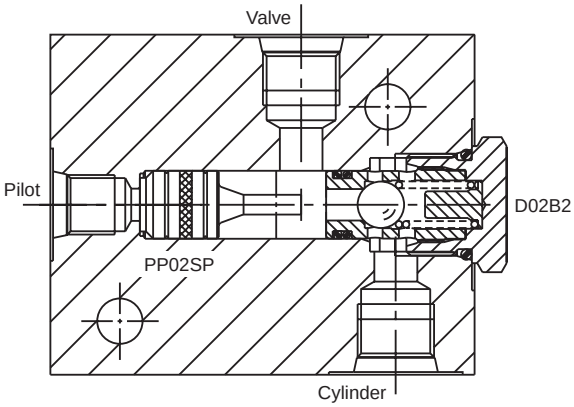
Features

- Uses standard check valve cartridge with separate piston to form a single pilot operated check.
- Cost effective
- Low leakage
- Leak free pilot pistons available - consult factory
- All external parts zinc plated

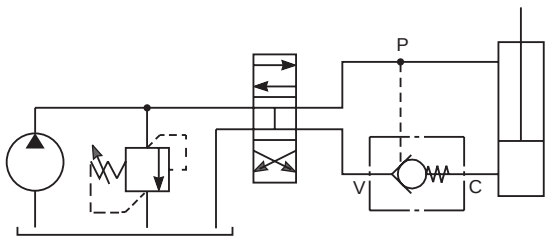


Specifications

Description	**D02B2 -** Check Valve **PP02SP -** Pilot Piston
Rated Flow	40 LPM (11 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Ratio	4:1
Approx. Weight	Aluminum Block Assembly .43 kg (.95 lbs.) Steel Block Assembly 1.13 kg (2.49 lbs.)

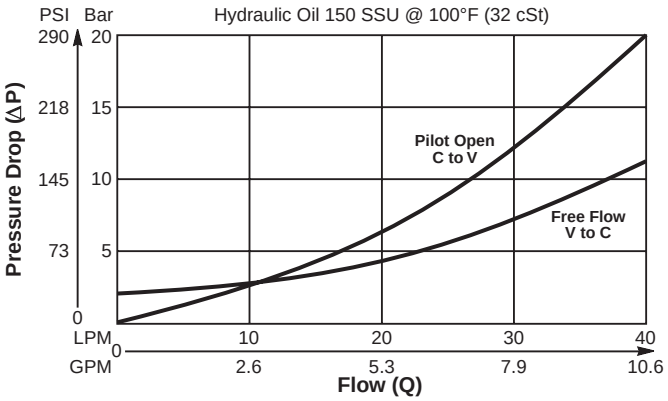


Typical Application

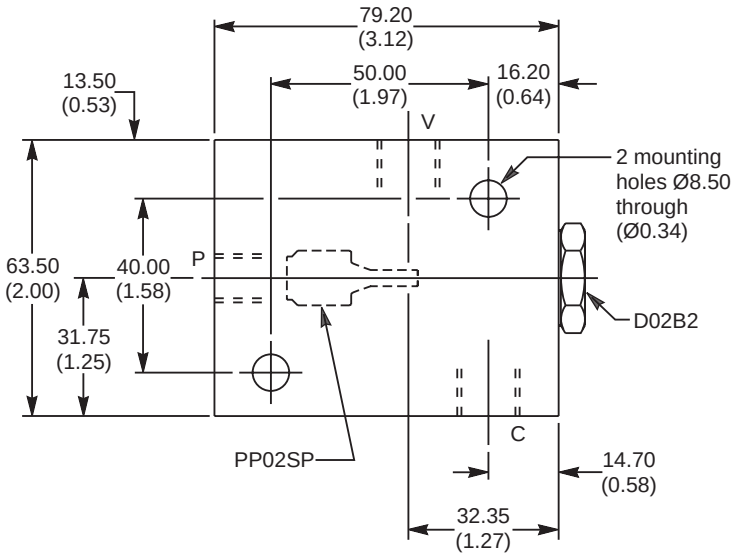


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

PP02SP				
Single P.O. Check Valve Package	Cracking Pressure	Seals	Porting	Body Material

Code	Cracking Pressure
2.1	2.1 Bar (30 PSI)
2.5	2.5 Bar (36 PSI)
3.4	3.4 Bar (50 PSI)
6.0	6.0 Bar (87 PSI)
6.9	6.9 Bar (100 PSI)
10.0	10.0 Bar (145 PSI)
12.5	12.5 Bar (181 PSI)
17.0	17.0 Bar (247 PSI)
20.0	20.0 Bar (290 PSI)
25.0	25.0 Bar (362 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30517N-1)
V	Fluorocarbon / (SK30517V-1)

Code	Porting
770	Main: 3/8″ SAE Aux.: 1/4″ SAE
771	Main: 3/8″ BSP Aux.: 1/4″ BSP

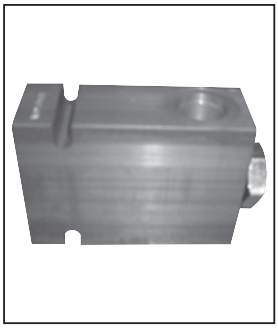
Code	Body Material
A	Aluminum
S	Steel

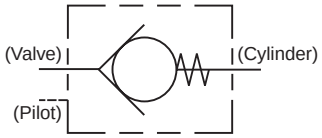
General Description

Single Pilot Operated Check Valve Package.
For additional information see Technical Tips on pages CV1-CV4.

Features

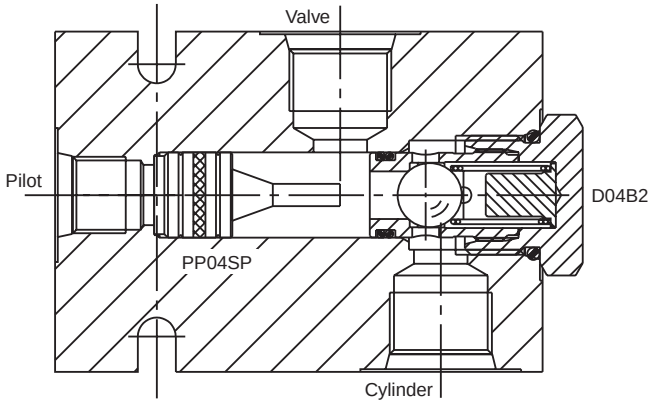
- Uses standard check valve cartridge with separate piston to form a single pilot operated check.
- Cost effective
- Low leakage
- Leak free pilot pistons available - consult factory
- All external parts zinc plated



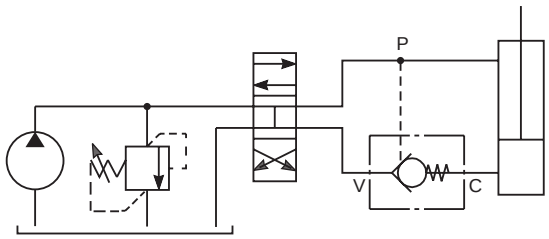


Specifications

Description	**D04B2 -** Check Valve **PP04SP -** Pilot Piston
Rated Flow	135 LPM (36 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Ratio	3:1
Approx. Weight	Aluminum Block Assembly .50 kg (1.1 lbs.) Steel Block Assembly 1.53 kg (3.37 lbs.)

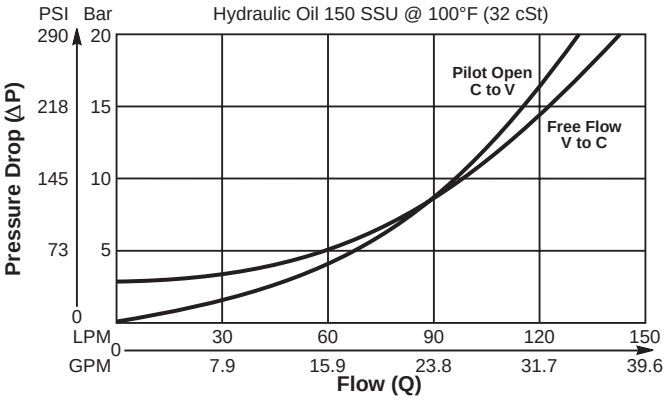


Typical Application

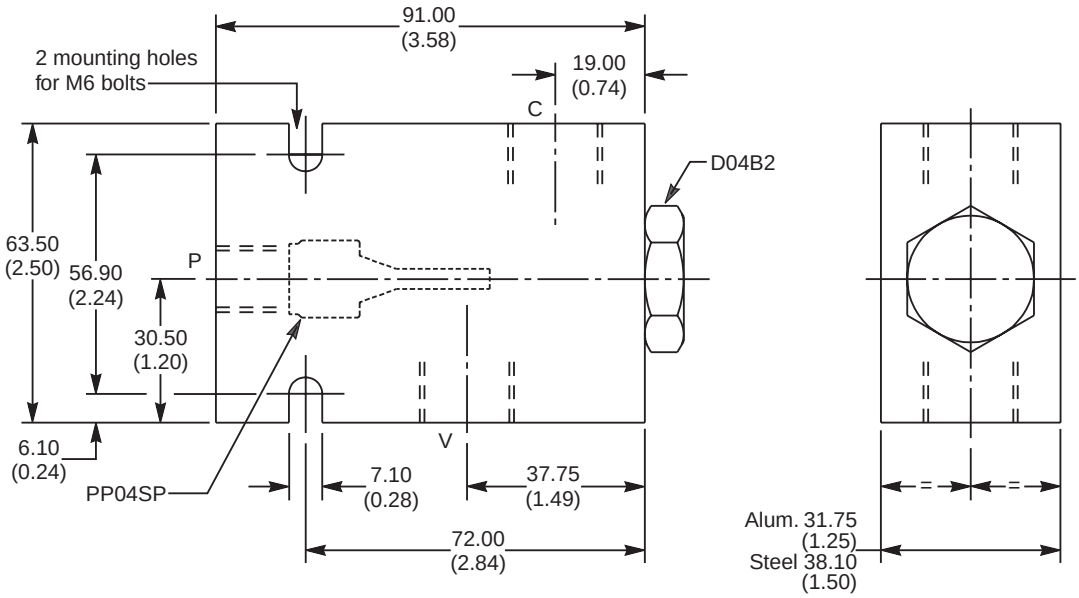


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

PP04SP				
Single P.O. Check Valve Package	Cracking Pressure	Seals	Porting	Body Material

Code	Cracking Pressure
2.1	2.1 Bar (30 PSI)
3.4	3.4 Bar (50 PSI)
6.9	6.9 Bar (100 PSI)
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (217 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30518N-1)
V	Fluorocarbon / (SK30518V-1)

Code	Porting
760	Main: 1/2″ SAE Aux.: 3/8″ SAE
761	Main: 1/2″ BSP Aux.: 1/4″ BSP

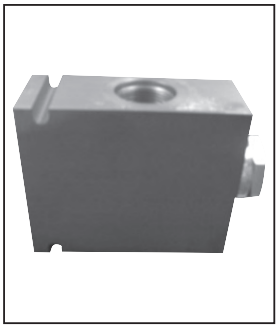
Code	Body Material
A	Aluminum
S	Steel

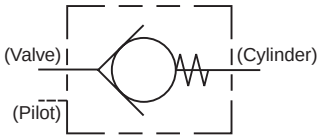
General Description

Single Pilot Operated Check Valve Package.
For additional information see Technical Tips on pages CV1-CV4.

Features

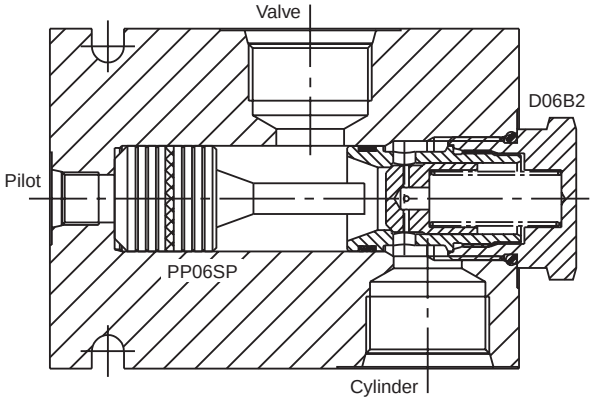
- Uses standard check valve cartridge with separate piston to form a single pilot operated check.
- Cost effective
- Low leakage
- Leak free pilot pistons available - consult factory
- All external parts zinc plated





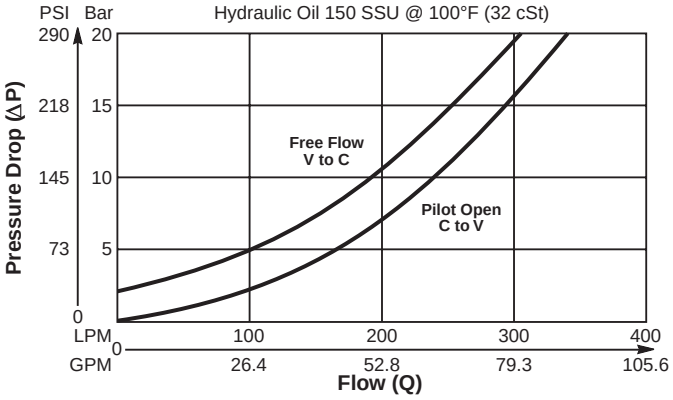
Specifications

Description	**D06B2 -** Check Valve **PP06SP -** Pilot Piston
Rated Flow	340 LPM (90 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Ratio	3:1
Approx. Weight	Aluminum Block Assembly 1.77 kg (3.9 lbs.) Steel Block Assembly 4.56 kg (10.05 lbs.)

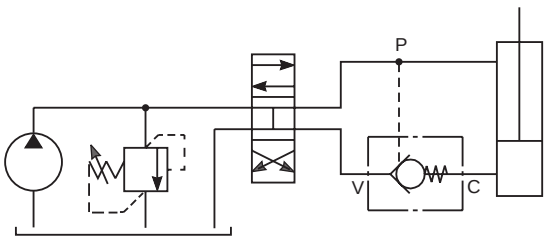


Performance Curve

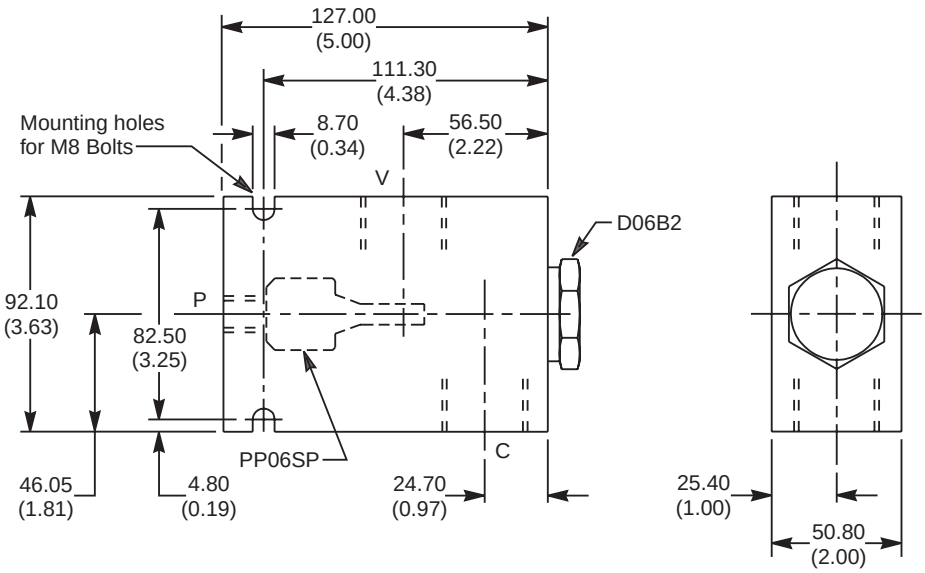
Pressure Drop vs. Flow (Through cartridge only)



Typical Application



Dimensions Millimeters (Inches)



Ordering Information

PP06SP				
Single P.O. Check Valve Package	Cracking Pressure	Seals	Porting	Body Material

Code	Cracking Pressure
2.1	2.1 Bar (30 PSI)
3.4	3.4 Bar (50 PSI)
4.1	4.1 Bar (60 PSI)
7.5	7.5 Bar (109 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30524N-1)
V	Fluorocarbon / (SK30524V-1)

Code	Porting
805	Main: 1″ SAE Aux.: 3/8″ SAE
806	Main: 1″ BSP Aux.: 3/8″ BSP

Code	Body Material
A	Aluminum
S	Steel

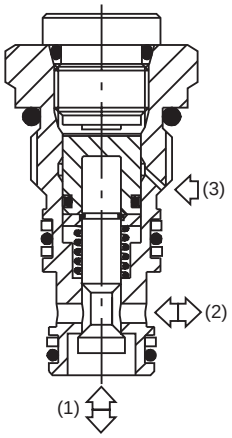
General Description

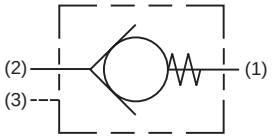
Miniature Pilot to Open, Poppet Type Check Valve. For additional information see Technical Tips on pages CV1-CV4.

Features

- Hardened poppet for maximum durability
- Low leakage - less than 3 drops/min.
- Sealed pilot
- Extremely compact construction - can be fitted directly into most cylinders
- Cavity commonality with load control valves
- Dual line blocks available
- All external parts zinc plated

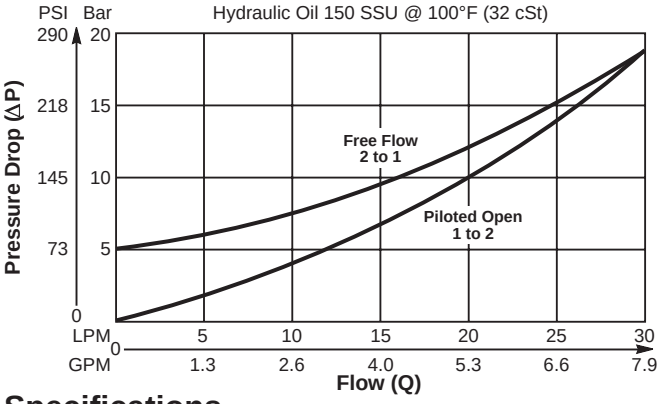






Performance Curve

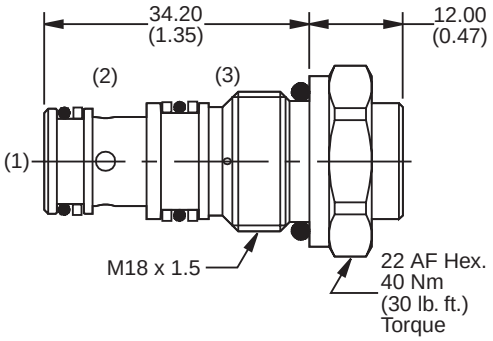
Pressure Drop vs. Flow (Through cartridge only)



Specifications

Rated Flow	30 LPM (8 GPM)
Nominal Flow @ 7 Bar (100 PSI)	16 LPM (4.2 GPM) (Piloted Open)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Cracking Pressure	5 Bar (72 PSI)
Pilot Ratio	4:1
Cartridge Material	Steel operating parts, hardened steel poppet.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.066 kg (.145 lbs.)
Cavity	53-1 (See BC Section for more details)

Dimensions Millimeters (Inches)



Ordering Information

D4A020 | [ ] | [ ]

Check Valve | **Seals**

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30090N-1)
V	Fluorocarbon / (SK30090V-1)

Order Bodies Separately

LB10 | [ ] | [ ]

Line Body | **Porting** | **Body Material**

Code	Porting
310	3/8″ BSP (Main) 1/4″ BSP (Aux.)
318	3/8″ SAE (Main) 1/4″ SAE (Aux.)
312	3/8″ BSP Dual Cavity
319	3/8″ SAE Dual Cavity

Code	Body Material
A	Aluminum
S	Steel

General Description

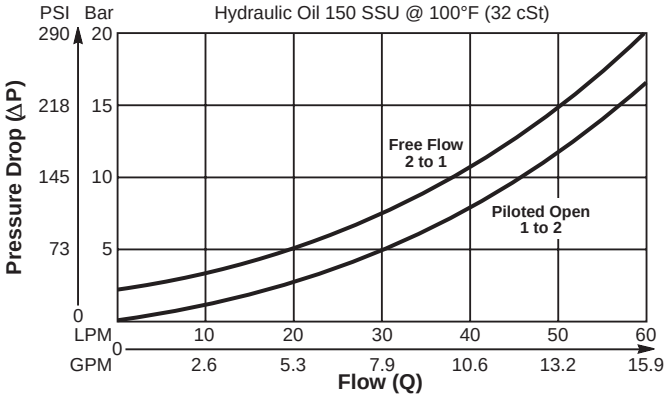
Pilot to Open, Poppet Type Check Valve. For additional information see Technical Tips on pages CV1-CV4.

Features

- Hardened poppet for maximum durability
- High flow capacity
- Low leakage - less than 3 drops/min.
- Sealed pilot
- Good contamination tolerance
- Cavity commonality with load control valves
- Dual line blocks available
- All external parts zinc plated

Performance Curve

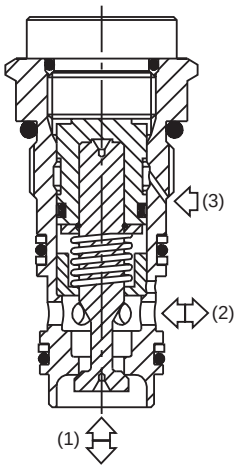
Pressure Drop vs. Flow (Through cartridge only)

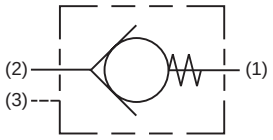


Specifications

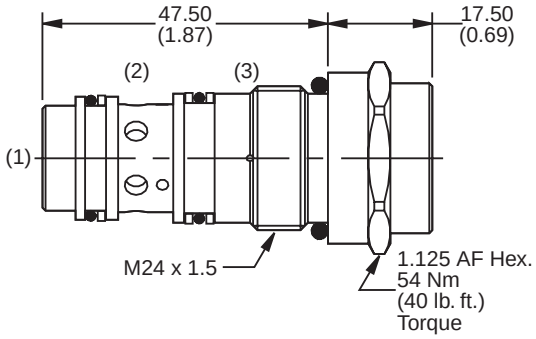
Rated Flow	60 LPM (16 GPM)
Nominal Flow @ 7 Bar (100 PSI)	32 LPM (8.5 GPM) (Piloted Open)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Cracking Pressure	3 Bar (43.5 PSI)
Pilot Ratio	4:1
Cartridge Material	Steel operating parts, hardened steel poppet.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.15 kg (.33 lbs.)
Cavity	68-1 (See BC Section for more details)







Dimensions Millimeters (Inches)



Ordering Information

D4A040 | | **Seals**

Check Valve

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30059N-1)
V	Fluorocarbon / (SK30059V-1)

Order Bodies Separately

LB10 | | | **Line Body** | **Porting** | **Body Material**

Code	Porting
251	1/2″ BSP (Main) 1/4″ BSP (Aux.)
253	1/2″ SAE (Main) 1/4″ SAE (Aux.)
259	1/2″ BSP Dual Cavity
261	1/2″ SAE Dual Cavity

Code	Body Material
A	Aluminum
S	Steel

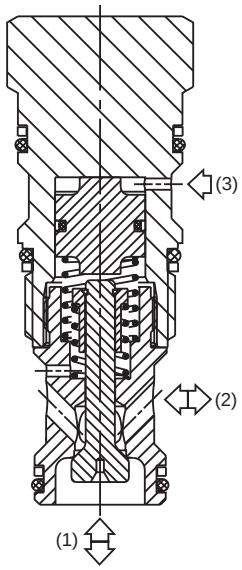
General Description

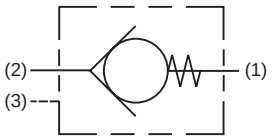
Pilot to Open, Poppet Type Check Valve. For additional information see Technical Tips on pages CV1-CV4.

Features

- Hardened poppet for maximum durability
- High flow capacity
- Low leakage - less than 3 drops/min.
- Sealed pilot, (optional)
- Good contamination tolerance
- Cavity commonality with load control valves
- Dual line blocks available
- All external parts zinc plated

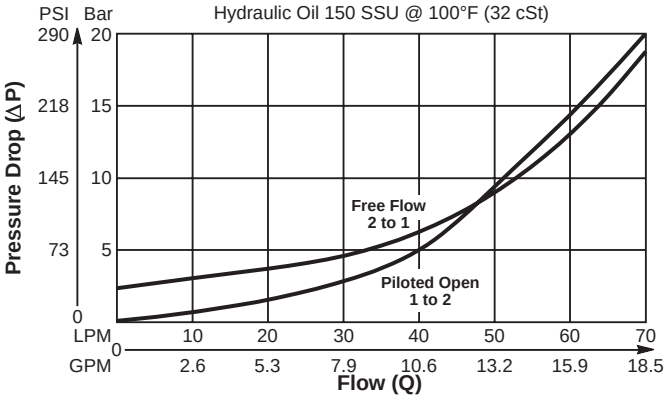






Performance Curve

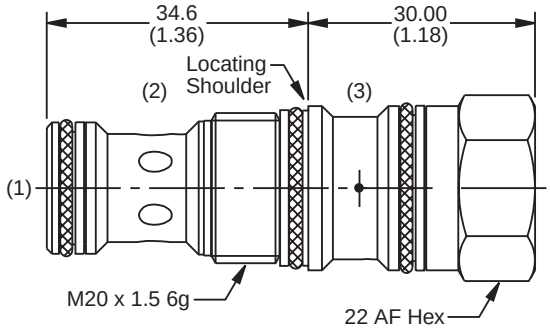
Pressure Drop vs. Flow (Through cartridge only)



Specifications

Rated Flow	70 LPM (18.5 GPM)
Nominal Flow @ 7 Bar (100 PSI)	45 LPM (11.9 GPM) (Piloted Open)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Pilot Ratio	3:1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.31 lbs.)
Cavity	CAVT11A (See BC Section for more details)

Dimensions Millimeters (Inches)



Ordering Information

D2K1	–			
Check Valve		Cracking Pressure	Seals	Sealed Pilot

Code	Cracking Pressure
0.3	0.3 Bar (4 PSI)
2.1	2.1 Bar (30 PSI) Std.
5.2	5.2 Bar (75 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30700N-1)
V	Fluorocarbon / (SK30700V-1)

Code	Sealed Pilot
S	Sealed Pilot (Omit if not required)

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
826	1/2″ BSP (Main) 1/4″ BSP (Aux.)
825	1/2″ SAE (Main) 1/4″ SAE (Aux.)
828	1/2″ BSP Dual Cavity
827	1/2″ SAE Dual Cavity

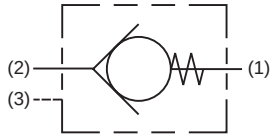
Code	Body Material
A	Aluminum
S	Steel

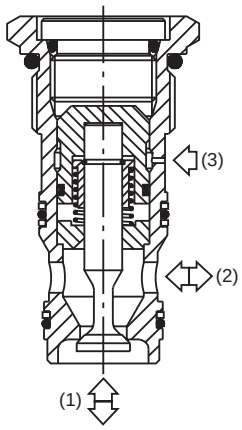
General Description

Pilot to Open, Poppet Type Check Valve. For additional information see Technical Tips on pages CV1-CV4.

Features

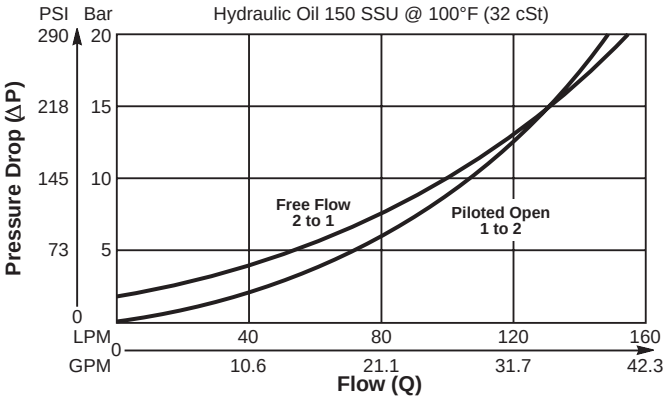
- Hardened poppet for maximum durability
- High flow capacity
- Low leakage - less than 3 drops/min.
- Sealed pilot
- Good contamination tolerance
- Cavity commonality with load control valves
- Dual line blocks available
- All external parts zinc plated





Performance Curve

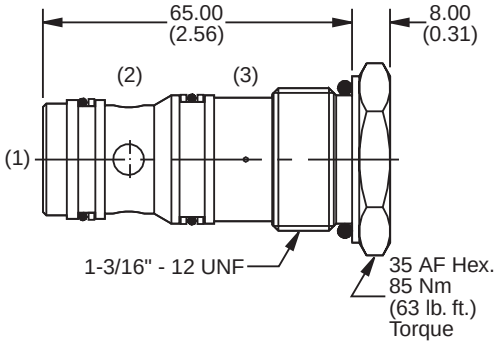
Pressure Drop vs. Flow (Through cartridge only)



Specifications

Rated Flow	150 LPM (40 GPM)
Nominal Flow @ 7 Bar (100 PSI)	80 LPM (21 GPM) (Piloted Open)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Cracking Pressure	2 Bar (30 PSI)
Pilot Ratio	4:1
Cartridge Material	Steel operating parts, hardened steel poppet.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.24 kg (.528 lbs.)
Cavity	3C (See BC Section for more details)

Dimensions Millimeters (Inches)



Ordering Information

D3B125 | | |

Check Valve | **Seals**

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30008N-1)
V	Fluorocarbon / (SK30008V-1)

Order Bodies Separately

LB10 | | |

Line Body | **Porting** | **Body Material**

Code	Porting
039	3/4″ BSP (Main) 1/4″ BSP (Aux.)
069	1″ SAE (Main) 1/4″ SAE (Aux.)
034	3/4″ BSP Dual Cavity
234	3/4″ SAE Dual Cavity

Code	Body Material
A	Aluminum
S	Steel

General Description

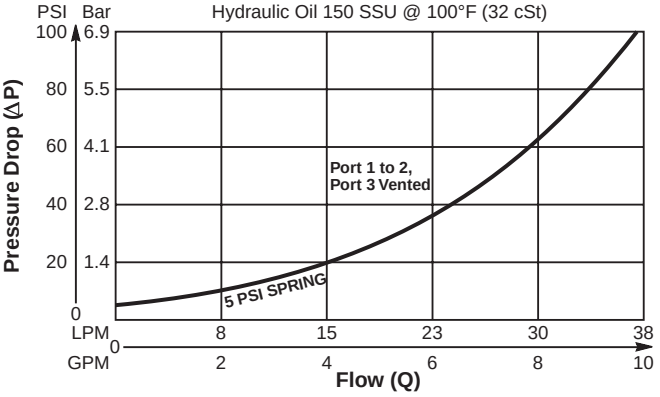
Pilot to Close Check Valve. For additional information see Technical Tips on pages CV1-CV4.

Features

- Hardened, precision ground parts for durability
- Fully guided poppet for smooth operation
- All external parts zinc plated

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)

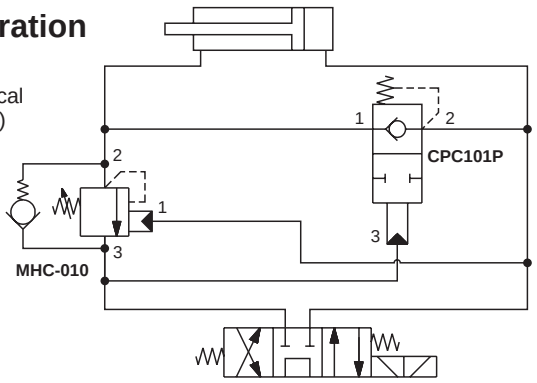


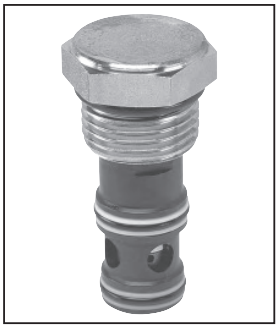
Specifications

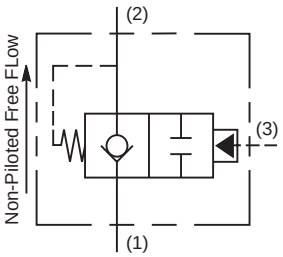
Rated Flow	38 LPM (10 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage at 150 SSU (32 cSt)	15 drops/min. (.99 cc/min.) at 240 Bar (3500 PSI)
Pilot Ratio	2:1
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Approx. Weight	.14 kg (0.31 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

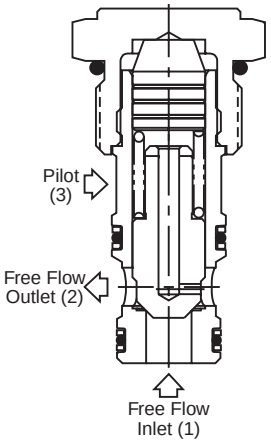
Regeneration Circuit

(See Technical Tips Section)

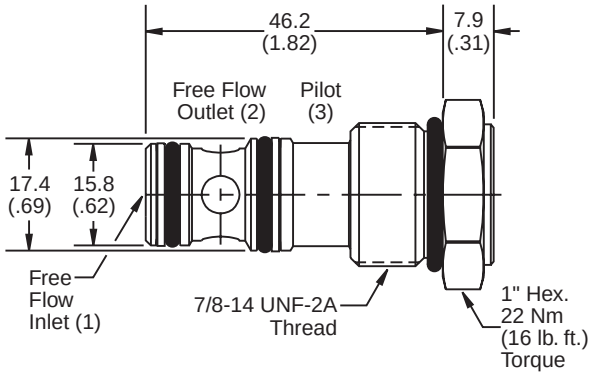








Dimensions Millimeters (Inches)



Ordering Information

CPC101P			—		
10 Size Pilot to Close Check Valve	Cracking Pressure	Seals		Body Material	Port Size

Code	Cracking Pressure
Omit	0.3 Bar (5 PSI)
50	3.5 Bar (50 PSI)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
Omit	Nitrile / (SK10-3)
V	Fluorocarbon / (SK10-3V)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8B)

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

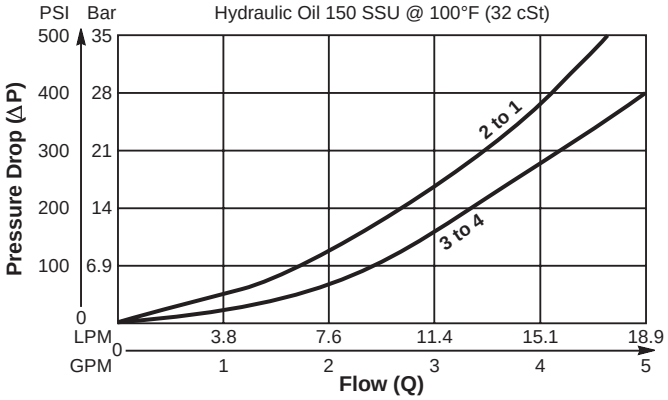
Cartridge Style Dual Pilot Operated Check Valve. For additional information see Technical Tips on pages CV1-CV4.

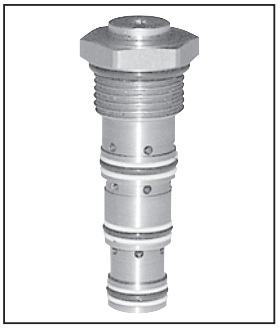
Features

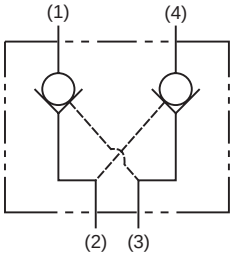
- Hardened, precision ground parts for durability
- Cost effective-replaces two cartridges
- Internal pilot position
- Common cavity
- All external parts zinc plated

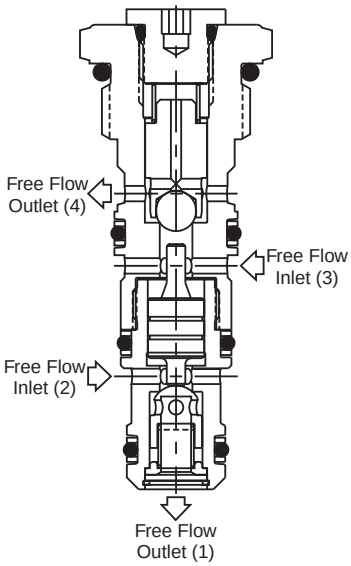
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)

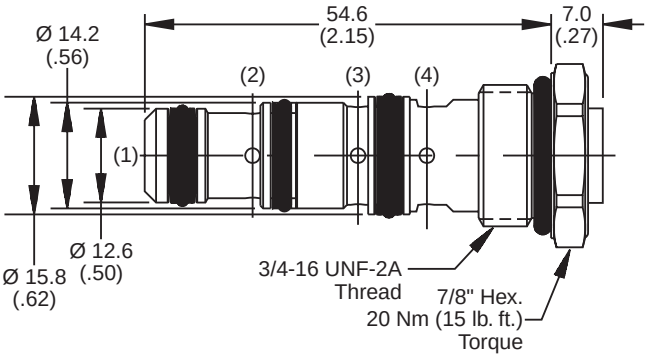








Dimensions Millimeters (Inches)



Specifications

Rated Flow	19 LPM (5 GPM)
Maximum Inlet Pressure	207 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) at 207 Bar (3000 PSI)
Pilot Ratio	3:1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.05 kg (.11 lbs.)
Cavity	C08-4 (See BC Section for more details)
Form Tool	Rougher NFT08-4R Finisher NFT08-4F

Ordering Information

CPD084P		—		
08 Size Dual P.O. Check Valve	Seals		Body Material	Port Size

Code	Seals / Kit No.
Omit	Nitrile / (SK08-4N)
V	Fluorocarbon / (SK08-4V)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4T	SAE-4	(B08-4-*4T)
6T	SAE-6	(B08-4-*6T)
6B	3/8″ BSPG	(B08-4-*6B)

**** Add "A" for aluminum, omit for steel.***

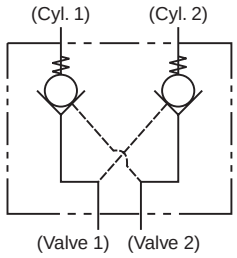
General Description

Dual Pilot Operated Check Valve Package.
For additional information see Technical Tips on pages CV1-CV4.

Features

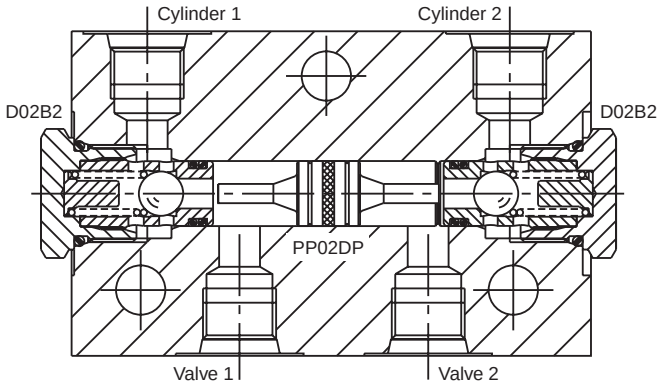
- Uses standard check valve cartridge with separate piston to form a dual pilot operated check.
- Cost effective
- Low leakage
- Leak free pilot pistons available - consult factory
- All external parts zinc plated



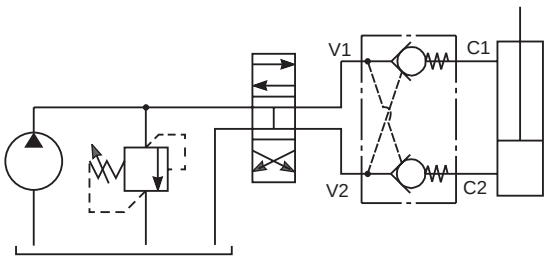


Specifications

Description	**D02B2 -** Check Valve **PP02DP -** Pilot Piston
Rated Flow	40 LPM (11 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Ratio	4:1
Approx. Weight	Aluminum Block Assembly .55 kg (1.21 lbs.) Steel Block Assembly 1.38 kg (3.04 lbs.)

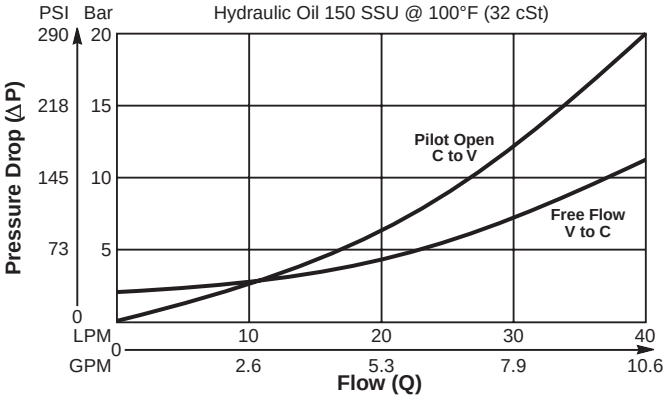


Typical Application

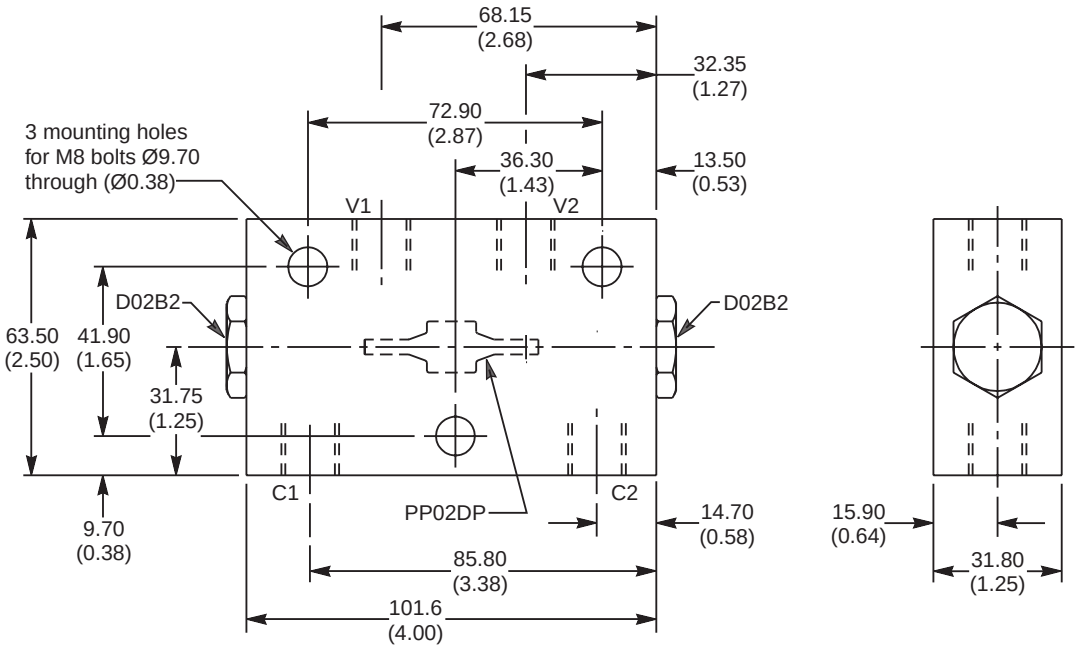


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

PP02DP				
Dual P.O. Check Valve Package	Cracking Pressure	Seals	Porting	Body Material

Code	Cracking Pressure
2.1	2.1 Bar (30 PSI)
2.5	2.5 Bar (36 PSI)
3.4	3.4 Bar (50 PSI)
6.0	6.0 Bar (87 PSI)
6.9	6.9 Bar (100 PSI)
10.0	10.0 Bar (145 PSI)
12.5	12.5 Bar (181 PSI)
17.0	17.0 Bar (247 PSI)
20.0	20.0 Bar (290 PSI)
25.0	25.0 Bar (362 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30517N-1)
V	Fluorocarbon / (SK30517V-1)

Code	Porting
775	Main: 3/8″ SAE
776	Main: 3/8″ BSP

Code	Body Material
A	Aluminum
S	Steel

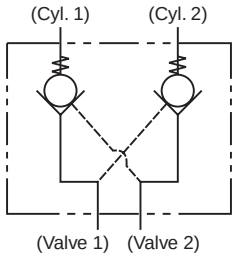
General Description

Dual Pilot Operated Check Valve Package.
For additional information see Technical Tips on pages CV1-CV4.



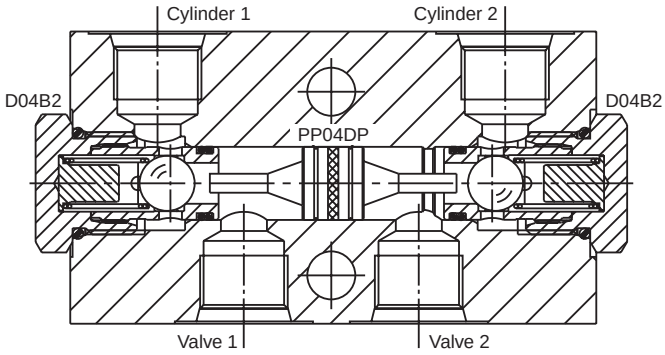
Features

- Uses standard check valve cartridge with separate piston to form a dual pilot operated check.
- Cost effective
- Low leakage
- Leak free pilot pistons available - consult factory
- All external parts zinc plated

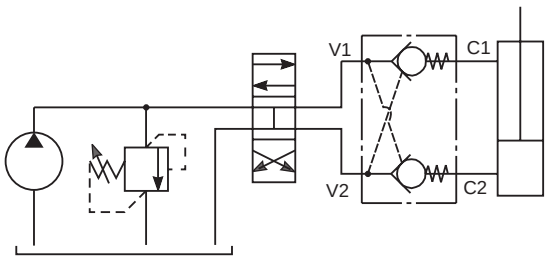


Specifications

Description	**D04B2 -** Check Valve **PP04DP -** Pilot Piston
Rated Flow	135 LPM (36 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Ratio	3:1
Approx. Weight	Aluminum Block Assembly .65 kg (1.43 lbs.) Steel Block Assembly 1.89 kg (4.17 lbs.)

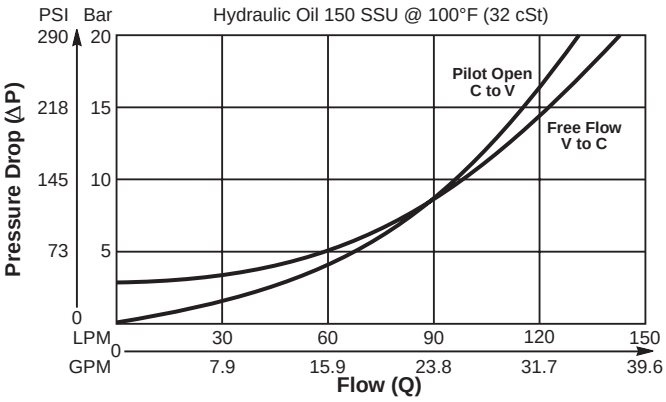


Typical Application

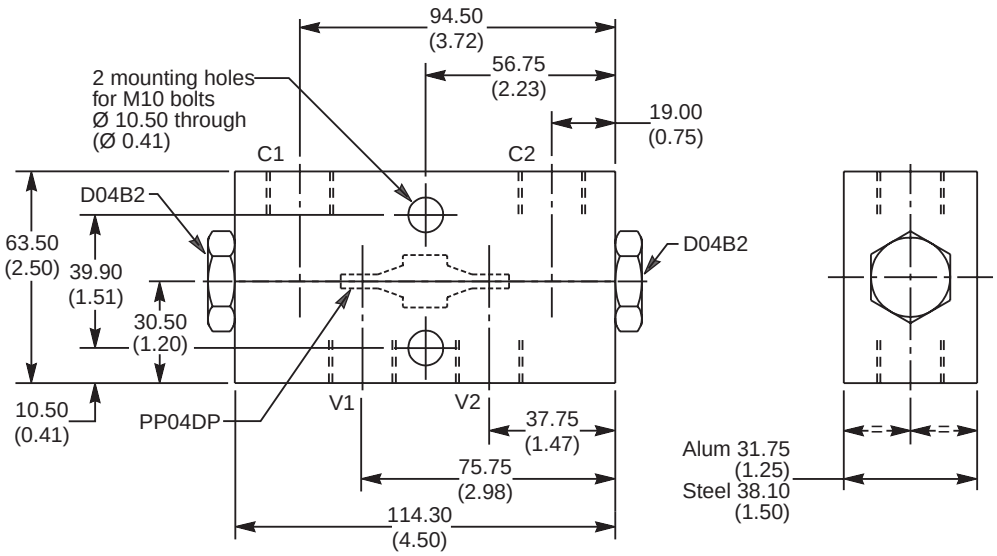


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

PP04DP				
Dual P.O. Check Valve Package	Cracking Pressure	Seals	Porting	Body Material

Code	Cracking Pressure
2.1	2.1 Bar (30 PSI)
3.4	3.4 Bar (50 PSI)
6.9	6.9 Bar (100 PSI)
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (217 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30518N-1)
V	Fluorocarbon / (SK30518V-1)

Code	Porting
765	Main: 1/2″ SAE
766	Main: 1/2″ BSP

Code	Body Material
A	Aluminum
S	Steel

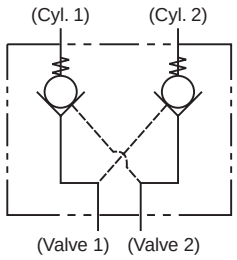
General Description

Dual Pilot Operated Check Valve Package.
For additional information see Technical Tips on pages CV1-CV4.



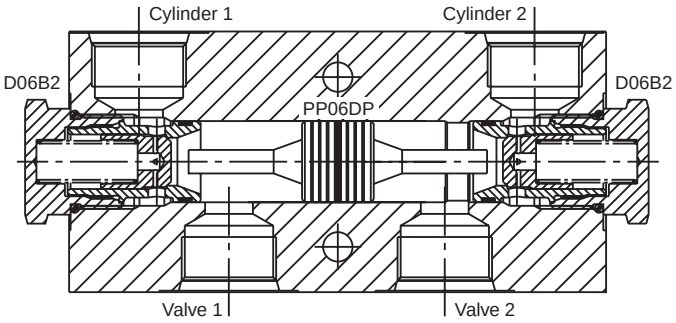
Features

- Uses standard check valve cartridge with separate piston to form a dual pilot operated check.
- Cost effective
- Low leakage
- Leak free pilot pistons available - consult factory
- All external parts zinc plated

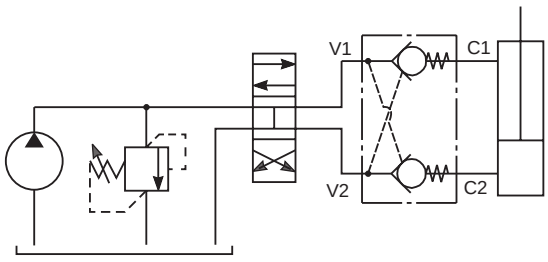


Specifications

Description	**D06B2 -** Check Valve **PP06DP -** Pilot Piston
Rated Flow	340 LPM (90 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Ratio	3:1
Approx. Weight	Aluminum Block Assembly 2.71 kg (6.0 lbs.) Steel Block Assembly 6.82 kg (15.04 lbs.)

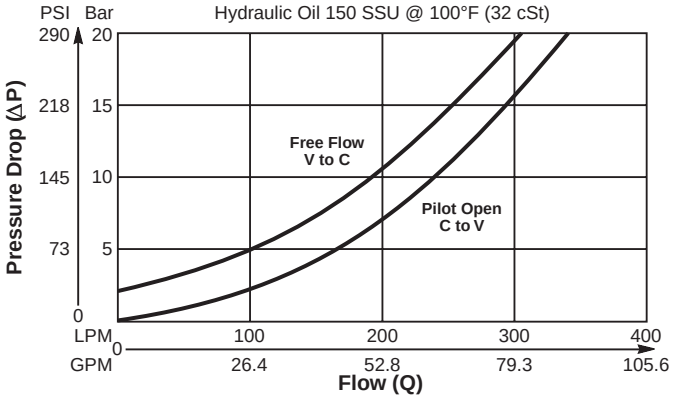


Typical Application

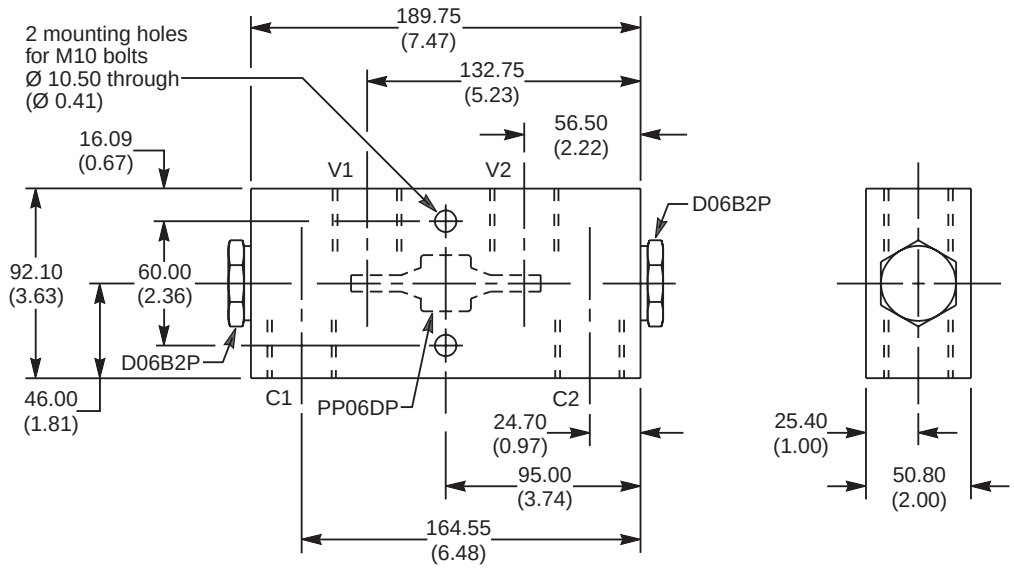


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

PP06DP				
Dual P.O. Check Valve Package	Cracking Pressure	Seals	Porting	Body Material

Code	Cracking Pressure
2.1	2.1 Bar (30 PSI)
3.4	3.4 Bar (50 PSI)
4.1	4.1 Bar (60 PSI)
7.5	7.5 Bar (109 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30524N-1)
V	Fluorocarbon / (SK30524V-1)

Code	Porting
810	Main: 1″ SAE
811	Main: 1″ BSP

Code	Body Material
A	Aluminum
S	Steel

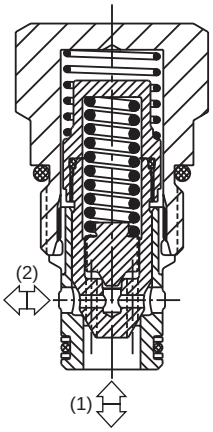
General Description

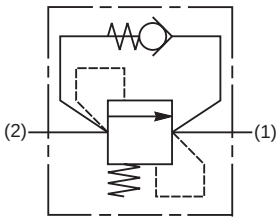
Poppet Type Check Valve with Relief Feature.
For additional information see Technical Tips on pages CV1-CV4.

Features

- Poppet type for minimal leakage - less than 3 drops/min.
- Relief feature to give thermal and shock relief protection
- Compact space saving design
- Hardened working parts for maximum durability
- Single and dual pilot pistons available to create pilot to open check
- Good contamination tolerance
- All external parts zinc plated

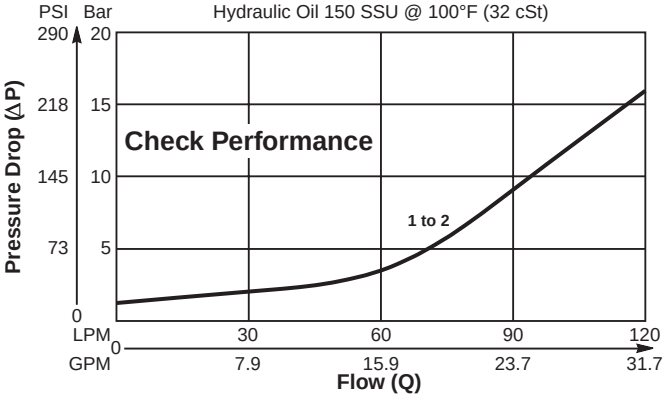






Performance Curve

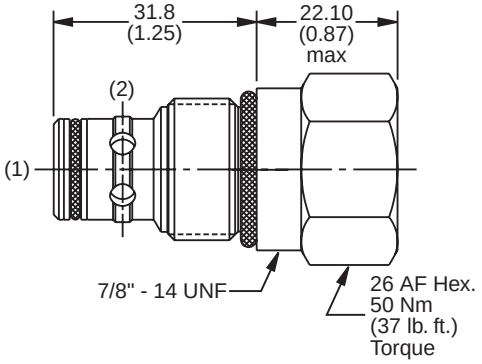
Pressure Drop vs. Flow (Through cartridge only)



Specifications

Rated Flow	130 LPM (40 GPM)
Nominal Flow @ 7 Bar (100 PSI)	72 LPM (19 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.13 kg (.29 lbs.)
Cavity	C10-2 (See BC Section for more details)

Dimensions Millimeters (Inches)



Ordering Information

D04F2	–		–			–		
Check Valve		Cracking Pressure (Check)		Cracking Pressure (Relief)		Seals	Body Material	Port Size

Code	Cracking Pressure (Check)
2.5	2.5 Bar (36 PSI)
7.0	7.0 Bar (102 PSI)

Code	Cracking Pressure (Relief)
35	35 Bar (507 PSI)
245	245 Bar (3553 PSI)
276	276 Bar (4000 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30503N-1)
V	Fluorocarbon / (SK30503V-1)

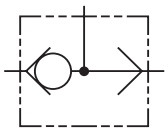
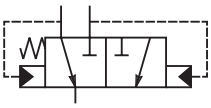
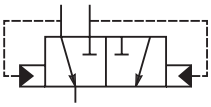
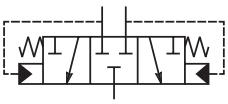
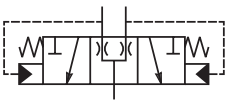
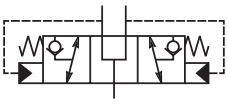
Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

Contents

Shuttle Valves

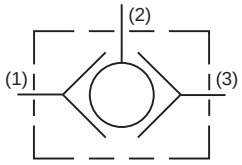
	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
	KSWA3	SW-3	Ball Insert Type	9.5/2.5	420/6000	SH3
	K2A005	3Z	Poppet Insert Type	38/10	350/5000	SH4
	CS041B	C04-3	Cartridge Shuttle	3.8/1.0	207/3000	SH5
	K02A3	C08-3	Cartridge Shuttle	50/13	420/6000	SH6
	CSH101B	C10-3	Cartridge Shuttle	38/10	350/5000	SH7
	ASH-04		In-Line Shuttle,-4 Male JIC	11/3	207/3000	SH8-SH9
	ASH-06		In-Line Shuttle,-6T	22/6	207/3000	SH8-SH9
	K04B3	C10-3	Spool Type Shuttle	90/24	420/6000	SH10
	K04D3	C10-3	Spool Type Shuttle	90/24	420/6000	SH11
	K04C3	C10-4	Spool Type, Spring Centered, All Ports Closed	100/26	420/6000	SH12
	K3A125	3J	Spool Type, Spring Centered, All Ports Closed	175/46	350/5000	SH13
	K04F3	C10-4	Spool Type, Spring Centered, All Ports Open	100/26	420/6000	SH14
	K04G3	C10-4	Spool Type Shuttle, Inverse	50/13	350/5000	SH15

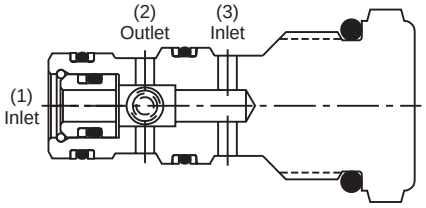
INTRODUCTION:

Shuttle valves accept flow from two different sources and divert the highest pressure to a single outlet port. Shuttle valves are commonly used in Load Sensing circuits as well as Brake circuits. Parker offers many different types of shuttles, including ball type, poppet type, spool type. There are a number of configurations available such as cartridge type, insert type, and an in-line version.

Ball Type - Cartridge Style

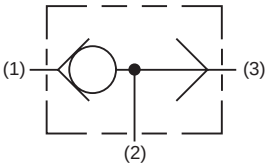
The valve consists of a steel ball that can seal against one of two adjacent seats, providing a path from the highest pressure signal to another function. When one inlet port is pressurized, the ball or poppet is forced against the opposite seat, blocking that inlet and providing a flow path to the outlet port.

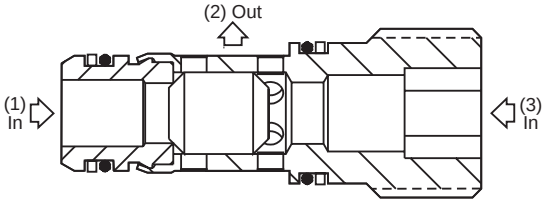




Poppet Type - Insert Style

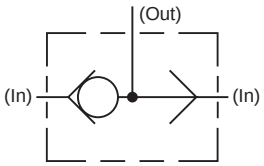
This shuttle performs the same function, but allows for higher flow rates due to poppet design.

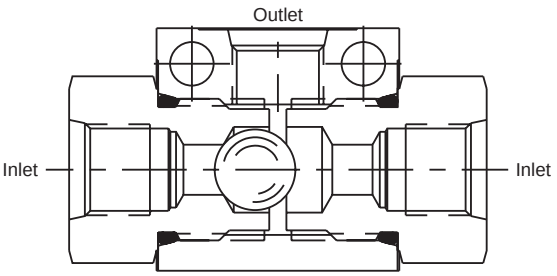




In-Line Type

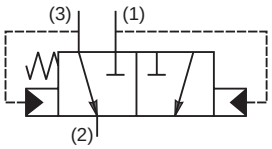
This shuttle variant performs the same function in a self-contained body. It can be mounted anywhere on the machine.

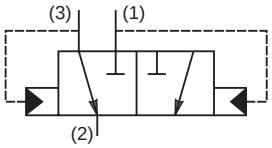


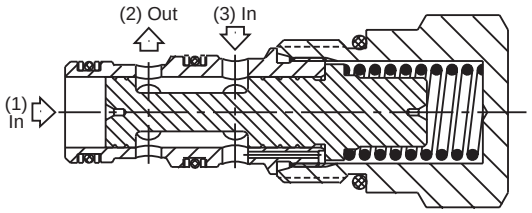


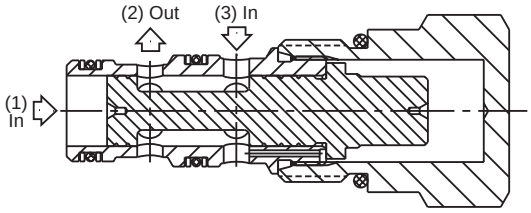
Spool Type - Centered or Spring Offset

The spool type shuttle allows for higher flow rates. These are 2 position valves.

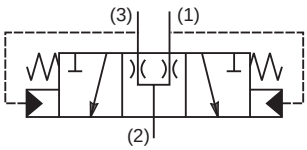


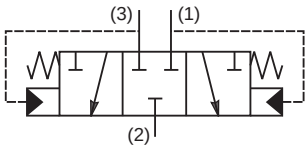


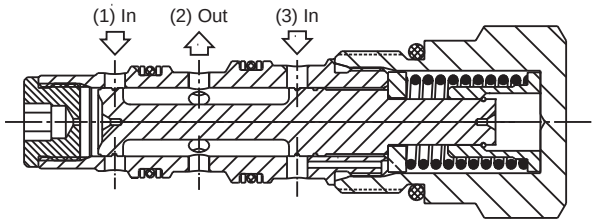


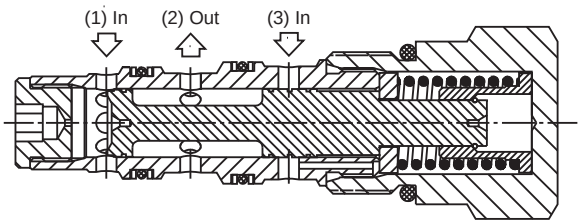


3 Way 2 Position Spool type shuttles are designed to direct flow in such a way as to allow higher pressure signals to open the lower pressure port and connect it to the common outlet port. These spring centered valves will shift when pressure at either end of the spool exceed the spring setting. These are typically used in transmission hot oil shuttle circuits.









Notes

General Description

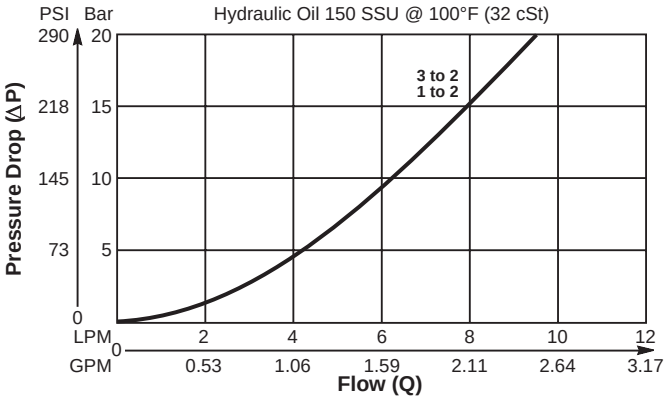
Ball Type, Two Position, Three Way Shuttle Valve. For additional information see Technical Tips on pages SH1-SH2.

Features

- Compact, cost effective design
- Ball type construction for maximum durability
- Minimal leakage - less than 3 drops/min.
- Contamination tolerant
- Hardened working parts for maximum durability
- All external parts zinc plated

Performance Curve

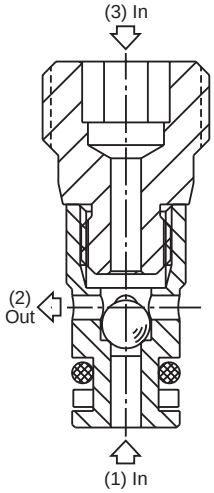
Pressure Drop vs. Flow (Through cartridge only)

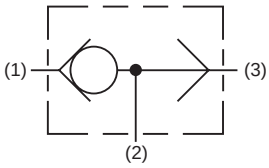


Specifications

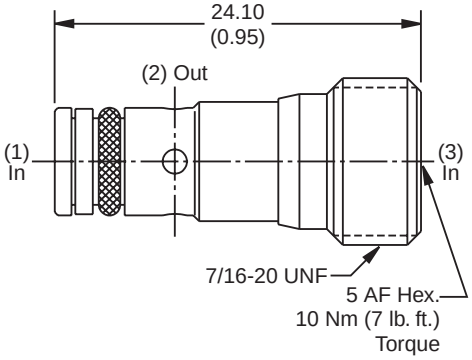
Rated Flow	9.5 LPM (2.5 GPM)
Nominal Flow @ 7 Bar (100 PSI)	5 LPM (1.32 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.01 kg (.02 lbs.)
Cavity	CAVSW-3 (See BC Section for more details)



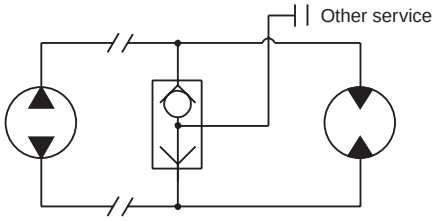




Dimensions Millimeters (Inches)



Application



Selects highest pressure from either line.

Ordering Information

KSWA3 (Shuttle Valve) | ☐ (Seals)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30523N-1)
V	Fluorocarbon / (SK30523V-1)

Order Bodies Separately

LB10 (Line Body) | ☐ (Porting) | ☐ (Body Material)

Code	Porting
815	1/4″ SAE
816	1/4″ BSP

Code	Body Material
A	Aluminum
S	Steel

General Description

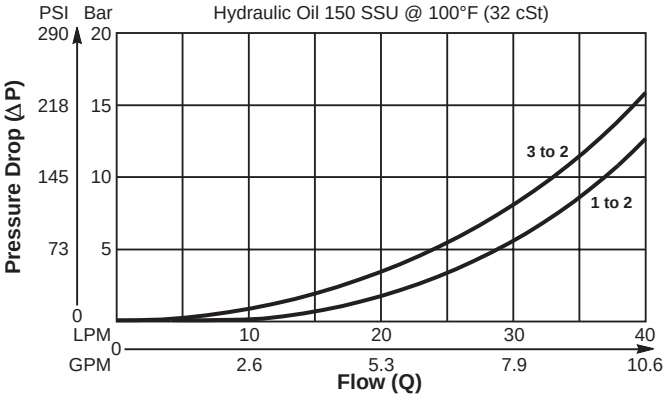
Poppet Type, Two Position, Three Way Shuttle Valve. For additional information see Technical Tips on pages SH1-SH2.

Features

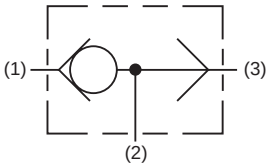
- High flow capacity
- Compact cost effective design
- Poppet type construction for minimal leakage
- Contamination tolerant
- All external parts zinc plated

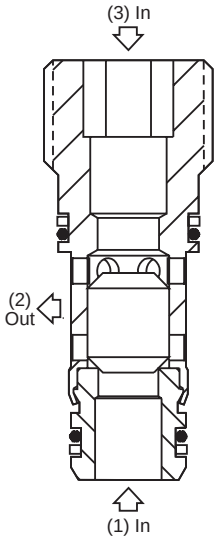
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)

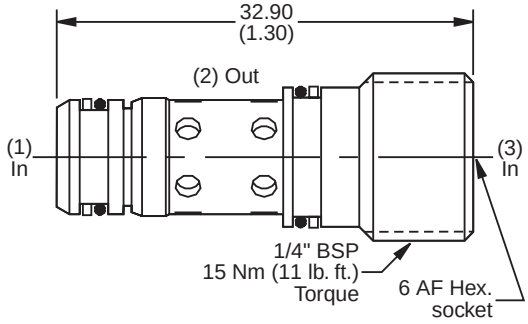








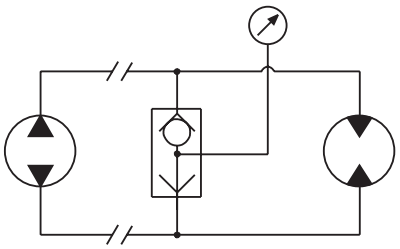
Dimensions Millimeters (Inches)



Specifications

Rated Flow	38 LPM (10 GPM)
Nominal Flow @ 7 Bar (100 PSI)	28 LPM (7.4 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Cartridge Material	Steel operating parts, hardened steel poppet.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.02 kg (.04 lbs.)
Cavity	3Z (See BC Section for more details)

Application



Selects highest pressure from either line.

Ordering Information

K2A005		
Shuttle Valve	Seals	

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30091N-1)
V	Fluorocarbon / (SK30091V-1)

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
313	1/4″ BSP
320	1/4″ SAE

Code	Body Material
A	Aluminum
S	Steel

General Description

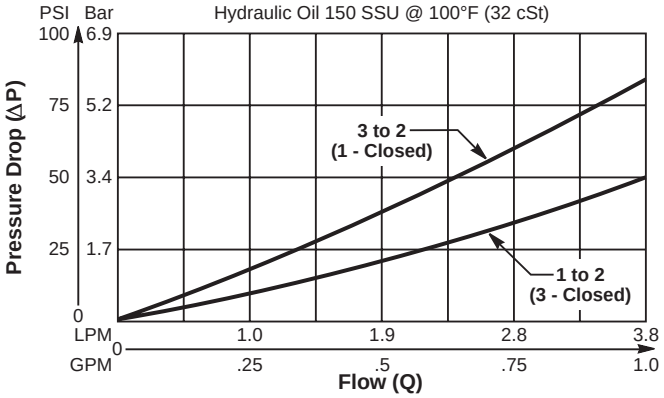
Cartridge Style Shuttle Valve. For additional information see Technical Tips on pages SH1-SH2.

Features

- Hardened, precision ground parts for durability
- Rapid response to load direction changes
- All external parts zinc plated

Performance Curve

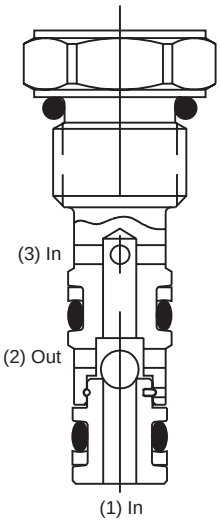
Pressure Drop vs. Flow (Through cartridge only)

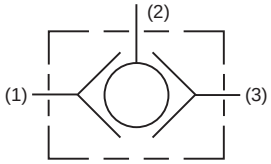


Specifications

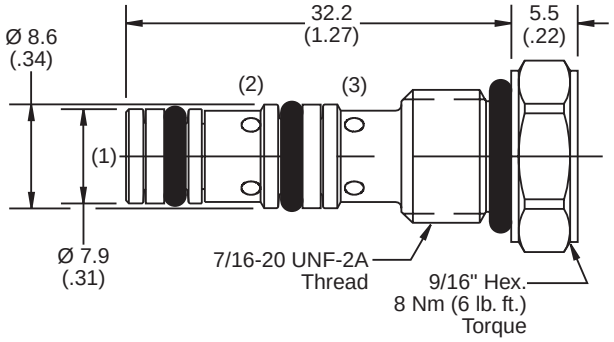
Rated Flow	3.8 LPM (1 GPM)
Nominal Flow @ 7 Bar (100 PSI)	
Maximum Inlet Pressure	207 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) at 207 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.02 kg (.04 lbs.)
Cavity	C04-3 (See BC Section for more details)
Form Tool	Rougher NFT04-3R Finisher NFT04-3F







Dimensions Millimeters (Inches)



Ordering Information

CS041B		—	
04 Size Shuttle Valve	Seals		Port Size

Code	Seals / Kit No.
Omit	Ntrile / (SK03-3)
V	Fluorocarbon / (SK04-3V)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
A4T	SAE-4	(B04-3-A4T)

General Description

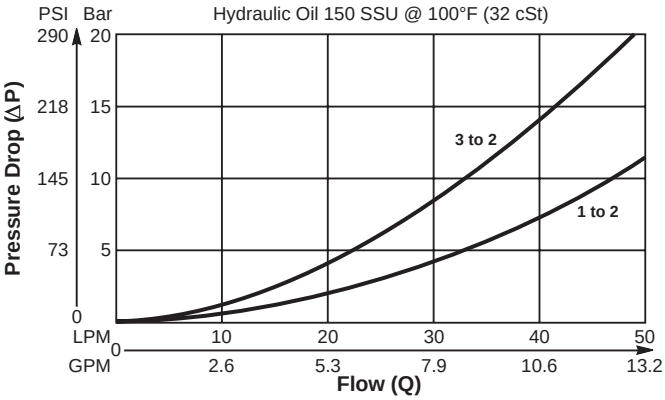
Ball Type, Two Position, Three Way Shuttle Valve. For additional information see Technical Tips on pages SH1-SH2.

Features

- High flow capacity
- Ball type construction for maximum wear resistance and greater durability
- Minimal leakage - less than 3 drops/min.
- Contamination tolerant
- All external parts zinc plated

Performance Curve

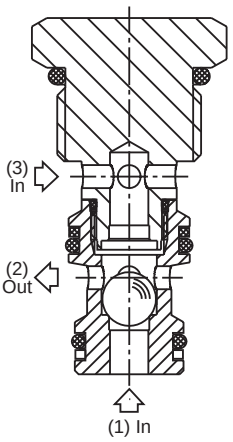
Pressure Drop vs. Flow (Through cartridge only)

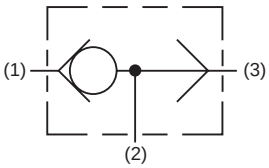


Specifications

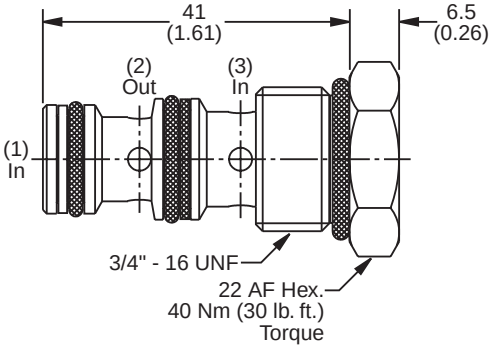
Rated Flow	50 LPM (13 GPM)
Nominal Flow @ 7 Bar (100 PSI)	27 LPM (7 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	Steel operating parts, hardened steel poppet.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.07 kg (.15 lbs.)
Cavity	C08-3 (See BC Section for more details)



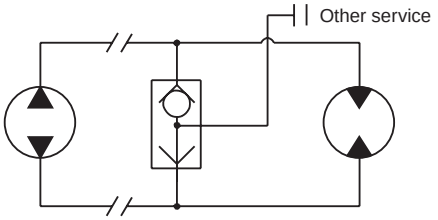




Dimensions Millimeters (Inches)



Application



Selects highest pressure from either line.

Ordering Information

K02A3		—		
Shuttle Valve	Seals		Body Material	Port Size

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30521N-1)
V	Fluorocarbon / (SK30521V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-3-*4P)
4T	SAE-4	(B08-3-*4T)
6T	SAE-6	(B08-3-*6T)
6B	3/8″ BSPG	(B08-3-*6B)

**** Add "A" for aluminum, omit for steel.***

General Description

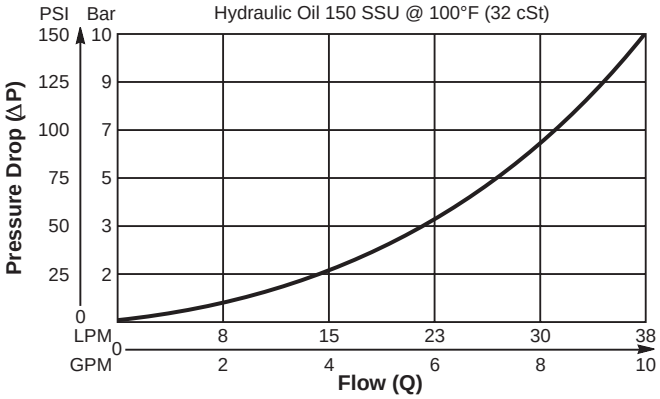
Cartridge Style Shuttle Valve. For additional information see Technical Tips on pages SH1-SH2.

Features

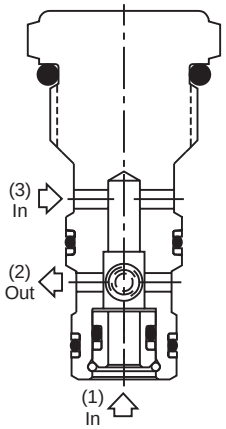
- Hardened, precision ground parts for durability
- 5000 PSI rated
- All external parts zinc plated

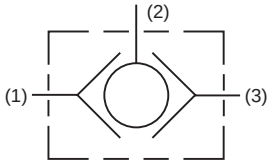
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)

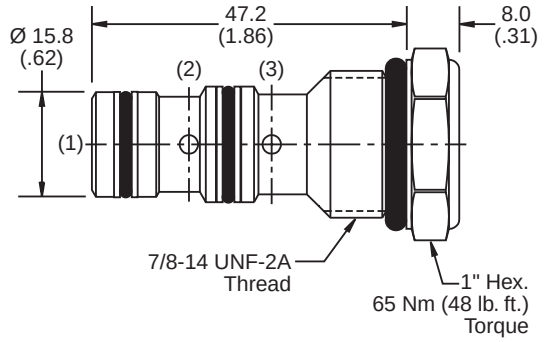








Dimensions Millimeters (Inches)



Specifications

Rated Flow	38 LPM (10 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	10 drops/min. (.67 cc/min.) at 350 Bar (5000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (0.3 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

Ordering Information

CSH101B	☐	—	☐	☐
10 Size Shuttle Valve	Seals		Body Material	Port Size

Code	Seals / Kit No.
Omit	Ntrile / (SK10-3N)
V	Fluorocarbon / (SK10-3V)

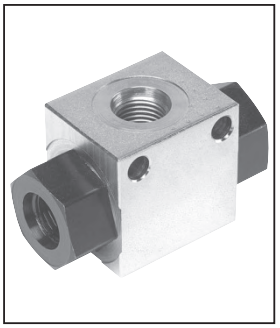
Code	Body Material
Omit	Steel
A	Aluminum

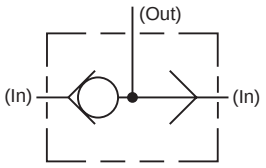
Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8B)

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

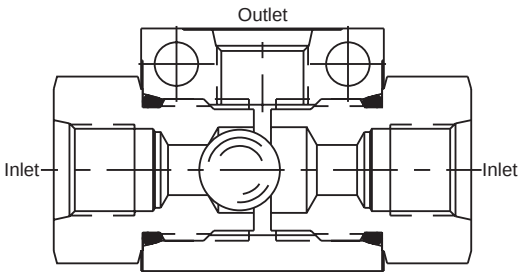
In-Line Style Shuttle Valve. For additional information see Technical Tips on pages SH1-SH2.





Features

- Compact in size
- In-line mounting
- Easily adaptable to various applications
- All external parts zinc plated

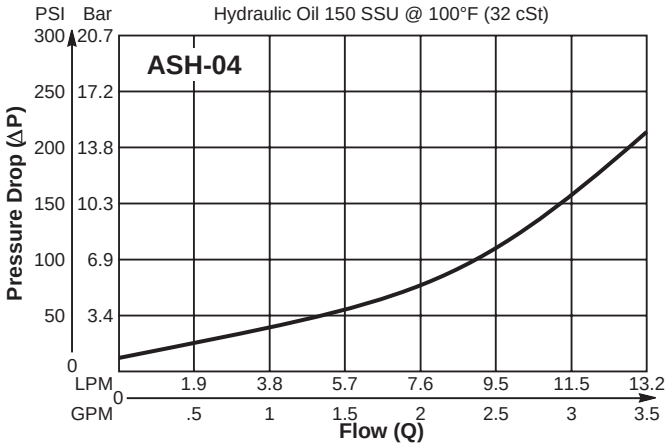


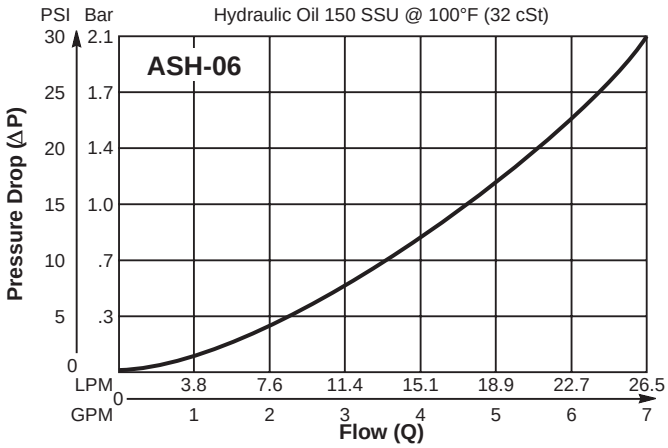
Specifications

Rated Flow	**ASH-04-3** 11 LPM (3 GPM) **ASH-06-2** 22 LPM (6 GPM)
Maximum Inlet Pressure	207 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) at 172 Bar (2500 PSI)
Body Material	Steel (Chromate Plated)
Operating Temp. Range/Seals	-40°C to +93.3°C (-40°F to +200°F) (Nitrile Seals Only)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	**ASH-04-3** .36 kg (0.8 lbs.) **ASH-06-2** .45 kg (1.0 lbs.)

Performance Curves

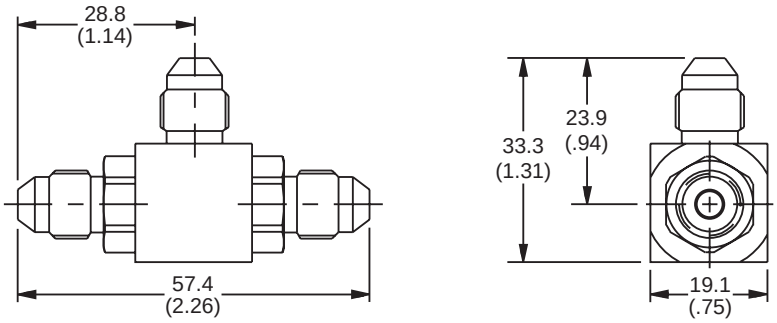
Flow vs. Pressure Drop (Through cartridge only)



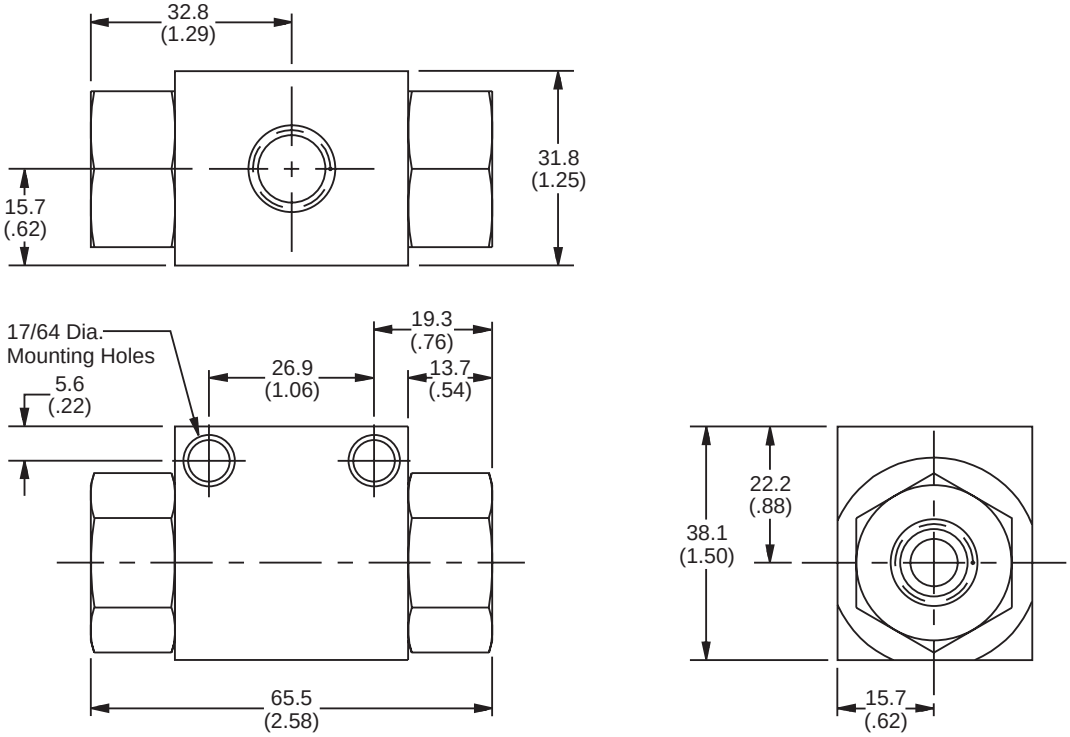


Dimensions Millimeters (Inches)

ASH-04-3



ASH-06-2



Ordering Information

ASH	—	☐	—	☐
In-Line Shuttle Valve		Port Size		Port Type

Code	Port Size
04	1/4″ JIC
06	SAE-6

Code	Port Type
2	SAE (#6)
3	Male JIC (1/4″ only)

General Description

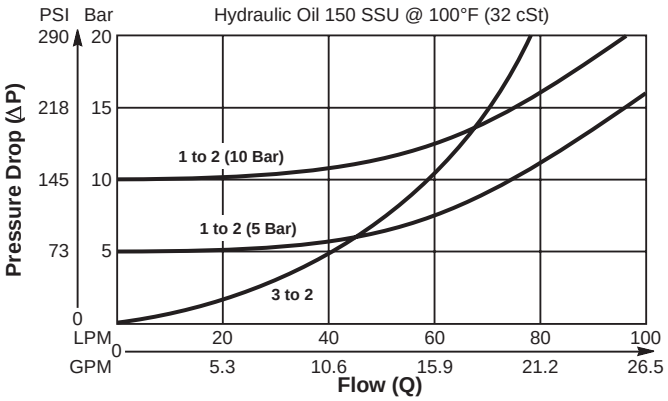
Two Position, Three Way, Spring Offset Shuttle Valve. For additional information see Technical Tips on pages SH1-SH2.

Features

- High flow capacity
- Various switching pressures available
- Used as automatic brake release valve on motors, where brake release is required at pressures between 1 & 10 bar.
- Hardened working parts for maximum durability
- All external parts zinc plated

Performance Curve

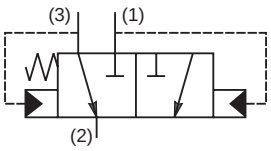
Pressure Drop vs. Flow (Through cartridge only)

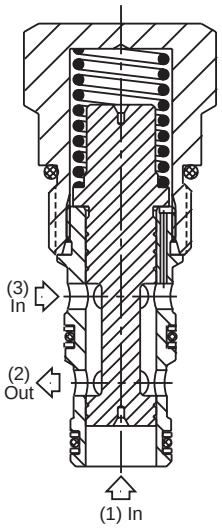


Specifications

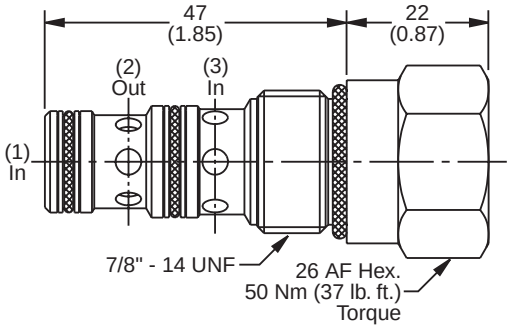
Rated Flow	90 LPM (24 GPM)
Nominal Flow @ 7 Bar (100 PSI)	50 LPM (13 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C10-3 (See BC Section for more details)



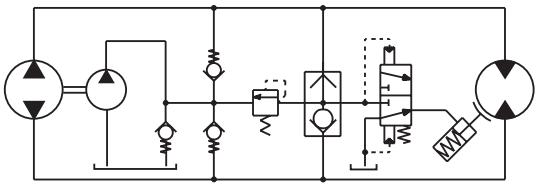




Dimensions Millimeters (Inches)



Application



Brake release at various switching pressures.

Ordering Information

K04B3 – [ ] [ ] – [ ] [ ]

Shuttle Valve | Switching Pressure | Seals | Body Material | Port Size

Code	Switching Pressure
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30505N-1)
V	Fluorocarbon / (SK30505V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8B)

**** Add "A" for aluminum, omit for steel.***
† Steel bodies only.

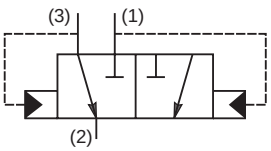
General Description

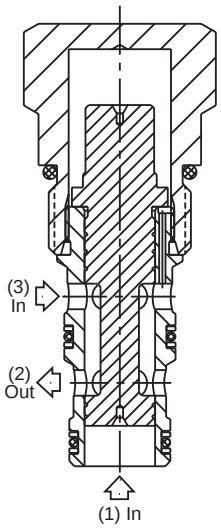
Two Position, Three Way Shuttle Valve.
For additional information see Technical Tips on pages SH1-SH2.

Features

- High flow capacity
- Used as automatic brake release valve on motors
- Hardened working parts for maximum durability
- All external parts zinc plated

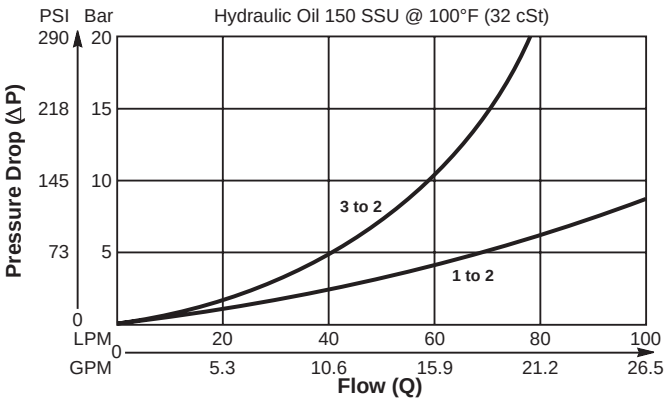




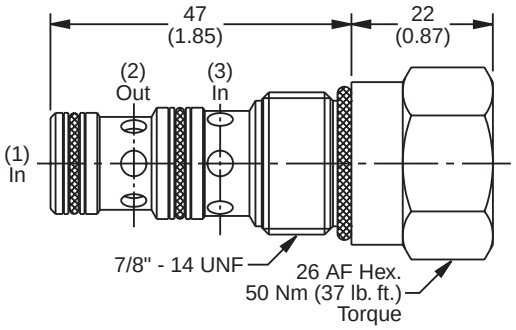


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



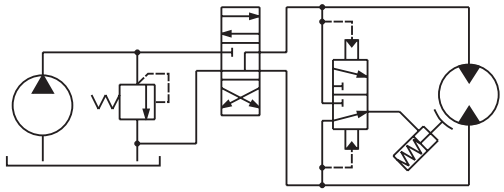
Dimensions Millimeters (Inches)



Specifications

Rated Flow	90 LPM (24 GPM)
Nominal Flow @ 7 Bar (100 PSI)	50 LPM (13 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C10-3 (See BC Section for more details)

Application



Brake release

Ordering Information

K04D3		–		
Shuttle Valve	Seals		Body Material	Port Size

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30505N-1)
V	Fluorocarbon / (SK30505V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8B)

**** Add "A" for aluminum, omit for steel.***
† Steel bodies only.

General Description

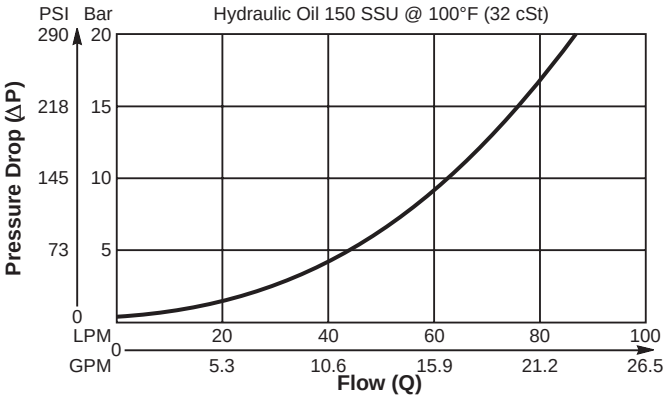
Two Position, Three Way, Spring Centered Shuttle Valve. For additional information see Technical Tips on pages SH1-SH2.

Features

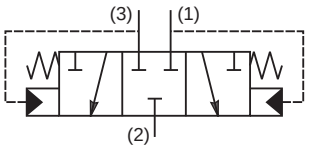
- High flow capacity
- Various switching pressures available
- Use as purge valve in transmission systems
- Hardened working parts for maximum durability
- All external parts zinc plated

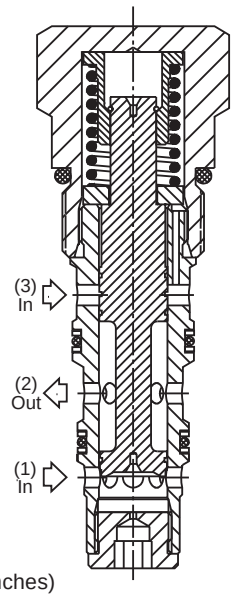
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



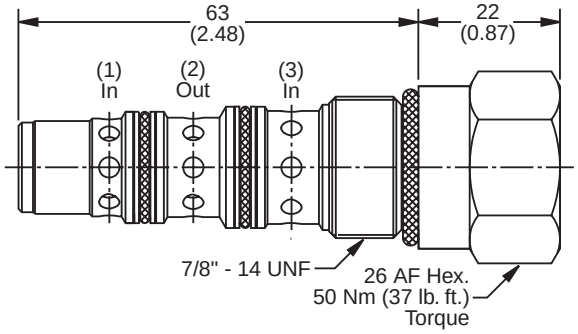




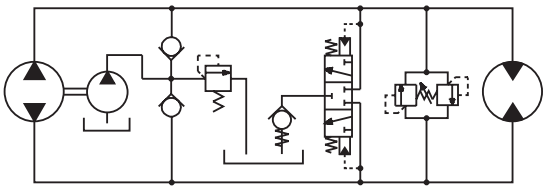


Dimensions

Millimeters (Inches)



Application



Purge valve in transmission circuit

Specifications

Rated Flow	100 LPM (26 GPM)
Nominal Flow @ 7 Bar (100 PSI)	55 LPM (15 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.17 kg (.37 lbs.)
Cavity	C10-4 (See BC Section for more details)

Ordering Information

K04C3 – [ ] [ ] – [ ] [ ]

Shuttle Valve | Switching Pressure | Seals | Body Material | Port Size

Code	Switching Pressure
0.0	0 Bar (0 PSI)
2.5	2.5 Bar (36 PSI)
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30504N-1)
V	Fluorocarbon / (SK30504V-1)

Code	Port Size	Body Part No.
Omit	**Cartridge Only**	
6P	3/8″ NTPF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel bodies only

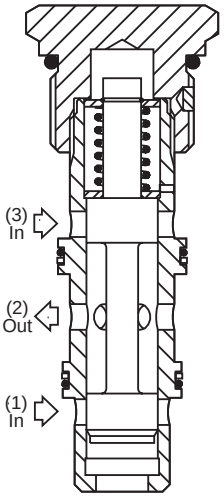
General Description

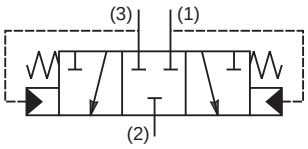
Two Position, Three Way, Spring Centered Shuttle Valve. For additional information see Technical Tips on pages SH1-SH2.

Features

- High flow capacity
- Compact cost effective design
- Various spring options available
- Used in transmission systems as purge valve where hydraulic parking brake is necessary
- Hardened working parts for maximum durability
- All external parts zinc plated

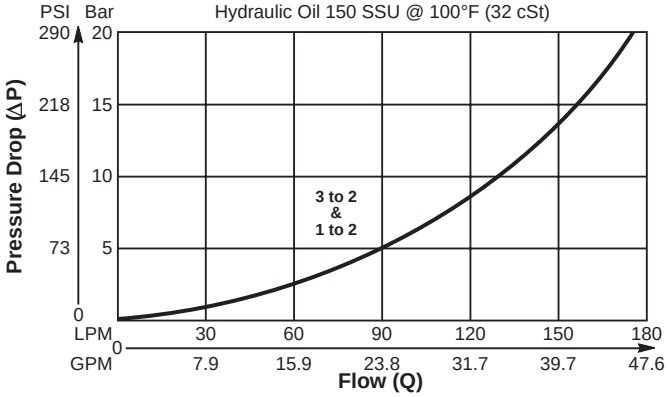




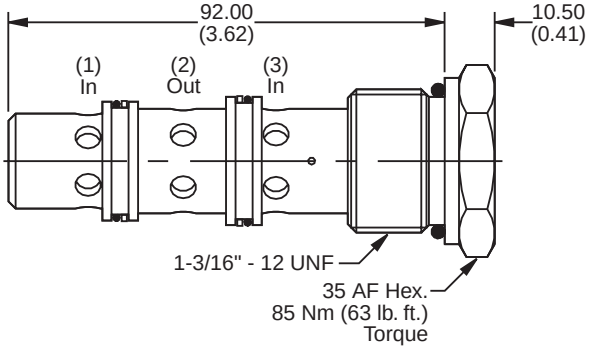


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



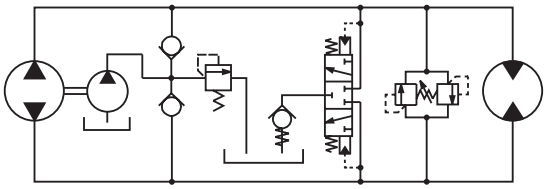
Dimensions Millimeters (Inches)



Specifications

Rated Flow	175 LPM (46 GPM)
Nominal Flow @ 7 Bar (100 PSI)	105 LPM (28 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Cartridge Material	Steel operating parts, hardened steel poppet.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.32 kg (.70 lbs.)
Cavity	3J (See BC Section for more details)

Application



Purge valve in transmissions with hydraulic parking brake

Ordering Information

K3A125 – [ ] [ ]

Shuttle Valve | Switching Pressure | Seals

Code	Switching Pressure
1.0	1.0 Bar (15 PSI) Std.
9.0	9.0 Bar (130 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30040N-1)
V	Fluorocarbon / (SK30040V-1)

Order Bodies Separately

LB10 [ ] [ ]

Line Body | Porting | Body Material

Code	Porting
092	3/4″ BSP
093	1″ SAE

Code	Body Material
A	Aluminum
S	Steel

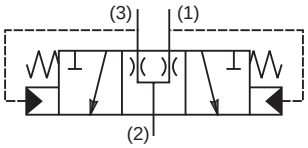
General Description

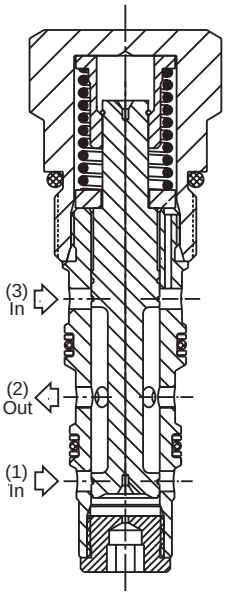
Two Position, Three Way, Spring Centered Shuttle Valve. For additional information see Technical Tips on pages SH1-SH2.

Features

- High flow capacity
- Various switching pressures available
- Hardened working parts for maximum durability
- All external parts zinc plated

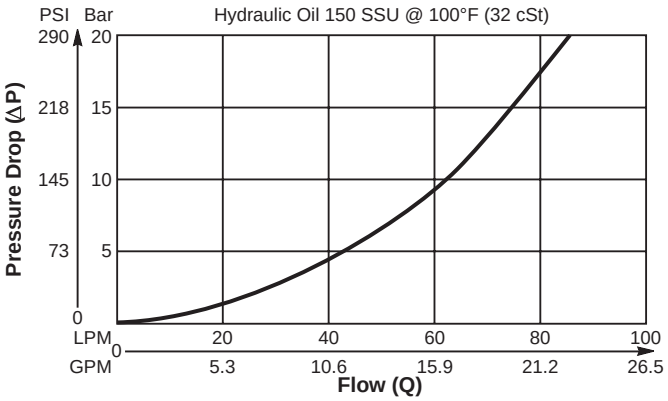




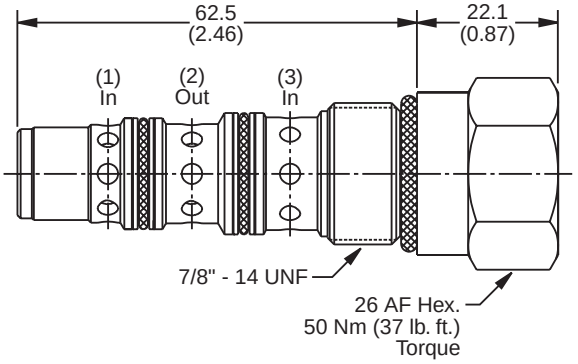


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	100 LPM (26 GPM)
Nominal Flow @ 7 Bar (100 PSI)	55 LPM (15 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.17 kg (.37 lbs.)
Cavity	C10-4 (See BC Section for more details)

Ordering Information

K04F3 – [ ] [ ] – [ ] [ ]

Shuttle Valve | Switching Pressure | Seals | Body Material | Port Size

Code	Switching Pressure
0.0	0 Bar (0 PSI)
2.5	2.5 Bar (36 PSI)
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30504N-1)
V	Fluorocarbon / (SK30504V-1)

Code	Port Size	Body Part No.
Omit	**Cartridge Only**	
6P	3/8″ NTPF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel bodies only

General Description

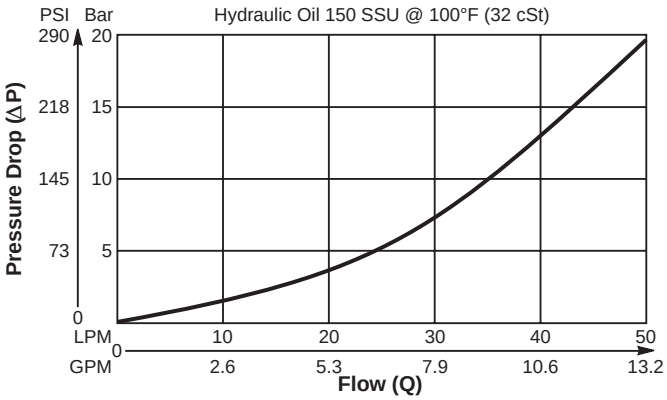
Three Way, Ball Type, Spring Centered Inverse Shuttle Valve. For additional information see Technical Tips on pages SH1-SH2.

Features

- Used to ensure that in a dual accumulator charging circuit the accumulator with the lowest pressure is sensed back to the charging valve
- Suitable for charge rates up to 25 LPM (7 GPM) per accumulator
- One size valve for most applications
- All external parts zinc plated

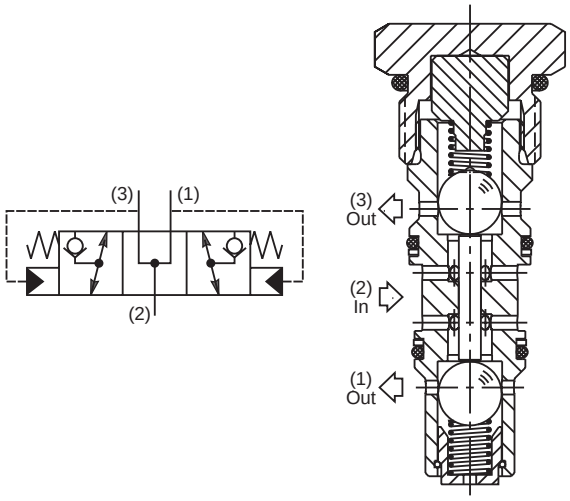
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)

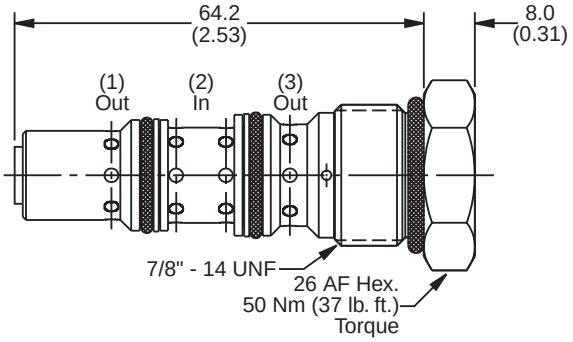


Specifications

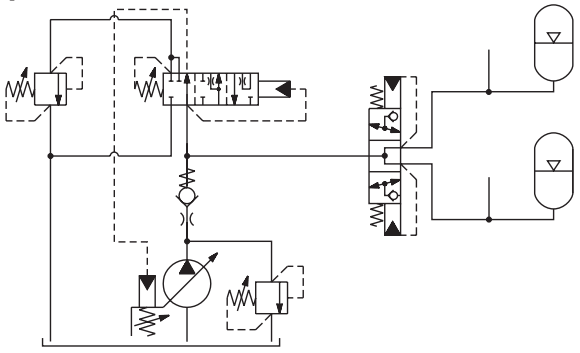
Rated Flow	50 LPM (13.2 GPM)
Nominal Flow @ 7 Bar (100 PSI)	30 LPM (7.9 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C10-4 (See BC Section for more details)



Dimensions Millimeters (Inches)



Application



Ordering Information

K04G3		–		
Shuttle Valve	Seals		Body Material	Port Size

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30534N-1)
V	Fluorocarbon / (SK30534V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6P	3/8″ NTPF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel bodies only

BLANK
PAGE

SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
STANDARD PILOT ASSISTED					
CB101	C10-3	Load Control Cartridge Valve	45/12	380/5500	LM5-LM6
MHC-010-S***	CDD-1010	Load Control Cartridge Valve	37/10	350/5000	LM7-LM8
MHC-022-S***	CDD-1036	Load Control Cartridge Valve	94/25	350/5000	LM9-LM10
E2*020	53-1	Load Control Cartridge Valve	20/5.3	420/6000	LM11-LM12
E2*040	68-1	Load Control Cartridge Valve	60/16	350/5000	LM13-LM14
E2*1	T11-A	Load Control Cartridge Valve	60/16	350/5000	LM15-LM16
E2*1S	T11-A	Load Control Cartridge Valve	60/16	350/5000	LM17-LM18
E2*1R	T11-A	Load Control Cartridge Valve	60/16	350/5000	LM19-LM20
E2*060	3C	Load Control Cartridge Valve	120/32	350/5000	LM21-LM22
E2*125	3M	Load Control Cartridge Valve	200/53	350/5000	LM23-LM24
E2*300	3K Flange		350/90	350/5000	LM25-LM26
INDEPENDENT OF BACK-PRESSURE, VENTED TO ATMOSPHERE					
E6B020	53-1	Load Control Cartridge Valve, 4.5:1 Ratio	20/5.3	350/5000	LM27-LM28
E6K020	53-1	Load Control Cartridge Valve, 15:1 Ratio	20/5.3	350/5000	LM29-LM30
E6*1	T11-A	Load Control Cartridge Valve	60/16	350/5000	LM31-LM32
E6B040	3C	Load Control Cartridge Valve, 3:1 Ratio	60/16	350/5000	LM33-LM34
E6A060*409	3C	Load Control Cartridge Valve, 3:1 Ratio	180/48	350/5000	LM35-LM36
E6B060*409	3C	Load Control Cartridge Valve, 3:1 Ratio	180/48	350/5000	LM35-LM36
MHC-010-V***	CDD-1010	Load Control Cartridge Valve	37/10	350/5000	LM7-LM8
MHC-022-V***	CDD-1036	Load Control Cartridge Valve	94/25	350/5000	LM9-LM10
INDEPENDENT OF BACK-PRESSURE, VENTED TO DRAIN ON PORT 4					
E9*1	T21A	Load Control Cartridge Valve	60/16	350/5000	LM37-LM38

Introduction

Counterbalance valves are one of the most misunderstood products in the hydraulic industry. Many people tend to complicate the task of selecting a counterbalance valve and as such avoid opportunities. The goal of this Technical Tips Section is to hopefully eliminate some of this confusion and help you chose the correct valve for your application. It is only a guide! It is not meant to be your only method of input, nor is it meant to replace good hydraulic common sense and reasoning.

Application

DO I NEED A COUNTERBALANCE VALVE?

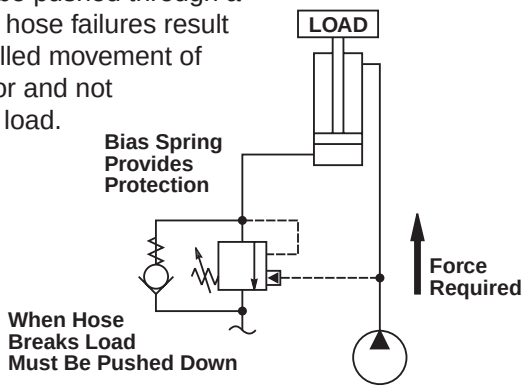
A counterbalance is generally used for one or more of the following purposes:

Control an Overrunning Load – It restricts the flow from an actuator, thus forcing the load to be pushed through the restriction and providing control of the potential runaway load. This also helps in the prevention of cavitation.

Control in Critical Metering Applications – The outward restriction also helps to gain control of systems with varying loads and speeds.

Holding a Load – Much like a pilot operated check valve, a load is held in one direction until the appropriate pilot pressure is available unseat the check and pass fluid.

Help Protect Against Hose Failures – Since the fluid must be pushed through a restriction, hose failures result in a controlled movement of the actuator and not a runaway load.



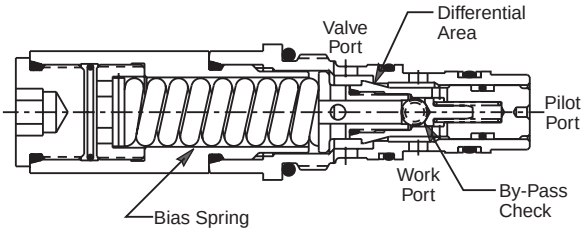
***NOTE:** Counterbalance Valves are only needed if the application calls for varying loads or varying speeds. If the load and speed are fixed, flow control valves and pilot operated check valves may be substituted at generally a lower cost.*

Operation

An understanding of the general operation of a counterbalance valve is required before proceeding further into valve selection.

The counterbalance valve is a pressure control device and functions as follows: Pressure is developed at the Work Port of the holding valve when the actuator is pressurized. This pressure acts on the differential area, and the force generated is counteracted by the bias spring. When there is sufficient pressure present to overcome the spring setting, the poppet begins to shift, allowing fluid to pass through the valve port to tank via the control valve.

To assist in the shifting of the poppet, an external pressure source (generally the opposite side of the actuator) is connected to the pilot port of the counterbalance valve. This pressure is applied to the pilot area and assists the differential area in opening the valve. The pilot assist reduces load pressure required to open the valve, and allows for a reduction in the horsepower required to move the load. If the load attempts to “run away” (move faster than the pump can supply flow), the pilot signal will diminish and the piston will begin to close restricting flow to tank and thus controlling the load. The counterbalance piston will maintain a position that maintains a positive pilot signal and will control the descent of the load.



An added feature of the counterbalance valve is its built-in thermal relief characteristic. A temperature rise can cause thermal expansion of the hydraulic fluid trapped between the actuator and the counterbalance valve’s poppet. As the pressure increases and reaches the bias spring setting, the poppet unseats and a few drops of oil are allowed to escape through the valve port of the counterbalance valve. This relieves the thermal expansion of oil, allowing the counterbalance valve to continue holding the load in the same position.

When the flow is reversed to the actuator, then pressure unseats the built-in bypass check portion of the counterbalance valve allowing flow to pass from the valve port to the work port. When no pressure is applied to either port of the counterbalance valve, the load is held in place.

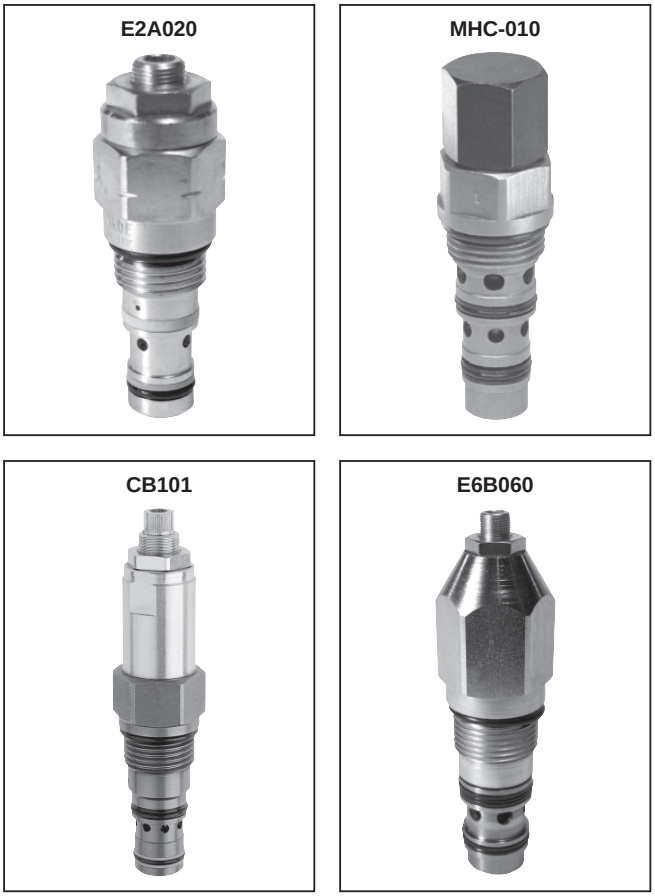
Valve Series

Parker offers the four series of products outlined below:

MHC – The MHC series is a threaded cartridge style counterbalance valve. This series is ideal for incorporating into an integrated manifold or for installation directly into the port of the actuator. There are various flow rates and pilot ratios available for the MHC Series.

CB101 – The CB101 is also a threaded cartridge style counterbalance valve. It also is ideal for incorporating into an integrated manifold or for installation directly into the port of the actuator. The CB101 has an industry common cavity (C10-3) and is available in three pilot ratios.

E2 Series – The E2 Series valves are threaded cartridge style counterbalance valves. They are available in standard and Vented configurations. In the Vented configurations, the valves maintain their settings regardless of system backpressure. There are various flow rates and pilot ratios available.



Selecting Options

Below is a brief description of the options available on the ordering information pages and a brief explanation of when each would be used.

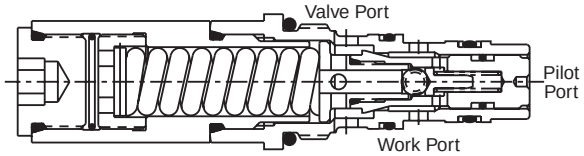
Flow Selection – Generally the counterbalance valve is sized according to the actual flow the valve will see and not the system flow. Note that the ordering information callout is the nominal flow rate and not the maximum. In other words, refer to the pressure drop curves when sizing the valves. For example: A MHC-010 can flow 25 GPM, but is rated as a 10 GPM valve. It is possible to oversize a counterbalance valve! If the counterbalance is oversized, the annulus between the poppet and the seat is too large, thus the poppet opens too far causing instability. Remember you are gaining control by causing a restriction. If you oversize the counterbalance valve, the restriction is reduced and so is the control.

Vented versus Non-Vented – With a standard counterbalance valve, the bias spring is internally vented to tank. This means any pressure on the tank line is sensed in the bias spring chamber and additive to the setting. Thus, the pressure at the work port now must be greater than the bias spring plus the tank pressure before the counterbalance poppet will shift allowing flow.

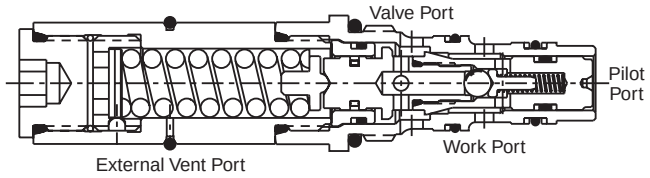
A vented style counterbalance valve relieves the bias spring chamber to atmosphere. Thus, the spring chamber is in no way related to the tank chamber of the counterbalance valve. So, if the pressure on the tank line is high, or if the pressure setting is critical, then a vented style counterbalance valve would be required.

Parker's counterbalance valves are externally vented. This means no extra porting or manifold costs are incurred when a vented counterbalance is needed.

MHC-010-S*S* Non-Vented Counterbalance Adjustable

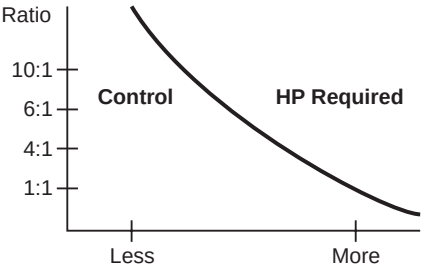


MHC-010-V*S* Vented Counterbalance Adjustable



Selection Options (Continued)

Pilot Ratio – The pilot ratio is the ratio of the pilot area versus the differential area poppet. Thus, the higher the pilot ratio, the less pressure that is needed to assist the load pressure in unseating the poppet. This means there is less restriction to the overrunning load, resulting in less horsepower required and more control of the load. So higher pilot ratio equates to less restriction to the overrunning load, less control and less horsepower required. Lower ratio equates to more restriction to the overrunning load, more control and more horsepower required. The pilot ratio decision is one of Horsepower versus Control. For reference the most popular ratio is 6:1.



Sample Ratios:

10:1
Primary function is load holding or hose break protection
Loads moving at fast speeds and positioning is not critical

7:1, 6:1 and 5:1
Most popular starting ratio

4:1 and 3:1
Positioning is critical such as a pick and place application
Instability with 6:1 ratio

1:1
Motor control application

ADJUSTMENT TYPE

Parker offers counterbalance valves with adjustable and non-adjustable pressure settings. The non-adjustable or shimmed version is recommended for most applications as it prevents tampering or improper adjustment by uneducated end users.

SELECTING SETTINGS

There are three basic settings to consider before finalizing a counterbalance valve for your application.

Holding Setting – The holding setting is sometimes referred to as the counterbalance setting. It is the maximum load setting you expect the counterbalance to hold. Note that the counterbalance valve should be set for the absolute maximum hold pressure required. Also note that counterbalance valves are restrictive type devices and as such are not ideal for low pressure applications, such as those below 750 psi. The holding setting is the setting you choose when selecting a counterbalance valve.

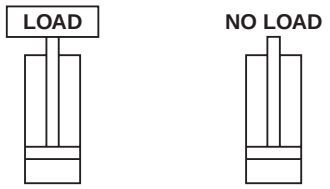
Thermal Setting – Counterbalance valves have a built-in thermal relief valve that compensates for the expansion of oil, due to temperature, by bleeding off excess pressure. In other words, the thermal setting is the pressure that the counterbalance will unload at if no pressure is present at the pilot port. Obviously, this setting should be above the holding setting. The Parker **MHC** counterbalance valves are automatically set 1000 psi above the holding setting of the valve. ***You do not specify this setting, only the holding setting.*** For the **CB101** Series, you do specify the Thermal/ Crack setting in the model code. The holding setting (maximum load induced pressure) is 70% of that specified setting. Example: Hold at 3000 psi, crack at 4285 psi. For the **E2** Series, you specify the Thermal/ Crack setting in the model code. The crack setting (maximum load induced pressure) should be 1.3 times the hold. Example: Hold at 3000 psi, crack at 3900 psi.

Pilot Area – The pilot pressure required to lower the cylinder when fully loaded and unloaded can also be determined before applying the valve. The pilot pressure can be determined by the below equation:

$$P_P = (T_S - L) / R_P$$

P_P = Pilot Pressure
T_S = Thermal Setting
L = Induced Load
R_P = Pilot Ratio

Example:
The maximum load is 3000 psi. A 6:1 Pilot Ratio was chosen and the thermal relief setting is the standard 1000 psi over load setting. What is the pilot pressure required to retract the cylinder if it is fully loaded? What pilot pressure is required to retract the cylinder if there is no load?



FULLY LOADED:

P_P = (4000 psi – 3000 psi) / 6
P_P = 1000 psi / 6
P_P = 167 psi

Thus, any time the pilot line sees at least 167 psi, the cylinder could lower the load.

UNLOADED:

P_P = (4000 psi – 0 psi) / 6
P_P = 4000 psi / 6
P_P = 667 psi

Thus, at least 667 psi will be needed to lower the cylinder when it is unloaded.

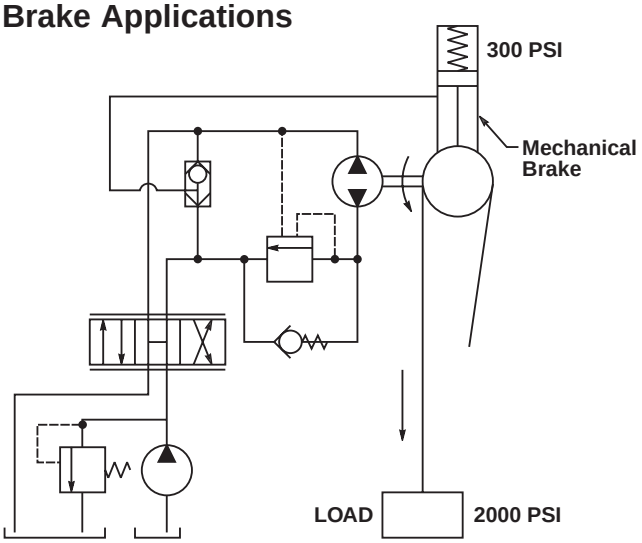
Motor Controls

Counterbalance valves are used in motor circuits to stop overrunning loads and prevent cavitation. Since hydraulic motors leak internally, the counterbalance valve by itself cannot be used to hold the load. So, a mechanical brake is used to hold the load on the motor in place, as shown below. Some typical applications include winches, swing drives, conveyor control and traction drives. For applications in closed loop motor circuits, vented spring cavities are required.

Operation

Free flow to the motor is allowed through the internal check valve. In the controlled flow direction, the oil passes across a metering poppet. The position of the metering poppet is determined by an external pilot signal from the other side of the motor. In an open loop motor circuit, this pilot signal will be a 1:1 ratio. The reason an equal ratio pilot signal is utilized is to provide positive control as well as to release mechanical brakes (when used in a braking circuit). In applications where the motor will see overrunning loads in both directions (such as a traction drive circuit), a dual MMB or two single MMB valves must be used.

Brake Applications



When the directional control valve is shifted, hydraulic pressure (usually 300 psi) releases the mechanical brake and allows the load to be moved. The counterbalance valve needs to provide adequate back pressure to open the brake, then immediately counterbalance the load. Ideally, the brake will be disengaged before the motor begins to rotate. If this sequence is not achieved, the motor will try to rotate against the applied brake reducing the life of the brake. This would be the equivalent of trying to drive with your emergency brake applied. Remember that hydraulic motors are equal area devices. So, in an effort to avoid the movement of the motor prior to the release of the brake, an equal area ratio counterbalance is used. To demonstrate let's look again at the above example with a 10:1 Ratio Counterbalance valve installed and a maximum thermal setting of 3000 psi.

10:1 Example

NO LOAD

$P_P = (T_S - L) / R_P$
$P_P = (3000 \text{ psi} - 0 \text{ psi}) / 10$
$P_P = 3000 \text{ psi} / 10$
$P_P = 300 \text{ psi}$

2000 PSI LOAD

$P_P = (T_S - L) / R_P$
$P_P = (3000 \text{ psi} - 2000 \text{ psi}) / 10$
$P_P = 1000 \text{ psi} / 10$
$P_P = 100 \text{ psi}$

Thus, when there is no load on the motor, the counterbalance opens at 300 psi, or just as the brake is being released. When there is a 2000 psi load on the motor, the counterbalance will start to open with a pilot pressure of 100 psi. The brake requires 300 psi, so the motor can start to rotate before the brake is released, causing wear on the brake. To offset this problem, you could increase the maximum thermal setting to 5000 psi, but this is very inefficient.

1:1 (Equal Area) Example

Equal area counterbalance valves are used primarily in brake applications to avoid the wear problem described above. With an Equal Area counterbalance valve, there is no thermal relief valve, and there is no differential area to work on. In other words, the counterbalance valve only opens when the pilot pressure is greater than the valve setting. The applied load has nothing to do with the pilot pressure required. Thus you will want to choose a pressure setting for the equal area counterbalance valve that is just slightly above the brake release pressure (usually 350 psi).

In our example, the valve would be set at 350 psi. This would allow the brake to release before the counterbalance allows the load to move. Since the equal counterbalance valve always opens at 350 psi pilot pressure and is not dependent on the load, it is the best valve for brake applications.

Large Pressure Spike Application – Keep in mind that equal area counterbalance valves do not have a built-in thermal relief valve. As such, if there are large pressure spikes caused by the stopping of heavy loads, then a ratioed counterbalance, such as a 10:1 should be used. In most cases these are non-brake type applications.

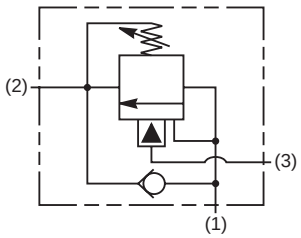
General Description

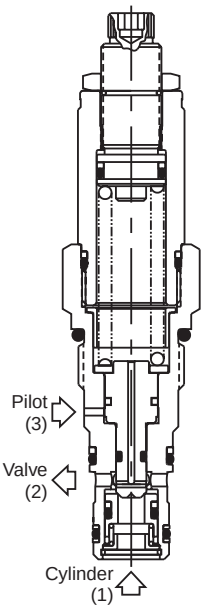
Cartridge Style Counterbalance Valve.
For additional information see Technical Tips on pages LM1-LM4.

Features

- Sealed spool type design for improved stability and accuracy as well as low leakage
- Low leakage poppet-type check valve for reliable load holding
- All external parts have yellow zinc dichromate finish.
- Parker cartridge design for ease of installation and maintenance
- Compact size for reduced space requirements





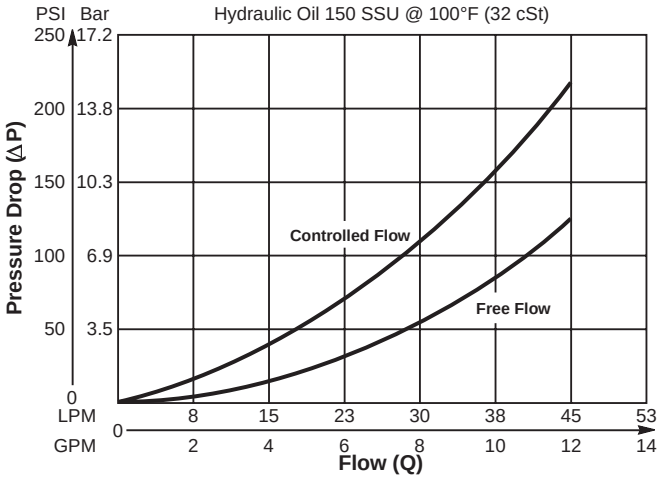


Specifications

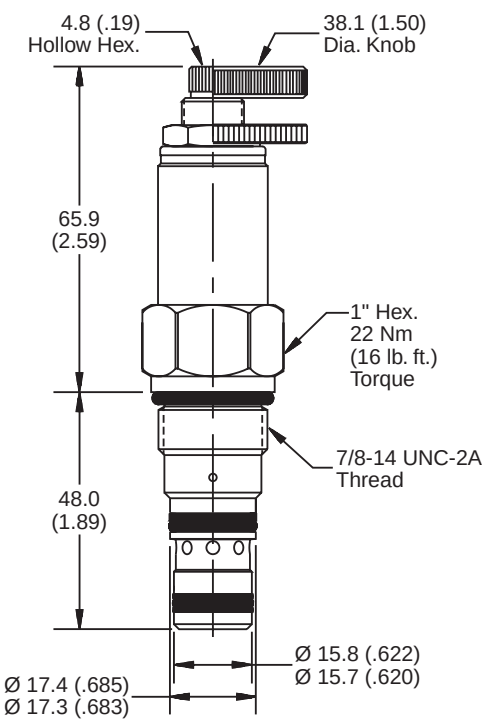
Rated Flow	45 LPM (12 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI) - Steel 210 Bar (3000 PSI) - Aluminum
Maximum Setting Pressure	350 Bar (5000 PSI) - Steel 210 Bar (3000 PSI) - Aluminum
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) @ 80% of thermal crack pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.23 kg (0.5 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

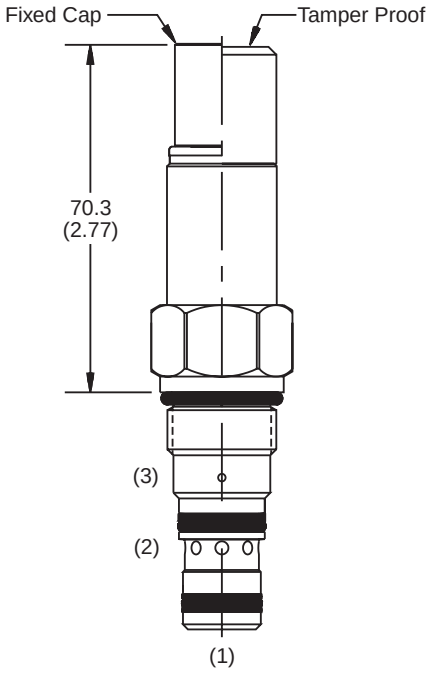
Performance Curve

Flow vs. Pressure Drop
(Through cartridge only)



Dimensions Millimeters (Inches)





THIRD-ANGLE PROJECTION

Ordering Information

CB101					—		—		
Counterbalance Cartridge Valve	Pilot Ratio	Adjustment Style	Pressure Range	Seals		Optional Pressure Setting		Body Material	Port Size

Code	Pilot Ratio
A	3:1
B	4.5:1
C	7:1

Code	Adjustment Style/Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-10)
S	Screw Adjust
T	Tamper Resistant Cap (717785)

Code	Pressure Range
10	20.7 - 90 Bar (300 - 1300 PSI) Standard Setting: 69 Bar (1000 PSI) @ 11.3 LPM (3 GPM)
20	69 - 172.4 Bar (1000 - 2500 PSI) Standard Setting: 138 Bar (2000 PSI) @ 11.3 LPM (3 GPM)
30	138 - 350 Bar (2000 - 5000 PSI) Standard Setting: 210 Bar (3000 PSI) @ 11.3 LPM (3 GPM)

Code	Seals / Kit No.
Omit	Nitrile / (SK10-3N)
V	Fluorocarbon / (SK10-3V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI Setting Range: 300 to 5000 PSI All settings at 11.3 LPM (3 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8P)

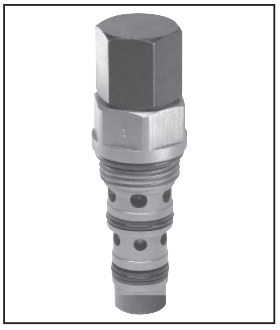
**** Body is available in steel or aluminum.***
† Steel body only.

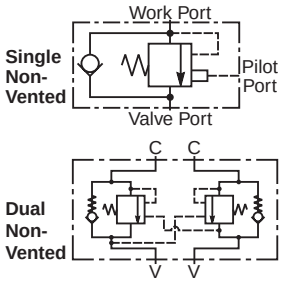
General Description

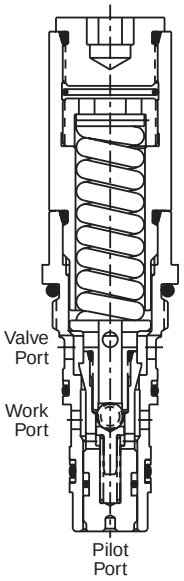
Threaded Cartridge Style Counterbalance Valve. For additional information see Technical Tips on pages LM1-LM4.

Features

- Conical Poppet design provides longer metering stroke for stable operation
- Hardened seat provides reliable load holding
- External vent option available for high back pressure applications
- Tamper resistant cap for added safety and security
- Various pilot ratios available for application flexibility
- Unique cavity prevents other valves from being "accidentally" installed
- All external parts zinc plated



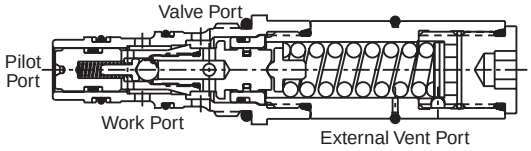




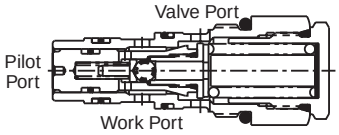
MHC-010-S*S* Non-Vented Counterbalance Adjustable

Construction

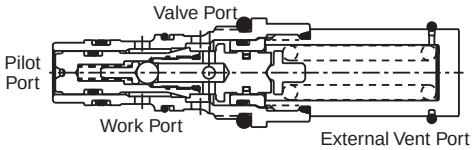
MHC-010-V*S* Vented Counterbalance Adjustable



MHC-010-S*N* Non-Vented Counterbalance Non-Adjustable



MHC-010-V*N* Vented Counterbalance Non-Adjustable

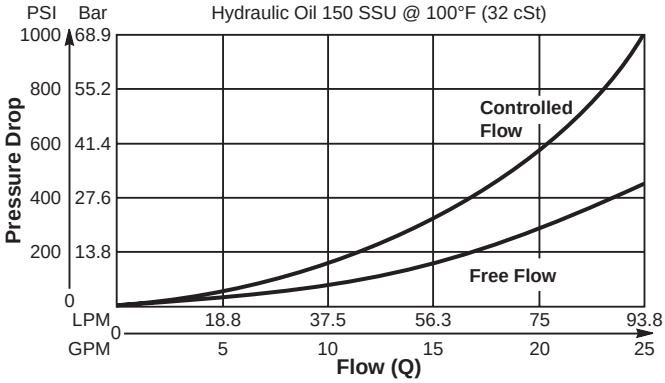


Specifications

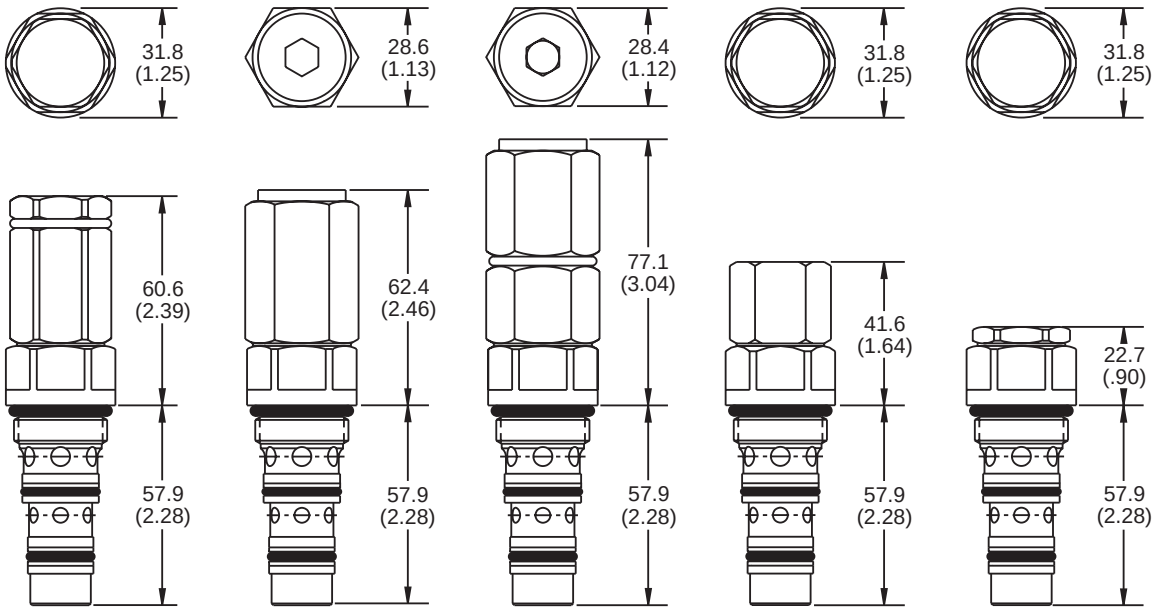
Rated Flow	37.5 LPM (10 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) @ 80% of thermal crack pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.38 kg (.88 lbs.)
Cavity	CDD-1010 (See BC Section for more details)
Form Tool	FR-500

Performance Curve

Flow vs. Pressure Drop (Through cartridge only)



Dimensions Millimeters (Inches)



MHC-010-V*N* | **MHC-010-S*S*** | **MHC-010-V*S*** | **MHC-010-S*N* (3:1) MHC-010-S*NK (10:1)** | **MHC-010-S*N* (3000 PSI Maximum "H")**

THIRD-ANGLE PROJECTION

Torque Values
68-75 Nm (50-55 lb. ft.)
Typical for all

Ordering Information

MHC	–	010	–					–		–		
Counterbalance Cartridge Valve		Nominal Flow Rating		Vent Type	Pilot Ratio	Design	Holding Pressure		Body Type		Ports	Seals

Code	Nominal Flow Rating
010	37.5 LPM (10 GPM)

Code	Vent Type
S	Standard (non-vented)
V	Vented

Code	Pilot Ratio
A	Equal Area (1:1)
B	4:1
F	7:1 (Standard)
J	10:1

Code	Design
S	Standard (adjustable)
N	Shimmed (non-adjustable)

Code	Holding Pressure
C	Equal Area 34.5 Bar (500 PSI) Crack
D	69 Bar (1000 PSI) Shim adjustable version only
E	105 Bar (1500 PSI)
F	140 Bar (2000 PSI)
G	170 Bar (2500 PSI)
H	210 Bar (3000 PSI) Standard version
K	350 Bar (5000 PSI) 7:1 and 10:1 only Shim version only

Code	Body Type	Part Number
Omit	No Body	
A	Single	MHC-010-A-53
D	Dual	MHC-010-D-53

Code	Ports
00	No Ports
52	SAE-8 through port
53	SAE-10 through port

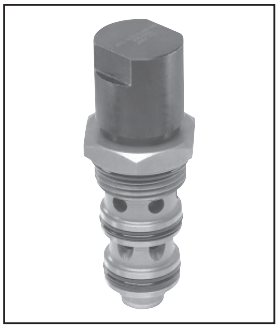
Code	Seals / Kits
B	Nitrile / 711922
F	Fluorocarbon / 711825

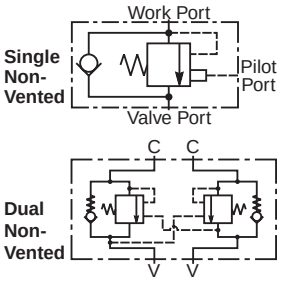
General Description

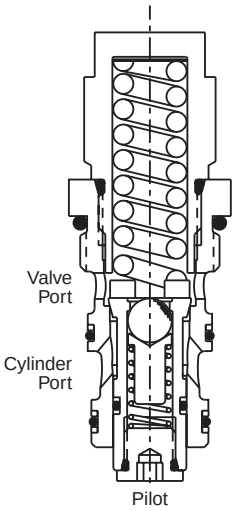
Threaded Cartridge Style Counterbalance Valve. For additional information see Technical Tips on pages LM1-LM5.

Features

- Conical Poppet design provides longer metering stroke for stable operation
- Hardened seat provides reliable load holding
- External vent option available for high back pressure applications
- Tamper resistant cap for added safety and security
- Various pilot ratios available for application flexibility
- Unique cavity prevents other valves from being "accidentally" installed
- All external parts zinc plated







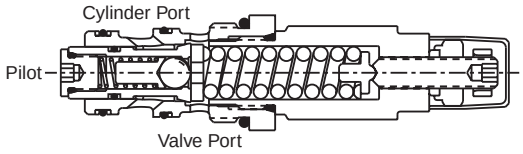
MHC-022-S*N* Non-Vented Counterbalance Non-Adjustable

Specifications

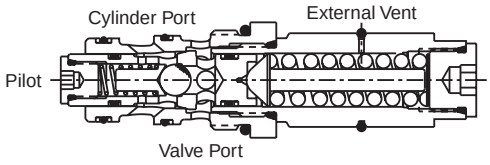
Rated Flow	93.75 LPM (25 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) @ 80% of thermal crack pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.44 kg (1.0 lbs.)
Cavity	CDD-1036 (See BC Section for more details)
Form Tool	FR-501

Construction

MHC-022-S*S* Non-Vented Counterbalance Adjustable

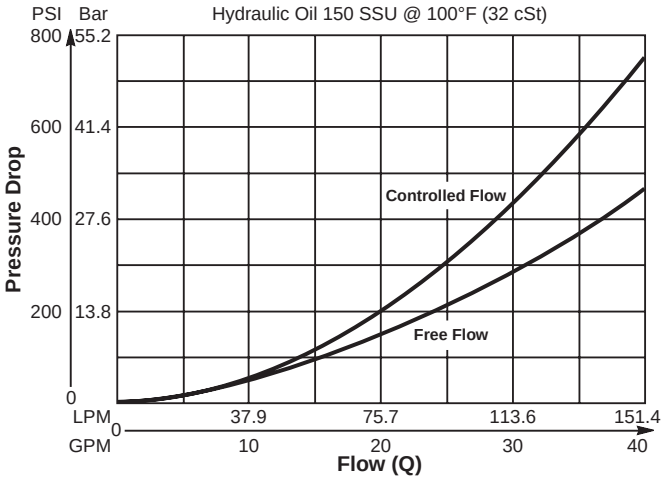


MHC-022-V*N* Vented Counterbalance Non-Adjustable

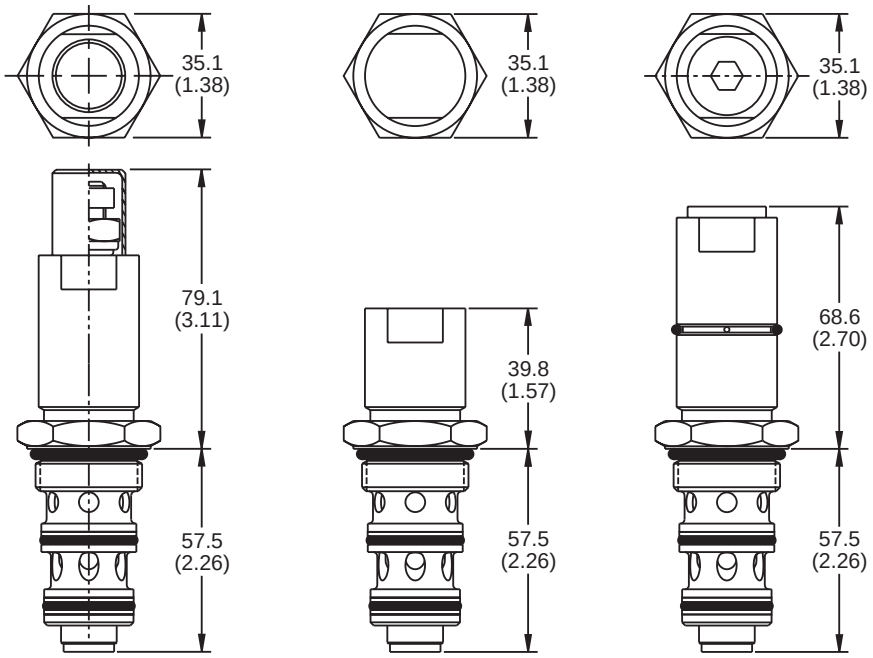


Performance Curve

Flow vs. Pressure Drop (Through cartridge only)



Dimensions Millimeters (Inches)



MHC-022-S*S* **MHC-022-S*N*** **MHC-022-V*N***

THIRD-ANGLE PROJECTION

Torque Values
8-9 Nm (6-7 lb. ft.)
Typical for all

Ordering Information

MHC	–	022	–					–		–		
Counterbalance Cartridge Valve		Nominal Flow Rating		Vent Type	Pilot Ratio	Design	Holding Pressure		Body Type		Ports	Seals

Code	Nominal Flow Rating
022	93.75 LPM (25 GPM)

Code	Vent Type
S	Standard (non-vented)
V	Vented

Code	Pilot Ratio
A	Equal Area (1:1)
C	5:1 (Standard)
J	10:1

Code	Design
S	Standard with tamper resistant cap (adjustable)
N	Shimmed (non-adjustable)

Code	Holding Pressure
C	Equal Area 34.5 Bar (500 PSI) Crack
E	103.4 Bar (1500 PSI) Shim adjustable version only
H	210 Bar (3000 PSI) Standard version
J	240 Bar (3500 PSI)
K	350 Bar (5000 PSI) 10:1 only

Code	Body Type	Part Number
Omit	No Body	
A	Single	MHC-022-A-53
D	Dual	MHC-022-D-53

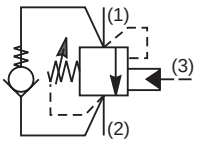
Code	Ports
00	No Ports
52	SAE-8 through port
53	SAE-10 through port

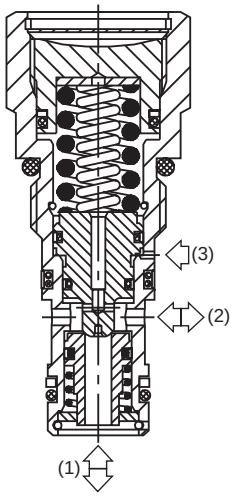
Code	Seals / Kits
B	Nitrile / 712226
F	Fluorocarbon / TBD

General Description

Threaded Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM4.







Features

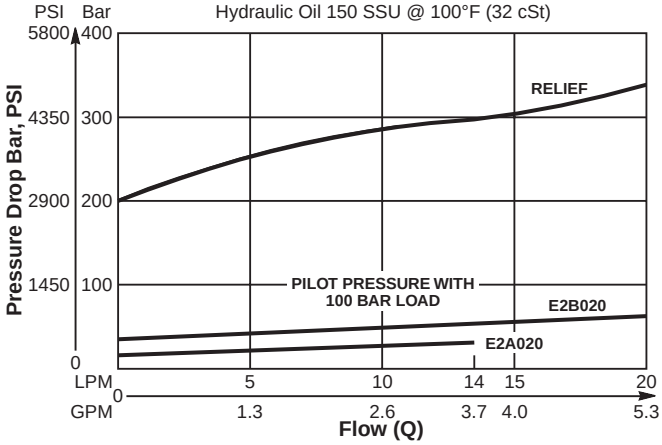
- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection
- Includes reverse check valve within body, saving space and minimizing installation cost
- Can be directly mounted into cylinder eliminating requirement for manifold block
- Fully sealed pilot for high efficiency and accurate pilot ratio
- Two pilot ratios available, 4.5:1 for cylinders and 8:1 for motor control
- Adjustable and tamper resistant versions available
- Preset version is tamper resistant and compact
- All external parts zinc plated

Specifications

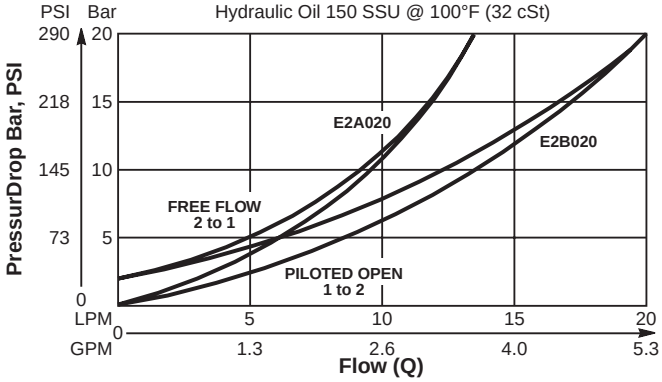
Rated Flow	**E2A020** 14 LPM (3.7 GPM) **E2B020** 20 LPM (5.3 GPM)
Pressure	50 - 420 Bar (725 - 6000 PSI)
Sensitivity: Pressure/Turn	**E2A020** 113 Bar (1640 PSI) **E2B020** 84 Bar (1220 PSI)
Pilot Ratio	**E2A020 -** 8 : 1 **E2B020 -** 4.5 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.08 kg (0.17 lbs.)
Cavity	53-1 (See BC Section for more details)

Performance Curves

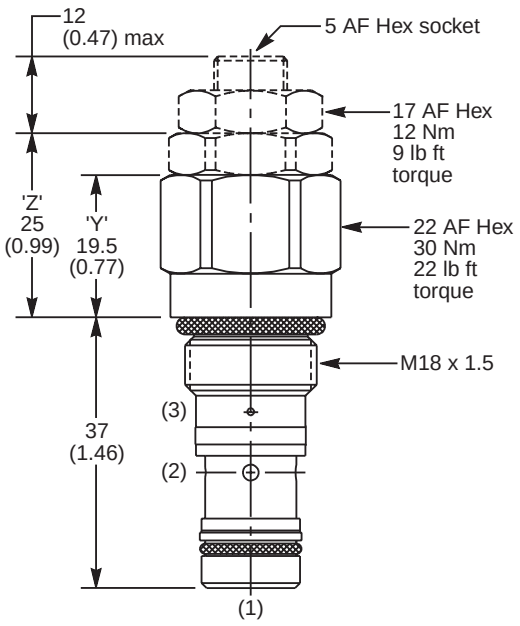
Relief & Pilot Performance 1 to 2



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E2		020			
Load Control Valve	**Pilot Ratio**		**Adjustment Style**	**Cracking Pressure**	**Seals**

Code	Pilot Ratio
A	8 : 1
B	4.5 : 1

Code	Adjustment Style / Kit No.
Z	Screw Adjust
T	Tamper Resistant (TC1125)
Y	Preset (Standard)

Code	Cracking Pressure
	Omit for no setting (Standard)*
	Specify setting if required

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30087N-1)
V	Fluorocarbon / (SK30087V-1)

Order Bodies Separately

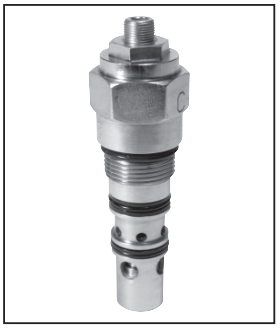
LB10		
Line Body	**Porting**	**Body Material**

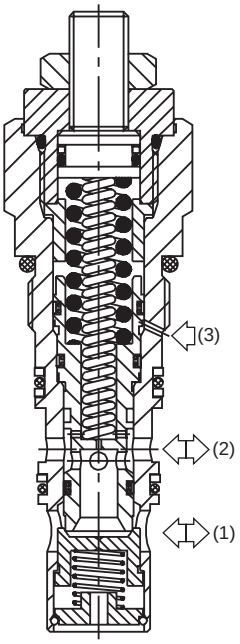
Code	Porting
310	3/8″ BSP (main) 1/4″ BSP (aux)
318	3/8″ SAE (main) 1/4″ SAE (aux)
312	3/8″ BSP Dual Cavity
319	3/8″ SAE Dual Cavity

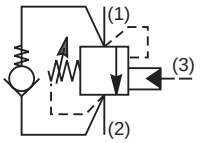
Code	Body Material
A	Aluminum
S	Steel

General Description

Threaded Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM4.







Features

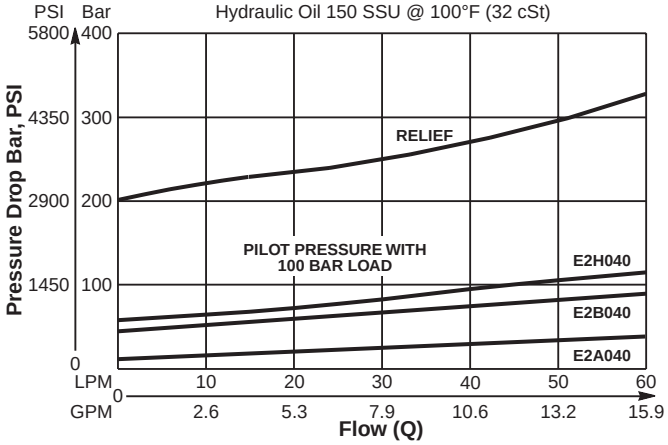
- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection
- Includes reverse check valve within body, saving space and minimizing installation cost
- Excellent control and very good stability
- Three pilot ratios available, 1.75:1 and 3:1 for cylinders and 8:1 for motor control
- Hardened working parts for maximum durability
- Adjustable, preset and tamper resistant versions available
- Preset version is tamper resistant and compact
- All external parts zinc plated

Specifications

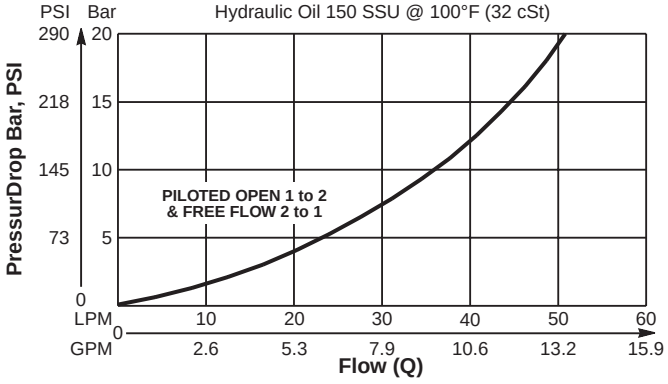
Rated Flow	60 LPM (15.9 GPM)
Pressure	50 - 350 Bar (725 - 5000 PSI)
Sensitivity: Pressure/Turn	99 Bar (1435 PSI)
Pilot Ratio	**E2A040 -** 8 : 1 **E2B040 -** 3 : 1 **E2H040 -** 1.75 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.27 kg (0.60 lbs.)
Cavity	68-1 (See BC Section for more details)

Performance Curves

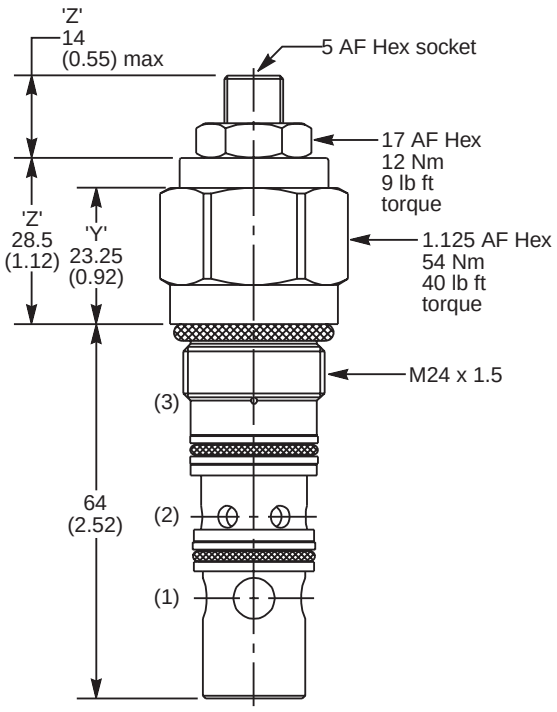
Relief & Pilot Performance 1 to 2



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E2		040			
Load Control Valve	Pilot Ratio		Adjustment Style	Cracking Pressure	Seals

Code	Pilot Ratio
A	8 : 1
B	3 : 1
H	1.75 : 1

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Standard)
T	Tamper Resistant (TC1125)
Y	Non Adjustable Preset

Code	Cracking Pressure
	Omit for no setting (Standard)*
	Specify setting if required
	Y: Setting must be specified

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30059N-1)
V	Fluorocarbon / (SK30059V-1)

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
251	1/2″ BSP (main) 1/4″ BSP (aux)
253	1/2″ SAE (main) 1/4″ SAE (aux)
259	1/2″ BSP Dual Cavity
261	1/2″ SAE Dual Cavity

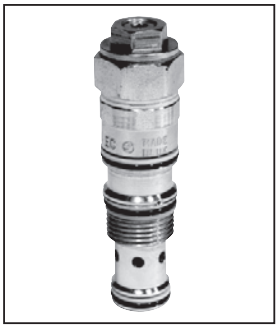
Code	Body Material
A	Aluminum
S	Steel

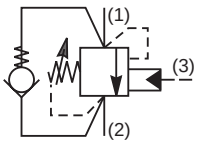
General Description

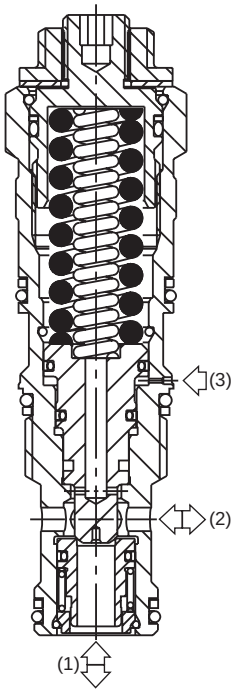
Threaded Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM4.

Features

- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection
- Includes reverse check valve within body, saving space and minimizing installation cost
- Fully sealed pilot for high efficiency and accurate pilot ratio
- Four pilot ratios available, 1.5:1, 2.3:1, 3:1 and 4.5:1
- Hardened working parts for maximum durability
- All external parts zinc plated





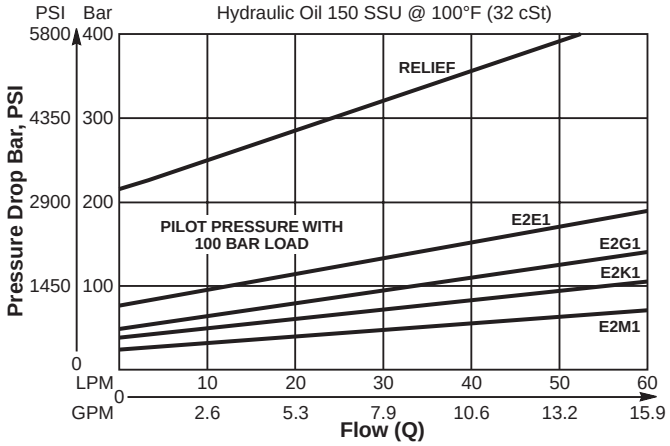


Specifications

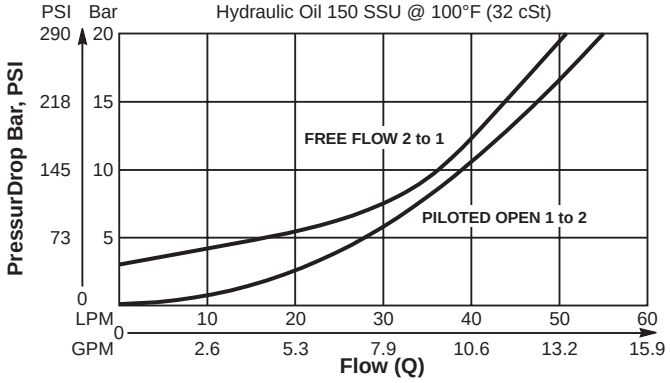
Rated Flow	60 LPM (16 GPM)
Pressure	40 - 350 Bar (580 - 5000 PSI)
Sensitivity: Pressure/Turn	104 Bar (1508 PSI)
Pilot Ratio	**E2E1 -** 1.5 : 1 **E2G1 -** 2.3 : 1 **E2K1 -** 3 : 1 **E2M1 -** 4.5 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.17 kg (0.37 lbs.)
Cavity	CAVT11A (See BC Section for more details)

Performance Curves

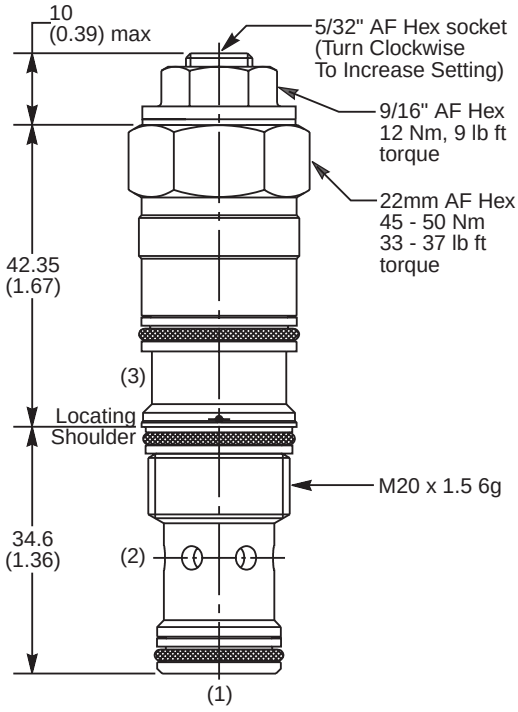
Relief & Pilot Performance 1 to 2



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E2		1			
Load Control Valve	**Pilot Ratio**		**Adjustment Style**	**Cracking Pressure**	**Seals**

Code	Pilot Ratio
E	1.5 : 1
G	2.3 : 1
K	3 : 1
M	4.5 : 1

Code	Cracking Pressure
	Omit for no setting (Standard)*
	Specify setting if required

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Standard)
T	Tamper Resistant (TC1131)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30700N-1)
V	Fluorocarbon / (SK30700V-1)

Order Bodies Separately

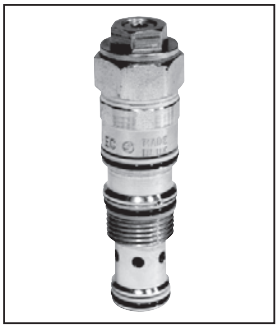
LB10		
Line Body	**Porting**	**Body Material**

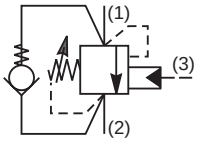
Code	Porting
826	1/2″ BSP (main) 1/4″ BSP (aux)
825	1/2″ SAE (main) 1/4″ SAE (aux)
828	1/2″ BSP Dual Cavity
827	1/2″ SAE Dual Cavity

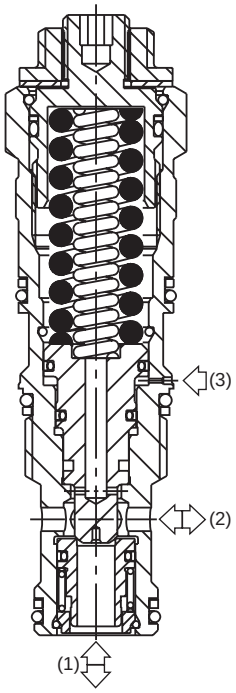
Code	Body Material
A	Aluminum
S	Steel

General Description

Threaded Cartridge Style Counterbalance Valve. Semi-Restrictive Ports 2 to 3. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM4.







Features

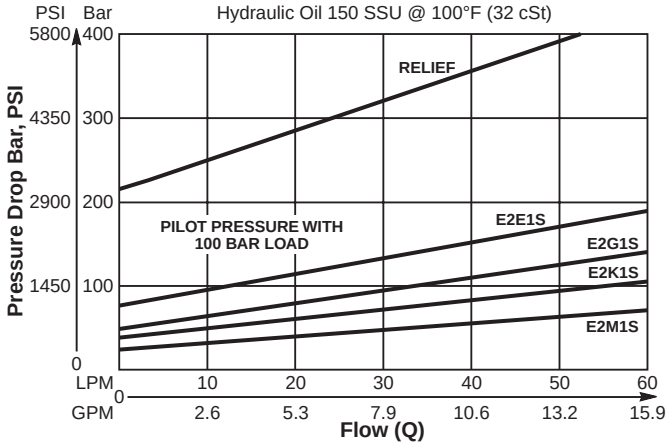
- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection
- Includes reverse check valve within body, saving space and minimizing installation cost
- Fully sealed pilot for high efficiency and accurate pilot ratio
- Four pilot ratios available, 1.5:1, 2.3:1, 3:1 and 4.5:1
- Hardened working parts for maximum durability
- All external parts zinc plated

Specifications

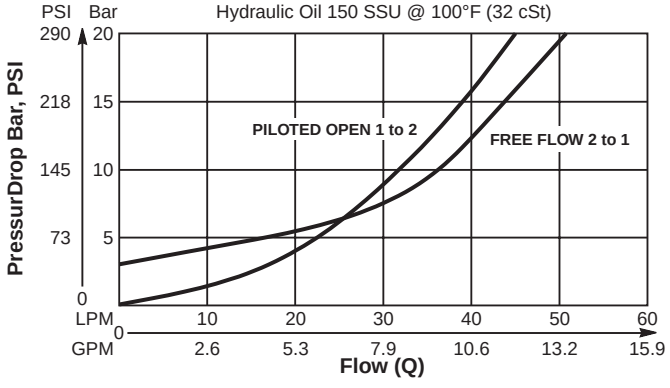
Rated Flow	Free flow 60 LPM (16 GPM) Piloted open flow 45 LPM (12 GPM)
Pressure	40 - 350 Bar (580 - 5000 PSI)
Sensitivity: Pressure/Turn	104 Bar (1508 PSI)
Pilot Ratio	**E2E1S -** 1.5 : 1 **E2G1S -** 2.3 : 1 **E2K1S -** 3 : 1 **E2M1S -** 4.5 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.17 kg (0.37 lbs.)
Cavity	CAVT11A (See BC Section for more details)

Performance Curves

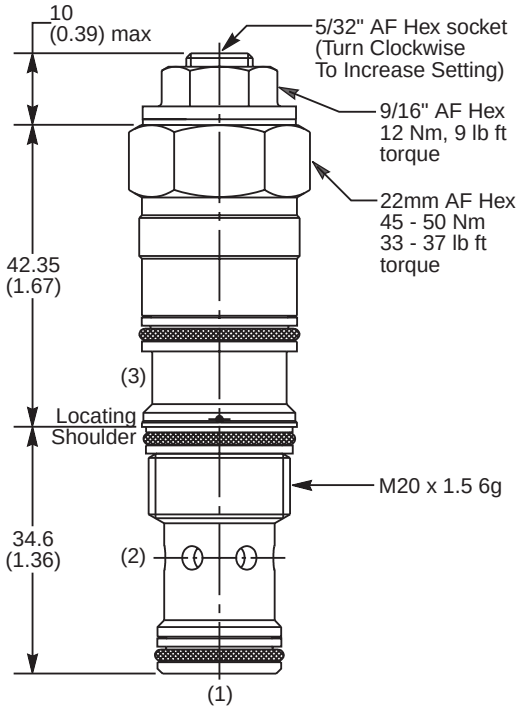
Relief & Pilot Performance 1 to 2



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E2		1S			
Load Control Valve	**Pilot Ratio**		**Adjustment Style**	**Cracking Pressure**	**Seals**

Code	Pilot Ratio
E	1.5 : 1
G	2.3 : 1
K	3 : 1
M	4.5 : 1

Code	Cracking Pressure
	Omit for no setting (Standard)*
	Specify setting if required

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Standard)
T	Tamper Resistant (TC1131)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30700N-1)
V	Fluorocarbon / (SK30700V-1)

Order Bodies Separately

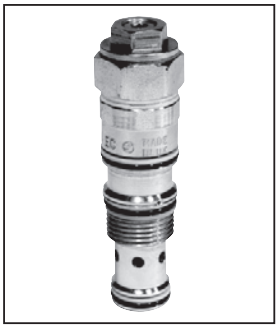
LB10		
Line Body	**Porting**	**Body Material**

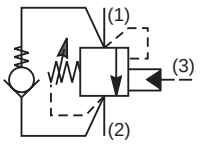
Code	Porting
826	1/2″ BSP (main) 1/4″ BSP (aux)
825	1/2″ SAE (main) 1/4″ SAE (aux)
828	1/2″ BSP Dual Cavity
827	1/2″ SAE Dual Cavity

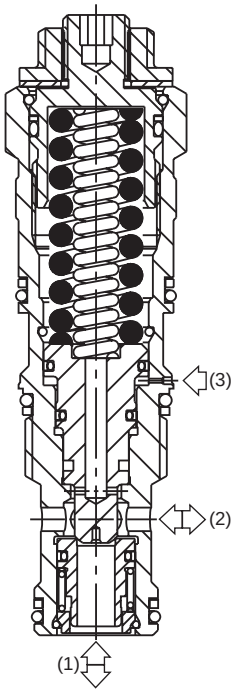
Code	Body Material
A	Aluminum
S	Steel

General Description

Threaded Cartridge Style Counterbalance Valve. Restrictive Ports 2 to 3. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM4.







Features

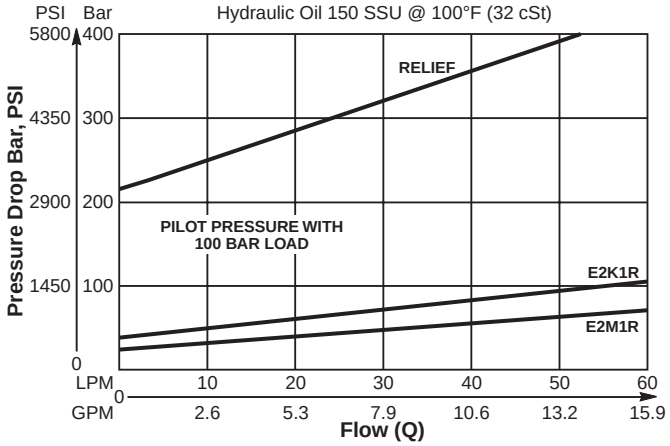
- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection
- Includes reverse check valve within body, saving space and minimizing installation cost
- Fully sealed pilot for high efficiency and accurate pilot ratio
- Two pilot ratios available, 3:1 and 4.5:1
- Hardened working parts for maximum durability
- All external parts zinc plated

Specifications

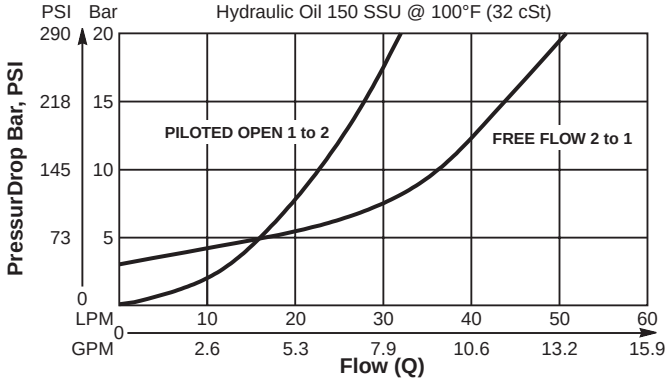
Rated Flow	Free flow 60 LPM (16 GPM) Piloted open flow 38 LPM (10 GPM)
Pressure	90 - 350 Bar (1305 - 5000 PSI)
Sensitivity: Pressure/Turn	104 Bar (1508 PSI)
Pilot Ratio	**E2K1R -** 3 : 1 **E2M1R -** 4.5 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.17 kg (0.37 lbs.)
Cavity	CAVT11A (See BC Section for more details)

Performance Curves

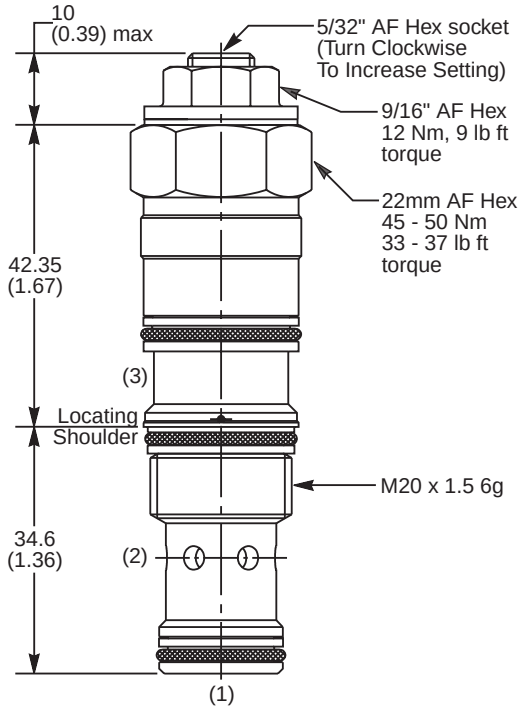
Relief & Pilot Performance 1 to 2



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E2		1R			
Load Control Valve	Pilot Ratio		Adjustment Style	Cracking Pressure	Seals

Code	Pilot Ratio
K	3 : 1
M	4.5 : 1

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Standard)
T	Tamper Resistant (TC1131)

Code	Cracking Pressure
	Omit for no setting (Standard)*
	Specify setting if required

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30700N-1)
V	Fluorocarbon / (SK30700V-1)

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

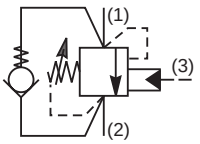
Code	Porting
826	1/2″ BSP (main) 1/4″ BSP (aux)
825	1/2″ SAE (main) 1/4″ SAE (aux)
828	1/2″ BSP Dual Cavity
827	1/2″ SAE Dual Cavity

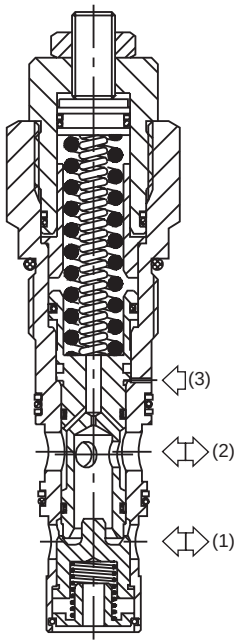
Code	Body Material
A	Aluminum
S	Steel

General Description

Threaded Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM4.







Features

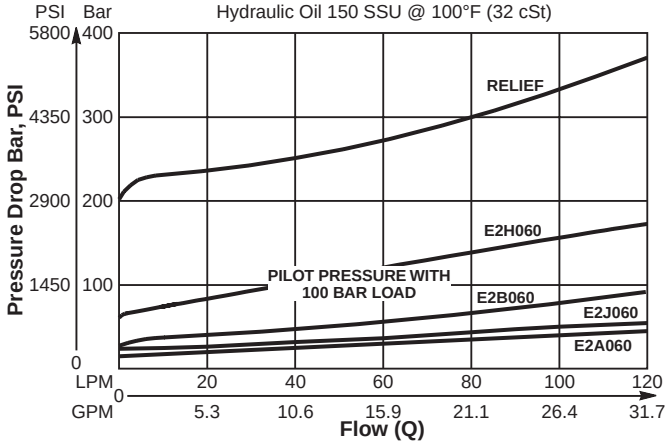
- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection
- Includes reverse check valve within body, saving space and minimizing installation cost
- Excellent control and very good stability
- Four pilot ratios available, 1.75:1, 3:1, and 5:1 for cylinders and 8:1 for motor control
- Hardened working parts for maximum durability
- Adjustable and tamper resistant versions also available
- All external parts zinc plated

Specifications

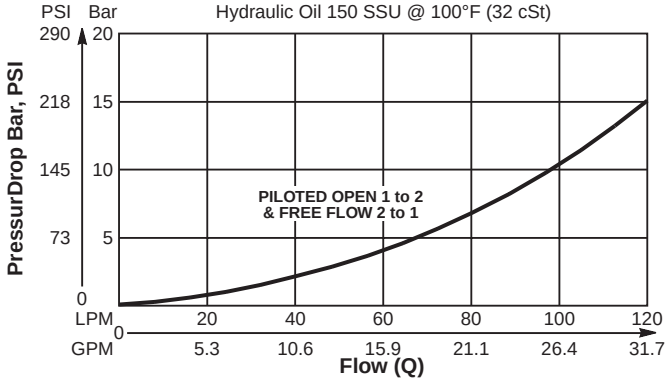
Rated Flow	120 LPM (32 GPM)
Pressure	50 - 350 Bar (725 - 5000 PSI)
Sensitivity: Pressure/Turn	44 Bar (640 PSI)
Pilot Ratio	**E2A060 -** 8 : 1 **E2B060 -** 3 : 1 **E2H060 -** 1.75 : 1 **E2J060 -** 5 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.54 kg (1.19 lbs.)
Cavity	3C (See BC Section for more details)

Performance Curves

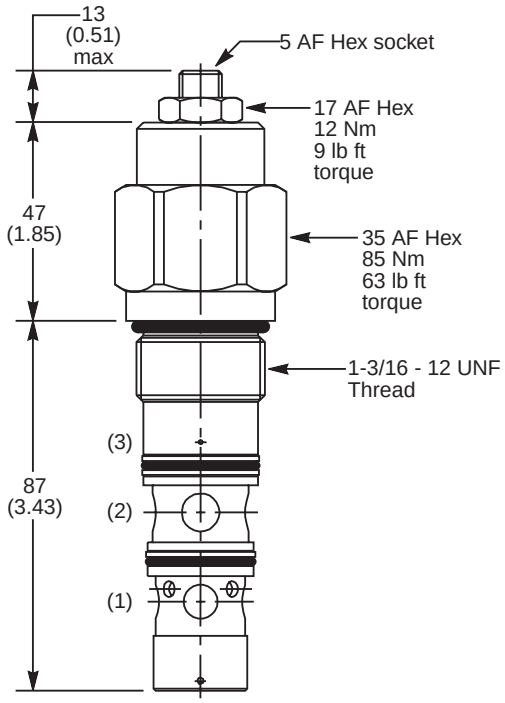
Relief & Pilot Performance 1 to 2



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E2		060			
Load Control Valve	**Pilot Ratio**		**Adjustment Style**	**Cracking Pressure**	**Seals**

Code	Pilot Ratio
A	8 : 1
B	3 : 1
H	1.75 : 1
J	5 : 1

Code	Cracking Pressure
	Omit for no setting (Standard)*
	Specify setting if required

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Standard)
T	Tamper Resistant (TC1125)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30008N-1)
V	Fluorocarbon / (SK30008V-1)

Order Bodies Separately

LB10		
Line Body	**Porting**	**Body Material**

Code	Porting
039	3/4″ BSP (main) 1/4″ BSP (aux)
069	1″ SAE (main) 1/4″ SAE (aux)
034	3/4″ BSP Dual Cavity
234	3/4″ SAE Dual Cavity

Code	Body Material
A	Aluminum
S	Steel

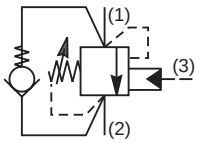
General Description

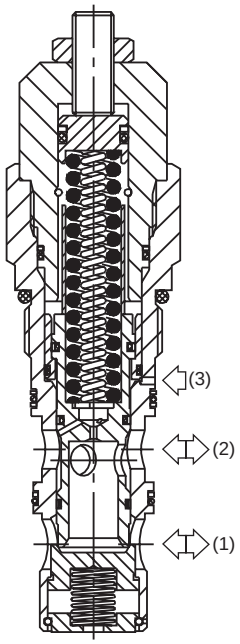
Threaded Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM4.

Features

- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection, and reverse check valve, saving space and minimizing installation cost
- Two pilot ratios available, 3:1 for cylinders and 8:1 for motor control
- Hardened working parts for maximum durability
- Adjustable and tamper resistant versions also available
- All external parts zinc plated





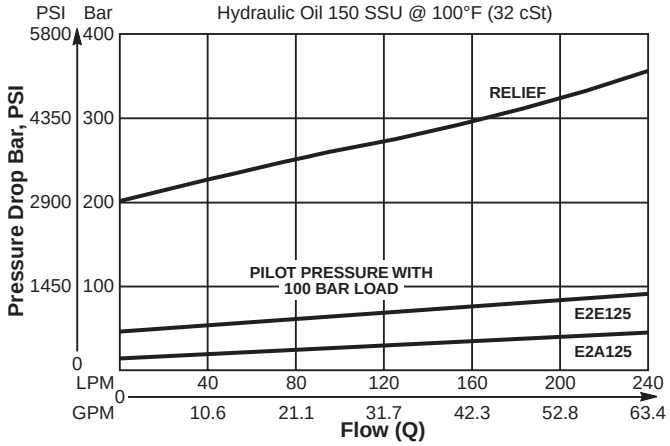


Specifications

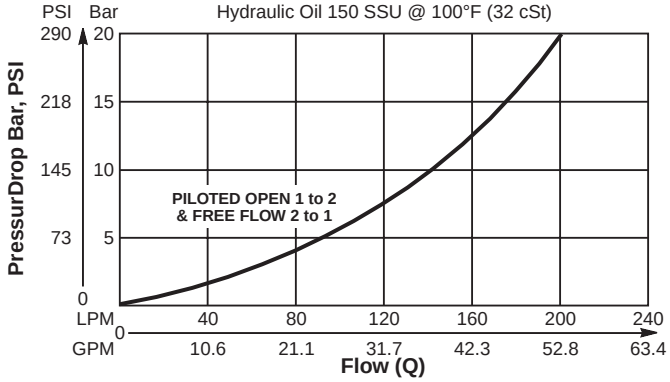
Rated Flow	200 LPM (53 GPM)
Pressure	50 - 350 Bar (725 - 5000 PSI)
Sensitivity: Pressure/Turn	34 Bar (493 PSI)
Pilot Ratio	**E2A125 -** 8 : 1 **E2E125 -** 3 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.75 kg (1.65 lbs.)
Cavity	3M (See BC Section for more details)

Performance Curves

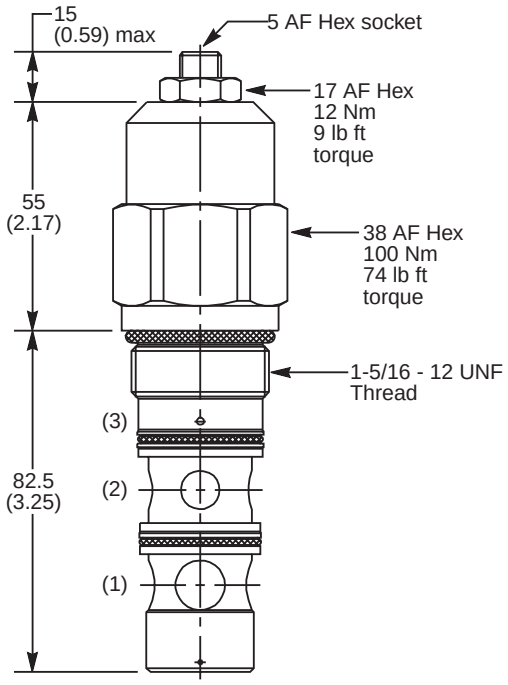
Relief & Pilot Performance 1 to 2



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E2		125			
Load Control Valve	**Pilot Ratio**		**Adjustment Style**	**Cracking Pressure**	**Seals**

Code	Pilot Ratio
A	8 : 1
E	3 : 1

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Standard)
T	Tamper Resistant (TC1125)
Y	Non-Adjustable Preset

Code	Cracking Pressure
	Omit for no setting (Standard)*
	Specify setting if required

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30035N-1)
V	Fluorocarbon / (SK30035V-1)

Order Bodies Separately

LB10		
Line Body	**Porting**	**Body Material**

Code	Porting
076	1″ BSP (main) 1/4″ BSP (aux)
078	1″ SAE (main) 1/4″ SAE (aux)
104	1″ BSP Dual Cavity
105	1″ SAE Dual Cavity

Code	Body Material
A	Aluminum
S	Steel

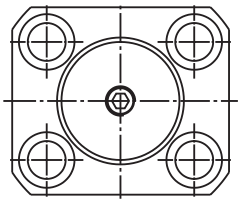
General Description

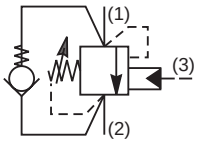
Threaded Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM4.

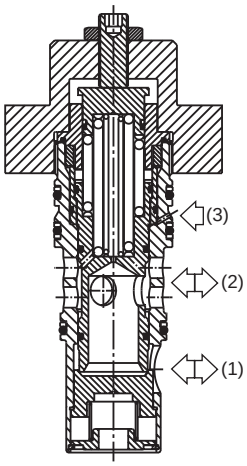
Features

- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection, and reverse check valve, saving space and minimizing installation cost
- Two pilot ratios available, 3:1 for cylinders and 8:1 for motor control
- Hardened working parts for maximum durability
- Adjustable and tamper resistant versions also available
- All external parts zinc plated







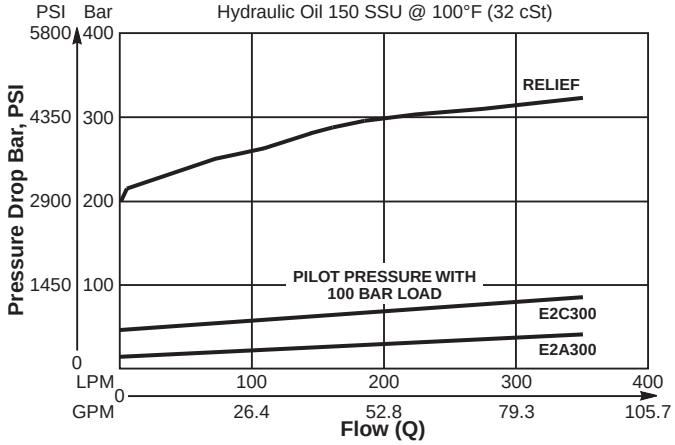


Specifications

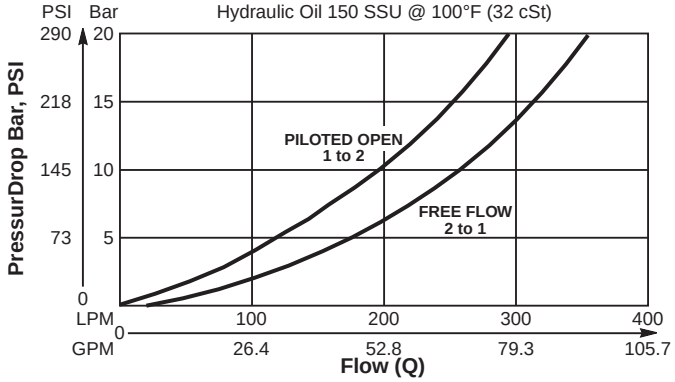
Rated Flow	350 LPM (92 GPM)
Pressure	50 - 350 Bar (725 - 5000 PSI)
Sensitivity: Pressure/Turn	45 Bar (653 PSI)
Pilot Ratio	**E2A300 -** 8 : 1 **E2C300 -** 3 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	1.44 kg (3.17 lbs.)
Cavity	3K (See BC Section for more details)

Performance Curves

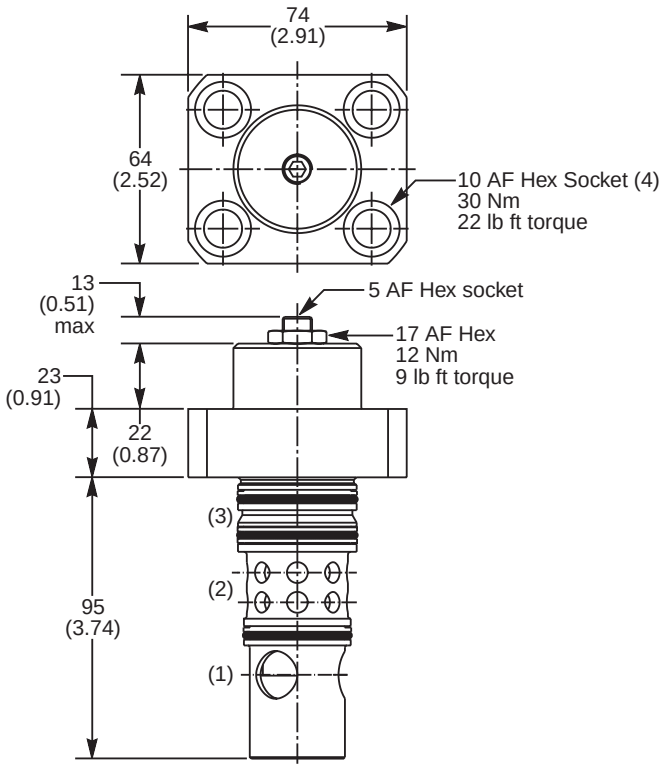
Relief & Pilot Performance 1 to 2



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E2		300			
Load Control Valve	Pilot Ratio		Adjustment Style	Cracking Pressure	Seals

Code	Pilot Ratio
A	8 : 1
C	3 : 1

Code	Adjustment Style / Kit No.
Z	Screw Adjust
T	Tamper Resistant (TC1125)

Code	Cracking Pressure
	Omit for no setting (Standard)*
	Specify setting if required

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30022N-1)
V	Fluorocarbon / (SK30022V-1)

Order Bodies Separately

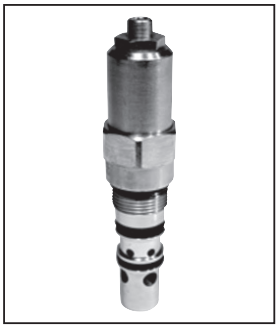
LB10		
Line Body	Porting	Body Material

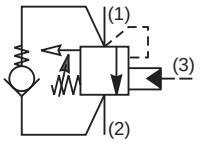
Code	Porting
089	1-1/4″ BSP (main) 1/4″ BSP (aux)

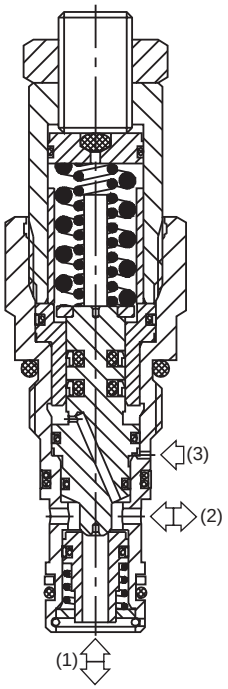
Code	Body Material
A	Aluminum
S	Steel

General Description

Threaded Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM4.







Features

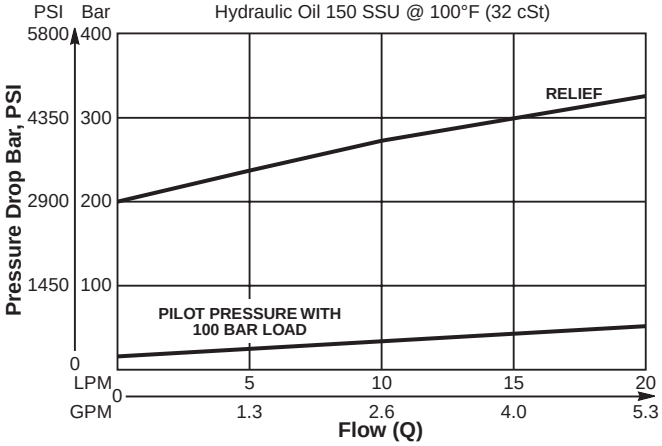
- Spring chamber isolated from system backpressure by double seal, eliminating vent port leakage and need for separate drain line
- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection
- Includes reverse check valve within body
- Small and compact, can be fitted directly into cylinder
- Adjustable and tamper resistant versions available
- All external parts zinc plated

Specifications

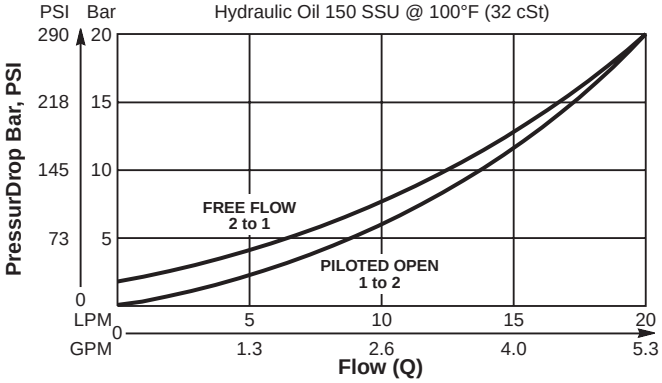
Rated Flow	20 LPM (5.3 GPM)
Pressure	50 - 420 Bar (725 - 6000 PSI)
Sensitivity: Pressure/Turn	84 Bar (1220 PSI)
Pilot Ratio	4.5 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.08 kg (0.18 lbs.)
Cavity	53-1 (See BC Section for more details)

Performance Curves

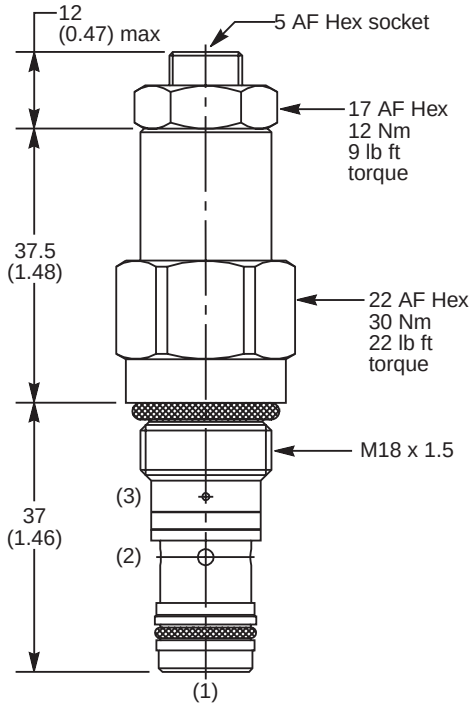
Relief & Pilot Performance 1 to 2



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E6	B	020			
Load Control Valve	**Pilot Ratio**		**Adjustment Style**	**Cracking Pressure**	**Seals**

Code	Pilot Ratio
B	4.5 : 1

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Standard)
T	Tamper Resistant (TC1125)

Code	Cracking Pressure
	Omit for no setting (Standard)*
	Specify setting if required

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30087N-1)
V	Fluorocarbon / (SK30087V-1)

Order Bodies Separately

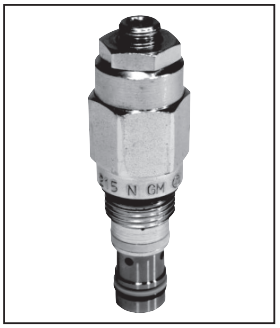
LB10		
Line Body	**Porting**	**Body Material**

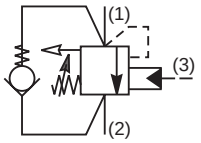
Code	Porting
310	3/8″ BSP (main) 1/4″ BSP (aux)
318	3/8″ SAE (main) 1/4″ SAE (aux)
312	3/8″ BSP Dual Cavity
319	3/8″ SAE Dual Cavity

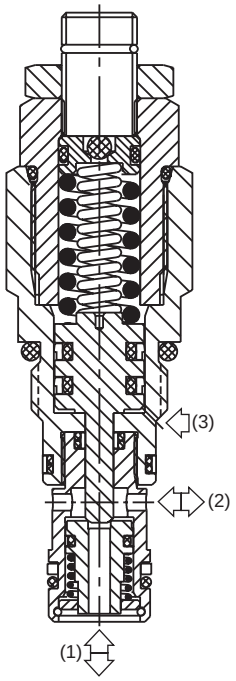
Code	Body Material
A	Aluminum
S	Steel

General Description

Threaded Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM4.







Features

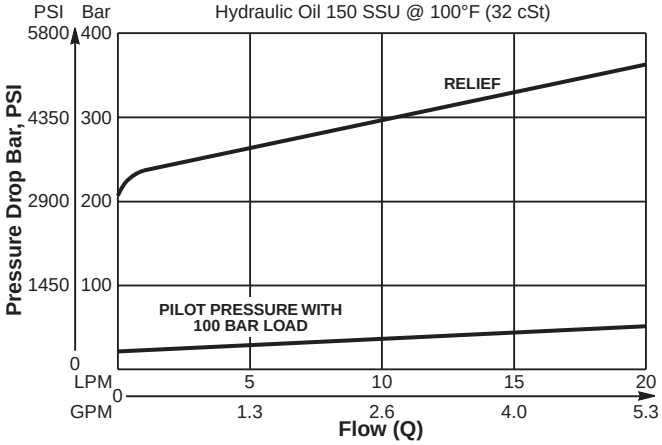
- Spring chamber isolated from system backpressure by double seal, eliminating vent port leakage and need for separate drain line
- Poppet construction for minimal leakage
- Suitable for remote pilot controlled boomlock applications as per ISO8463
- Incorporates direct acting relief valve for overload protection
- Includes reverse check valve within body
- Hardened working parts for maximum durability
- Adjustable and tamper resistant versions available
- All external parts zinc plated

Specifications

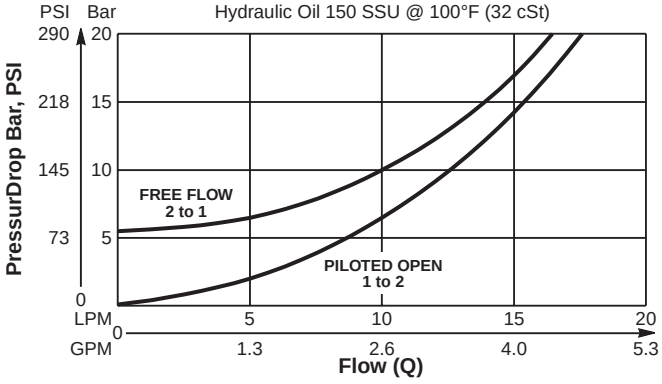
Rated Flow	20 LPM (5.3 GPM)
Pressure	100 - 350 Bar (1450 - 5075 PSI)
Sensitivity: Pressure/Turn	114 Bar (1650 PSI)
Pilot Ratio	15 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.08 kg (0.18 lbs.)
Cavity	53-1 (See BC Section for more details)

Performance Curves

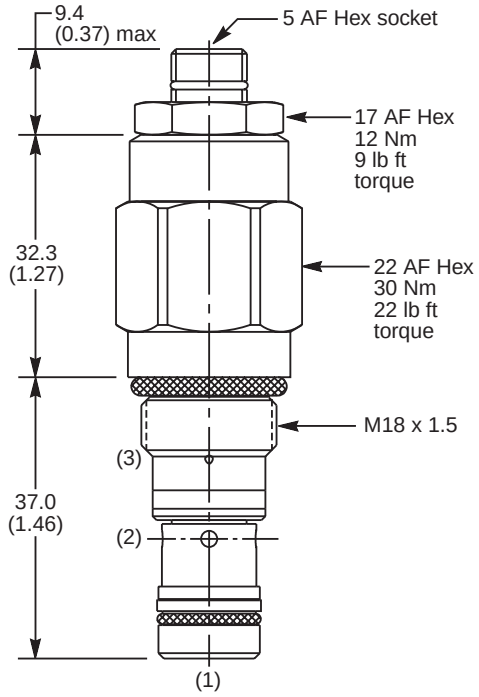
Relief & Pilot Performance 1 to 2



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E6	K	020			
Load Control Valve	Pilot Ratio		Adjustment Style	Cracking Pressure	Seals

Code	Pilot Ratio
K	15 : 1

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Standard)
T	Tamper Resistant (TC1125)

Code	Cracking Pressure
	Omit for no setting (Standard)*
	Specify setting if required

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30087N-1)
V	Fluorocarbon / (SK30087V-1)

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

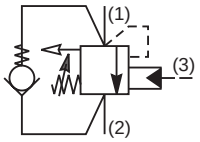
Code	Porting
310	3/8″ BSP (main) 1/4″ BSP (aux)
318	3/8″ SAE (main) 1/4″ SAE (aux)
312	3/8″ BSP Dual Cavity
319	3/8″ SAE Dual Cavity

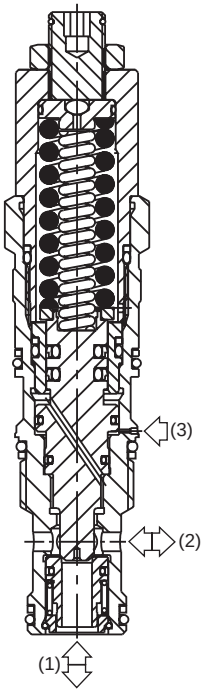
Code	Body Material
A	Aluminum
S	Steel

General Description

Threaded Cartridge Style Counterbalance Valve. 3 Port, Independent of Back Pressure, Vented to Atmosphere. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM4.







Features

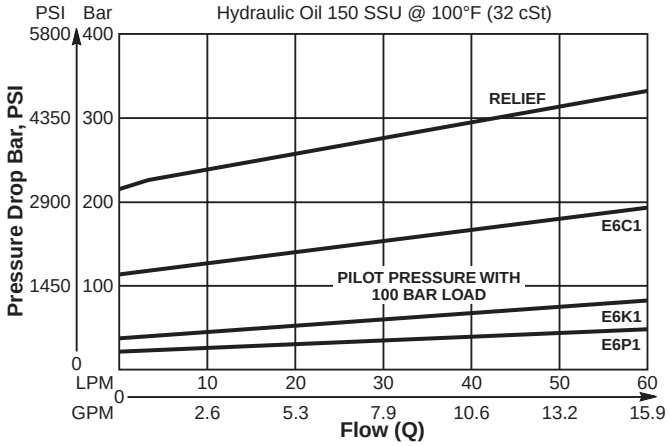
- Spring chamber isolated from system back pressure by double seal, eliminating vent port leakage and need for separate drain line
- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection
- Includes reverse check valve within body, saving space and minimizing installation cost
- Fully sealed pilot for high efficiency and accurate pilot ratio
- Three pilot ratios available, 1:1, 3:1 and 5:1
- Adjustable and tamper resistant versions available
- All external parts zinc plated

Specifications

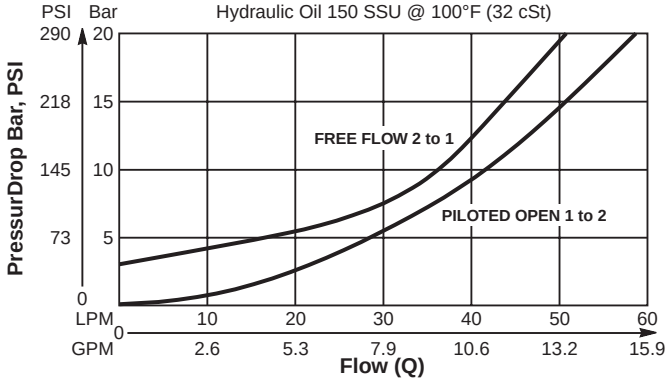
Rated Flow	60 LPM (16 GPM)
Pressure	40 - 350 Bar (580 - 5000 PSI)
Sensitivity: Pressure/Turn	78 Bar (1131 PSI)
Pilot Ratio	**E6C1 -** 1 : 1 **E6K1 -** 3 : 1 **E6P1 -** 5 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.22 kg (0.48 lbs.)
Cavity	CAVT11A (See BC Section for more details)

Performance Curves

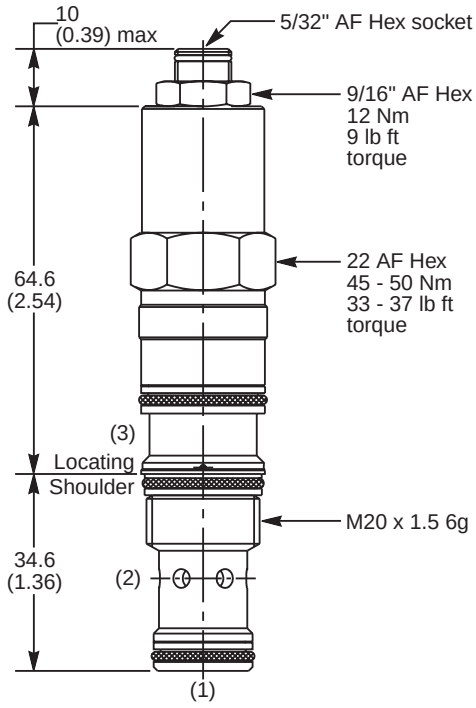
Relief & Pilot Performance 1 to 2



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E6		1			
Load Control Valve	Pilot Ratio		Adjustment Style	Cracking Pressure	Seals

Code	Pilot Ratio
C	1 : 1
K	3 : 1
P	5 : 1

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Standard)
T	Tamper Resistant (TC1130)

Code	Cracking Pressure
	Omit for no setting (Standard)*
	Specify setting if required

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30700N-1)
V	Fluorocarbon / (SK30700V-1)

Order Bodies Separately

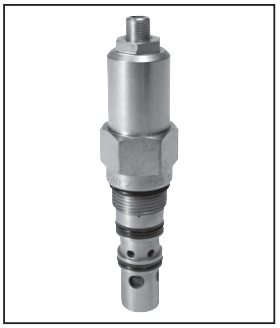
LB10		
Line Body	Porting	Body Material

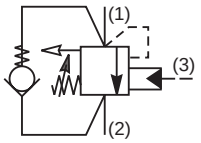
Code	Porting
826	1/2″ BSP (main) 1/4″ BSP (aux)
825	1/2″ SAE (main) 1/4″ SAE (aux)
828	1/2″ BSP Dual Cavity
827	1/2″ SAE Dual Cavity

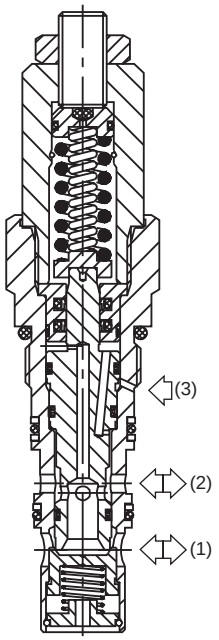
Code	Body Material
A	Aluminum
S	Steel

General Description

Threaded Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM4.







Features

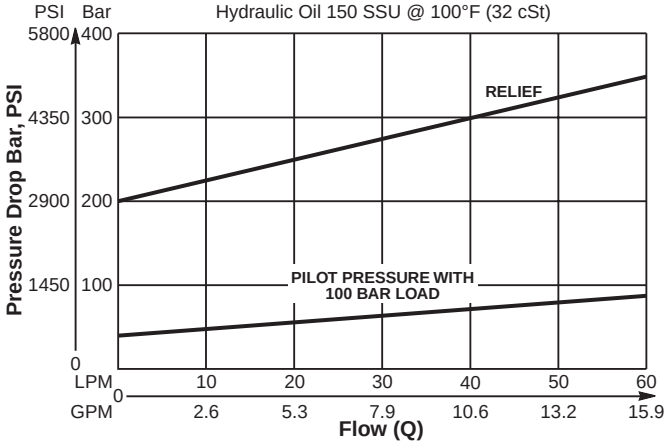
- Spring chamber isolated from system backpressure by double seal, eliminating vent port leakage and need for separate drain line
- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection
- Includes reverse check valve within body, saving space and minimizing installation cost
- Hardened working parts for maximum durability
- Adjustable and tamper resistant versions available
- All external parts zinc plated

Specifications

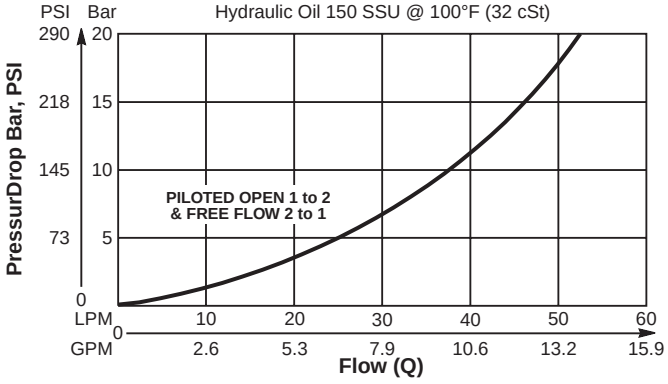
Rated Flow	60 LPM (15.9 GPM)
Pressure	50 - 350 Bar (725 - 5000 PSI)
Sensitivity: Pressure/Turn	92 Bar (1335 PSI)
Pilot Ratio	3 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.33 kg (0.73 lbs.)
Cavity	68-1 (See BC Section for more details)

Performance Curves

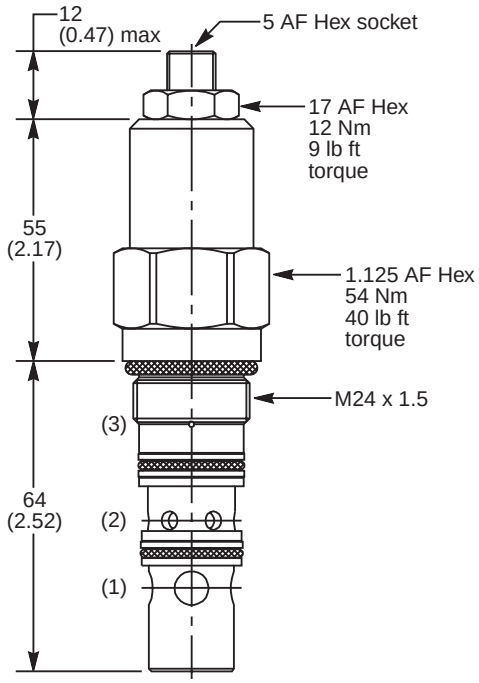
Relief & Pilot Performance 1 to 2



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E6	B	040			
Load Control Valve	Pilot Ratio		Adjustment Style	Cracking Pressure	Seals

Code	Pilot Ratio
B	3 : 1

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Standard)
T	Tamper Resistant (TC1125)

Code	Cracking Pressure
	Omit for no setting (Standard)*
	Specify setting if required

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30059N-1)
V	Fluorocarbon / (SK30059V-1)

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

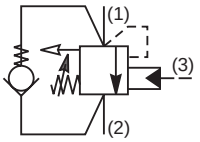
Code	Porting
251	1/2″ BSP (main) 1/4″ BSP (aux)
253	1/2″ SAE (main) 1/4″ SAE (aux)
259	1/2″ BSP Dual Cavity
261	1/2″ SAE Dual Cavity

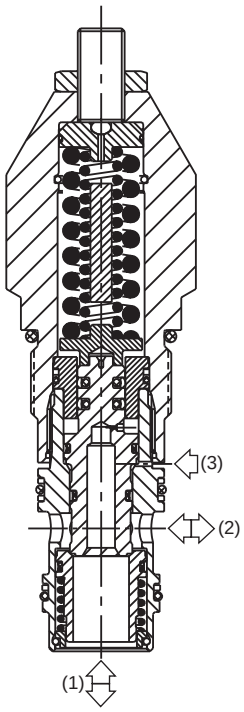
Code	Body Material
A	Aluminum
S	Steel

General Description

Threaded Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM4.







Features

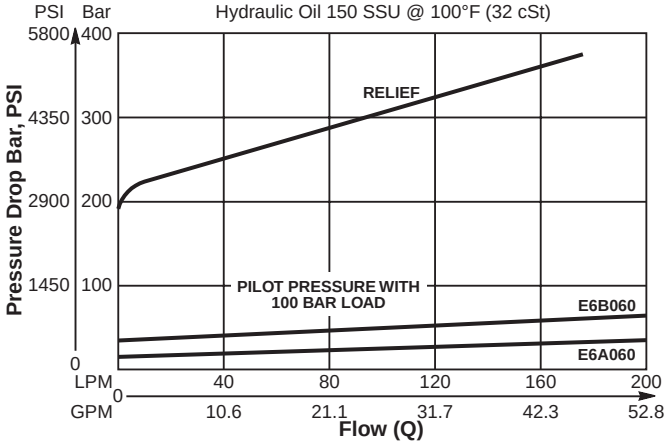
- High flow design with extra dampening
- Spring chamber isolated from system backpressure by double seal, eliminating vent port leakage and need for separate drain line
- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection
- Includes reverse check valve within body, saving space and minimizing installation cost
- Hardened working parts for maximum durability
- Adjustable and tamper resistant versions available
- All external parts zinc plated

Specifications

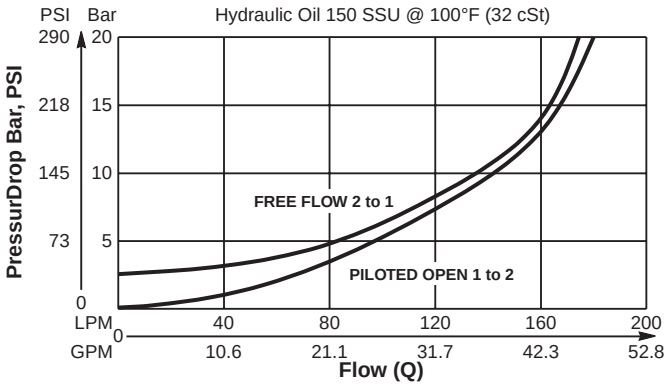
Rated Flow	180 LPM (48 GPM)
Pressure	50 - 350 Bar (725 - 5000 PSI)
Sensitivity: Pressure/Turn	50 Bar (725 PSI)
Pilot Ratio	**E6A060*409 -** 8 : 1 **E6B060*409 -** 3 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.53 kg (1.17 lbs.)
Cavity	3C (See BC Section for more details)

Performance Curves

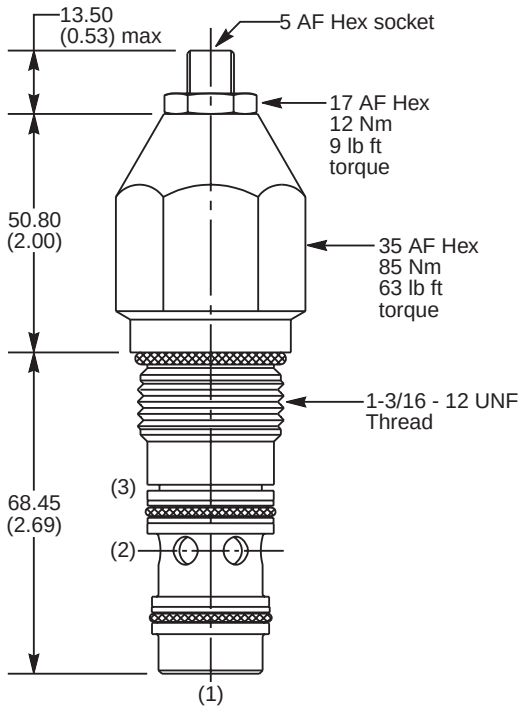
Relief & Pilot Performance 1 to 2



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E6		060				409
Load Control Valve	Pilot Ratio		Adjustment Style	Cracking Pressure	Seals	Suffix Number

Code	Pilot Ratio
A	8 : 1
B	3 : 1

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Standard)
T	Tamper Resistant (TC1125)

Code	Cracking Pressure
	Omit for no setting (Standard)*
	Specify setting if required

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.4 times maximum load induced pressure.

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30008N-1)
V	Fluorocarbon / (SK30008V-1)

Code	Suffix Number
409	High flow design with extra dampening

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

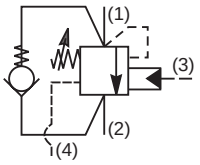
Code	Porting
039	3/4″ BSP (main) 1/4″ BSP (aux)
069	1″ SAE (main) 1/4″ SAE (aux)
034	3/4″ BSP Dual Cavity
234	3/4″ SAE Dual Cavity

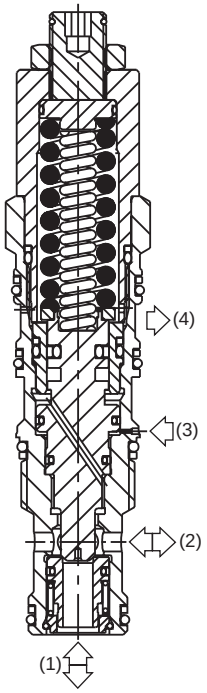
Code	Body Material
A	Aluminum
S	Steel

General Description

Threaded Cartridge Style Counterbalance Valve. 4 Port, Independent of Back Pressure, Vented to Drain Line. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM4.







Features

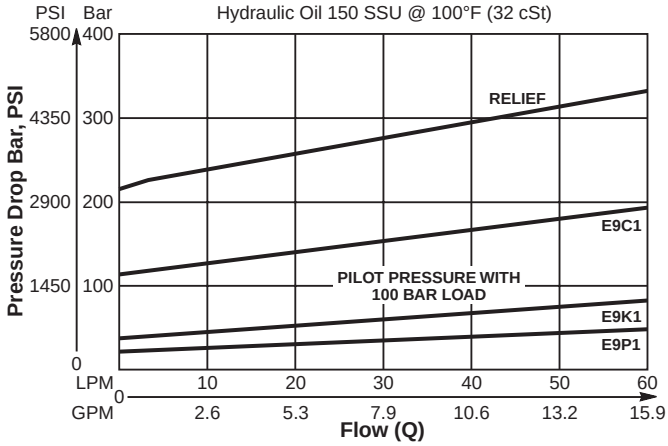
- Spring chamber isolated from system back pressure by vent port and use of separate drain line
- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection
- Includes reverse check valve, saving space and minimizing installation cost
- Fully sealed pilot for high efficiency and accurate pilot ratio
- Three pilot ratios available, 1:1, 3:1 and 5:1
- Adjustable and tamper resistant versions available
- All external parts zinc plated

Specifications

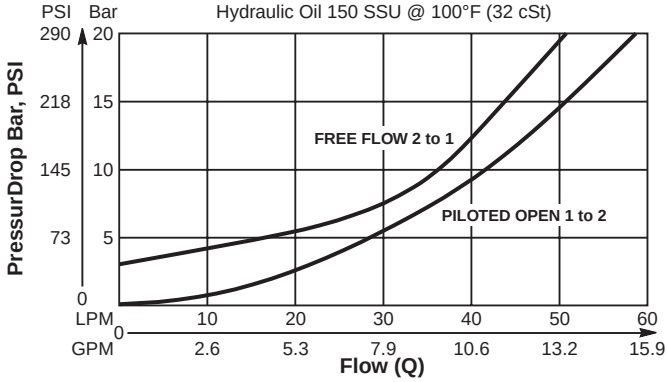
Rated Flow	60 LPM (16 GPM)
Pressure	40 - 350 Bar (580 - 5000 PSI)
Sensitivity: Pressure/Turn	78 Bar (1131 PSI)
Pilot Ratio	**E9C1 -** 1 : 1 **E9K1 -** 3 : 1 **E9P1 -** 5 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.22 kg (0.48 lbs.)
Cavity	CAVT21A (See BC Section for more details)

Performance Curves

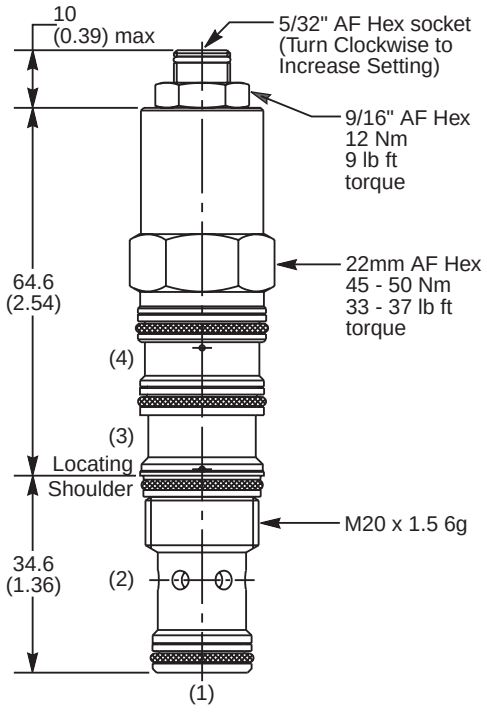
Relief & Pilot Performance 2 to 3



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E9		1			
Load Control Valve	Pilot Ratio		Adjustment Style	Cracking Pressure	Seals

Code	Pilot Ratio
C	1 : 1
K	3 : 1
P	5 : 1

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Standard)
T	Tamper Resistant (TC1130)

Code	Cracking Pressure
	Omit for no setting (Standard)*
	Specify setting if required

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30701N-1)
V	Fluorocarbon / (SK30701V-1)

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
831	1/2″ BSP (main) 3/8″ BSP (pilot) 1/4″ BSP (drain)
830	1/2″ SAE (main) 3/8″ SAE (pilot) 1/4″ SAE (drain)

Code	Body Material
A	Aluminum
S	Steel

BLANK
PAGE

Contents

Flow Control Valves

SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
		NEEDLE VALVES			
J02A2	C08-2	Needle Valve, Cartridge Type	45/12	420/6000	FC5-FC6
NVH081	C08-2	Needle Valve, Cartridge Type	38/10	380/5500	FC7-FC8
NVH101	C10-2	Needle Valve, Cartridge Type	60/16	380/5500	FC9-FC10
J06A2	C16-2	Needle Valve, Cartridge Type	225/60	420/6000	FC11-FC12
J02B2	C08-2	Needle Valve with Reverse Check, 2 to 1 Free Flow	30/8	420/6000	FC13-FC14
FV101	C10-3	Needle Valve with Reverse Check, 1 to 2 Free Flow	45/12	210/3000	FC15-FC16
FV102	C10-2	Needle Valve with Reverse Check, 1 to 2 Free Flow	23/6	210/3000	FC15-FC16
		PRESSURE COMPENSATED FLOW CONTROLS			
J02E2	C08-2	Restrictive Flow Control, Adjustable	20/5.3	420/6000	FC17-FC18
FR101	C10-2	Restrictive Flow Control, Tuneable	26/7	245/3500	FC19-FC20
J04E2	C10-2	Restrictive Flow Control, Adjustable	40/10	420/6000	FC21-FC22
J04C2	C10-2	Restrictive Flow Control, Adjustable	40/10	420/6000	FC23-FC24
FA101	C10-2	Restrictive Flow Control, Reverse Check, Adjustable	21/5.5	210/3000	FC25-FC26
FC101	C10-2	Restrictive Flow Control, Reverse Check, Tuneable	56/15	210/3000	FC27-FC28
		PRESSURE COMPENSATED PRIORITY FLOW CONTROLS			
J02D3	C08-3	Priority Type, with Bypass	15/4	420/6000	FC29-FC30
FP101	C10-3	Priority Type, with Bypass	56/15	245/3500	FC31-FC32
J04D3	C10-3	Priority Type, with Bypass	45/12	420/6000	FC33-FC34
J1A125	3A	Priority Type, with Bypass	90/24	350/5000	FC35-FC36
		PRESSURE COMPENSATORS			
FCR101	C10-3	Restrictive Type, Press. Compensators	38/10	245/3500	FC37
FCR161	C16-3	Restrictive Type, Press. Compensators	150/40	245/3500	FC38
		PRIORITY PRESSURE COMPENSATORS			
FCP101	C10-4	Priority Type, with Bypass	56/15	245/3500	FC39
FCPH121	C12-4	Priority Type, with Bypass	95/25	380/5500	FC41-FC42
		FLOW DIVIDERS/COMBINERS			
FDC101	C10-4	Flow Divider/Combiner	45/12	245/3500	FC43-FC44
L04A3	C10-4	Flow Divider/Combiner	60/16	420/6000	FC45-FC46
L06A3	C16-4	Flow Divider/Combiner	180/47	420/6000	FC47-FC48
L1A300	91-1	Flow Divider/Combiner	320/85	350/5000	FC49-FC50

INTRODUCTION

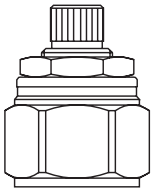
This technical tips section is designed to help familiarize you with the Parker line of Flow Control Valves. In this section we present common options available as well as a brief synopsis of the operation and applications of the various product offered in this section. The intent of this section is to help you in selecting the best products for your application.

COMMON OPTIONS

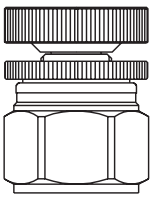
As you will see, Parker offers a variety of Flow Control products. As such, some of the options mentioned below may not be available on all valve models. Consult the model coding and dimensions of each valve for specifics. Here are some of the common options available.

Adjustment Types: Parker offers four primary types of adjustments for most of the flow control products. Samples of these types are shown below. Please note all options may not be available for all valves. Consult the individual catalog pages for more details.

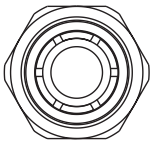
Screw Adjustment - Valve can be adjusted with an allen wrench. Lock nut included to maintain desired setting after adjustment. This is the most common adjustment option available on most Parker products.

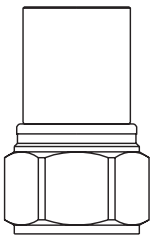


Knob Adjustment - An aluminum knob is added to the standard screw adjustment. A lock knob is provided to help maintain the desired setting after adjustment. Parker offers knob conversion kits for most flow control valves. For kit numbers consult the individual valve pages.

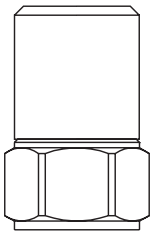


Fixed Style - In most cases, the Fixed Style product is a screw adjustable product with a steel collet threaded over the adjustment. These valves are preset at the factory. Should the valve need to adjusted, the star washer and aluminum plate can be removed from the top of the assembly exposing the adjustment.





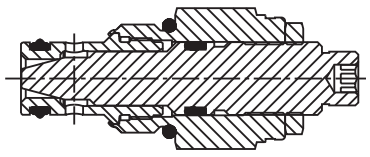
Tamper Resistant - The tamper resistant option is a screw adjustable valve with a steel cap installed to conceal the adjustment. The cap is designed so the internal edges clamp into the groove of the valve adapter. Once the cap is installed, it cannot be removed without damaging the cap and the valve. When a valve is ordered with the tamper resistant option, it will be preset at the factory, and the cap will be included in a separate plastic bag to allow for fine tuning at the customer site. Parker offers tamper resistant cap conversion kits for most flow control valves. For kit numbers consult the individual valve pages.



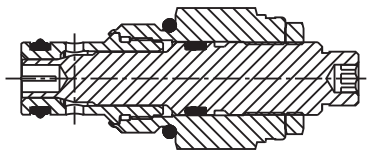
Seals: The Winner's Circle products feature a standard 4301 Polyurethane "D"-Ring. The "D"-Ring eliminates the need for backup rings.The majority of the products are available in Nitrile or Fluorocarbon Seals. You should match the seal compatibility to the temperature and fluid being used in your application.

Fine Meter Options: Fine meter needles are offered on some needle valve series. When this option is specified, the standard needle is replaced by a slotted needle. The slotted needle restricts substantially more flow giving you finer control in the small flow ranges. Obviously, the maximum flow capacity of the needle valve is decreased with the fine meter option.

Coarse Needle

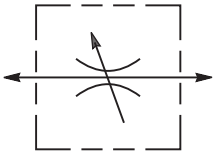


Fine Needle

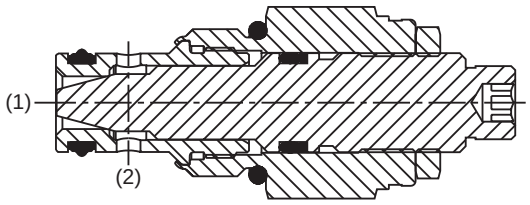


PRODUCT TYPES / APPLICATIONS

Needle Valve

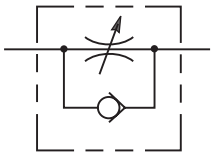


Needle valves provide uncompensated adjustable flow control of a desired function. They are ideal for applications where general control of hydraulic flow is needed, like in a bleed off circuit. When used with a compensator spool, a pressure compensated system can be obtained.

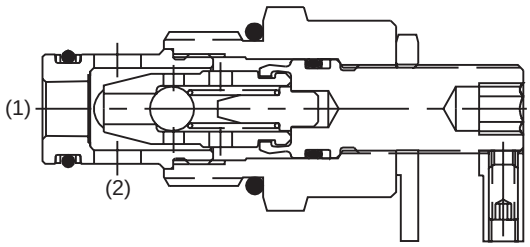


OPERATION - The valve acts as a fixed orifice in a hydraulic circuit. The effective size of the orifice increases as the tapered needle is opened. Shutoff is provided when fully closed. While a needle valve will meter flow regardless of the flow path, flow from port 2 to 1 is preferred. When you flow in the reverse direction (1 to 2), pressure forces work on the nose of the needle in an effort to drive it off of its seat. As such, all leakage conditions found in the catalog are based on flow from side to nose (port 2 to port 1). In addition, the adjustment will be harder to turn due to the added force.

Needle with a Reverse Check

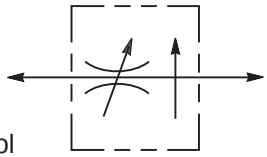


Needle valves with reverse check functions are sometimes also referred to as flow control valves. As the name implies, these valves provide uncompensated adjustable speed control in one direction and allow free flow in the opposite direction. When used with a compensator spool, a pressure compensated system can be obtained.

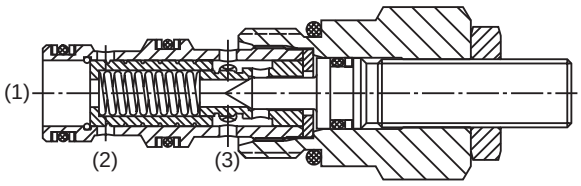


OPERATION - With flow entering the side of the cartridge (port 2), the needle acts as a fixed orifice. The effective size of this orifice is increased as the needle is opened controlling the output flow to port 1. With flow entering the nose (port 1), the check ball inside the needle is unseated allowing free flow to port 2.

P.C. Flow Regulator

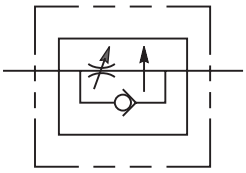


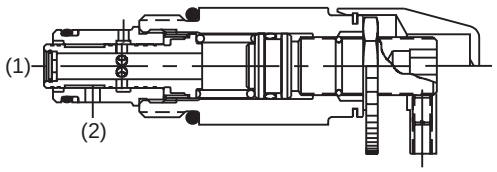
Pressure compensated flow regulators maintain a regulated flow regardless of changes in load or inlet pressure. They are commonly used to accurately control an actuator function. They can be used in meter-in or meter-out applications.



OPERATION - The valve consists of a control orifice within a normally open, spring biased compensator spool. Flow through the control orifice produces a pressure drop across the compensator spool. When inlet flow exceeds the flow setting of the valve, the force produced by the pressure differential across the spool exceeds the spring force and shifts the compensator spool to throttle or restrict flow; thus maintaining consistent flow through the valve. In the reverse direction, flow is metered, but not pressure compensated.

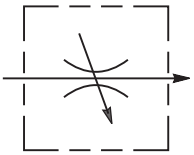
P.C. Flow Control

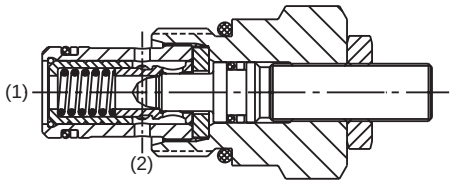




Pressure compensated flow controls are pressure compensated regulators with a reverse flow check valve. They provide constant regulated flow in the one direction regardless of changes in load pressure. Flow in the reverse direction is non-regulated, free flow. They can be used in meter-in or meter-out applications.

Adjustable Flow Controls

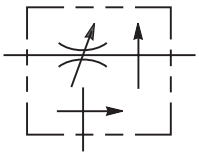


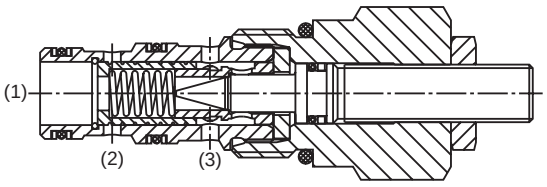


Most adjustable pressure compensated flow controls have a limited adjustment range. You will see in our catalog that we use the term “tuneable” for the FR101 and FC101 valves. This means they are only adjustable within a pre-set range. The FA101, J02E2, J04E2 and J04C2 are fully adjustable. Keep this adjustment capability in mind when you select a flow control.

OPERATION - When flow enters the nose (port 1) of the cartridge, it passes through a control orifice. This control orifice creates a pressure differential across the regulating spool. As the inlet flow increases, the pressure differential across the regulating spool increases, allowing the regulating spool to overcome its spring force and begin to shift. As it shifts, it throttles to maintain a constant flow. When used in conjunction with a fixed displacement pump, a relief valve between pump and valve is needed. Full flow is allowed in the reverse direction (port 2 to 1).

Priority Style P.C. Flow Regulator



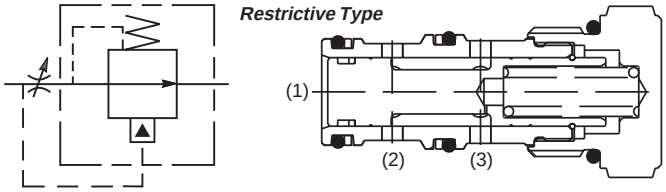


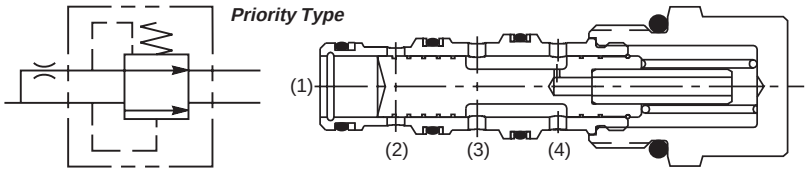
Priority style pressure compensator regulators maintain constant priority flow to one leg of the circuit regardless of changes in load or inlet pressure. Once this priority flow requirement is satisfied, the excess flow is diverted and can be used in another leg of the circuit. These valves are usually used in meter-in applications.

OPERATION - The valve consists of a control orifice within a spring biased compensator spool. The priority port is normally open while the bypass port is normally closed. As flow enters the inlet of the cartridge and passes through the control orifice, a pressure differential is created across the compensator spool. When the inlet flow exceeds the setting of the valve, the force produced by this pressure differential exceeds the spring force and shifts the compensator spool; opening up the bypass port, and bypassing the excess flow. If load pressure at the bypass port is greater than the load pressure at the priority port, the compensator spool will further shift restricting the priority flow to that of the valve setting. ***Caution:*** If the priority line is blocked so that no flow can pass through the control orifice, the compensator spool will shift, blocking the bypass port and allowing inlet pressure to go to full system relief pressure. These valves do not provide a pressure relieving function, so it is common to place an external relief valve downstream of port 3 to prevent a no flow condition.

Compensator Valves

Compensator valves are used to provide pressure compensated control across an external fixed or adjustable orifice. Parker offers both the restrictive type of compensator and a priority style.

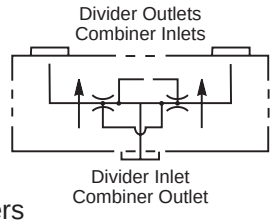


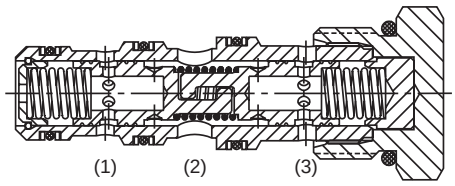


OPERATION - ***Restrictive Type:*** Inlet flow (upstream of the orifice) is split with one portion going to the compensator port inlet (port 1), the other portion passes through the orifice to the supply port (port 3). As pressure drop across the orifice reaches the selected compensator pressure drop, the higher pressure (pre-orifice) at port 1 starts to shift the compensator spool into throttling position. The valve works to maintain a constant pressure drop across the orifice.
Priority Type: Flow through the external orifice into the supply port (port 4) produces a pressure drop across the compensator spool. When the inlet pressure exceeds the initial setting of the valve, the force produced by the pressure differential across the spool exceeds the spring force and shifts the compensator spool to throttle or restrict the flow, thus maintaining constant flow through the priority port (port 3). The excess flow is bypassed to port 2. Regulated port flow must be maintained for bypass flow to continue.

Flow Divider / Combiner

Flow divider / combiner valves are used to proportion the flow from a single source into two actuators. In the reverse mode, the valve takes the flow from the two sources and combines it into one flow. When attempting to synchronize two cylinders with a flow/divider combiner valve, please consider that the flow accuracy is +10%.
A crossover relief can be used to help re-synchronize the cylinders by bottoming them out after several cycles.

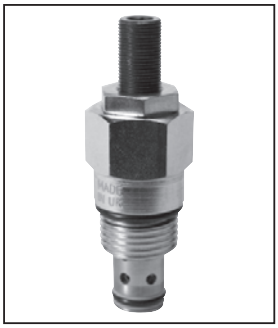


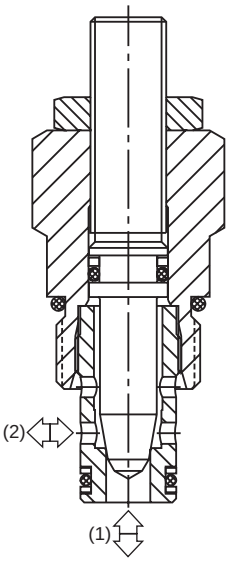


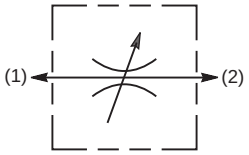
OPERATION - When flow enters the divider inlet port, it will pass through orifices in each of the interconnected spools. The flow passing through the orifices creates a pressure drop which pulls the two spools away from each other. The flow then passes to the two divider outlet ports. The division of flow (i.e. 50-50, 60-40, 66-33, etc.) is determined by the orifice sizes in the two spools.When flow is being combined, it enters the valve through two combiner inlets. The pressure drop across the orifices pulls the two spools together. The combined flow then passes through the combiner outlet.

General Description

Cartridge Style Needle Valve. For additional information see Technical Tips on pages FC1-FC4.







Features

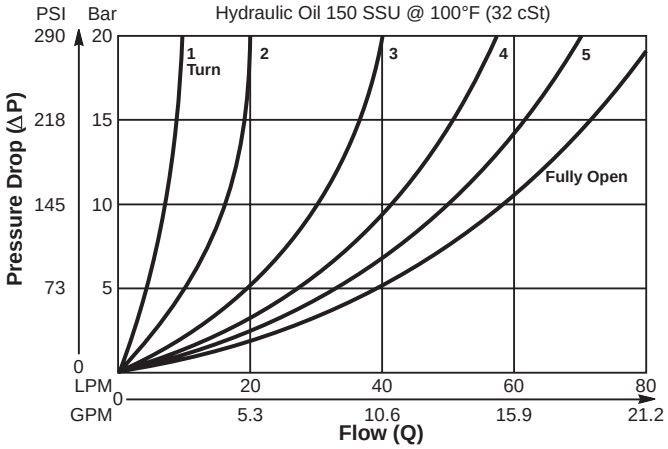
- Shuts off to a very low leakage level
- High flow capacity from a small cavity
- Good adjustment sensitivity - ideal for fine control
- Good contamination tolerant
- Adjustable and tamperproof versions available
- All external parts zinc plated

Specifications

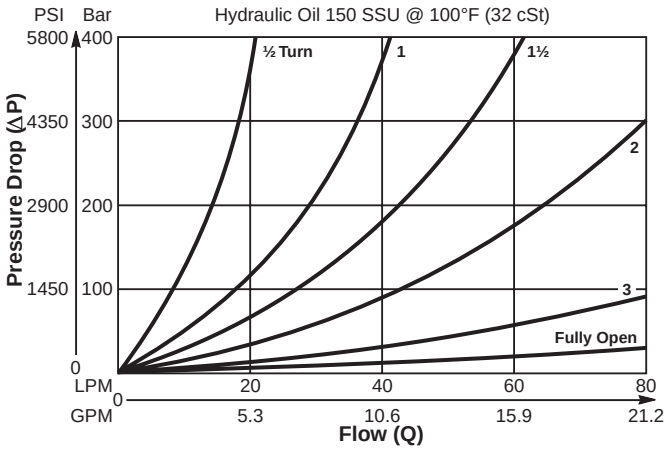
Rated Flow	45 LPM (12 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.11 kg (.24 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

Performance Curves (Through cartridge only)

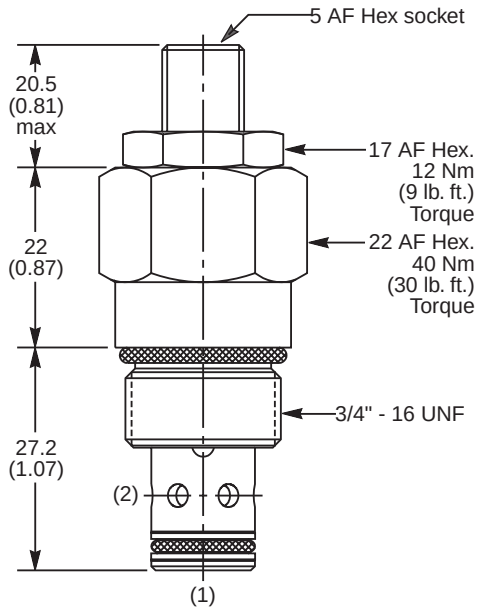
Low Pressure Drop vs. Flow 1 to 2 & 2 to 1



High Pressure Drop vs. Flow 1 to 2 & 2 to 1



Dimensions Millimeters (Inches)



Ordering Information

J02A2			—		
08 Size Needle Valve	Adjustment Style	Seals		Body Material	Port Size

Code	Adjustment Style
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30500N-1)
V	Fluorocarbon / (SK30500V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-2-*4P)
6P	3/8″ NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8″ BSPG	(B08-2-*6B)

**** Add "A" for aluminum, omit for steel.***

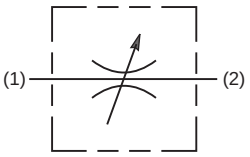
General Description

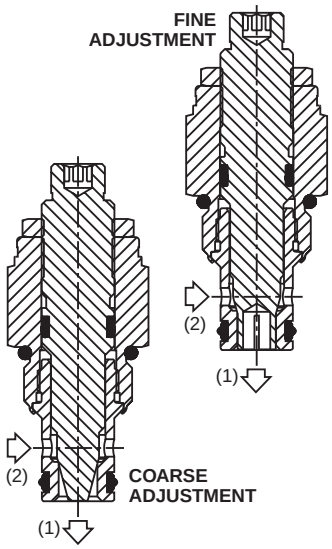
Cartridge Style Needle Valve.
For additional information see
Technical Tips on pages FC1-FC4.

Features

- Hardened, precision ground parts for durability
- Compact size for reduced space requirements
- Fine adjustment needle option available for precise adjustment
- Polyurethane “D”-Ring eliminates backup rings and prevents hydrolysis
- Valve meters flow in either direction, but (2 to 1) is the preferred direction for lowest leakage at shut off
- All external parts zinc plated





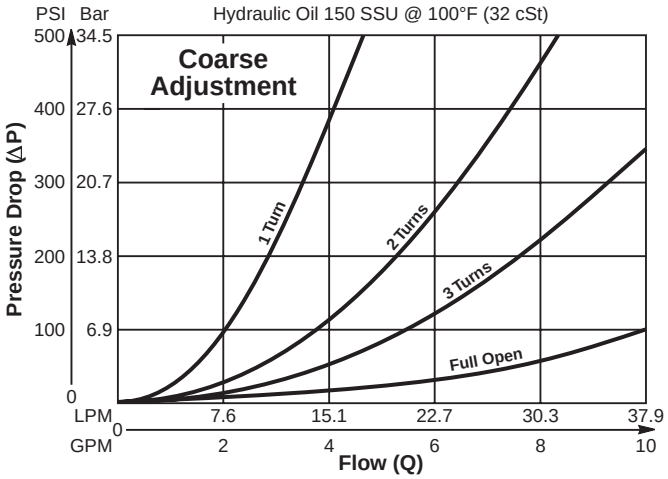


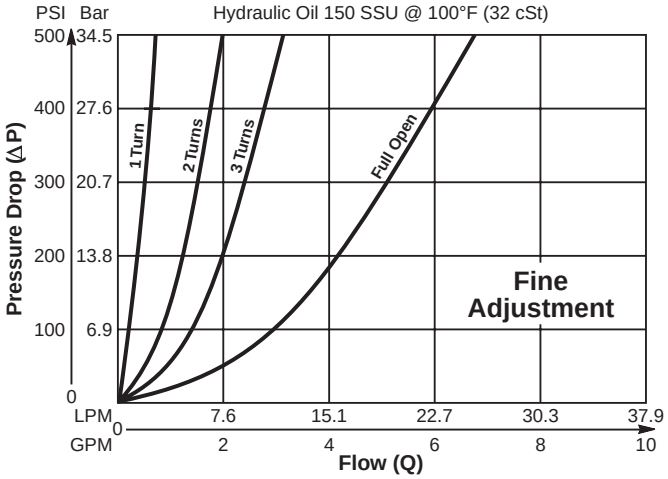
Specifications

Rated Flow	Fixed 37.9 LPM (10 GPM) Adjusted
Maximum Inlet Pressure	380 Bar (5500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.10 kg (.20 lbs.)
Cavity	No. C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

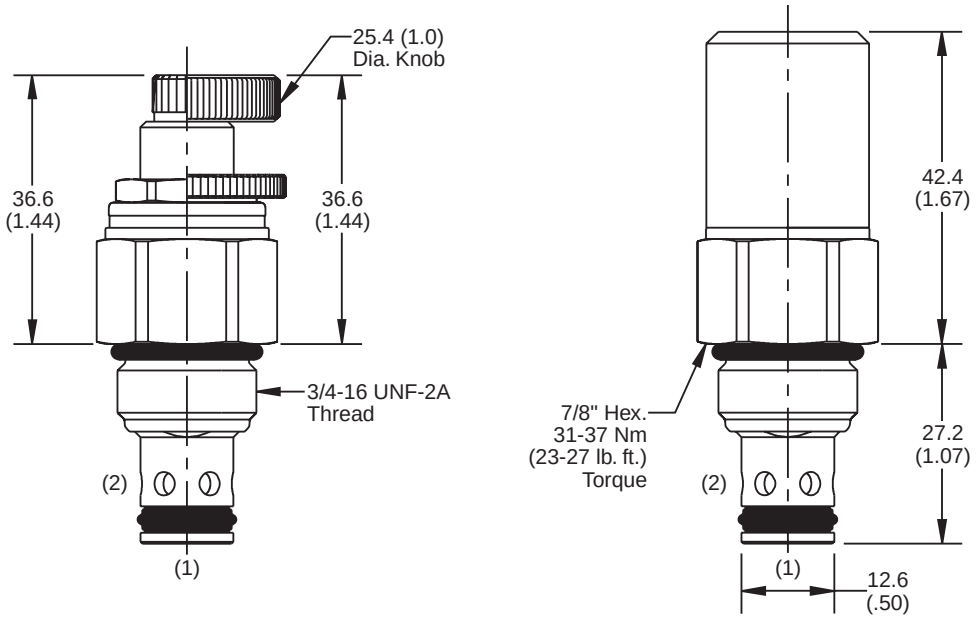
Performance Curves

Flow vs. Inlet Pressure (Through cartridge only)





Dimensions Millimeters (Inches)



Screw/Knob Version

Tamper Resistant Version

THIRD-ANGLE PROJECTION

Ordering Information

NVH081				—		
08 Size Needle Valve	Flow Needle	Adjustment Style	Seals		Body Material	Port Size

Code	Flow Needle
Omit	Coarse
F	Fine

Code	Adjustment Style
K	Knob Adjust (717784-10)
S	Screw Adjust
T	Tamper Resistant Cap (717943)

Code	Seals / Kit. No.
Omit	"D"-Ring / (SK08-2)
N	Nitrile / (SK08-2N)
V	Fluorocarbon / (SK08-2V)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-2-*4P)
6P	3/8″ NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8″ BSPG	(B08-2-*6B)

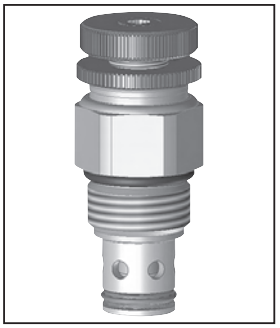
**** Add "A" for aluminum, omit for steel.***

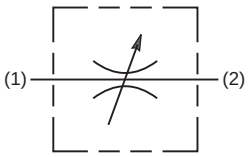
General Description

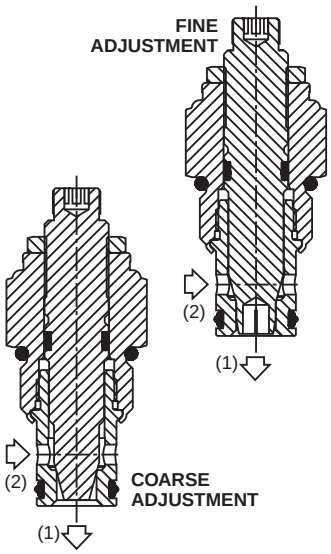
Cartridge Style Needle Valve. For additional information see Technical Tips on pages FC1-FC4.

Features

- Hardened, precision ground parts for durability
- Compact size for reduced space requirements
- Fine adjustment needle option available for precise adjustment
- Polyurethane “D”-Ring eliminates backup rings and prevents hydrolysis
- Valve meters flow in either direction, but (2 to 1) is the preferred direction for lowest leakage at shut off
- All external parts zinc plated





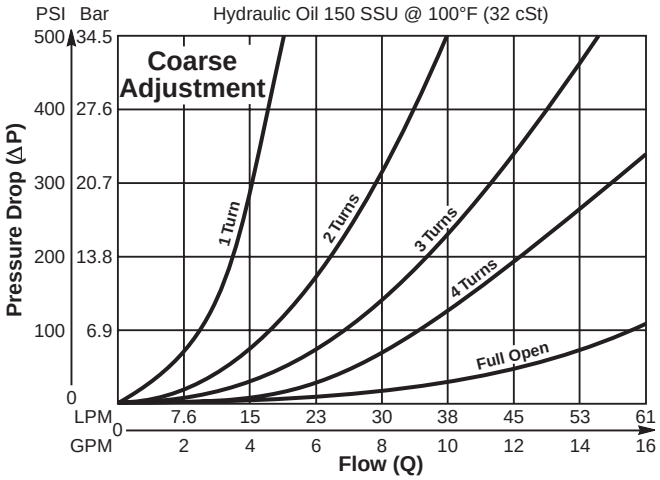


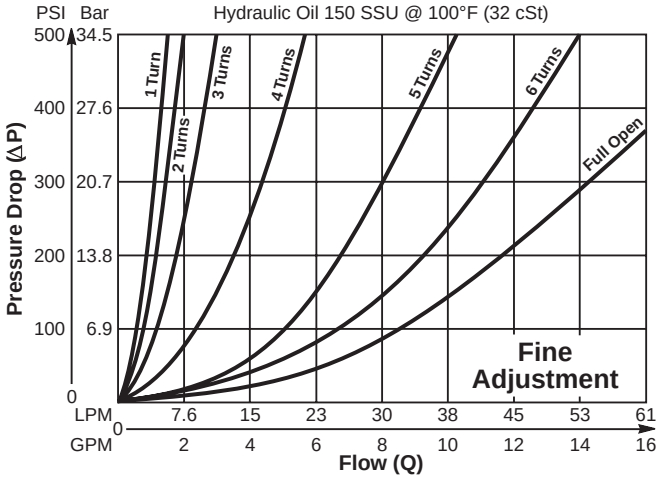
Specifications

Rated Flow	Fixed 60 LPM (16 GPM) Adjusted 60 LPM (16 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.18 kg (0.4 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

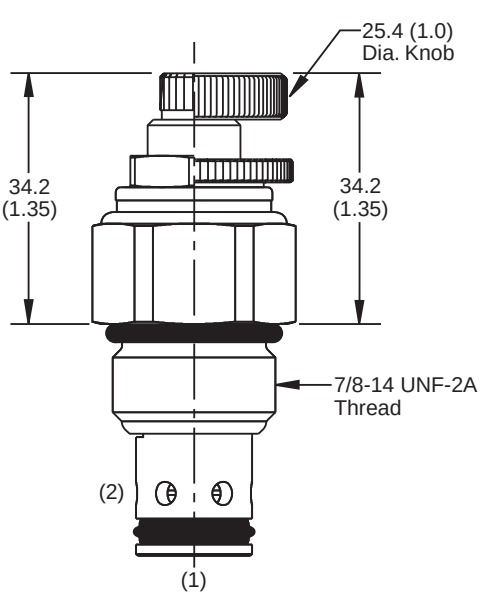
Performance Curves

Flow vs. Inlet Pressure (Through cartridge only)

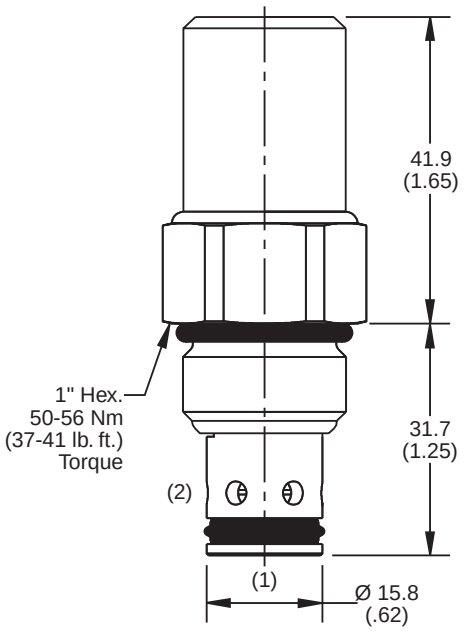




Dimensions Millimeters (Inches)



Screw/Knob Version



Tamper Resistant Version

THIRD-ANGLE PROJECTION

Ordering Information

NVH101				—		
10 Size Needle Valve	Flow Needle	Adjustment Style	Seals		Body Material	Port Size

Code	Flow Needle
Omit	Coarse
F	Fine

Code	Adjustment Style
K	Knob Adjust (717784-10)
S	Screw Adjust
T	Tamper Resistant Cap (717943)

Code	Seals / Kit. No.
Omit	"D"-Ring / (SK10-2)
N	Nitrile / (SK10-2N)
V	Fluorocarbon / (SK10-2V)

Code	Body Material
Omit	Steel
A	Aluminum

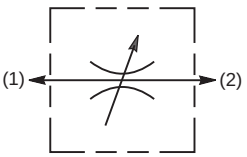
Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-*6B)

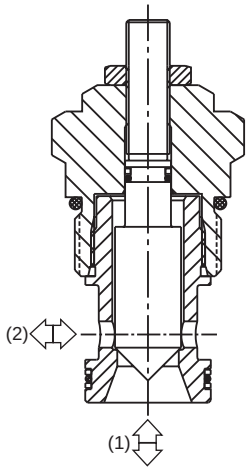
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

Cartridge Style Needle Valve. For additional information see Technical Tips on pages FC1-FC4.







Features

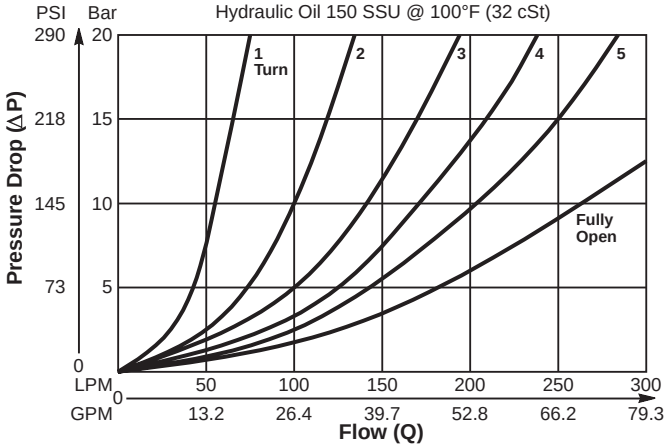
- Shuts off to a very low leakage level
- High flow capacity
- Good adjustment sensitivity - ideal for fine control
- Good contamination tolerant
- Adjustable and tamperproof versions available
- All external parts zinc plated

Specifications

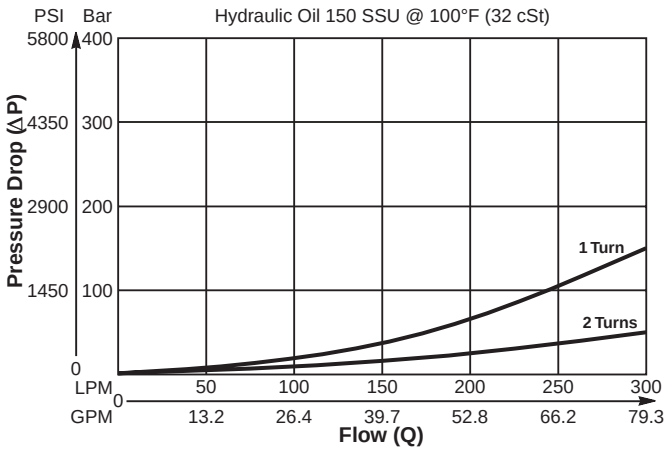
Rated Flow	225 LPM (60 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.38 kg (.84 lbs.)
Cavity	C16-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT16-2F

Performance Curves (Through cartridge only)

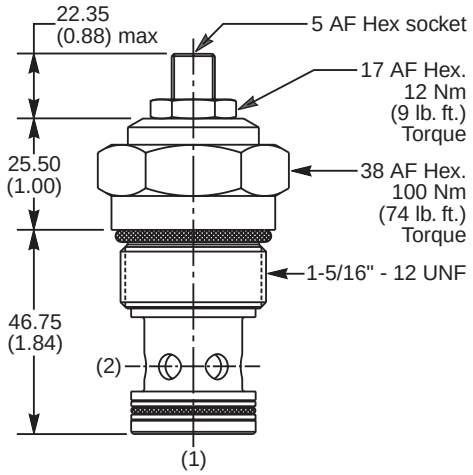
Low Pressure Drop vs. Flow 1 to 2 & 2 to 1



High Pressure Drop vs. Flow 1 to 2 & 2 to 1



Dimensions Millimeters (Inches)



Ordering Information

J06A2			—		
16 Size Needle Valve	Adjustment Style	Seals		Body Material	Port Size

Code	Adjustment Style
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30507N-1)
V	Fluorocarbon / (SK30507V-1)

Code	Body Material
Omit	Steel
A	Aluminum

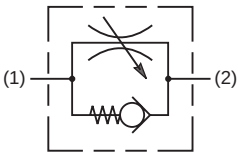
Code	Port Size	Body Part No.
Omit	Cartridge Only	
12P	3/4″ NPTF	(B16-2-*12P)
16P	1″ NPTF	(B16-2-*16P)
8T	SAE-8	(B16-2-*8T)
12T	SAE-12	(B16-2-*12T)
16T	SAE-16	(B16-2-*16T)
12B	3/4″ BSPG	(B16-2-12B)†
16B	1″ BSPG	(B16-2-*16B)

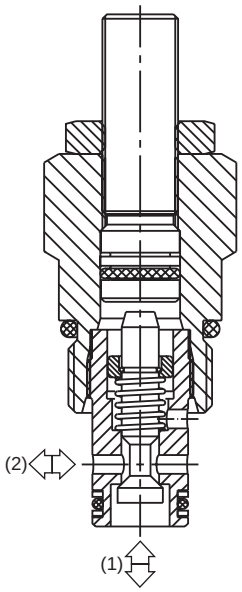
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

Poppet Type Needle Valve with Reverse Flow Check. For additional information see Technical Tips on pages FC1-FC4.







Features

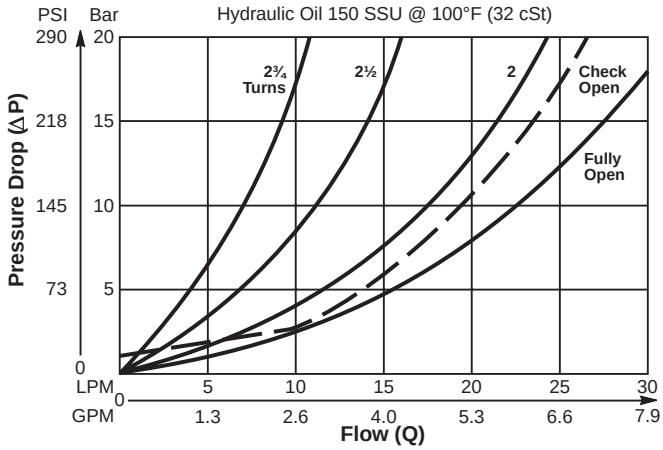
- Shuts off to a very low leakage level
- Good adjustment sensitivity - ideal for fine control
- Good contamination tolerant
- Adjustable and tamperproof versions available
- All external parts zinc plated

Specifications

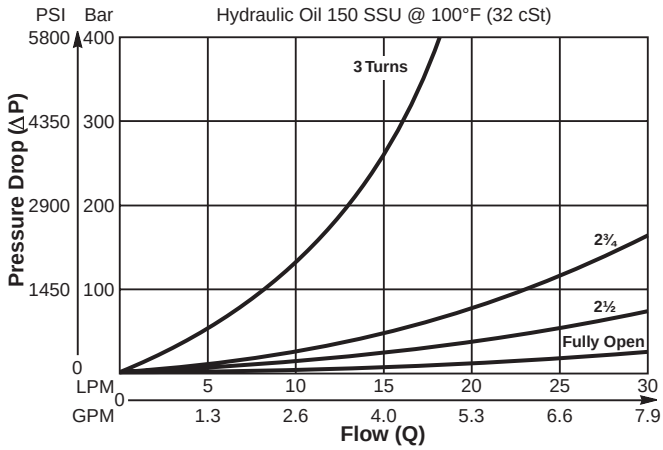
Rated Flow	30 LPM (8 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.11 kg (.24 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

Performance Curves (Through cartridge only)

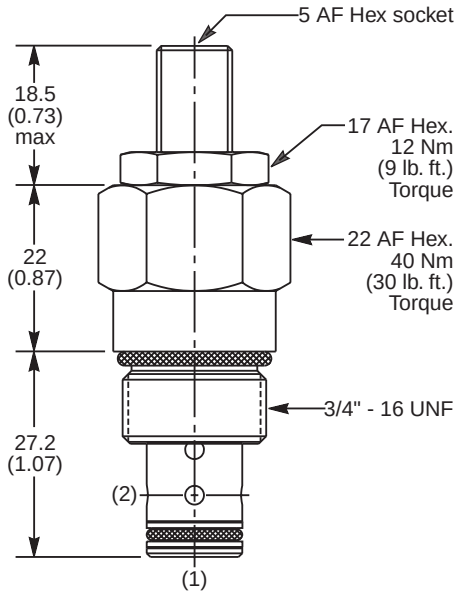
Low Pressure Drop vs. Flow 1 to 2 & 2 to 1



High Pressure Drop vs. Flow 1 to 2



Dimensions Millimeters (Inches)



Ordering Information

J02B2			—		
08 Size Needle Valve	Adjustment Style	Seals		Body Material	Port Size

Code	Adjustment Style
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30500N-1)
V	Fluorocarbon / (SK30500V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-2-*4P)
6P	3/8″ NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8″ BSPG	(B08-2-*6B)

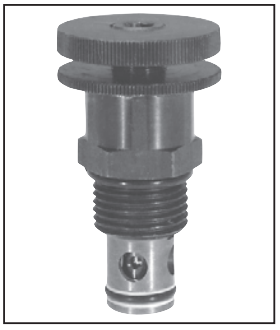
**** Add "A" for aluminum, omit for steel.***

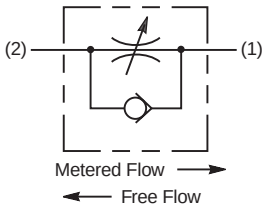
General Description

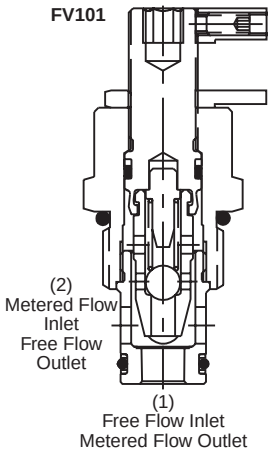
Needle Valve with a Reverse Check. Also known as a Flow Control Valve. For additional information see Technical Tips on pages FC1-FC4.

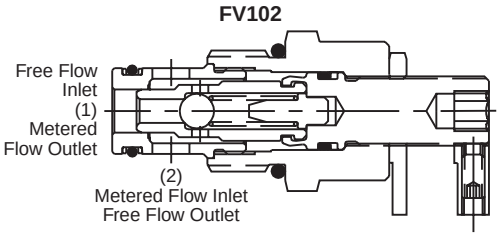
Features

- Hardened, precision ground parts for durability
- Compact size for reduced space requirements
- Fine thread needle option available for precise adjustment
- All external parts zinc plated





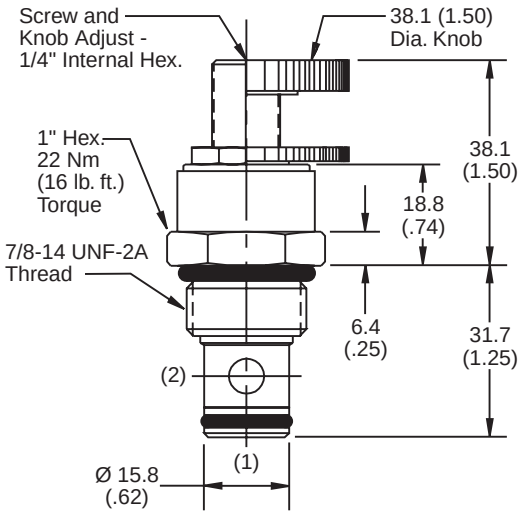




Specifications

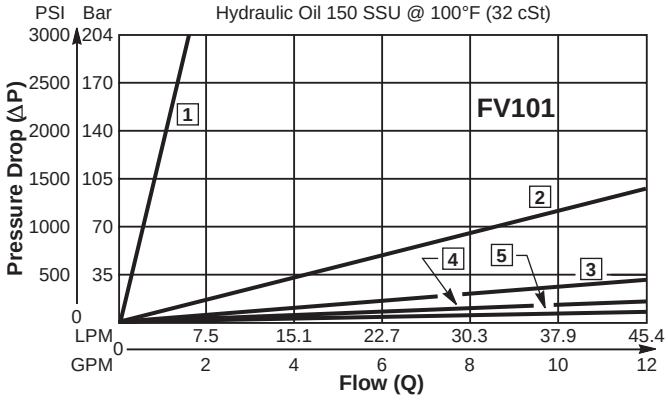
Rated Flow	**FV101** 45 LPM (12 GPM) **FV102** 23 LPM (6 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.23 kg (0.5 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

Dimensions Millimeters (Inches)



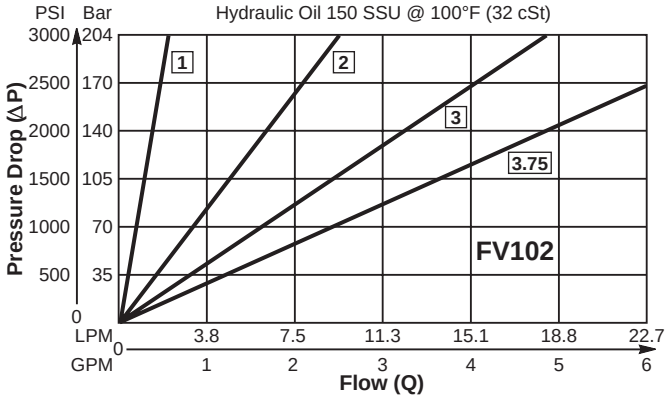
Performance Curves

Metered Flow vs. Pressure Drop (Through cartridge only)



☐ = No. of Turns From Fully Closed.

The number on each curve indicates the number of complete turns of the knob or screw adjustment from fully closed. When the metered flow is 22.5 LPM (6 GPM) and the adjustment is two complete turns from closed, the pressure drop will be 13.8 Bar (200 PSI). When the metered flow is 22.5 LPM (6 GPM) and the adjustment is five complete turns from closed, the pressure drop will be 3.5 Bar (50 PSI).



☐ = No. of Turns From Fully Closed.

The number on each curve indicates the number of complete turns of the knob or screw adjustment from fully closed (non-metered flow). When the metered flow is 7.5 LPM (2 GPM) and the adjustment is two complete turns from closed, the pressure drop will be 156.9 Bar (2275 PSI). When the metered flow is 7.5 LPM (2 GPM) and the adjustment is 3.75 turns from closed, the pressure drop will be 56.6 Bar (820 PSI).

Ordering Information

FV10	☐	☐	☐	—	☐	☐
10 Size Flow Control Valve	Style	Adjustment Style	Seals		Body Material	Port Size

Code	Style
1	Coarse Flow
2	Fine Flow

Code	Seals / Kit. No.
Omit	Nitrile / (SK10-2N)
V	Fluorocarbon / (SK10-2V)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Adjustment Style
K	Knob Adjust
S	Screw Adjust

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

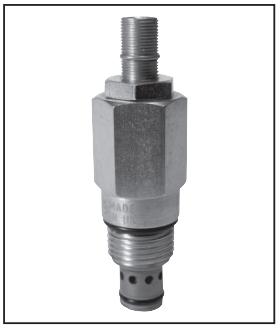
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

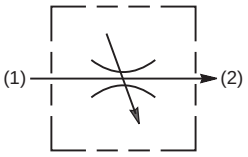
General Description

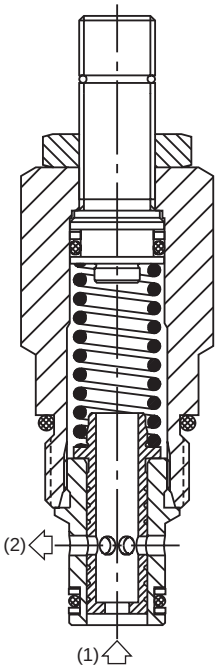
Restrictive Style, Pressure Compensated Flow Control Valve. For additional information see Technical Tips on pages FC1-FC4.

Features

- Minimal flow change with pressure variation
- Reverse flow function
- Full adjustment from 1-20 LPM (0.3-5.3 GPM)
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated





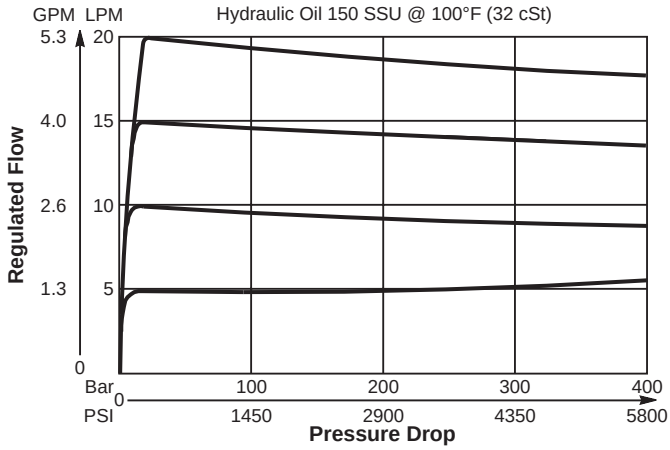


Specifications

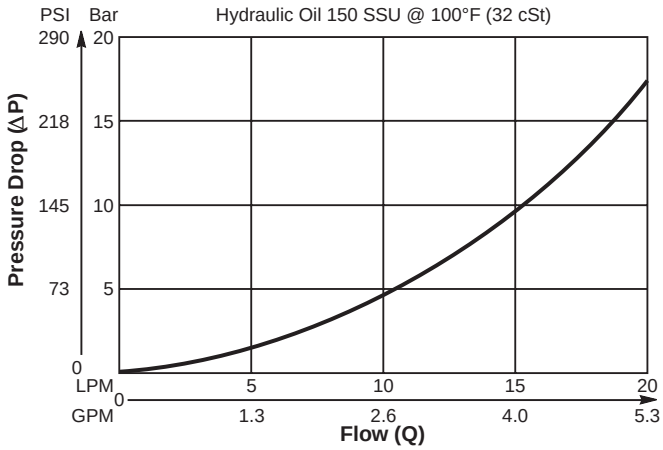
Rated Flow	20 LPM (5.3 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.13 kg (.29 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

Performance Curves (Through cartridge only)

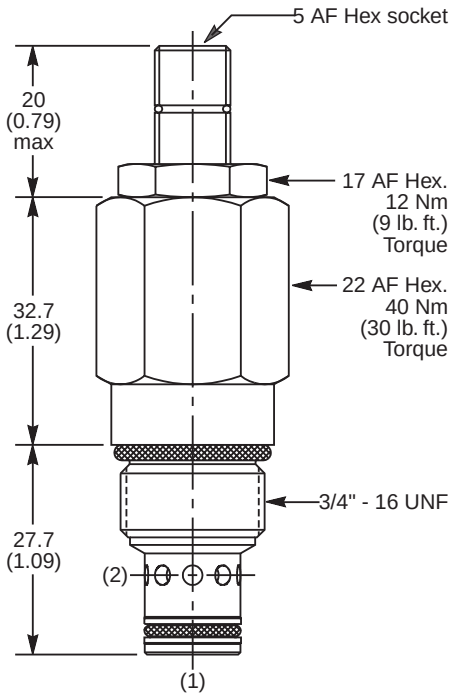
Flow Regulating Performance



Reverse Flow Pressure Drop vs. Flow



Dimensions Millimeters (Inches)



Ordering Information

J02E2				—		
08 Size Pressure Compensated Flow Control Valve	Adjustment Style	Optional Flow Setting	Seals		Body Material	Port Size

Code	Adjustment Style
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30500N-1)
V	Fluorocarbon / (SK30500V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-2-*4P)
6P	3/8″ NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8″ BSPG	(B08-2-*6B)

**** Add "A" for aluminum, omit for steel.***

Code	Optional Flow Setting
Omit	Omit for no setting*
	Specify setting if required (LPM)

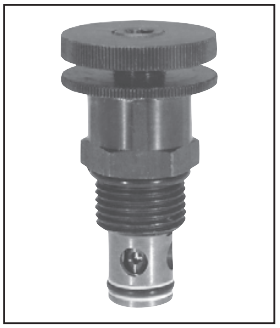
**** Appropriate mid-range setting for Standard = 10 LPM***

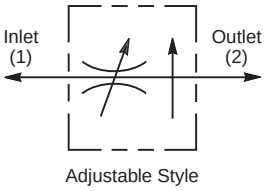
General Description

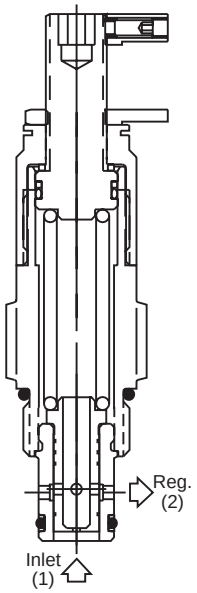
Pressure Compensated Flow Regulator Valve.
NOTE: When used with a fixed displacement pump, pressure to the cartridge must be controlled by a relief valve located between the pump and the FR101 cartridge. For additional information see Technical Tips on pages FC1-FC4.

Features

- Hardened, precision ground parts for durability
- Cartridge design
- Acts as a fixed orifice in reverse flow condition
- All external parts zinc plated







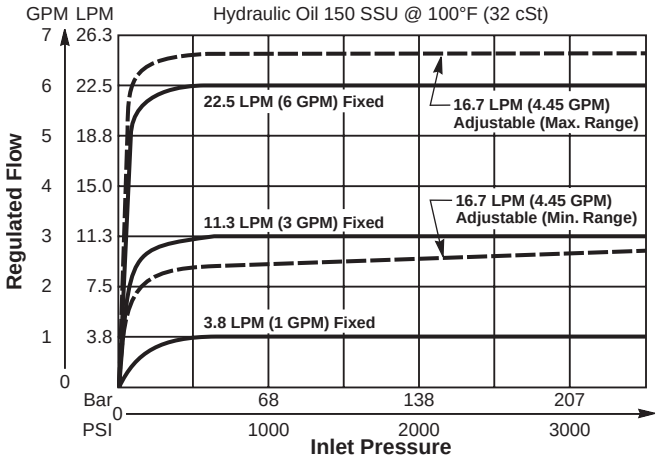
Specifications

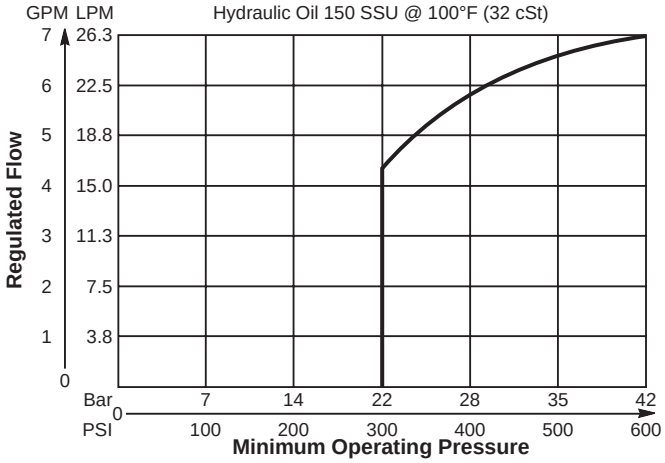
Rated Flow	**Fixed** 22.5 LPM (6 GPM) **Adjusted** 26.5 LPM (7 GPM)
Maximum Inlet Pressure	245 Bar (3500 PSI)
Accuracy (Fixed)	3.8 LPM (1 GPM) ±20% 7.5 - 11.3 LPM (2-3 GPM) ±15% 15 - 22.5 LPM (4-6 GPM) ±10%
Adjustment Range (Adj. Version)	±30% Nominal
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.23 kg (0.5 lbs.)
Cavity	No. C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

Performance Curves

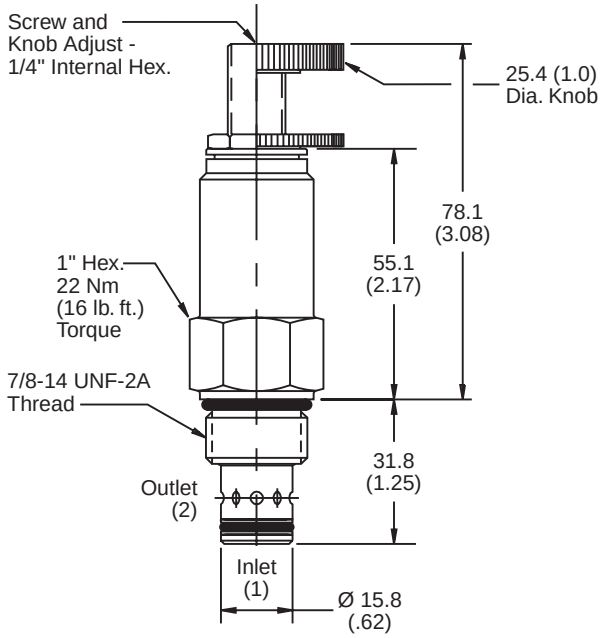
Regulated Flow vs. Pressure

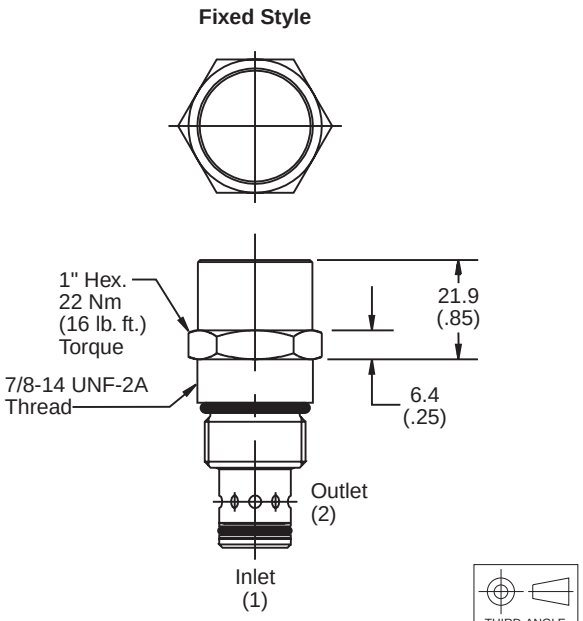
(Through cartridge only)





Dimensions Millimeters (Inches)





Ordering Information

FR101						
10 Size Pressure Compensated Flow Regulator (Restrictive)	Adjustment Style	Flow Setting/ Range	Optional Setting	Seals	Body Material	Port Size

Code	Adjustment Style
F	Fixed Style present at factory
K	Knob Adjust
S	Screw Adjust

Code	Fixed Style Flow
100	3.8 LPM (1 GPM)
200	7.5 LPM (2 GPM)
300	11.3 LPM (3 GPM)
400	15 LPM (4 GPM)
500	18.8 LPM (5 GPM)
600	22.5 LPM (6 GPM)

Code	Knob/Screw Style Flow Range
065	1.9-3.0 LPM (0.5-0.8 GPM)
095	3.0-4.5 LPM (0.8-1.2 GPM)
135	4.1-6.4 LPM (1.1-1.7 GPM)
185	6.0-8.3 LPM (1.6-2.2 GPM)
260	7.9-11.6 LPM (2.1-3.1 GPM)
375	11.3-16.9 LPM (3.0-4.5 GPM)
550	16.1-25.1 LPM (4.3-6.7 GPM)

Optional Setting
Flow setting specified in .38 LPM (.1 GPM) increments other than standard

Code	Seals / Kit. No.
Omit	Nitrile / (SK10-2N)
V	Fluorocarbon / (SK10-2V)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

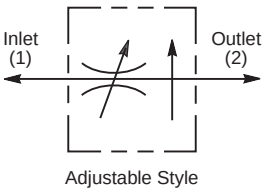
General Description

Restrictive Style, Pressure Compensated Flow Control Valve. For additional information see Technical Tips on pages FC1-FC4.

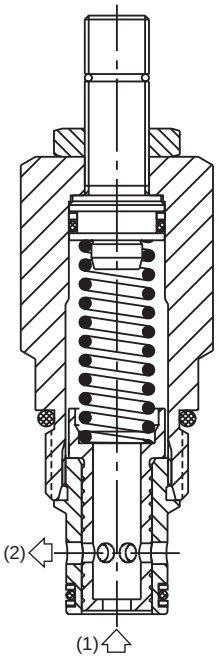
Features

- Minimal flow change with pressure variation
- Reverse flow function
- Full adjustment from 1-40 LPM (0.3-10.6 GPM)
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated





Adjustable Style

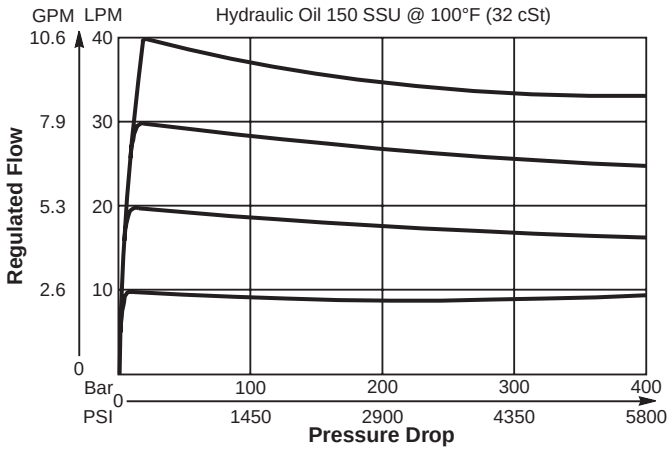


Specifications

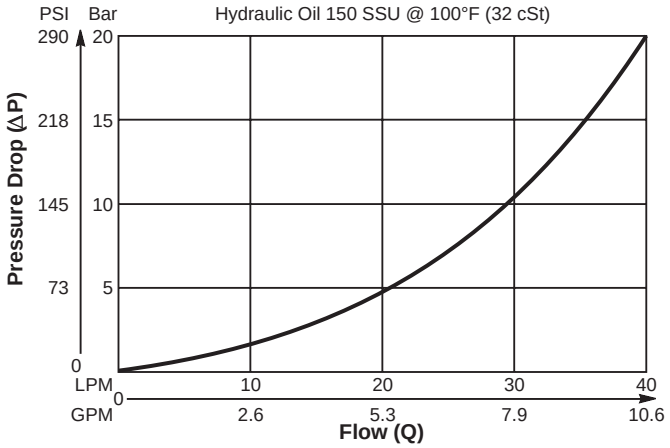
Rated Flow	40 LPM (10.6 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.20 kg (.44 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

Performance Curves (Through cartridge only)

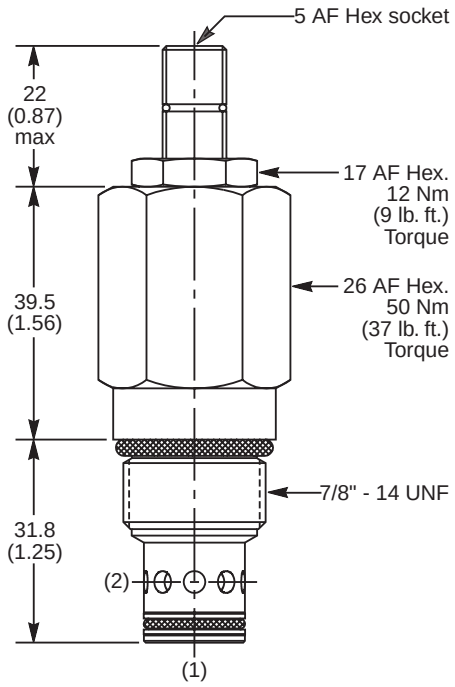
Flow Regulating Performance



Reverse Flow Pressure Drop vs. Flow



Dimensions Millimeters (Inches)



Ordering Information

J04E2				—		
10 Size Pressure Compensated Flow Control Valve	Adjustment Style	Optional Flow Setting	Seals		Body Material	Port Size

Code	Adjustment Style
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30500N-1)
V	Fluorocarbon / (SK30500V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

Code	Optional Flow Setting
Omit	Omit for no setting*
	Specify setting if required (LPM)

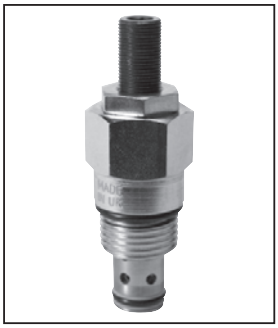
**** Appropriate mid-range setting for Standard = 20 LPM***

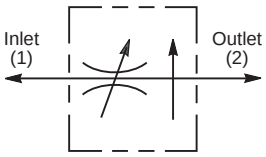
General Description

Restrictive Variable Orifice Style, Pressure Compensated Flow Control Valve. For additional information see Technical Tips on pages FC1-FC4.

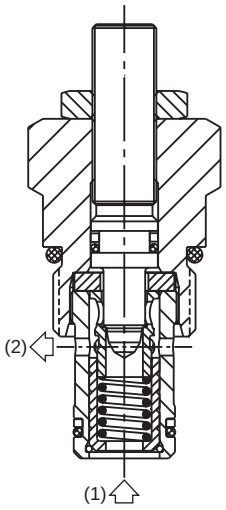
Features

- Minimal flow change with pressure variation
- Partial reverse flow capability
- Full adjustment from 1-40 LPM (0.3-10.6 GPM)
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated





Adjustable Style

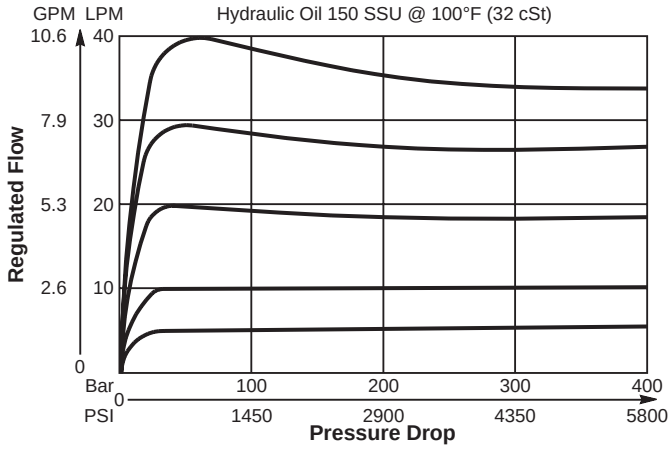


Specifications

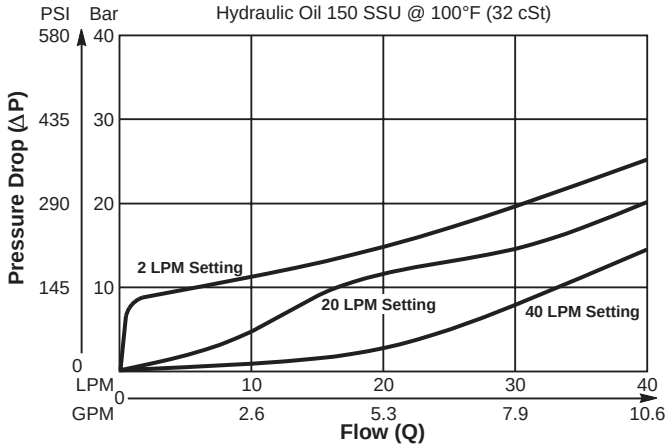
Rated Flow	40 LPM (10.6 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.15 kg (.33 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

Performance Curves (Through cartridge only)

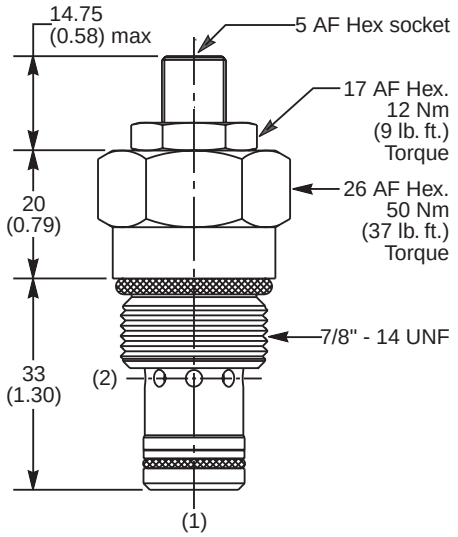
Flow Regulating Performance 2 to 1



Reverse Flow Pressure Drop vs. Flow 2 to 1



Dimensions Millimeters (Inches)



Ordering Information

J04C2				—		
10 Size Pressure Compensated Flow Control Valve	Adjustment Style	Optional Flow Setting	Seals		Body Material	Port Size

Code	Adjustment Style
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30503N-1)
V	Fluorocarbon / (SK30503V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

Code	Optional Flow Setting
Omit	Omit for no setting*
	Specify setting if required (LPM)

**** Appropriate mid-range setting for Standard = 20 LPM***

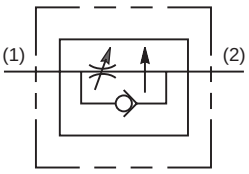
General Description

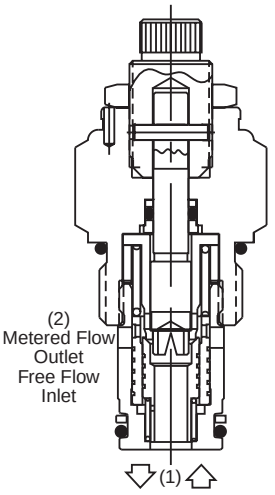
Fully Adjustable, Pressure Compensated Flow Control Valve. For additional information see Technical Tips on pages FC1-FC4.

Features

- Fully adjustable from 0.75 LPM (0.2 GPM) to 20.6 LPM (5.5 GPM)
- Hardened, precision ground parts for durability
- All external parts are finished in yellow zinc dichromate. This enables them to withstand a 200 hour salt spray test.
- Compact size for reduced space requirements







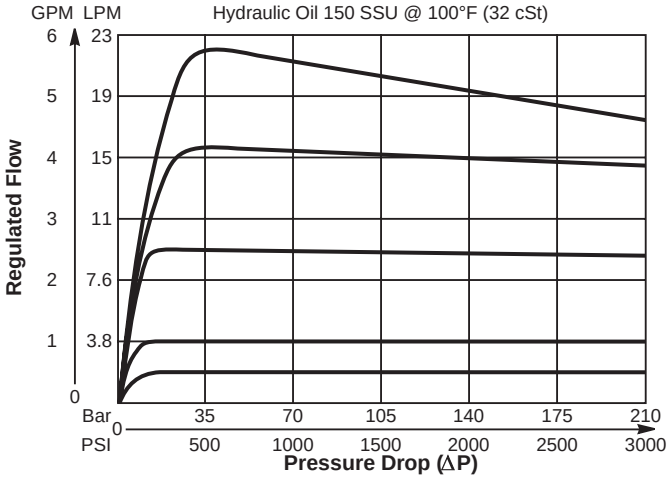
Specifications

Rated Flow	0.75 LPM (0.2 GPM) 20.6 LPM (5.5 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.23 kg (0.5 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

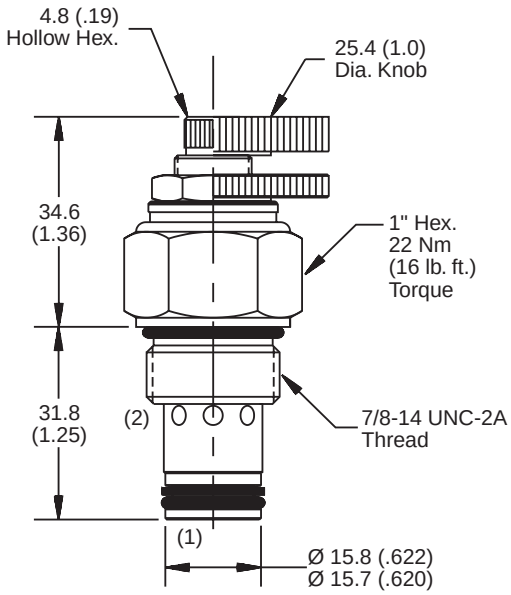
Performance Curves

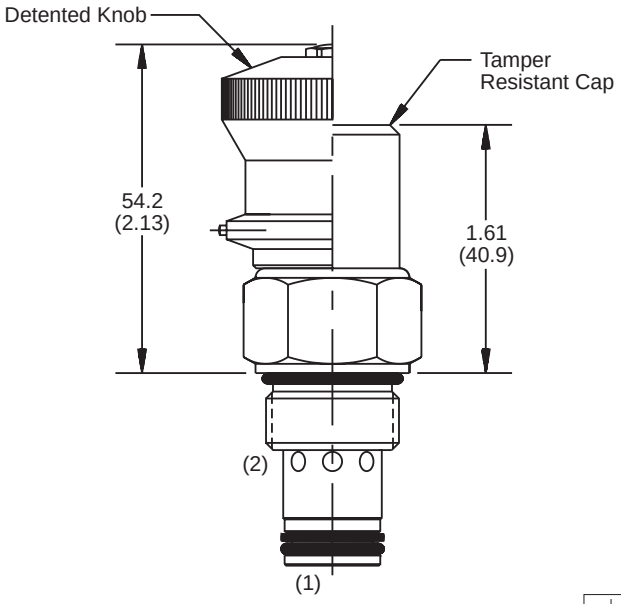
Regulated Flow vs. Pressure Drop

(Through cartridge only)



Dimensions Millimeters (Inches)





Ordering Information

FA101				—		
10 Size Pressure Compensated Flow Control Valve	Adjustment Style	Optional Flow Setting	Seals		Body Material	Port Size

Code	Adjustment Style
D	Detented Knob
K	Knob Adjust (717784-10)
S	Screw Adjust
T	Tamper Resistant Cap (717785)

Code	Seals / Kit. No.
Omit	Nitrile / (SK10-2N)
V	Fluorocarbon / (SK10-2V)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-*6B)

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

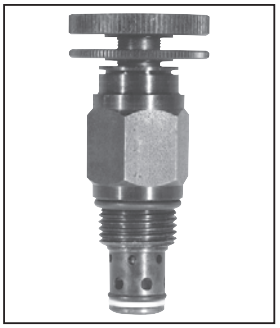
Description
Flow Setting x 10 i.e. 45 = 4.5 GPM

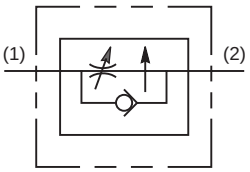
General Description

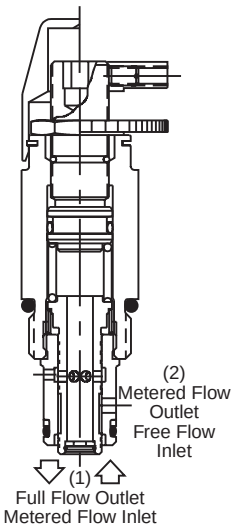
Pressure Compensated Flow Control. For additional information see Technical Tips on pages FC1-FC4.

Features

- Hardened, precision ground parts for durability
- Compact size for reduced space requirements
- Free flow in reverse condition
- All external parts zinc plated





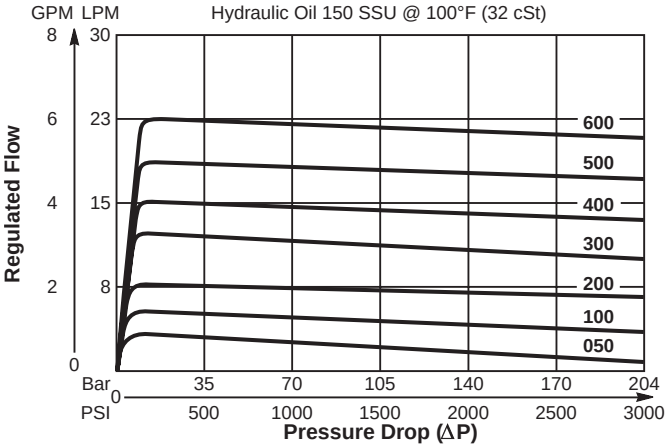


Specifications

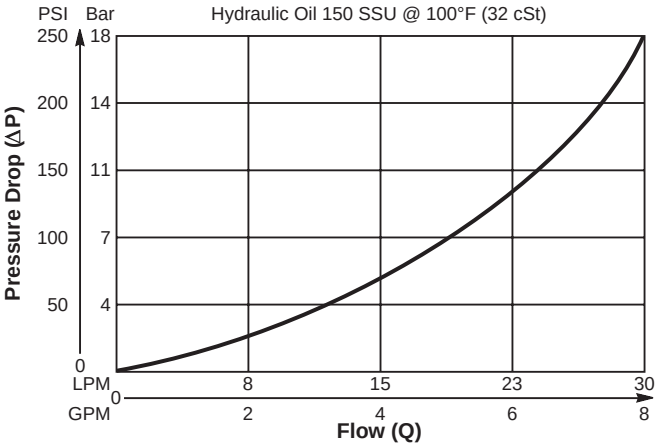
Rated Flow	20.6 LPM (5.5 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.23 kg (0.5 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

Performance Curves

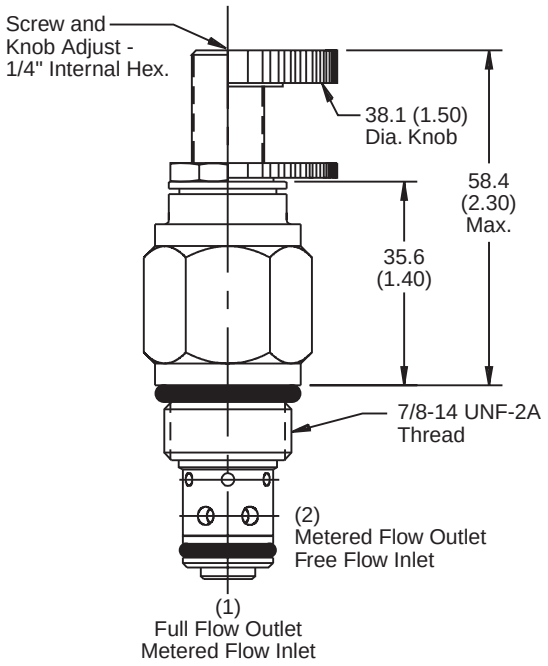
Regulated Flow vs. Pressure Drop
(Through cartridge only)

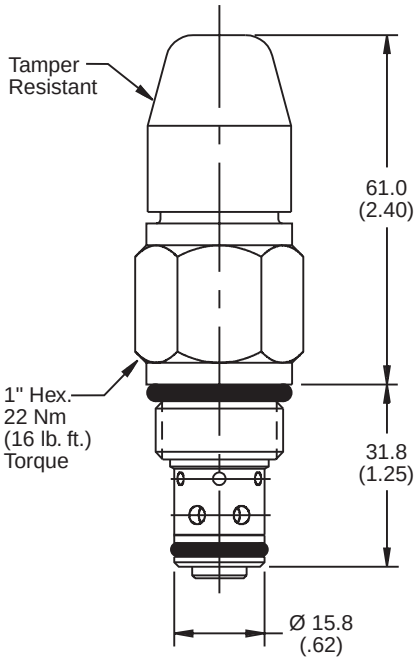


Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)





THIRD-ANGLE PROJECTION

Ordering Information

FC101					—		
10 Size Pressure Compensated Flow Control	Adjustment Style	Flow Range	Optional Setting	Seals		Body Material	Port Size

Code	Adjustment Style
K	Knob Adjust (717784-10)
S	Screw Adjust
T	Tamper Resistant Cap (717783)

Optional Setting
Flow setting specified in .38 LPM (.1 GPM) increments other than standard

Code	Body Material
Omit	Steel
A	Aluminum

Code	Flow Range and Standard Setting
050	1.1-3.8 LPM (.30-1.0 GPM) (1.9 LPM (.5 GPM) @ 69 Bar (1000 PSI) ΔP)
100	2.8-8.3 LPM (.75-2.2 GPM) (3.8 LPM (1 GPM) @ 69 Bar (1000 PSI) ΔP)
300	7.5-16.9 LPM (2.0-4.5 GPM) (11.3 LPM (3 GPM) @ 69 Bar (1000 PSI) ΔP)
600	15-30 LPM (4.0-8.0 GPM) (22.5 LPM (6 GPM) @ 69 Bar (1000 PSI) ΔP)

Code	Seals / Kit. No.
Omit	Nitrile / (SK10-2N)
V	Fluorocarbon / (SK10-2V)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

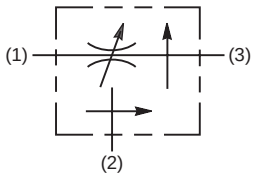
General Description

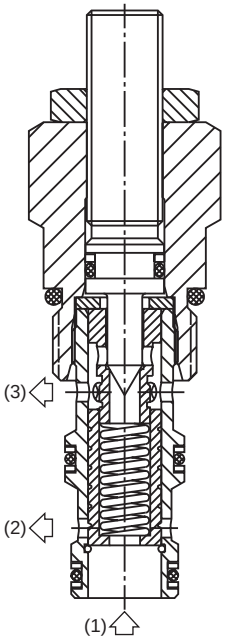
Needle Type, Pressure Compensated Flow Regulator Valve. For additional information see Technical Tips on pages FC1-FC4.

Features

- Good adjustment from 1-15 LPM (0.3-4 GPM)
- Used for systems requiring priority flow such as steering systems
- Hardened working parts for maximum durability
- Reverse flow function 3 to 1
- Adjustable and tamperproof versions available
- All external parts zinc plated





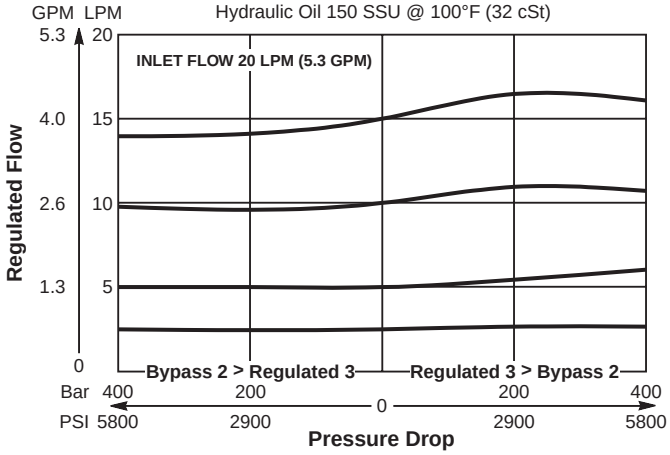


Specifications

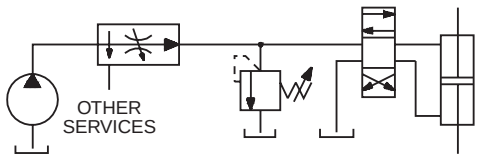
Rated Flow	15 LPM (4 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.08 kg (.18 lbs.)
Cavity	C08-3 (See BC Section for more details)
Form Tool	Rougher NFT08-3R Finisher NFT08-3F

Performance Curves (Through cartridge only)

Flow Regulating Performance

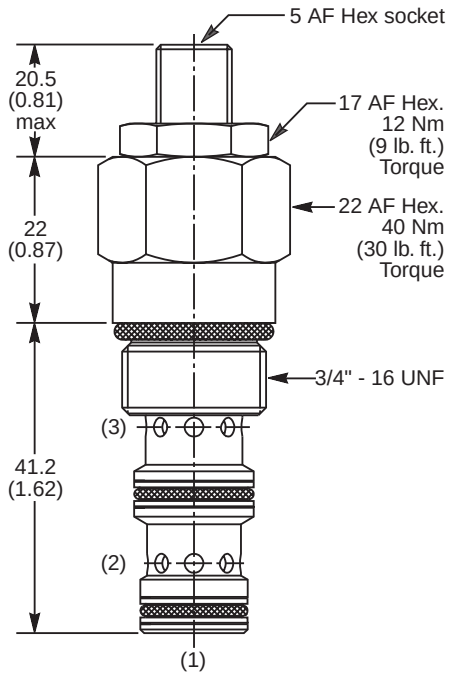


Application



Priority flow on steering circuit

Dimensions Millimeters (Inches)



Ordering Information

J02D3				—		
Pressure Compensated Priority Flow Control Valve	Adjustment Style	Optional Flow Setting	Seals		Body Material	Port Size

Code	Adjustment Style
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30501N-1)
V	Fluorocarbon / (SK30501V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-3-*4P)
4T	SAE-4	(B08-3-*4T)
6T	SAE-6	(B08-3-*6T)
6B	3/8″ BSPG	(B08-3-*6B)

**** Add "A" for aluminum, omit for steel.***

Code	Optional Flow Setting
Omit	Omit for no setting*
	Specify setting if required (LPM)

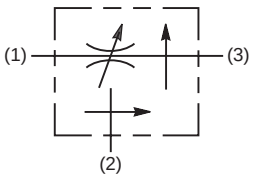
**** Appropriate mid-range setting for Standard = 7 LPM***

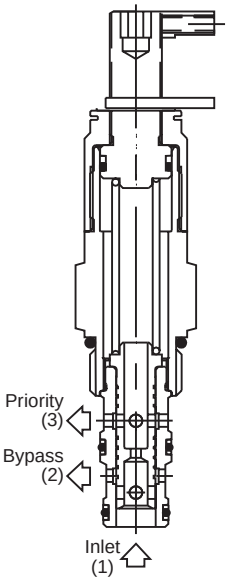
General Description

Pressure Compensated Priority Flow Regulator Valve. For additional information see Technical Tips on pages FC1-FC4.

Caution: If the priority line is blocked so that no flow can pass through the control orifice; the compensator spool will shift, blocking the bypass port and allowing inlet pressure to go to full system relief pressure. The FP101 cartridge does not provide a pressure relieving function.







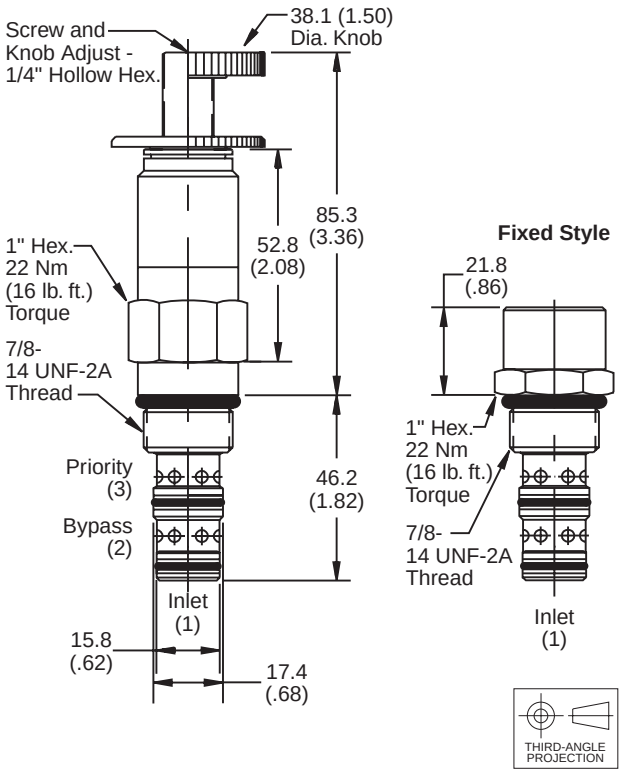
Specifications

Maximum Priority Flow	**Fixed** 30.0 LPM (8 GPM) **Adjusted** 33.8 LPM (9 GPM)
Maximum Inlet Flow	56.3 LPM (15 GPM)
Minimum Inlet Flow	See Valve Performance Curves
Maximum Inlet Pressure	245 Bar (3500 PSI)
Minimum Inlet Pressure	See Valve Performance Curves
Accuracy (Fixed)	±20%
Adjustment Range (Adj. Version)	±20% Nominal
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.23 kg (0.5 lbs.)
Cavity	No. C10-3 (See BC Section for more details)
Form Tool	Regulator NFT10-3R Finisher NFT10-3F

Features

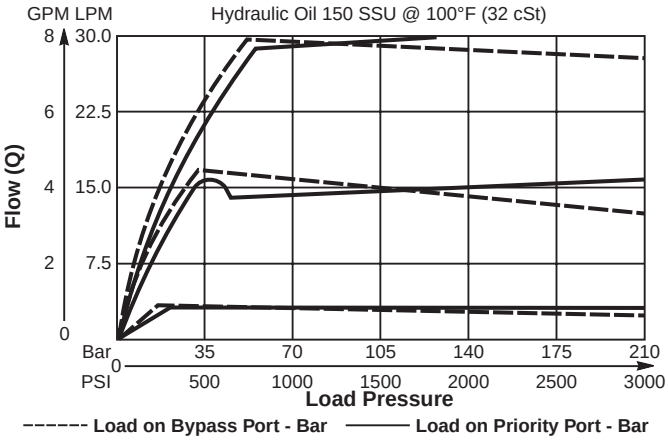
- Hardened, precision ground parts for durability
- Cartridge design
- Acts as a fixed orifice in reverse flow condition (Priority line only)
- All external parts zinc plated

Dimensions Millimeters (Inches)

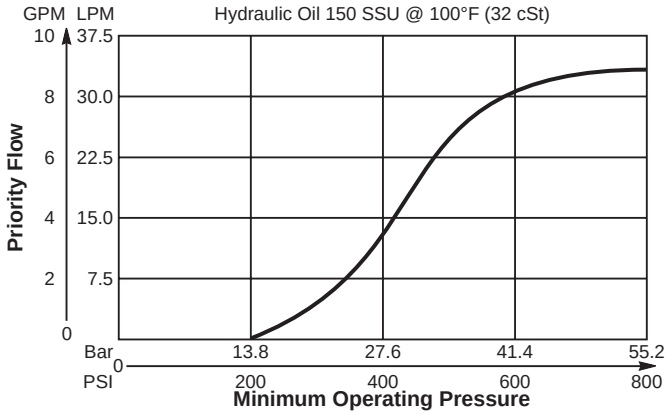


Performance Curves (Through cartridge only)

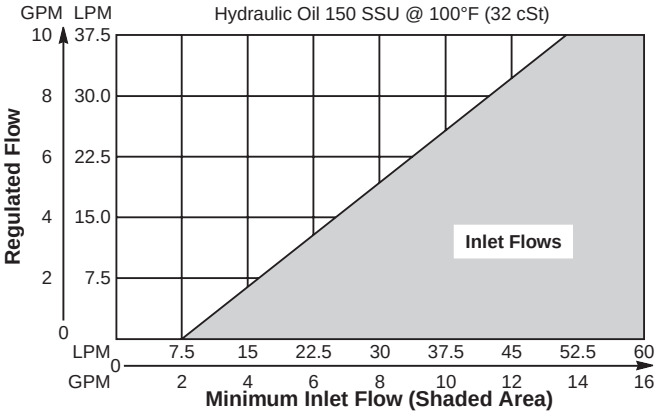
Regulated Flow vs. Load Pressure



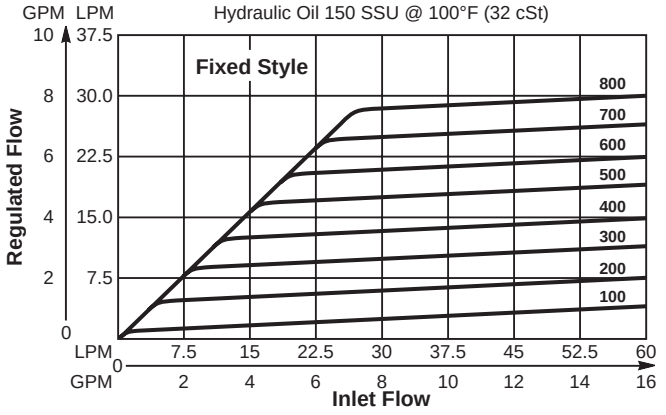
Pressure vs. Priority Flow Minimum Operating Pressure



Minimum Inlet Flow



Inlet Flow vs. Regulated Flow



Ordering Information

FP101					—		
10 Size Pressure Compensated Flow Regulator	Adjustment Style	Flow Setting/ Range	Optional Setting	Seals		Body Material	Port Size

Code	Adjustment Style
F	Fixed Style present at factory
K	Knob Adjust
S	Screw Adjust

Code	Fixed Style Flow
100	3.8 LPM (1 GPM)
200	7.5 LPM (2 GPM)
300	11.3 LPM (3 GPM)
400	15 LPM (4 GPM)
500	18.8 LPM (5 GPM)
600	22.5 LPM (6 GPM)
700	26.3 LPM (7 GPM)
800	30 LPM (8 GPM)

Code	Knob/Screw Style Flow Range
085	2.6-3.8 LPM (0.7-1.0 GPM)
110	3.0-5.3 LPM (0.8-1.4 GPM)
155	4.5-7.1 LPM (1.2-1.9 GPM)
220	6.4-10.1 LPM (1.7-2.7 GPM)
295	8.6-13.5 LPM (2.3-3.6 GPM)
405	11.6-18.8 LPM (3.1-5.0 GPM)
575	16.9-26.3 LPM (4.5-7.0 GPM)
780	23.6-34.9 LPM (6.3-9.3 GPM)

Optional Setting
Flow setting specified in .38 LPM (.1 GPM) increments x 10. (ie. 65 = 6.5 GPM

Code	Seals / Kit. No.
Omit	Nitrile / (SK10-3N)
V	Fluorocarbon / (SK10-3V)

Code	Body Material
Omit	Steel
A	Aluminum

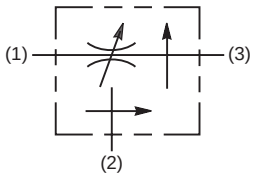
Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8B)

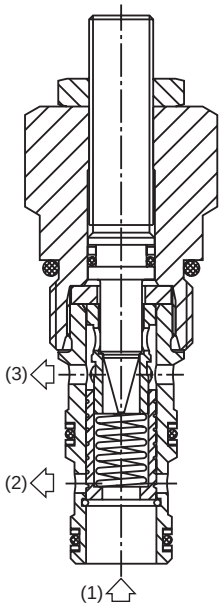
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

Priority Type, Pressure Compensated Flow Regulator Valve. For additional information see Technical Tips on pages FC1-FC4.







Features

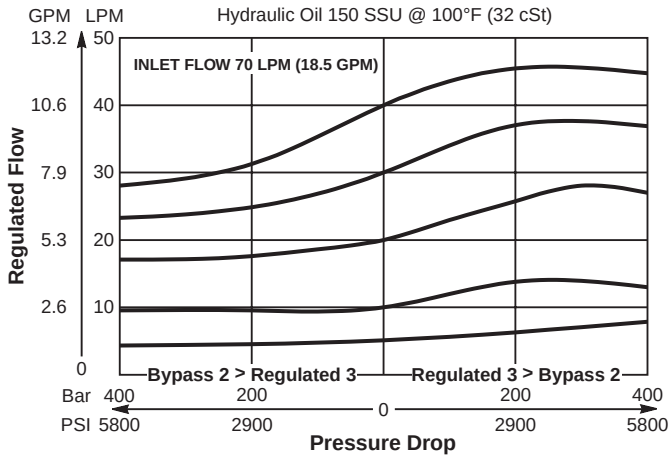
- High flow capacity
- Good adjustment from 2-45 LPM (0.5-12 GPM)
- Used for systems requiring priority flow such as steering systems
- Hardened working parts for maximum durability
- Reverse flow function 3 to 1
- Adjustable and tamperproof versions available
- All external parts zinc plated

Specifications

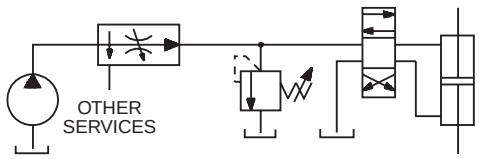
Rated Flow	45 LPM (12 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.18 kg (.40 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

Performance Curves (Through cartridge only)

Flow Regulating Performance

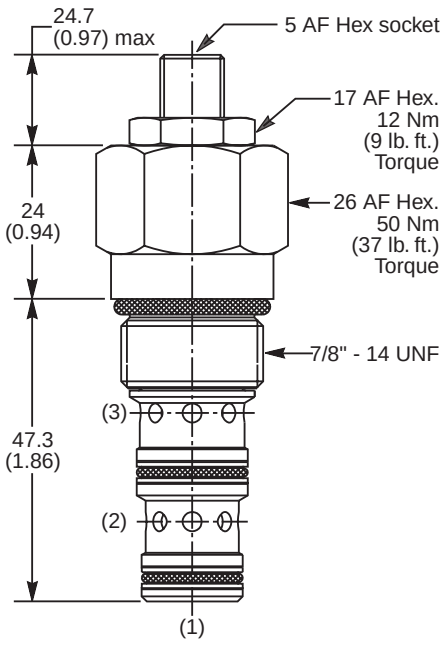


Application



Priority flow on steering circuit

Dimensions Millimeters (Inches)



Ordering Information

J04D3				—		
Pressure Compensated Priority Flow Control Valve	Adjustment Style	Optional Flow Setting	Seals		Body Material	Port Size

Code	Adjustment Style
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30505N-1)
V	Fluorocarbon / (SK30505V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8B)

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

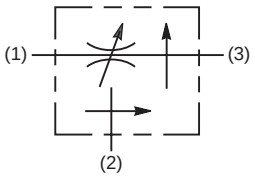
Code	Optional Flow Setting
Omit	Omit for no setting*
	Specify setting if required (LPM)

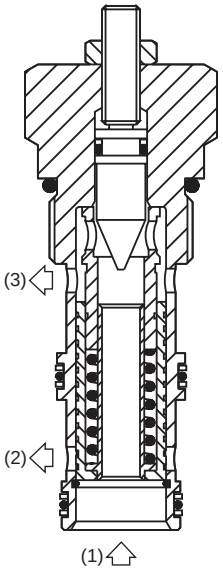
**** Appropriate mid-range setting for Standard = 20 LPM***

General Description

Priority Style, Pressure Compensated Flow Regulator Valve With Bypass. For additional information see Technical Tips on pages FC1-FC4.







Features

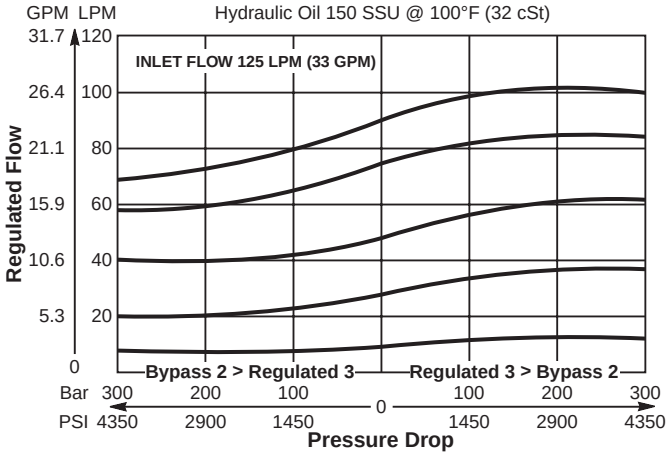
- Free reverse flow function
- High flow capacity
- Used for systems requiring priority flow such as steering systems
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated

Specifications

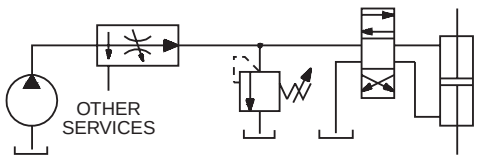
Rated Flow	90 LPM (24 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.45 kg (1.00 lbs.)
Cavity	3A (See BC Section for more details)
Form Tool	Rougher Finisher

Performance Curve (Through cartridge only)

Flow Regulating Performance

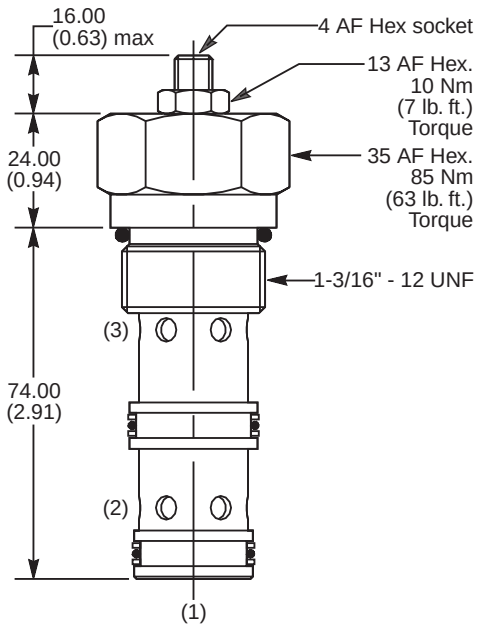


Application



Priority flow on steering circuit

Dimensions Millimeters (Inches)



Ordering Information

J1A125			
Pressure Compensated Priority Flow Control Valve	Adjustment Style	Optional Regulated Flow Setting	Seals

Code	Adjustment Style
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1124)

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30011N-1)
V	Fluorocarbon / (SK30011V-1)

Code	Optional Regulated Flow Setting
Omit	Omit for no setting (Std.)*
	Specify setting if required (LPM)

**** Setting for standard: J1A125***
Inlet: 45 LPM (12 GPM)
Regulated: 25 LPM (6.5 GPM)

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
007	3/4″ BSP
066	1″ SAE

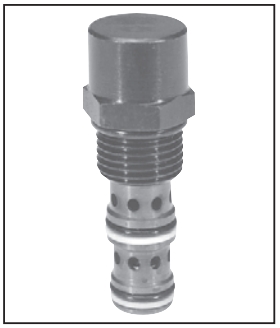
Code	Body Material
A	Aluminum
S	Steel

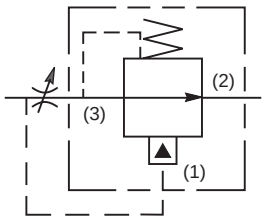
General Description

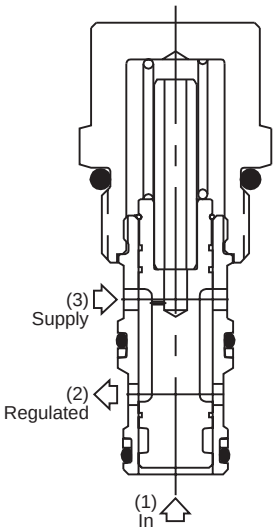
Restrictive Type Pressure Compensator. This valve is designed to be used in conjunction with an external orifice, fixed or variable, to provide a constant flow regardless of changes in load or pressure. For additional information see Technical Tips on pages FC1-FC4.

Features

- Hardened, precision ground parts for durability
- Stable and quiet response
- Contamination tolerant
- Standard valve bodies and common cavities
- Seal variations and other options available
- All external parts zinc plated

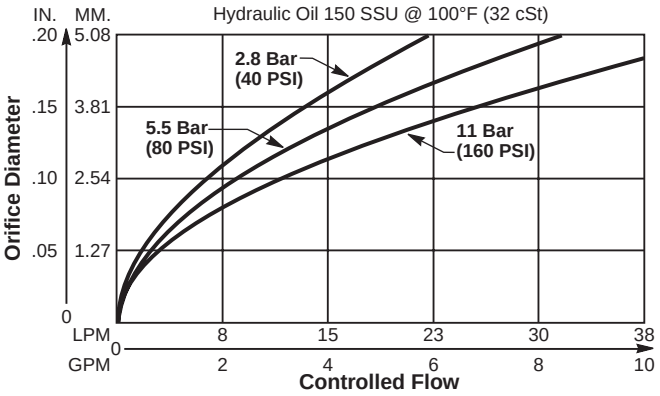






Performance Curve

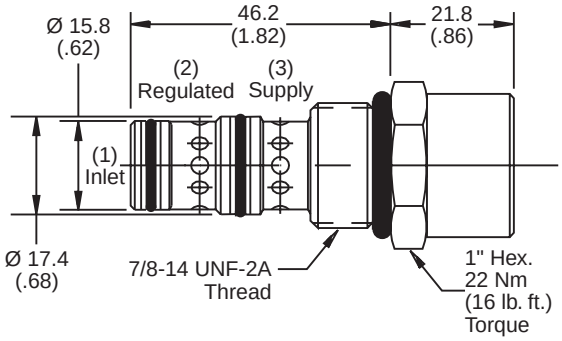
Contol ΔP (Through cartridge only)



Specifications

Rated Flow	38 LPM (10 GPM)
Maximum Inlet Pressure	245 Bar (3500 PSI)
Accuracy (Fixed)	±10% Spring rating to 210 Bar (3000 PSI)
Adjustment Range	None
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (0.3 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

Dimensions Millimeters (Inches)



Ordering Information

FCR101F			—		
10 Size Pressure Compensator Valve (Fixed Style)	Pressure Differential	Seals		Body Material	Port Size

Code	Press. Differential
Omit	11 Bar (160 PSI)
04	2.8 Bar (40 PSI)
08	5.5 Bar (80 PSI)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
Omit	Nitrile / (SK10-3N)
V	Fluorocarbon/ (SK10-3V)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8B)

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

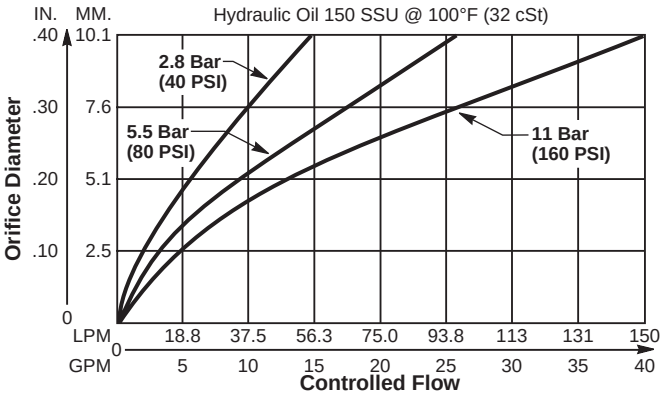
Restrictive Type Pressure Compensator. This valve is designed to be used in conjunction with an external orifice, fixed or variable, to provide a constant flow regardless of changes in load or pressure. For additional information see Technical Tips on pages FC1-FC4.

Features

- Hardened, precision ground parts for durability
- Stable and quiet response
- Contamination tolerant
- Standard valve bodies and common cavities
- Seal variations and other options available
- All external parts zinc plated

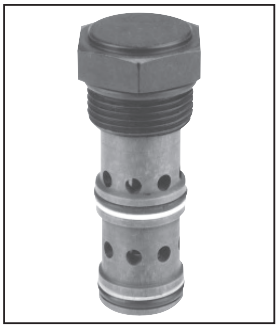
Performance Curve

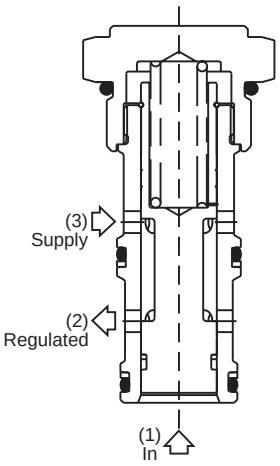
Contol ΔP (Through cartridge only)

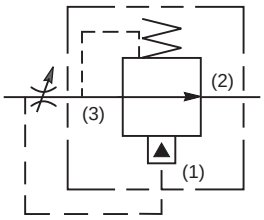


Specifications

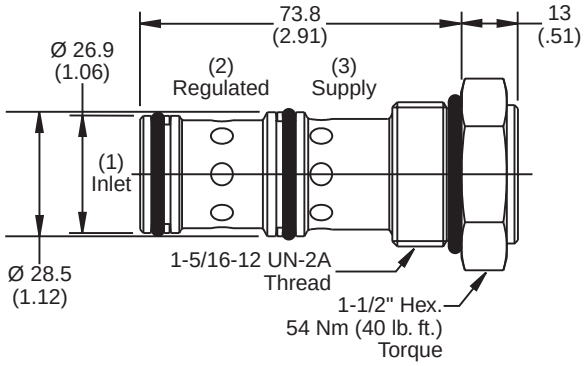
Rated Flow	150 LPM (40 GPM)
Maximum Inlet Pressure	245 Bar (3500 PSI)
Accuracy (Fixed)	±10% Spring rating to 210 Bar (3000 PSI)
Adjustment Range	None
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.34 kg (.75 lbs.)
Cavity	C16-3 (See BC Section for more details)
Form Tool	Rougher NFT16-3R Finisher NFT16-3F







Dimensions Millimeters (Inches)



Ordering Information

FCR161F			—		
16 Size Pressure Compensator Valve (Fixed Style)	Pressure Differential	Seals		Body Material	Port Size

Code	Press. Differential
Omit	11 Bar (160 PSI)
04	2.8 Bar (40 PSI)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
Omit	Nitrile / (SK16-3)
V	Fluorocarbon / (SK16-3V)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
12T	SAE-12	(B16-3-*12T)
16T	SAE-16	(B16-3-*16T)

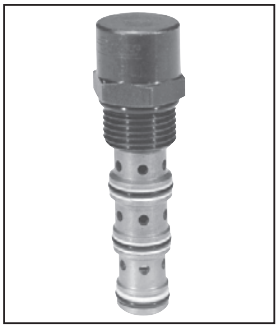
**** Add "A" for aluminum, omit for steel.***

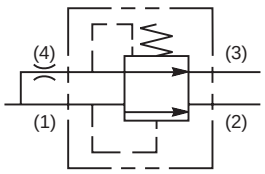
General Description

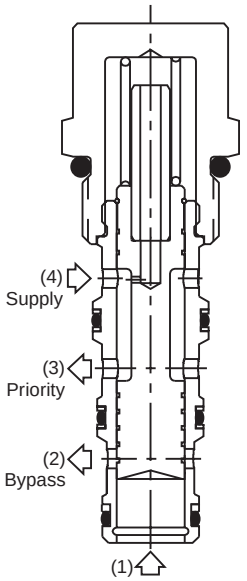
Priority Type Pressure Compensator. This valve is designed to be used in conjunction with an external orifice (fixed or variable) to provide a constant flow to the priority port. Excess flow is bypassed through port 2. For additional information see Technical Tips on pages FC1-FC4.

Features

- Hardened, precision ground parts for durability
- Stable and quiet response
- Contamination tolerant
- Standard valve bodies and common cavities
- All external parts zinc plated

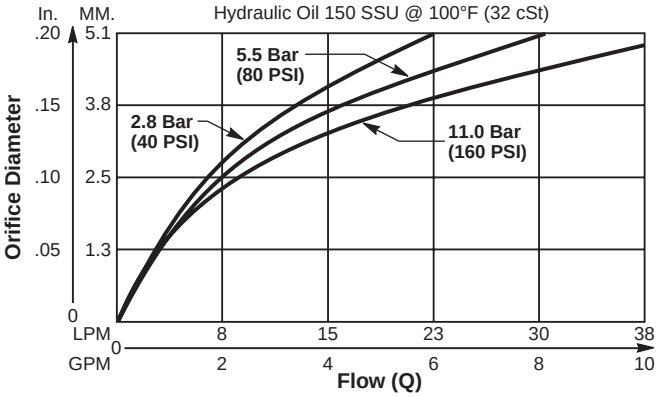






Performance Curve

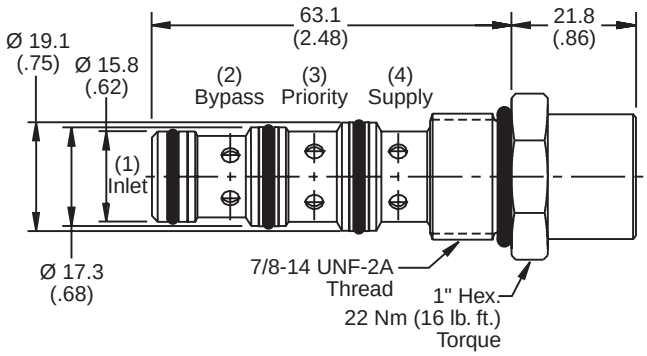
Contol ΔP (Through cartridge only)



Specifications

Rated Flow	**Inlet** 56 LPM (15 GPM) **Flow Setting** 38 LPM (10 GPM)
Maximum Inlet Pressure	245 Bar (3500 PSI)
Accuracy (Fixed)	±10% Spring rating to 210 Bar (3000 PSI)
Adjustment Range	None
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (0.3 lbs.)
Cavity	C10-4 (See BC Section for more details)
Form Tool	Rougher NFT10-4R Finisher NFT10-4F

Dimensions Millimeters (Inches)



Ordering Information

FCP101F			—		
10 Size Pressure Compensator Valve (Fixed Style)	Pressure Differential	Seals		Body Material	Port Size

Code	Press. Differential
Omit	11 Bar (160 PSI)
04	2.8 Bar (40 PSI)
08	5.5 Bar (80 PSI)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
Omit	Nitrile / (SK10-4N)
V	Fluorocarbon / (SK10-4V)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6P	3/8″ NPTF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

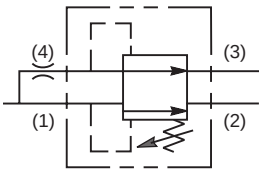
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

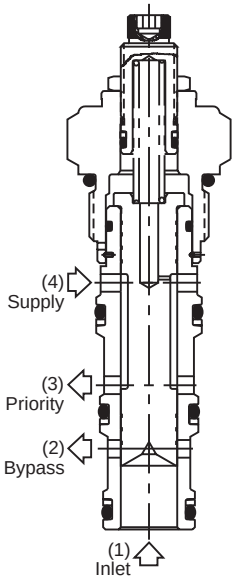
Notes

General Description

Priority Type Pressure Compensator. This valve is designed to be used in conjunction with an external orifice (fixed or variable) to provide a constant flow to the priority port. Excess flow is bypassed through port 2. For additional information see Technical Tips on pages FC1-FC4.







Features

- Hardened, precision ground parts for durability
- Stable and quiet response
- Contamination tolerant
- Standard valve bodies and common cavities
- Steel variations and other options available
- All external parts zinc plated

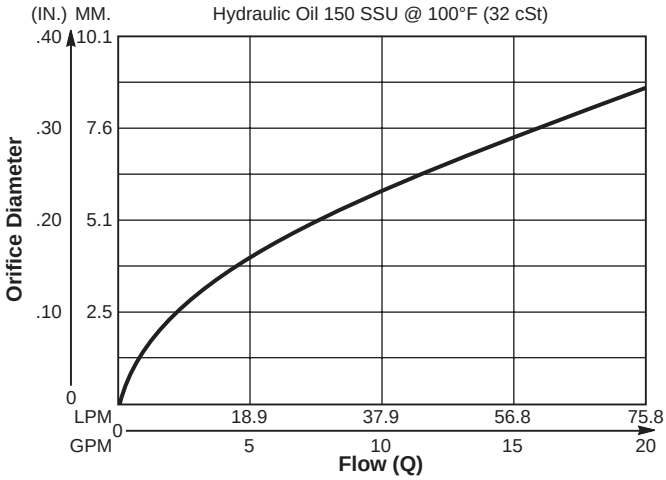
Specifications

Rated Flow	**Inlet** 95 LPM (25 GPM) **Flow Setting** 75 LPM (20 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.28 kg (.62 lbs.)
Cavity	C12-4 (See BC Section for more details)
Form Tool	Rougher NFT12-4R Finisher NFT12-4F

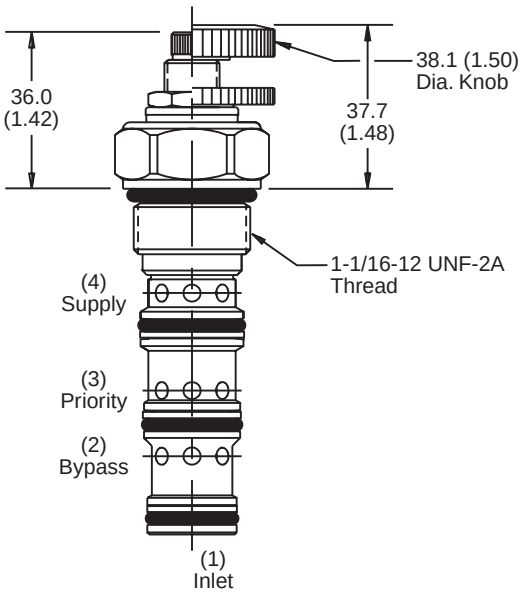
Performance Curve

Flow vs. Orifice Diameter

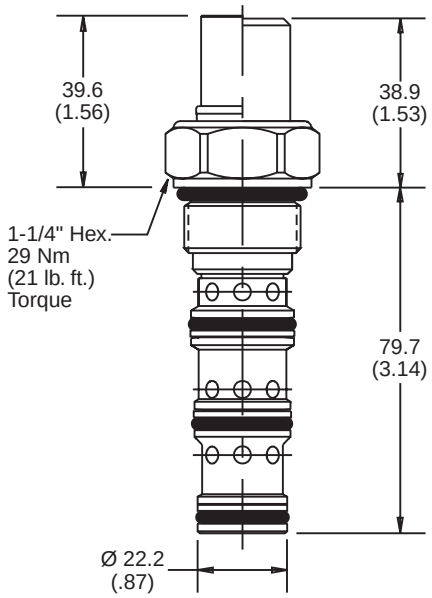
(Through cartridge only)



Dimensions Millimeters (Inches)



Screw/Knob Version



Fixed Cap/Tamper Resistant Version

THIRD-ANGLE PROJECTION

Ordering Information

FCPH121				—		
12 Size Pressure Compensator Priority Type	Adjustment Style	Pressure Differential	Seals		Body Material	Port Size

Code	Adjustment Style
F	Fixed style, present at factory
K	Knob Adjust (717784-15)
S	Screw Adjust
T	Tamper Resistant Cap (717785)

Code	Pressure Differential
Omit	11 Bar (160 PSI)

Code	Seals / Kit. No.
Omit	Nitrile / (SK12-4)
V	Fluorocarbon / (SK12-4V)

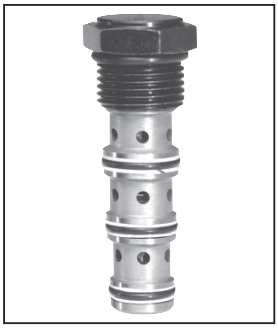
Code	Body Material
Omit	Steel
A	Aluminum

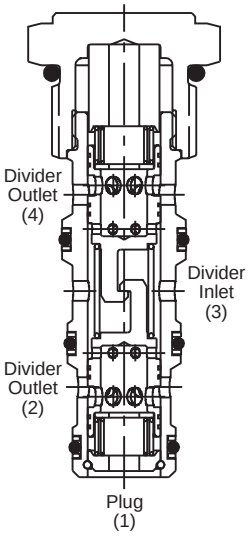
Code	Port Size	Body Part No.
Omit	Cartridge Only	
12T	SAE-12	(B12-4-*12T)

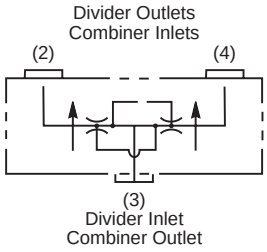
**** Add "A" for aluminum, omit for steel.***

General Description

Flow Divider/Combiner Valve. FDC101 divides flow from a single source proportionally to two actuators. In the reverse mode, flow from two sources is combined into one flow. When dividing or combining flow to synchronize two cylinders, please consider that the flow accuracy is ±10%. For additional information see Technical Tips on pages FC1-FC4.







Features

- Hardened, precision ground parts for durability
- Cartridge design
- Ratios of 50-50, 60-40 and 66-33 available
- All external parts zinc plated

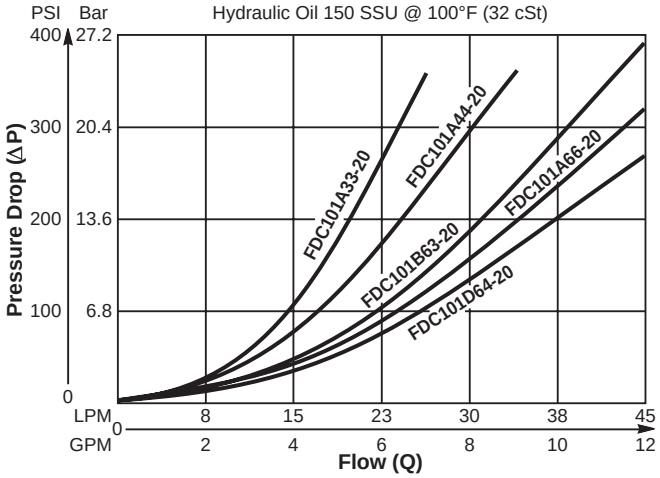
Specifications

Maximum Flow	45 LPM (12 GPM) See ordering information
Maximum Inlet Pressure	245 Bar (3500 PSI)
Accuracy	±10%
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range (Ambient)	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Filtration	ISO Code 16/13, SAE Class 4 or better
Fluids	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Approx. Weight	.14 kg (0.3 lbs.)
Cavity	No. C10-4
Form Tool	Rougher NFT10-4R Finisher NFT10-4F

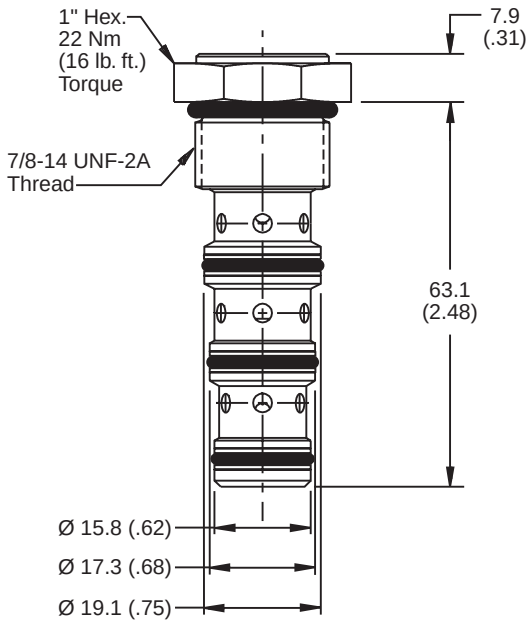
Note: When machining a manifold using the FDC101, use C10-4 cavity. Do not machine a port that directs flow to the nose of the cavity.

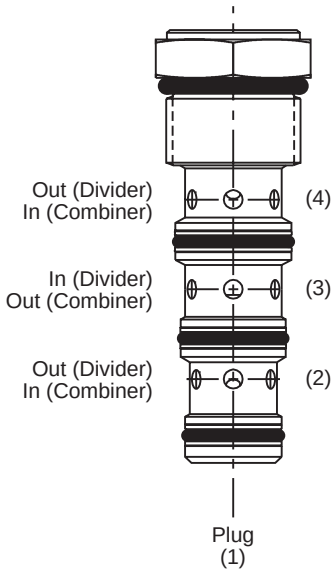
Performance Curve

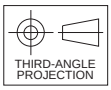
Flow vs. Pressure Drop
(Through cartridge only)



Dimensions Millimeters (Inches)







Ordering Information

FDC101			—		
10 Size Pressure Compensated Flow Control	Flow Division	Seals		Body Material	Port Size**

Code	Flow Division
A11	3.80 LPM (1 GPM) min. inlet 11.3 LPM (3 GPM) max. inlet 50% '4' Port and 50% '2' Port
A33	11.3 LPM (3 GPM) min. inlet 22.5 LPM (6 GPM) max. inlet 50% '4' Port and 50% '2' Port
A44	15.0 LPM (4 GPM) min. inlet 30.0 LPM (8 GPM) max. inlet 50% '4' Port and 50% '2' Port
A66	22.5 LPM (6 GPM) min. inlet 45.0 LPM (12 GPM) max. inlet 50% '4' Port and 50% '2' Port
B64	15.0 LPM (4 GPM) min. inlet 37.5 LPM (10 GPM) max. inlet 50% '4' Port and 40% '2' Port
D63	11.3 LPM (3 GPM) min. inlet 33.8 LPM (9 GPM) max. inlet 33% '4' Port and 66% '2' Port

Code	Seals / Kit. No.
Omit	Nitrile / (SK10-4N)
V	Fluorocarbon / (SK10-4V)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6P	3/8″ NPTF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

**The FDC101 cartridge has three ports. Due to its size, it requires a B10-4 series body. As a result, all cartridges in a body will be supplied with a plug located 180° from the cartridge cavity (port 1).

B10-4-6T body — 6HP*50-S
B10-4-8T body — 8HP*50-S
B10-4-4P body — 102 x 4
B10-4-6P body — 102 x 6
B10-4-8P body — 102 x 8

When machining a manifold using the FDC101, use C10-4 cavity. Do not machine a port that directs flow to the nose of the cavity.

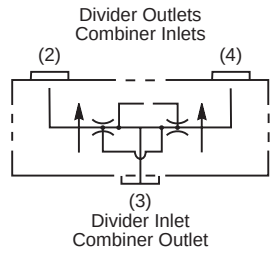
General Description

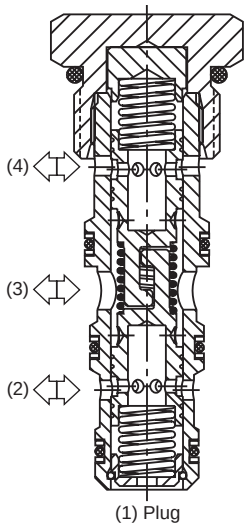
Spool Type, Flow Divider/Combiner Valve. For additional information see Technical Tips on pages FC1-FC4.

Features

- Interlocking spools for equal control dividing or combining
- Range of flow settings available for optimising control
- Pressure compensated control in both directions
- 50/50 ratio standard, other ratios available on request
- Commonly used for differential lock in transmission applications
- Hardened working parts for maximum durability
- All external parts zinc plated





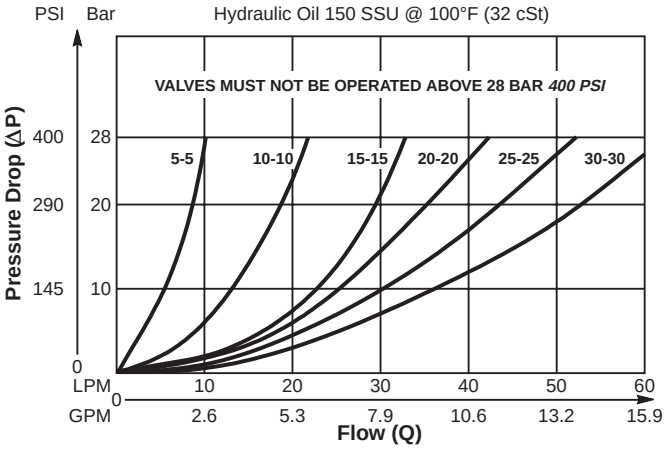


Specifications

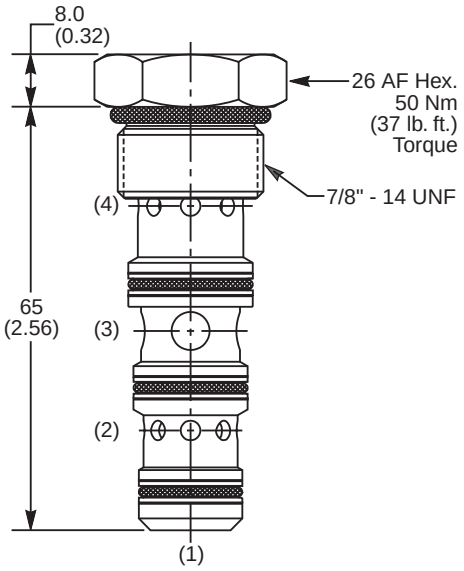
Rated Flow	60 LPM (16 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Flow Rating and Ratio	See Ordering Information
Accuracy Per Leg	± 10%
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.12 kg (0.26 lbs.)
Cavity	C10-4 (See BC Section for more details)
Form Tool	Rougher NFT10-4R Finisher NFT10-4F

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

L04A3	–	☐	☐	–	☐	☐
10 Size Flow Divider/ Combiner Valve		Flow Rating and Ratio	Seals		Body Material	Port Size

Code	Total Flow Rating - Port 2 (Flow Ratio)
5-5	6-10 LPM (1.6-2.6 GPM) (50/50 Ratio)
10-10	8-20 LPM (2.1-5.3 GPM) (50/50 Ratio)
15-15	10-30 LPM (2.6-7.9 GPM) (50/50 Ratio)
20-20	12-40 LPM (3.2-10.6 GPM) (50/50 Ratio)
25-25	13-50 LPM (3.4-13.2 GPM) (50/50 Ratio)
30-30	14-60 LPM (3.7-15.9 GPM) (50/50 Ratio)

Other ratios and ratings available on request.

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30506N-1)
V	Fluorocarbon / (SK30506V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	**Cartridge Only**	
6P	3/8″ NTPF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

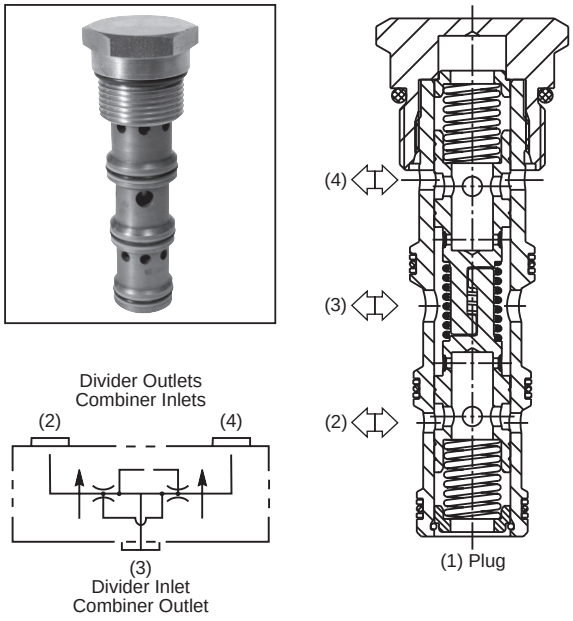
**** Add "A" for aluminum, omit for steel.***
† Steel bodies only

General Description

Spool Type, Flow Divider/Combiner Valve. For additional information see Technical Tips on pages FC1-FC4.

Features

- Interlocking spools for equal control dividing or combining
- Range of flow settings available for optimising control
- Pressure compensated control in both directions
- 50/50 ratio standard, other ratios available on request
- Commonly used for differential lock in transmission applications
- Hardened working parts for maximum durability
- All external parts zinc plated

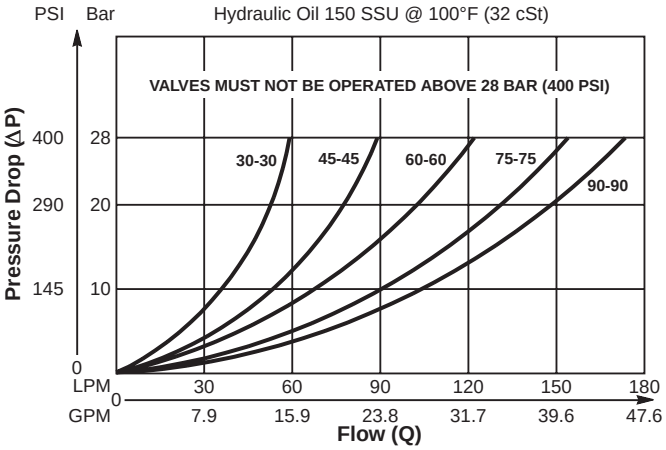


Specifications

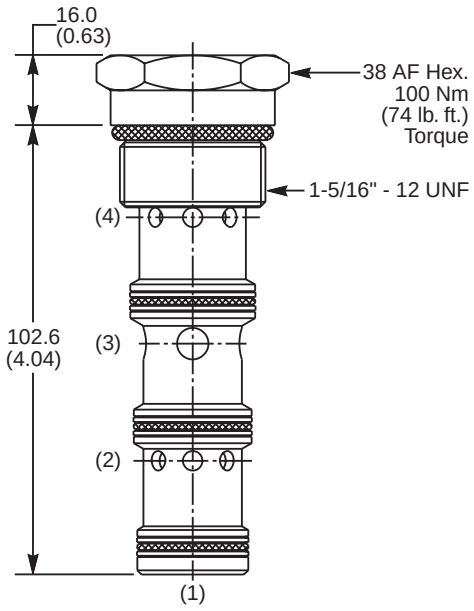
Rated Flow	180 LPM (47 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Flow Rating and Ratio	See Ordering Information
Accuracy Per Leg	± 10%
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.40 kg (0.86 lbs.)
Cavity	C16-4 (See BC Section for more details)
Form Tool	Rougher Finisher

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

L06A3	–		
16 Size Flow Divider/ Combiner Valve		Flow Rating and Ratio	Seals

Code	Total Flow Rating - Port 2 (Flow Ratio)
30-30	20-60 LPM (5.3-15.9 GPM) (50/50 Ratio)
45-45	25-90 LPM (6.6-23.8 GPM) (50/50 Ratio)
60-60	35-120 LPM (9.2-31.7 GPM) (50/50 Ratio)
75-75	55-150 LPM (14.6-39.6 GPM) (50/50 Ratio)
90-90	65-180 LPM (17.2-47.8 GPM) (50/50 Ratio)

Other ratios and ratings available on request.

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30510N-1)
V	Fluorocarbon / (SK30510V-1)

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
785	1″ SAE
786	1″ BSP

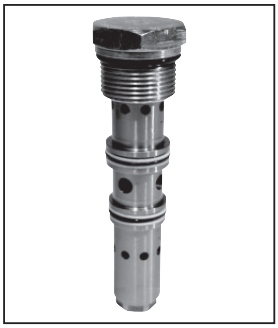
Code	Body Material
A	Aluminum
S	Steel

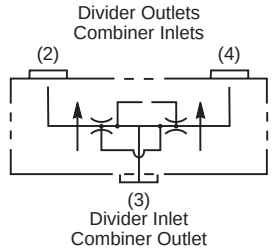
General Description

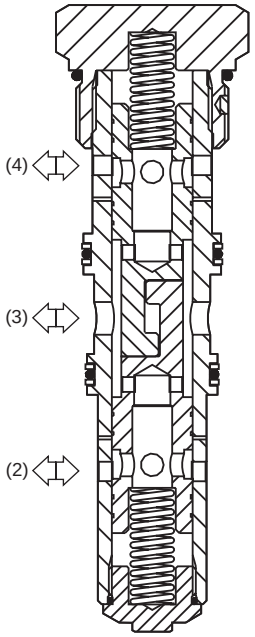
Spool Type, Flow Divider/Combiner Valve. For additional information see Technical Tips on pages FC1-FC4.

Features

- Interlocking spools for equal control dividing or combining
- Range of flow settings available for optimising control
- Pressure compensated control in both directions
- 50/50 ratio standard, other ratios available on request
- Commonly used for differential lock in transmission applications
- Hardened working parts for maximum durability
- All external parts zinc plated







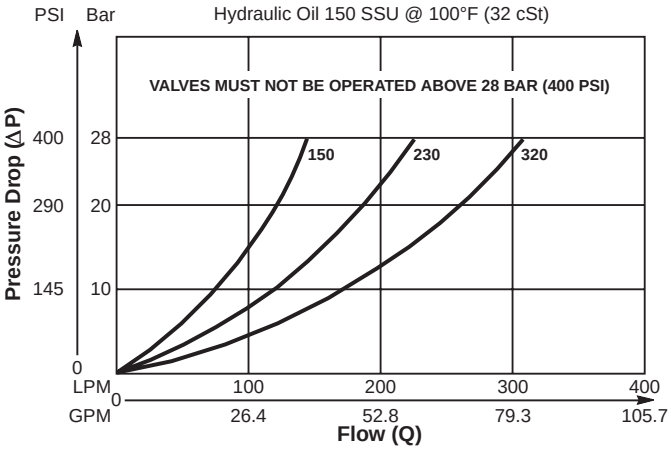
(1) Plug

Specifications

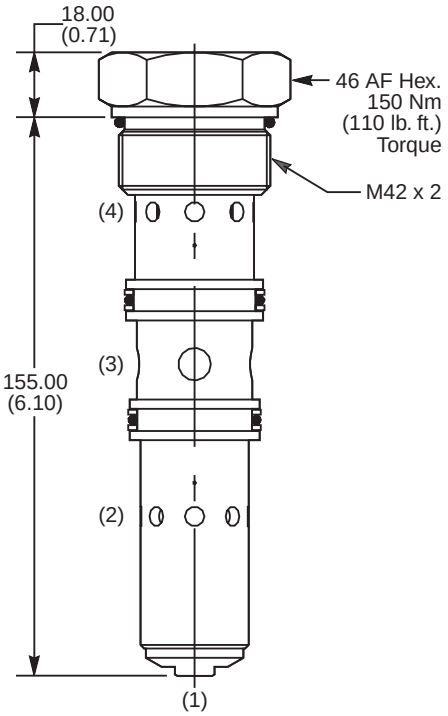
Rated Flow	320 LPM (85 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Flow Rating and Ratio	See Ordering Information
Accuracy Per Leg	± 10%
Cartridge Material	Steel operating parts, hardened steel poppet.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	1.0 kg (2.2 lbs.)
Cavity	91-1 (See BC Section for more details)
Form Tool	Rougher Finisher

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

L1A300			
Flow Divider/ Combiner Valve	Flow Rating	Dividing/ Combining Ratio	Seals

Code	Flow Rating
150	60-150 LPM (15.9-39.7 GPM)
230	75-230 LPM (19.8-60.8 GPM)
320	110-320 LPM (29.1-84.7 GPM)

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30050N-1)
V	Fluorocarbon / (SK30050V-1)

Code	Dividing/Combining Ratio
5050	50 : 50 Ratio

Other ratios available on request.

Order Bodies Separately

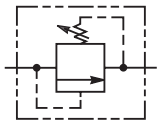
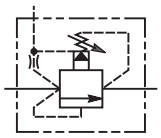
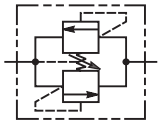
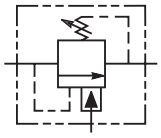
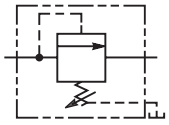
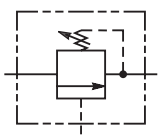
LB10		
Line Body	Porting	Body Material

Code	Porting
156	2 x 1″ BSP 1 x 1-1/2″ BSP
157	2 x 1″ SAE 1 x 1-1/2″ SAE

Code	Body Material
A	Aluminum
S	Steel

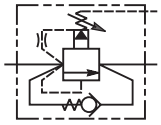
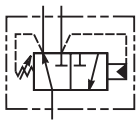
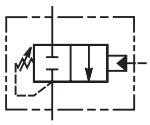
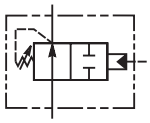
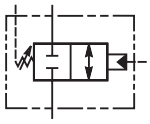
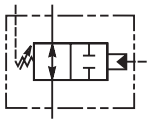
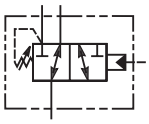
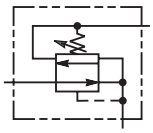
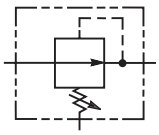
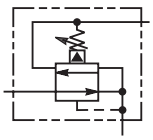
Contents

Pressure Control Valves

	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
RELIEF VALVES	**DIRECT ACTING**					
	RDH042	C04-2	Direct Acting Relief, Poppet Type	3.8/1	350/5000	PC7-PC8
	A02A2	C08-2	Direct Acting Relief, Ball Type	6/1.6	420/6000	PC9-PC10
	A02B2	C08-2	Direct Acting Relief, Poppet Type	8/30	420/6000	PC11-PC12
	RD102	C10-2	Direct Acting Relief, Poppet Type	38/10	250/3600	PC13-PC14
	A04B2	C10-2	Direct Acting Relief, Poppet Type	100/26	420/6000	PC15-PC16
	A04B2*CE	C10-2	Direct Acting Relief, Poppet Type*			PC17-PC18
	A04C2	C10-2	Direct Acting Relief, Spool Type	200/53	100/1450	PC19-PC20
						**CE marked, PED Compliant*
	DIFFERENTIAL AREA					
	RDH083	C08-2	Direct Acting Differential Area Relief	53/14	350/5000	PC21-PC22
	RDH103	C10-2	Direct Acting Differential Area Relief	75/20	350/5000	PC23-PC24
	RD163	C16-2	Direct Acting Differential Area Relief	151/40	210/3000	PC25-PC26
	PILOT OPERATED					
	RAH081	C08-2	Pilot Operated Spool Type	75.8/20	350/5000	PC27-PC28
	RAH101	C10-2	Pilot Operated Spool Type	113/30	350/5000	PC29-PC30
	RAH161	C16-2	Pilot Operated Spool Type	303/80	380/5500	PC31-PC32
	A06G2	C16-2	Pilot Operated Spool Type	400/106	420/6000	PC33-PC34
	RAH201	C20-2	Pilot Operated Spool Type	379/100	350/5000	PC35-PC36
	A04K2	C10-2	Pilot Operated Spool Type Kick Down	160/42	420/6000	PC37-PC38
	**VENTABLE**					
	RAH101V	C10-3	Pilot Operated Vented Relief	68/18	380/5500	PC39-PC40
	A04H3	C10-3S	Pilot Operated Vented Relief	190/50	420/6000	PC41-PC42
	A06H3	C16-3S	Pilot Operated Vented Relief	400/106	420/6000	PC43-PC44
	**CROSS-OVER**					
	A04J2	C10-2	Direct Acting Cross-over Relief	120/32	350/5000	PC45-PC46
	A04J2*CE	C10-2	Direct Acting Cross-over Relief*	120/32	350/5000	PC47-PC48
						**CE marked, PED Compliant*
	**UNLOADING**					
	RU101	C10-3	Direct Acting Unloading	3.75/1	210/3000	PC49-PC50
	M04A4J	C10-4	Direct Acting Piloting Unloading	2/0.53	420/6000	PC51-PC52
	PILOT OPERATED WITH REVERSE CHECK					
	A06P2	C16-2	Pilot Operated Poppet Type	400/106	420/6000	PC53-PC54
SEQUENCE VALVES	**PILOT OPERATED**					
	SVH081	C08-3	Pilot Operated, Int. Pilot, Ext. Drain	45/12	350/5000	PC55-PC56
	SVH101	C10-3	Pilot Operated, Int. Pilot, Ext. Drain	56.3/15	350/5000	PC57-PC58
	SVH161	C16-3	Pilot Operated, Int. Pilot, Ext. Drain	151.6/40	350/5000	PC59-PC60
	SVH102	C10-3	Pilot Operated, Ext. Pilot, Int. Drain	56.3/15	350/5000	PC61-PC62
	SVH162	C16-3	Pilot Operated, Ext. Pilot, Int. Drain	151.6/40	350/5000	PC63-PC64

Contents

Pressure Control Valves

	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
SEQUENCE VALVES	**Pilot Operated (Continued)**					
	B04D3	C10-3S	Pilot Operated, Reverse Check, Ext. Drain	120/32	420/6000	PC65-PC66
	B04C3	C10-3S	Pilot Operated, Kick Down	160/42	420/6000	PC67-PC68
	DIRECT ACTING					
	B02E3F	C08-3	Direct Acting, 2P-3W, Int. Pilot, Int. Drain	30/8	420/6000	PC69-PC70
	B04E3	C10-3	Direct Acting, 2P-3W, Int. Pilot, Int. Drain	50/13	420/6000	PC71-PC72
	B04F3	C10-3	Direct Acting, 2P-2W, NC, Ext. Pilot, Int. Drain	34/9	420/6000	PC73-PC74
	B04G3	C10-3	Direct Acting, 2P-2W, NO, Ext. Pilot, Int. Drain	40/10.6	420/6000	PC75-PC76
	B04H4	C10-4	Direct Acting, 2P-2W, NC, Ext. Pilot, Ext. Drain	47/12	420/6000	PC77-PC78
	B04J4	C10-4	Direct Acting, 2P-2W, NO, Ext. Pilot, Ext. Drain	47/12	420/6000	PC79-PC80
	B04K4	C10-4	Direct Acting, 2P-3W, NO, Ext. Pilot, Int. Drain	42/11	420/6000	PC81-PC82
REDUCING VALVES	**DIRECT ACTING**					
	C02A3	C08-3	Direct Acting Reducing/Relieving	20/5	420/6000	PC83-PC84
	PR103	C10-3	Direct Acting Reducing/Relieving	56/13	210/3000	PC85-PC86
	PILOT OPERATED					
	PRH082	C08-3	Pilot Operated Reducing	30/8	350/5000	PC87-PC88
	PRH102	C10-3	Pilot Operated Reducing	56.3/15	350/5000	PC89-PC90
	PRH122	C12-3	Pilot Operated Reducing	113.7/30	350/5000	PC91-PC92
	PRH162	C16-3	Pilot Operated Reducing	150/40	350/5000	PC92-PC94
	PRH081	C08-3	Pilot Operated Reducing/Relieving	30/8	350/5000	PC95-PC96
	PRH101	C10-3	Pilot Operated Reducing/Relieving	56.3/15	350/5000	PC97-PC98
	PRH121	C12-3	Pilot Operated Reducing/Relieving	113.7/30	350/5000	PC99-PC100
	PRH161	C16-3	Pilot Operated Reducing/Relieving	150/40	350/5000	PC101-PC102

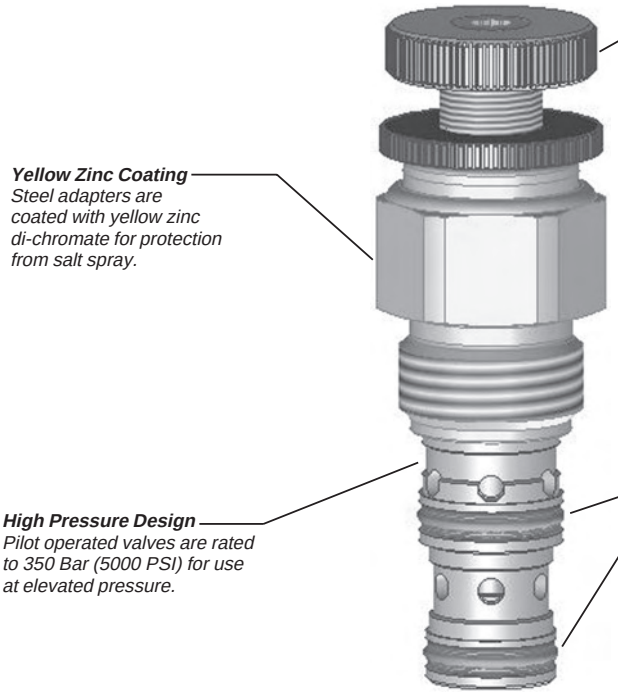
INTRODUCTION

This technical tips section is designed to help familiarize you with the Parker line of Pressure Controls. In this section we highlight new products to this catalog as well as some design features of our pressure control line. In addition we present common options available to help you in selecting products for your application. Finally we give a brief synopsis of the operation and applications of the various product offered in this section.

NEW PRODUCTS

There are several new additions and product improvements to our Pressure Controls product line.

Here are just some of the design features and advantages to the "Winner's Circle" product line.

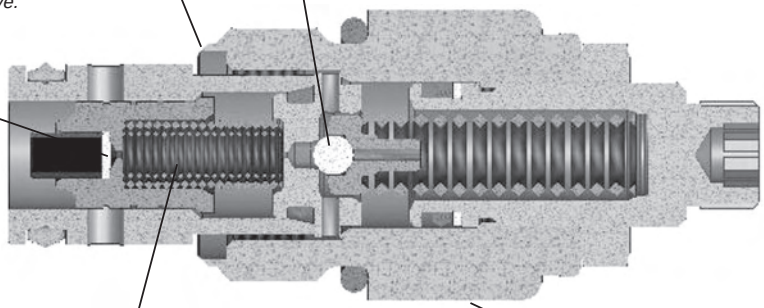


Variety of Adjustments
Pressure controls are offered in screw adjust, knob adjust, fixed and tamper resistant configurations.

Yellow Zinc Coating
Steel adapters are coated with yellow zinc di-chromate for protection from salt spray.

High Pressure Design
Pilot operated valves are rated to 350 Bar (5000 PSI) for use at elevated pressure.

"D"-Ring
Standard 4301 Polyurethane Seal eliminates the need for backup rings providing easier manifold installation. (For more information on "D"-Ring see Technical Data Section)



Crimp Design
Fold over crimp provides secure holding and eliminates the need for adhesive.

Guided Pilot
Pilot is fully guided providing a more consistent reseat.

Internal Screen
A small internal screen protects the pilot orifice and spring chamber from debris.

High Rate Bias Spring
Pilot operated reducing and sequence valves are designed with a high rate bias spring pressure, enhancing stability.

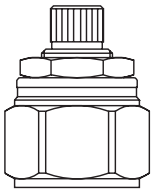
Low Profile Adapter
The low profile shape of the pilot operated pressure controls reduces the manifold clearance required.

COMMON OPTIONS

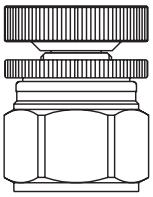
As you will see, Parker offers a variety of Pressure Control products. As such, some of the options mentioned below may not be available on all valves. Consult the model coding and dimensions for each valve for specifics. Here are some of the common options available.

Adjustment Types: Parker offers four primary types of adjustments for most of the pressure control products. Samples of these types are shown below. Please note all options may not be available for all valves. Consult the individual catalog pages for more details.

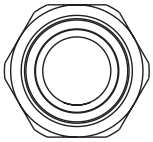
Screw Adjustment - Valve can be adjusted with an allen wrench. Lock nut included to maintain desired setting after adjustment. This is the most common adjustment option available on most Parker products.

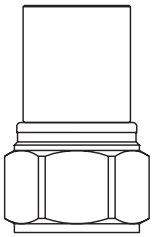


Knob Adjustment - An aluminum knob is added to the standard screw adjustment. A lock knob is provided to help maintain the desired setting after adjustment. Parker offers knob conversion kits for most pressure control valves. For kit numbers consult individual valve pages.

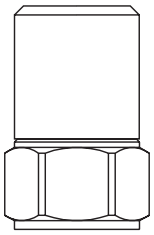


Fixed Style - In most cases, the Fixed Style product is a screw adjustable product with a steel collet threaded over the screw adjustment. These valves are preset at the factory.





Tamper Resistant - The tamper resistant option is a screw adjustable valve with a steel cap installed to conceal the adjustment. The cap is designed so that the internal edges clamp into the groove of the valve adapter. Once the cap is installed, it cannot be removed without damaging the cap and the valve. When a valve is ordered with the tamper resistant option, it will be preset at the factory, and the cap will be included in a separate plastic bag to allow for fine tuning at the customer site. Parker offers tamper resistant cap conversion kits for most pressure control valves. For kit numbers consult individual valve pages.

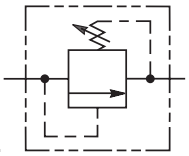


Seals: The Winner's Circle products feature a standard 4301 Polyurethane "D"-Ring. The "D"-Ring eliminates the need for backup rings. The majority of the products are available in Nitrile or Fluorocarbon Seals. You should match the seal compatibility to the temperature and fluid being used in your application.

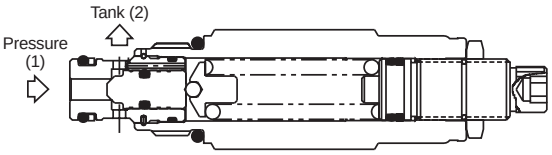
Pressure Range: Parker offers a range of spring settings for the Pressure Control product line. You want to choose the setting that best meets the operating range. The model callout is equivalent to the maximum setting (in psi) of the spring divided by 100 (i.e. 50 = 5000 psi).

PRODUCT TYPES / APPLICATIONS

Direct Acting Relief Valves

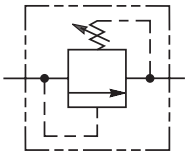


Direct acting relief valves are designed for fast response in intermittent duty applications. They are often used as an economical solution to clip pressure spikes. The poppet design allows for low leakage.

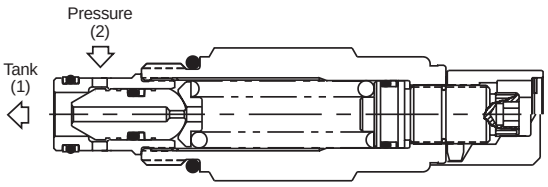


OPERATION - The valve poppet is held against the seat by the spring force. Inlet pressure on the nose (port 1) of the poppet acts against the spring force to unseat the poppet at the valve setting and allow flow to pass to tank. Since the pressure is working directly on the spring, this valve is very fast responding. It is not the best choice for system pressure regulation as it is slightly noisier than pilot operated relief valves and has higher pressure rise. *Note:* Any backpressure on port 2 would be additive to the spring setting.

Differential Area Relief Valves

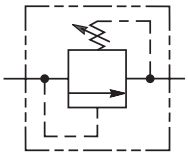


Differential area relief valves also are also best suited for intermittent applications where fast response is critical. These valves are often used as cross-over relief valves to chop pressure spikes. Due to their design, they generally can handle a larger flow rate and have a lower pressure rise than the standard directing acting relief. The poppet design allows for low leakage.

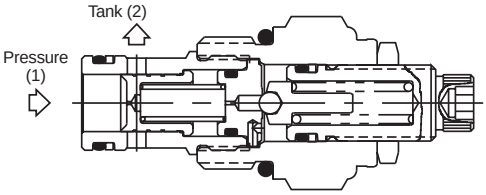


OPERATION - Pressure on the inlet (port 2) of the valve acts on the differential area of the poppet (difference between the O.D. of the poppet and the seat diameter) to produce a force which is opposed by the spring force. When pressure reaches the valve setting, the poppet is pushed off its seat, permitting flow to tank. *Note:* Any backpressure on port 1 would be additive to the spring setting.

Pilot Operated Relief



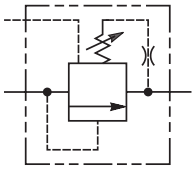
Pilot operated relief valves are designed for continuous duty applications. Due to their stability and low pressure rise, the pilot operated relief is the best option for setting the pressure of a hydraulic system.

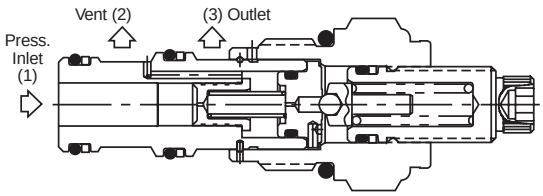


OPERATION - When inlet pressure at the nose (port 1) exceeds the valve setting, the pilot ball unseats. The pilot flow creates a pressure imbalance across the main spool causing the spool to move and allowing flow from inlet (port) 1 to tank (port 2.) *Note:* Any backpressure on port 2 would be additive to the spring setting.

Ventable Pilot Operated Relief

Ventable relief valves are a unique type of pilot operated relief. With this valve, you can control the pressure setting with the internal adjustment as well as via remote circuit. These valves are ideal in cirucits where multiple pressures are needed.

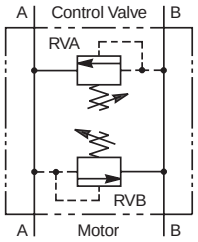


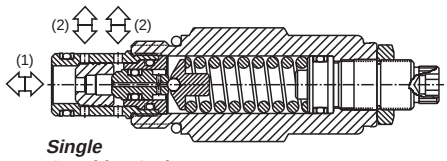


OPERATION - This valve can be controlled by the adjustment setting on the valve, or a remote circuit via the vent line. When the vent line is used, the smaller of the two pressure settings will determine the valve setting. In other words, if the pressure setting of the remote circuit is less than the adjusted setting, then the valve will relieve at the remote setting. If the pressure setting of the remote circuit is greater than the adjusted setting, then the valve will relieve at the adjusted setting. With the vent port (port 2) blocked, the valve operates like a standard pilot operated relief valve. Thus, a solenoid valve could be used on the vent port to select control between this valve another remote valve.

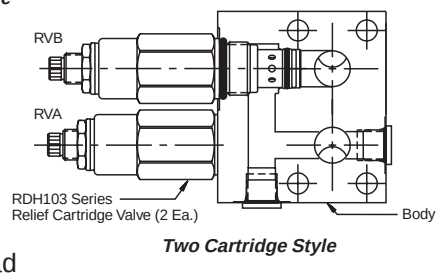
Dual Crossover Relief Valves

Dual crossover relief valves provide pressure surge protection for double acting hydraulic actuators. For best results, you always want to install the valve as close to the actuator as possible. The dual crossover feature can be achieved in two different methods. One way is to manifold two Differential Area Relief Valves into a single body. Parker offers three versions of this two cartridge arrangement. The advantage gained is higher flows can be pushed through this arrangement. The second method is to combine this dual function into a single cartridge. The single cartridge arrangement reduces cost considerably of the total package. In addition, a standard common cavity line body can be used instead of a special two body arrangement. The operation for the single cartridge style is shown below.





Single Cartridge Style

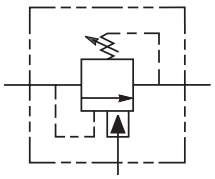


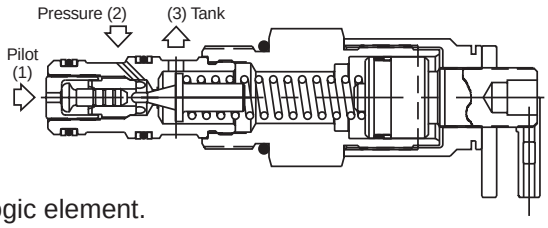
Two Cartridge Style

OPERATION - Pressure at port 1 acts on the spool to produce a force which is opposed by the spring setting. When pressure reaches the valve setting, the spool and poppet move relieving flow from port 1 to port 2. When port 2 is pressurized, the pressure acts on the differential area poppet to produce a force which is opposed by the spring force. When the pressure reaches the valve setting, the poppet is pushed off of its seat, relieving flow from port 2 to port 1. *Note:* Due to the construction and flow paths through the valve, the relief pressure settings may vary by approximately 300 psi from one direction to the other.

Differential Area Unloading Relief Valve

Unloading valves are differential area relief valves that can also be fully dumped or unloaded via a remote signal. They are best suited for low flow accumulator unloading circuits. They provide a fixed percentage between load and unload pressures. This pilot valve would generally be used in conjunction with a logic element.

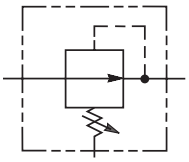


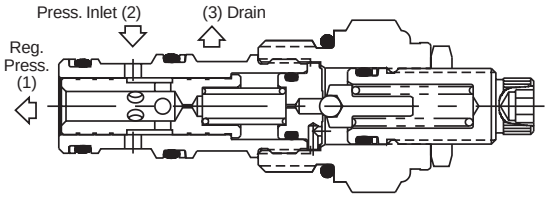


OPERATION - The fixed differential is provided by the pilot piston which has greater area than the dart seat. With its greater area, the piston is able to hold the dart off its seat, permitting flow from pressure to tank, until pressure on the pilot piston falls below the fixed percentage of the valve settings.

Pilot Operated Reducing Valve

Pilot operated pressure reducing valves can be used to reduce the pressure in a leg of the circuit lower than system pressure. Thus, they can be used to provide protection to downstream components from higher pressures.



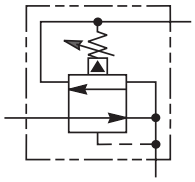


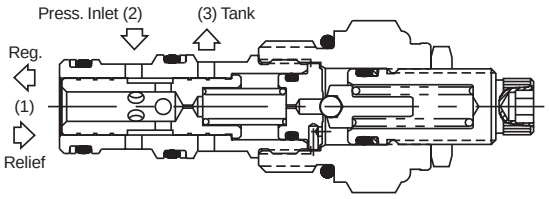
OPERATION - The pilot section controls the valve setting when reducing. As pressure at the regulated port exceeds the valve setting, the pilot ball is unseated. The pilot flow creates a pressure imbalance across the main spool causing the spool to throttle in order to maintain constant downstream pressure. The normally open design will allow flow to pass from inlet to reduced port with the only restriction being the pressure drop.

Pressure Reducing / Relieving Valves

Pressure reducing / relieving valves can be used to reduce the pressure in a leg of the circuit lower than system pressure. The valve also acts as a relief valve, relieving any shocks or surges that occur between the regulated port and the actuator. When the valve is in the relieving mode, the inlet port is blocked. Parker offers pressure reducing/relieving valves in both pilot operated and directing acting styles. The direct acting version is generally used in static applications where response is critical, or leakage is a concern.

Pilot Operated

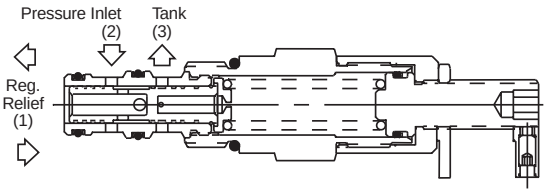




OPERATION - The pilot section controls the valve setting when reducing. As pressure at the regulated port exceeds the valve setting, the pilot ball is unseated. The pilot flow creates a pressure imbalance across the main spool causing the spool to throttle in order to maintain constant downstream pressure. A shock or surge at the regulated port shifts the spool, relieving flow to tank.

Direct Acting

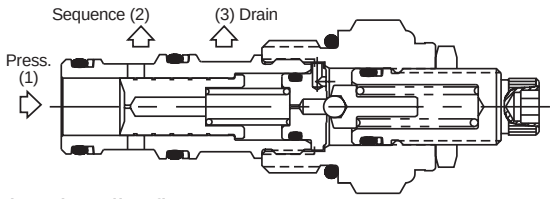
OPERATION - As pressure at the regulated port exceeds the valve setting, the valve throttles or closes in order to maintain constant downstream pressure. A shock or surge at the regulated port further shifts the spool, relieving flow to tank. This valve is not intended for rapidly changing flows which could lead to instability.



Pilot Operated Sequence Valves

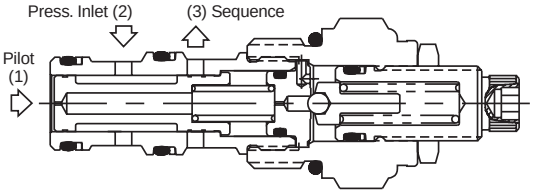
Sequence valves are used to control the sequence of operation of two or more hydraulic actuators. The sequence valve pressure is set higher than the first actuator operation pressure. Once the first actuator has completed its cycle, the sequence valve opens allowing the second actuator to move. Parker's line of pilot operated sequence valves include a series of internally piloted, externally drained valves and a series of externally piloted, internally vented valves. Parker also offers a line of direct acting sequence valves which are ideal for piloting logic elements in steady state applications.

P.O. Sequence (Internally Piloted, Externally Drained)



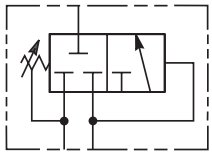
OPERATION - For this valve, the pilot pressure is sensed from the inlet of the valve (port 1). When the pilot pressure exceeds the valve setting, the pilot section opens creating a pressure imbalance across the main spool. This causes the spool to move allowing the flow to pass from the nose of the cartridge (port 1) to the actuator port (port 2). By externally draining the pilot flow directly to tank (port 3), the valve is insensitive to back pressure at the sequence port.

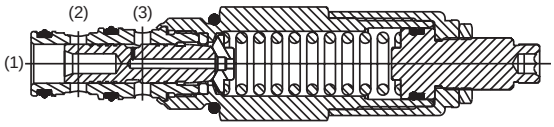
P.O. Sequence (Externally Piloted, Internally Vented)



OPERATION - For this valve, the pilot pressure is obtained from an external source and not from the pressure port. When the external pilot pressure (port 1) exceeds the valve setting, the pilot section opens creating a pressure imbalance across the main spool. This causes the spool to move allowing the flow to pass from the side of the cartridge (port 2) to the actuator port (port 3). Any pressure at port 3 is additive to the pressure setting. It is most common for port 3 to be connected to tank.

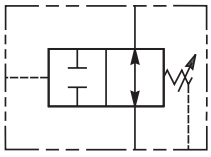
D.A. Sequence (Internally Piloted, Externally Drained)

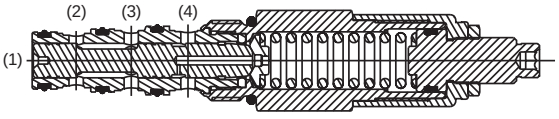




OPERATION - In the steady state condition, all three ports are blocked with the spring chamber drained to port 3. When the pressure at port 1 exceeds the valve setting, the spool moves allowing flow from the nose of the cartridge (port 1) to the actuator port (port 2). By externally draining the spring chamber directly to tank (port 3), the valve is insensitive to back pressure at the sequence port.

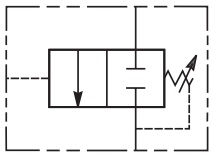
D.A. Sequence, N.O. (Externally Piloted, Externally Drained)

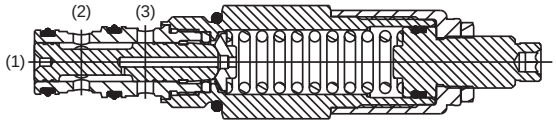




OPERATION - With no pressure at the pilot port (port 1), bi-directional flow is allowed between port 3 and port 2. When the pilot pressure at port 1 exceeds the valve setting the spool moves blocking both port 3 and port 2. By externally draining the spring chamber to tank (port 4), the valve is insensitive to back pressure at the sequencing ports.

D.A. Sequence, N.C. (Externally Piloted)



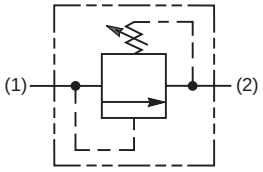


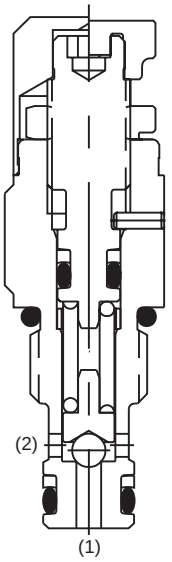
OPERATION - With no pressure at the pilot port (port 1), both port 3 and port 2 are blocked. When the pilot pressure at port 1 exceeds the valve setting, the spool moves opening a path and allowing flow from port 3 to port 2. This valve internally drains the spring chamber to tank via the sequencing port, thus any backpressure on port 2 would be additive to the spring setting.

General Description

Direct Acting Ball-Type Relief Valve. For additional information see Technical Tips on pages PC1-PC6.







Features

- Hardened, precision ground parts for durability
- Compact size for reduced space requirements
- Low leakage design
- Fast response
- All external parts zinc plated

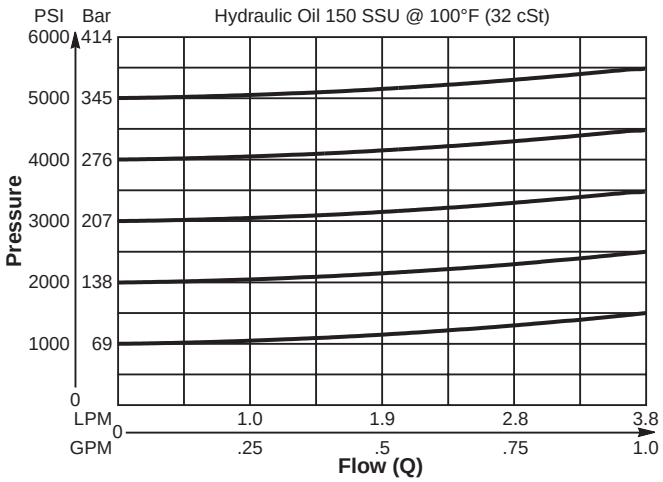
Specifications

Rated Flow	3.8 LPM (1 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Reseat Pressure	80% of crack pressure
Leakage at 150 SSU (32 cSt)	10 drops/min. (.66 cc/min.) @75% of crack pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.03 kg (.07 lbs.)
Cavity	C04-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT04-2F

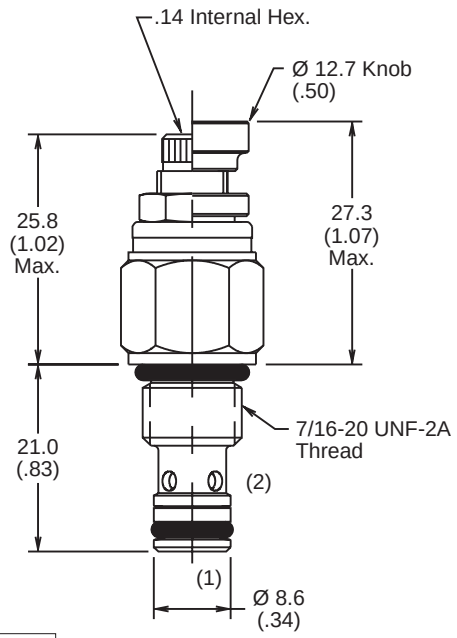
Performance Curve

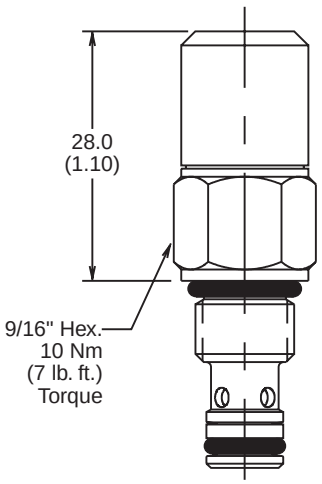
Flow vs. Inlet Pressure

(Pressure rise through cartridge only)

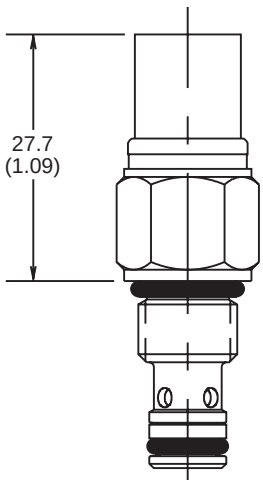


Dimensions Millimeters (Inches)





Tamper Resistant



Fixed

THIRD-ANGLE PROJECTION

Ordering Information

RDH042				—		—		
04 Size Direct Acting Relief Valve	Adjustment Style	Pressure Range	Seals		Optional Pressure Setting		Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (852544)
S	Screw Adjust
T	Tamper Resistant Cap (852519)

Code	Pressure Range
30	6.9 - 207 Bar (100 - 3000 PSI) Standard Setting: 103 Bar (1500 PSI) @ 1.9 LPM (.5 GPM)
50	103 - 345 Bar (1500 - 5000 PSI) Standard Setting: 172 Bar (2500 PSI) @ 1.9 LPM (.5 GPM)

Code	Seals / Kit No.
Omit	Nitrile / (SK04-2)
V	Fluorocarbon / (SK04-2V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at 1.9 LPM (.5 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4T	SAE-4	(B04-2-*4T)

**** Add "A" for aluminum, omit for steel.***

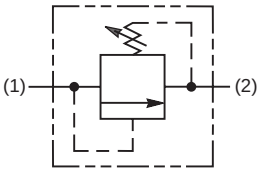
General Description

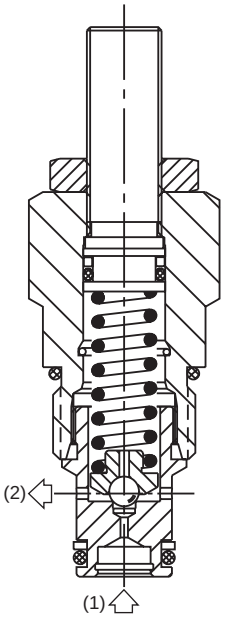
Direct Acting Ball-Type Relief Valve. For additional information see Technical Tips on pages PC1-PC6.

Features

- Fast response
- Ideal for controlling ventable relief valves, or for thermal relief
- Hardened working parts for maximum durability
- Integral 250 micron inlet filter available
- All external parts zinc plated







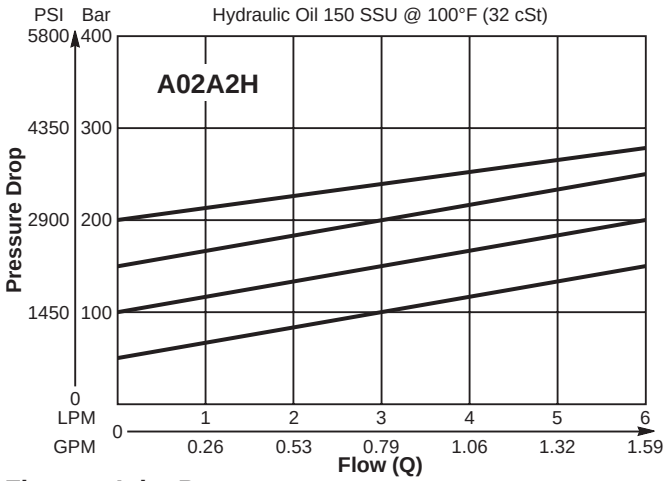
Specifications

Rated Flow	6 LPM (1.6 GPM)
Maximum Inlet Pressure	**H -** 10-210 Bar (145-3000 PSI) **P -** 10-420 Bar (145-6000 PSI)
Maximum Pressure Setting	420 Bar (6000 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. @100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.11 kg (0.24 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

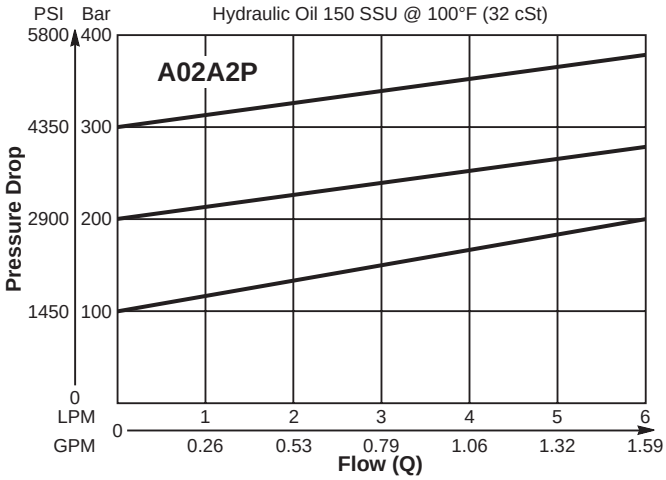
Performance Curves

(Pressure rise through cartridge only)

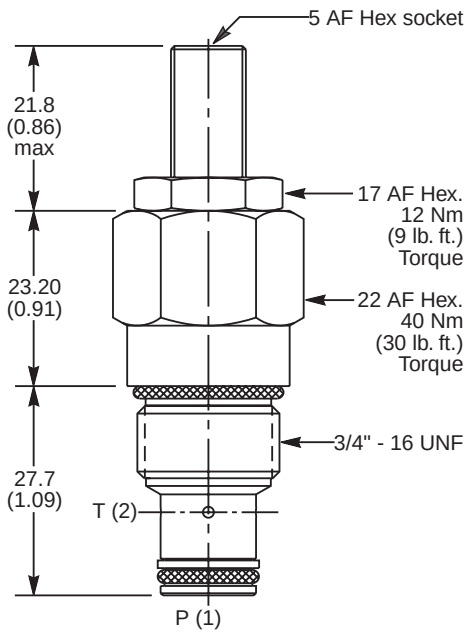
Flow vs. Inlet Pressure



Flow vs. Inlet Pressure



Dimensions Millimeters (Inches)



Ordering Information

A02A2			—				—		
08 Size Direct Acting Relief Valve	Pressure Adjustment Range	Adjustment Style		Optional Pressure Setting	Seals	Filter		Body Material	Port Size

Code	Pressure Adjustment Range
H	10 - 210 Bar (145 - 3000 PSI)
P	10 - 420 Bar (145 - 6000 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Optional Pressure Setting
Specify setting if required (Bar)
A02A2H Standard Setting: 100 Bar (1400 PSI) @ 0.5 LPM (0.13 GPM)
A02A2P Standard Setting: 200 Bar (2900 PSI) @ 0.5 LPM (0.13 GPM)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30515N-1)
V	Fluorocarbon / (SK30515V-1)

Code	Filter
Omit	Omit for no filter (Std.)
F	250 micron inlet filter

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-2-*4P)
6P	3/8″ NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8″ BSPG	(B08-2-*6B)

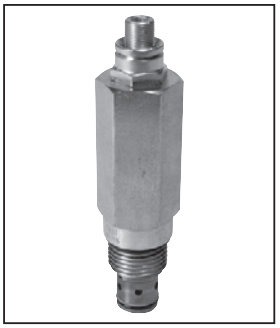
**** Add "A" for aluminum, omit for steel.***

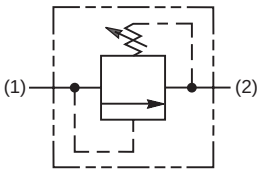
General Description

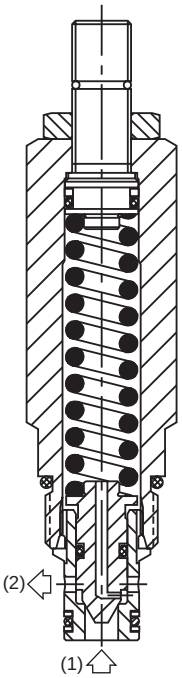
Direct Acting Poppet-Type Relief Valve. For additional information see Technical Tips on pages PC1-PC6.

Features

- Fast response
- Excellent stability throughout flow range
- Virtually leak free
- Hardened working parts for maximum durability
- Adjustable, preset and tamper resistant versions available
- Preset version is tamper resistant and compact
- All external parts zinc plated







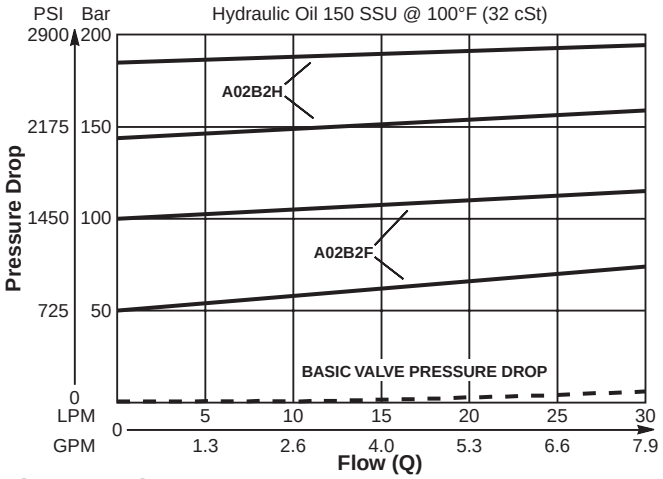
Specifications

Rated Flow	8 LPM (30 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**F -** 2-100 Bar (29-1450 PSI) **H -** 5-210 Bar (72-3000 PSI) **P -** 5-420 Bar (72-6000 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.20 kg (0.44 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

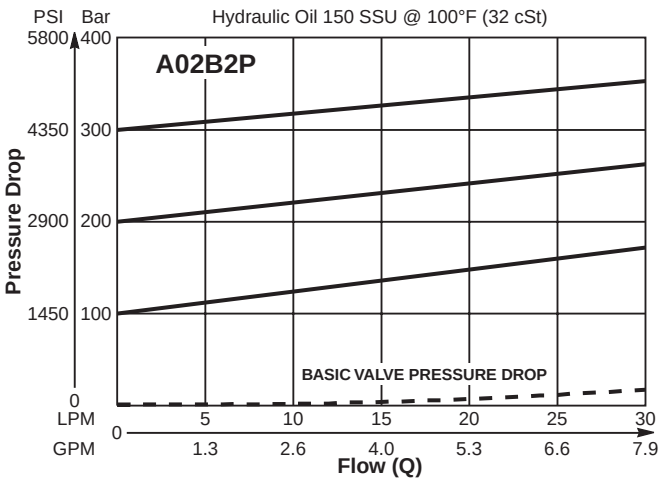
Performance Curves

(Pressure rise through cartridge only)

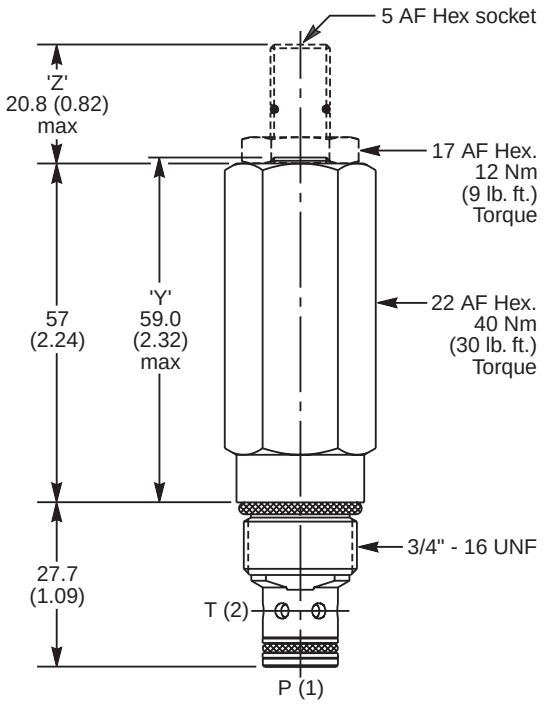
Flow vs. Inlet Pressure



Flow vs. Inlet Pressure



Dimensions Millimeters (Inches)



Ordering Information

A02B2							
08 Size Direct Acting Relief Valve	Pressure Adjustment Range	Adjustment Style	—	Optional Pressure Setting	Seals	— Body Material	Port Size

Code	Pressure Adjustment Range
F	2 - 100 Bar (29 - 1450 PSI)
H	5 - 210 Bar (72 - 3000 PSI)
P	5 - 420 Bar (72 - 6000 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)
Y	Non Adjustable Preset

Optional Pressure Setting
Specify setting if required (Bar)
Y Setting must be specified
A02B2F Standard Setting: 50 Bar (725 PSI) @ 2 LPM (0.5 GPM)
A02B2H Standard Setting: 100 Bar (1450 PSI) @ 2 LPM (0.5 GPM)
A02B2P Standard Setting: 200 Bar (2900 PSI) @ 2 LPM (0.5 GPM)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30500N-1)
V	Fluorocarbon / (SK30500V-1)

Code	Body Material
Omit	Steel
A	Aluminum

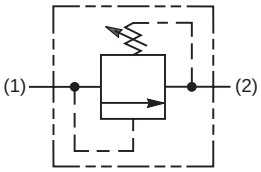
Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-2-*4P)
6P	3/8″ NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8″ BSPG	(B08-2-*6B)

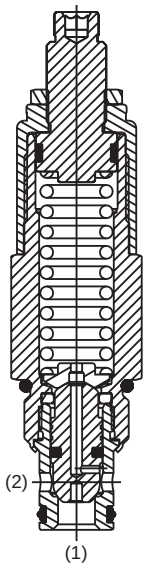
**** Add "A" for aluminum, omit for steel.***

General Description

Direct Acting Poppet-Type Relief Valve. For additional information see Technical Tips on pages PC1-PC6.







Features

- Hardened, precision ground parts for durability
- Internal mechanical stop limits poppet travel eliminating spring solidification
- Spherical poppets for low leakage
- "D"-Ring eliminates backup rings
- All external parts have yellow zinc dichromate. This coating is ideal for salt spray applications.
- Fast response

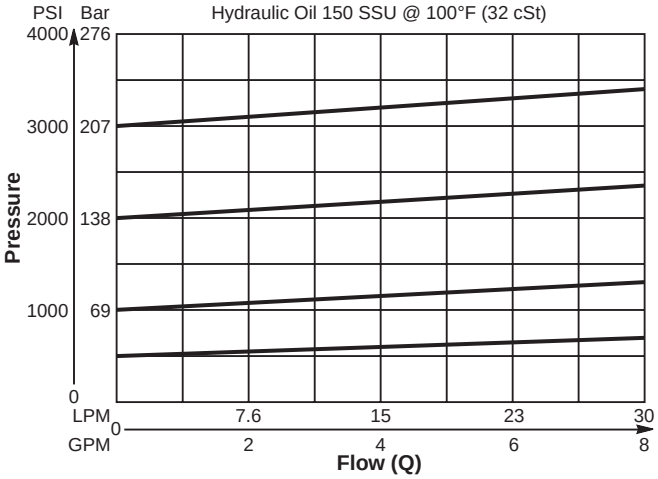
Specifications

Rated Flow	38 LPM (10 GPM)
Maximum Inlet Pressure	250 Bar (3600 PSI)
Maximum Pressure Setting	210 Bar (3000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Reseat Pressure	85% of crack pressure
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) @75% of crack pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range (Ambient)	-45°C to +93.3°C ("D"-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluids	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.23 kg (0.5 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

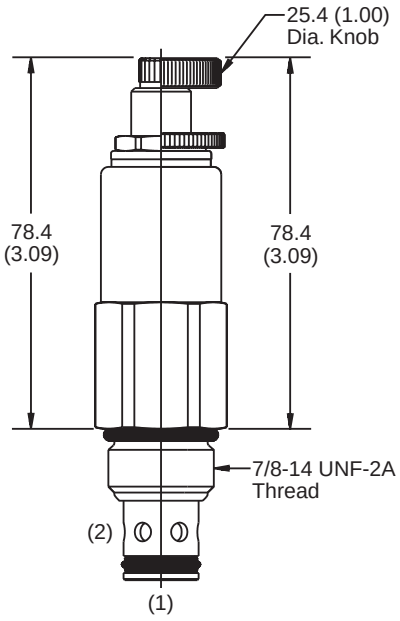
Performance Curve

Flow vs. Inlet Pressure

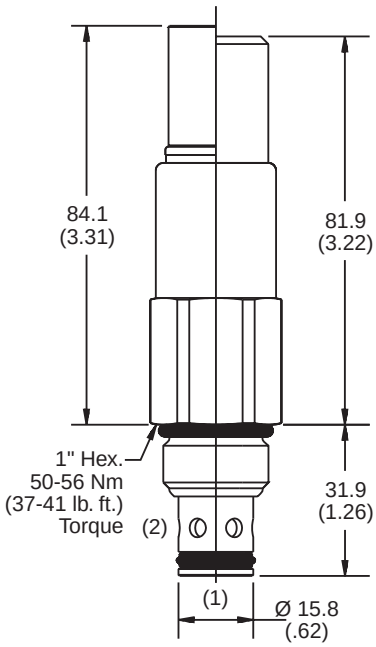
(Pressure rise through cartridge only)



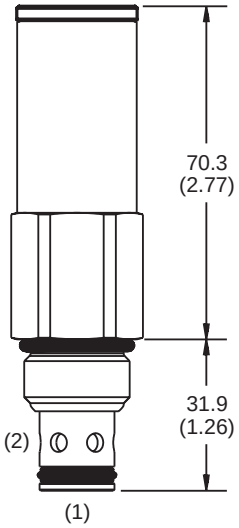
Dimensions Millimeters (Inches)



Screw/Knob Version



Fixed Cap/Tamper Resistant Version



Non-Adjustable Version

THIRD-ANGLE PROJECTION

Ordering Information

RD102				—		—		
10 Size Direct Acting Relief Valve	Adjustment Style	Pressure Range	Seals		Optional Pressure Setting		Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-10)
N	Non-Adjustable
S	Screw Adjust
T	Tamper Resistant Cap (717943)

Code	Pressure Range
03	6.9 - 20.7 Bar (100 - 300 PSI) Standard Setting: 10.3 Bar (150 PSI) @ .95 LPM (.25 GPM)
09	13.8 - 62.1 Bar (200 - 900 PSI) Standard Setting: 31.0 Bar (450 PSI) @ .95 LPM (.25 GPM)
18	20.7 - 124 Bar (300 - 1800 PSI) Standard Setting: 62.1 Bar (900 PSI) @ .95 LPM (.25 GPM)
30	41.4 - 207 Bar (600 - 3000 PSI) Standard Setting: 103.4 Bar (1500 PSI) @ .95 LPM (.25 GPM)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK10-2)
N	Nitrile / (SK10-2N)
V	Fluorocarbon / (SK10-2V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 3000 PSI All settings at .95 LPM (.25 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

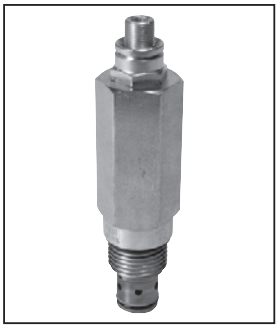
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

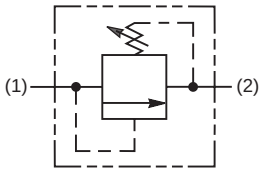
General Description

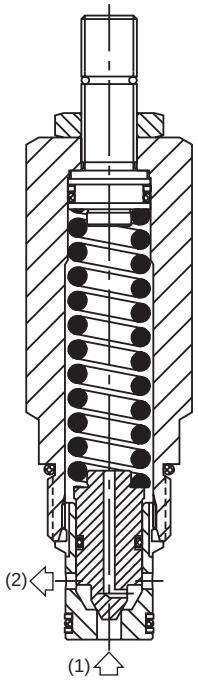
Direct Acting Poppet-Type Relief Valve. For additional information see Technical Tips on pages PC1-PC6.

Features

- Fast response with good stability
- Virtually leak-free
- Hardened working parts for maximum durability
- Adjustable, preset and tamperproof versions available
- Preset version is tamperproof and compact
- All external parts zinc plated







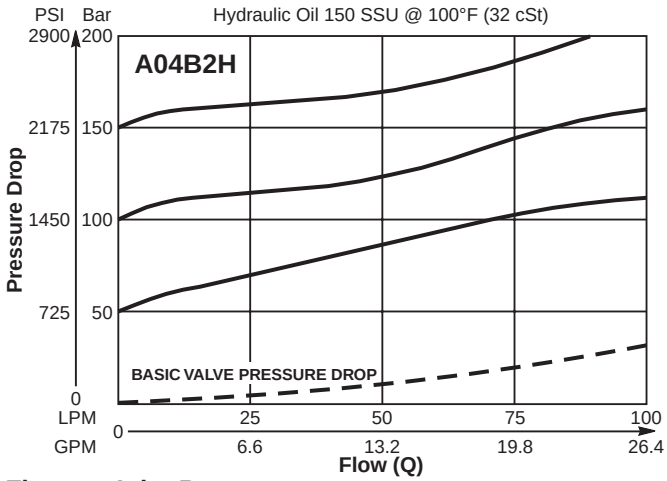
Specifications

Rated Flow	100 LPM (26 GPM)
Maximum Inlet Pressure	**H -** 5-210 Bar (72-3000 PSI) **P -** 5-420 Bar (72-6000 PSI)
Maximum Pressure Setting	420 Bar (6000 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.28 kg (0.62 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

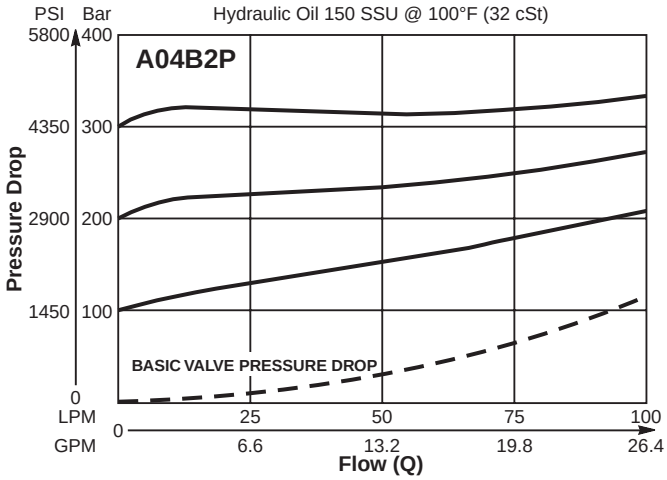
Performance Curves

(Pressure rise through cartridge only)

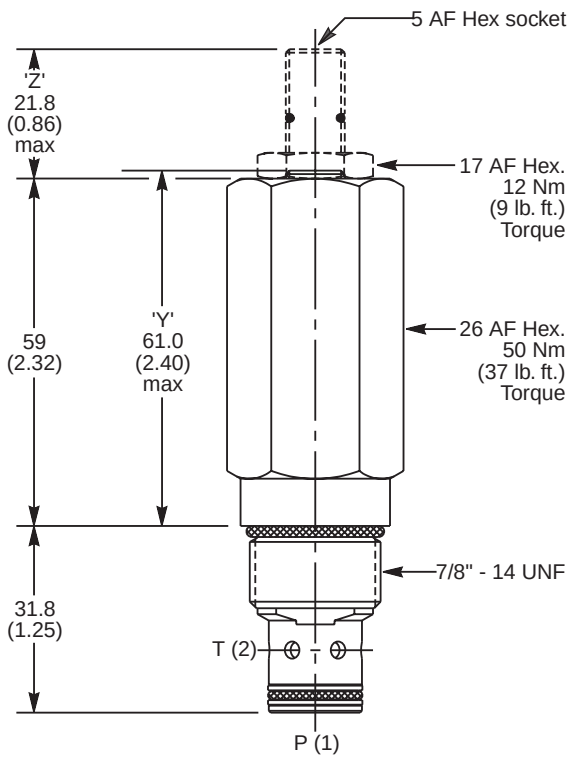
Flow vs. Inlet Pressure



Flow vs. Inlet Pressure



Dimensions Millimeters (Inches)



Ordering Information

A04B2			—			—		
10 Size Direct Acting Relief Valve	Pressure Adjustment Range	Adjustment Style		Optional Pressure Setting	Seals		Body Material	Port Size

Code	Pressure Adjustment Range
H	5 - 210 Bar (72 - 3000 PSI)
P	5 - 420 Bar (72 - 6000 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)
Y	Non Adjustable Preset

Optional Pressure Setting
Specify setting if required (Bar)
Y Setting must be specified
A04B2H Standard Setting: 100 Bar (1450 PSI) @ 15 LPM (4.0 GPM)
A04B2P Standard Setting: 200 Bar (2900 PSI) @ 15 LPM (4.0 GPM)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30503N-1)
V	Fluorocarbon / (SK30503V-1)

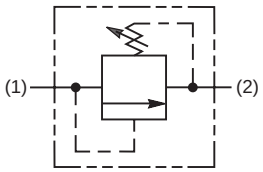
Code	Body Material
Omit	Steel
A	Aluminum

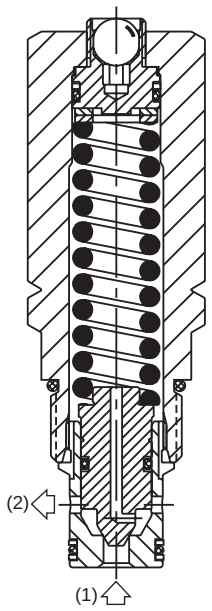
Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

Direct Acting Poppet-Type Relief Valve. Pressure Equipment Directive (PED 97/23/EC) compliant to hazard category IV. For additional information see Technical Tips on pages PC1-PC6.





Features

- Fast response with good stability
- Compact space saving design
- Poppet type construction for lower leakage
- Full 420 Bar (6000 PSI) pressure capability
- Hardened working parts for maximum durability
- Tamperproof setting
- All external parts zinc plated

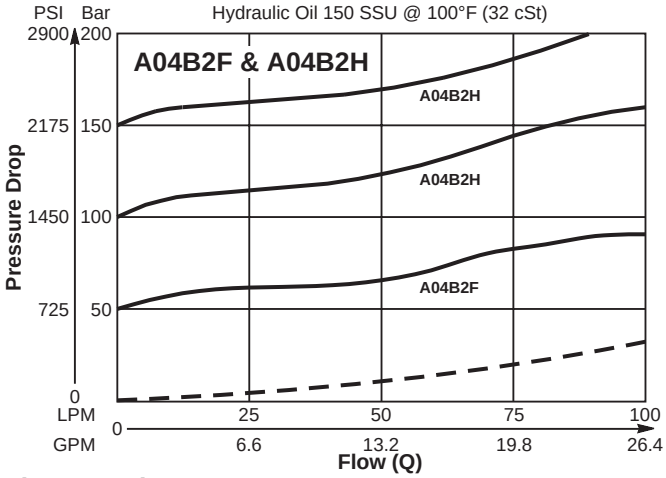
Specifications

Rated Flow	100 LPM (26 GPM)
Maximum Inlet Pressure	**FY -** 2-100 Bar (29-1450 PSI) **HY -** 5-210 Bar (72-3000 PSI) **PY -** 5-420 Bar (72-6000 PSI)
Maximum Pressure Setting	420 Bar (6000 PSI)
Sensitivity: Pressure/Turn	**FY -** 11 Bar (165 PSI) **HY -** 21 Bar (305 PSI) **PY -** 44 Bar (630 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.25 kg (0.55 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

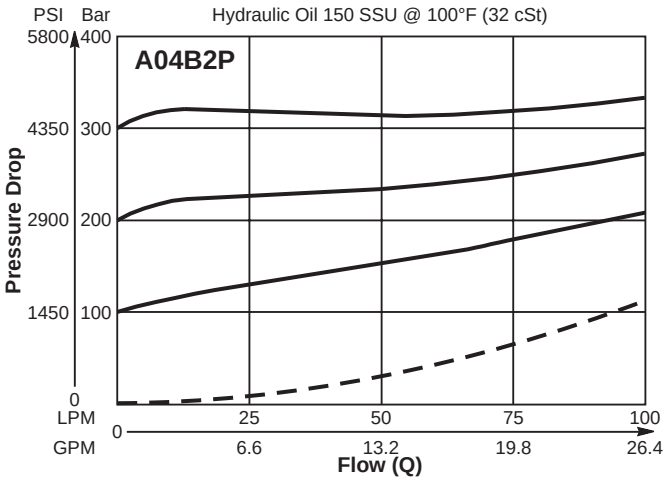
Performance Curves

(Pressure rise through cartridge only)

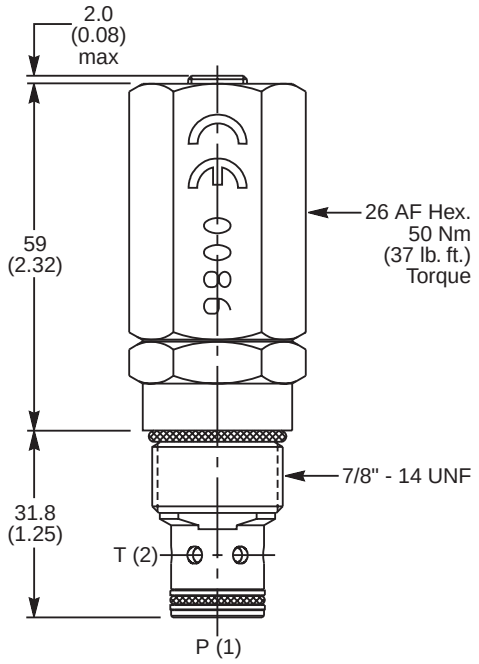
Flow vs. Inlet Pressure



Flow vs. Inlet Pressure



Dimensions Millimeters (Inches)



Ordering Information

A04B2		Y	–			CE	–		
10 Size Direct Acting Relief Valve	Pressure Adjustment Range	Adjustment Style		Optional Pressure Setting	Seals			Body Material	Port Size

Code	Pressure Adjustment Range
F	2 - 100 Bar (29 - 1450 PSI)
H	5 - 210 Bar (72 - 3000 PSI)
P	5 - 420 Bar (72 - 6000 PSI)

Code	Adjustment Style / Kit No.
Y	Non Adjustable Preset (Std.)

Optional Pressure Setting
Setting must be specified (Bar)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30503NP-1)
V	Fluorocarbon / (SK30503VP-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

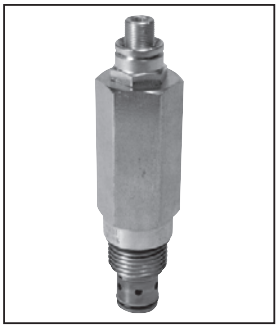
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

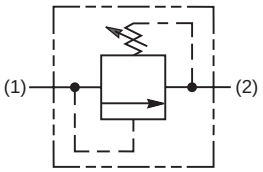
General Description

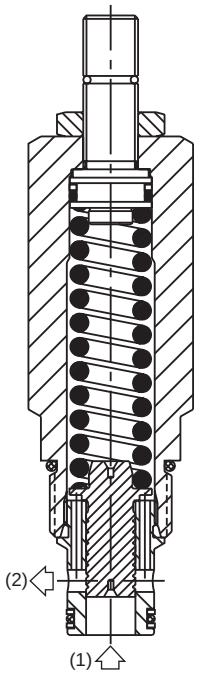
Direct Acting Spool-Type Relief Valve. For additional information see Technical Tips on pages PC1-PC6.

Features

- High flow capacity
- Fast response with good stability
- Low pressure setting
- Full 420 Bar 6000 PSI tank line back pressure
- Hardened working parts for maximum durability
- Adjustable, preset and tamperproof versions available
- All external parts zinc plated







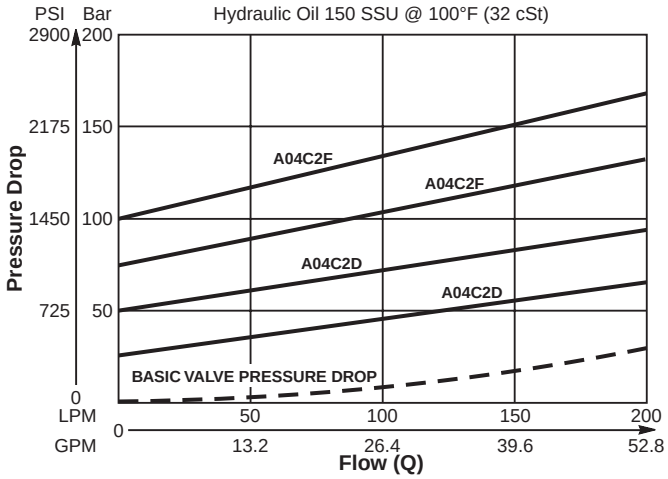
Specifications

Rated Flow	200 LPM (53 GPM)
Maximum Inlet Pressure	**D -** 2-50 Bar (29-725 PSI) **F -** 2-100 Bar (29-1450 PSI)
Maximum Pressure Setting	420 Bar (6000 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	25 ml/min. @ 50 Bar (725 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.28 kg (0.62 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

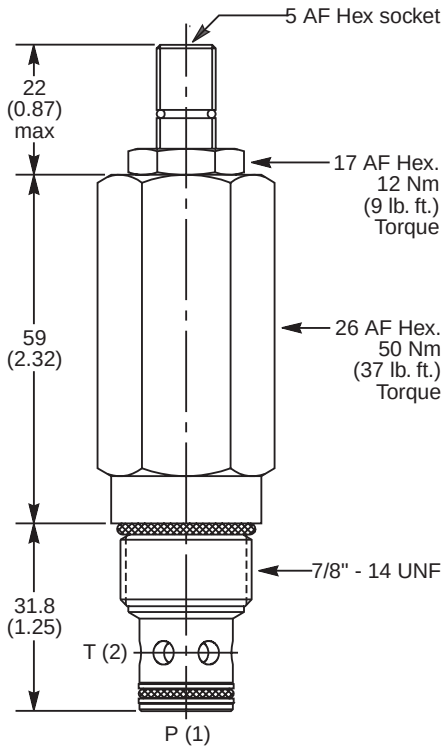
Performance Curve

(Pressure rise through cartridge only)

Flow vs. Inlet Pressure



Dimensions Millimeters (Inches)



Ordering Information

A04C2			—			—		
10 Size Direct Acting Relief Valve	Pressure Adjustment Range	Adjustment Style		Optional Pressure Setting	Seals		Body Material	Port Size

Code	Pressure Adjustment Range
D	2 - 50 Bar (29 - 725 PSI)
F	2 - 100 Bar (29 - 1450 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Optional Pressure Setting
Specify setting if required (Bar)
A04C2D Standard Setting: 25 Bar (360 PSI) @ 15 LPM (4.0 GPM)
A04C2F Standard Setting: 50 Bar (725 PSI) @ 15 LPM (4.0 GPM)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30503N-1)
V	Fluorocarbon / (SK30503V-1)

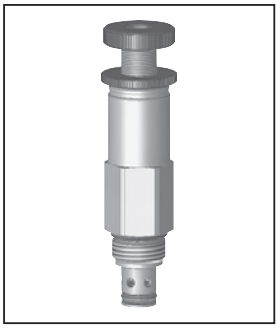
Code	Body Material
Omit	Steel
A	Aluminum

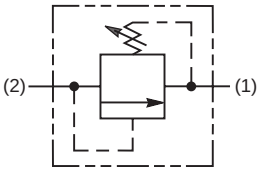
Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

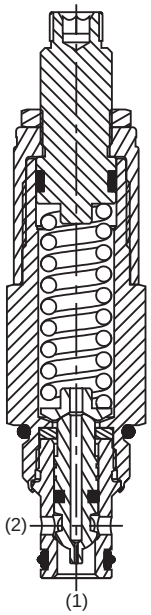
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

Differential Area Relief Valve. For additional information see Technical Tips on pages PC1-PC6.







Features

- Hardened, precision ground parts for durability
- Spherical poppets for low leakage
- High flow capacity
- Internal mechanical stop limits poppet travel eliminating spring solidification
- All external parts have yellow zinc dichromate. This coating is ideal for salt spray applications.
- Polyurethane “D”-Ring eliminates backup rings and prevents hydrolysis

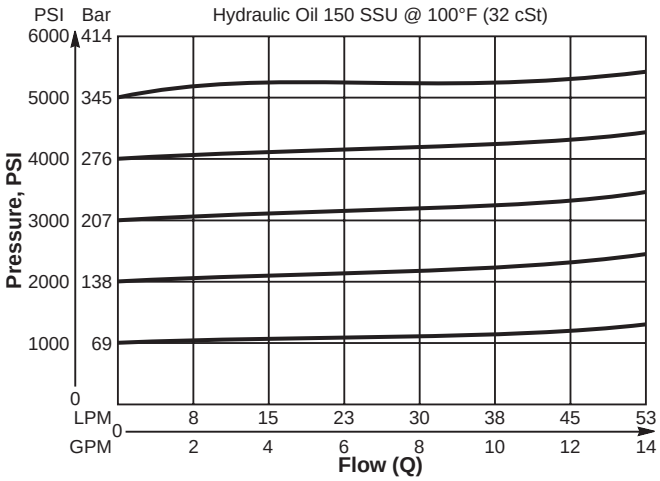
Specifications

Rated Flow	53 LPM (14 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Reseat Pressure	85% of crack pressure
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) @75% of crack pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.19 kg (.43 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

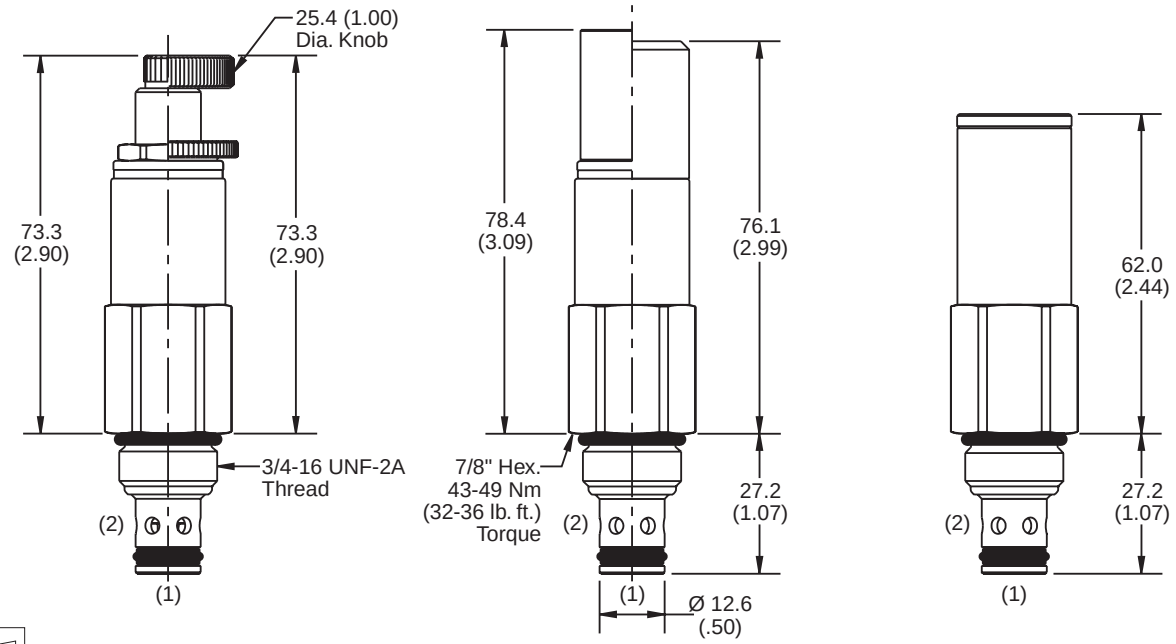
Performance Curve

Flow vs. Inlet Pressure

(Pressure rise through cartridge only)



Dimensions Millimeters (Inches)



THIRD-ANGLE PROJECTION

Screw/Knob Version | **Fixed Cap/Tamper Resistant Version** | **Non-Adjustable Version**

Ordering Information

RDH083				—		—		
08 Size Differential Area Relief Valve	Adjustment Style	Pressure Range	Seals		Optional Pressure Setting		Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-10)
N	Non-Adjustable
S	Screw Adjust
T	Tamper Resistant Cap (718083)

Code	Pressure Range
15	6.9 - 103 Bar (100 - 1500 PSI) Standard Setting: 51.7 Bar (750 PSI) @ crack pressure approximately .95 LPM (.25 GPM)
30	17.2 - 207 Bar (250 - 3000 PSI) Standard Setting: 103 Bar (1500 PSI) @ crack pressure approximately .95 LPM (.25 GPM)
50	34.5 - 345 Bar (500 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ crack pressure approximately .95 LPM (.25 GPM)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK08-2)
N	Nitrile / (SK08-2N)
V	Fluorocarbon / (SK08-2V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at crack pressure, approximately .95 LPM (.25 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

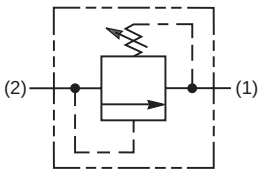
Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-2-*4P)
6P	3/8″ NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8″ BSPG	(B08-2-*6B)

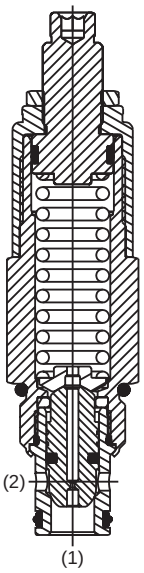
**** Add "A" for aluminum, omit for steel.***

General Description

Differential Area Relief Valve. For additional information see Technical Tips on pages PC1-PC6.







Features

- Hardened, precision ground parts for durability
- Internal mechanical stop limits poppet travel eliminating spring solidification
- Spherical poppets for low leakage
- "D"-Ring eliminates backup rings
- All external parts have yellow zinc dichromate. This coating is ideal for salt spray applications.
- High flow capacity

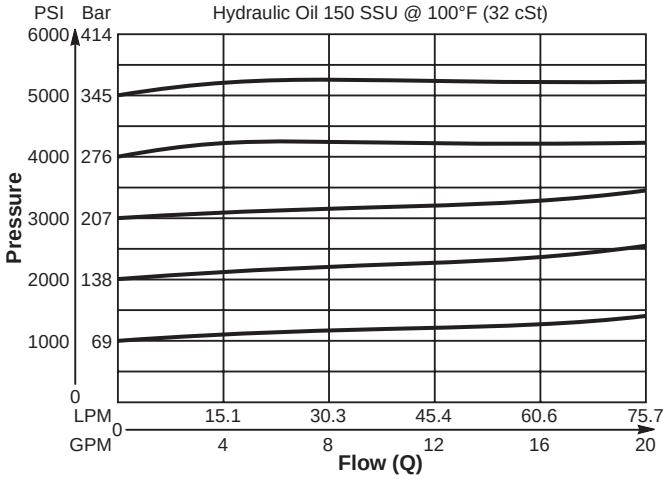
Specifications

Rated Flow	75 LPM (20 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Reseat Pressure	85% of crack pressure
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) @75% of crack pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C ("D"-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.23 kg (0.5 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

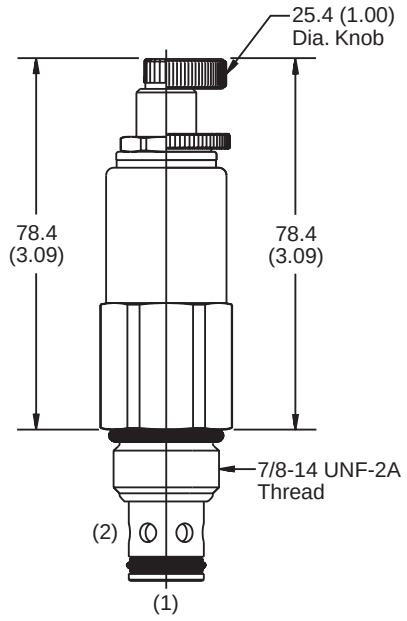
Performance Curve

Flow vs. Inlet Pressure

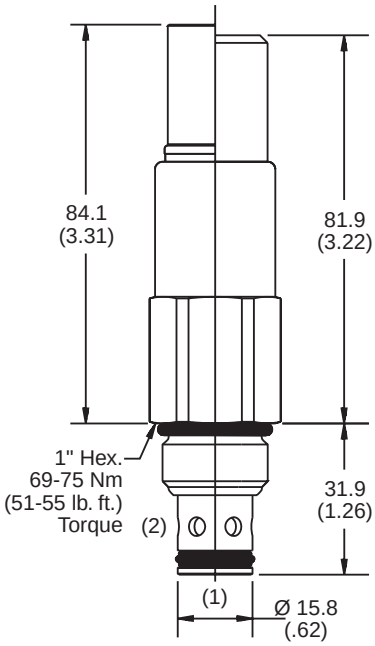
(Pressure rise through cartridge only)



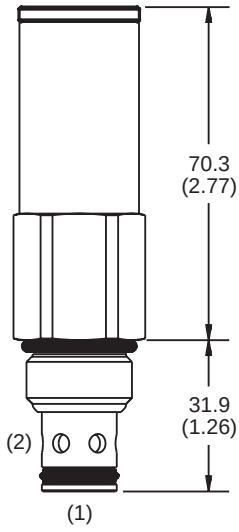
Dimensions Millimeters (Inches)



Screw/Knob Version



Fixed Cap/Tamper Resistant Version



Non-Adjustable Version

THIRD-ANGLE PROJECTION

Ordering Information

RDH103				—		—		
10 Size Differential Area Relief Valve	Adjustment Style	Pressure Range	Seals		Optional Pressure Setting		Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-10)
N	Non-Adjustable
S	Screw Adjust
T	Tamper Resistant Cap (717943)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ .95 LPM (.25 GPM)
20	34.5 - 138 Bar (500 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ .95 LPM (.25 GPM)
30	34.5 - 207 Bar (500 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ .95 LPM (.25 GPM)
50	34.5 - 345 Bar (500 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ .95 LPM (.25 GPM)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK10-2)
N	Nitrile / (SK10-2N)
V	Fluorocarbon / (SK10-2V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at .95 LPM (.25 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

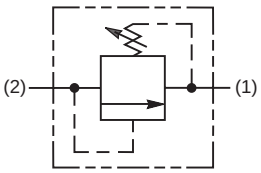
General Description

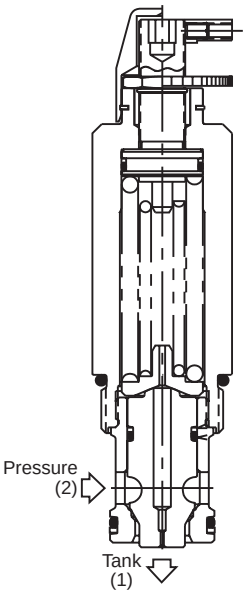
Differential Area Relief Valve. For additional information see Technical Tips on pages PC1-PC6.

Features

- Hardened, precision ground parts for durability
- Compact size for reduced space requirements
- Low leakage design
- Fast response
- All external parts zinc plated







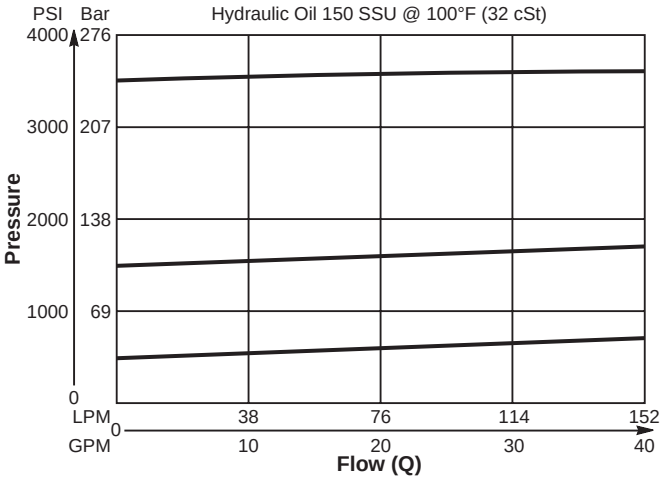
Specifications

Rated Flow	151 LPM (40 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Maximum Pressure Setting	210 Bar (3000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Reseat Pressure	80% of crack pressure
Leakage at 150 SSU (32 cSt)	10 drops/min. (.66 cc/min.) @75% of crack pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.23 kg (0.5 lbs.)
Cavity	C16-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT16-2F

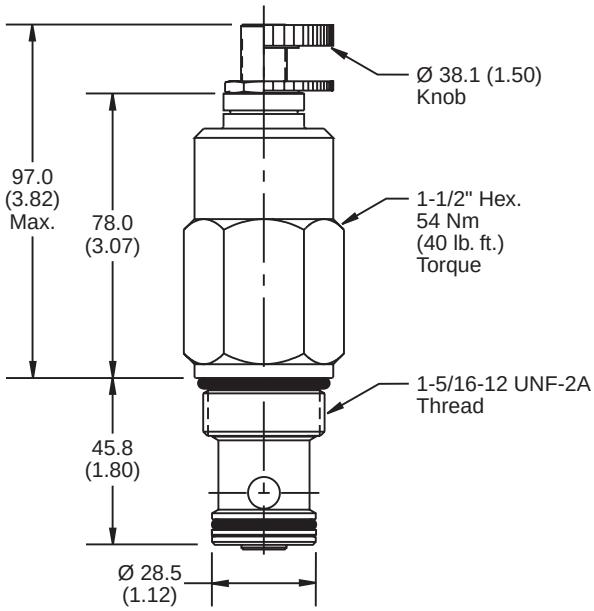
Performance Curve

Flow vs. Inlet Pressure

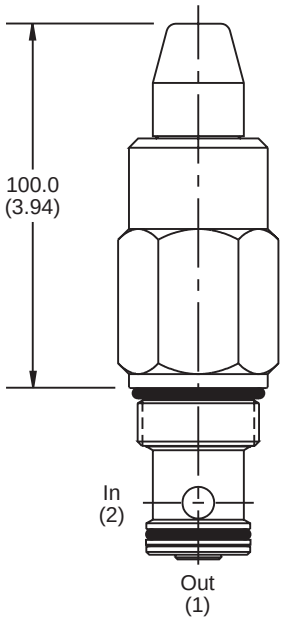
(Pressure rise through cartridge only)



Dimensions Millimeters (Inches)



Screw/Knob Version



Tamper Resistant Version

THIRD-ANGLE PROJECTION

Ordering Information

RD163				—		—		
16 Size Differential Area Relief Valve	Adjustment Style	Pressure Range	Seals		Optional Pressure Setting		Body Material	Port Size

Code	Adjustment Style / Kit No.
K	Knob Adjust (840208K)
S	Screw Adjust
T	Tamper Resistant Cap (717783)

Code	Pressure Range
10	13.8 - 69 Bar (200 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ 11.3 LPM (3 GPM)
20	27.6 - 138 Bar (400 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ 11.3 LPM (3 GPM)
30	41.4 - 207 Bar (600 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ 11.3 LPM (3 GPM)

Code	Seals / Kit No.
Omit	Nitrile / (SK16-2)
V	Fluorocarbon / (SK16-2V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 3000 PSI All settings at 11.3 LPM (3 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
12P	3/4″ NPTF	(B16-2-*12P)
16P	1″ NPTF	(B16-2-*16P)
8T	SAE-8	(B16-2-*8T)
12T	SAE-12	(B16-2-*12T)
16T	SAE-16	(B16-2-*16T)
12B	3/4″ BSPG	(B16-2-12B)†
16B	1″ BSPG	(B16-2-*16B)

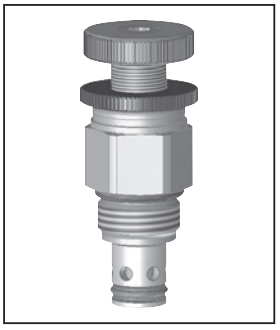
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

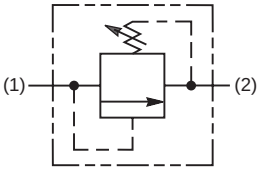
General Description

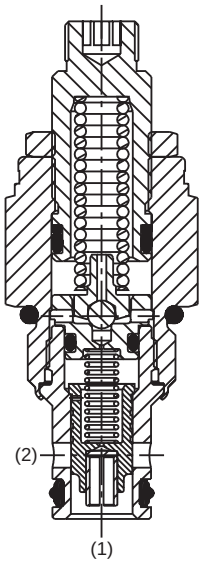
Pilot Operated Spool-Type Relief Valve. For additional information see Technical Tips on pages PC1-PC6.

Features

- Hardened, precision ground parts for durability
- Low profile adapter for minimal space requirements
- Fully guided pilot for more consistent reseat
- Steel adapters are coated with yellow zinc dichromate for protection from salt spray
- Polyurethane “D”-Ring eliminates backup rings and prevents hydrolysis
- Internal screening protects pilot spring from debris







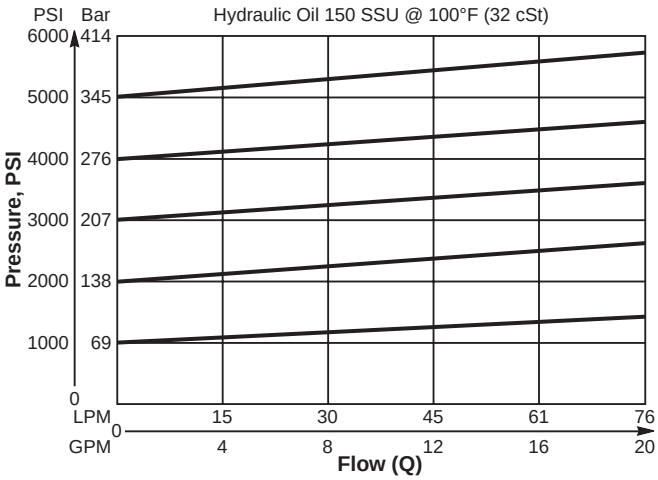
Specifications

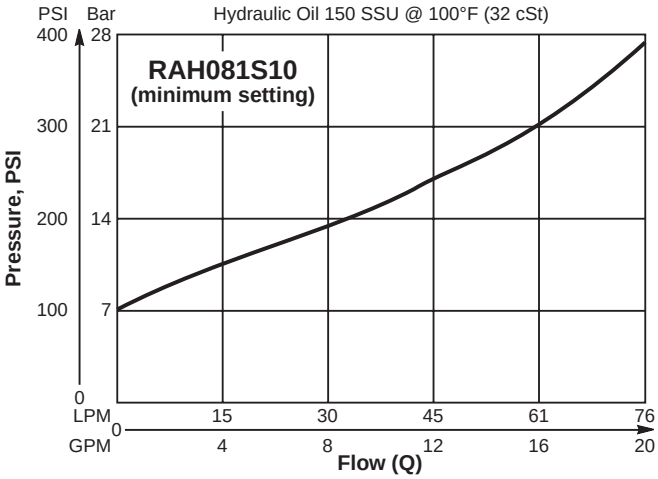
Rated Flow	75.8 LPM (20 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Reseat Pressure	90% of crack pressure
Leakage at 150 SSU (32 cSt)	82 cc/min. (5 cu. in./min.) @75% of crack pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.09 kg (.20 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

Performance Curves

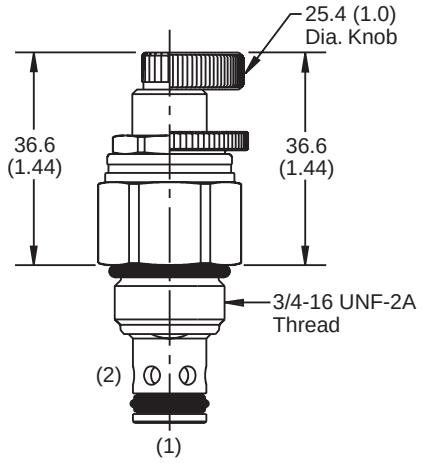
Flow vs. Inlet Pressure

(Pressure rise through cartridge only)

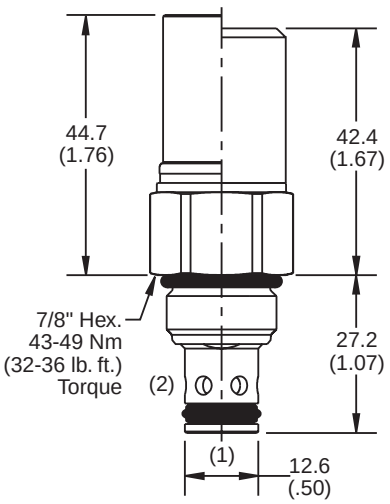




Dimensions Millimeters (Inches)



Screw/Knob Version



Fixed Cap/Tamper Resistant Version

THIRD-ANGLE PROJECTION

Ordering Information

RAH081 [ ] [ ] [ ] — [ ] — [ ] [ ]

08 Size Pilot Operated Relief Valve	Adjustment Style	Pressure Range	Seals	Optional Pressure Setting	Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-10)
S	Screw Adjust
T	Tamper Resistant Cap (717943)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
20	6.9 - 138 Bar (100 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
30	13.8 - 207 Bar (200 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
50	13.8 - 345 Bar (200 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK08-2)
N	Nitrile / (SK08-2N)
V	Fluorocarbon / (SK08-2V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at crack pressure, approximately .95 LPM (.25 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-2-*4P)
6P	3/8″ NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8″ BSPG	(B08-2-*6B)

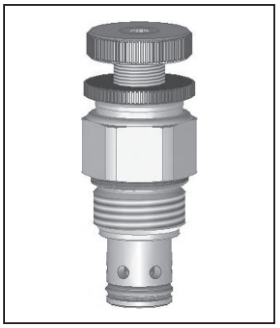
**** Add "A" for aluminum, omit for steel.***

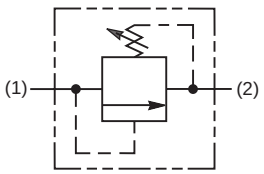
General Description

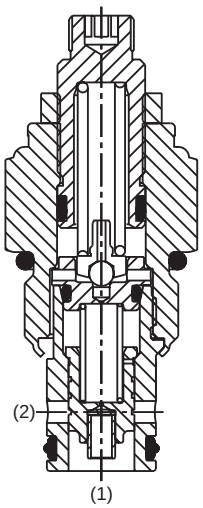
Pilot Operated Spool-Type Relief Valve. For addition information see Technical Tips on pages PC1-PC6.

Features

- Hardened, precision ground parts for durability
- Low profile adapter for minimal space requirements
- Fully guided poppet for more consistent reseat
- Steel adapters are coated with yellow zinc dichromate for protection from salt spray
- Polyurethane “D”-Ring eliminates backup rings and prevents hydrolysis
- Internal screening protects pilot spring from debris







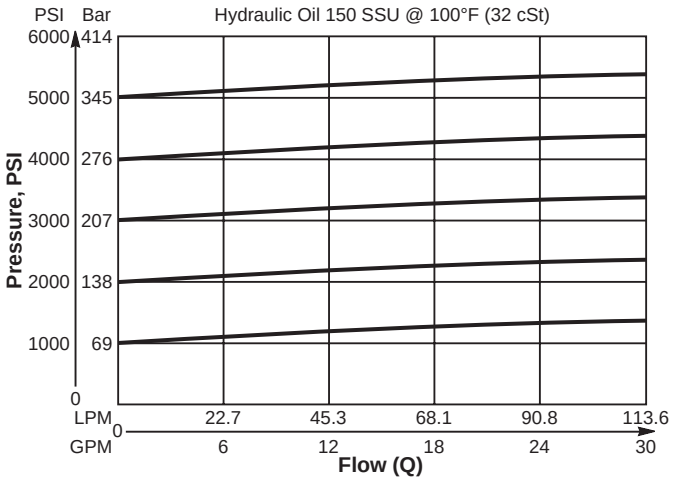
Specifications

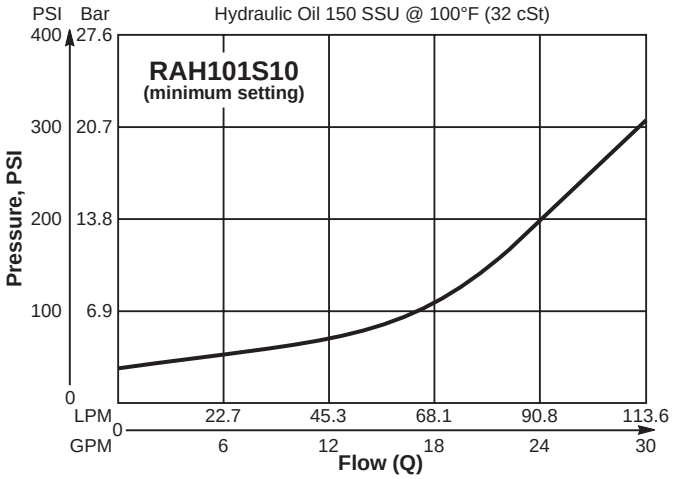
Rated Flow	113 LPM (30 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Reseat Pressure	90% of crack pressure
Leakage at 150 SSU (32 cSt)	82 cc/min. (5 cu. in./min.) @75% of crack pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.23 kg (.50 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

Performance Curves

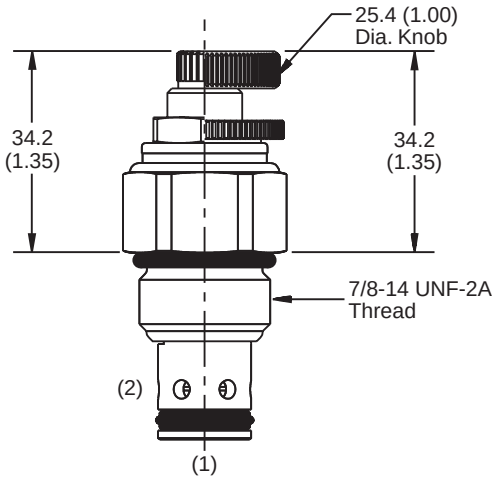
Flow vs. Inlet Pressure

(Pressure rise through cartridge only)

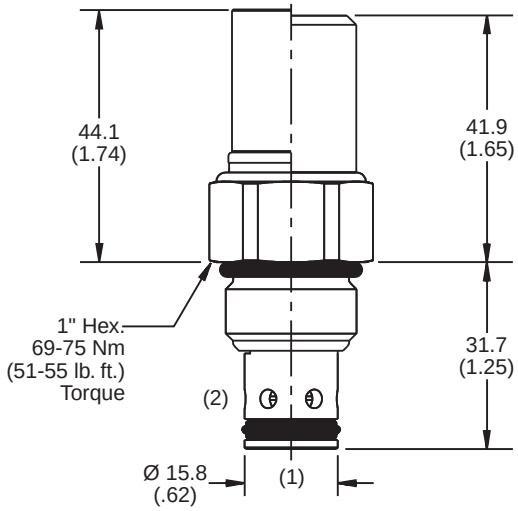




Dimensions Millimeters (Inches)



Screw/Knob Version



Fixed Cap/Tamper Resistant Version

THIRD-ANGLE PROJECTION

Ordering Information

RAH101				—		—		
10 Size Pilot Operated Relief Valve	Adjustment Style	Pressure Range	Seals		Optional Pressure Setting		Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-10)
S	Screw Adjust
T	Tamper Resistant Cap (125407)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
20	6.9 - 138 Bar (100 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
30	13.8 - 207 Bar (200 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
50	13.8 - 345 Bar (200 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK10-2)
N	Nitrile / (SK10-2N)
V	Fluorocarbon / (SK10-2V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at crack pressure, approximately .95 LPM (.25 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

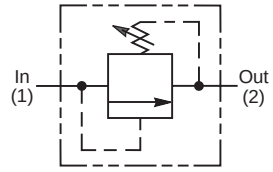
General Description

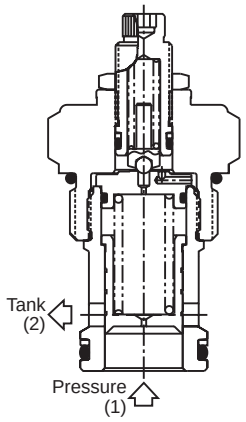
Pilot Operated Spool-Type Relief Valve. For additional information see Technical Tips on pages PC1-PC6.

Features

- Low override curve
- Ball-type pilot for added stability
- High accuracy - pilot operated design
- Hardened, precision ground parts for durability
- Compact size for reduced space requirements
- All external parts have yellow zinc dichromate. This coating is ideal for salt spray applications.







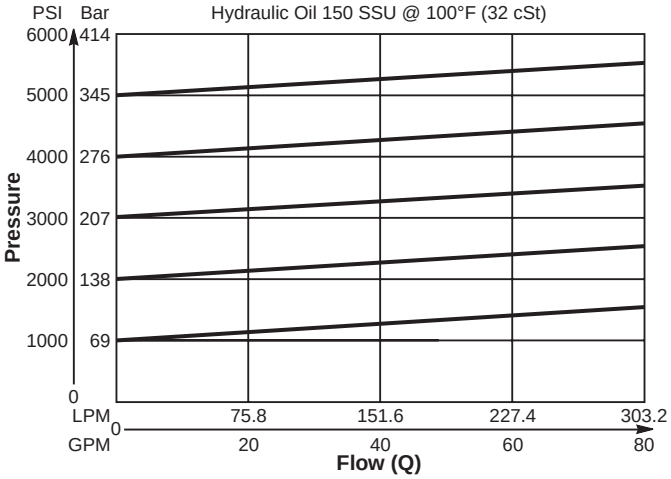
Specifications

Maximum Flow	302.8 LPM (80 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Reseat Pressure	80% of crack pressure
Leakage at 150 SSU (32 cSt)	82 cc/min. (5 cu. in./min.) @ 75% of crack pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range (Ambient)	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.9 kg (2.0 lbs.)
Cavity	C16-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT16-2F

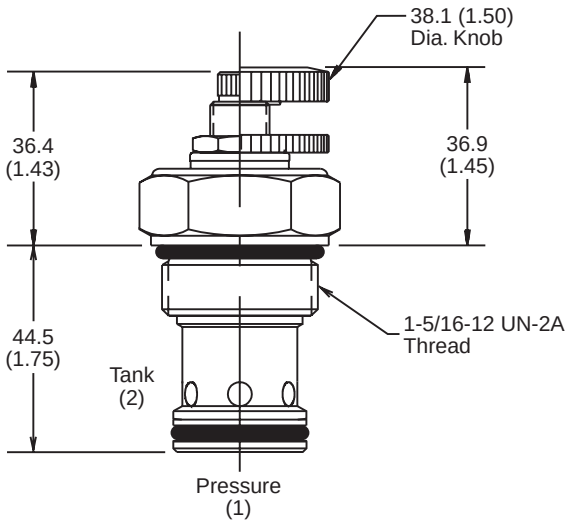
Performance Curve

Flow vs. Inlet Pressure

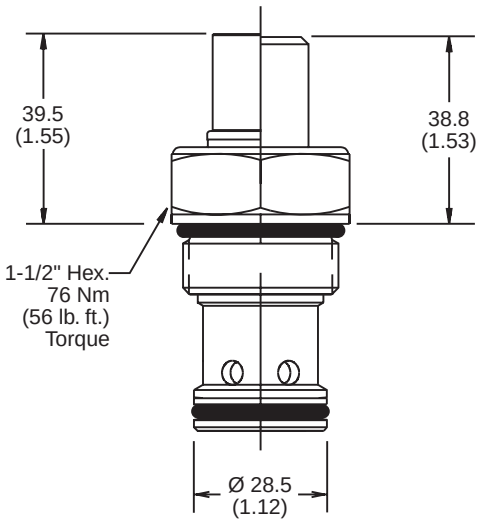
(Pressure rise through cartridge only)



Dimensions Millimeters (Inches)



Screw/Knob Version



Fixed Cap/Tamper Resistant Version

THIRD-ANGLE PROJECTION

Ordering Information

RAH161				—		—		
16 Size Pilot Operated Relief Valve	Adjustment Style	Pressure Range	Seals		Optional Pressure Setting		Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-15)
S	Screw Adjust
T	Tamper Resistant Cap (717785)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ 37.5 LPM (10 GPM)
20	13.8 - 138 Bar (200 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ 37.5 LPM (10 GPM)
30	20.7 - 207 Bar (300 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ 37.5 LPM (10 GPM)
50	34.5 - 345 Bar (500 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ 37.5 LPM (10 GPM)

Code	Seals / Kit No.
Omit	Nitrile / (SK16-2)
V	Fluorocarbon / (SK16-2V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at 37.5 LPM (10 GPM)

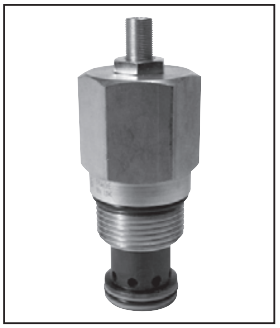
Code	Body Material
Omit	Steel
A	Aluminum

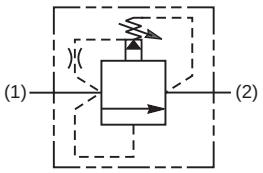
Code	Port Size	Body Part No.
Omit	Cartridge Only	
12P	3/4″ NPTF	(B16-2-*12P)
16P	1″ NPTF	(B16-2-*16P)
8T	SAE-8	(B16-2-*8T)
12T	SAE-12	(B16-2-*12T)
16T	SAE-16	(B16-2-*16T)
12B	3/4″ BSPG	(B16-2-12B)†
16B	1″ BSPG	(B16-2-*16B)

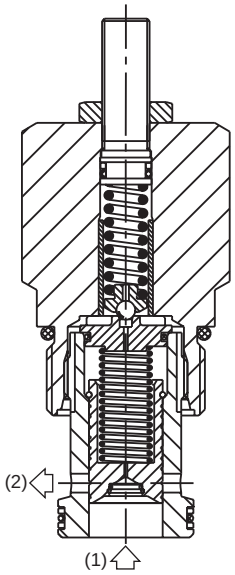
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

Pilot Operated, Spool-Type Relief Valve. For additional information see Technical Tips on pages PC1-PC6.







Features

- Very high flow capacity
- Minimal pressure variation with flow change
- Full tank line back pressure capability, ideal for crossline relief applications
- Integral 250 micron pilot flow filter
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated

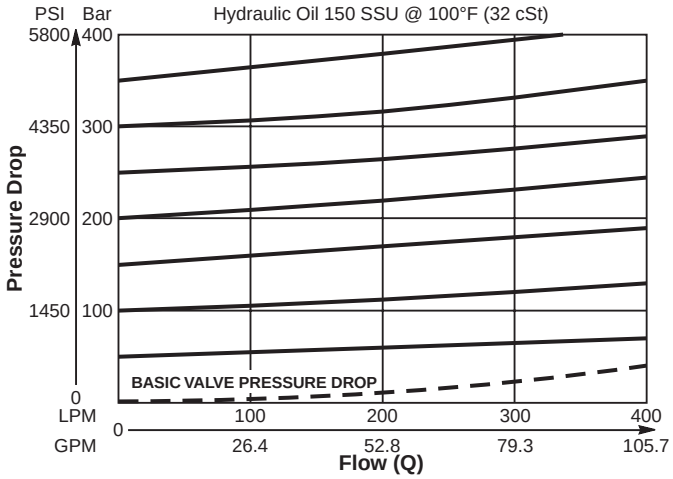
Specifications

Rated Flow	400 LPM (106 GPM)
Maximum Inlet Pressure	**H -** 10-210 Bar (145-3000 PSI) **P -** 10-420 Bar (145-6000 PSI)
Maximum Pressure Setting	420 Bar (6000 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	100 ml/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.57 kg (1.26 lbs.)
Cavity	C16-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT16-2F

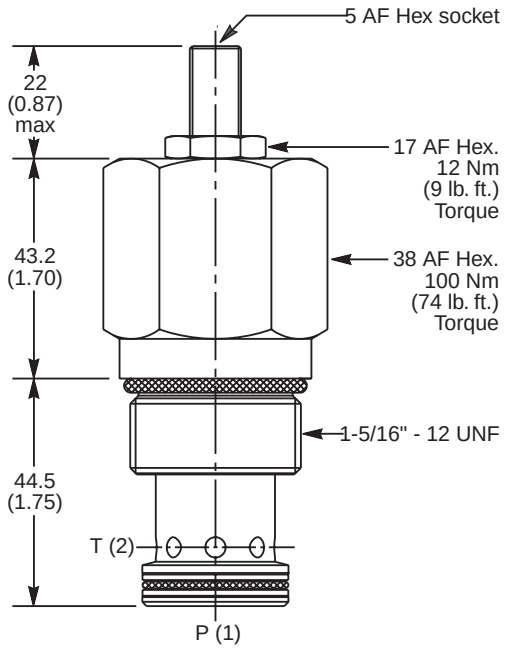
Performance Curve

(Pressure rise through cartridge only)

Flow vs. Inlet Pressure



Dimensions Millimeters (Inches)



Ordering Information

A06G2			—			—		
16 Size Pilot Operated Relief Valve	Pressure Adjustment Range	Adjustment Style		Optional Pressure Setting	Seals		Body Material	Port Size

Code	Pressure Adjustment Range
H	10 - 210 Bar (145 - 3000 PSI)
P	10 - 420 Bar (145 - 6000 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Optional Pressure Setting
Specify setting if required (Bar)
A06G2H Standard Setting: 100 Bar (1450 PSI) @ 15 LPM (4.0 GPM)
A06G2P Standard Setting: 200 Bar (2900 PSI) @ 15 LPM (4.0 GPM)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30507N-1)
V	Fluorocarbon / (SK30507V-1)

Code	Body Material
Omit	Steel
A	Aluminum

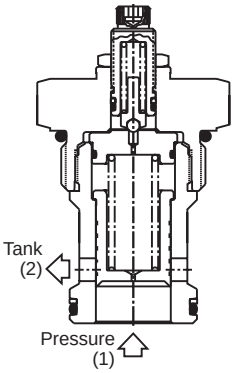
Code	Port Size	Body Part No.
Omit	Cartridge Only	
12P	3/4″ NPTF	(B16-2-*12P)
16P	1″ NPTF	(B16-2-*16P)
8T	SAE-8	(B16-2-*8T)
12T	SAE-12	(B16-2-*12T)
16T	SAE-16	(B16-2-*16T)
12B	3/4″ BSPG	(B16-2-12B)†
16B	1″ BSPG	(B16-2-*16B)

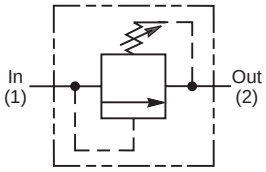
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

Pilot Operated Spool-Type Relief Valve. For additional information see Technical Tips on pages PC1-PC6.







Features

- Low override curve
- Ball-type pilot for added stability
- High accuracy - pilot operated design
- Hardened, precision ground parts for durability
- Compact size for reduced space requirements
- All external parts have yellow zinc dichromate. This coating is ideal for salt spray applications.

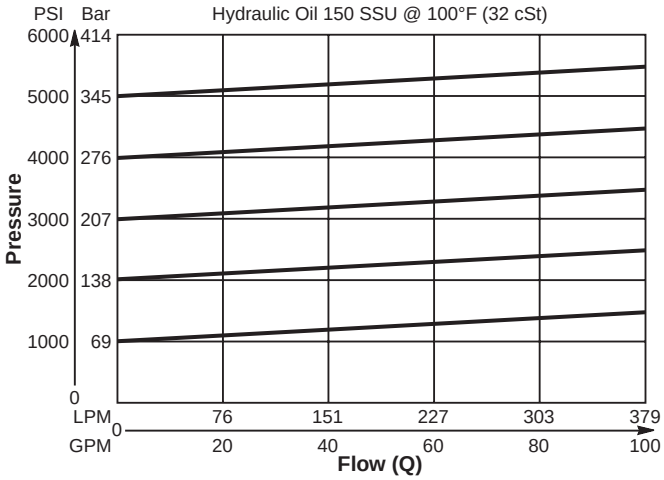
Specifications

Rated Flow	379 LPM (100 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Reseat Pressure	80% of crack pressure
Leakage at 150 SSU (32 cSt)	82 cc/min. (5 cu. in./min.) @75% of crack pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.9 kg (2.0 lbs.)
Cavity	C20-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT20-2F

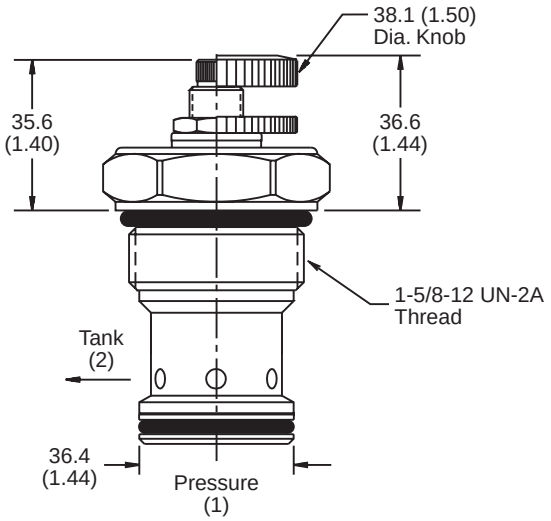
Performance Curve

Flow vs. Inlet Pressure

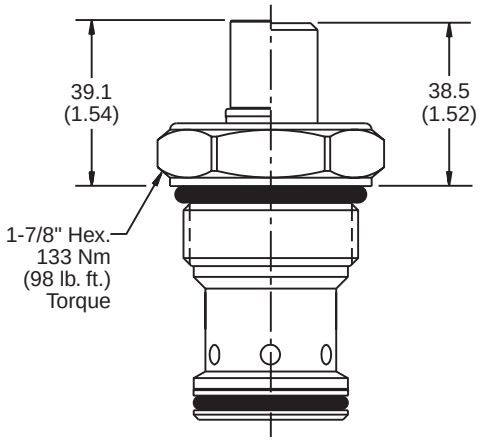
(Pressure rise through cartridge only)



Dimensions Millimeters (Inches)



Screw/Knob Version



Fixed Cap/Tamper Resistant Version

THIRD-ANGLE PROJECTION

Ordering Information

RAH201				—		—		
20 Size Pilot Operated Relief Valve	Adjustment Style	Pressure Range	Seals		Optional Pressure Setting		Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-15)
S	Screw Adjust
T	Tamper Resistant Cap (717785)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ 37.5 LPM (10 GPM)
20	13.8 - 138 Bar (200 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ 37.5 LPM (10 GPM)
30	20.7 - 207 Bar (300 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ 37.5 LPM (10 GPM)
50	34.5 - 345 Bar (500 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ 37.5 LPM (10 GPM)

Code	Seals / Kit No.
Omit	Nitrile / (SK20-2)
V	Fluorocarbon / (SK20-2V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at 37.5 LPM (10 GPM)

Code	Body Material
Omit	Steel

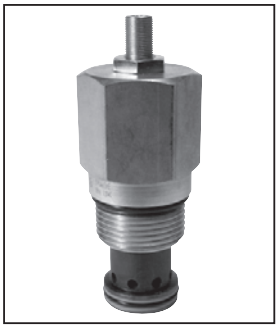
Code	Port Size	Body Part No.
Omit	Cartridge Only	
20T	SAE-20	(B20-2-20T)
20B	1-1/4″ BSPG	(B20-2-20B)

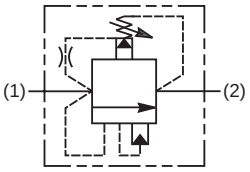
General Description

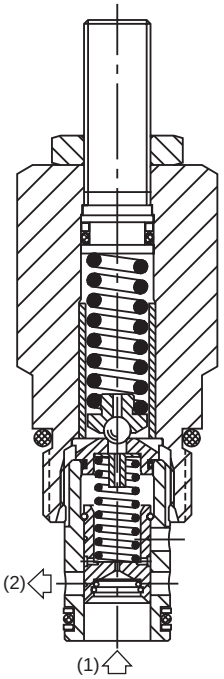
Kick-Down, Pilot Operated Relief Valve. For additional information see Technical Tips on pages PC1-PC6.

Features

- High flow capacity
- Integral 250 micron pilot flow filter
- Hardened working parts for maximum durability
- Adjustable and tamper resistant versions available
- All external parts zinc plated







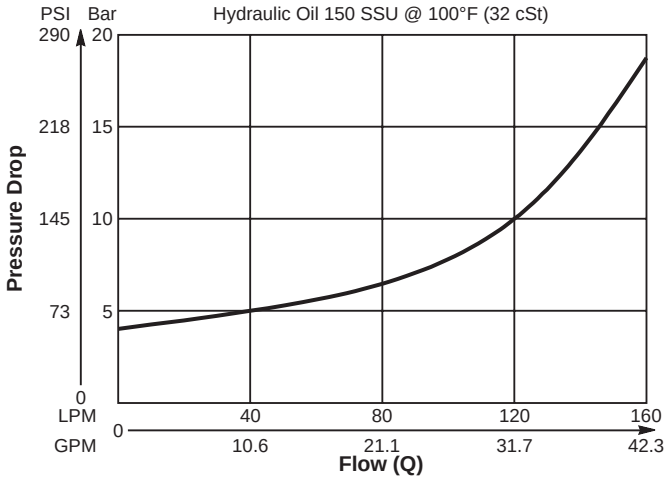
Specifications

Rated Flow	160 LPM (42 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**H -** 10-210 Bar (145-3000 PSI) **P -** 10-420 Bar (144-6000 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Sensitivity: Pressure/Turn	**H -** 30 Bar (435 PSI) **P -** 55 Bar (800 PSI)
Leakage at 150 SSU (32 cSt)	25 ml/min. @ 50 Bar (725 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.29 kg (0.64 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher

Performance Curve

(Pressure rise through cartridge only)

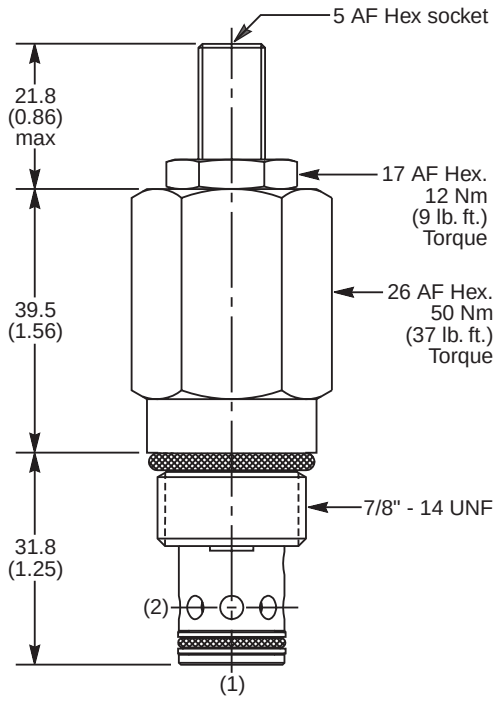
Pressure Drop vs. Flow



Application Note

Valve unloads completely when setting is reached and resets when fluid supply is removed.

Dimensions Millimeters (Inches)



Ordering Information

A04K2					—		
10 Size Kick-Down Relief Valve	Pressure Adjustment Range	Adjustment Style	Optional Pressure Setting	Seals		Body Material	Port Size

Code	Pressure Adjustment Range
H	10 - 210 Bar (145 - 3000 PSI)
P	10 - 420 Bar (145 - 6000 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Optional Pressure Setting
Specify setting if required (Bar)
A04K2H Standard Setting: 100 Bar (1450 PSI)
A04K2P Standard Setting: 200 Bar (2900 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30503N-1)
V	Fluorocarbon / (SK30503V-1)

Code	Body Material
Omit	Steel
A	Aluminum

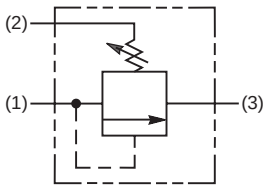
Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

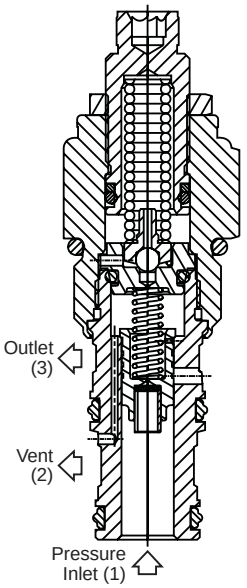
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

Ventable Pilot Operated Spool-Type Relief Valve. This valve controls pressure via the internal spring chamber or via an external vent line. For addition information see Technical Tips on pages PC1-PC6.







Features

- Low override curve
- Ball-type pilot for added stability
- High accuracy - pilot operated design
- Hardened, precision ground parts for durability
- Compact size for reduced space requirements
- All external parts have yellow zinc dichromate. This coating is ideal for salt spray applications.

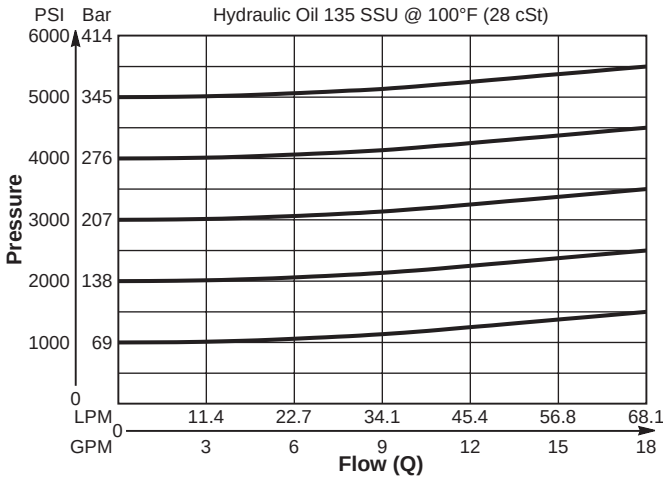
Specifications

Rated Flow	68 LPM (18 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Reseat Pressure	80% of crack pressure
Leakage at 150 SSU (32 cSt)	82 cc/min. (5 cu. in./min.) @75% of crack pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.23 kg (.50 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

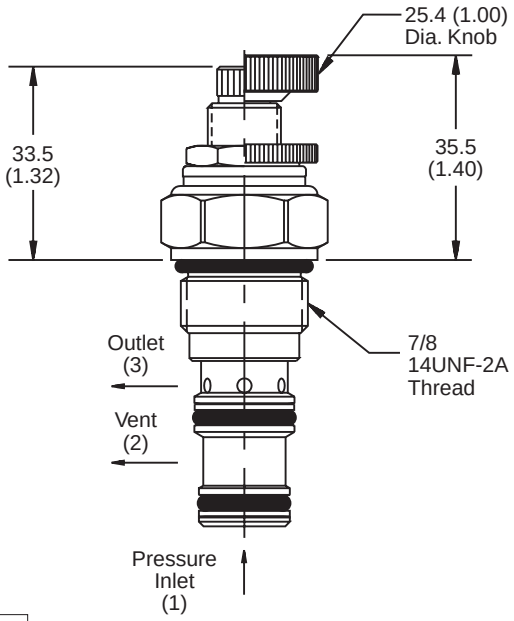
Performance Curves

Flow vs. Inlet Pressure

(Pressure rise through cartridge only)

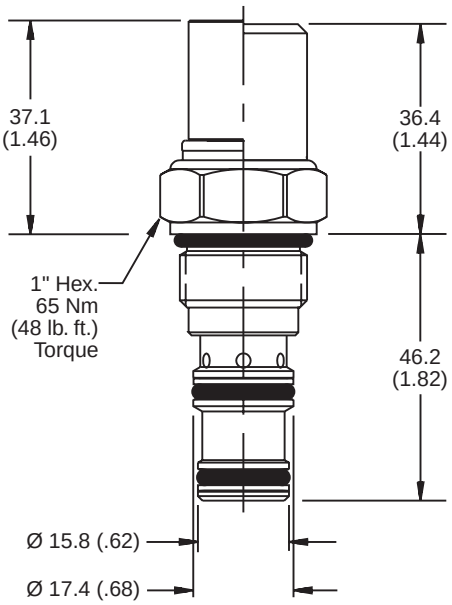


Dimensions Millimeters (Inches)



THIRD-ANGLE PROJECTION

Screw/Knob Version



Fixed Cap/Tamper Resistant Version

Ordering Information

RAH101V [ ] [ ] [ ] — [ ] — [ ] [ ]

10 Size Ventable Pilot Operated Relief Valve	Adjustment Style	Pressure Range	Seals	Optional Pressure Setting	Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-10)
S	Screw Adjust
T	Tamper Resistant Cap (717785)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ 11.3 LPM (3 GPM)
20	13.8 - 138 Bar (200 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ 11.3 LPM (3 GPM)
30	20.7 - 207 Bar (300 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ 11.3 LPM (3 GPM)
50	34.5 - 345 Bar (500 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ 11.3 LPM (3 GPM)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK10-3)
N	Nitrile / (SK10-3N)
V	Fluorocarbon / (SK10-3V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at 11.3 LPM (3 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
4B	1/4″ BSPG	(B10-3-4B)†
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8B)

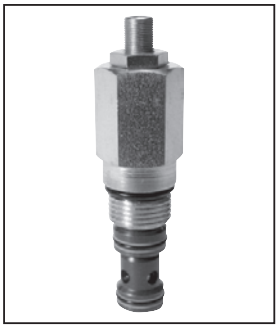
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

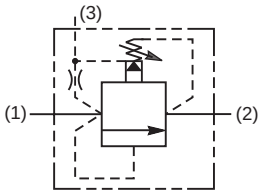
General Description

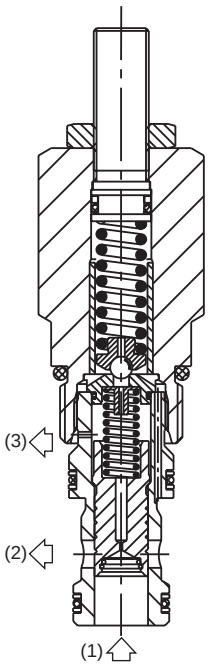
Pilot Operated, Spool-Type, Ventable Relief Valve. For additional information see Technical Tips on pages PC1-PC6.

Features

- High flow capacity
- Full tank line back pressure capability
- Excellent flow pressure characteristics for consistent pressure setting
- Ideal for pump relief and remote control or unloading via vent (port 3)
- Integral 250 micron pilot flow filter
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated







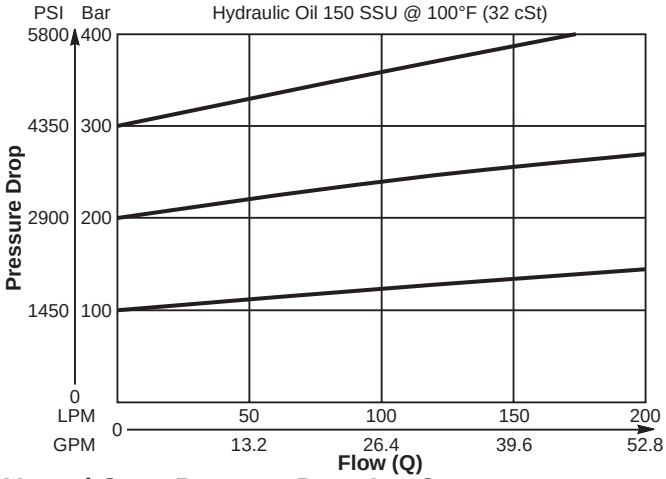
Specifications

Rated Flow	190 LPM (50 GPM)
Maximum Inlet Pressure	**H -** 10-210 Bar (145-3000 PSI) **P -** 10-420 Bar (145-6000 PSI)
Maximum Pressure Setting	420 Bar (6000 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	25 ml/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.25 kg (0.55 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher None Finisher

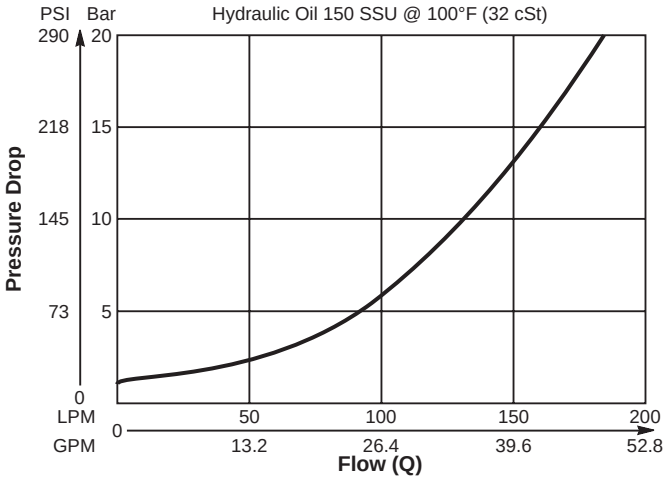
Performance Curves

(Pressure rise through cartridge only)

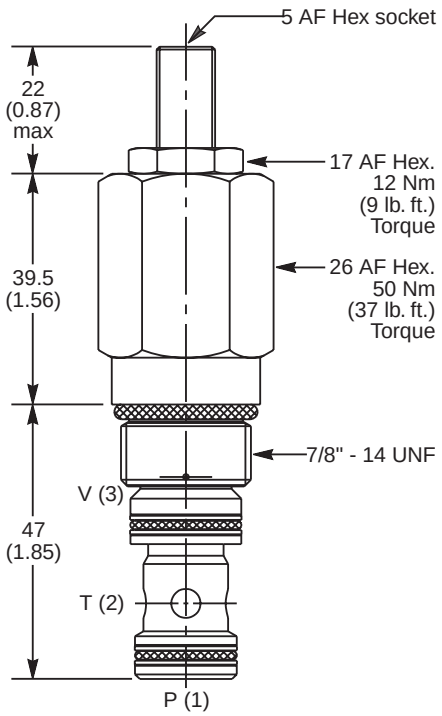
Flow vs. Inlet Pressure 1 to 2



Vented Open Pressure Drop 1 to 2



Dimensions Millimeters (Inches)



Ordering Information

A04H3			—		
10 Size Pilot Operated Relief Valve	Pressure Adjustment Range	Adjustment Style		Optional Pressure Setting	Seals

Code	Pressure Adjustment Range
H	10 - 210 Bar (145 - 3000 PSI)
P	10 - 420 Bar (145 - 6000 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Optional Pressure Setting
Specify setting if required (Bar)
A04H3H Standard Setting: 100 Bar (1450 PSI) @ 15 LPM (4.0 GPM)
A04H3P Standard Setting: 200 Bar (2900 PSI) @ 15 LPM (4.0 GPM)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30504N-1)
V	Fluorocarbon / (SK30504V-1)

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
710	5/8″ SAE (main) 3/8″ SAE (aux)
711	3/4″ BSP (main) 1/4″ BSP (aux)

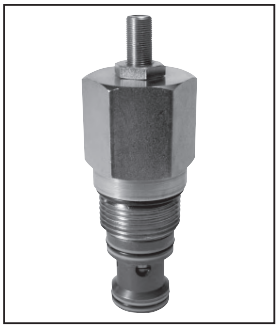
Code	Body Material
A	Aluminum
S	Steel

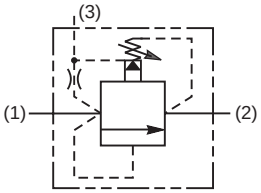
General Description

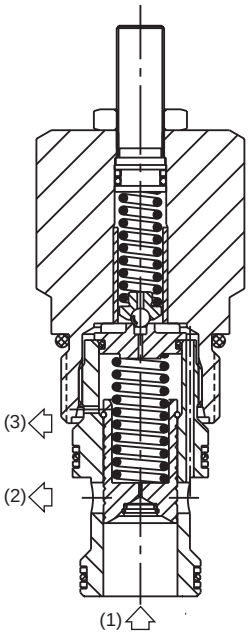
Pilot Operated, Spool-Type, Ventable Relief Valve. For additional information see Technical Tips on pages PC1-PC6.

Features

- High flow capacity
- Full tank line back pressure
- Excellent pressure flow characteristics
- Ideal for pump relief and remote control or unloading via vent (port 3)
- Integral 250 micron pilot flow filter
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated







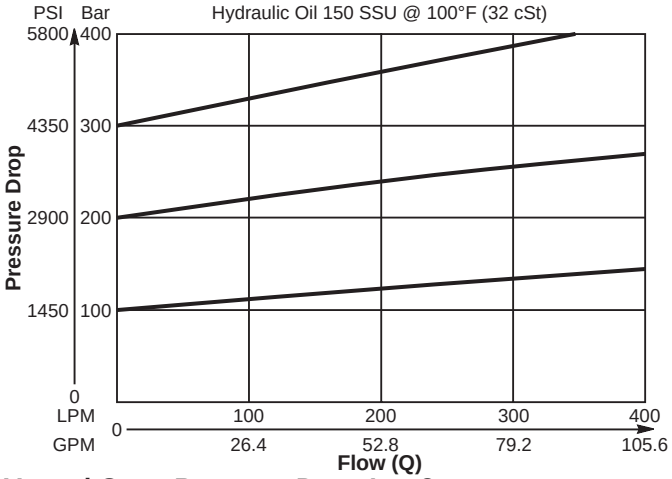
Specifications

Rated Flow	400 LPM (106 GPM)
Maximum Inlet Pressure	**H -** 10-210 Bar (145-3000 PSI) **P -** 10-420 Bar (145-6000 PSI)
Maximum Pressure Setting	420 Bar (6000 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	100ml/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.58 kg (1.28 lbs.)
Cavity	C16-3S (See BC Section for more details)
Form Tool	Rougher None Finisher

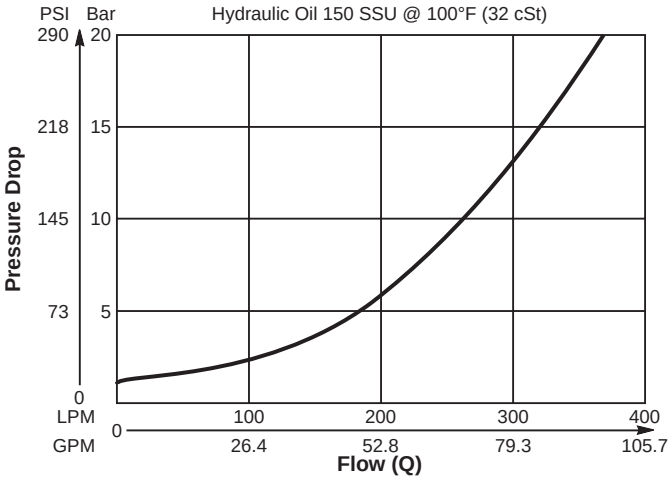
Performance Curves

(Pressure rise through cartridge only)

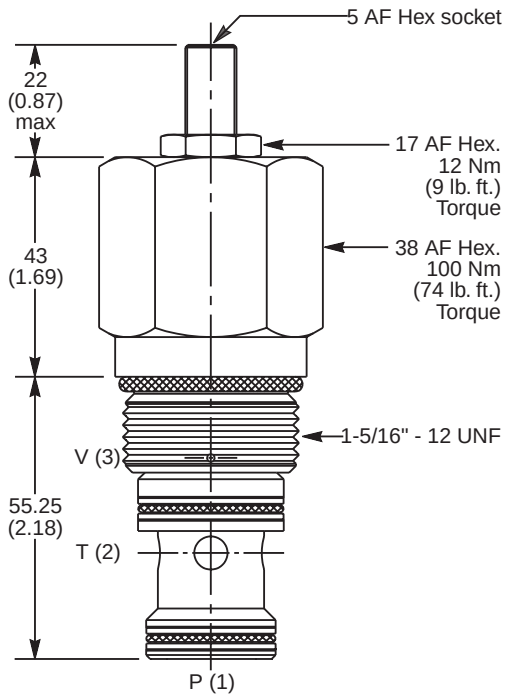
Flow vs. Inlet Pressure 1 to 2



Vented Open Pressure Drop 1 to 2



Dimensions Millimeters (Inches)



Ordering Information

A06H3			—			—		
16 Size Pilot Operated Relief Valve	Pressure Adjustment Range	Adjustment Style		Optional Pressure Setting	Seals		Body Material	Port Size

Code	Pressure Adjustment Range
H	10 - 210 Bar (145 - 3000 PSI)
P	10 - 420 Bar (145 - 6000 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Optional Pressure Setting
Specify setting if required (Bar)
A06H3H Standard Setting: 100 Bar (1450 PSI) @ 15 LPM (4.0 GPM)
A06H3P Standard Setting: 200 Bar (2900 PSI) @ 15 LPM (4.0 GPM)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30508N-1)
V	Fluorocarbon / (SK30508V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
16T	SAE-16	(B16-3S-*16T)
16B	1″ BSPG	(B16-3S-*16B)

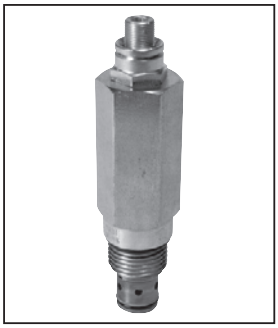
**** Add "A" for aluminum, omit for steel.***

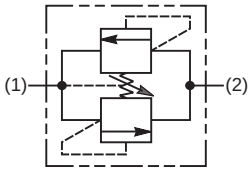
General Description

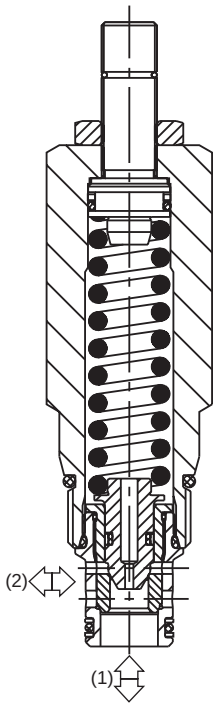
Direct Acting, Dual Poppet-Type, Cross-over Relief Valve. For additional information see Technical Tips on pages PC1-PC6.

Features

- Compact space saving design
- Cost effective - only requires one cavity
- Poppet-type construction for lower leakage
- Full 350 Bar, 5000 PSI pressure capability
- High flow capability for the size of valve
- Minimal pressure variation with flow change
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- Available as CE marked valve in compliance with Pressure Equipment Directive
- All external parts zinc plated



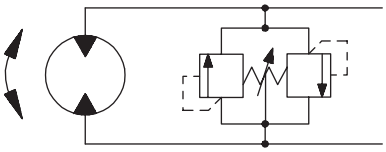




Specifications

Rated Flow	120 LPM (32 GPM)
Maximum Inlet Pressure	**H -** 5-210 Bar (72-3000 PSI) **M -** 10-350 Bar (144-5000 PSI)
Maximum Pressure Setting	420 Bar (6000 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	10 drops/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.29 kg (0.64 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher

Application

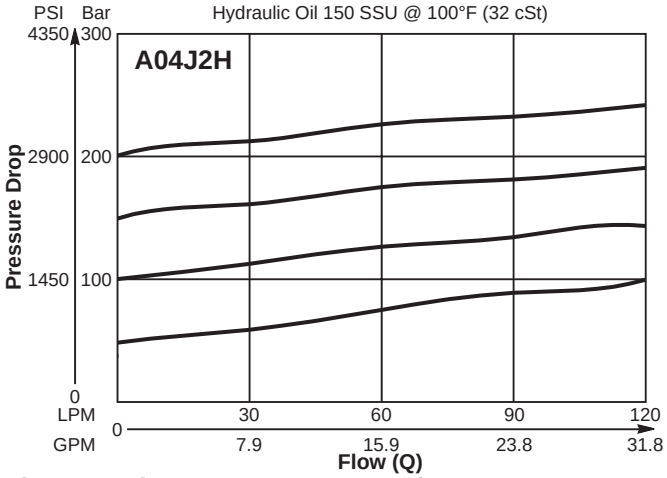


Motor protection in both directions

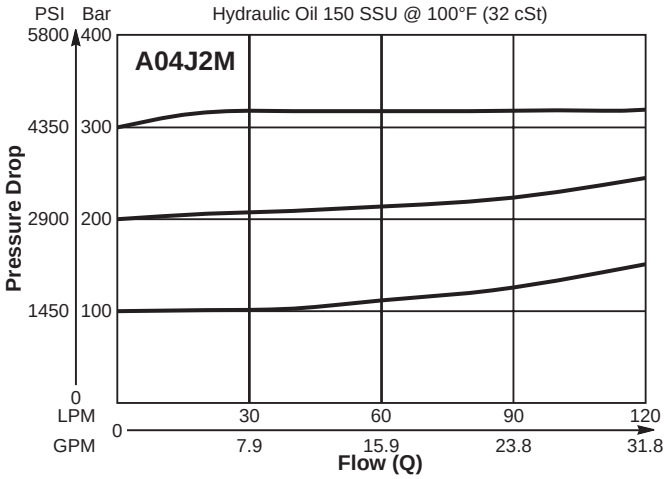
Performance Curves

(Pressure rise through cartridge only)

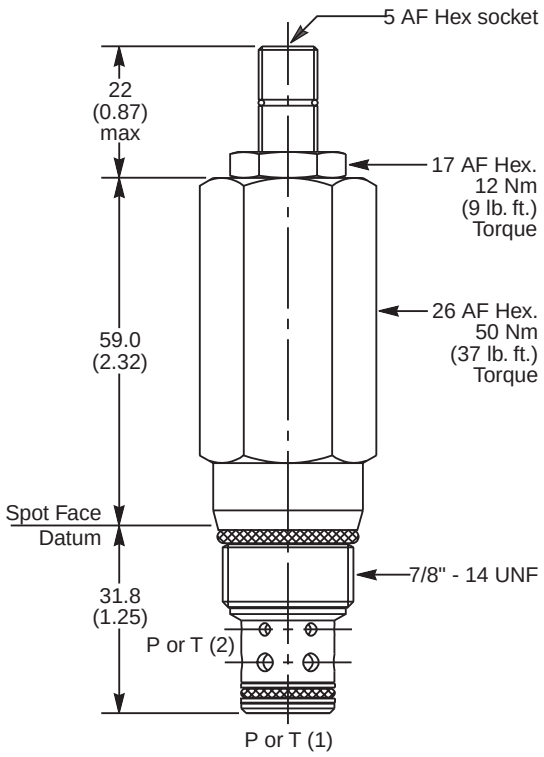
Flow vs. Inlet Pressure 1 to 2 and 2 to 1



Flow vs. Inlet Pressure 1 to 2 and 2 to 1



Dimensions Millimeters (Inches)



Ordering Information

A04J2			—			—		
10 Size Direct Acting Relief Valve	Pressure Adjustment Range	Adjustment Style		Optional Pressure Setting	Seals		Body Material	Port Size

Code	Pressure Adjustment Range
H	5 - 210 Bar (72 - 3000 PSI)
M	10 - 350 Bar (144 - 5000 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Optional Pressure Setting
Specify setting if required (Bar)
A04J2H Standard Setting: 100 Bar (1450 PSI) @ 15 LPM (4.0 GPM)
A04J2M Standard Setting: 200 Bar (2900 PSI) @ 15 LPM (4.0 GPM)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30529N-1)
V	Fluorocarbon / (SK30529V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

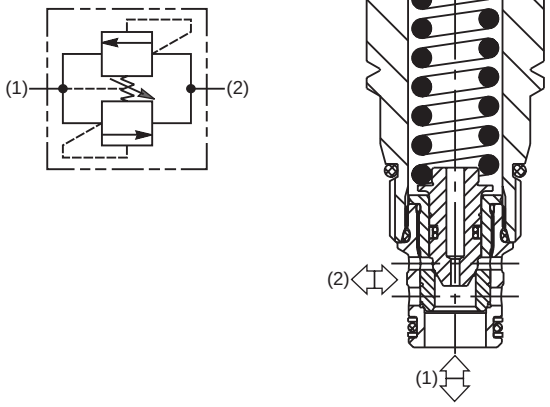
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

Direct Acting Poppet-Type Relief Valve. Pressure Equipment Directive (PED 97/23/EC) compliant to hazard category IV. For additional information see Technical Tips on pages PC1-PC6.

Features

- Bi-directional flow design for installation flexibility and security
- Compact space saving design
- Poppet type construction for lower leakage
- Full 350 Bar (5000 PSI) pressure capability
- High flow compatibility for the size of valve
- Minimal pressure variation with flow change
- Hardened working parts for maximum durability
- Tamperproof setting
- All external parts zinc plated



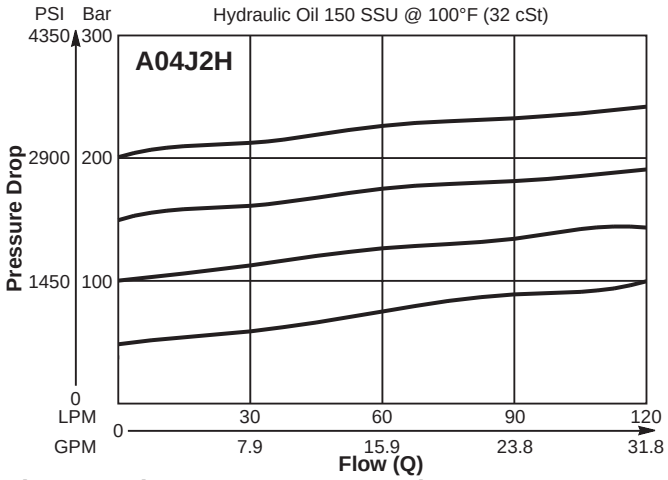
Specifications

Rated Flow	120 LPM (32 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Maximum Pressure Setting	**HY -** 5-210 Bar (72-3000 PSI) **MY -** 10-350 Bar (145-5000 PSI)
Sensitivity: Pressure/Turn	**HY -** 25 Bar (362 PSI) **MY -** 34 Bar (493 PSI)
Leakage at 150 SSU (32 cSt)	10 drops/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.29 kg (0.64 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

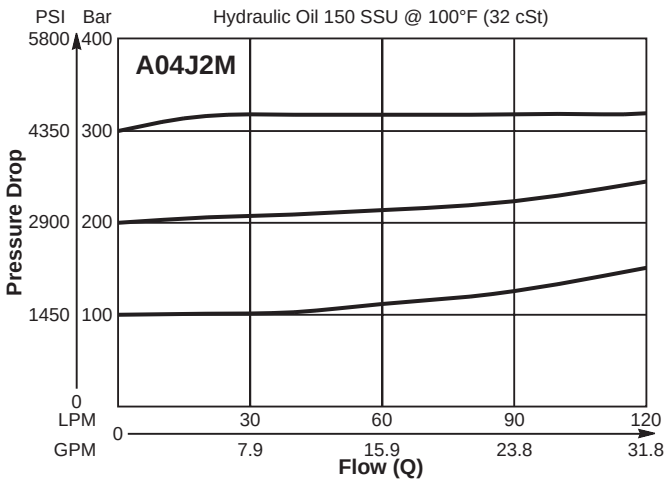
Performance Curves

(Pressure rise through cartridge only)

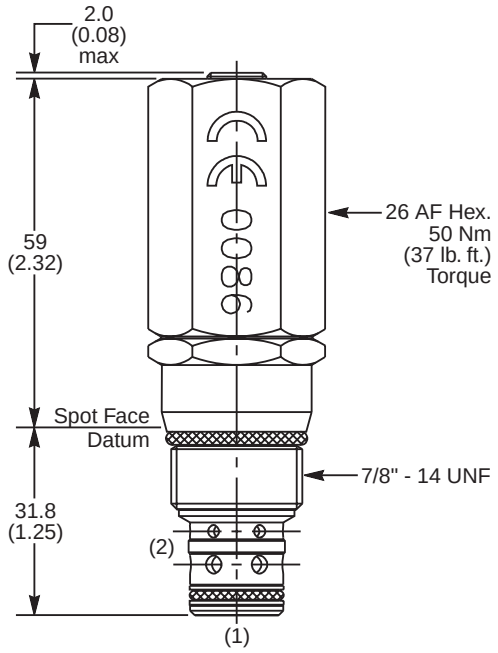
Flow vs. Inlet Pressure 1 to 2 and 2 to 1



Flow vs. Inlet Pressure 1 to 2 and 2 to 1



Dimensions Millimeters (Inches)



Ordering Information

A04J2		Y	–					CE	–		
10 Size Direct Acting Relief Valve	Pressure Adjustment Range	Adjustment Style		Optional Pressure Setting	Seals	Suffix Number				Body Material	Port Size

Code	Pressure Adjustment Range
H	5 - 210 Bar (72 - 3000 PSI)
M	10 - 350 Bar (145 - 5000 PSI)

Code	Adjustment Style / Kit No.
Y	Non Adjustable Preset (Std.)

Optional Pressure Setting
Setting must be specified (Bar)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30529N-1)
V	Fluorocarbon / (SK30529V-1)

Code	Suffix Number
Omit	Omit for valve to be set side to nose (2 to 1)
580	For valve to be set nose to side (1 to 2)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

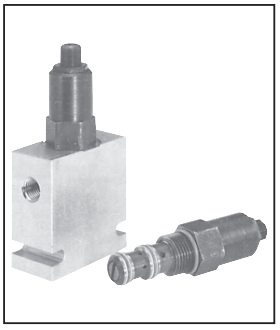
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

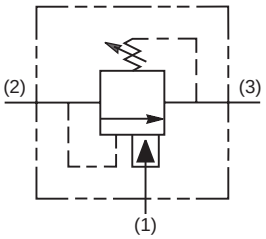
General Description

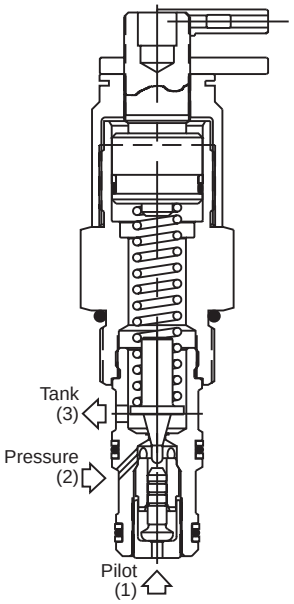
Differential Area Unloading Relief Valve. This valve is best suited for low flow accumulator unloading circuits or can be used as remote pilot valves. They provide a fixed percentage between load and unload pressures. For additional information see Technical Tips on pages PC1-PC6.

Features

- Low hysteresis
- Cartridge design
- All external parts zinc plated







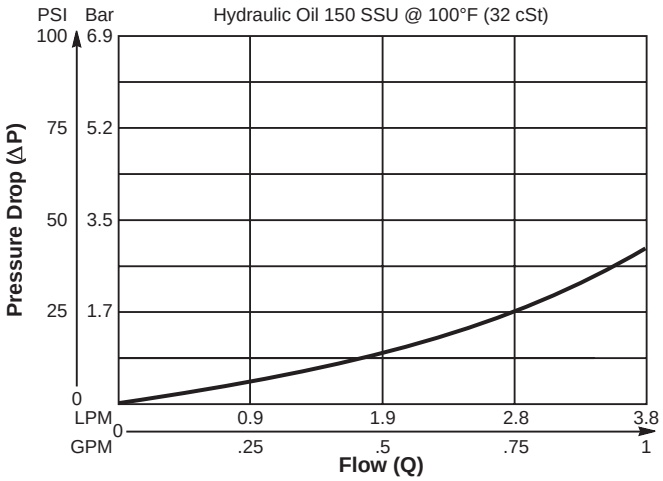
Specifications

Rated Flow	3.75 LPM (1 GPM)
Maximum Pilot Flow	.94 LPM (.25 GPM)
Maximum Inlet Pressure	245 Bar (3500 PSI)
Maximum Pressure Setting	210 Bar (3000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	10 drops/min. (66 cc/min.)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.23 kg (.50 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

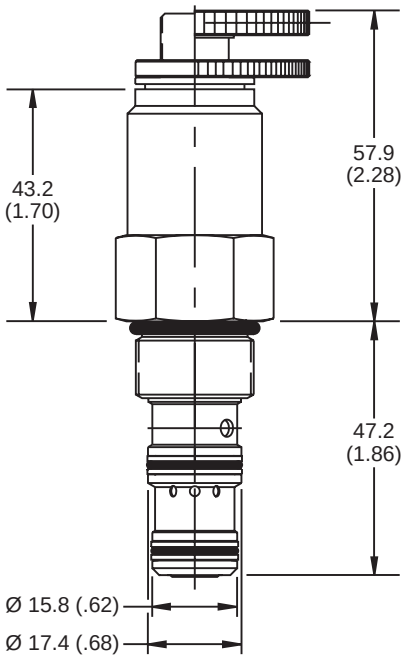
Performance Curve

Inlet Flow vs. Pressure Drop

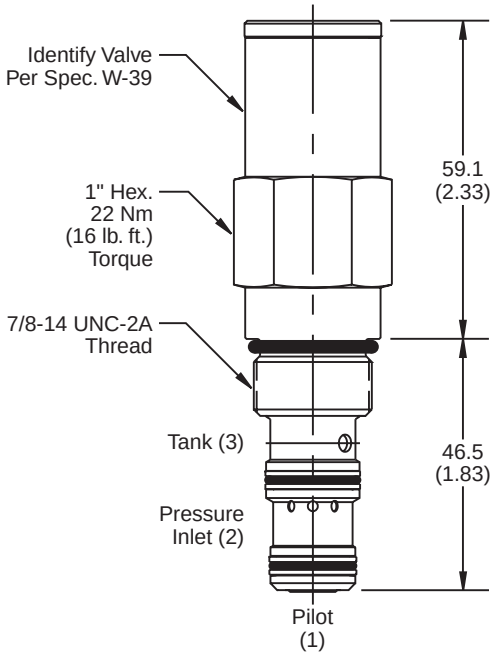
Without pilot assist (Through cartridge only)



Dimensions Millimeters (Inches)



Screw/Knob Version



Fixed Cap Version

THIRD-ANGLE PROJECTION

Ordering Information

RU101			C			—		
10 Size Differential Area Unloading Relief Valve	Adjustment Style	Pressure Range	Reload	Optional Pressure Setting	Seals		Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (840208K)
S	Screw Adjust

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ 1.1 LPM (.3 GPM)
20	10.3 - 138 Bar (150 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ 1.1 LPM (.3 GPM)
30	13.8 - 207 Bar (200 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ 1.1 LPM (.3 GPM)

Code	Reload
C	80% ±5% of Pressure Setting

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 3000 PSI All settings at 1.1 LPM (0.3 GPM)

Code	Seals / Kit No.
Omit	Nitrile / (SK10-3N)
V	Fluorocarbon / (SK10-3V)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8B)

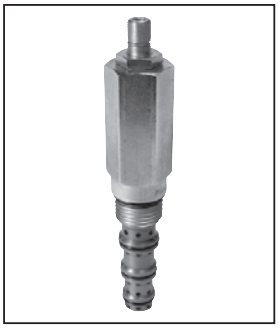
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

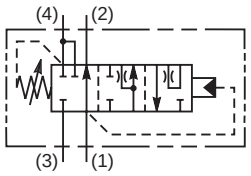
General Description

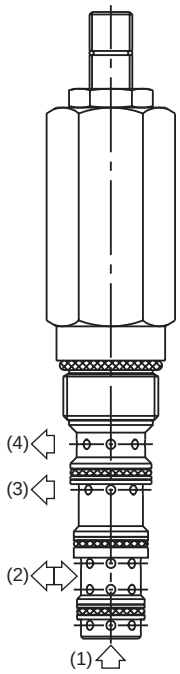
Direct Acting, Spool-Type, Unloading Relief Valve with Internal Pilot. For additional information see Technical Tips on pages PC1-PC6.

Features

- Use to unload a load sense pump in an accumulator circuit
- One size unloading valve for all flow size applications
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated





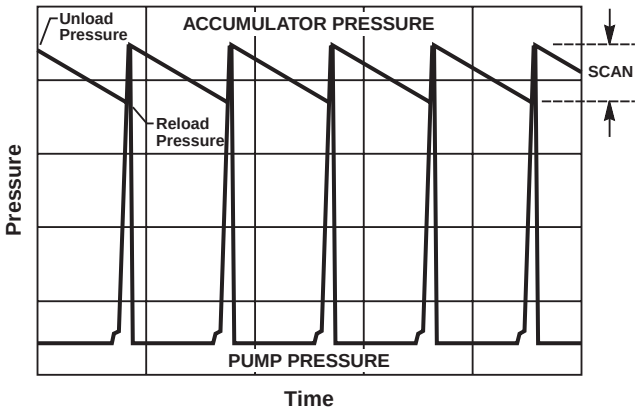


Specifications

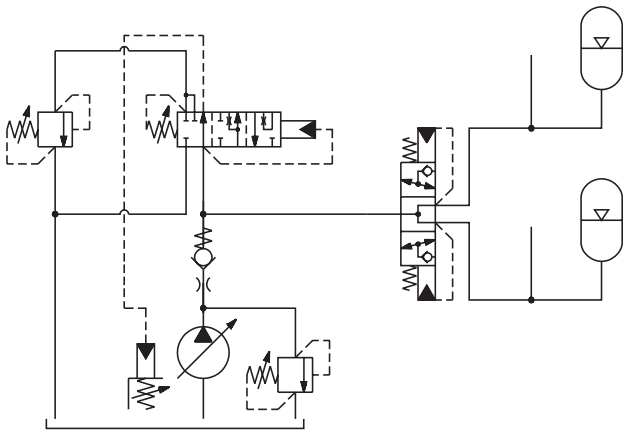
Rated Flow	2 LPM (0.53 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	200 Bar (2900 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	25 ml/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.33 kg (0.73 lbs.)
Cavity	C10-4 (See BC Section for more details)
Form Tool	Rougher None Finisher

Performance Curve

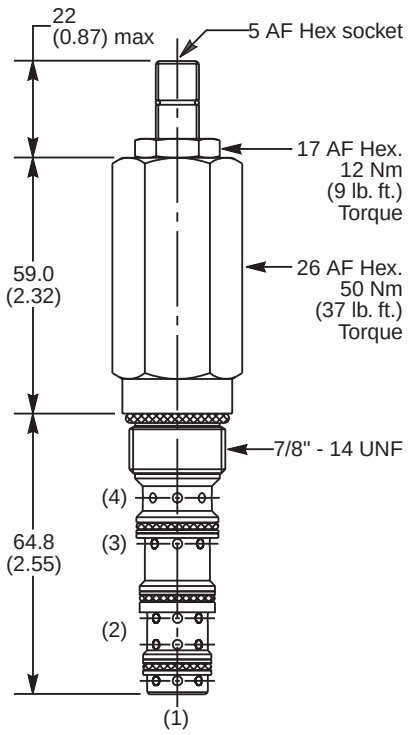
Accumulator Circuit



Application



Dimensions Millimeters (Inches)



Ordering Information

M04A4	J				—		
10 Size Direct Acting Unloading Relief Valve	Reload Pressure Adjustment Range	Adjustment Style	Reload Pressure Setting	Seals		Body Material	Port Size

Code	Reload Pressure Adjustment Range
J	50 - 200 Bar (725 - 2900 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
T	Tamper Resistant Cap (TC1130)

Code	Reload Pressure Setting
Omit	Omit for standard setting Specify setting if required **M04A4J** Standard Setting: 125 Bar (1850 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30530N-1)
V	Fluorocarbon / (SK30530V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

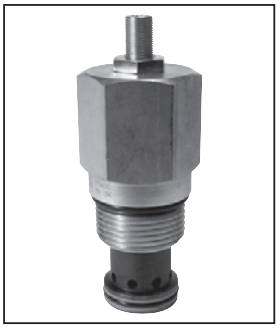
**** Add "A" for aluminum. omit for steel.***
† Steel body only.

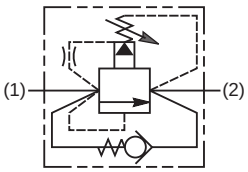
General Description

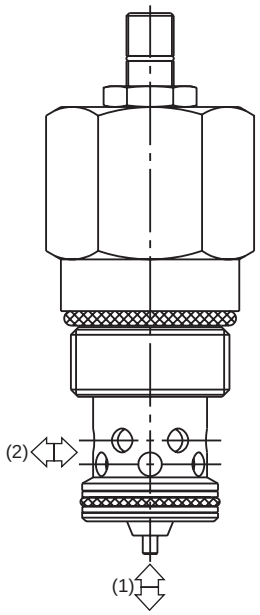
Pilot Operated, Poppet-Type Relief Valve with Free Reverse Check. For additional information see Technical Tips on pages PC1-PC6.

Features

- High flow capacity
- Virtually leak free, can be used for load holding applications
- Compact space saving design
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated







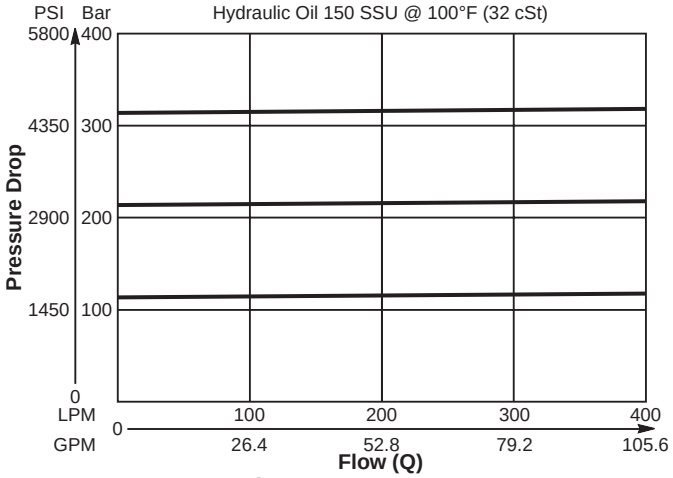
Specifications

Rated Flow	200 LPM (53 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**H -** 10-210 Bar (145-3000 PSI) **P -** 10-420 Bar (145-6000 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.57 kg (1.26 lbs.)
Cavity	C16-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT16-2F

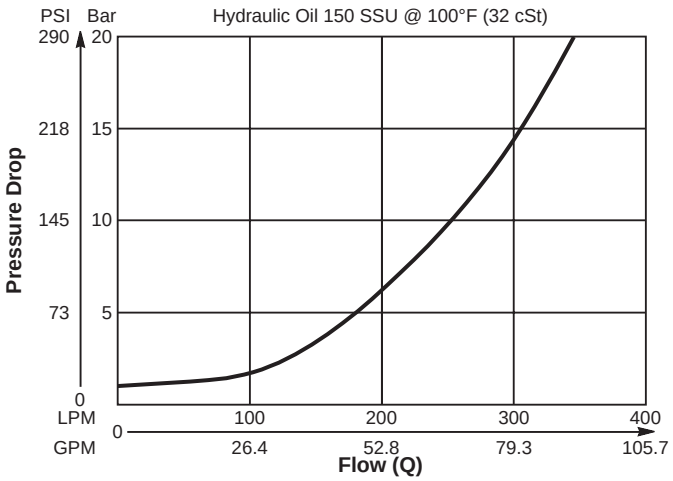
Performance Curves

(Pressure rise through cartridge only)

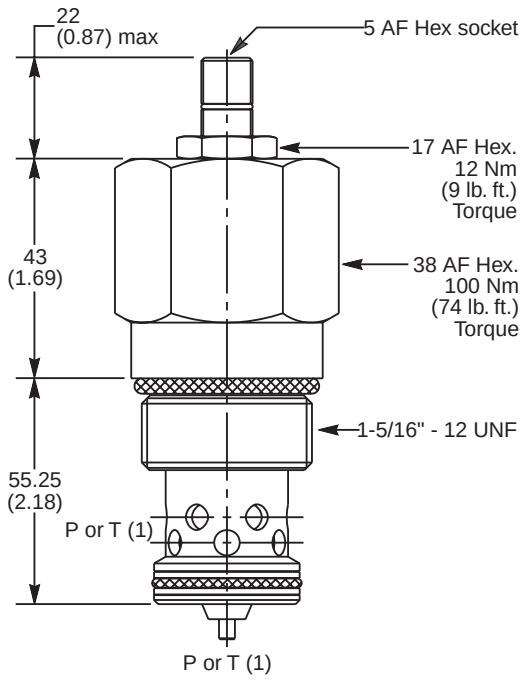
Relief Performance 1 to 2



Pressure Drop vs. Flow 2 to 1



Dimensions Millimeters (Inches)



Ordering Information

A06P2							
16 Size Pilot Operated Relief Valve	Pressure Adjustment Range	Adjustment Style	—	Optional Pressure Setting	Seals	— Body Material	Port Size

Code	Pressure Adjustment Range
H	10 - 210 Bar (145 - 3000 PSI)
P	10 - 420 Bar (145 - 6000 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Optional Pressure Setting
Specify setting if required (Bar)
A06P2H Standard Setting: 100 Bar (1450 PSI) @ 20 LPM (5.3 GPM)
A06P2P Standard Setting: 200 Bar (2900 PSI) @ 20 LPM (5.3 GPM)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30507N-1)
V	Fluorocarbon / (SK30507V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
12P	3/4″ NPTF	(B16-2-*12P)
16P	1″ NPTF	(B16-2-*16P)
8T	SAE-8	(B16-2-*8T)
12T	SAE-12	(B16-2-*12T)
16T	SAE-16	(B16-2-*16T)
12B	3/4″ BSPG	(B16-2-12B)†
16B	1″ BSPG	(B16-2-*16B)

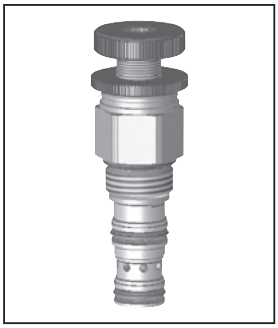
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

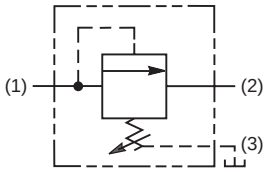
General Description

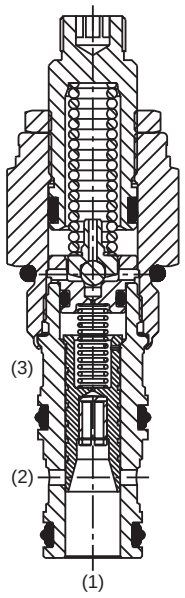
Pilot Operated Sequence Valve (Internally Piloted, Externally Vented). For additional information see Technical Tips on pages PC1-PC6.

Features

- Hardened, precision ground parts for durability
- Low profile adapter for minimal space requirements
- Fully guided pilot for more consistent reseat
- Steel adapters are coated with yellow zinc dichromate for protection from salt spray
- Polyurethane “D”-Ring eliminates backup rings and prevents hydrolysis
- Internal screening protects pilot spring from debris







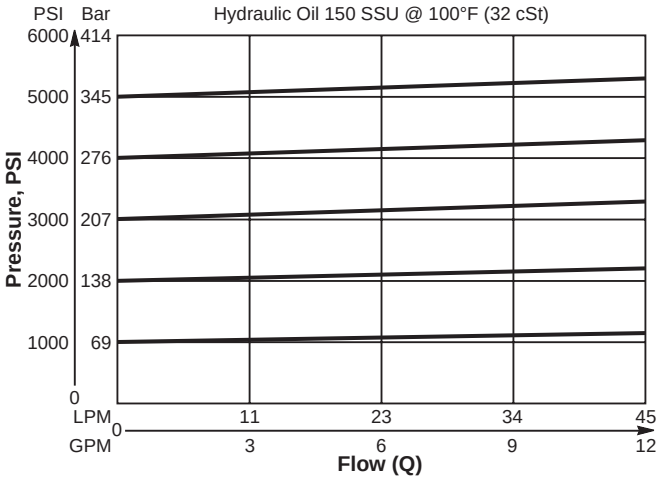
Specifications

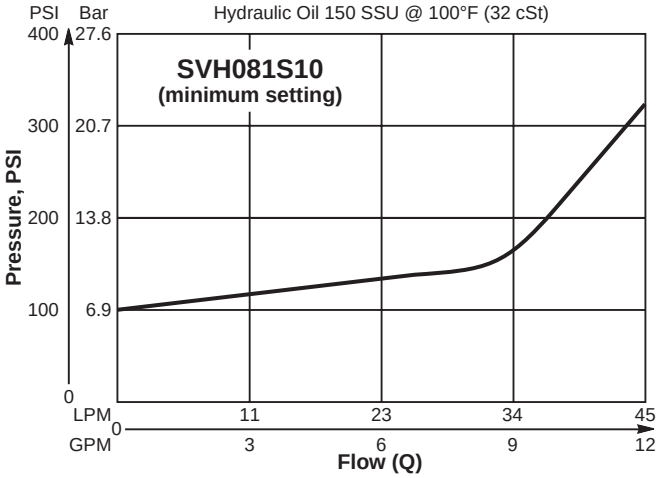
Rated Flow	45 LPM (12 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Maximum Drain Flow	0.56 LPM (0.15 GPM)
Reseat Pressure	90% of crack pressure
Leakage at 150 SSU (32 cSt)	82 cc/min. (5 cu. in./min.) @ 210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.11 kg (.25 lbs.)
Cavity	C08-3 (See BC Section for more details)
Form Tool	Rougher NTF08-3R Finisher NFT08-3F

Performance Curves

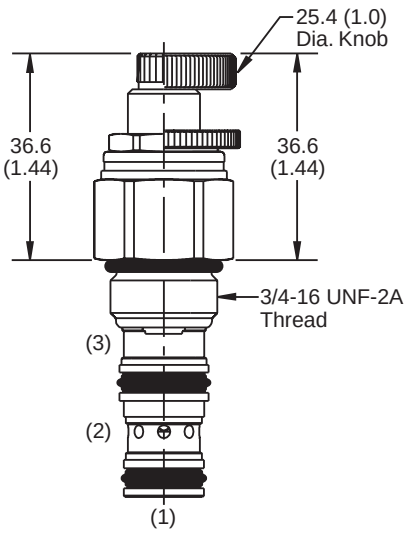
Flow vs. Inlet Pressure

(Pressure rise through cartridge only)



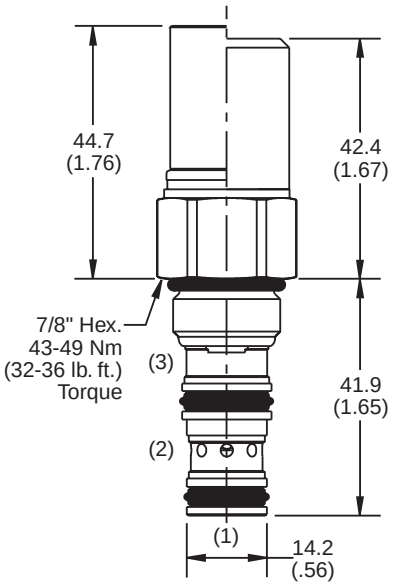


Dimensions Millimeters (Inches)



THIRD-ANGLE PROJECTION

Screw/Knob Version



Fixed Cap/Tamper Resistant Version

Ordering Information

SVH081						
08 Size P.O. Sequence Valve (Internal Pilot)	Adjustment Style	Pressure Range	Seals	Optional Pressure Setting	Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-10)
S	Screw Adjust
T	Tamper Resistant Cap (717943)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
20	6.9 - 138 Bar (100 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
30	13.8 - 207 Bar (200 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
50	13.8 - 345 Bar (200 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK08-3)
N	Nitrile / (SK08-3N)
V	Fluorocarbon / (SK08-3V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at crack pressure, approximately .95 LPM (.25 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-3-*4P)
4T	SAE-4	(B08-3-*4T)
6T	SAE-6	(B08-3-*6T)
6B	3/8″ BSPG	(B08-3-*6B)

**** Add "A" for aluminum, omit for steel.***

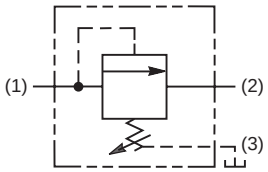
General Description

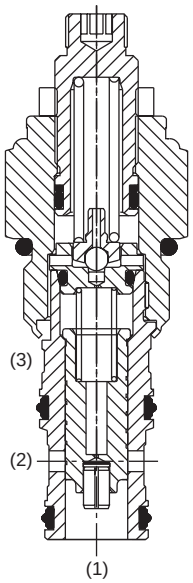
Pilot Operated Sequence Valve (Internally Piloted, Externally Drained). For additional information see Technical Tips on pages PC1-PC6.

Features

- Hardened, precision ground parts for durability
- Low profile adapter for minimal space requirements
- Fully guided poppet for more consistent reseat
- Steel adapters are coated with yellow zinc dichromate for protection from salt spray
- Polyurethane “D”-Ring eliminates backup rings and prevents hydrolysis
- Internal screening protects pilot spring from debris







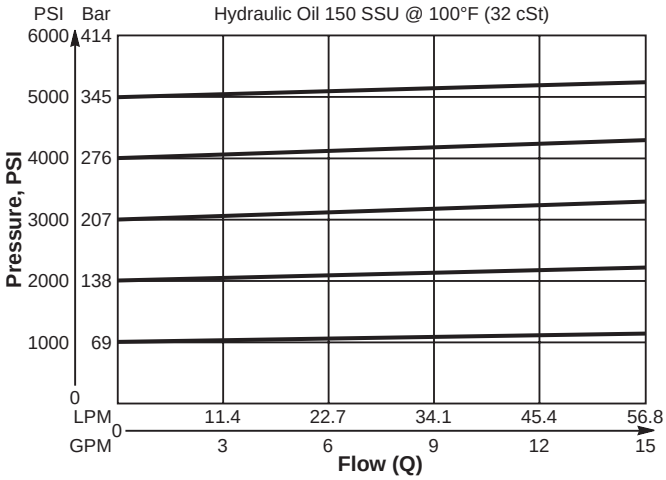
Specifications

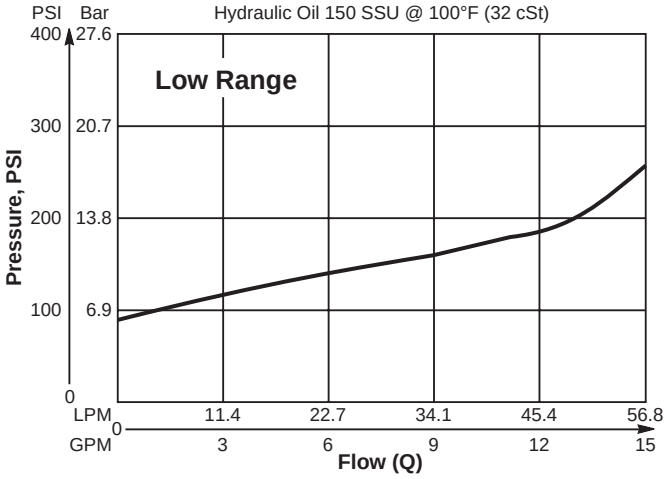
Rated Flow	56.3 LPM (15 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Maximum Drain Flow (Port 3)	0.94 LPM (0.25 GPM)
Reseat Pressure	90% of crack pressure
Leakage at 150 SSU (32 cSt)	82 cc/min. (5 cu. in./min.) @ 210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Campatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.45 kg (1.0 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NTF10-3R Finisher NFT10-3F

Performance Curves

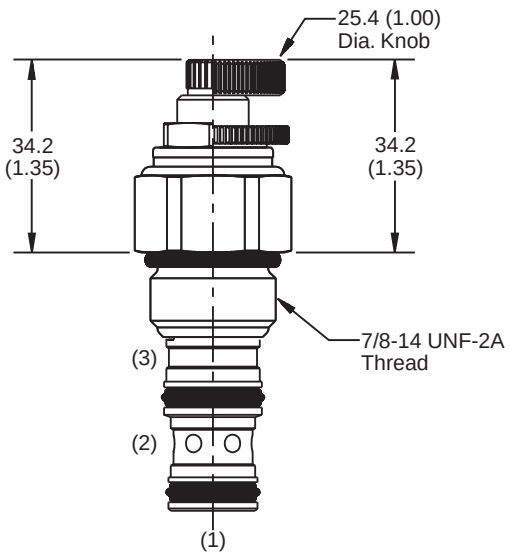
Flow vs. Inlet Pressure

(Pressure rise through cartridge only)



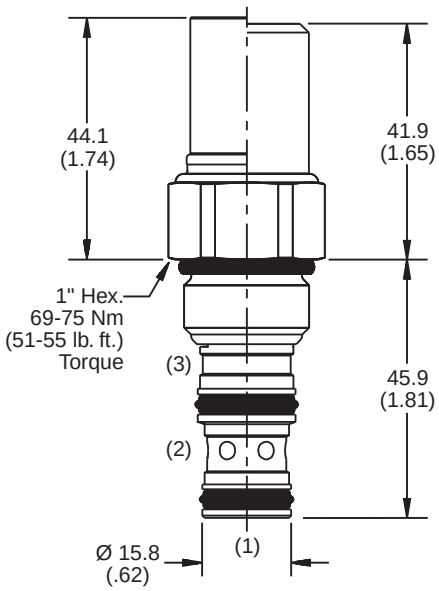


Dimensions Millimeters (Inches)



THIRD-ANGLE PROJECTION

Screw/Knob Version



Fixed Cap/Tamper Resistant Version

Ordering Information

SVH101								
10 Size P.O. Sequence Valve (Internal Pilot)	Adjustment Style	Pressure Range	Seals	—	Optional Pressure Setting	—	Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-10)
S	Screw Adjust
T	Tamper Resistant Cap (718083)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
20	6.9 - 138 Bar (100 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
30	13.8 - 207 Bar (200 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
50	13.8 - 345 Bar (200 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK10-3)
N	Nitrile / (SK10-3N)
V	Fluorocarbon / (SK10-3V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at crack pressure, approximately .95 LPM (.25 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8B)

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

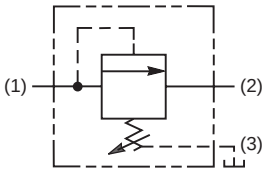
General Description

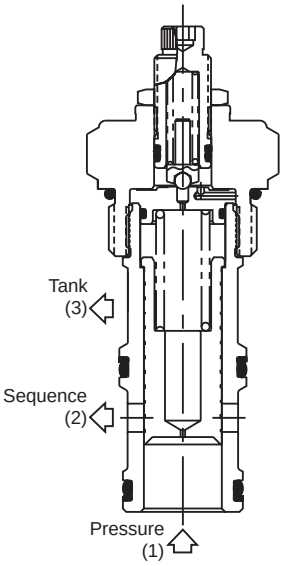
Pilot Operated Sequence Valve (Internally Piloted, Externally Drained). For additional information see Technical Tips on pages PC1-PC6.

Features

- Hardened, precision ground parts for durability
- High accuracy, pilot operation design
- Ball-type pilot for added stability
- All external parts have yellow zinc dichromate. This coating is ideal for salt spray applications.







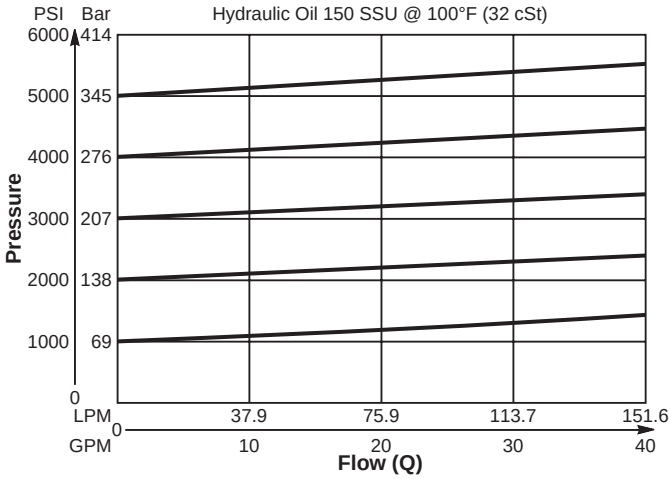
Specifications

Rated Flow	151.6 LPM (40 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Maximum Drain Flow	1.9 LPM (0.5 GPM)
Reseat Pressure	80% of crack pressure
Leakage at 150 SSU (32 cSt)	82 cc/min. (5 cu. in./min.) @ 75% of Crack Pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Campatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.45 kg (1.0 lbs.)
Cavity	C16-3 (See BC Section for more details)
Form Tool	Rougher NTF16-3R Finisher NFT16-3F

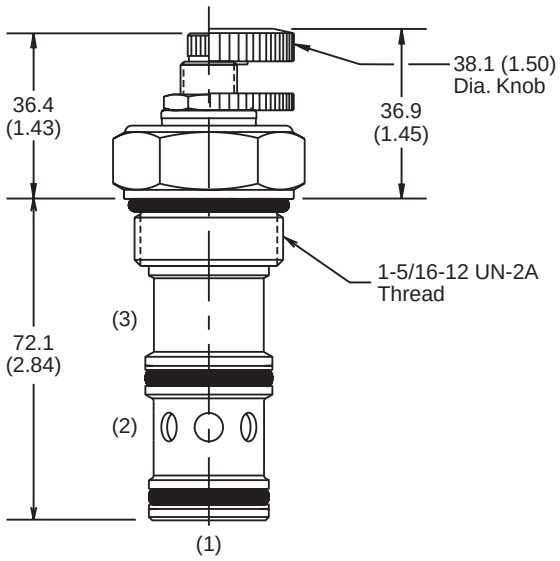
Performance Curve

Flow vs. Inlet Pressure

(Pressure rise through cartridge only)

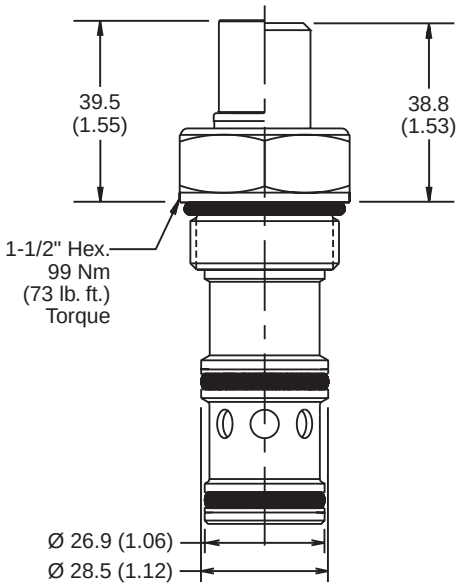


Dimensions Millimeters (Inches)



THIRD-ANGLE PROJECTION

Screw/Knob Version



Fixed Cap/Tamper Resistant Version

Ordering Information

SVH161							
16 Size P.O. Sequence Valve (Internal Pilot)	Adjustment Style	Pressure Range	Seals		Optional Pressure Setting	Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-15)
S	Screw Adjust
T	Tamper Resistant Cap (717785)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ 11.3 LPM (3 GPM)
20	13.8 - 138 Bar (200 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ 11.3 LPM (3 GPM)
30	20.7 - 207 Bar (300 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ 11.3 LPM (3 GPM)
50	34.5 - 345 Bar (500 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ 11.3 LPM (3 GPM)

Code	Seals / Kit No.
Omit	Nitrile / (SK16-3)
V	Fluorocarbon / (SK16-3V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at 11.3 LPM (3 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
12T	SAE-12	(B16-3-*12T)
16T	SAE-16	(B16-3-*16T)

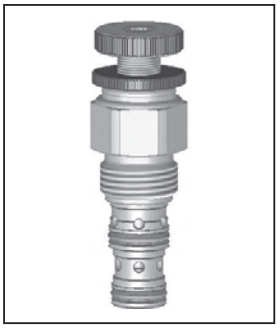
**** Add "A" for aluminum, omit for steel.***

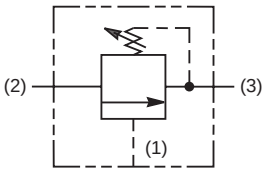
General Description

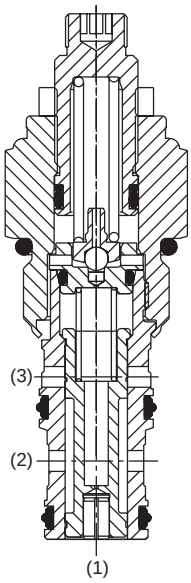
Pilot Operated Sequence Valve (Externally Piloted, Internally Vented). For additional information see Technical Tips on pages PC1-PC6.

Features

- Hardened, precision ground parts for durability
- Low profile adapter for minimal space requirements
- Fully guided poppet for more consistent reseat
- Steel adapters are coated with yellow zinc dichromate for protection from salt spray
- Polyurethane “D”-Ring eliminates backup rings and prevents hydrolysis
- Internal screening protects pilot spring from debris







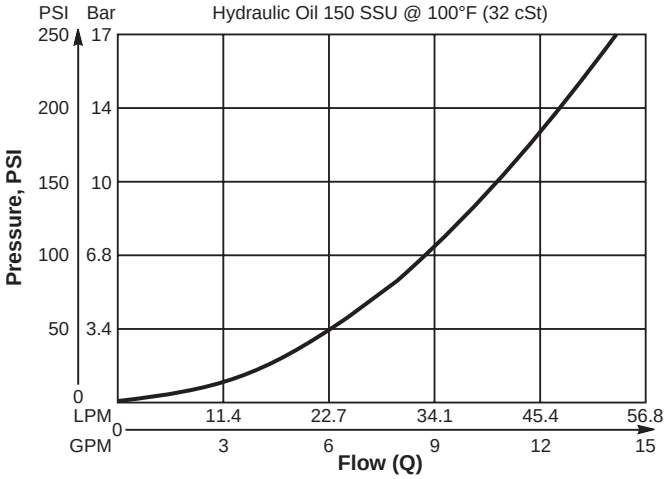
Specifications

Rated Flow	56.3 LPM (15 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Maximum Drain Flow	See maximum drain flow chart (Lower right)
Reseat Pressure	90% of crack pressure
Leakage at 150 SSU (32 cSt)	82 cc/min. (5 cu. in./min.) @ 210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Campatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.45 kg (1.0 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NTF10-3R Finisher NFT10-3F

Performance Curve

Flow vs. Inlet Pressure

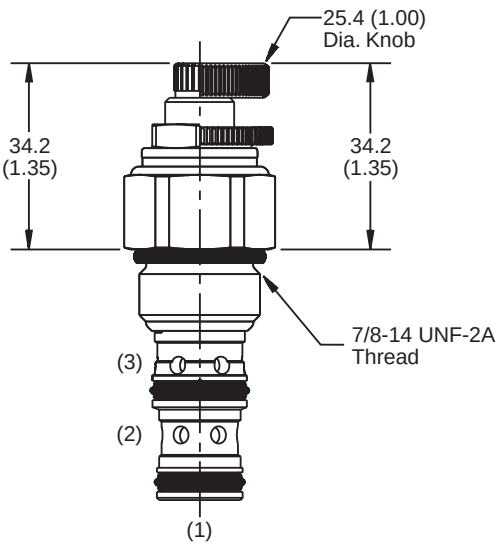
(Pressure rise through cartridge only)



Maximum Drain Flow

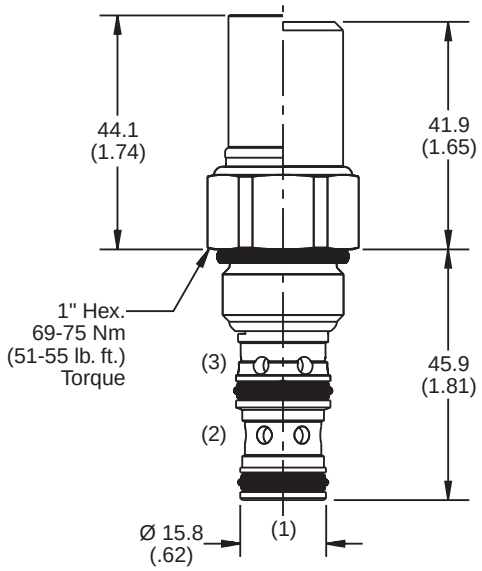
P_{PILOT} - $P_{SETTING}$	Drain Flow
6.9 Bar (100 PSI)	0.34 LPM (0.09 GPM)
35 Bar (500 PSI)	0.76 LPM (0.20 GPM)
69 Bar (1000 PSI)	1.08 LPM (0.29 GPM)
138 Bar (2000 PSI)	1.53 LPM (0.40 GPM)
207 Bar (3000 PSI)	1.87 LPM (0.50 GPM)

Dimensions Millimeters (Inches)



THIRD-ANGLE PROJECTION

Screw/Knob Version



Fixed Cap/Tamper Resistant Version

Ordering Information

SVH102							
10 Size P.O. Sequence Valve (External Pilot)	Adjustment Style	Pressure Range	Seals	—	Optional Pressure Setting	Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-10)
S	Screw Adjust
T	Tamper Resistant Cap (718083)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
20	6.9 - 138 Bar (100 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
30	13.8 - 207 Bar (200 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
50	13.8 - 345 Bar (200 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK10-3)
N	Nitrile / (SK10-3N)
V	Fluorocarbon / (SK10-3V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at crack pressure, approximately .95 LPM (.25 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8B)

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

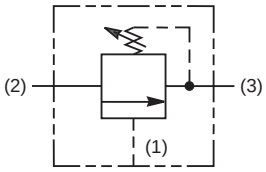
General Description

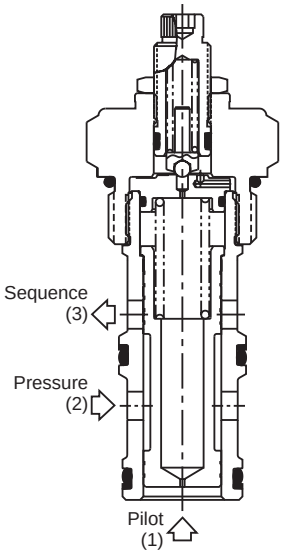
Pilot Operated Sequence Valve (Externally Piloted, Internally Vented). For additional information see Technical Tips on pages PC1-PC6.

Features

- Hardened, precision ground parts for durability
- High accuracy, pilot operation design
- Ball-type pilot for added stability
- All external parts have yellow zinc dichromate. This coating is ideal for salt spray applications.







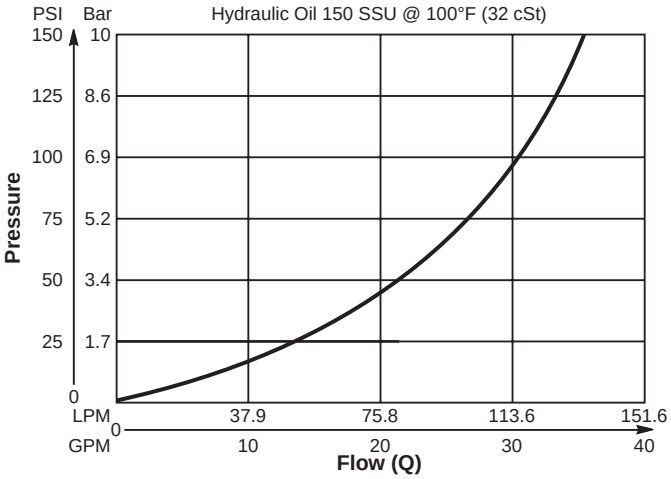
Specifications

Rated Flow	151.6 LPM (40 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Maximum Drain Flow	See maximum drain flow chart (Lower right)
Reseat Pressure	80% of Crack Pressure
Leakage at 150 SSU (32 cST)	82 cc/min. (5 cu. in./min.) @ 75% of Crack Pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.45 kg (1.0 lbs.)
Cavity	C16-3 (See BC Section for more details)
Form Tool	Rougher NFT16-3R Finisher NFT16-3F

Performance Curve

Flow vs. Inlet Pressure

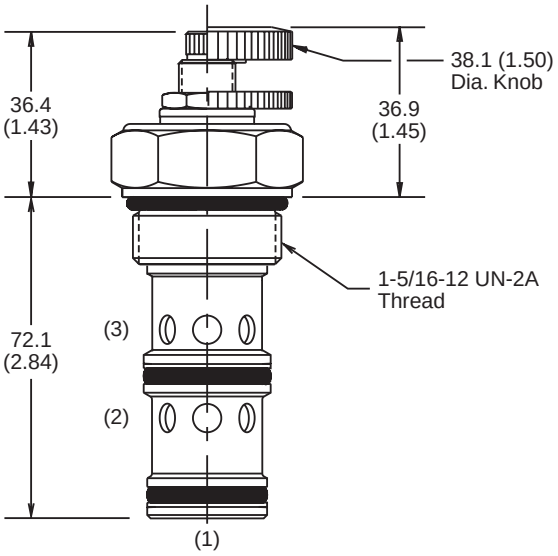
(Pressure rise through cartridge only)



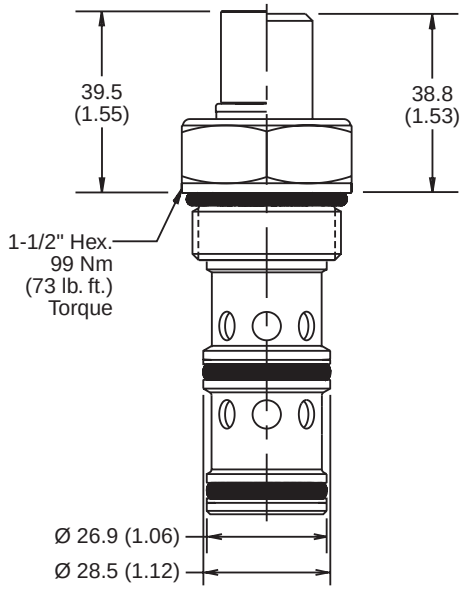
Maximum Drain Flow

P_{PILOT} - $P_{SETTING}$	Drain Flow
6.9 Bar (100 PSI)	0.69 LPM (0.18 GPM)
35 Bar (500 PSI)	1.55 LPM (0.41 GPM)
69 Bar (1000 PSI)	2.19 LPM (0.58 GPM)
138 Bar (2000 PSI)	3.10 LPM (0.82 GPM)
207 Bar (3000 PSI)	3.79 LPM (1.00 GPM)

Dimensions Millimeters (Inches)



Screw/Knob Version



Fixed Cap/Tamper Resistant Version

THIRD-ANGLE PROJECTION

Ordering Information

SVH162	☐	☐	☐	—	☐	—	☐	☐
16 Size P.O. Sequence Valve (External Pilot)	Adjustment Style	Pressure Range	Seals		Optional Pressure Setting		Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-15)
S	Screw Adjust
T	Tamper Resistant Cap (717785)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ 11.3 LPM (3 GPM)
20	13.8 - 138 Bar (200 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ 11.3 LPM (3 GPM)
30	20.7 - 207 Bar (300 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ 11.3 LPM (3 GPM)
50	34.5 - 345 Bar (500 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ 11.3 LPM (3 GPM)

Code	Seals / Kit No.
Omit	Nitrile / (SK16-3)
V	Fluorocarbon / (SK16-3V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at 11.3 LPM (3 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
12T	SAE-12	(B16-3-*12T)
16T	SAE-16	(B16-3-*16T)

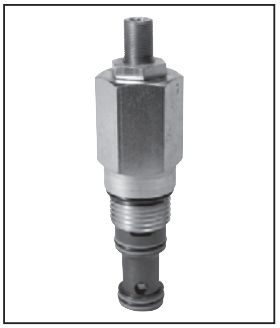
**** Add "A" for aluminum, omit for steel.***

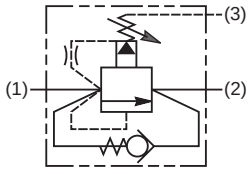
General Description

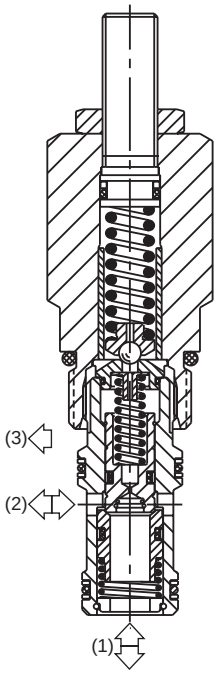
Pilot Operated Sequence Valve with Reverse Flow Check. For additional information see Technical Tips on pages PC1-PC6.

Features

- High flow capacity
- For use on clamp and drill circuits where pressure is to be maintained regardless of drop in system pressure
- Integral 250 micron pilot flow filter
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated







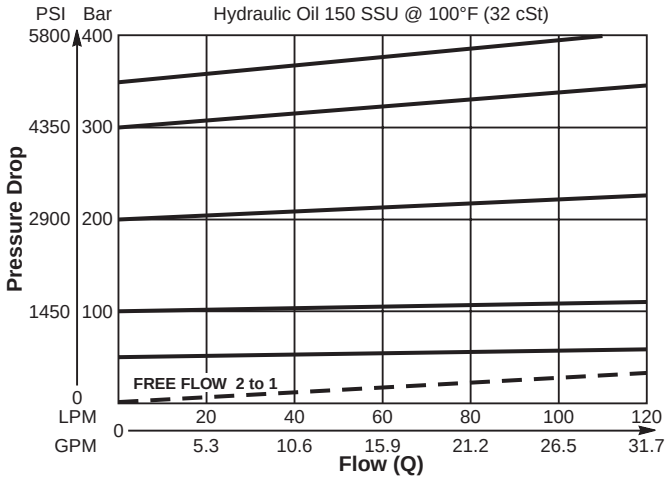
Specifications

Rated Flow	70 LPM (18.5 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**H -** 10-210 Bar (145-3000 PSI) **P -** 10-420 Bar (145-6000 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.25 kg (0.55 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher NFT10S-3R Finisher NFT10S-3F

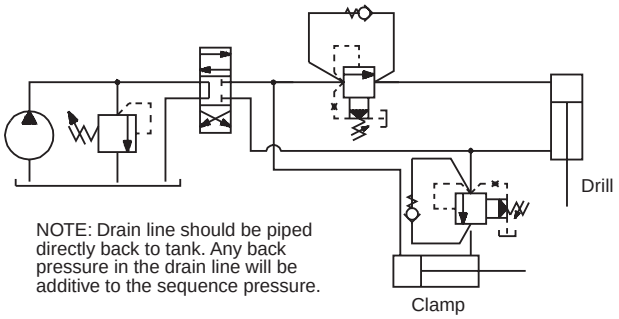
Performance Curve

(Pressure rise through cartridge only)

Flow vs. Inlet Pressure 1 to 2

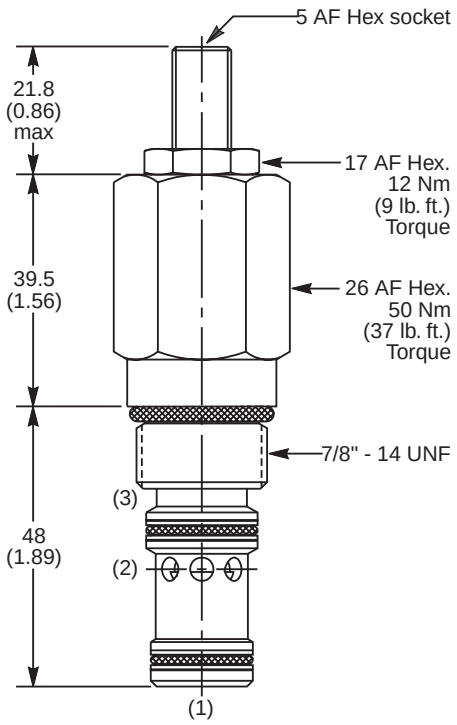


Application



NOTE: Drain line should be piped directly back to tank. Any back pressure in the drain line will be additive to the sequence pressure.

Dimensions Millimeters (Inches)



Ordering Information

B04D3			—		
10 Size Pilot Operated Sequence Valve	Pressure Adjustment Range	Adjustment Style		Optional Pressure Setting	Seals

Code	Pressure Adjustment Range
H	10 - 210 Bar (145 - 3000 PSI)
P	10 - 420 Bar (145 - 6000 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Optional Pressure Setting
Specify setting if required (Bar)
B04D3H Standard Setting: 100 Bar (1450 PSI) @ 15 LPM (4.0 GPM)
B04D3P Standard Setting: 200 Bar (2900 PSI) @ 15 LPM (4.0 GPM)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30504N-1)
V	Fluorocarbon / (SK30504V-1)

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
710	5/8″ SAE (main) 3/8″ SAE (aux)
711	3/4″ BSP (main) 1/4″ BSP (aux)

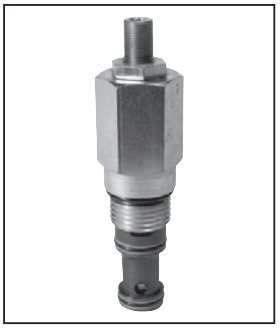
Code	Body Material
A	Aluminum
S	Steel

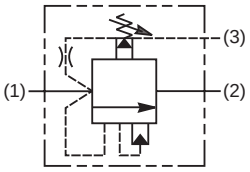
General Description

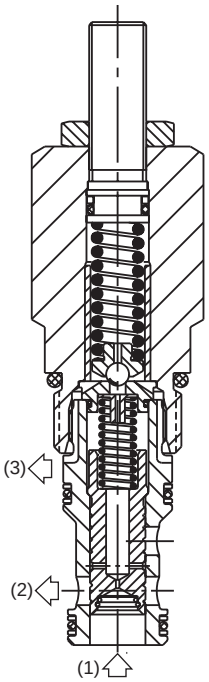
Kick-Down, Spool Type, Pilot Operated Sequence Valve. For additional information see Technical Tips on pages PC1-PC6.

Features

- High flow capacity
- Integral 250 micron pilot flow filter
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated







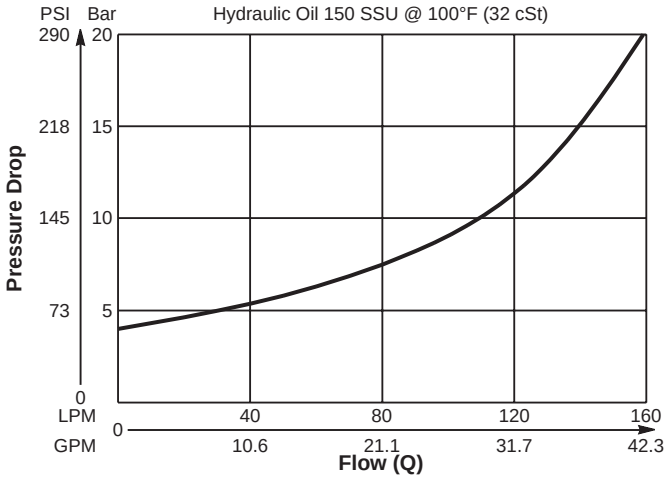
Specifications

Rated Flow	160 LPM (42 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**H -** 10-210 Bar (145-3000 PSI) **P -** 10-420 Bar (145-6000 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Sensitivity: Pressure/Turn	**H -** 30 Bar (435 PSI) **P -** 55 Bar (800 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.27 kg (0.55 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher NFT10S-3R Finisher NFT10S-3F

Performance Curve

(Pressure rise through cartridge only)

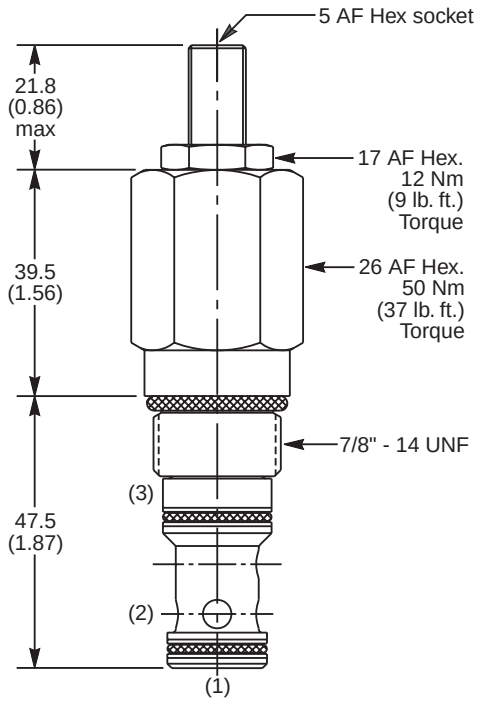
Pressure Drop vs. Flow 1 to 2



Application Note

Valve unloads completely when setting is reached and resets when fluid supply is removed.

Dimensions Millimeters (Inches)



Ordering Information

B04C3				
10 Size Kick-Down Pilot Operated Sequence Valve	Pressure Adjustment Range	Adjustment Style	Optional Pressure Setting	Seals

Code	Pressure Adjustment Range
H	10 - 210 Bar (145 - 3000 PSI)
P	10 - 420 Bar (145 - 6000 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Optional Pressure Setting
Specify setting if required (Bar)
B04C3H Standard Setting: 100 Bar (1450 PSI)
B04C3P Standard Setting: 200 Bar (2900 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30504N-1)
V	Fluorocarbon / (SK30504V-1)

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
710	5/8″ SAE (main) 3/8″ SAE (aux)
711	3/4″ BSP (main) 1/4″ BSP (aux)

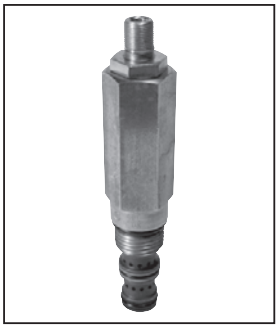
Code	Body Material
A	Aluminum
S	Steel

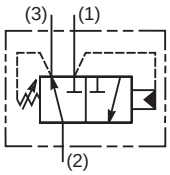
General Description

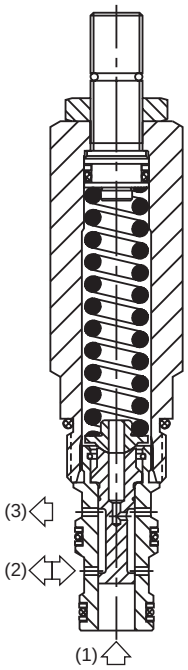
Direct Acting Sequence Valve with Internal Pilot and Drain. For additional information see Technical Tips on pages PC1-PC6.

Features

- Hardened working parts for maximum durability
- All external parts zinc plated
- Adjustable and tamperproof versions available







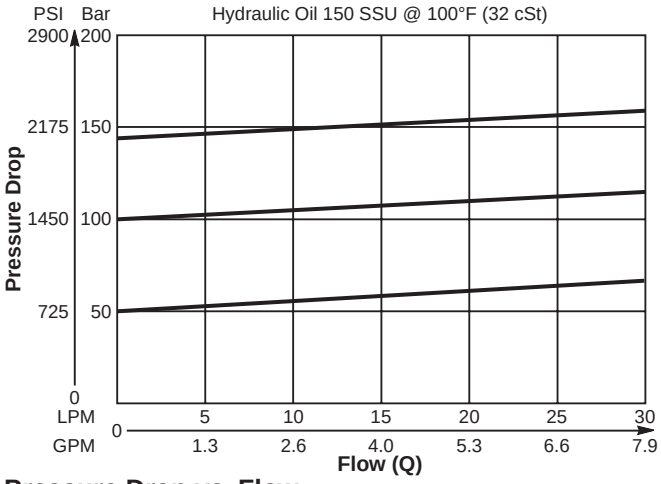
Specifications

Rated Flow	30 LPM (8 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	2-148 Bar (30-2150 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	25 ml/min. @ 35 Bar (580 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.21 kg (0.46 lbs.)
Cavity	C08-3 (See BC Section for more details)
Form Tool	Rougher NFT08-3R Finisher NFT08-3F

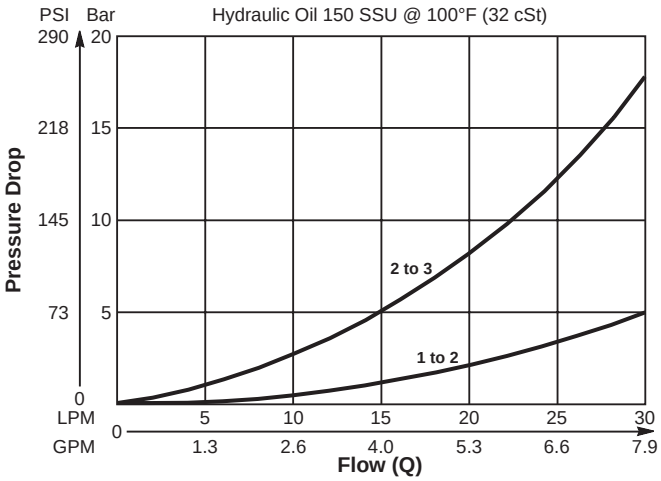
Performance Curves

(Pressure rise through cartridge only)

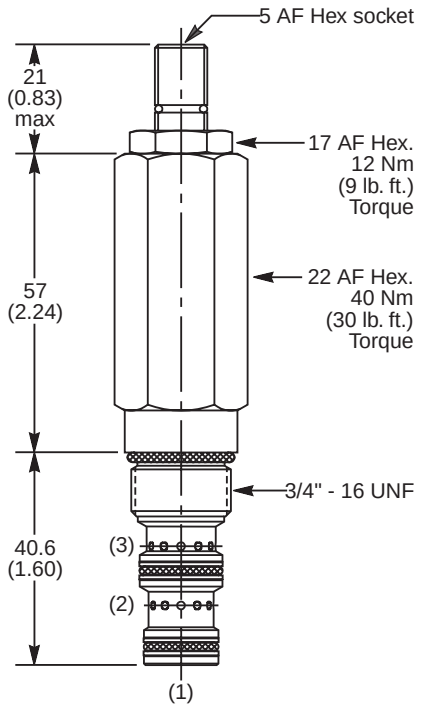
Flow vs. Inlet Pressure 1 to 2



Pressure Drop vs. Flow



Dimensions Millimeters (Inches)



Ordering Information

B02E3	F		—			—		
08 Size D.A. Sequence Valve (Int. Pilot & Drain)	Pressure Adjustment Range	Adjustment Style		Optional Pressure Setting	Seals		Body Material	Port Size

Code	Pressure Adjustment Range
F	2 - 148 Bar (30 - 2150 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Optional Pressure Setting
Specify setting if required (Bar)
B02E3F Standard Setting: 75 Bar (1100 PSI) @ 5 LPM (1.3 GPM)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30501N-1)
V	Fluorocarbon / (SK30501V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-3-*4P)
4T	SAE-4	(B08-3-*4T)
6T	SAE-6	(B08-3-*6T)
6B	3/8″ BSPG	(B08-3-*6B)

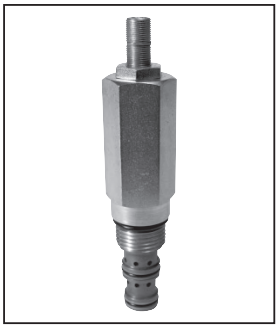
**** Add "A" for aluminum, omit for steel.***

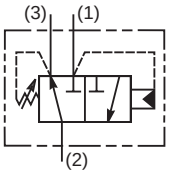
General Description

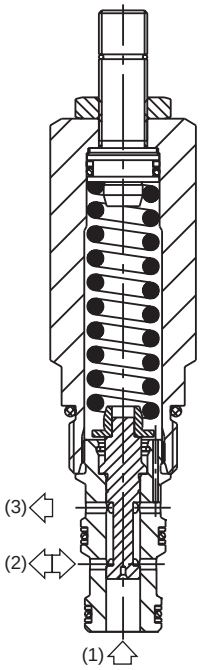
Direct Acting Sequence Valve with Internal Pilot and Drain. For additional information see Technical Tips on pages PC1-PC6.

Features

- Hardened working parts for maximum durability
- All external parts zinc plated
- Adjustable and tamperproof versions available







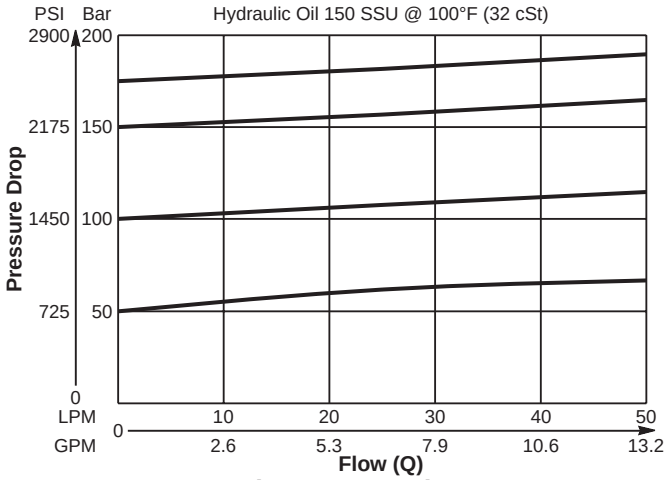
Specifications

Rated Flow	50 LPM (13 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**E -** 2-80 Bar (30-1160 PSI) **G -** 2-166 Bar (30-2400 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	25 ml/min. @ 60 Bar (870 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.27 kg (0.60 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

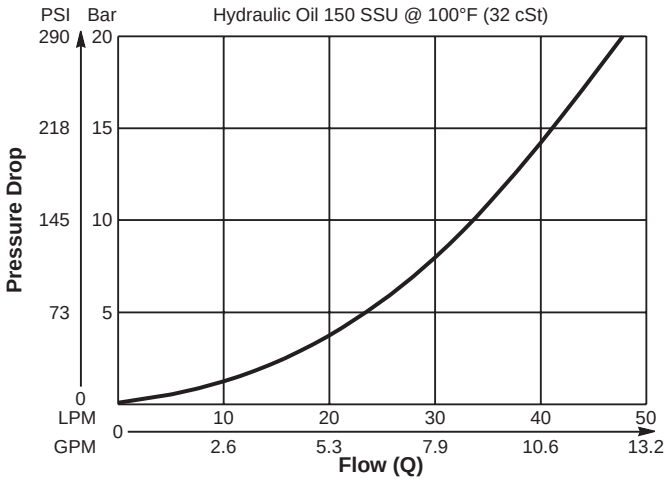
Performance Curves

(Pressure rise through cartridge only)

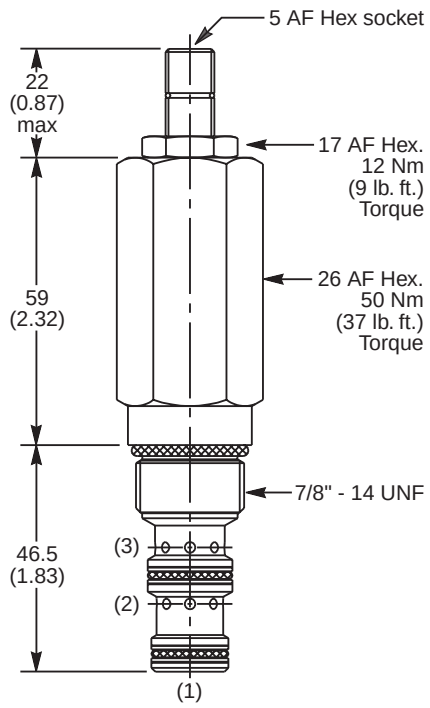
Flow vs. Inlet Pressure 1 to 2



Pressure Drop vs. Flow 1 to 2 and 2 to 3



Dimensions Millimeters (Inches)



Ordering Information

B04E3			—			—		
10 Size D.A. Sequence Valve (Int. Pilot & Drain)	Pressure Adjustment Range	Adjustment Style		Optional Pressure Setting	Seals		Body Material	Port Size

Code	Pressure Adjustment Range
E	2 - 80 Bar (30 - 1160 PSI)
G	2 - 166 Bar (30 - 2400 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Optional Pressure Setting
Specify setting if required (Bar)
B04E3E Standard Setting: 40 Bar (580 PSI) @ 5 LPM (1.3 GPM)
B04E3G Standard Setting: 80 Bar (1160 PSI) @ 5 LPM (1.3 GPM)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30505N-1)
V	Fluorocarbon / (SK30505V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8P)

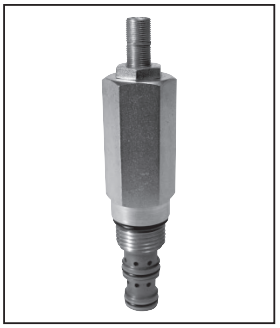
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

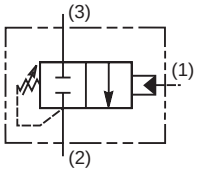
General Description

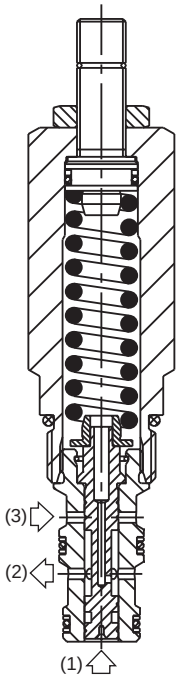
Direct Acting, Normally Closed Sequence Valve with External Pilot and Internal Drain. For additional information see Technical Tips on pages PC1-PC6.

Features

- Sealed pilot option available
- Hardened working parts for maximum durability
- All external parts zinc plated
- Adjustable and tamperproof versions available







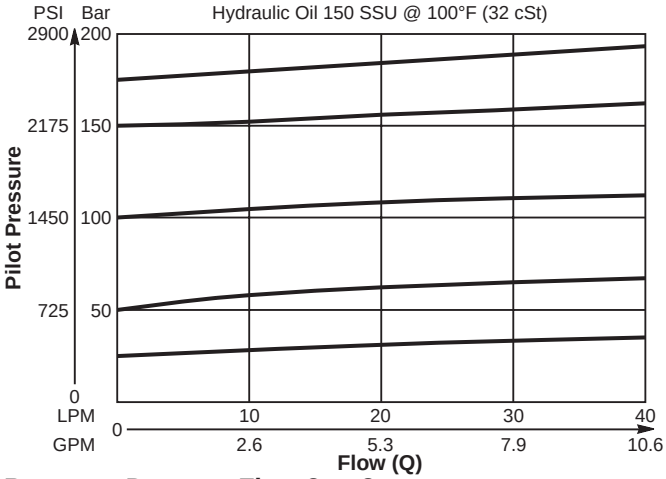
Specifications

Rated Flow	34 LPM (9 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**E -** 2-80 Bar (30-1160 PSI) **G -** 2-166 Bar (30-2400 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	25 ml/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.30 kg (0.66 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

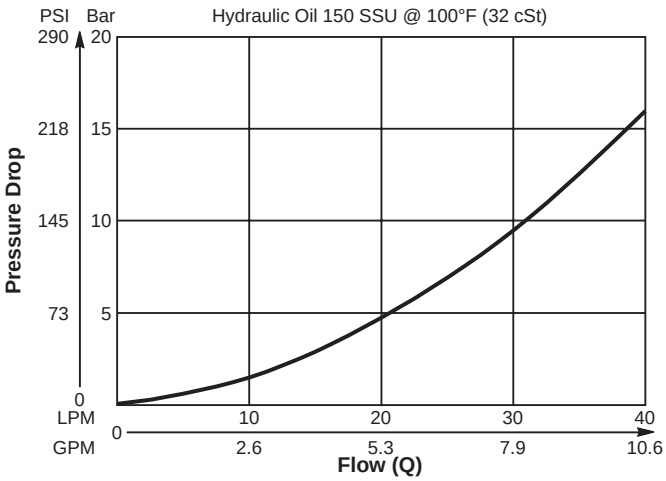
Performance Curves

(Pressure rise through cartridge only)

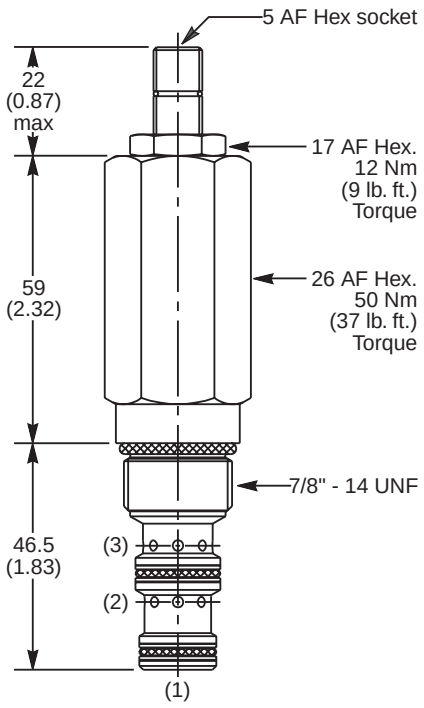
Flow vs. Inlet Pressure 3 to 2



Pressure Drop vs. Flow 3 to 2



Dimensions Millimeters (Inches)



Ordering Information

B04F3						—		
10 Size D.A. Sequence Valve (External Pilot & Internal Drain)	Pilot Pressure Adjustment Range	Adjustment Style	Pilot Switching Pressure	Seals	Sealed Pilot		Body Material	Port Size

Code	Pilot Pressure Adjustment Range
E	2 - 80 Bar (30 - 1160 PSI)
G	2 - 166 Bar (30 - 2400 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Code	Pilot Switching Pressure
Omit	Omit for no setting (Std.) **B04F3E** Standard Setting: 40 Bar (580 PSI) @ 5 LPM (1.3 GPM) **B04F3G** Standard Setting: 80 Bar (1160 PSI) @ 5 LPM (1.3 GPM) Specify setting if required

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30505N-1)
V	Fluorocarbon / (SK30505V-1)

Code	Sealed Pilot
Omit	Omit if not required
S	Sealed Pilot

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8P)

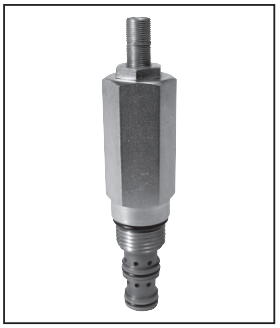
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

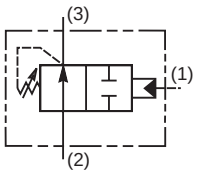
General Description

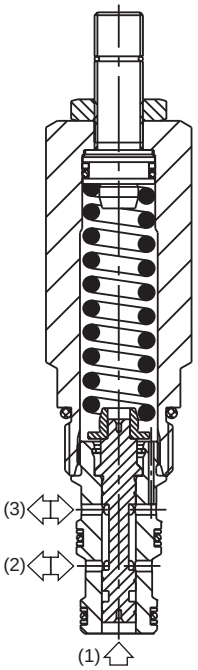
Direct Acting, Normally Open Sequence Valve with External Pilot and Internal Drain. For additional information see Technical Tips on pages PC1-PC6.

Features

- Sealed pilot option available
- Hardened working parts for maximum durability
- All external parts zinc plated
- Adjustable and tamperproof versions available







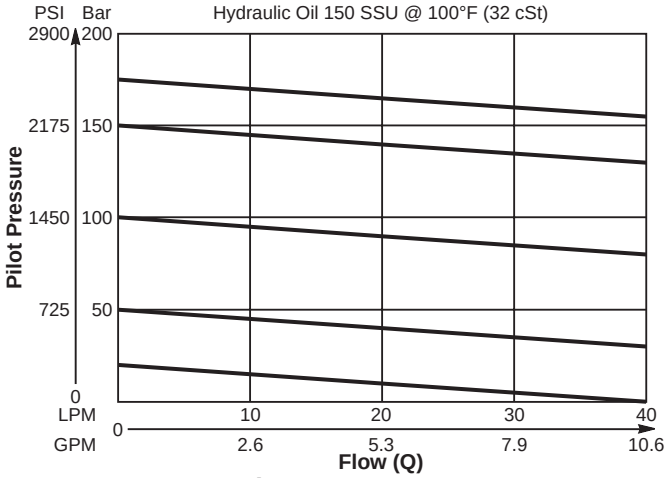
Specifications

Rated Flow	40 LPM (10.6 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**E -** 2-80 Bar (30-1160 PSI) **G -** 2-166 Bar (30-2400 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	25 ml/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.30 kg (0.66 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

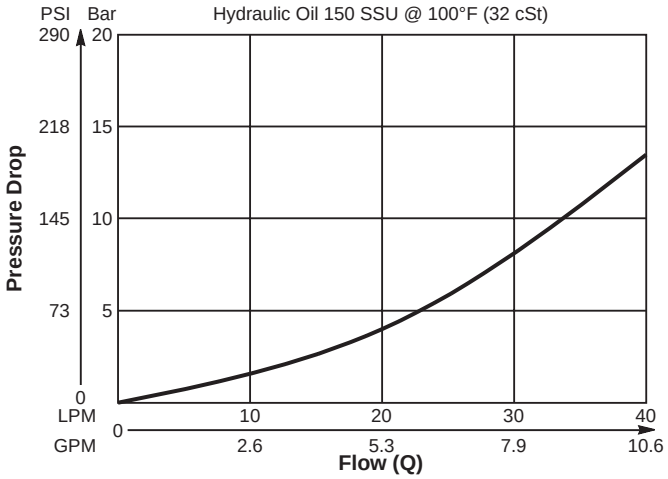
Performance Curves

(Pressure rise through cartridge only)

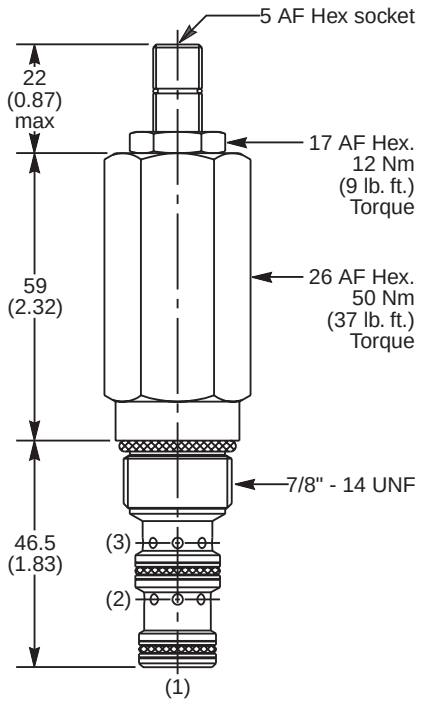
Flow vs. Inlet Pressure 2 to 3



Pressure Drop vs. Flow 2 to 3



Dimensions Millimeters (Inches)



Ordering Information

B04G3						—		
10 Size D.A. Sequence Valve (External Pilot & Internal Drain)	Pilot Pressure Adjustment Range	Adjustment Style	Pilot Switching Pressure	Seals	Sealed Pilot		Body Material	Port Size

Code	Pilot Pressure Adjustment Range
E	2 - 80 Bar (30 - 1160 PSI)
G	2 - 166 Bar (30 - 2400 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Code	Pilot Switching Pressure
Omit	Omit for no setting (Std.) **B04G3E** Standard Setting: 40 Bar (580 PSI) @ 5 LPM (1.3 GPM) **B04G3G** Standard Setting: 80 Bar (1160 PSI) @ 5 LPM (1.3 GPM) Specify setting if required

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30505N-1)
V	Fluorocarbon / (SK30505V-1)

Code	Sealed Pilot
Omit	Omit if not required
S	Sealed Pilot

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8P)

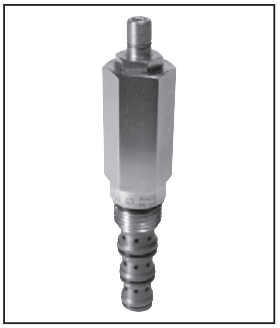
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

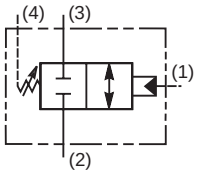
General Description

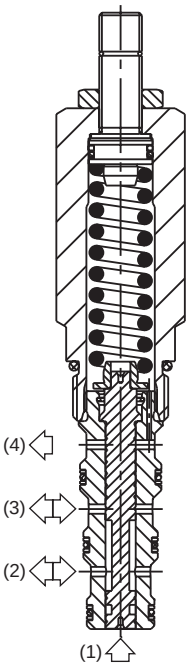
Direct Acting, Normally Closed Sequence Valve with External Pilot and Drain. For additional information see Technical Tips on pages PC1-PC6.

Features

- Sealed pilot option available
- Hardened working parts for maximum durability
- All external parts zinc plated
- Adjustable and tamperproof versions available







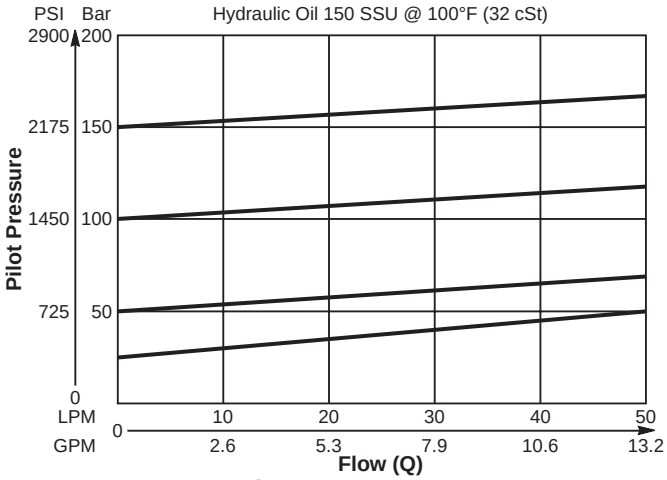
Specifications

Rated Flow	47 LPM (12 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**E -** 2-80 Bar (30-1160 PSI) **G -** 2-166 Bar (30-2400 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	25 ml/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.33 kg (0.73 lbs.)
Cavity	C10-4 (See BC Section for more details)
Form Tool	Rougher NFT10-4R Finisher NFT10-4F

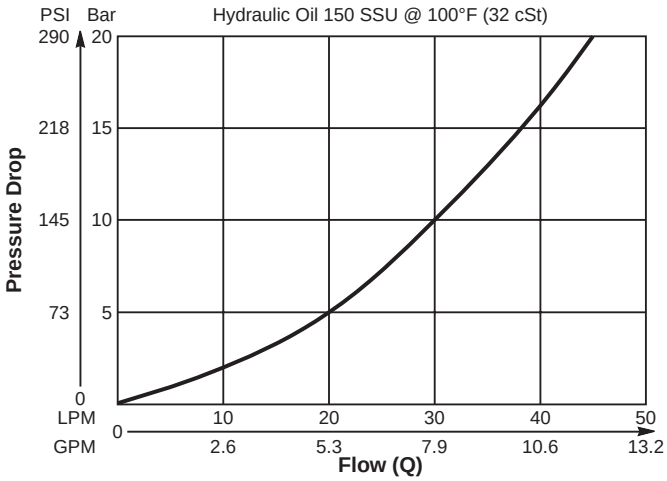
Performance Curves

(Pressure rise through cartridge only)

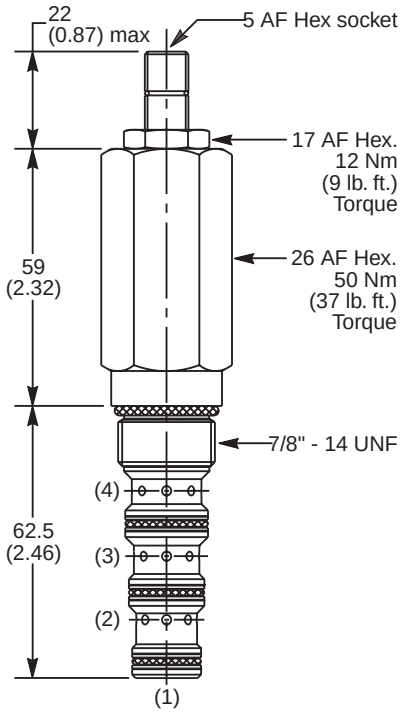
Flow vs. Inlet Pressure 2 to 3



Pressure Drop vs. Flow 3 to 2



Dimensions Millimeters (Inches)



Ordering Information

B04H4						—		
10 Size D.A. Sequence Valve (External Pilot and Drain)	Pilot Pressure Adjustment Range	Adjustment Style	Pilot Switching Pressure	Seals	Sealed Pilot		Body Material	Port Size

Code	Pilot Pressure Adjustment Range
E	2 - 80 Bar (30 - 1160 PSI)
G	2 - 166 Bar (30 - 2400 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Code	Pilot Switching Pressure
Omit	Omit for Standard Setting **B04H4E** Standard Setting: 40 Bar (580 PSI) @ 5 LPM (1.3 GPM) **B04H4G** Standard Setting: 80 Bar (1160 PSI) @ 5 LPM (1.3 GPM) Specify setting if required

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30506N-1)
V	Fluorocarbon / (SK30506V-1)

Code	Sealed Pilot
Omit	Omit if not required
S	Sealed Pilot

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6P	3/8″ NTPF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

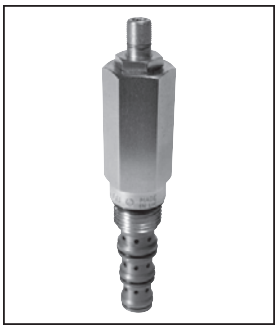
**** Add "A" for aluminum, omit for steel.***
† Steel bodies only

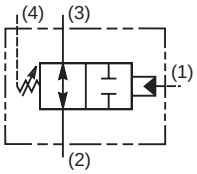
General Description

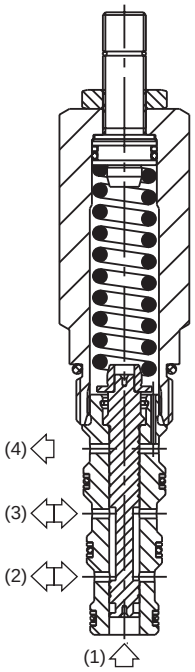
Direct Acting, Normally Open Sequence Valve with External Pilot and Drain. For additional information see Technical Tips on pages PC1-PC6.

Features

- Sealed pilot option available
- Hardened working parts for maximum durability
- All external parts zinc plated
- Adjustable and tamperproof versions available







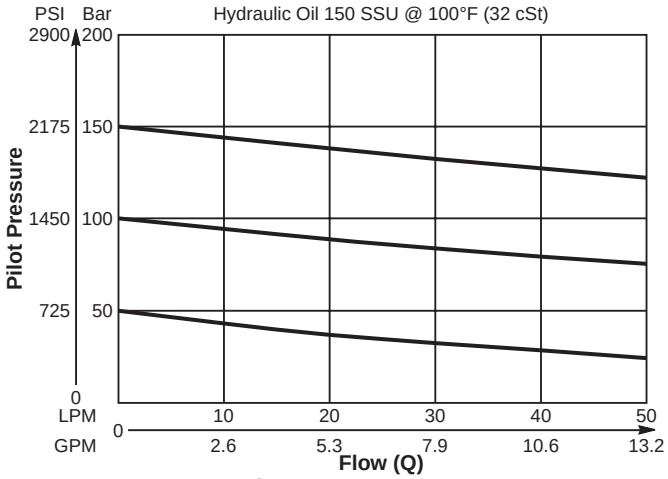
Specifications

Rated Flow	47 LPM (12 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**E -** 2-80 Bar (30-1160 PSI) **G -** 2-166 Bar (30-2400 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	25 ml/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.33 kg (0.73 lbs.)
Cavity	C10-4 (See BC Section for more details)
Form Tool	Rougher NFT10-4R Finisher NFT10-4F

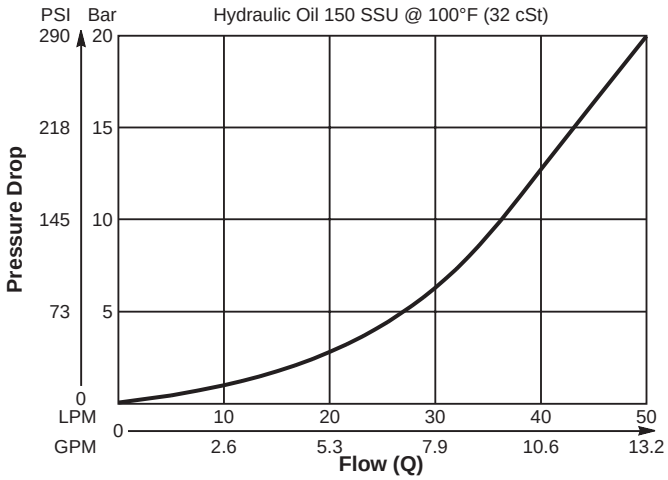
Performance Curves

(Pressure rise through cartridge only)

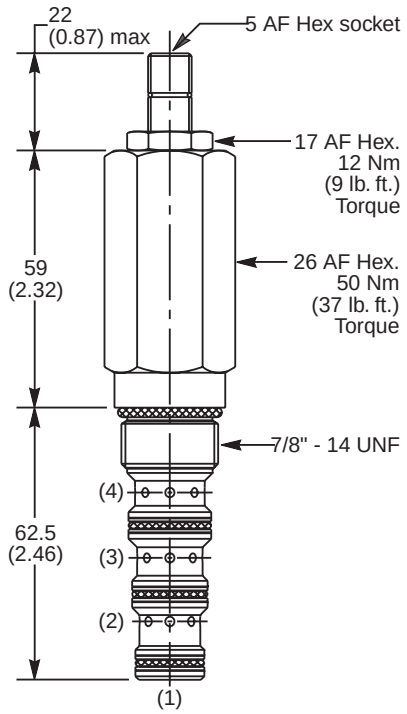
Flow vs. Inlet Pressure 2 to 3 & 3 to 2



Pressure Drop vs. Flow 2 to 3 & 3 to 2



Dimensions Millimeters (Inches)



Ordering Information

B04J4						—		
10 Size D.A. Sequence Valve (External Pilot and Drain)	Pilot Pressure Adjustment Range	Adjustment Style	Pilot Switching Pressure	Seals	Sealed Pilot		Body Material	Port Size

Code	Pilot Pressure Adjustment Range
E	2 - 80 Bar (30 - 1160 PSI)
G	2 - 166 Bar (30 - 2400 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Code	Pilot Switching Pressure
Omit	Omit for no setting (Std.) **B04J4E** Standard Setting: 40 Bar (580 PSI) @ 5 LPM (1.3 GPM) **B04J4G** Standard Setting: 80 Bar (1160 PSI) @ 5 LPM (1.3 GPM) Specify setting if required

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30506N-1)
V	Fluorocarbon / (SK30506V-1)

Code	Sealed Pilot
Omit	Omit if not required
S	Sealed Pilot

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6P	3/8″ NTPF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

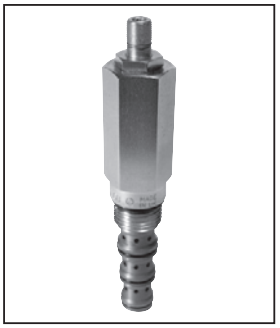
**** Add "A" for aluminum, omit for steel.***
† Steel bodies only

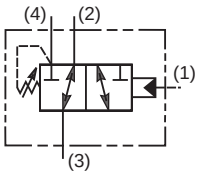
General Description

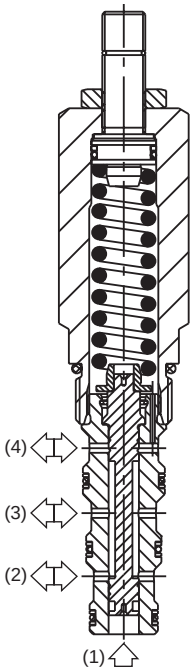
Direct Acting, Normally Open, 3 Way Sequence Valve with Internal Pilot and External Drain. For additional information see Technical Tips on pages PC1-PC6.

Features

- Sealed pilot option available
- Hardened working parts for maximum durability
- All external parts zinc plated
- Adjustable and tamperproof versions available







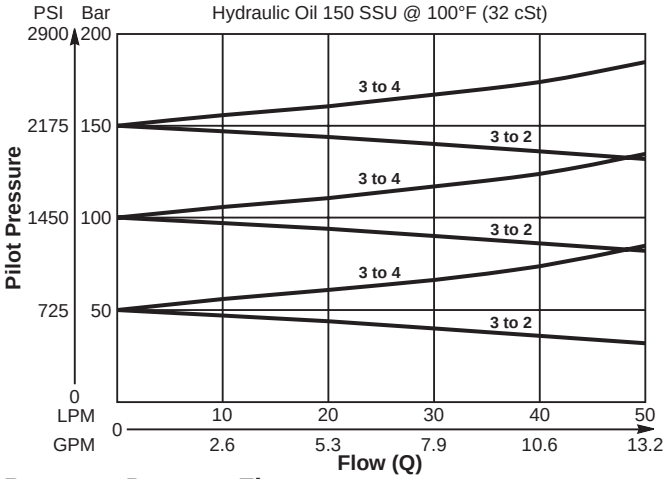
Specifications

Rated Flow	42 LPM (11 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**E -** 2-80 Bar (30-1160 PSI) **G -** 2-166 Bar (30-2400 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	40 ml/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.33 kg (0.73 lbs.)
Cavity	C10-4 (See BC Section for more details)
Form Tool	Rougher NFT10-4R Finisher NFT10-4F

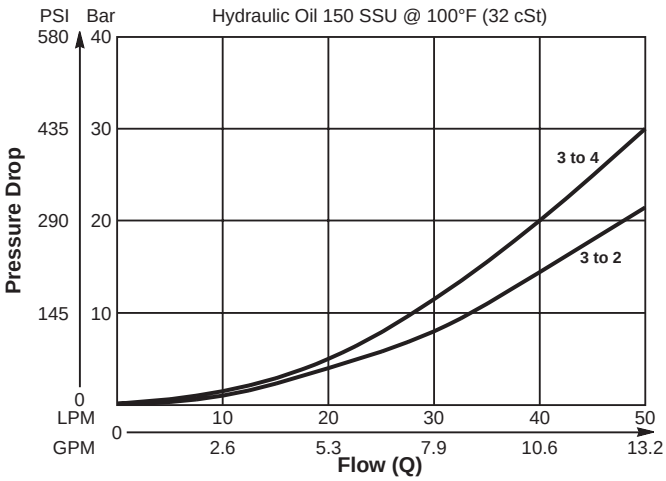
Performance Curves

(Pressure rise through cartridge only)

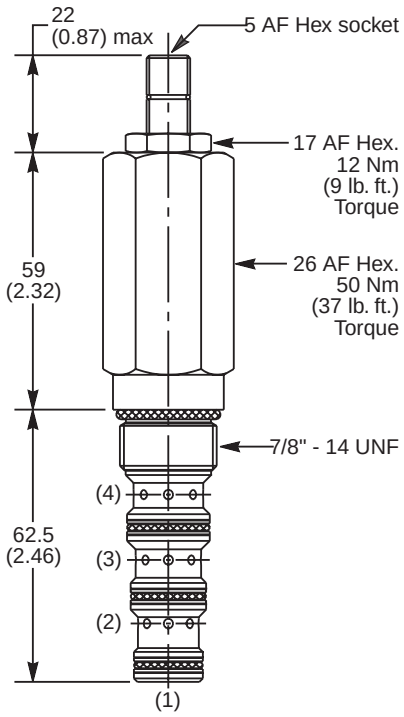
Flow vs. Inlet Pressure



Pressure Drop vs. Flow



Dimensions Millimeters (Inches)



Ordering Information

B04K4						—		
10 Size D.A. Sequence Valve (Internal Pilot & External Drain)	Pilot Pressure Adjustment Range	Adjustment Style	Pilot Switching Pressure	Seals	Sealed Pilot		Body Material	Port Size

Code	Pilot Pressure Adjustment Range
E	2 - 80 Bar (30 - 1160 PSI)
G	2 - 166 Bar (30 - 2400 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Code	Pilot Switching Pressure
Omit	Omit for Standard Setting **B04K4E** Standard Setting: 40 Bar (580 PSI) @ 5 LPM (1.3 GPM) **B04K4G** Standard Setting: 80 Bar (1160 PSI) @ 5 LPM (1.3 GPM) Specify setting if required

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30506N-1)
V	Fluorocarbon / (SK30506V-1)

Code	Sealed Pilot
Omit	Omit if not required
S	Sealed Pilot

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6P	3/8″ NTPF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

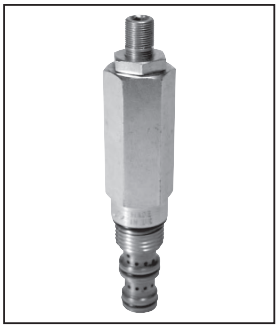
**** Add "A" for aluminum, omit for steel.***
† Steel bodies only

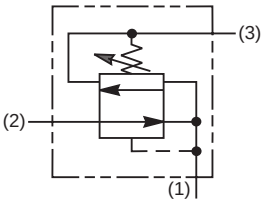
General Description

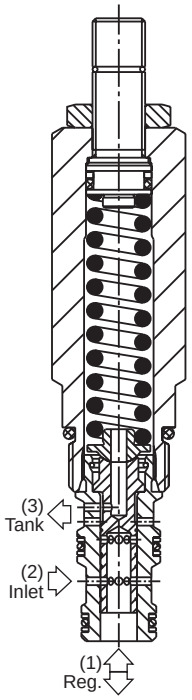
Direct Acting Pressure Reducing/Relieving Valve. For additional information see Technical Tips on pages PC1-PC6.

Features

- Maximum pressure setting up to 150 Bar, 2175 PSI
- Three pressure ranges available for more accurate pressure control
- Partial reverse flow capability
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated







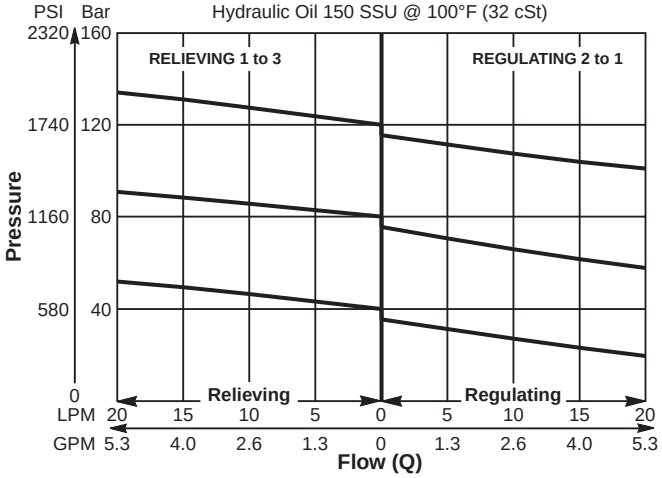
Specifications

Rated Flow	20 LPM (5 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**C -** 5-40 Bar (73-580 PSI) **E -** 25-75 Bar (363-1088 PSI) **G -** 50-150 Bar (725-2175 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.20 kg (0.44 lbs.)
Cavity	C08-3 (See BC Section for more details)
Form Tool	Rougher NFT08-3R Finisher NFT08-3F

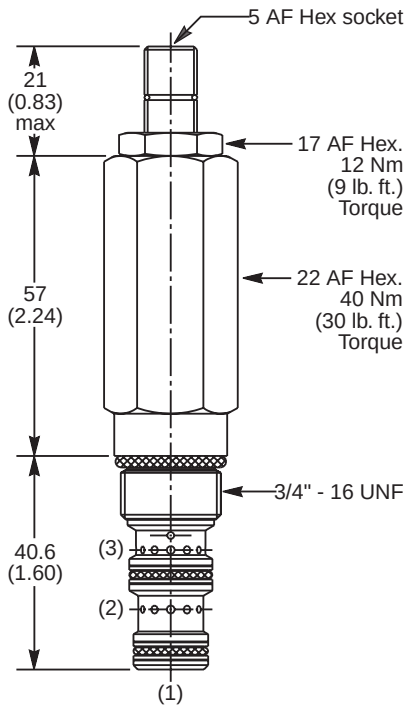
Performance Curve

(Pressure rise through cartridge only)

Flow vs. Regulated Pressure



Dimensions Millimeters (Inches)



Ordering Information

C02A3			—			—		
08 Size D.A. Pressure Reducing/Relieving Valve	Pressure Adjustment Range	Adjustment Style		Optional Pressure Setting	Seals		Body Material	Port Size

Code	Pressure Adjustment Range
C	5 - 40 Bar (73 - 580 PSI)
E	25 - 75 Bar (363 - 1088 PSI)
G	50 - 150 Bar (725 - 2175 PSI)

Code	Adjustment Style / Kit No.
Z	Screw Adjust (Std.)
W	Knob Adjust
T	Tamper Resistant Cap (TC1130)

Optional Pressure Setting
Specify setting if required (Bar)
C02A3C Standard Setting: 20 Bar (290 PSI)
C02A3E Standard Setting: 38 Bar (551 PSI)
C02A3G Standard Setting: 75 Bar (1088 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N (Std.) / (SK30501N-1)
V	Fluorocarbon / (SK30501V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-3-*4P)
4T	SAE-4	(B08-3-*4T)
6T	SAE-6	(B08-3-*6T)
6B	3/8″ BSPG	(B08-3-*6B)

**** Add "A" for aluminum, omit for steel.***

General Description

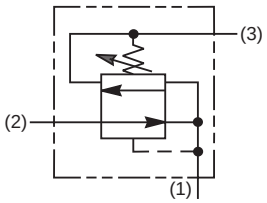
Direct Acting Pressure Reducing/Relieving Valve. For additional information see Technical Tips on pages PC1-PC6.

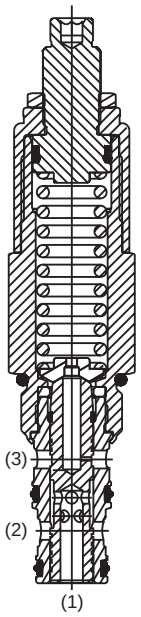
Note: The differential between system pressure and pressure setting of the valve can greatly affect the stability of this valve. For best performance, the inlet pressure setting should not exceed 69 Bar (1000 PSI) above the reducing valve setting.

Features

- Hardened, precision ground parts for durability
- Internal mechanical stop limits spool travel eliminating spring solidification
- "D"-Ring eliminates backup rings
- All external parts have yellow zinc dichromate. This coating is ideal for salt spray applications.







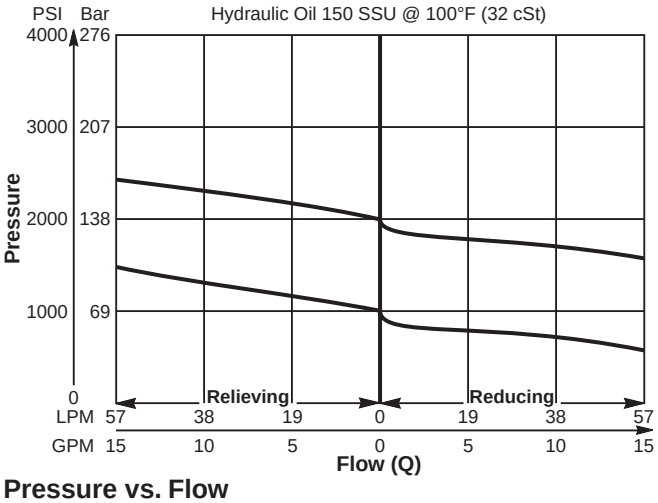
Specifications

Rated Flow	56 LPM (15 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI) 69 Bar (1000 PSI) maximum differential above valve setting for best stability
Maximum Pressure Setting	124 Bar (1800 PSI)
Maximum Tank Pressure	124 Bar (1800 PSI)
Maximum Drain Flow	120 mL/min. (0.03 GPM)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C ("D"-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Campatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.23 kg (0.5 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NTF10-3R Finisher NFT10-3F

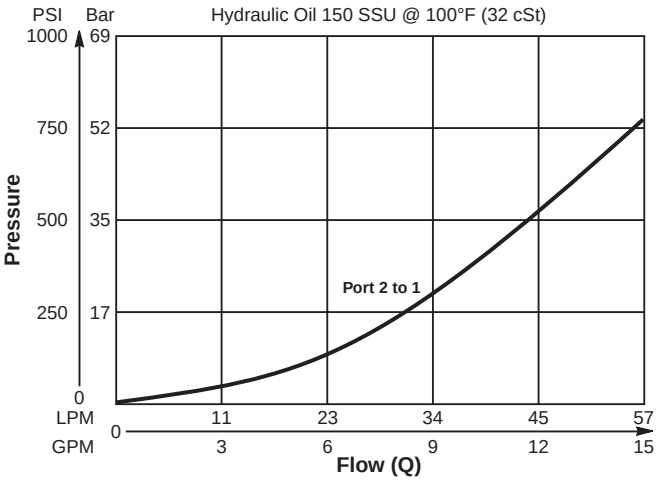
Performance Curves

(Pressure rise through cartridge only)

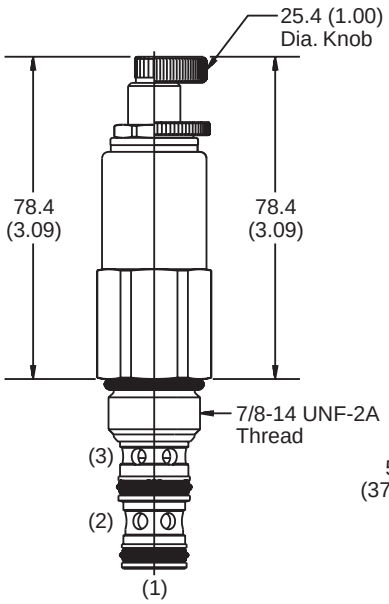
Flow vs. Regulated Pressure



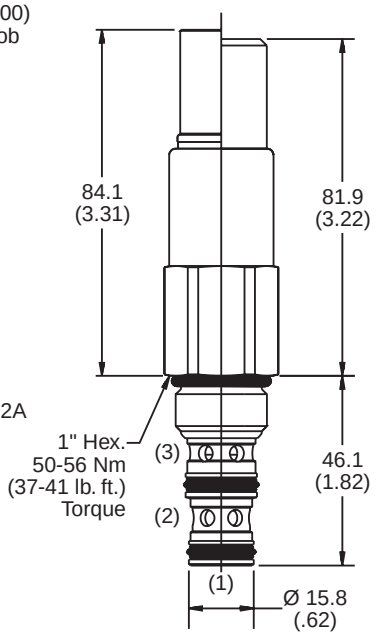
Pressure vs. Flow



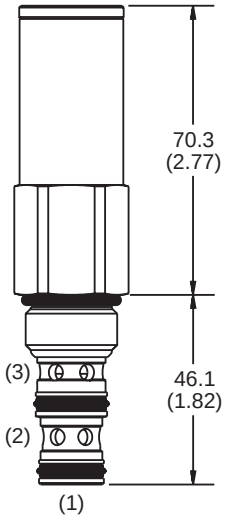
Dimensions Millimeters (Inches)



Screw/Knob Version



Fixed Cap/Tamper Resistant Version



Non-Adjustable Version

THIRD-ANGLE PROJECTION

Ordering Information

PR103				—		—		
10 Size D.A. Pressure Reducing/Relieving Valve	Adjustment Style	Pressure Range	Seals		Optional Pressure Setting		Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-10)
N	Non-Adjustable
S	Screw Adjust
T	Tamper Resistant Cap (717943)

Code	Pressure Range
02	3.5 - 13.8 Bar (50 - 200 PSI) Standard Setting: 6.9 Bar (100 PSI) @ .95 LPM (.25 GPM)
06	6.9 - 41.4 Bar (100 - 600 PSI) Standard Setting: 20.7 Bar (300 PSI) @ .95 LPM (.25 GPM)
12	13.8 - 83 Bar (200 - 1200 PSI) Standard Setting: 41.4 Bar (600 PSI) @ .95 LPM (.25 GPM)
21	27.6 - 124 Bar (400 - 1800 PSI) Standard Setting: 69 Bar (1000 PSI) @ .95 LPM (.25 GPM)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK10-3)
N	Nitrile / (SK10-3N)
V	Fluorocarbon / (SK10-3V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 150 = 1500 PSI (Omit if standard setting is used) Setting Range: 50 to 2100 PSI All settings at .95 LPM (.25 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8P)

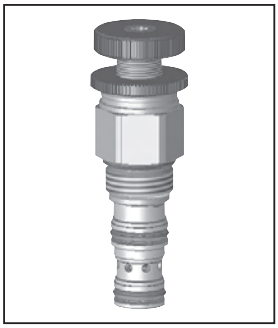
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

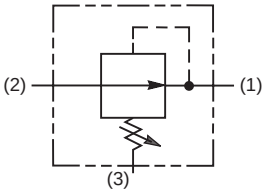
General Description

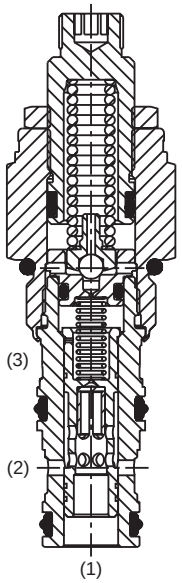
Pilot Operated Pressure Reducing Valve.
For additional information see Technical Tips on pages PC1-PC6.

Features

- Hardened, precision ground parts for durability
- Low profile adapter for minimal space requirements
- Fully guided pilot for more consistent reseat
- Steel adapters are coated with yellow zinc dichromate for protection from salt spray
- Polyurethane “D”-Ring eliminates backup rings and prevents hydrolysis
- Internal screening protects pilot spring from debris





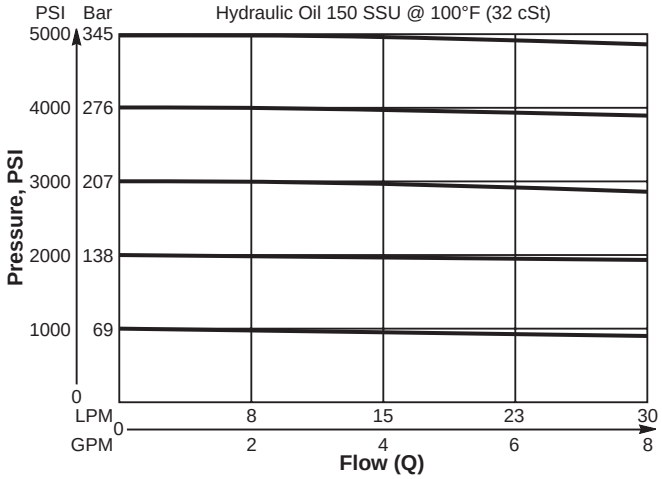


Specifications

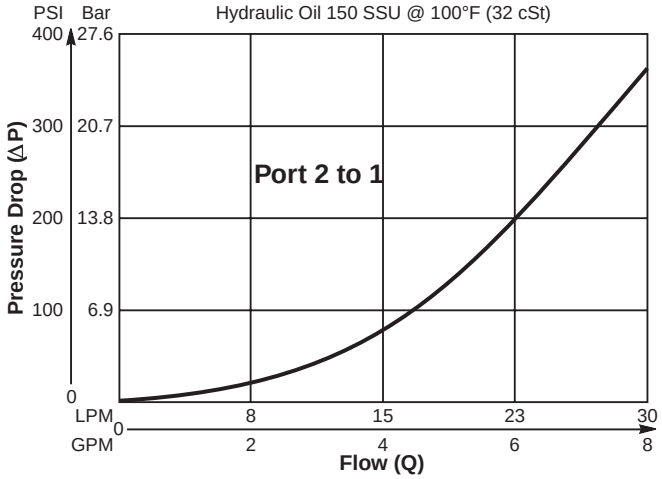
Rated Flow	30 LPM (8 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Maximum Drain Flow	0.56 LPM (0.15 GPM)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Campatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.11 kg (.25 lbs.)
Cavity	C08-3 (See BC Section for more details)
Form Tool	Rougher NTF08-3R Finisher NFT08-3F

Performance Curves

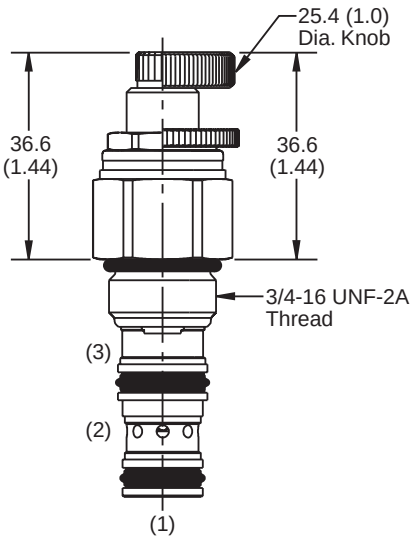
Flow vs. Pressure (Through cartridge only)



Flow vs. Pressure Drop (Through cartridge only)

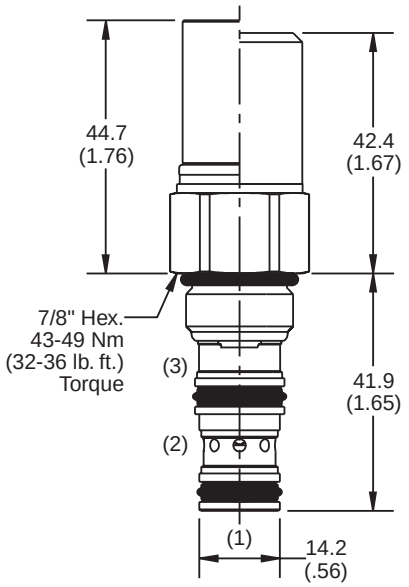


Dimensions Millimeters (Inches)



THIRD-ANGLE PROJECTION

Screw/Knob Version



Fixed Cap/Tamper Resistant Version

Ordering Information

PRH082							
08 Size P.O. Pressure Reducing Valve	Adjustment Style	Pressure Range	Seals	—	Optional Pressure Setting	Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-10)
S	Screw Adjust
T	Tamper Resistant Cap (717943)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
20	6.9 - 138 Bar (100 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
30	13.8 - 207 Bar (200 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
50	13.8 - 345 Bar (200 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK08-3)
N	Nitrile / (SK08-3N)
V	Fluorocarbon / (SK08-3V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at crack pressure, approximately .95 LPM (.25 GPM)

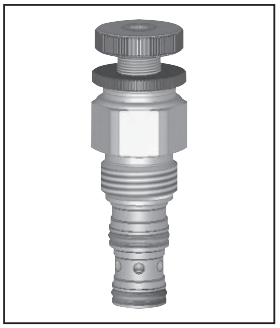
Code	Body Material
Omit	Steel
A	Aluminum

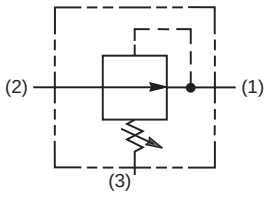
Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-3-*4P)
4T	SAE-4	(B08-3-*4T)
6T	SAE-6	(B08-3-*6T)
6B	3/8″ BSPG	(B08-3-*6B)

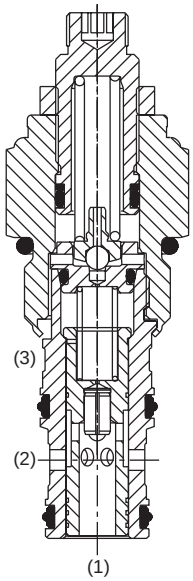
**** Add "A" for aluminum, omit for steel.***

General Description

Pilot Operated Pressure Reducing Valve.
For additional information see Technical Tips on pages PC1-PC6.







Features

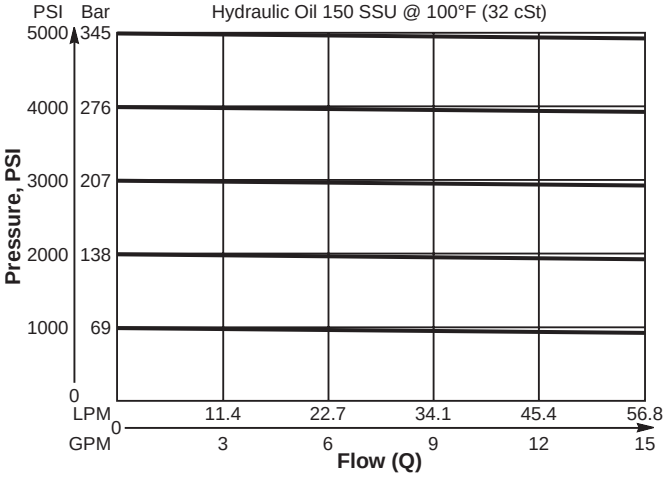
- Hardened, precision ground parts for durability
- Low profile adapter for minimal space requirements
- Fully guided poppet for more consistent reseat
- Steel adapters are coated with yellow zinc dichromate for protection from salt spray
- Polyurethane “D”-Ring eliminates backup rings and prevents hydrolysis
- Internal screening protects pilot spring from debris

Specifications

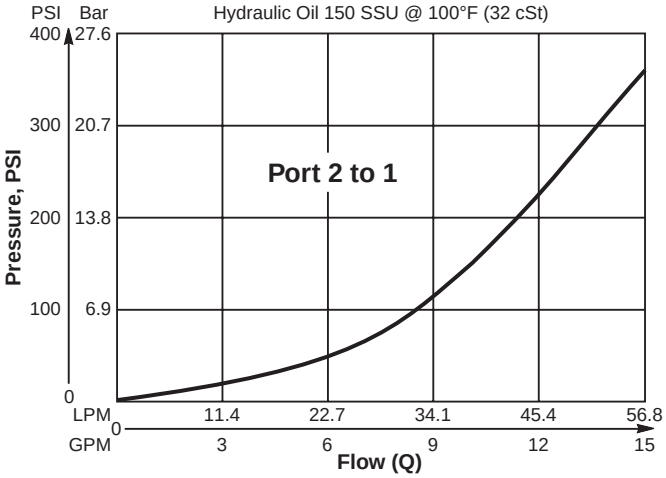
Rated Flow	56.3 LPM (15 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Maximum Drain Flow	0.94 LPM (0.25 GPM)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Campatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.23 kg (0.5 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NTF10-3R Finisher NFT10-3F

Performance Curves

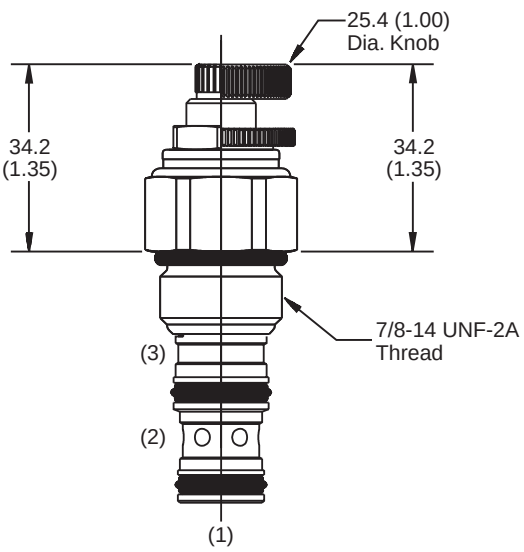
Flow vs. Pressure (Through cartridge only)



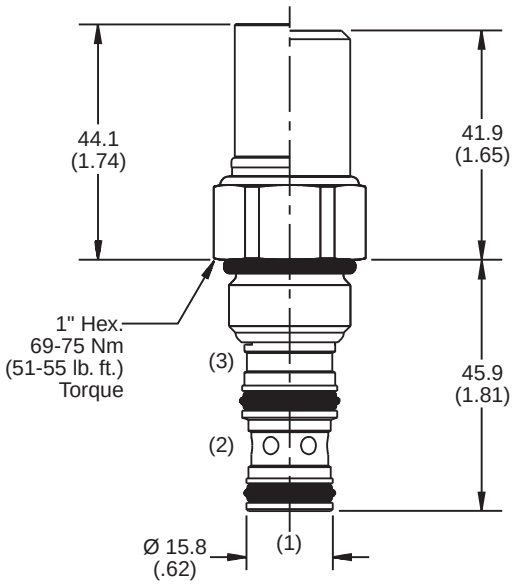
Pressure vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Screw/Knob Version



Fixed Cap/Tamper Resistant Version

THIRD-ANGLE PROJECTION

Ordering Information

PRH102				—		—		
10 Size P.O. Pressure Reducing Valve	Adjustment Style	Pressure Range	Seals		Optional Pressure Setting		Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-10)
S	Screw Adjust
T	Tamper Resistant Cap (718083)

Code	Pressure Range
03	4.8 - 20.7 Bar (70 - 300 PSI) Standard Setting: 10.4 Bar (150 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
20	6.9 - 138 Bar (100 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
30	13.8 - 207 Bar (200 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
50	13.8 - 345 Bar (200 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK10-3)
N	Nitrile / (SK10-3N)
V	Fluorocarbon / (SK10-3V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at crack pressure, approximately .95 LPM (.25 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8B)

**** Add "A" for aluminum, omit for steel.***
† Steel Body only.

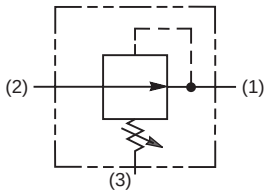
General Description

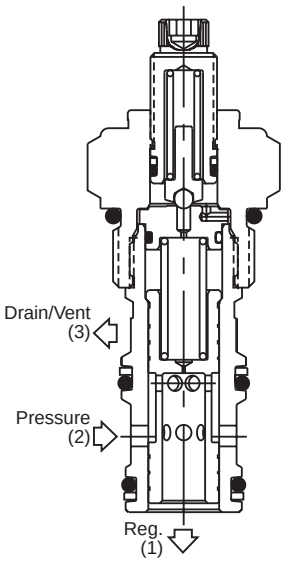
Pilot Operated Pressure Reducing Valve. For additional information see Technical Tips on pages PC1-PC6.

Features

- Hardened, precision ground parts for durability
- High accuracy, pilot operation design
- Ball-type pilot for added stability
- All external parts have yellow zinc dichromate. This coating is ideal for salt spray applications.







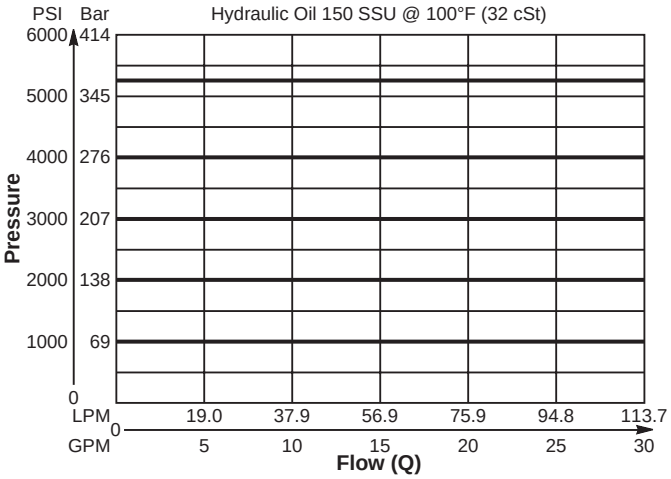
Specifications

Rated Flow	113.7 LPM (30 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Maximum Drain Flow	1.9 LPM (0.50 GPM)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range (Ambient)	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.27 kg (0.6 lbs.)
Cavity	C12-3 (See BC Section for more details)
Form Tool	Rougher NFT12-3R Finisher NFT12-3F

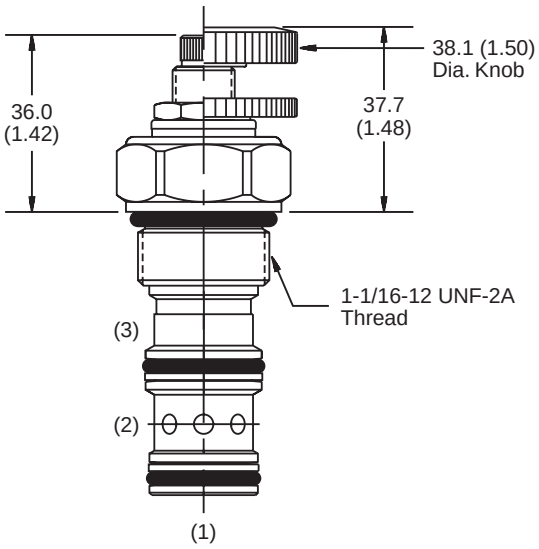
Performance Curve

Flow vs. Pressure

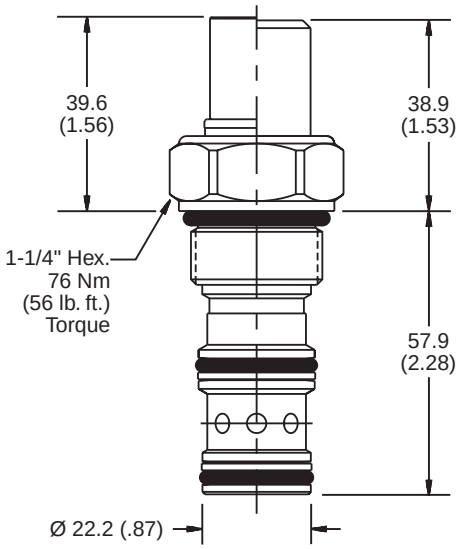
(Pressure rise through cartridge only)



Dimensions Millimeters (Inches)



Screw/Knob Version



Fixed Cap/Tamper Resistant Version

THIRD-ANGLE PROJECTION

Ordering Information

PRH122							
12 Size P.O. Pressure Reducing Valve	Adjustment Style	Pressure Range	Seals	—	Optional Pressure Setting	Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-15)
S	Screw Adjust
T	Tamper Resistant Cap (717785)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ 11.3 LPM (3 GPM)
20	13.8 - 138 Bar (200 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ 11.3 LPM (3 GPM)
30	20.7 - 207 Bar (300 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ 11.3 LPM (3 GPM)
50	34.5 - 345 Bar (500 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ 11.3 LPM (3 GPM)

Code	Seals / Kit No.
Omit	Nitrile / (SK12-3)
V	Fluorocarbon / (SK12-3V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit is standard setting is used) Setting Range: 100 to 5000 PSI All settings at 11.3 LPM (3 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
8T	SAE-8	(B12-3-*8T)
12T	SAE-12	(B12-3-*12T)
8B	1/2″ BSPG	(B12-3-8B)†

**** Add "A" for aluminum, omit for steel.***
† Steel Body only.

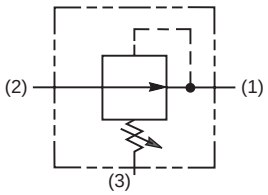
General Description

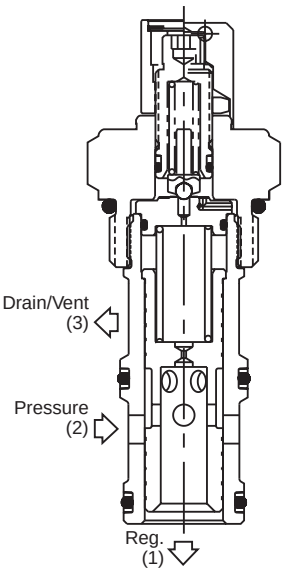
Pilot Operated Pressure Reducing Valve. For additional information see Technical Tips on pages PC1-PC6.

Features

- Hardened, precision ground parts for durability
- High accuracy, pilot operation design
- Ball-type pilot for added stability
- All external parts have yellow zinc dichromate. This coating is ideal for salt spray applications.







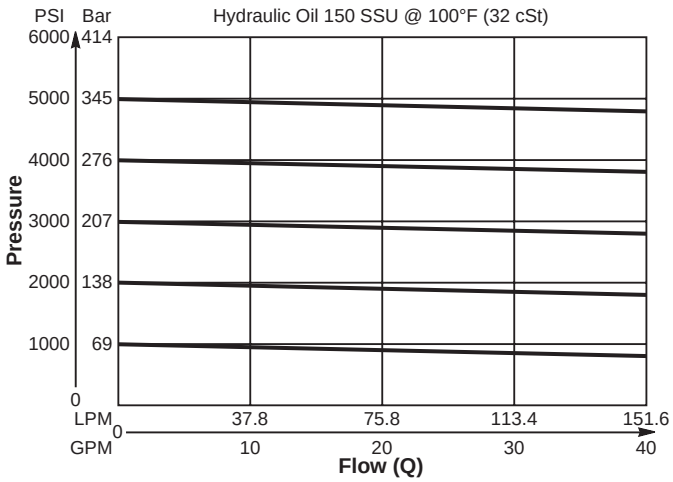
Specifications

Rated Flow	150 LPM (40 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Maximum Drain Flow	0.94 LPM (0.25 GPM)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Campatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.9 kg (2.0 lbs.)
Cavity	C16-3 (See BC Section for more details)
Form Tool	Rougher NTF16-3R Finisher NFT16-3F

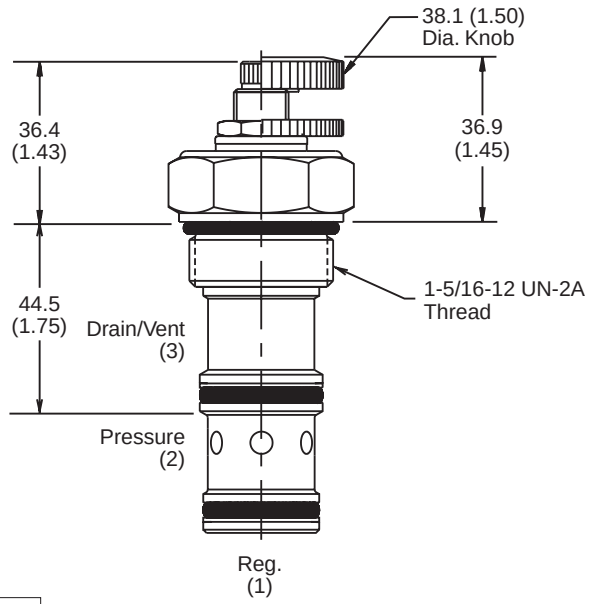
Performance Curve

Flow vs. Pressure

(Pressure rise through cartridge only)

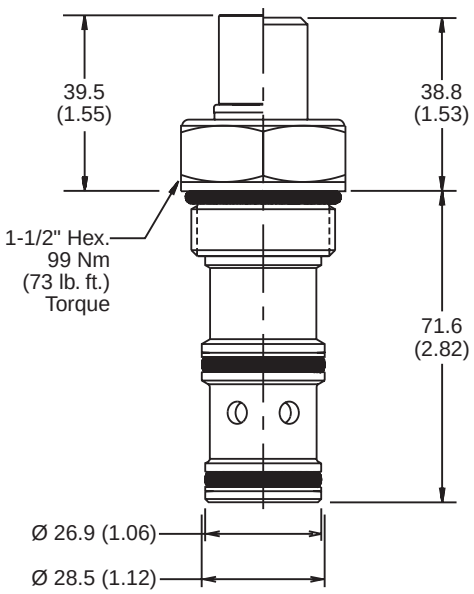


Dimensions Millimeters (Inches)



THIRD-ANGLE PROJECTION

Screw/Knob Version



Fixed Cap/Tamper Resistant Version

Ordering Information

PRH162				—		—		
16 Size P.O. Pressure Reducing Valve	Adjustment Style	Pressure Range	Seals		Optional Pressure Setting		Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-15)
S	Screw Adjust
T	Tamper Resistant Cap (717785)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ 11.3 LPM (3 GPM)
20	13.8 - 138 Bar (200 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ 11.3 LPM (3 GPM)
30	20.7 - 207 Bar (300 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ 11.3 LPM (3 GPM)
50	34.5 - 345 Bar (500 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ 11.3 LPM (3 GPM)

Code	Seals / Kit No.
Omit	Nitrile / (SK16-3)
V	Fluorocarbon / (SK16-3V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at 11.3 LPM (3 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
12T	SAE-12	(B16-3-*12T)
16T	SAE-16	(B16-3-*16T)

**** Add "A" for aluminum, omit for steel.***

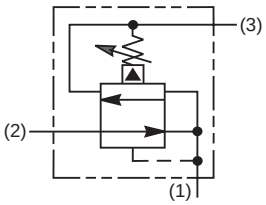
General Description

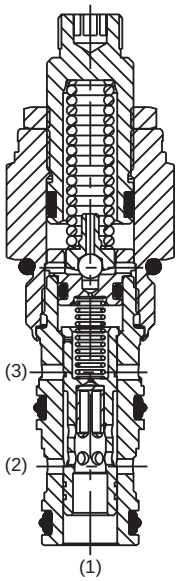
Pilot Operated Pressure Reducing/Relieving Valve. For additional information see Technical Tips on pages PC1-PC6.

Features

- Hardened, precision ground parts for durability
- Low profile adapter for minimal space requirements
- Fully guided pilot for more consistent reseat
- Steel adapters are coated with yellow zinc dichromate for protection from salt spray
- Polyurethane “D”-Ring eliminates backup rings and prevents hydrolysis
- Internal screening protects pilot spring from debris





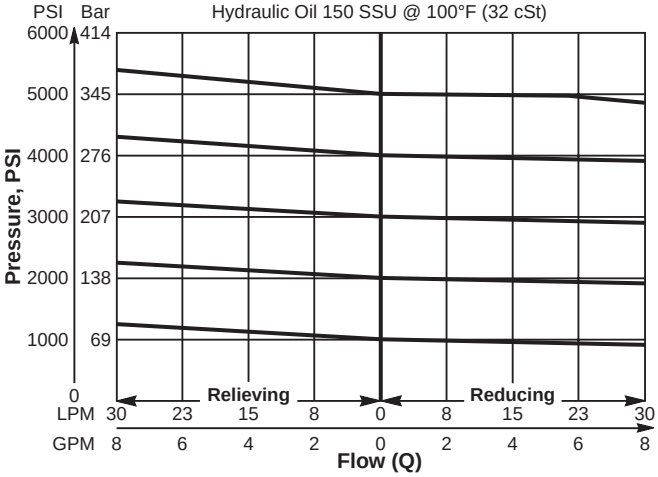


Specifications

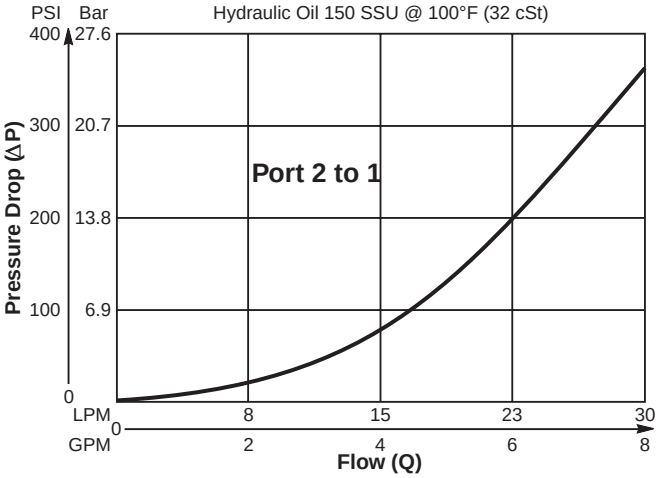
Rated Flow	30 LPM (8 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Maximum Drain Flow	0.56 LPM (0.15 GPM)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Campatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.11 kg (.25 lbs.)
Cavity	C08-3 (See BC Section for more details)
Form Tool	Rougher NTF08-3R Finisher NFT08-3F

Performance Curves

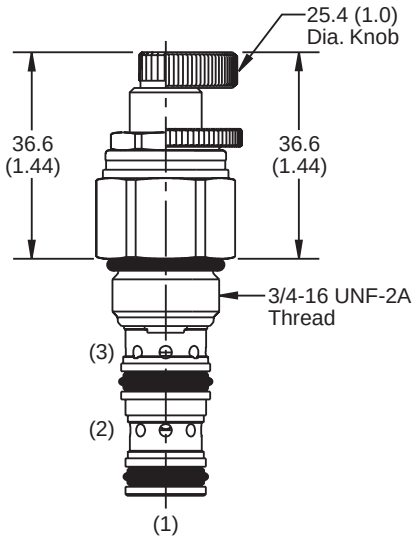
Flow vs. Regulated Pressure (Through cartridge only)



Flow vs. Pressure Drop (Through cartridge only)

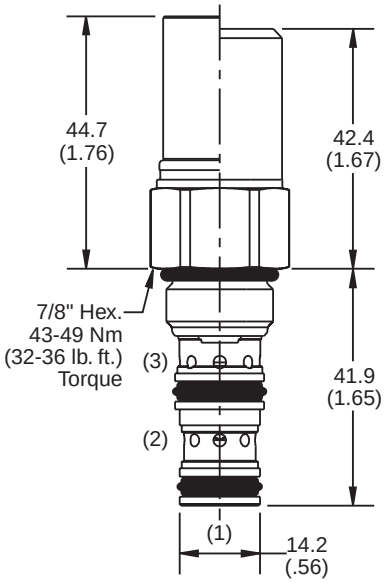


Dimensions Millimeters (Inches)



THIRD-ANGLE PROJECTION

Screw/Knob Version



Fixed Cap/Tamper Resistant Version

Ordering Information

PRH081					—		—	
08 Size P.O. Pressure Reducing/Relieving Valve	Adjustment Style	Pressure Range	Seals		Optional Pressure Setting		Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-10)
S	Screw Adjust
T	Tamper Resistant Cap (717943)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
20	6.9 - 138 Bar (100 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
30	13.8 - 207 Bar (200 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
50	13.8 - 345 Bar (200 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK08-3)
N	Nitrile / (SK08-3N)
V	Fluorocarbon / (SK08-3V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at crack pressure, approximately .95 LPM (.25 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

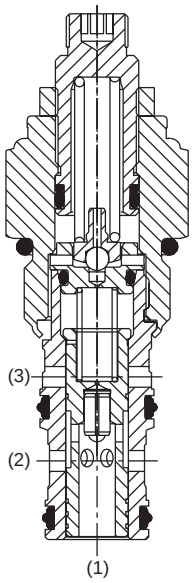
Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-3-*4P)
4T	SAE-4	(B08-3-*4T)
6T	SAE-6	(B08-3-*6T)
6B	3/8″ BSPG	(B08-3-*6B)

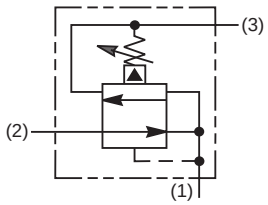
**** Add "A" for aluminum, omit for steel.***

General Description

Pilot Operated Pressure Reducing/Relieving Valve. For additional information see Technical Tips on pages PC1-PC6.







Features

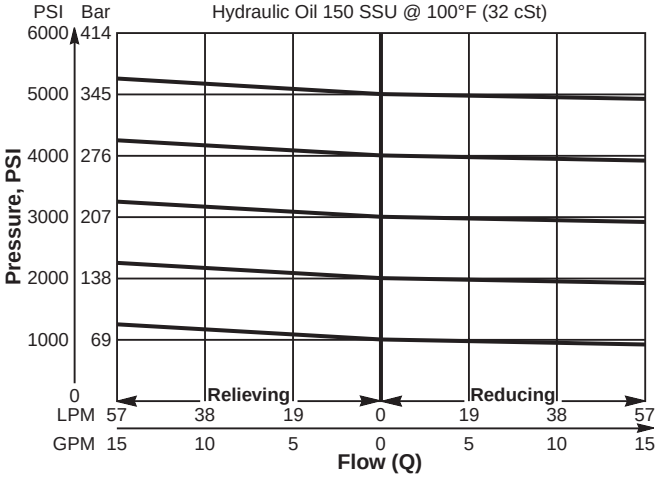
- Hardened, precision ground parts for durability
- Low profile adapter for minimal space requirements
- Fully guided poppet for more consistent reseat
- Steel adapters are coated with yellow zinc dichromate for protection from salt spray
- Polyurethane “D”-Ring eliminates backup rings and prevents hydrolysis
- Internal screening protects pilot spring from debris

Specifications

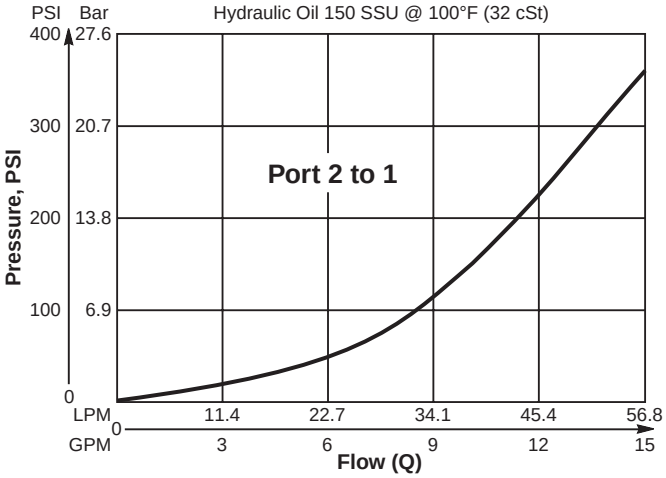
Rated Flow	56.3 LPM (15 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Maximum Drain Flow	0.94 LPM (0.25 GPM)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Campatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.23 kg (0.5 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NTF10-3R Finisher NFT10-3F

Performance Curves

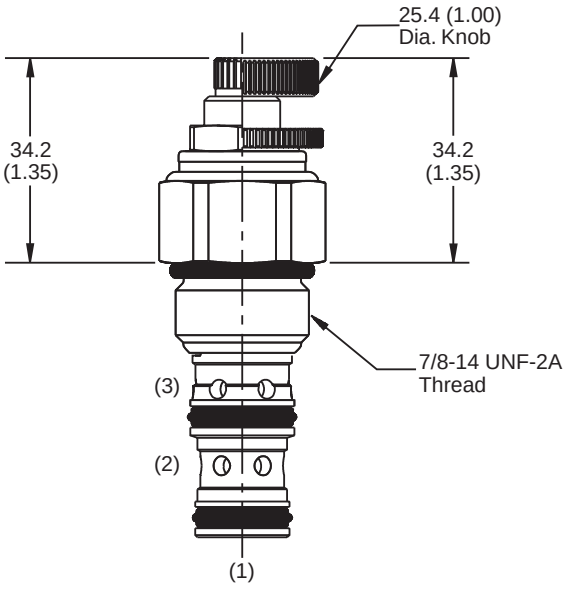
Flow vs. Regulated Pressure (Through cartridge only)



Pressure vs. Flow (Through cartridge only)

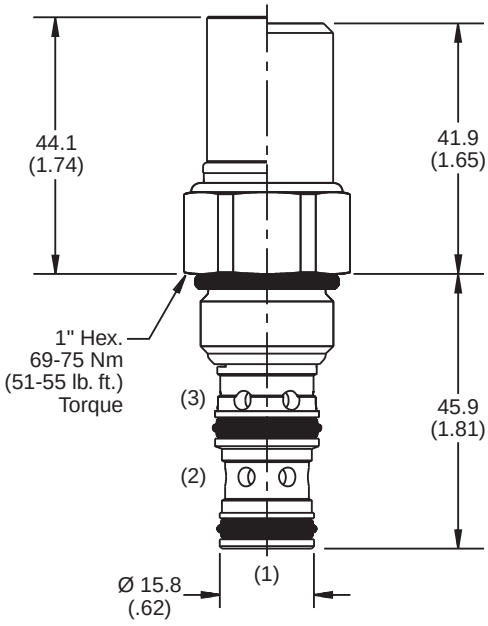


Dimensions Millimeters (Inches)



THIRD-ANGLE PROJECTION

Screw/Knob Version



Fixed Cap/Tamper Resistant Version

Ordering Information

PRH101								
10 Size P.O. Pressure Reducing/Relieving Valve	Adjustment Style	Pressure Range	Seals	—	Optional Pressure Setting	—	Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-10)
S	Screw Adjust
T	Tamper Resistant Cap (718083)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
20	6.9 - 138 Bar (100 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
30	13.8 - 207 Bar (200 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
50	13.8 - 345 Bar (200 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK10-3)
N	Nitirle / (SK10-3N)
V	Fluorocarbon / (SK10-3V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at crack pressure, approximately .95 LPM (.25 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8P)

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

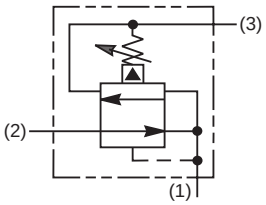
General Description

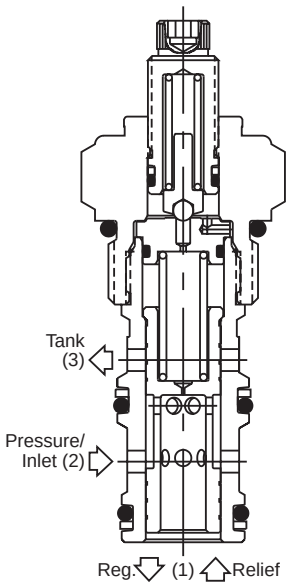
Pilot Operated Pressure Reducing/Relieving Valve. For additional information see Technical Tips on pages PC1-PC6.

Features

- Hardened, precision ground parts for durability
- Ball-type pilot for added stability
- Full capacity reducing/relieving
- Performs job of two separate valves in one
- All external parts have yellow zinc dichromate. This coating is ideal for salt spray applications.







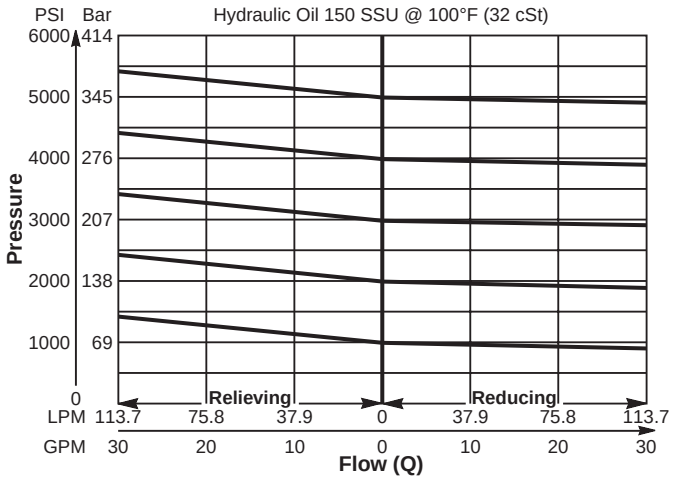
Specifications

Rated Flow	113.7 LPM (30 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Maximum Drain Flow	0.94 LPM (0.25 GPM)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Campatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.27 kg (0.6 lbs.)
Cavity	C12-3 (See BC Section for more details)
Form Tool	Rougher NTF12-3R Finisher NFT12-3F

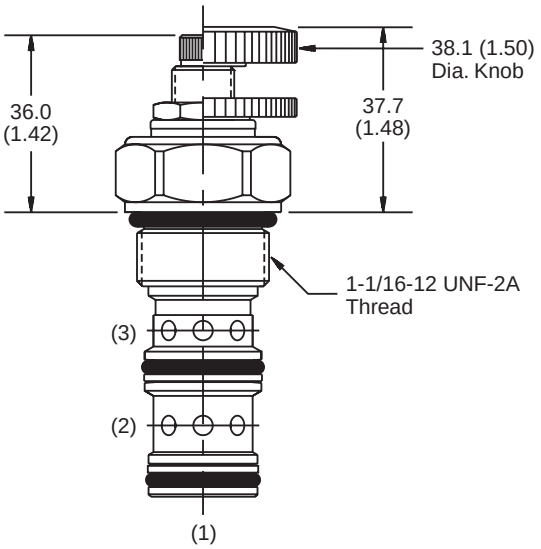
Performance Curve

Flow vs. Regulated Pressure

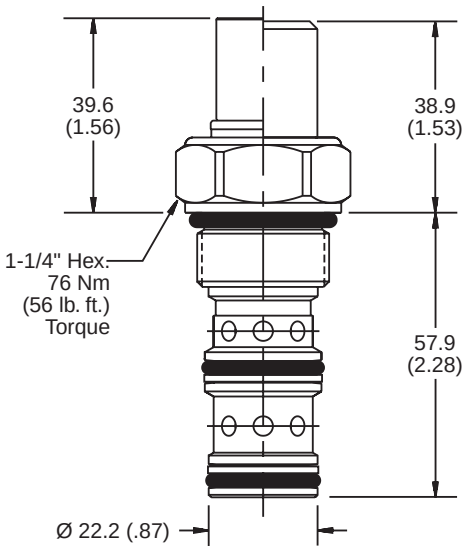
(Pressure rise through cartridge only)



Dimensions Millimeters (Inches)



Screw/Knob Version



Fixed Cap/Tamper Resistant Version

THIRD-ANGLE PROJECTION

Ordering Information

PRH121							
12 Size P.O. Pressure Reducing/Relieving Valve	Adjustment Style	Pressure Range	Seals	—	Optional Pressure Setting	Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-15)
S	Screw Adjust
T	Tamper Resistant Cap (717785)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ 11.3 LPM (3 GPM)
20	13.8 - 138 Bar (200 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ 11.3 LPM (3 GPM)
30	20.7 - 207 Bar (300 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ 11.3 LPM (3 GPM)
50	34.5 - 345 Bar (500 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ 11.3 LPM (3 GPM)

Code	Seals / Kit No.
Omit	Nitrile / (SK12-3)
V	Fluorocarbon / (SK12-3V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at 11.3 LPM (3 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
8T	SAE-8	(B12-3-*8T)
12T	SAE-12	(B12-3-*12T)
8B	1/2″ BSPG	(B12-3-8B)†

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

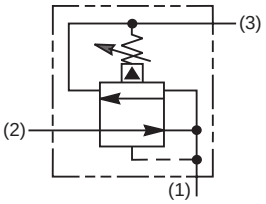
General Description

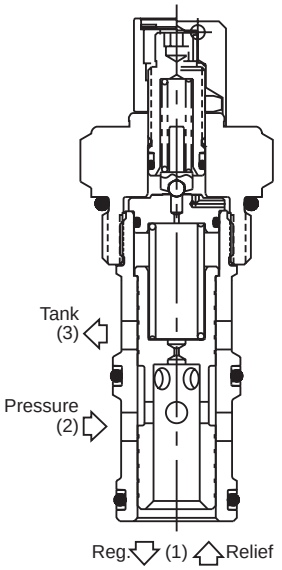
Pilot Operated Pressure Reducing/Relieving Valve. For additional information see Technical Tips on pages PC1-PC6.

Features

- Hardened, precision ground parts for durability
- Ball-type pilot for added stability
- Full capacity reducing/relieving
- Performs job of two separate valves in one
- All external parts have yellow zinc dichromate. This coating is ideal for salt spray applications.







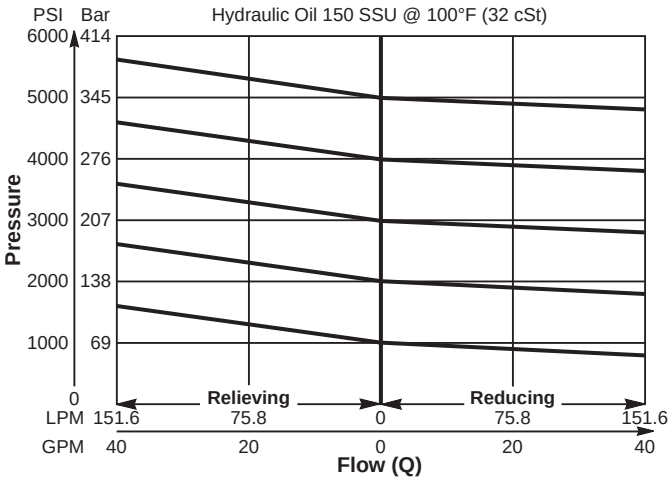
Specifications

Rated Flow	150 LPM (40 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Maximum Drain Flow	1.9 LPM (0.5 GPM)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Campatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.9 kg (2.0 lbs.)
Cavity	C16-3 (See BC Section for more details)
Form Tool	Rougher NTF16-3R Finisher NFT16-3F

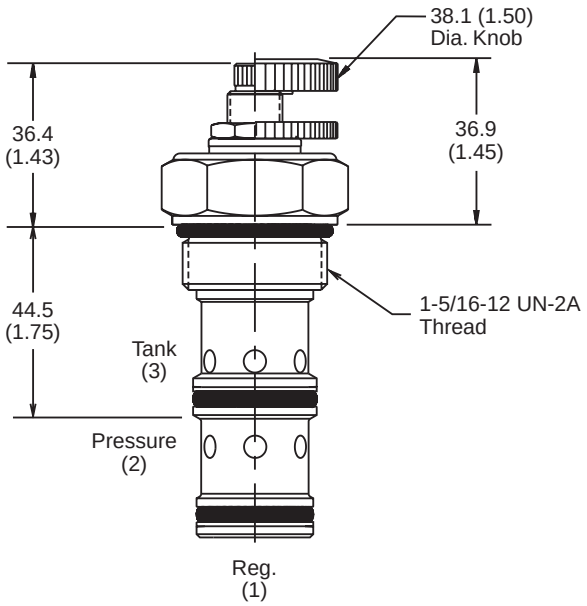
Performance Curve

Flow vs. Regulated Pressure

(Pressure rise through cartridge only)

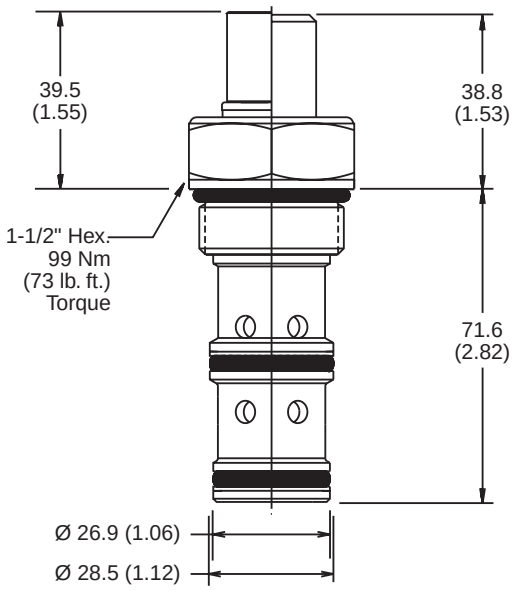


Dimensions Millimeters (Inches)



THIRD-ANGLE PROJECTION

Screw/Knob Version



Fixed Cap/Tamper Resistant Version

Ordering Information

PRH161				—		—		
16 Size P.O. Pressure Reducing/Relieving Valve	Adjustment Style	Pressure Range	Seals		Optional Pressure Setting		Body Material	Port Size

Code	Adjustment Style / Kit No.
F	Fixed style, preset at factory.
K	Knob Adjust (717784-15)
S	Screw Adjust
T	Tamper Resistant Cap (717785)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ 11.3 LPM (3 GPM)
20	13.8 - 138 Bar (200 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ 11.3 LPM (3 GPM)
30	20.7 - 207 Bar (300 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ 11.3 LPM (3 GPM)
50	34.5 - 345 Bar (500 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ 11.3 LPM (3 GPM)

Code	Seals / Kit No.
Omit	Nitrile / (SK16-3)
V	Fluorocarbon / (SK16-3V)

Optional Pressure Setting
Pressure ÷ 10 i.e. 235 = 2350 PSI (Omit if standard setting is used) Setting Range: 100 to 5000 PSI All settings at 11.3 LPM (3 GPM)

Code	Body Material
Omit	Steel
A	Aluminum

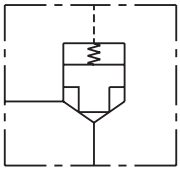
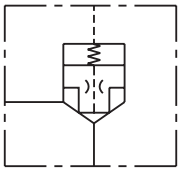
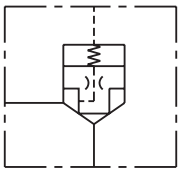
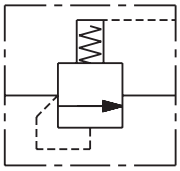
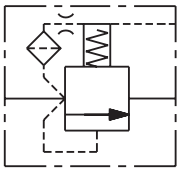
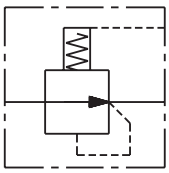
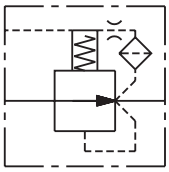
Code	Port Size	Body Part No.
Omit	Cartridge Only	
12T	SAE-12	(B16-3-*12T)
16T	SAE-16	(B16-3-*16T)

**** Add "A" for aluminum, omit for steel.***

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PAGE

Contents

Logic Elements

	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
	**POPPET TYPE**					
	10SLC1-A	C10-3S	Normally Closed, Pilot to Close	57/15	240/3500	LE7
	16SLC1-A	C16-3S	Normally Closed, Pilot to Close	189/50	240/3500	LE8
	20SLC1-A	C20-3S	Normally Closed, Pilot to Close	303/80	240/3500	LE9
	16SLC1-B	C16-3S	Normally Closed, Vent to Open	189/50	240/3500	LE10
	16SLC1-C	C16-3S	Normally Closed, Vent to Open	189/50	240/3500	LE11
	**SPOOL TYPE**					
	10SLC2-A	C10-3S	Normally Closed, Pilot to Close	57/15	240/3500	LE12
	16SLC2-A	C16-3S	Normally Closed, Pilot to Close	189/50	240/3500	LE13
	20SLC2-A	C20-3S	Normally Closed, Pilot to Close	303/80	240/3500	LE14
	R04E3	C10-3S	Normally Closed, Pilot to Close	170/45	420/6000	LE15
	R06E3	C16-3S	Normally Closed, Pilot to Close	400/106	420/6000	LE16
	R08E3	C20-3S	Normally Closed, Pilot to Close	500/132	420/6000	LE17
	10SLC2-B	C10-3S	Normally Closed, Vent to Open	57/15	240/3500	LE18
	16SLC2-B	C16-3S	Normally Closed, Vent to Open	189/50	240/3500	LE19
	20SLC2-B	C20-3S	Normally Closed, Vent to Open	303/80	240/3500	LE20
	R04F3	C10-3S	Normally Closed, Vent to Open	170/45	420/6000	LE21
	R06F3	C16-3S	Normally Closed, Vent to Open	400/106	420/6000	LE22
	R08F3	C20-3S	Normally Closed, Vent to Open	500/132	420/6000	LE23
	10SLC3-A	C10-3S	Normally Open, Vent to Close	57/15	240/3500	LE24
	16SLC3-A	C16-3S	Normally Open, Vent to Close	189/50	240/3500	LE25
	R04H3	C10-3S	Normally Open, Vent to Close	57/15	420/6000	LE26
	R06H3	C16-3S	Normally Open, Vent to Close	160/42	420/6000	LE27
	10SLC3-B	C10-3S	Normally Open, Vent to Close	57/15	240/3500	LE28
	16SLC3-B	C16-3S	Normally Open, Vent to Close	189/50	240/3500	LE29
	R04G3	C10-3S	Normally Open, Vent to Close	57/15	420/6000	LE30
	R06G3	C16-3S	Normally Open, Vent to Close	160/42	420/6000	LE31

INTRODUCTION:

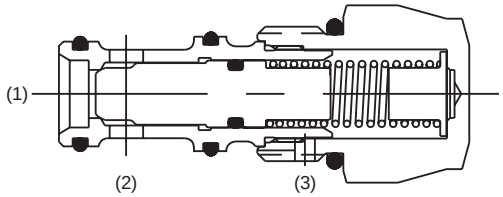
Parker's logic valves offer system designers a versatile range of screw-in elements that, when used in the proper combinations, can provide flexible design solutions for many common cartridge valve applications. They offer system designers the advantage of applying cartridge valve technology in applications where the flow and pressure conditions may exceed the limits of typical cartridge valves. Logic valves are essentially high flow poppet or spool elements that are controlled by small pilot devices. They can be used to control flow, pressure, or direction, and when applied in the proper arrangements, can perform multi-task control functions. Parker's logic valves offer system designers alternative products that can help reduce the size, cost, and complexity of integrated manifold systems.

NEW PRODUCTS:

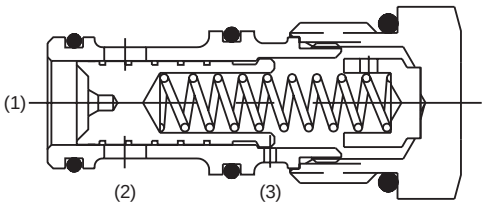
Parker Logic Valves are offered in two basic categories: Poppet and Spool.

Now Available in 6000 PSI

Poppet Type - Used for flow switching directional control applications.

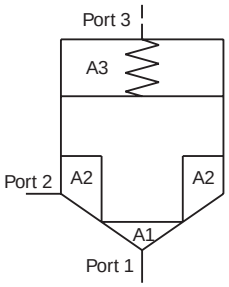


Spool Type - Used for pressure sensing in modulating applications to regulate flow and pressure.



PRODUCT TYPES / APPLICATIONS

POPPET TYPE



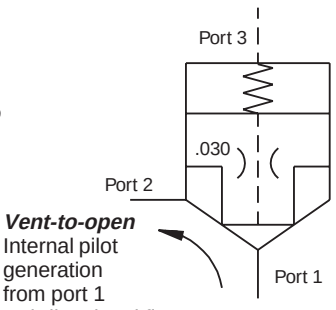
A1 + A2 = A3

Poppet type logic valves are 3 ported, 2-way on/off valves that switch flow between port 1 and port 2. The poppet's on/off action is operated by controlling pilot oil at port 3 of the valve. A small low flow solenoid or pilot valve is an ideal control for this purpose. Parker offers vent-to-open and pilot-to-close style poppet logic valves.

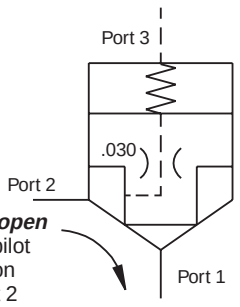
Note: *Poppet logic valves are an unbalanced 2:1 ratio poppet design. The opening and closing of the poppet is dependent on the force balances on the areas of the poppet at port 1, port 2, and port 3.*

Vent-to-open logic valves:

Vent-to-open logic valves are primarily used for uni-directional flow switching applications. The poppet in the vent-to-open logic valve is spring biased to the closed condition. The pilot oil source that operates the logic element is generated internally by direct pressure from either work port 1 or 2, depending on the option chosen. Venting the pilot oil at port 3 allows the valve to open and pass flow between port 1 and port 2 at the bias spring setting. Blocking the pilot at port 3 causes the valve to close. When closed, the 2:1 ratio poppet design provides a positive low leak seal. Because the pilot source is generated internally within the valve, vent-to-open logic valves are best suited for uni-directional applications.



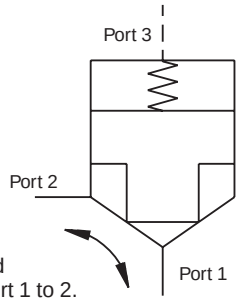
Vent-to-open
Internal pilot generation from port 1
Uni-directional flow, port 1 to 2.



Vent-to-open
Internal pilot generation from port 2
Uni-directional flow, port 2 to 1.

POPPET TYPE *Continued*

Pilot-to-close logic valve:
Pilot-to-close logic elements are primarily used for bi-directional flow switching applications. The poppet in the pilot-to-close logic valve is spring biased to the closed condition. With no pilot signal at port 3, the valve will open allowing flow in either direction between work ports 1 and 2 once pressure at one of the work ports reaches the biased spring setting. Appling a sufficient externally generated pilot force to port 3 of the valve closes the poppet creating a low leak seal between port 1 and port 2.



Pilot-to-close
External pilot required
Bi-directional flow, port 1 to 2.

2-way, 3-way, and 4-way Directional Control:
Poppet logic valves are typically used to perform high flow directional switching operations using small low power pilot valves to control the sequence of the directional operation.

- A single logic valve can be used to control 2-way, on/off switching.
- Multiple elements in a bridge arrangement can control 3-way or 4-way directional switching.
- Since each logic valve is individually controlled, the timing, sequence, and overlap of directional functions can be controlled very precisely.
- Uni-directional or bi-directional flow can be achieved, depending on the valve selected.
- Flows in excess of 80 gpm can be controlled through a single logic element, and more than one logic valve can be used in parallel to control flow in excess of the rated flow of a single element.
- Poppet construction provides a low leak directional control.

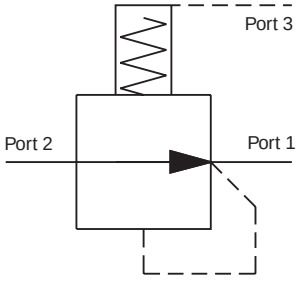
(See circuit examples on pages LE4-LE5)

SPOOL TYPE

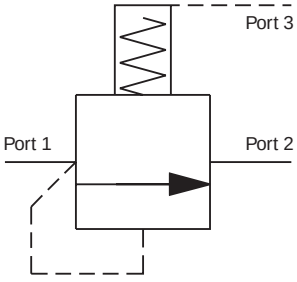
Spool type logic valves can also be used for directional switching, however, they are typically used in modulating applications to control flow or regulate pressure. Virtually any pressure or flow control function can be achieved with a spool type logic valve including; restrictive or priority flow control, pressure relief, pressure reducing, sequencing, and unloading.

The spools in this category of logic valves are balanced designs; the spool area at the work port (port 1) and the pilot port (port 3) are equal (1:1). The spool is held in a biased condition by a spring. Venting the pilot at port 3 creates an unbalanced condition causing the valve spool to modulate open or close, depending on the valve chosen. This spool design makes the valve vary stable because the forces acting to open and close the valve are in balance.

Flow Control / Compensators:
Parker offers two types of logic valves for flow control functions.
1) Normally open spools function as a restrictive type compensator.
2) Normally closed spools function as a priority or by-pass compensator.



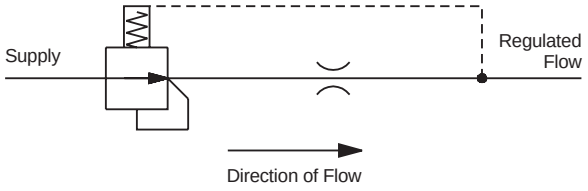
Normally open spool



Normally closed spool

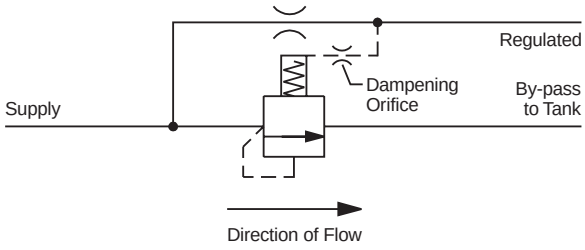
Restrictive Flow Regulator:

Normally open spool type logic elements can be used with an external orifice or valve as a compensator to regulate flow. Used as restrictive compensator, a normally open spool senses the upstream and downstream pressure across an orifice or valve. The spool modulates closed to maintain a constant pressure drop across the controlled device equal to the bias spring in the logic valve, thus maintaining a constant flow rate regardless of changes in upstream or downstream pressure.



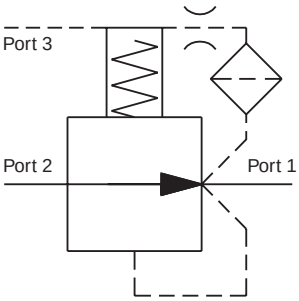
Priority / Bypass Flow Regulator:

A logic valve with a normally closed spool can be used as a priority or by-pass compensator. In this case, the spool modulates open to maintain a constant pressure drop across the controlled orifice or valve, thereby maintaining a constant priority flow regardless of upstream or downstream pressure changes. In a priority arrangement, any oil that doesn't saturate the controlled device is by-passed at load pressure plus the value of the bias spring in the logic valve.

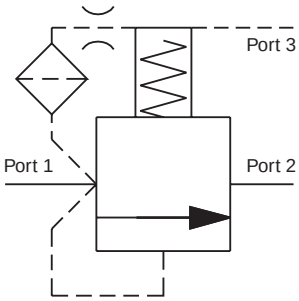


Pressure Control:

Spool type logic valves can be used as the main stage spool in high flow pressure control applications with the logic valve handling the high flow, and a small pilot valve controlling the action of the logic valve spool. Normally open, and normally closed spool options are available enabling virtually all pressure control functions to be achieved. When used in pressure control applications, the logic valve spool modulates open or closed to maintain the pressure setting of the pilot valve communicated to port 3. Pressure control applications require a pilot connection between the control port (port 1 or 2), and the pilot port (port 3). In order to simplify the design, Parker offers spool type logic valves with internal piloting options that can help minimize the number of connections needed. When used in manifold systems, the internal piloting options help to simplify the manifold design by reducing the number of construction drillings in the block. Multiple functions such as relief, pump unloading, and pressure compensation can be performed with one logic valve by communicating multiple pilot devices to the same logic element.



Normally open spool
- Pressure Reducing



Normally closed spool
- Relief
- Sequence
- Unloading

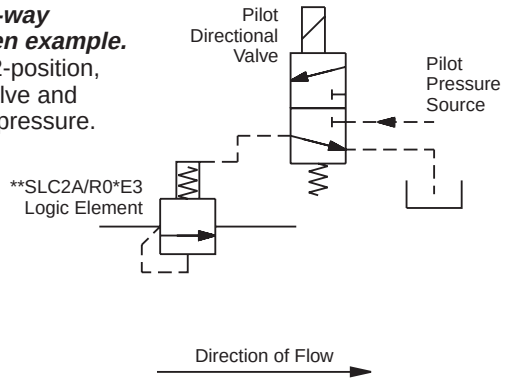
(See circuit examples on page LE6)

Application Note:

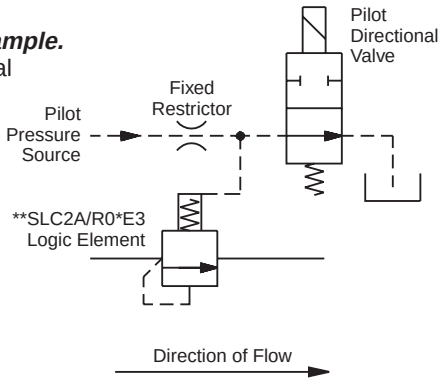
This section is as an application guide, and it is intended to illustrate the various ways that logic elements can be used to create a variety of hydraulic control functions. For additional help applying logic valves, contact your Parker Sales Engineer.

DIRECTIONAL CONTROL EXAMPLES

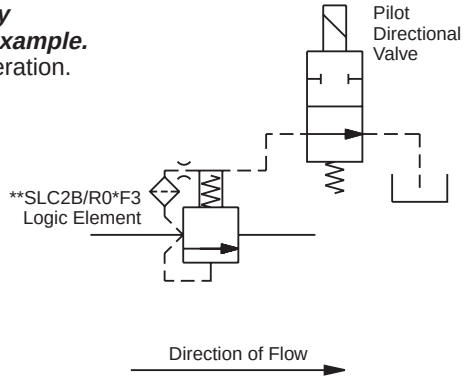
2-position, 2-way normally open example.
Switched by 2-position, 3-way pilot valve and external pilot pressure.



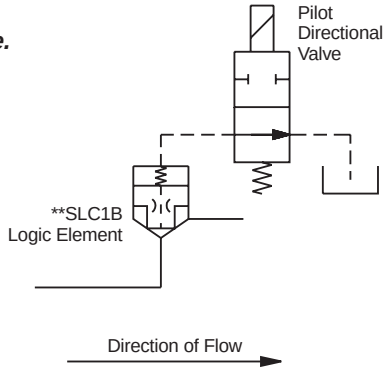
2-position, 2-way normally open example.
Switched by external pilot pressure and vented through 2-position, 2-way pilot valve.



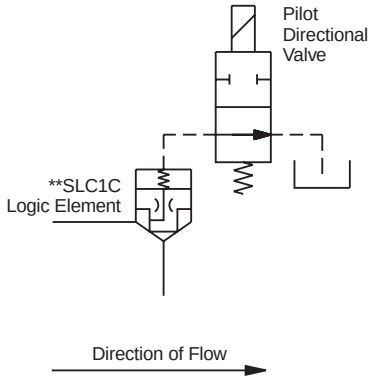
2-position, 2-way normally open example.
Internal pilot generation.



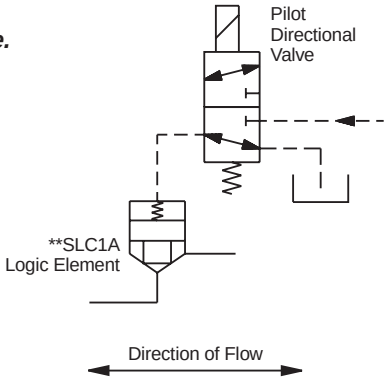
2-position, 2-way normally open example.
Internal pilot generation.



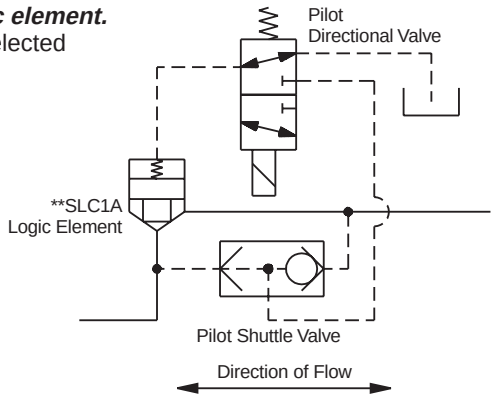
2-position, 2-way normally open example.
Internal pilot generation.



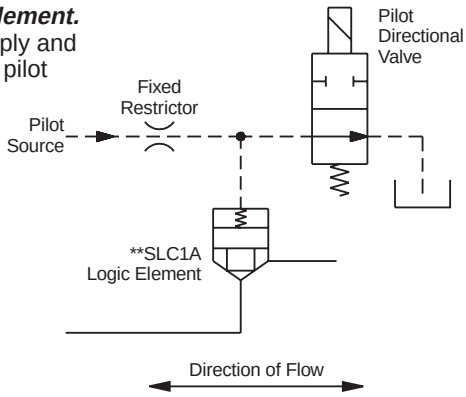
2-position, 2-way normally open example.
Switched by 2-position, 3-way pilot valve and external pilot.



*****SLC1A logic element.***
With shuttle-selected pilot supply.



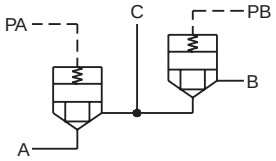
*****SLC1A logic element.***
External pilot supply and 2-position, 2-way pilot directional valve.



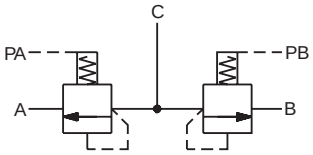
DIRECTIONAL CONTROL EXAMPLES

THREE-WAY BRIDGE CIRCUITS

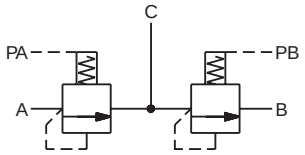
Circuit 1, with **SLC1A poppet logic element.

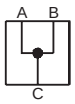
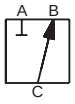


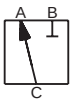
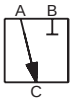
Circuit 2, with **SLC2A/R0*E3 spool logic element.



Circuit 3, with **SLC2A/R0*E3 spool logic element.



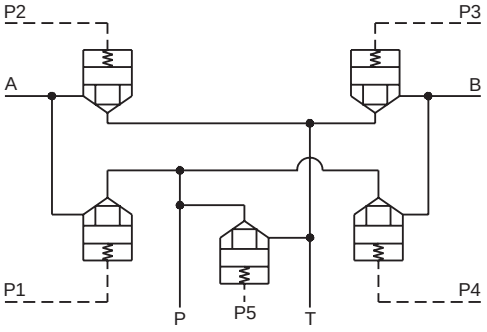
Required Flow Path	Pilot Pressure Applied To		Available From Circuit		
	PA	PB	1	2	3
	NO	NO	X	X	
	YES	NO	X	X	X

Required Flow Path	Pilot Pressure Applied To		Available From Circuit		
	PA	PB	1	2	3
	NO	YES	X	X	
	NO	YES	X		X

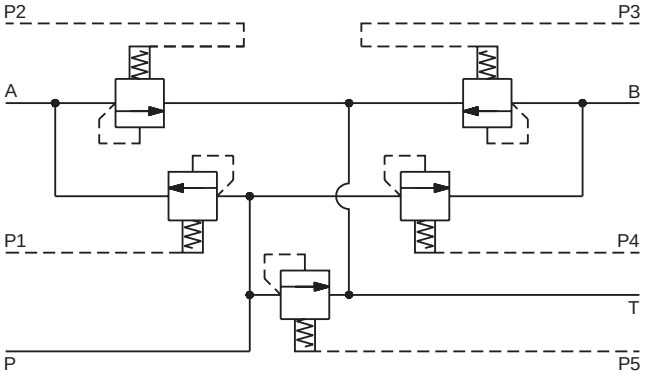
***NOTE:** Pilot pressure must exceed load pressure in order for valve to close.*

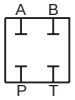
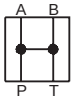
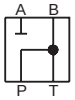
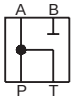
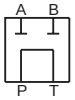
FOUR-WAY BRIDGE CIRCUITS

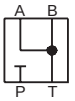
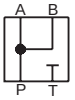
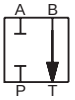
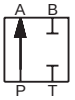
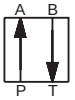
Circuit 1, with **SLC1A poppet logic elements.

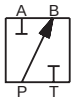


Circuit 2, with **SLC2A/R0*E3 spool logic elements.



Required Flow Path	Pilot Pressure Applied To				
	P1	P2	P3	P4	P5
	YES	YES	YES	YES	YES
	NO	NO	NO	NO	NO
	YES	YES	NO	NO	NO
	NO	NO	YES	YES	NO
	YES	YES	YES	YES	NO

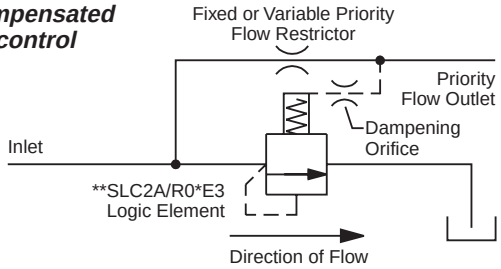
Required Flow Path	Pilot Pressure Applied To				
	P1	P2	P3	P4	P5
	YES	NO	NO	YES	YES
	NO	YES	YES	NO	YES
	YES	YES	NO	YES	YES
	NO	YES	YES	YES	YES
	NO	YES	NO	YES	YES

Required Flow Path	Pilot Pressure Applied To				
	P1	P2	P3	P4	P5
	YES	NO	YES	NO	YES
	YES	YES	YES	NO	YES
	YES	NO	YES	YES	YES

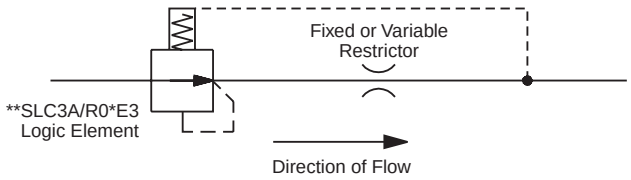
***NOTE:** Pilot pressure must exceed load pressure in order for valve to close.*

FLOW CONTROL EXAMPLES

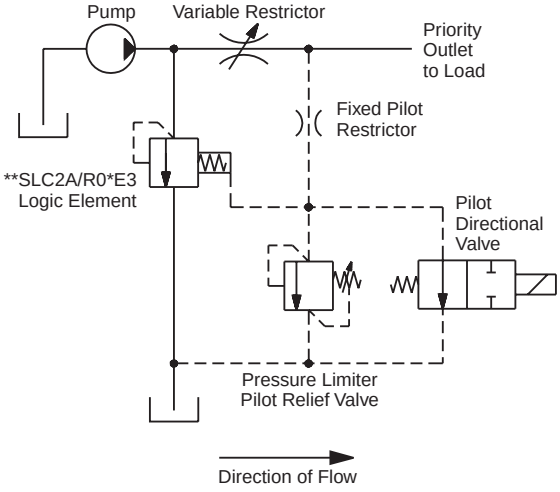
Pressure compensated priority flow control example.



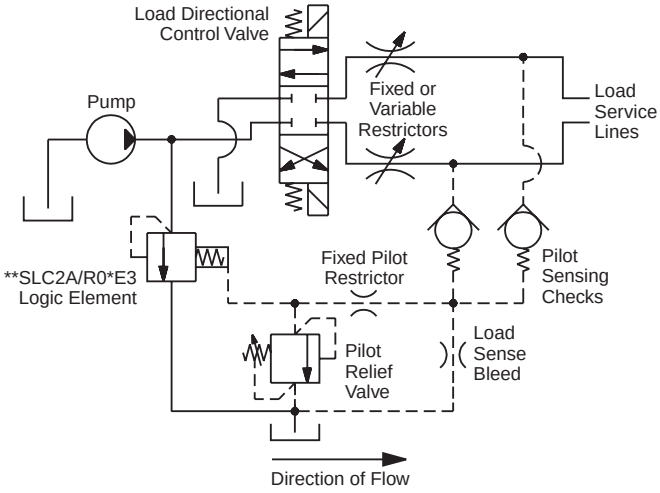
Pressure compensated restrictive flow control example.



Load sensing priority flow control example with pressure limiting and unloading.

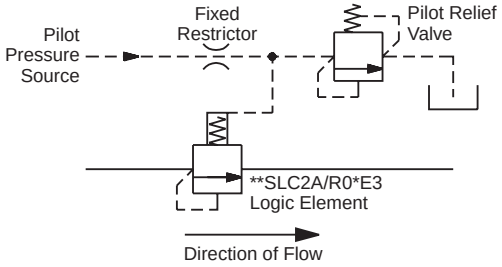


Load sensing priority flow control example with pressure limiter.

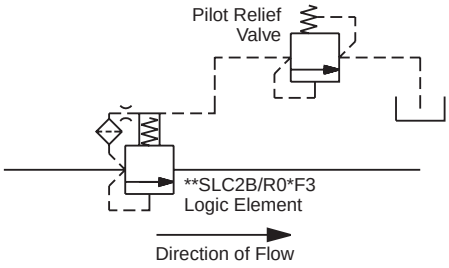


PRESSURE CONTROL EXAMPLES

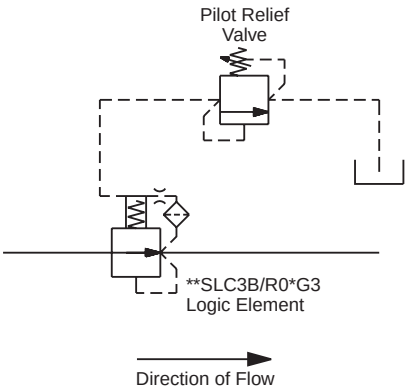
Pressure relief or sequence example with external pilot supply and pilot relief.



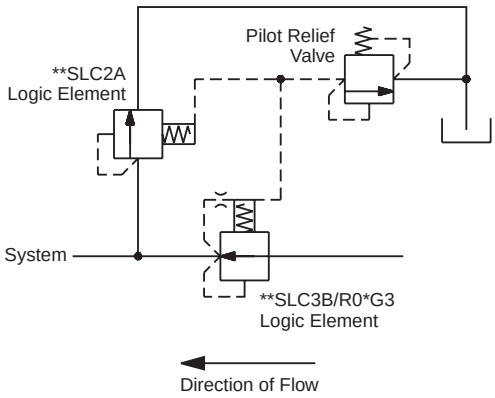
Pressure relief or sequence example with internal pilot supply and pilot relief.



Pressure reducing example, non-relieving type.



Pressure reducing-relieving example.

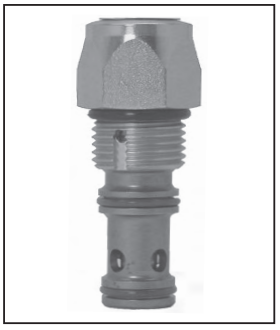


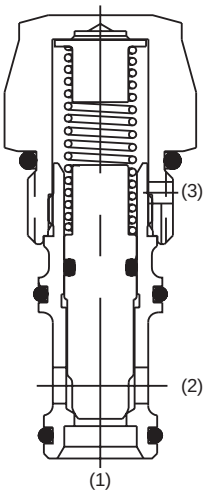
General Description

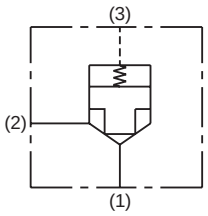
Poppet Type, Bi-Directional, Normally Closed, Pilot to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- Hardened, precision ground parts for durability
- Polyurethane seals only
- No backup rings
- Low leakage design
- All external parts zinc plated

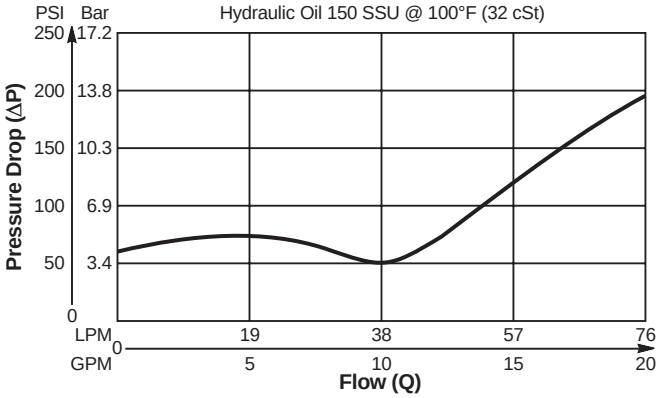




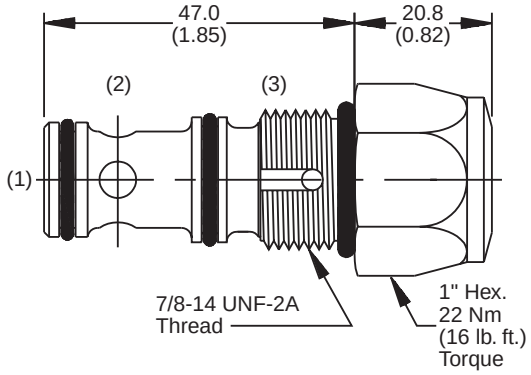


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	57 LPM (15 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage @ 150 SSU (32 cst)	Port 1 to 2 5 drops/min. (.33 cc/min.) @ 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (Polyurethane) (-50°F to +200°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.30 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher NFT10-3SR Finisher NFT10-3SF

Ordering Information

10SLC1	—	A	—	
10 Size Logic Element		Poppet Bi-Directional		Bias Spring

Code	Bias Spring
25	1.7 Bar (25 PSI)
50	3.5 Bar (50 PSI)
75	5.2 Bar (75 PSI)
100	6.9 Bar (100 PSI)
150	10.3 Bar (150 PSI)

Seal Kit
WRK-10-3S

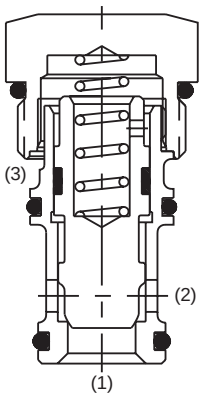
General Description

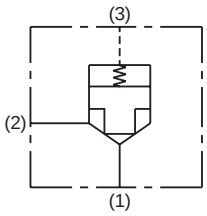
Poppet Type, Bi-Directional, Normally Closed, Pilot to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- Hardened, precision ground parts for durability
- Polyurethane seals only
- No backup rings
- Low leakage design
- All external parts zinc plated

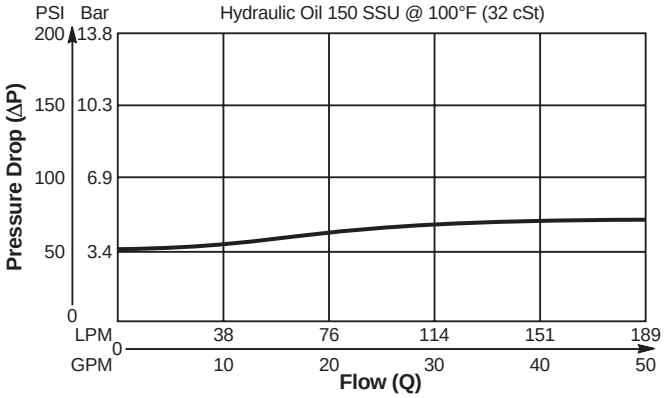




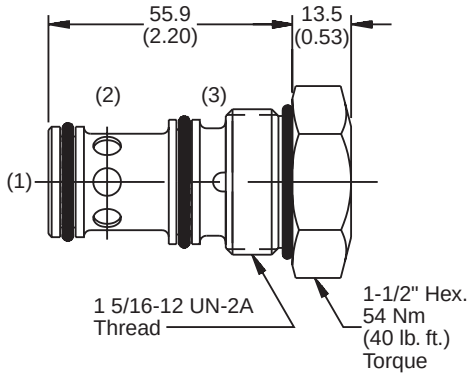


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	189 LPM (50 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage @ 150 SSU (32 cst)	Port 1 to 2 5 drops/min. (.33 cc/min.) @ 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (Polyurethane) (-50°F to +200°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.33 kg (.78 lbs.)
Cavity	C16-3S (See BC Section for more details)
Form Tool	Rougher NFT16-3SR Finisher NFT16-3SF

Ordering Information

16SLC1	—	A	—	
16 Size Logic Element		Poppet Bi-Directional		Bias Spring

Code	Bias Spring
25	1.7 Bar (25 PSI)
50	3.5 Bar (50 PSI)
75	5.2 Bar (75 PSI)
100	6.9 Bar (100 PSI)
150	10.3 Bar (150 PSI)

Seal Kit
WRK-16-3S

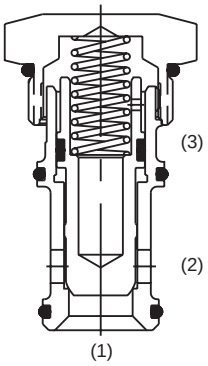
General Description

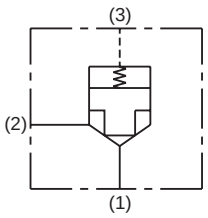
Poppet Type, Bi-Directional , Normally Closed, Pilot to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- Hardened, precision ground parts for durability
- Polyurethane seals only
- No backup rings
- Low leakage design
- All external parts zinc plated

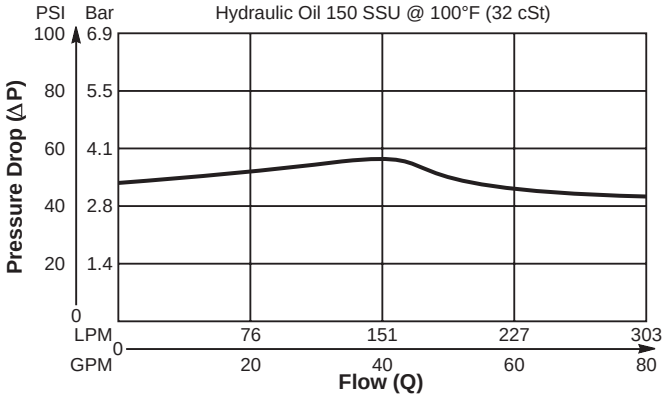




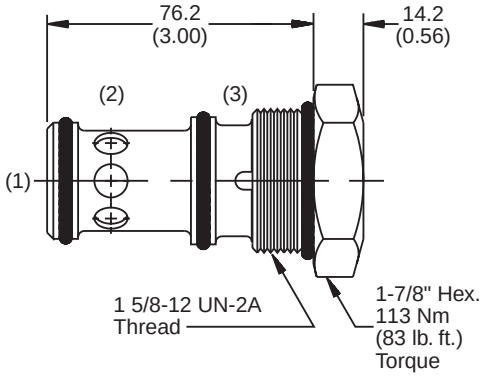


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	303 LPM (80 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage @ 150 SSU (32 cst)	Port 1 to 2 5 drops/min. (.33 cc/min.) @ 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (Polyurethane) (-50°F to +200°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.81 kg (1.78 lbs.)
Cavity	C20-3S (See BC Section for more details)
Form Tool	Rougher NFT20-3SR Finisher NFT20-3SF

Ordering Information

20SLC1	—	A	—	
20 Size Logic Element		Poppet Bi-Directional		Bias Spring

Code	Bias Spring
25	1.7 Bar (25 PSI)
50	3.5 Bar (50 PSI)
75	5.2 Bar (75 PSI)
100	6.9 Bar (100 PSI)
150	10.3 Bar (150 PSI)

Seal Kit
WRK-20-3S

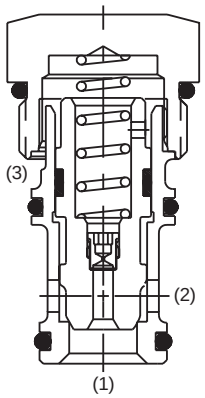
General Description

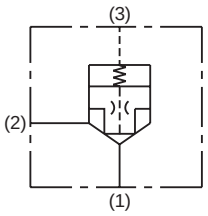
Poppet Type , Normally Closed, Vent to Open Logic Element. Generation port is from 1 to 3. For additional information see Technical Tips on pages LE1-LE6.

Features

- Hardened, precision ground parts for durability
- Polyurethane seals only
- No backup rings
- Low leakage design
- All external parts zinc plated

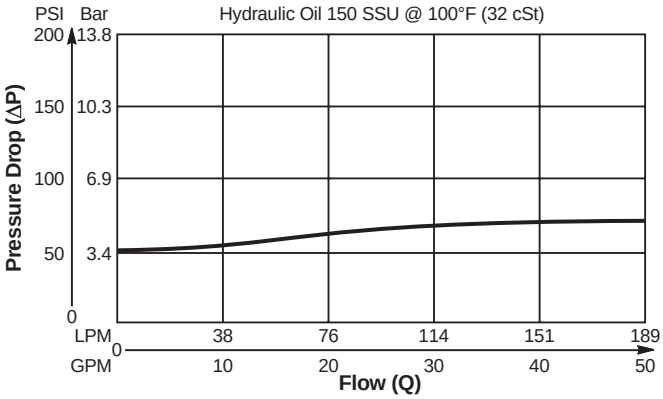




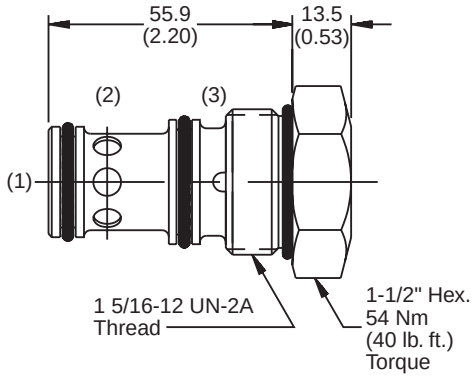


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	189 LPM (50 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage @ 150 SSU (32 cst)	Port 1 to 2 5 drops/min. (.33 cc/min.) @ 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (Polyurethane) (-50°F to +200°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.33 kg (.78 lbs.)
Cavity	C16-3S (See BC Section for more details)
Form Tool	Rougher NFT16-3SR Finisher NFT16-3SF

Ordering Information

16SLC1	—	B	—	
16 Size Logic Element		Poppet Vent to Open		Bias Spring

Code	Bias Spring
25	1.7 Bar (25 PSI)
50	3.5 Bar (50 PSI)
75	5.2 Bar (75 PSI)
100	6.9 Bar (100 PSI)
150	10.3 Bar (150 PSI)

Seal Kit
WRK-16-3S

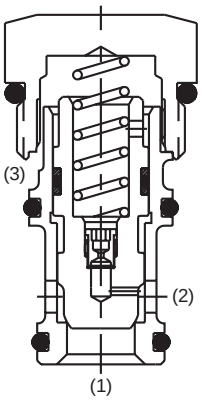
General Description

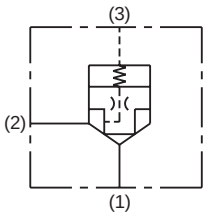
Poppet Type , Normally Closed, Vent to Open Logic Element. Generation port is from 2 to 3. For additional information see Technical Tips on pages LE1-LE6.

Features

- Hardened, precision ground parts for durability
- Polyurethane seals only
- No backup rings
- Low leakage design
- All external parts zinc plated

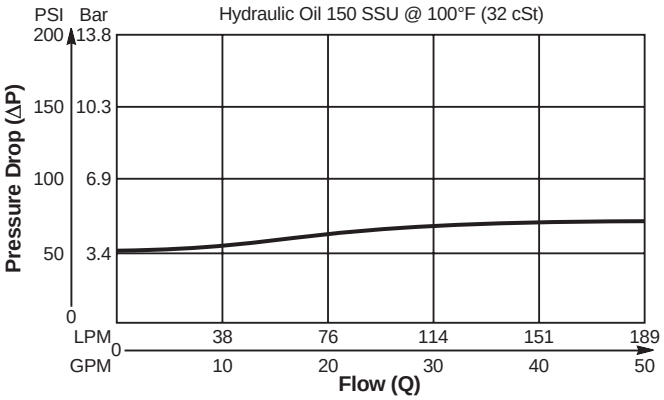




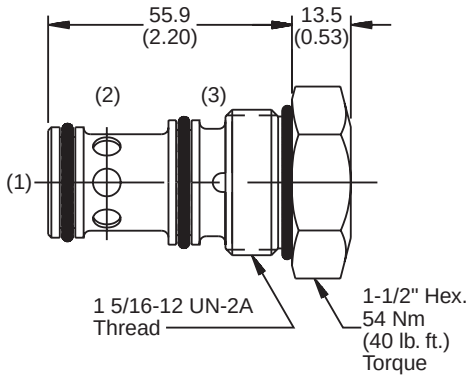


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	189 LPM (50 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage @ 150 SSU (32 cst)	Port 1 to 2 5 drops/min. (.33 cc/min.) @ 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (Polyurethane) (-50°F to +200°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.33 kg (.78 lbs.)
Cavity	C16-3S (See BC Section for more details)
Form Tool	Rougher NFT16-3SR Finisher NFT16-3SF

Ordering Information

16SLC1	—	C	—	
16 Size Logic Element		**Poppet Vent to Open**		**Bias Spring**

Code	Bias Spring
25	1.7 Bar (25 PSI)
50	3.5 Bar (50 PSI)
75	5.2 Bar (75 PSI)
100	6.9 Bar (100 PSI)
150	10.3 Bar (150 PSI)

Seal Kit
WRK-16-3S

General Description

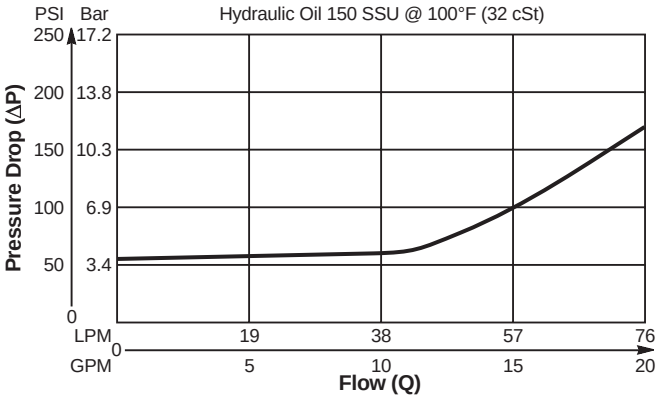
Spool Type, Normally Closed, Pilot to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

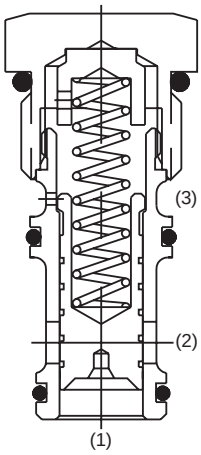
- Hardened, precision ground parts for durability
- Polyurethane seals only
- No backup rings
- All external parts zinc plated

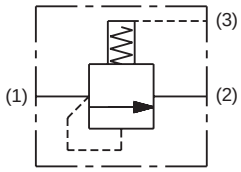
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)

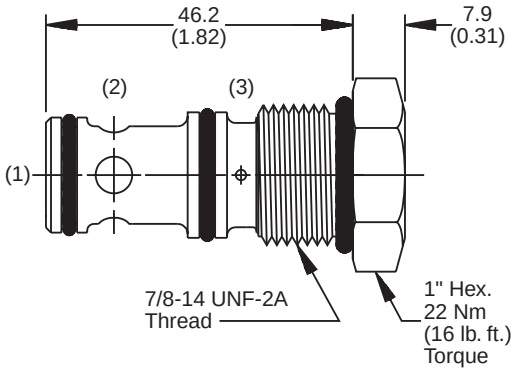








Dimensions Millimeters (Inches)



Specifications

Rated Flow	57 LPM (15 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage @ 150 SSU (32 cst)	Port 1 to 2 82 cc/min. (5 in^3/min.) @ 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (Polyurethane) (-50°F to +200°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.30 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher NFT10-3SR Finisher NFT10-3SF

Ordering Information

10SLC2	—	A	—	
10 Size Logic Element		Spool Pilot to Close		Bias Spring

Code	Bias Spring
25	1.7 Bar (25 PSI)
50	3.5 Bar (50 PSI)
75	5.2 Bar (75 PSI)
100	6.9 Bar (100 PSI)
150	10.3 Bar (150 PSI)

Seal Kit
WRK-10-3S

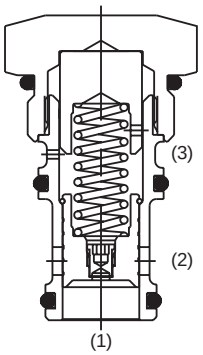
General Description

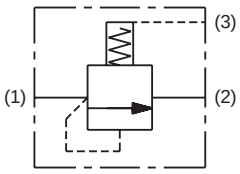
Spool Type , Normally Closed, Pilot to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- Hardened, precision ground parts for durability
- Polyurethane seals only
- No backup rings
- All external parts zinc plated

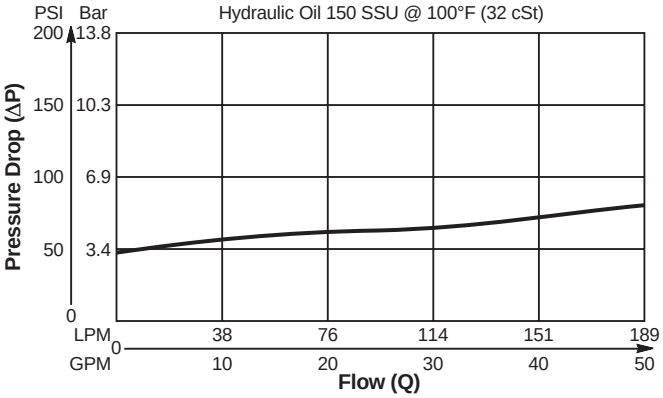




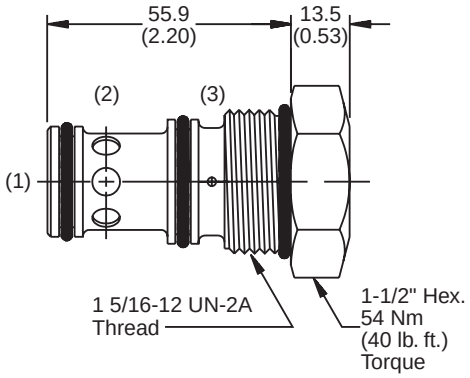


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	189 LPM (50 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage @ 150 SSU (32 cst)	Port 1 to 2 82 cc/min. (5 in^3/min.) @ 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (Polyurethane) (-50°F to +200°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.33 kg (.78 lbs.)
Cavity	C16-3S (See BC Section for more details)
Form Tool	Rougher NFT16-3SR Finisher NFT16-3SF

Ordering Information

16SLC2	—	A	—	
16 Size Logic Element		**Spool Pilot to Close**		**Bias Spring**

Code	Bias Spring
25	1.7 Bar (25 PSI)
50	3.5 Bar (50 PSI)
75	5.2 Bar (75 PSI)
100	6.9 Bar (100 PSI)
150	10.3 Bar (150 PSI)

Seal Kit
WRK-16-3S

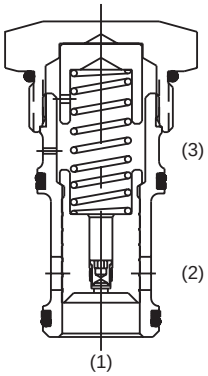
General Description

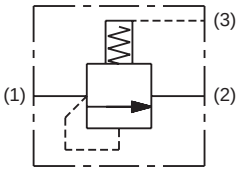
Spool Type, Normally Closed, Pilot to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- Hardened, precision ground parts for durability
- Polyurethane seals only
- No backup rings
- All external parts zinc plated

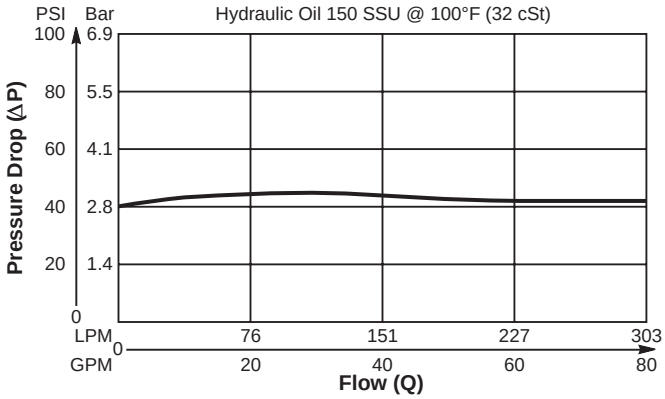




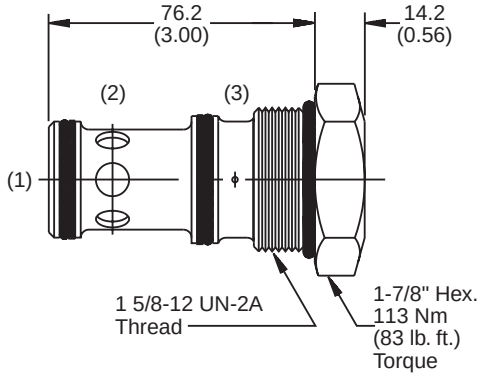


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	303 LPM (80 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage @ 150 SSU (32 cst)	Port 1 to 2 82 cc/min. (5 in^3/min.) @ 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (Polyurethane) (-50°F to +200°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.81 kg (1.78 lbs.)
Cavity	C20-3S (See BC Section for more details)
Form Tool	Rougher NFT20-3SR Finisher NFT20-3SF

Ordering Information

20SLC2	—	A	—	
20 Size Logic Element		**Spool Pilot to Close**		**Bias Spring**

Code	Bias Spring
25	1.7 Bar (25 PSI)
50	3.5 Bar (50 PSI)
75	5.2 Bar (75 PSI)
100	6.9 Bar (100 PSI)
150	10.3 Bar (150 PSI)

Seal Kit
WRK-20-3S

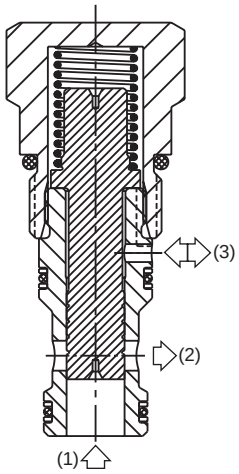
General Description

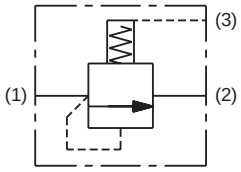
Spool Type , Normally Closed, Pilot to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Used as high flow switching or metering element
- Can be used as bleed off style pressure compensated flow regulator when used with restrictor
- More stable than poppet type
- Various switching pressures available
- 1:1 pilot pressure ratio
- Hardened working parts for maximum durability
- All external parts zinc plated

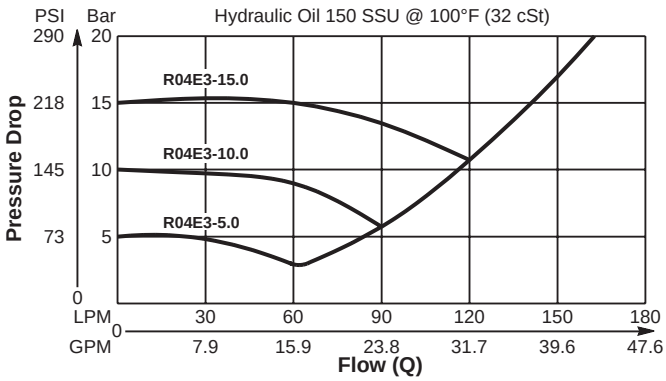






Performance Curve (Through cartridge only)

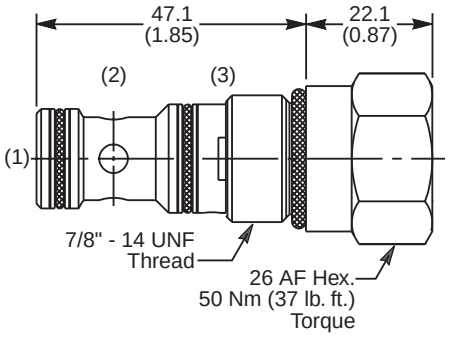
Vented Open Pressure Drop vs. Flow 1 to 2



Specifications

Rated Flow	170 LPM (45 GPM)
Nominal Flow @ 7 Bar (100 PSI)	100 LPM (26 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	50 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher NFT10-3SR Finisher NFT10-3SF

Dimensions Millimeters (Inches)



Ordering Information

R04E3		
10 Size Logic Element	Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
1.0	1.0 Bar (14.5 PSI)
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)
20.0	20.0 Bar (290 PSI)

If no switching pressure is specified, valve will be supplied as R04E3-5.0N

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30504N-1)
V	Fluorocarbon / (SK30504V-1)

General Description

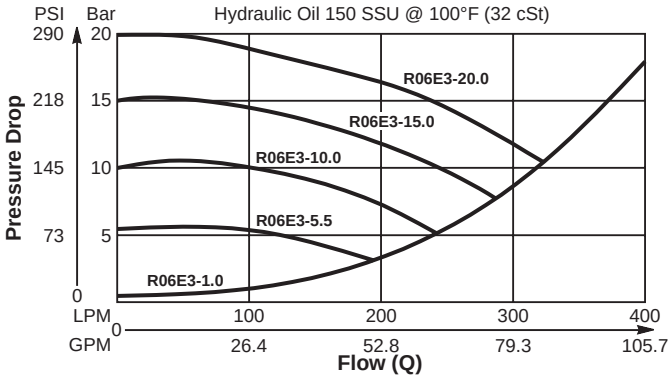
Spool Type , Normally Closed, Pilot to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Used as high flow switching or metering element
- Can be used as bleed off style pressure compensated flow regulator when used with restrictor
- More stable than poppet type
- Various switching pressures available
- 1:1 pilot pressure ratio
- Hardened working parts for maximum durability
- All external parts zinc plated

Performance Curve (Through cartridge only)

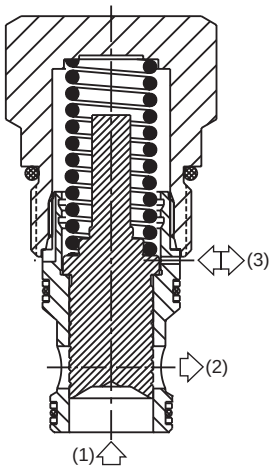
Vented Open Pressure Drop vs. Flow 1 to 2

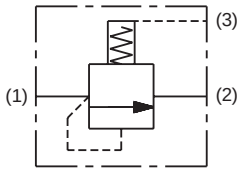


Specifications

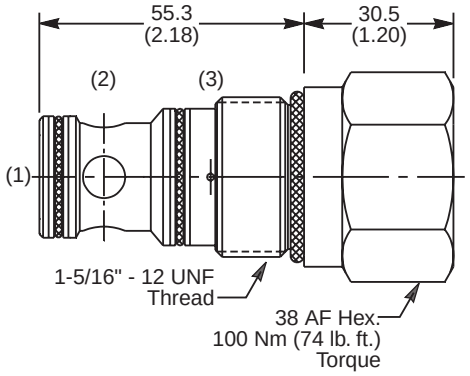
Rated Flow	400 LPM (106 GPM)
Nominal Flow @ 7 Bar (100 PSI)	270 LPM (71 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	90 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.38 kg (.84 lbs.)
Cavity	C16-3S (See BC Section for more details)
Form Tool	Rougher NFT16-3SR Finisher NFT16-3SF







Dimensions Millimeters (Inches)



Ordering Information

R06E3		
16 Size Logic Element	Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
1.0	1.0 Bar (14.5 PSI)
5.5	5.5 Bar (80 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)
20.0	20.0 Bar (290 PSI)

If no switching pressure is specified, valve will be supplied as R06E3-5.5N

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30508N-1)
V	Fluorocarbon / (SK30508V-1)

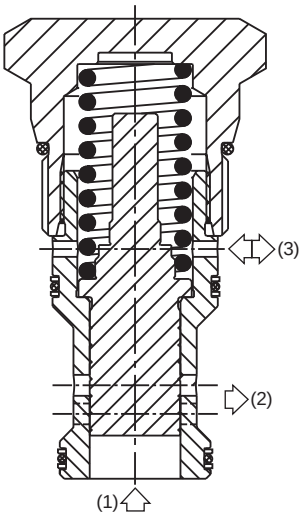
General Description

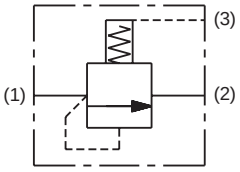
Spool Type , Normally Closed, Pilot to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Can be used as high flow switching or metering element
- Can be used as bleed off style pressure compensated flow regulator when used with restrictor
- Various switching pressures available
- 1:1 pilot pressure ratio
- Hardened working parts for maximum durability
- All external parts zinc plated

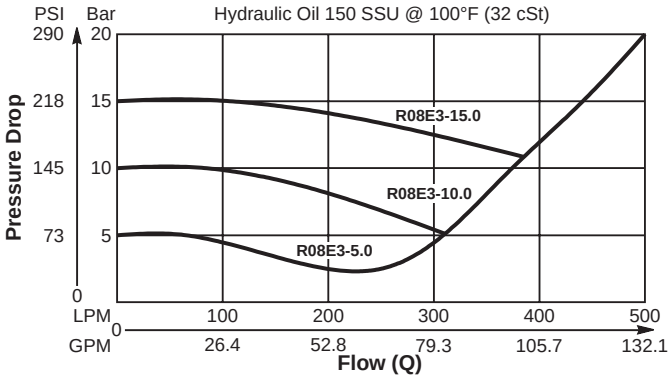






Performance Curve (Through cartridge only)

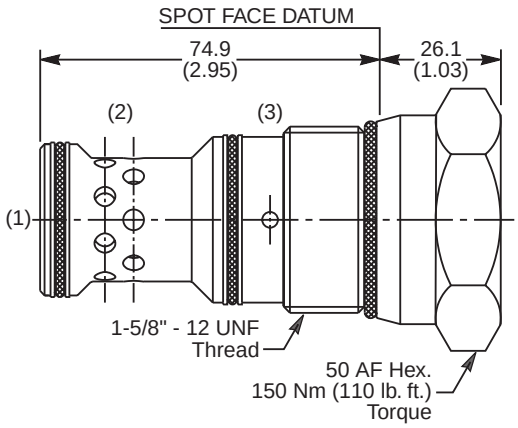
Vented Open Pressure Drop vs. Flow 1 to 2



Specifications

Rated Flow	500 LPM (132 GPM)
Nominal Flow @ 7 Bar (100 PSI)	340 LPM (90 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	90 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.69 kg (1.52 lbs.)
Cavity	C20-3S (See BC Section for more details)
Form Tool	Rougher NFT20-3SR Finisher NFT20-3SF

Dimensions Millimeters (Inches)



Ordering Information

R08E3		
20 Size Logic Element	Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
5.5	5.5 Bar (80 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)
20.0	20.0 Bar (290 PSI)

If no switching pressure is specified, valve will be supplied as R06E3-5.5N

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30512N-1)
V	Fluorocarbon / (SK30512V-1)

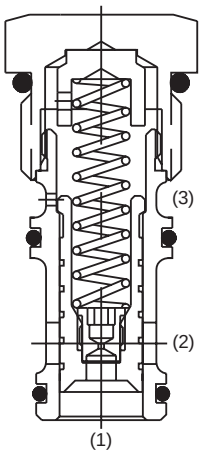
General Description

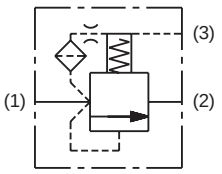
Spool Type, Normally Closed, Vent to Open Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- Hardened, precision ground parts for durability
- Polyurethane seals only
- No backup rings
- All external parts zinc plated

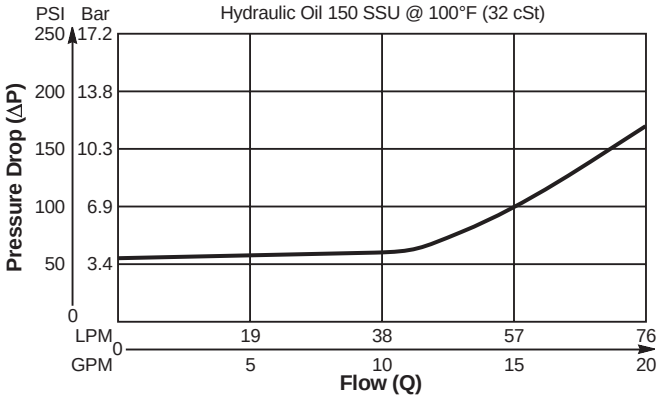




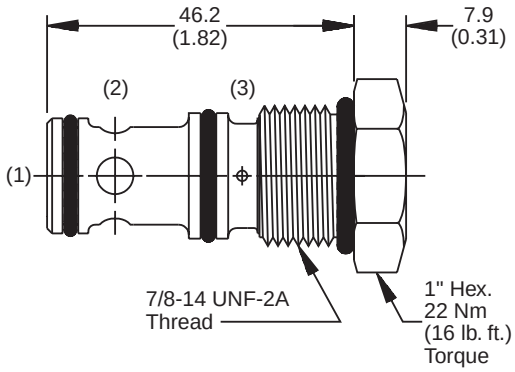


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	57 LPM (15 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage @ 150 SSu (32 cst)	Port 1 to 2 82 cc/min. (5 in^3/min.) @ 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (Polyurethane) (-50°F to +200°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.30 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher NFT10-3SR Finisher NFT10-3SF

Ordering Information

10SLC2	—	B	—	
10 Size Logic Element		**Spool Vent to Open**		**Bias Spring**

Code	Bias Spring
25	1.7 Bar (25 PSI)
50	3.5 Bar (50 PSI)
75	5.2 Bar (75 PSI)
100	6.9 Bar (100 PSI)
150	10.3 Bar (150 PSI)

Seal Kit
WRK-10-3S

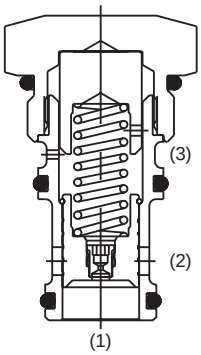
General Description

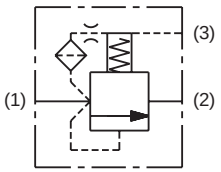
Spool Type , Normally Closed, Vent to Open Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- Hardened, precision ground parts for durability
- Polyurethane seals only
- No backup rings
- All external parts zinc plated

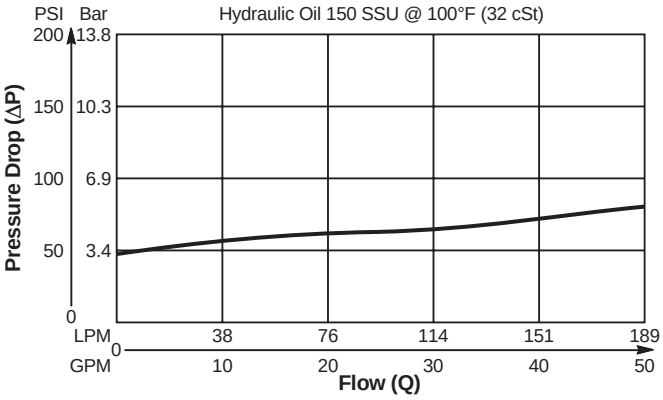




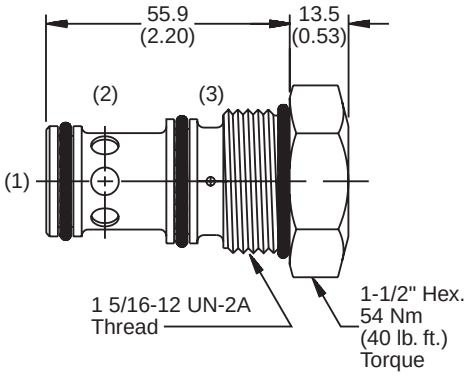


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	189 LPM (50 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage @ 150 SSU (32 cst)	Port 1 to 2 82 cc/min. (5 in^3/min.) @ 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (Polyurethane) (-50°F to +200°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.33 kg (.78 lbs.)
Cavity	C16-3S (See BC Section for more details)
Form Tool	Rougher NFT16-3SR Finisher NFT16-3SF

Ordering Information

16SLC2	—	B	—	
16 Size Logic Element		**Spool Vent to Open**		**Bias Spring**

Code	Bias Spring
25	1.7 Bar (25 PSI)
50	3.5 Bar (50 PSI)
75	5.2 Bar (75 PSI)
100	6.9 Bar (100 PSI)
150	10.3 Bar (150 PSI)

Seal Kit
WRK-16-3S

General Description

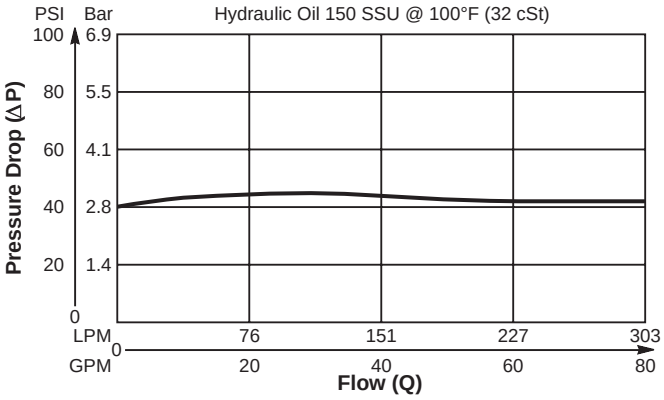
Spool Type, Normally Closed, Vent to Open Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

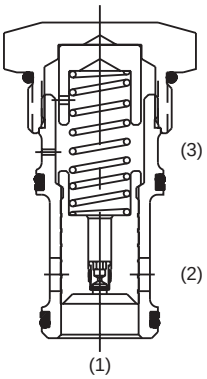
- Hardened, precision ground parts for durability
- Polyurethane seals only
- No backup rings
- All external parts zinc plated

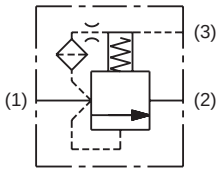
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)

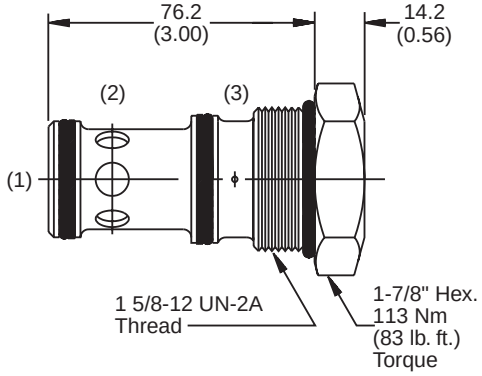








Dimensions Millimeters (Inches)



Specifications

Rated Flow	303 LPM (80 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage @ 150 SSU (32 cst)	Port 1 to 2 82 cc/min. (5 in^3/min.) @ 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (Polyurethane) (-50°F to +200°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.81 kg (1.78 lbs.)
Cavity	C20-3S (See BC Section for more details)
Form Tool	Rougher NFT20-3SR Finisher NFT20-3SF

Ordering Information

20SLC2	—	B	—	
20 Size Logic Element		Spool Vent to Open		Bias Spring

Code	Bias Spring
25	1.7 Bar (25 PSI)
50	3.5 Bar (50 PSI)
75	5.2 Bar (75 PSI)
100	6.9 Bar (100 PSI)
150	10.3 Bar (150 PSI)

Seal Kit
WRK-20-3S

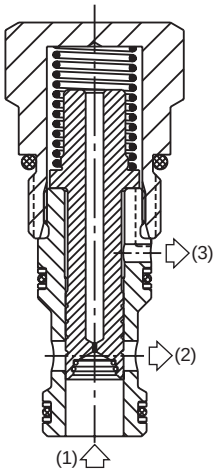
General Description

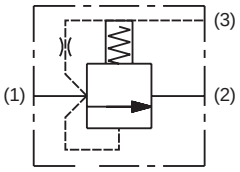
Spool Type , Normally Closed, Vent to Open Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Used as high flow switching or metering element
- Can be used as main stage for a pilot operated relief or sequence valve
- Integral 250 micron pilot flow filter
- Various switching pressures available
- 1:1 pilot pressure ratio
- Hardened working parts for maximum durability
- All external parts zinc plated

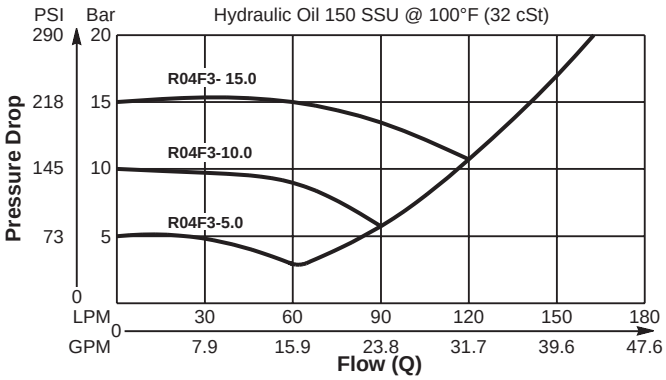






Performance Curve (Through cartridge only)

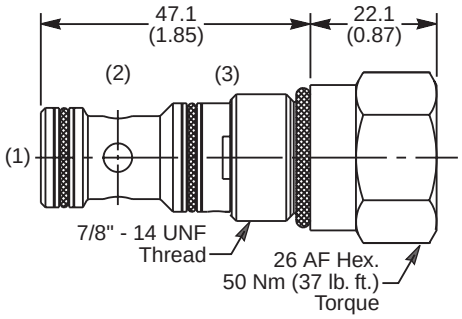
Vented Open Pressure Drop vs. Flow 1 to 2



Specifications

Rated Flow	170 LPM (45 GPM)
Nominal Flow @ 7 Bar (100 PSI)	100 LPM (26 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	50 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.13 kg (.29 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher NFT10-3SR Finisher NFT10-3SF

Dimensions Millimeters (Inches)



Ordering Information

R04F3		
10 Size Logic Element	Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
1.0	1.0 Bar (14.5 PSI)
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)
20.0	20.0 Bar (290 PSI)

If no switching pressure is specified, valve will be supplied as R04F3-5.0N

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30504N-1)
V	Fluorocarbon / (SK30504V-1)

General Description

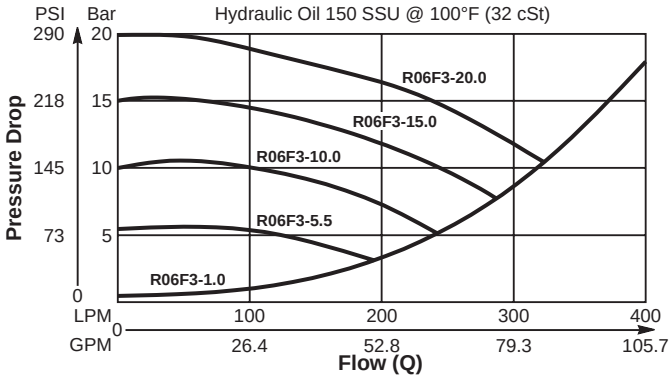
Spool Type , Normally Closed, Vent to Open Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Used as high flow switching or metering element
- Can be used as main stage for a pilot operated relief or sequence valve
- Integral 250 micron pilot flow filter
- Various switching pressures available
- 1:1 pilot pressure ratio
- Hardened working parts for maximum durability
- All external parts zinc plated

Performance Curve (Through cartridge only)

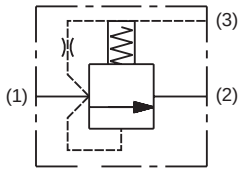
Vented Open Pressure Drop vs. Flow 1 to 2

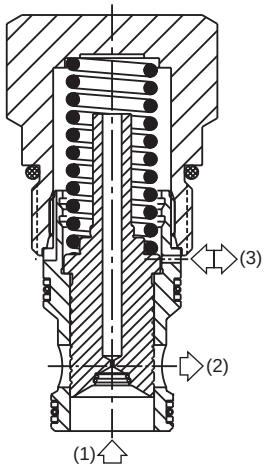


Specifications

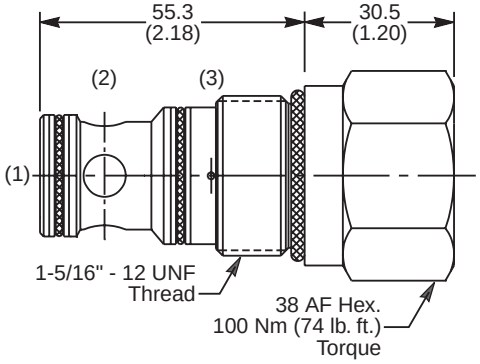
Rated Flow	400 LPM (106 GPM)
Nominal Flow @ 7 Bar (100 PSI)	270 LPM (71 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	90 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.38 kg (.84 lbs.)
Cavity	C16-3S (See BC Section for more details)
Form Tool	Rougher NFT16-3SR Finisher NFT16-3SF







Dimensions Millimeters (Inches)



Ordering Information

R06F3		
16 Size Logic Element	Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
1.0	1.0 Bar (14.5 PSI)
5.5	5.5 Bar (80 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)
20.0	20.0 Bar (290 PSI)

If no switching pressure is specified, valve will be supplied as R06F3-5.5N

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30508N-1)
V	Fluorocarbon / (SK30508V-1)

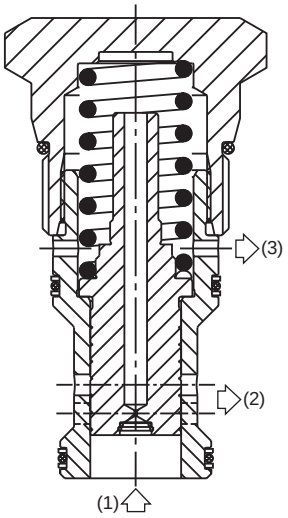
General Description

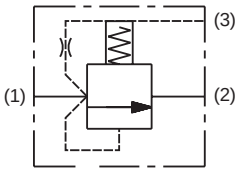
Spool Type , Normally Closed, Vent to Open Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Can be used as high flow switching or metering element
- Can be used as main stage for a pilot operated relief or sequence valve
- Integral 250 micron pilot flow filter
- Various switching pressures available
- 1:1 pilot pressure ratio
- Hardened working parts for maximum durability
- All external parts zinc plated

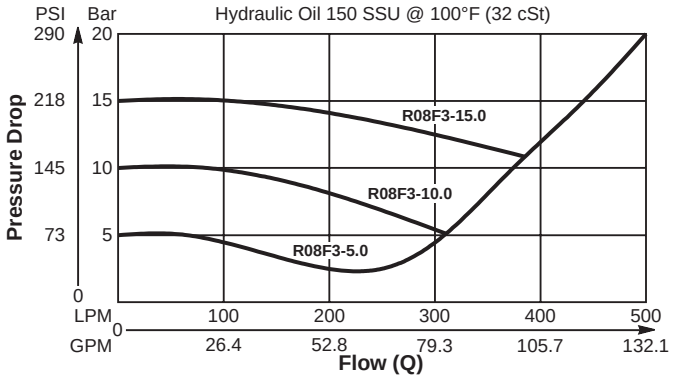






Performance Curve (Through cartridge only)

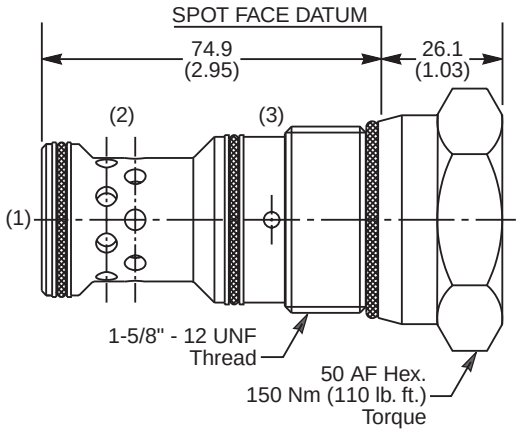
Vented Open Pressure Drop vs. Flow 1 to 2



Specifications

Rated Flow	500 LPM (132 GPM)
Nominal Flow @ 7 Bar (100 PSI)	340 LPM (90 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	90 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.69 kg (1.52 lbs.)
Cavity	C20-3S (See BC Section for more details)
Form Tool	Rougher NFT20-3SR Finisher NFT20-3SF

Dimensions Millimeters (Inches)



Ordering Information

R08F3		
20 Size Logic Element	Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
5.5	5.5 Bar (80 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)
20.0	20.0 Bar (290 PSI)

If no switching pressure is specified, valve will be supplied as R08E3-5.5N

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30512N-1)
V	Fluorocarbon / (SK30512V-1)

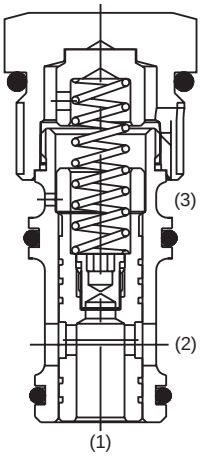
General Description

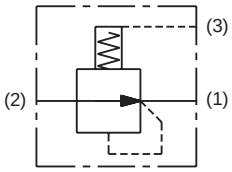
Spool Type, Normally Open, Logic Element. This type is ideal for flow control functions. For additional information see Technical Tips on pages LE1-LE6.

Features

- Hardened, precision ground parts for durability
- Polyurethane seals only
- No backup rings
- All external parts zinc plated

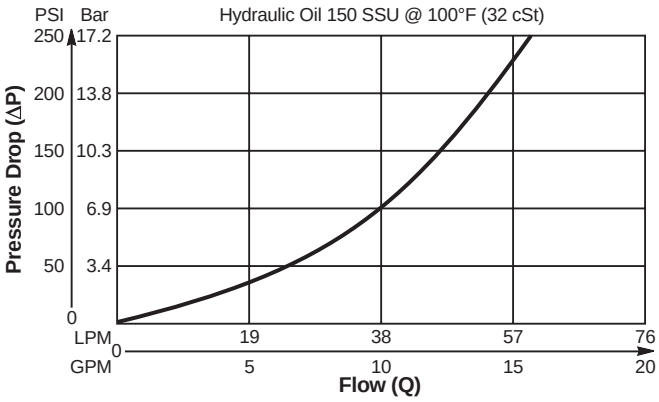




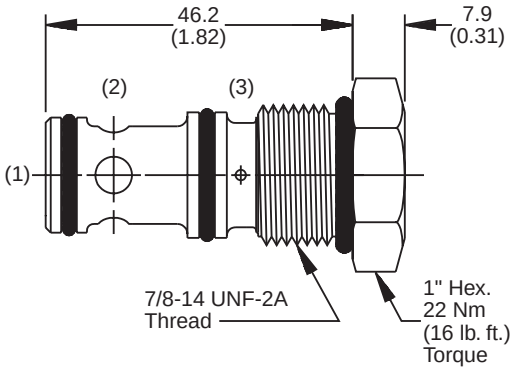


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	57 LPM (15 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage @ 150 SSU (32 cst)	Port 1 to 2 82 cc/min. (5 in^3/min.) @ 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (Polyurethane) (-50°F to +200°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.30 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher NFT10-3SR Finisher NFT10-3SF

Ordering Information

10SLC3	—	A	—	
10 Size Logic Element		Spool Pilot to Open		Bias Spring

Code	Bias Spring
25	1.7 Bar (25 PSI)
50	3.5 Bar (50 PSI)
75	5.2 Bar (75 PSI)
100	6.9 Bar (100 PSI)
150	10.3 Bar (150 PSI)

Seal Kit
WRK-10-3S

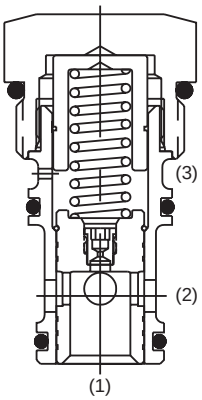
General Description

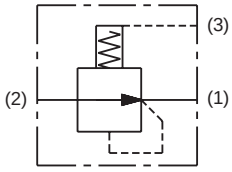
Spool Type , Normally Open, Logic Element. This type is ideal for flow control functions. For additional information see Technical Tips on pages LE1-LE6.

Features

- Hardened, precision ground parts for durability
- Polyurethane seals only
- No backup rings
- All external parts zinc plated

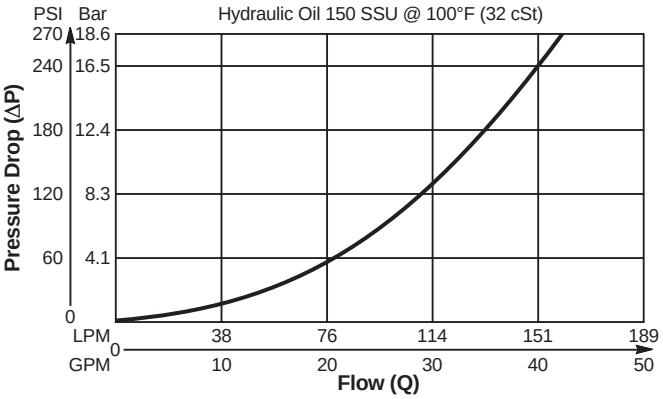




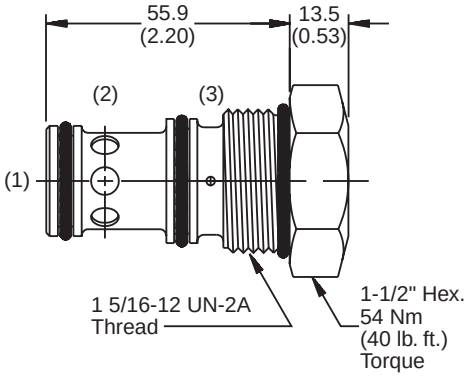


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	189 LPM (50 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage @ 150 SSU (32 cst)	Port 1 to 2 82 cc/min. (5 in^3/min.) @ 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (Polyurethane) (-50°F to +200°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.33 kg (.78 lbs.)
Cavity	C16-3S (See BC Section for more details)
Form Tool	Rougher NFT16-3SR Finisher NFT16-3SF

Ordering Information

16SLC3	—	A	—	
16 Size Logic Element		Spool Pilot to Open		Bias Spring

Code	Bias Spring
25	1.7 Bar (25 PSI)
50	3.5 Bar (50 PSI)
75	5.2 Bar (75 PSI)
100	6.9 Bar (100 PSI)
150	10.3 Bar (150 PSI)

Seal Kit
WRK-16-3S

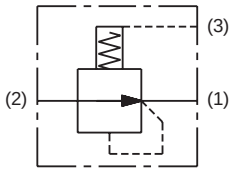
General Description

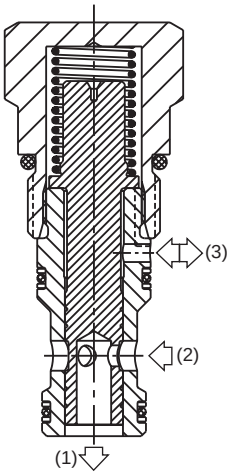
Spool Type , Normally Open, Vent to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Used as high flow switching or metering element
- Can be used for inline pressure compensated flow control when used with restrictor (refer to application)
- More stable than poppet type
- Various switching pressures available
- 1:1 pilot ratio
- Hardened working parts for maximum durability
- All external parts zinc plated

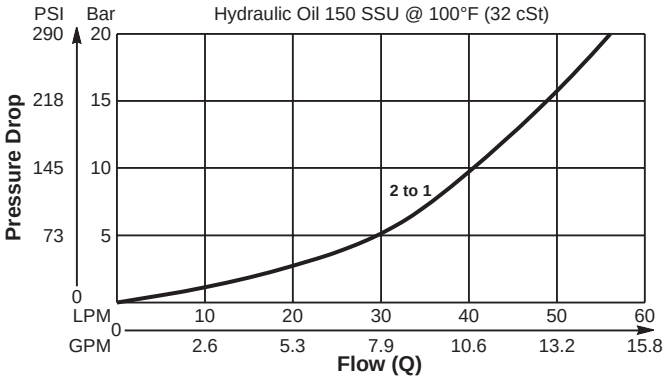






Performance Curve

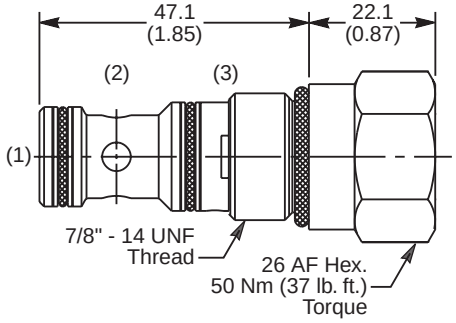
Pressure Drop vs. Flow (Through cartridge only)



Specifications

Rated Flow	58 LPM (15 GPM)
Nominal Flow @ 7 Bar (100 PSI)	35 LPM (9.2 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	50 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher NFT10-3SR Finisher NFT10-3SF

Dimensions Millimeters (Inches)



Ordering Information

R04H3		
10 Size Logic Element	Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
1.0	1.0 Bar (14.5 PSI)
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)
20.0	20.0 Bar (290 PSI)

If no switching pressure is specified, valve will be supplied as R04H3-5.0N

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30504N-1)
V	Fluorocarbon / (SK30504V-1)

General Description

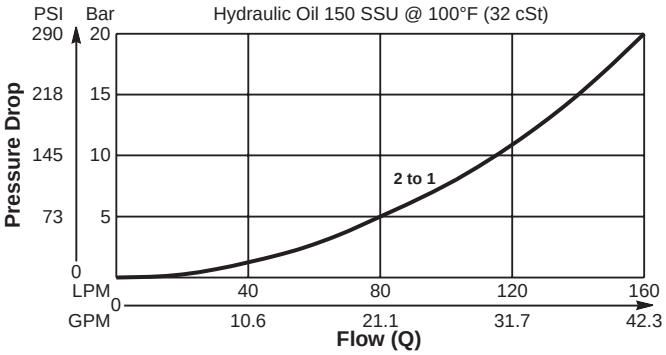
Spool Type , Normally Open, Vent to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Used as high flow switching or metering element
- Can be used for inline pressure compensated flow control when used with restrictor (refer to application)
- More stable than poppet type
- Range of spring ratings available
- Integral 250 micron pilot flow filter
- 1:1 pilot ratio
- Hardened working parts for maximum durability
- All external parts zinc plated

Performance Curve

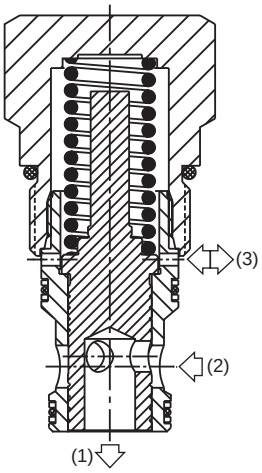
Pressure Drop vs. Flow (Through cartridge only)

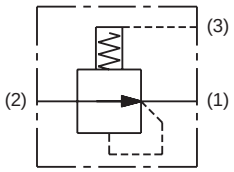


Specifications

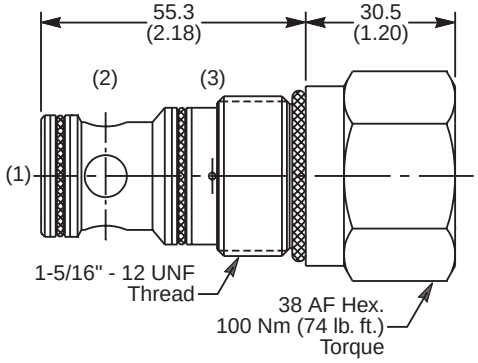
Rated Flow	160 LPM (42 GPM)
Nominal Flow @ 7 Bar (100 PSI)	90 LPM (24 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	125 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.37 kg (.82 lbs.)
Cavity	C16-3S (See BC Section for more details)
Form Tool	Rougher NFT16-3SR Finisher NFT16-3SF







Dimensions Millimeters (Inches)



Ordering Information

R06H3		
16 Size Logic Element	Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
1.0	1.0 Bar (14.5 PSI)
5.5	5.5 Bar (80 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)
20.0	20.0 Bar (290 PSI)

If no switching pressure is specified, valve will be supplied as R06H3-5.5N

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30508N-1)
V	Fluorocarbon / (SK30508V-1)

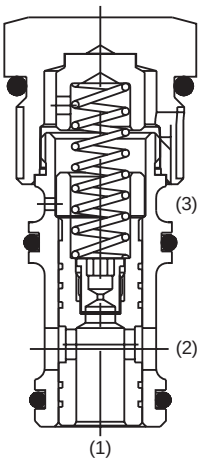
General Description

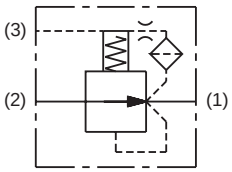
Spool Type, Normally Open, Vent to Close Logic Element. This type is ideal for pressure reducing functions. For additional information see Technical Tips on pages LE1-LE6.

Features

- Hardened, precision ground parts for durability
- Polyurethane seals only
- No backup rings
- All external parts zinc plated

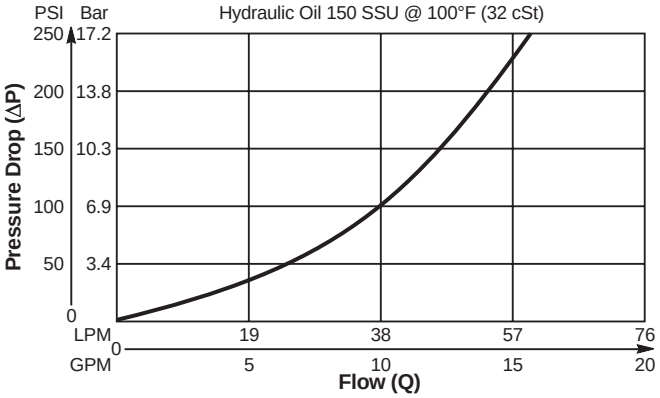




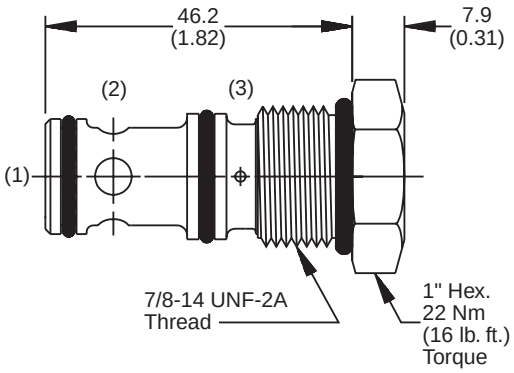


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	57 LPM (15 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage @ 150 SSU (32 cst)	Port 1 to 2 82 cc/min. (5 in^3/min.) @ 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (Polyurethane) (-50°F to +200°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.30 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher NFT10-3SR Finisher NFT10-3SF

Ordering Information

10SLC3	—	B	—	
10 Size Logic Element		Spool Vent to Close		Bias Spring

Code	Bias Spring
25	1.7 Bar (25 PSI)
50	3.5 Bar (50 PSI)
75	5.2 Bar (75 PSI)
100	6.9 Bar (100 PSI)
150	10.3 Bar (150 PSI)

Seal Kit
WRK-10-3S

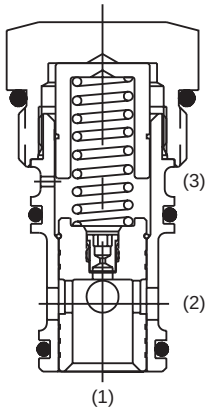
General Description

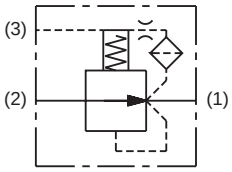
Spool Type , Normally Open, Vent to Close Logic Element. This type is ideal for pressure reducing functions. For additional information see Technical Tips on pages LE1-LE6.

Features

- Hardened, precision ground parts for durability
- Polyurethane seals only
- No backup rings
- All external parts zinc plated

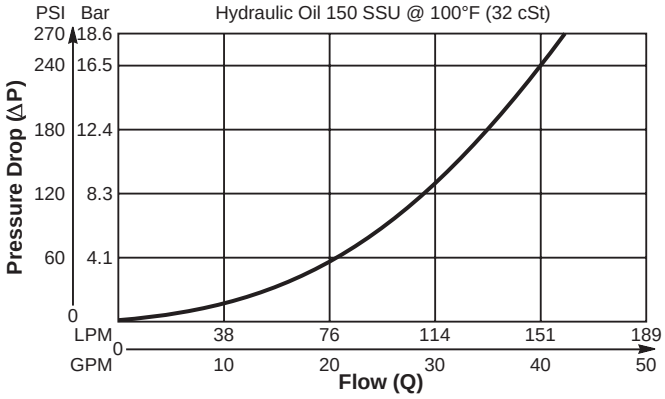




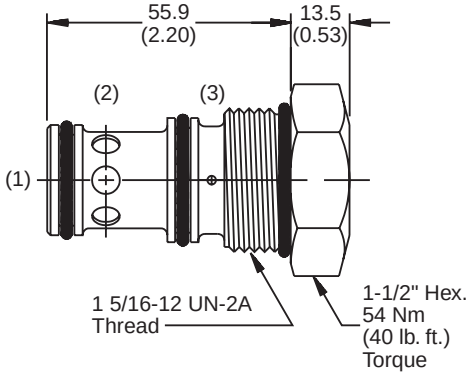


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	189 LPM (50 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage @ 150 SSU (32 cst)	Port 1 to 2 82 cc/min. (5 in^3/min) @ 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (Polyurethane) (-50°F to +200°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.33 kg (.78 lbs.)
Cavity	C16-3S (See BC Section for more details)
Form Tool	Rougher NFT16-3SR Finisher NFT16-3SF

Ordering Information

16SLC3	—	B	—	
16 Size Logic Element		Spool Vent to Close		Bias Spring

Code	Bias Spring
25	1.7 Bar (25 PSI)
50	3.5 Bar (50 PSI)
75	5.2 Bar (75 PSI)
100	6.9 Bar (100 PSI)
150	10.3 Bar (150 PSI)

Seal Kit
WRK-16-3S

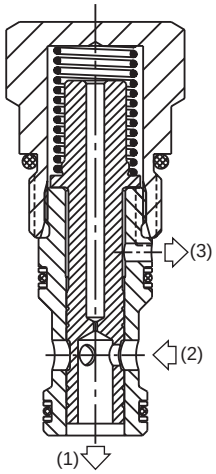
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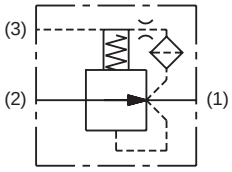
Spool Type , Normally Open, Vent to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Used as high flow switching or metering element
- Can be used as pressure regulator with mainstage controlled remotely by a pilot relief valve or a proportional valve
- Various switching pressures available
- 1:1 pilot ratio
- Hardened working parts for maximum durability
- All external parts zinc plated

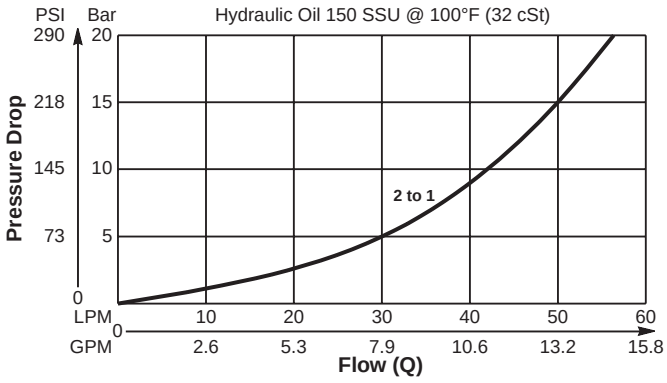




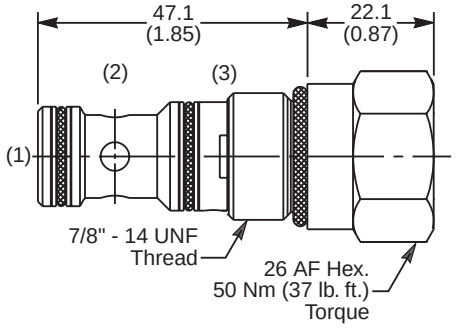


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	58 LPM (15 GPM)
Nominal Flow @ 7 Bar (100 PSI)	35 LPM (9.2 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	50 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher NFT10-3SR Finisher NFT10-3SF

Ordering Information

R04G3			
10 Size Logic Element	Adjustment Style	Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
1.0	1.0 Bar (14.5 PSI)
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)
20.0	20.0 Bar (290 PSI)

If no switching pressure is specified, valve will be supplied as R04G3-5.0N

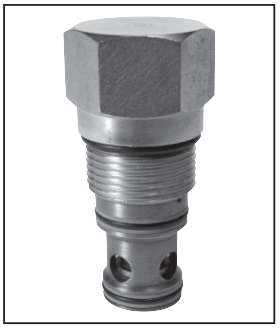
Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30504N-1)
V	Fluorocarbon / (SK30504V-1)

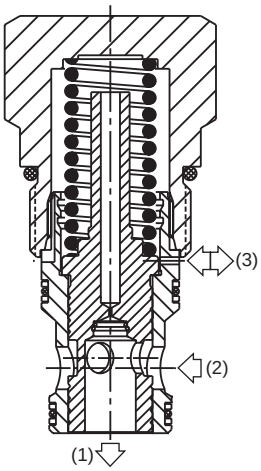
General Description

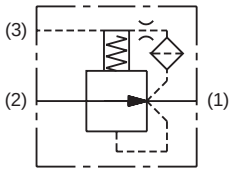
Spool Type , Normally Open, Vent to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Used as high flow switching or metering element
- Can be used as pressure regulator with mainstage controlled remotely by a pilot relief valve or a proportional valve
- Various switching pressures available
- Integral 250 micron pilot flow filter
- Hardened working parts for maximum durability
- All external parts zinc plated

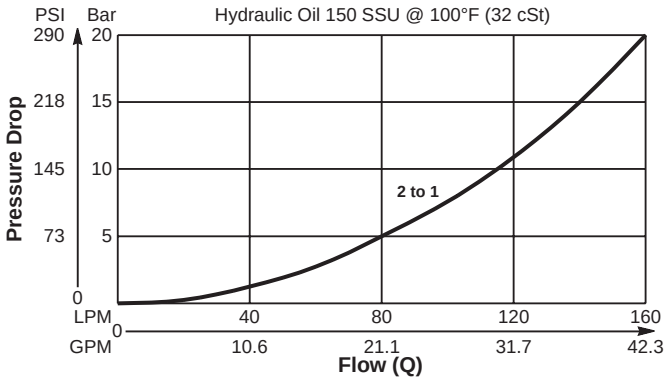






Performance Curve

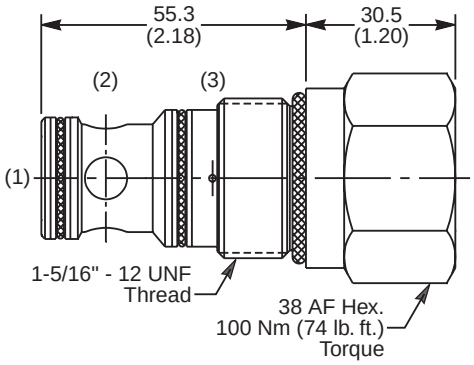
Pressure Drop vs. Flow (Through cartridge only)



Specifications

Rated Flow	160 LPM (42 GPM)
Nominal Flow @ 7 Bar (100 PSI)	90 LPM (24 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	125 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.38 kg (.84 lbs.)
Cavity	C16-3S (See BC Section for more details)
Form Tool	Rougher NFT16-3SR Finisher NFT16-3SF

Dimensions Millimeters (Inches)



Ordering Information

R06G3		
16 Size Logic Element	Switching Pressure	Seals

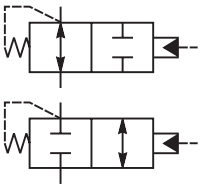
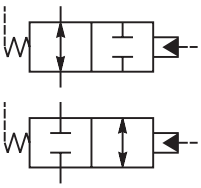
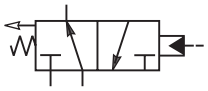
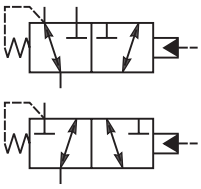
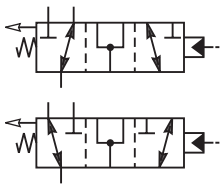
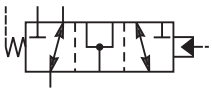
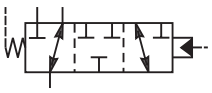
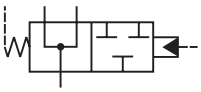
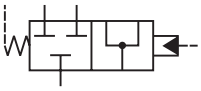
Code	Switching Pressure Non Adjustable Preset
1.0	1.0 Bar (14.5 PSI)
5.5	5.5 Bar (80 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)
20.0	20.0 Bar (290 PSI)

If no switching pressure is specified, valve will be supplied as R06G3-5.5N

Code	Seals / Kit. No.
N	Nitrile, Buna-N (Std.)/ (SK30508N-1)
V	Fluorocarbon / (SK30508V-1)

Contents

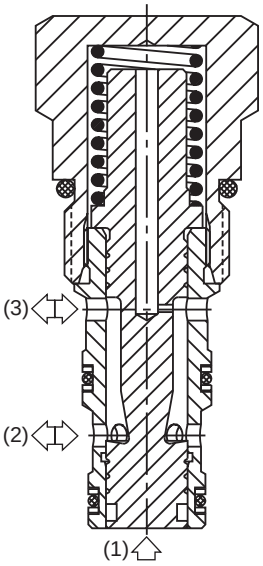
Directional Control Valves

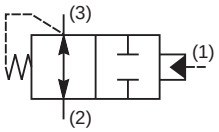
	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
	R04C3	C10-3	2 Way, Normally Open, Pilot to Close	80/21	420/6000	DC1-DC2
	R04D3	C10-3	2 Way, Normally Closed, Pilot to Open	100/26	420/6000	DC3
	R04A4	C10-4	2 Way, Normally Open, Pilot to Close, External Vent	80/21	420/6000	DC4
	R04B4	C10-4	2 Way, Normally Closed, Pilot to Open, External Vent	80/21	420/6000	DC5
	DH103	C10-4	3 Way, External Pilot, Normally Open, Vent to Atmosphere	38/10	240/3500	DC7-DC8
	N04A4	C10-4	3 Way, Internal Vent, External Pilot	90/24	420/6000	DC9
	N04B4	C10-4	3 Way, Internal Vent, External Pilot	90/24	420/6000	DC10
	N04G4	C10-4	3 Way, Vent to Atmosphere, External Pilot	85/22	420/6000	DC11
	N04H4	C10-4	3 Way, Vent to Atmosphere, External Pilot	85/22	420/6000	DC12
	N5A125	5A	3 Way, 2 Position, External Drain, Open Transition	160/42	420/6000	DC13
	N5A300	100-1	3 Way, 2 Position, External Drain, Open Transition	400/105	420/6000	DC14
	N5B125	5A	3 Way, 2 Position, External Drain, Closed Transition	160/42	420/6000	DC15
	N5B300	100-1	3 Way, 2 Position, External Drain, Closed Transition	400/105	420/6000	DC16
	N5C125	5A	3 Way, 2 Position, External Drain, Diverter Valve, Normally Open	160/42	420/6000	DC17
	N5C300	100-1	3 Way, 2 Position, External Drain, Diverter Valve, Normally Open	400/105	420/6000	DC18
	N5D125	5A	3 Way, 2 Position, External Drain, Diverter Valve, Normally Closed	160/42	420/6000	DC19
	N5D300	100-1	3 Way, 2 Position, External Drain, Diverter Valve, Normally Closed	400/105	420/6000	DC20

General Description

Diverter Valve, Normally Open, Pilot to Close Vent and Pressure Compensating Flow Control Element.







Features

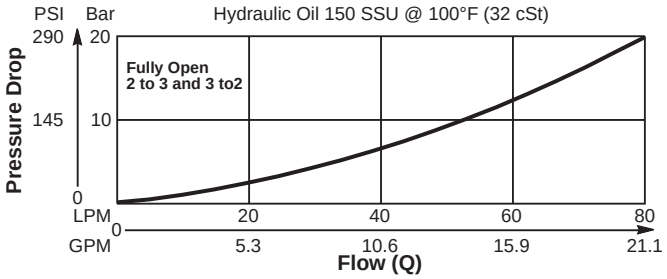
- Two switching and one compensating spring available
- Very accurate flow regulation when used with separate orifice
- Sealed pilot option available
- Industry common cavity
- Hardened working parts for maximum durability
- All external parts zinc plated

Specifications

Rated Flow	80 LPM (21 GPM)
Nominal Flow @ 7 Bar (100 PSI)	**Diverter** - 40 LPM (10 GPM) **Compensator -** See Application
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.15 kg (.33 lbs.)
Cavity	C10-3 (See BC Section for more details)

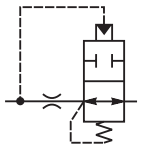
Performance Curve

Diverting Pressure Drop (Through cartridge only)

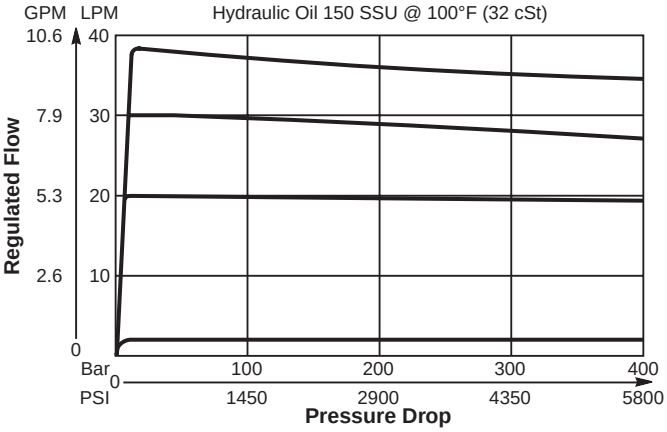


Application

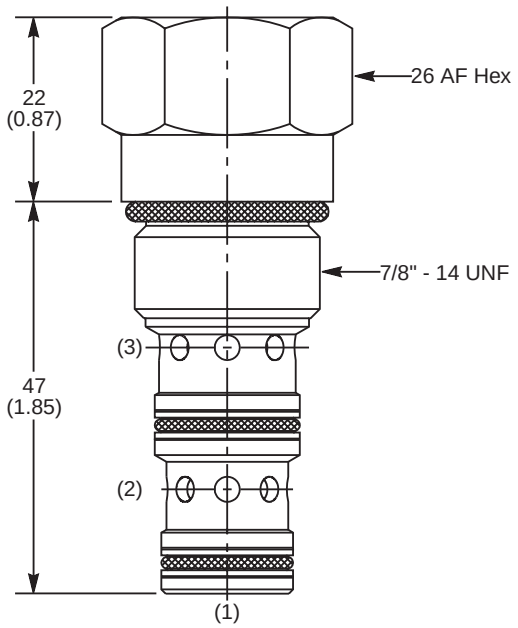
Compensator Circuit



Compensating Flow Regulation Performance 3 to 2



Dimensions Millimeters (Inches)



Ordering Information

R04C3 — [ ] [ ] [ ] — [ ] [ ]

10 Size Diverter Valve | **Pilot Switching Pressure** | **Seals** | **Sealed Pilot** | **Body Material** | **Port Size**

Code	Switching Pressure
For Switching	
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)
For Flow Regulation	
7.7	7.7 Bar (112 PSI)

If no switching pressure is specified, valve will be supplied as R04C3-5.0N

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30505N-1)
V	Fluorocarbon / (SK30505V-1)

Code	Sealed Pilot
Omit	If not required
S	Sealed Pilot

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8B)

**** Add "A" for aluminum, omit for steel.***
† Steel bodies only.

General Description

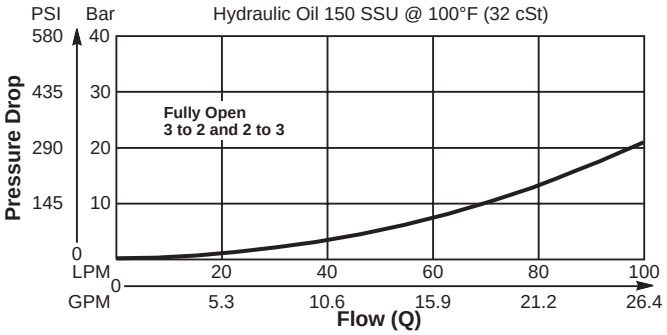
Diverter Valve, Normally Closed, Pilot to Open.

Features

- Two switching pressures available
- Sealed pilot option available
- Hardened working parts for maximum durability
- All external parts zinc plated

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



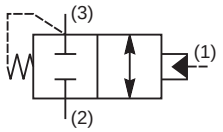
Application Note

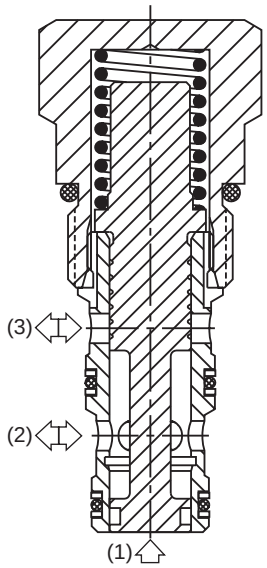
To fully open, the valve requires at least a further 2 Bar (29 PSI) above the pilot switching pressure.

Specifications

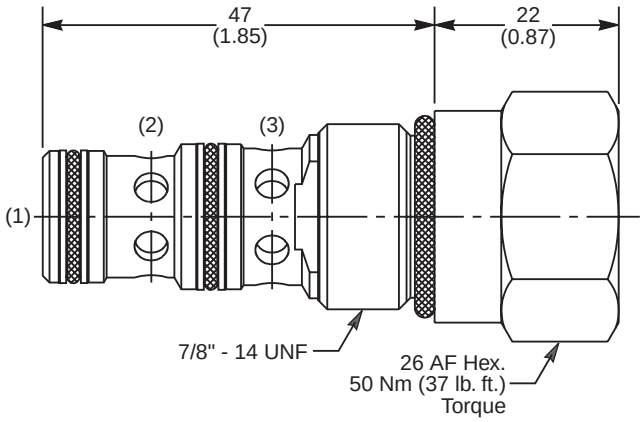
Rated Flow	100 LPM (22 GPM)
Nominal Flow @ 7 Bar (100 PSI)	60 LPM (16 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.15 kg (.33 lbs.)
Cavity	C10-3 (See BC Section for more details)







Dimensions Millimeters (Inches)



Ordering Information

R04D3 – [ ] [ ] [ ] – [ ] [ ]

10 Size Diverter Valve	Pilot Switching Pressure	Seals	Sealed Pilot	Body Material	Port Size

Code	Switching Pressure
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)

If no switching pressure is specified, valve will be supplied as R04D3-5.0N

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30505N-1)
V	Fluorocarbon / (SK30505V-1)

Code	Sealed Pilot
Omit	If not required
S	Sealed Pilot

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8B)

**** Add "A" for aluminum, omit for steel.***
† Steel bodies only.

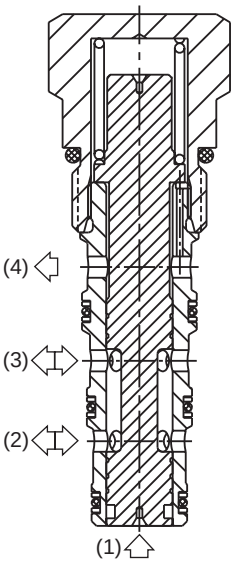
General Description

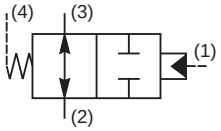
Diverter Valve, Normally Open, 2-Way with External Pilot and Vent.

Features

- High flow capacity
- Two switching pressures
- Sealed pilot option available
- Hardened working parts for maximum durability
- All external parts zinc plated

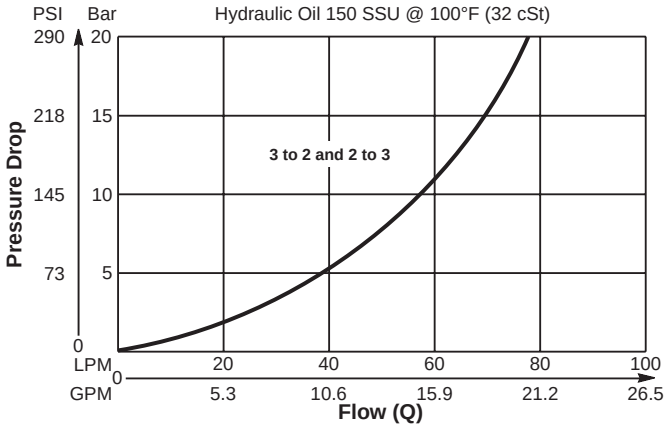




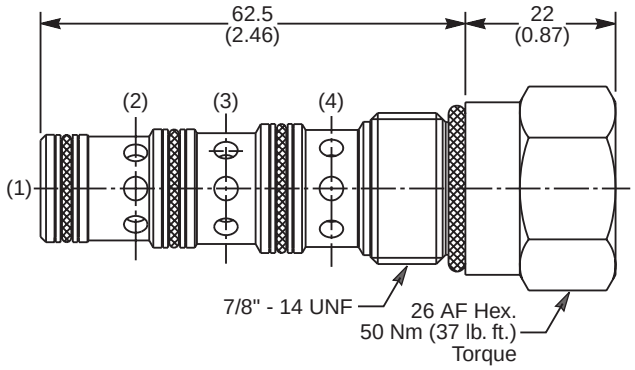


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	80 LPM (21 GPM)
Nominal Flow @ 7 Bar (100 PSI)	47 LPM (12 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.17 kg (.37 lbs.)
Cavity	C10-4 (See BC Section for more details)

Ordering Information

R04A4	–				–		
10 Size Diverter Valve		Pilot Switching Pressure	Seals	Sealed Pilot		Body Material	Port Size

Code	Switching Pressure
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)

If no switching pressure is specified, valve will be supplied as R04A4-5.0N

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30506N-1)
V	Fluorocarbon / (SK30506V-1)

Code	Port Size	Body Part No.
Omit	**Cartridge Only**	
6P	3/8″ NTPF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel bodies only

Code	Sealed Pilot
Omit	If not required
S	Sealed Pilot

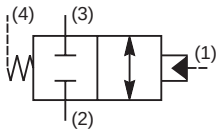
General Description

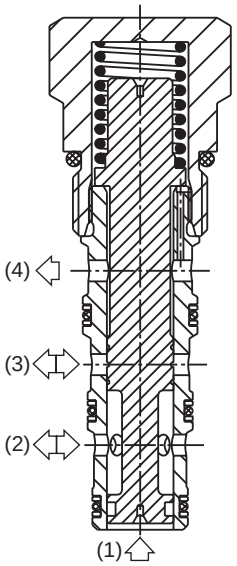
Diverter Valve, Normally Closed, 2-Way with External Pilot and Vent.

Features

- High flow capacity
- Two switching pressures available
- Sealed pilot option available
- Hardened working parts for maximum durability
- All external parts zinc plated

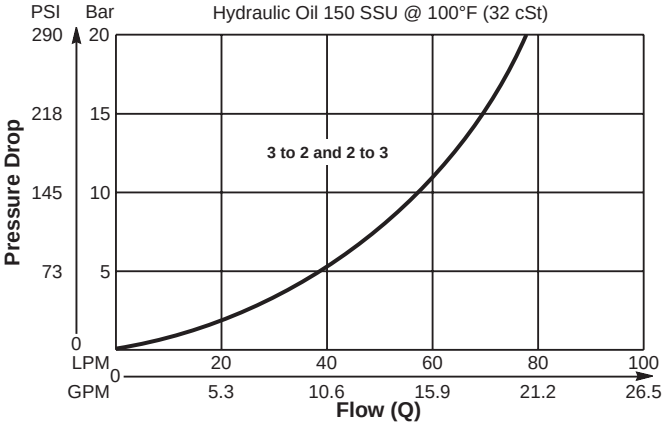




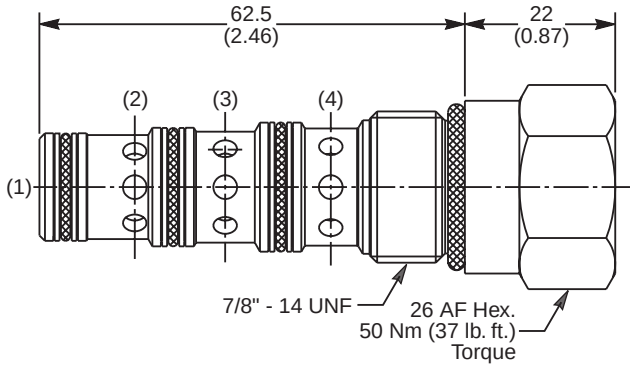


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	80 LPM (21 GPM)
Nominal Flow @ 7 Bar (100 PSI)	47 LPM (12 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.17 kg (.37 lbs.)
Cavity	C10-4 (See BC Section for more details)

Ordering Information

R04B4	–				–		
10 Size Diverter Valve		Pilot Switching Pressure	Seals	Sealed Pilot		Body Material	Port Size

Code	Switching Pressure
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)

If no switching pressure is specified, valve will be supplied as R04B4-5.0N

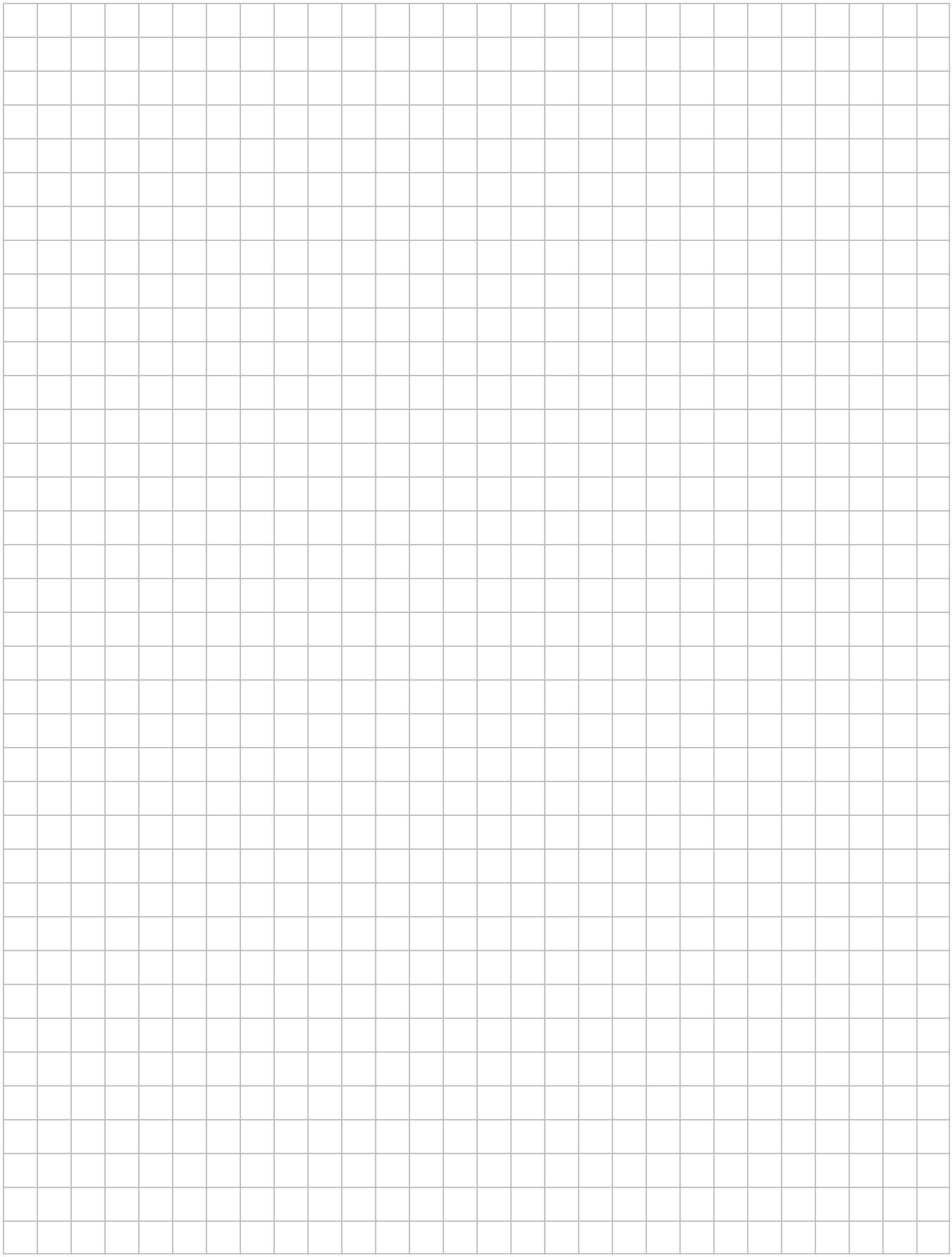
Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30506N-1)
V	Fluorocarbon / (SK30506V-1)

Code	Sealed Pilot
Omit	If not required
S	Sealed Pilot

Code	Port Size	Body Part No.
Omit	**Cartridge Only**	
6P	3/8″ NTPF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel bodies only



General Description

3-Way Pilot Operated Spool Valve. The DH103A/B/C Series Valves are used in normally closed or normally open directional control three way circuits requiring remote pilot actuation. The DH103-D/E Series Valves are used to direct flow alternately from either side of a closed loop transmission for cooling or filtering. All external parts are zinc plated.

Operation

DH103A (Normally Open)

- Neutral (Deactivated)
  Port (3) open to port (2), inlet port (4) is blocked.
- Activated with pilot pressure at port (1):
  Port (4) open to port (3), port (2) blocked.
  Note: There is an air breather vent plug in the end cap to allow for air pressure equalization in the spring chamber

DH103B (Normally Closed)

- Neutral (Deactivated)
  Port (4) open to port (3), inlet port (2) is blocked.
- Activated with pilot pressure at port (1):
  Port (3) open to port (2), port (4) blocked.

DH103C (Normally Open)

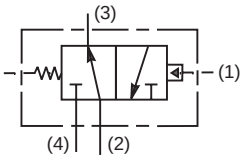
- Neutral (Deactivated)
  Port (3) open to port (2), inlet port (4) is blocked.
- Activated with pilot pressure at port (1):
  Port (4) open to port (3), port (2) blocked.

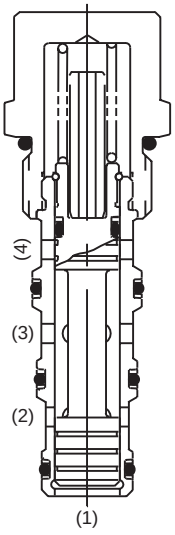
Specifications

Nominal Flow	38 LPM (10 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage at 150 SSU (32 cSt)	50 cc/min. at 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Fliltration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	0.23 kg (0.5 lbs.)
Cavity	C10-4 (See BC Section for more details)
Form Tool	Rougher NFT10-4R Finisher NFT10-4F



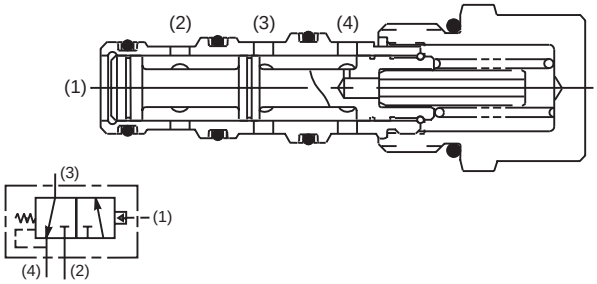
"A" SPOOL – DH103A



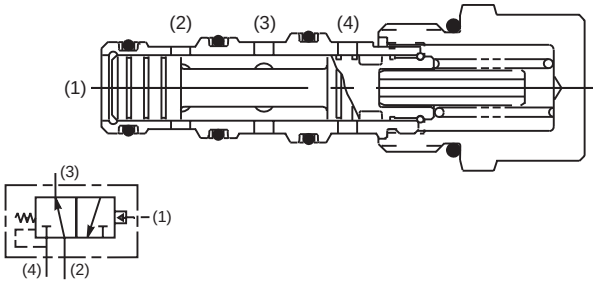


"A" SPOOL — DH103A

"B" SPOOL — DH103B

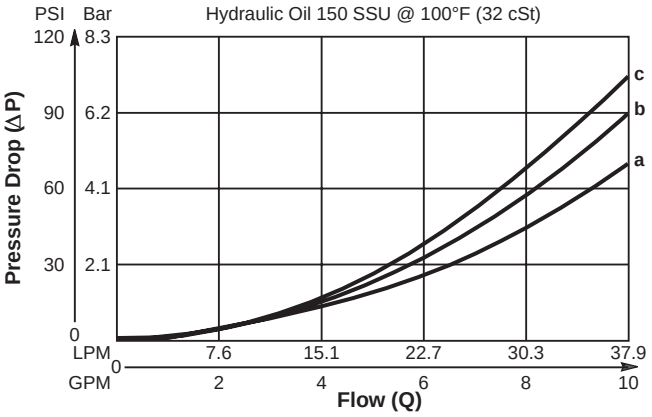


"C" SPOOL — DH103C



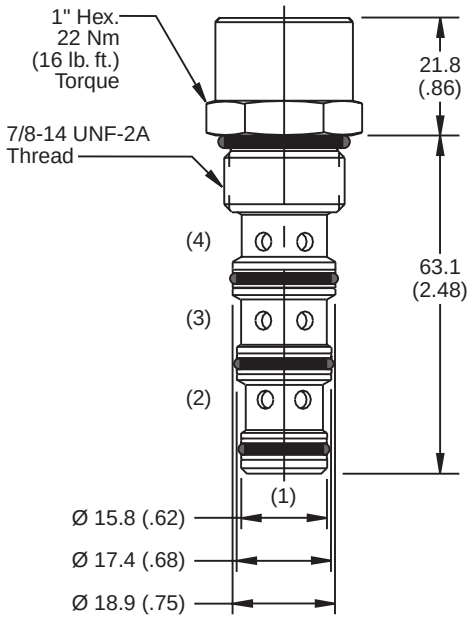
Performance Curve

Flow vs. Pressure Drop (Through cartridge only)



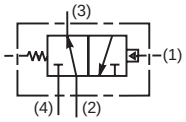
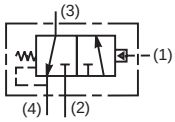
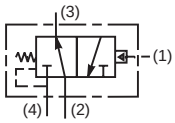
FLOW DIRECTION \ SPOOL NO.	A	B	C
SPOOL SHIFTED	3 → 4 c	2 → 3 d	3 → 4 c
SPOOL NEUTRAL	2 → 3 a	3 → 4 b	2 → 3 a

Dimensions Millimeters (Inches)



Ordering Information

DH103				—		
10 Size Pilot Operated Spool Valve	Spool Type	Pressure Differential	Seals		Body Material	Port Size

Code / Spool Type	
A Normally open 2 position, vent to atmosphere.	
B Normally closed 2 position, internally drain.	
C Normally open, 2 position, internally drain.	

Code	Pressure Differential
Omit	5.5 Bar (80 PSI)
04	2.8 Bar (40 PSI)
16	11 Bar (160 PSI)

Code	Seals / Kit. No.
Omit	Nitrile / (SK10-4N)
V	Fluorocarbon / (SK10-4V)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-4-*4P)
6P	3/8″ NPTF	(B10-4-*6P)
8P	1/2″ NPTF	(B10-4-*6P)
6T	SAE - 6	(B10-4-*6T)
8T	SAE - 8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†
8B	1/2″ BSPG	(B10-4-*8B)

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

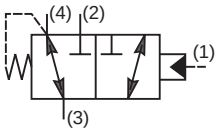
General Description

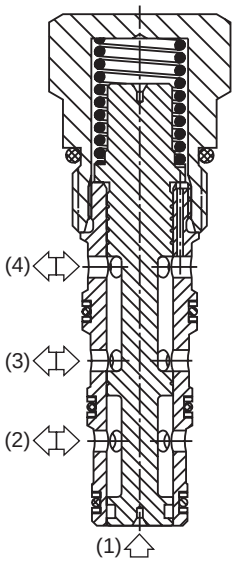
Pilot Operated Directional Valve, 3-Way External Pilot, Internal Vent.

Features

- High flow capacity
- Two switching pressures available
- Sealed pilot option available
- Hardened working parts for maximum durability
- All external parts zinc plated

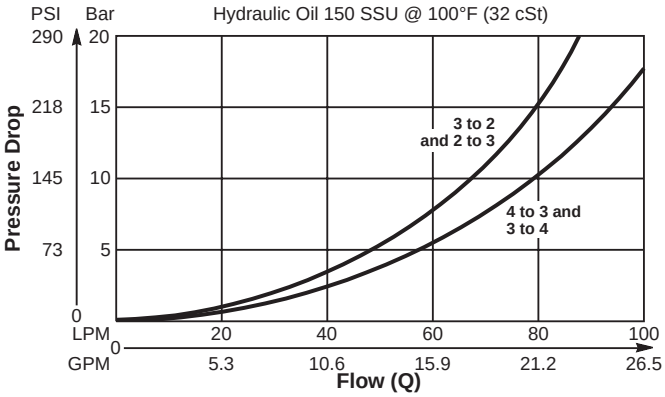




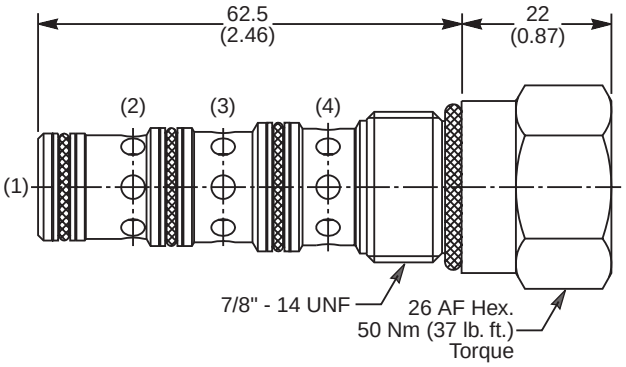


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	90 LPM (24 GPM)
Nominal Flow @ 7 Bar (100 PSI)	50 LPM (13 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.17 kg (.37 lbs.)
Cavity	C10-4 (See BC Section for more details)

Ordering Information

N04A4	–				–		
10 Size Directional Valve		Pilot Switching Pressure	Seals	Sealed Pilot		Body Material	Port Size

Code	Switching Pressure
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)

If no switching pressure is specified, valve will be supplied as N04A4-5.0N

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30506N-1)
V	Fluorocarbon / (SK30506V-1)

Code	Sealed Pilot
Omit	If not required
S	Sealed Pilot

Code	Port Size	Body Part No.
Omit	**Cartridge Only**	
6P	3/8″ NTPF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel bodies only

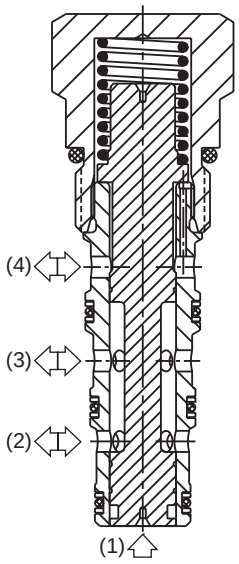
General Description

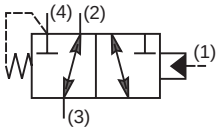
Pilot Operated Directional Valve, 3-Way External Pilot, Internal Vent.

Features

- High flow capacity
- Two switching pressures available
- Sealed pilot option available
- Hardened working parts for maximum durability
- All external parts zinc plated

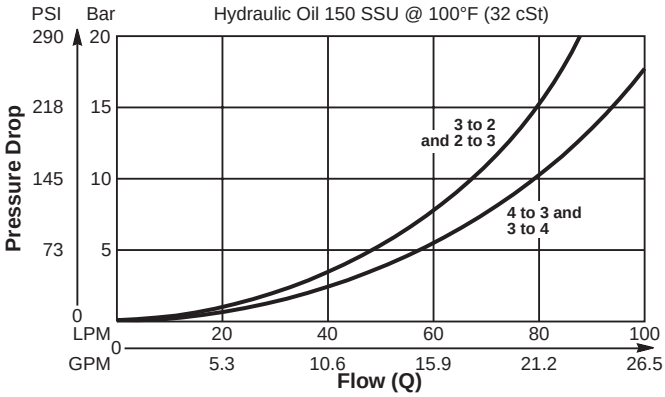




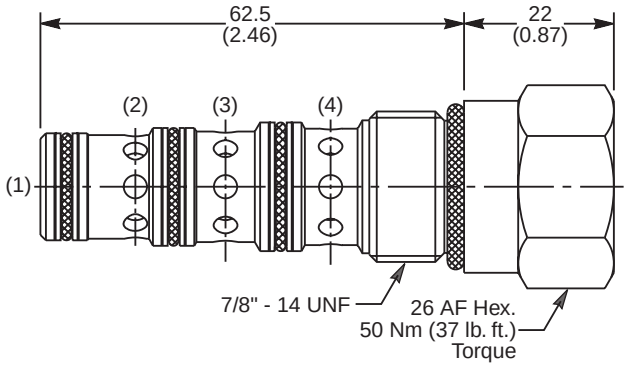


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	90 LPM (24 GPM)
Nominal Flow @ 7 Bar (100 PSI)	50 LPM (13 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.17 kg (.37 lbs.)
Cavity	C10-4 (See BC Section for more details)

Ordering Information

N04B4	–				–		
10 Size Directional Valve		Pilot Switching Pressure	Seals	Sealed Pilot		Body Material	Port Size

Code	Switching Pressure
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)

If no switching pressure is specified, valve will be supplied as N04B4-5.0N

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30506N-1)
V	Fluorocarbon / (SK30506V-1)

Code	Sealed Pilot
Omit	If not required
S	Sealed Pilot

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	**Cartridge Only**	
6P	3/8″ NTPF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

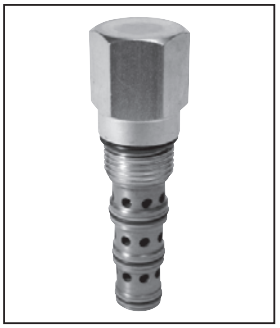
**** Add "A" for aluminum, omit for steel.***
† Steel bodies only

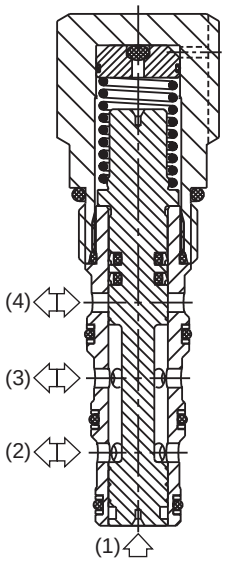
General Description

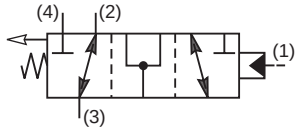
Pilot Operated Directional Valve, 3-Way External Pilot Vented to Atmosphere. Open Transition Feature.

Features

- High flow capacity
- Two switching pressures available
- Sealed pilot option available
- Hardened working parts for maximum durability
- All external parts zinc plated

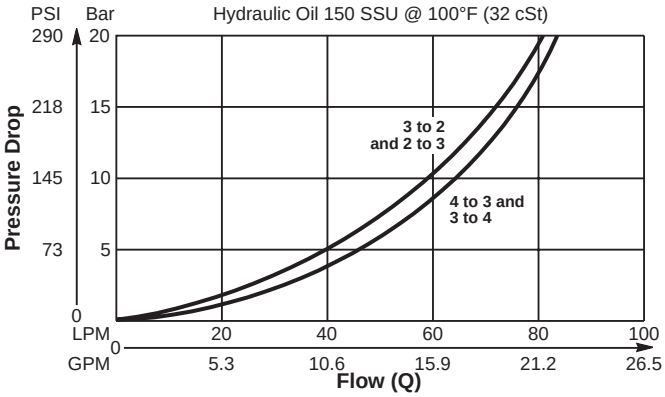




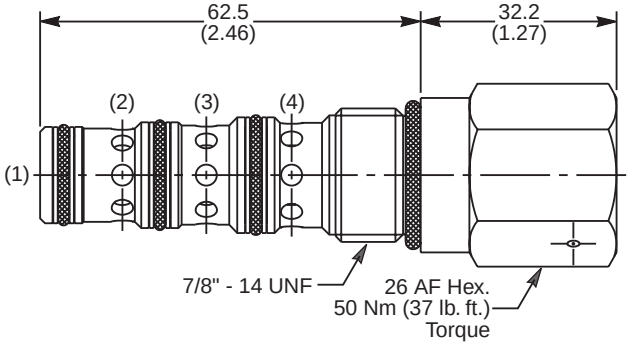


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	85 LPM (22.5 GPM)
Nominal Flow @ 7 Bar (100 PSI)	50 LPM (13 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.22 kg (.48 lbs.)
Cavity	C10-4 (See BC Section for more details)

Ordering Information

N04G4	–				–		
10 Size Directional Valve		Pilot Switching Pressure	Seals	Sealed Pilot		Body Material	Port Size

Code	Switching Pressure
10.0	10.0 Bar (145 PSI) Std.
15.0	15.0 Bar (218 PSI)

If no switching pressure is specified, valve will be supplied as N04G4-10.0N

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30506N-1)
V	Fluorocarbon / (SK30506V-1)

Code	Port Size	Body Part No.
Omit	**Cartridge Only**	
6P	3/8″ NTPF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel bodies only

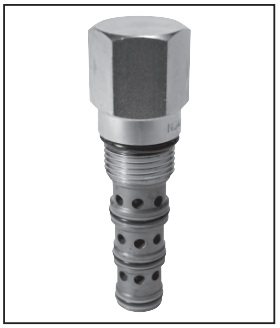
Code	Sealed Pilot
Omit	If not required
S	Sealed Pilot

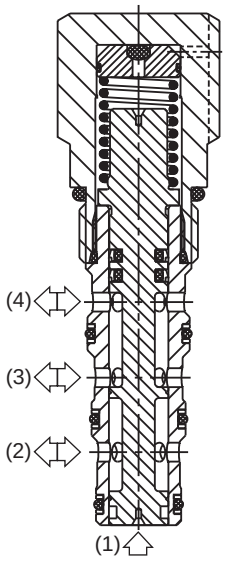
General Description

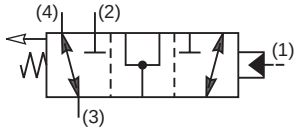
Pilot Operated Directional Valve, 3-Way External Pilot Vented to Atmosphere. Open Transition Feature.

Features

- High flow capacity
- Two switching pressures available
- Sealed pilot option available
- Hardened working parts for maximum durability
- All external parts zinc plated

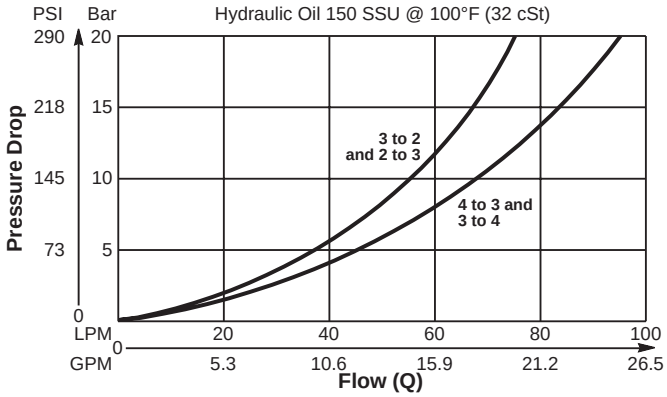




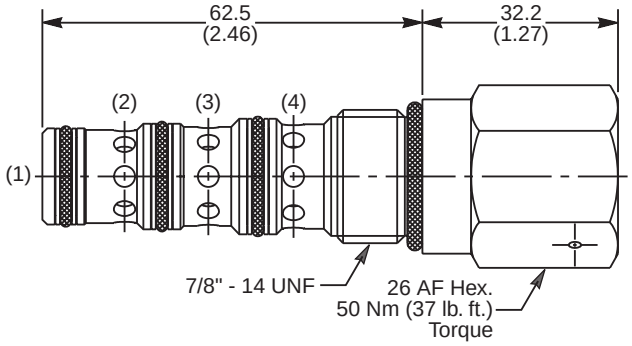


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	85 LPM (22.5 GPM)
Nominal Flow @ 7 Bar (100 PSI)	50 LPM (13 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.22 kg (.48 lbs.)
Cavity	C10-4 (See BC Section for more details)

Ordering Information

N04H4	–				–		
10 Size Directional Valve		Pilot Switching Pressure	Seals	Sealed Pilot		Body Material	Port Size

Code	Switching Pressure
10.0	10.0 Bar (145 PSI) Std.
15.0	15.0 Bar (218 PSI)

If no switching pressure is specified, valve will be supplied as N04H4-10.0N

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30506N-1)
V	Fluorocarbon / (SK30506V-1)

Code	Port Size	Body Part No.
Omit	**Cartridge Only**	
6P	3/8″ NTPF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel bodies only

Code	Sealed Pilot
Omit	If not required
S	Sealed Pilot

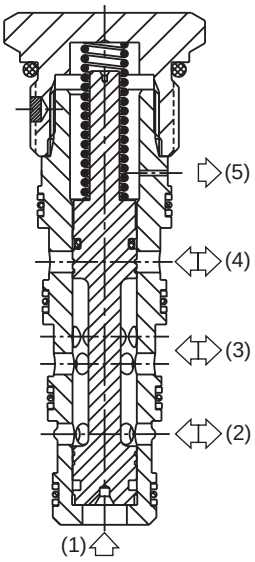
General Description

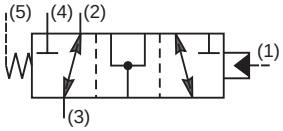
Pilot Operated Directional Valve, 3-Way, 2 Position, External Drain, Open Transition.

Features

- High flow capacity
- Used as high flow switching or metering element
- Range of spring settings available
- All external parts zinc plated

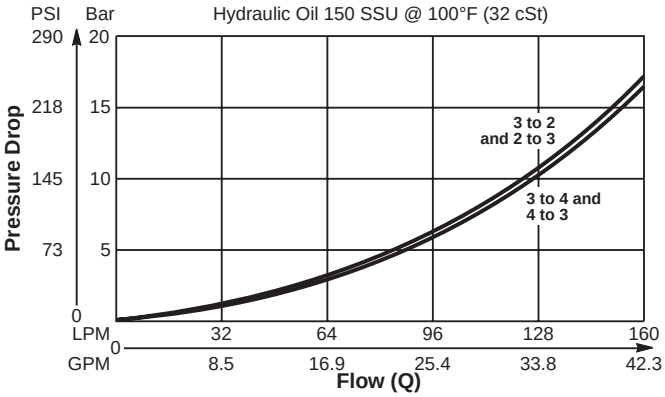




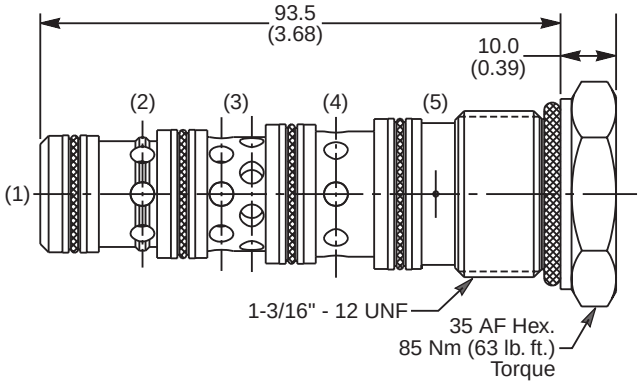


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	160 LPM (42.3 GPM)
Nominal Flow @ 7 Bar (100 PSI)	90 LPM (24 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	Steel operating parts, hardened steel spool.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.33 kg (.76 lbs.)
Cavity	5A (See BC Section for more details)

Ordering Information

N5A125 – [ ] [ ]

Directional Valve (All Ports Open) | **Pilot Switching Pressure** | **Seals**

Code	Switching Pressure
0.0	0.0 Bar (0 PSI)
5.0	5.0 Bar (73 PSI)
6.9	6.9 Bar (100 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (217 PSI)

If no switching pressure is specified, valve will be supplied as N5A125-6.9N

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30103N-1)
V	Fluorocarbon / (SK30103V-1)

Order Bodies Separately

LB10 [ ] [ ]

Line Body | **Porting** | **Body Material**

Code	Porting
314	3/4″ BSP (main) 1/4″ BSP (aux)
321	3/4″ SAE (main) 1/4″ SAE (aux)

Code	Body Material
A	Aluminum
S	Steel

General Description

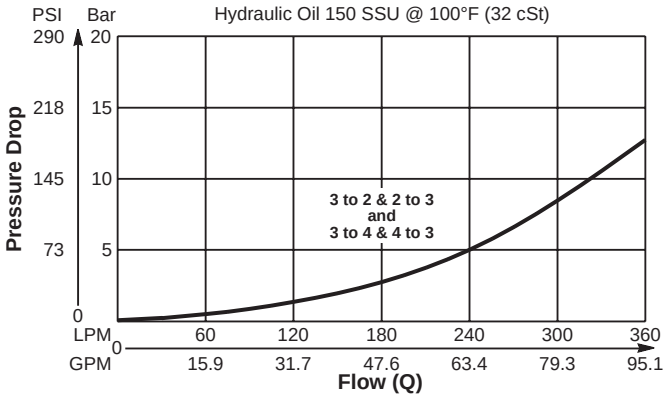
Pilot Operated Directional Valve, 3-Way, 2 Position, External Drain, Open Transition.

Features

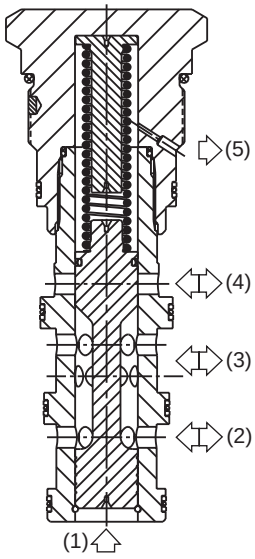
- High flow capacity
- Used as high flow switching or metering element
- Range of spring settings available
- All external parts zinc plated

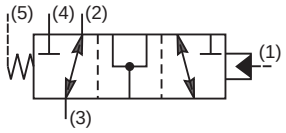
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)

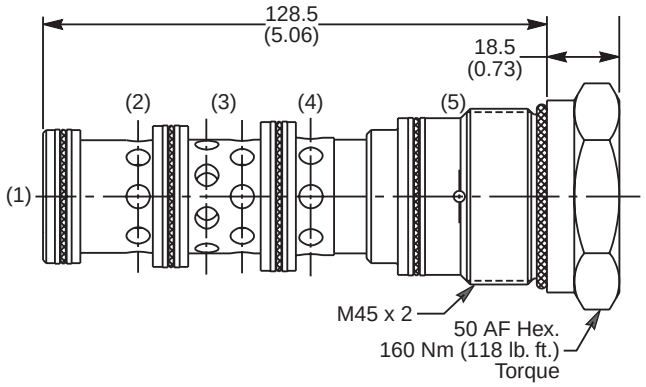








Dimensions Millimeters (Inches)



Specifications

Rated Flow	400 LPM (105 GPM)
Nominal Flow @ 7 Bar (100 PSI)	270 LPM (71 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	Steel operating parts, hardened steel spool.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	1.00 kg (2.2 lbs.)
Cavity	100-1 (See BC Section for more details)

Ordering Information

N5A300	–		
Directional Valve (All Ports Open)		Pilot Switching Pressure	Seals

Code	Switching Pressure
3.0	3.0 Bar (44 PSI)
6.9	6.9 Bar (100 PSI) Std.
10.0	10.0 Bar (145 PSI)

If no switching pressure is specified, valve will be supplied as N5A300-6.9N

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30065N-1)
V	Fluorocarbon / (SK30065V-1)

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
316	1-1/4″ BSP (main) 3/8″ BSP (aux)
317	1-1/4″ SAE (main) 3/8″ SAE (aux)

Code	Body Material
A	Aluminum
S	Steel

General Description

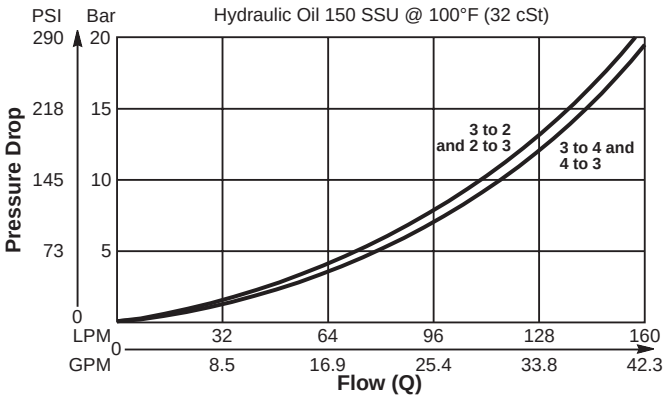
Pilot Operated Directional Valve, 3-Way, 2 Position, External Drain, Closed Transition.

Features

- High flow capacity
- Used as high flow switching or metering element
- Range of spring settings available
- All external parts zinc plated

Performance Curve

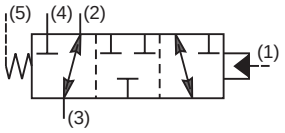
Pressure Drop vs. Flow (Through cartridge only)

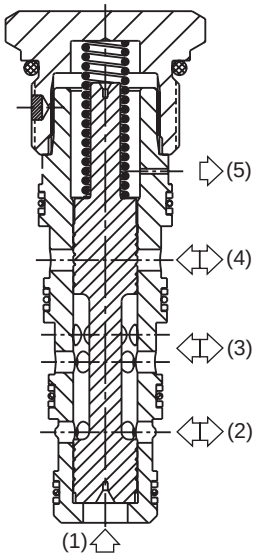


Specifications

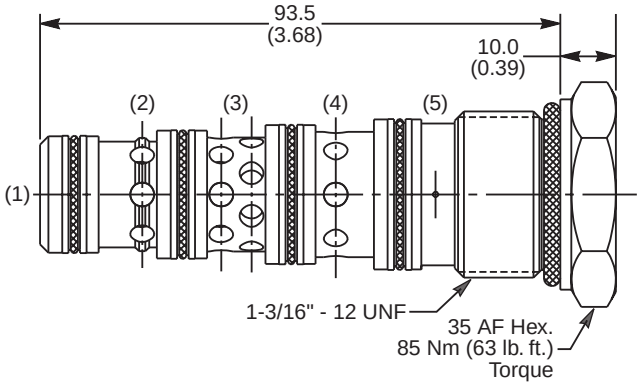
Rated Flow	160 LPM (42.3 GPM)
Nominal Flow @ 7 Bar (100 PSI)	90 LPM (24 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	Steel operating parts, hardened steel spool.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.33 kg (.76 lbs.)
Cavity	5A (See BC Section for more details)







Dimensions Millimeters (Inches)



Ordering Information

N5B125 – [ ] [ ]

Directional Valve (All Ports Closed) | **Pilot Switching Pressure** | **Seals**

Code	Switching Pressure
0.0	0.0 Bar (0 PSI)
5.0	5.0 Bar (73 PSI)
6.9	6.9 Bar (100 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (217 PSI)

If no switching pressure is specified, valve will be supplied as N5B125-6.9N

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30103N-1)
V	Fluorocarbon / (SK30103V-1)

Order Bodies Separately

LB10 [ ] [ ]

Line Body | **Porting** | **Body Material**

Code	Porting
314	3/4″ BSP (main) 1/4″ BSP (aux)
321	3/4″ SAE (main) 1/4″ SAE (aux)

Code	Body Material
A	Aluminum
S	Steel

General Description

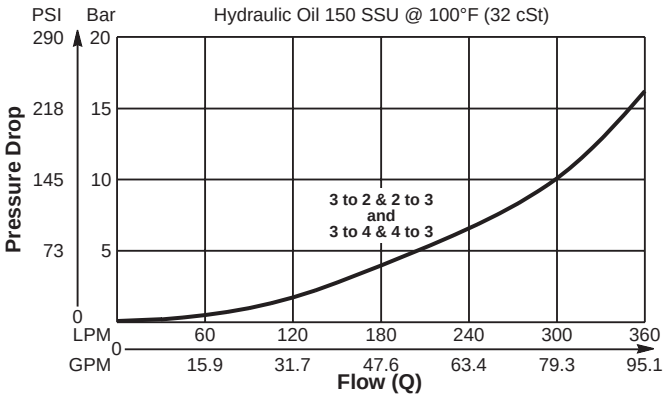
Pilot Operated Directional Valve, 3-Way, 2 Position, External Drain, Closed Transition.

Features

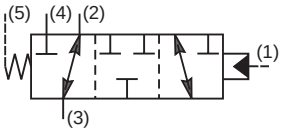
- High flow capacity
- Used as high flow switching or metering element
- Range of spring settings available
- All external parts zinc plated

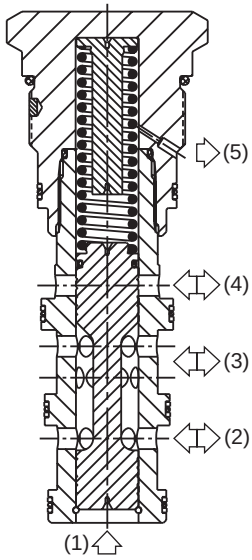
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)

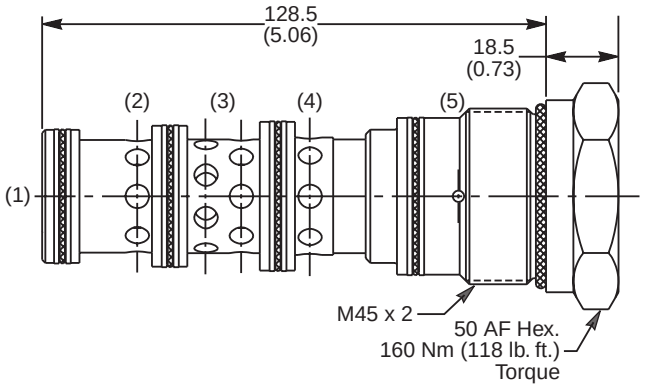








Dimensions Millimeters (Inches)



Specifications

Rated Flow	400 LPM (105 GPM)
Nominal Flow @ 7 Bar (100 PSI)	270 LPM (71 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	Steel operating parts, hardened steel spool.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	1.00 kg (2.2 lbs.)
Cavity	100-1 (See BC Section for more details)

Ordering Information

N5B300 – [ ] [ ]

Directional Valve (All Ports Closed) | **Pilot Switching Pressure** | **Seals**

Code	Switching Pressure
3.0	3.0 Bar (44 PSI)
6.9	6.9 Bar (100 PSI) Std.
10.0	10.0 Bar (145 PSI)

If no switching pressure is specified, valve will be supplied as N5B300-6.9N

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30065N-1)
V	Fluorocarbon / (SK30065V-1)

Order Bodies Separately

LB10 [ ] [ ]

Line Body | **Porting** | **Body Material**

Code	Porting
316	1-1/4″ BSP (main) 3/8″ BSP (aux)
317	1-1/4″ SAE (main) 3/8″ SAE (aux)

Code	Body Material
A	Aluminum
S	Steel

General Description

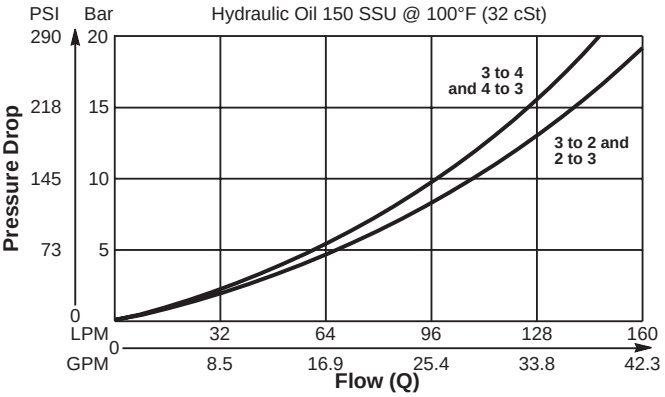
Diverter Valve, 3-Way, 2 Position, External Drain, Normally Open.

Features

- High flow capacity
- Used as high flow switching or metering element
- Range of spring settings available
- Sealed pilot option available
- All external parts zinc plated

Performance Curve

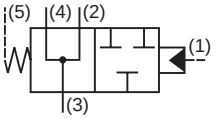
Pressure Drop vs. Flow (Through cartridge only)

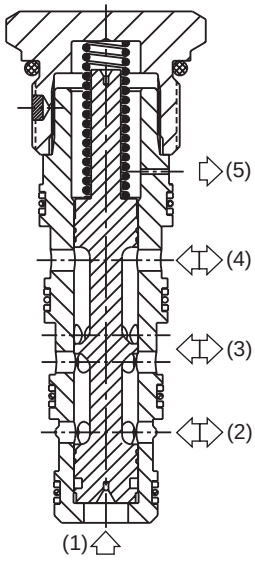


Specifications

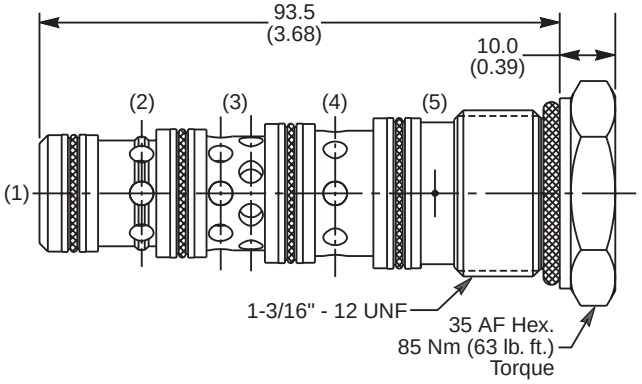
Rated Flow	160 LPM (42.3 GPM)
Nominal Flow @ 7 Bar (100 PSI)	80 LPM (21 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	Steel operating parts, hardened steel spool.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.33 kg (.76 lbs.)
Cavity	5A (See BC Section for more details)







Dimensions Millimeters (Inches)



Ordering Information

N5C125 – [ ] [ ]

Diverter Valve (All Ports Open) | **Pilot Switching Pressure** | **Seals**

Code	Switching Pressure
0.0	0.0 Bar (0 PSI)
5.0	5.0 Bar (73 PSI)
6.9	6.9 Bar (100 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (217 PSI)

If no switching pressure is specified, valve will be supplied as N5C125-6.9N

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30103N-1)
V	Fluorocarbon / (SK30103V-1)

Order Bodies Separately

LB10 [ ] [ ]

Line Body | **Porting** | **Body Material**

Code	Porting
314	3/4″ BSP (main) 1/4″ BSP (aux)
321	3/4″ SAE (main) 1/4″ SAE (aux)

Code	Body Material
A	Aluminum
S	Steel

General Description

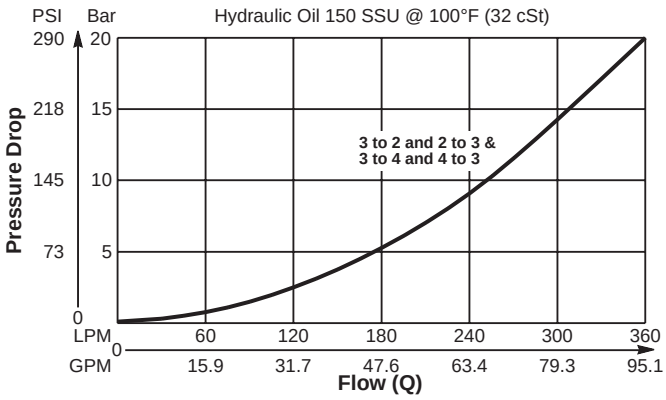
Diverter Valve, 3-Way, 2 Position, External Drain, Normally Open.

Features

- High flow capacity
- Used as high flow switching or metering element
- Range of spring settings available
- All external parts zinc plated

Performance Curve

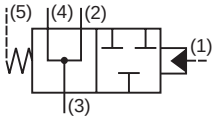
Pressure Drop vs. Flow (Through cartridge only)

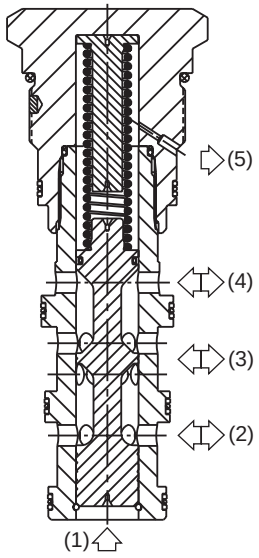


Specifications

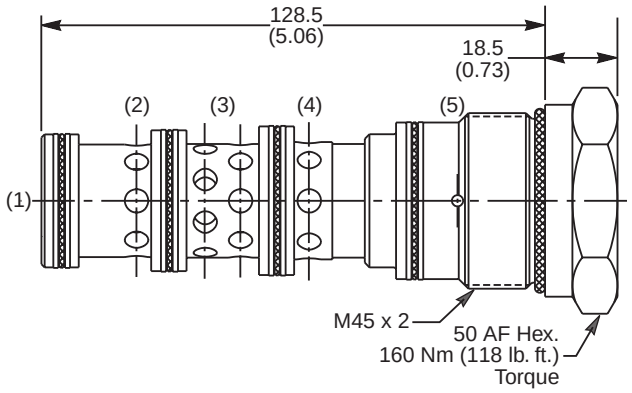
Rated Flow	400 LPM (105 GPM)
Nominal Flow @ 7 Bar (100 PSI)	**3 to 2 -** 130 LPM (34 GPM) **3 to 4 -** 240 LPM (63 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	Steel operating parts, hardened steel spool.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	1.00 kg (2.2 lbs.)
Cavity	100-1 (See BC Section for more details)







Dimensions Millimeters (Inches)



Ordering Information

N5C300 – [ ] [ ]

Diverter Valve (All Ports Open) | **Pilot Switching Pressure** | **Seals**

Code	Switching Pressure
3.0	3.0 Bar (44 PSI)
6.9	6.9 Bar (100 PSI) Std.
10.0	10.0 Bar (145 PSI)

If no switching pressure is specified, valve will be supplied as N5C300-6.9N

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30065N-1)
V	Fluorocarbon / (SK30065V-1)

Order Bodies Separately

LB10 [ ] [ ]

Line Body | **Porting** | **Body Material**

Code	Porting
316	1-1/4″ BSP (main) 3/8″ BSP (aux)
317	1-1/4″ SAE (main) 3/8″ SAE (aux)

Code	Body Material
A	Aluminum
S	Steel

General Description

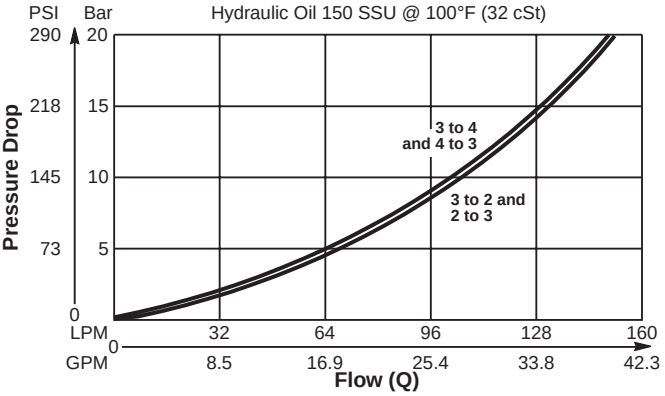
Diverter Valve, 3-Way, 2 Position, External Drain, Normally Closed.

Features

- High flow capacity
- Used as high flow switching or metering element
- Range of spring settings available
- Sealed pilot option available
- All external parts zinc plated

Performance Curve

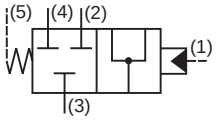
Pressure Drop vs. Flow (Through cartridge only)

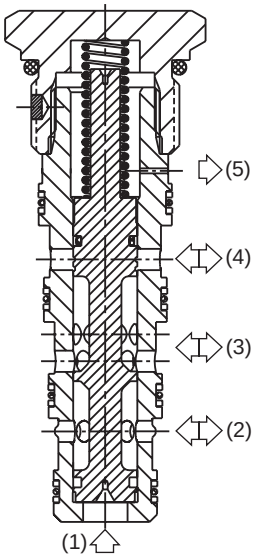


Specifications

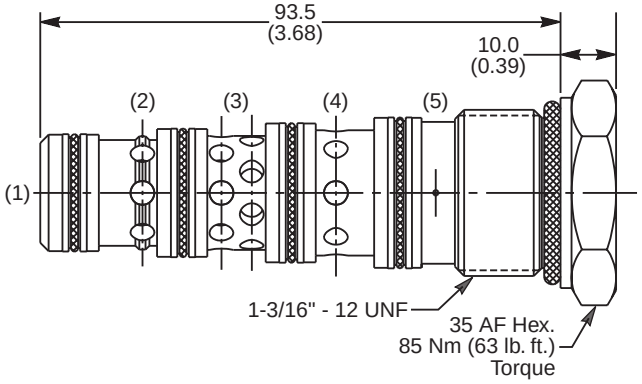
Rated Flow	160 LPM (42.3 GPM)
Nominal Flow @ 7 Bar (100 PSI)	80 LPM (21 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	Steel operating parts, hardened steel spool.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.33 kg (.76 lbs.)
Cavity	5A (See BC Section for more details)







Dimensions Millimeters (Inches)



Ordering Information

N5D125 – [ ] [ ]

Diverter Valve (All Ports Closed) | **Pilot Switching Pressure** | **Seals**

Code	Switching Pressure
0.0	0.0 Bar (0 PSI)
5.0	5.0 Bar (73 PSI)
6.9	6.9 Bar (100 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (217 PSI)

If no switching pressure is specified, valve will be supplied as N5D125-6.9N

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30103N-1)
V	Fluorocarbon / (SK30103V-1)

Order Bodies Separately

LB10 [ ] [ ]

Line Body | **Porting** | **Body Material**

Code	Porting
314	3/4″ BSP (main) 1/4″ BSP (aux)
321	3/4″ SAE (main) 1/4″ SAE (aux)

Code	Body Material
A	Aluminum
S	Steel

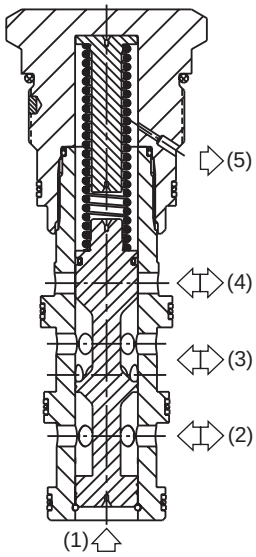
General Description

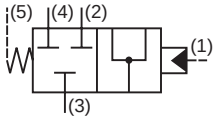
Diverter Valve, 3-Way, 2 Position, External Drain, Normally Closed.

Features

- High flow capacity
- Used as high flow switching or metering element
- Range of spring settings available
- All external parts zinc plated

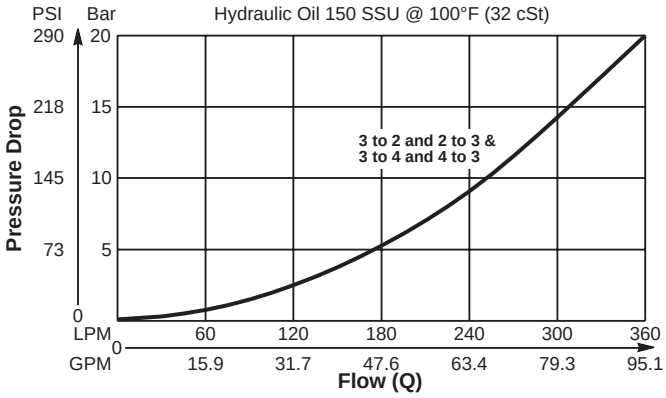




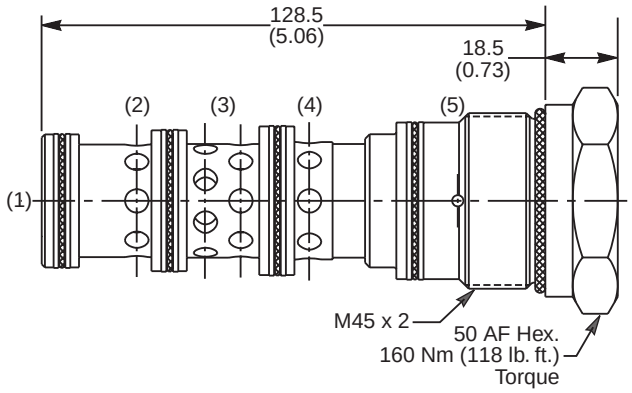


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	400 LPM (105 GPM)
Nominal Flow @ 7 Bar (100 PSI)	**3 to 2 -** 200 LPM (53 GPM) **3 to 4 -** 200 LPM (53 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	Steel operating parts, hardened steel spool.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	1.00 kg (2.2 lbs.)
Cavity	100-1 (See BC Section for more details)

Ordering Information

N5D300 – [ ] [ ]

Diverter Valve (All Ports Closed) | **Pilot Switching Pressure** | **Seals**

Code	Switching Pressure
3.0	3.0 Bar (44 PSI)
6.9	6.9 Bar (100 PSI) Std.
10.0	10.0 Bar (145 PSI)

If no switching pressure is specified, valve will be supplied as N5D300-6.9N

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30065N-1)
V	Fluorocarbon / (SK30065V-1)

Order Bodies Separately

LB10 [ ] [ ]

Line Body | **Porting** | **Body Material**

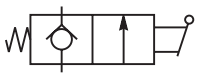
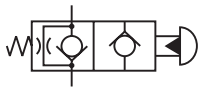
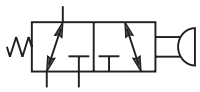
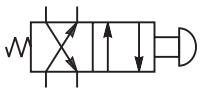
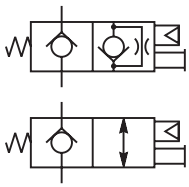
Code	Porting
316	1-1/4″ BSP (main) 3/8″ BSP (aux)
317	1-1/4″ SAE (main) 3/8″ SAE (aux)

Code	Body Material
A	Aluminum
S	Steel

BLANK
PAGE

Contents

Manual Valves

	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
	DL081	C08-2	2 Position, 2 Way, N.C. Poppet, Pull to Open	30/8	210/3000	MV1
	DL101	C10-2	2 Position, 2 Way, N.C. Poppet, Pull to Open	49/13	210/3000	MV2
	GM0212	C08-2	2 Position, 2 Way, N.O. Poppet, Push to Close	45/12	350/5000	MV3
	GM0233	C08-3	2 Position, 3 Way, Spool Type, Pull to Shift	19/5	350/5000	MV4
	DM103	C10-3	3 Way, Rotary Spool	22/6	240/3500	MV5-MV6
	DM104	C10-4	4 Way, Rotary Spool	7/2	240/3500	MV7-MV8
	GM0240XS	C08-4	2 Position, 4 Way, Push to Shift	15/4	350/5000	MV9
	GM0240CS	C08-4	2 Position, 4 Way, Push to Shift	15/4	350/5000	MV10
	GM0251	C08-4	3 Position, 4 Way, Closed Center, Pull to Shift and Push to Shift	17/5	350/5000	MV11
	GM0253	C08-4	3 Position, 4 Way, Float Center, Pull to Shift and Push to Shift	17/5	350/5000	MV12
	GM0257	C08-4	3 Position, 4 Way, Tandem Center, Pull to Shift and Push to Shift	15/4	350/5000	MV13
	GM0259	C08-4	3 Position, 4 Way, Open Center, Pull to Shift and Push to Shift	15/4	350/5000	MV14
	GA0201	C08-2	2 Position, 2 Way, N.C. Poppet, Air Pilot or Pull to Open, Restricted Reverse Flow	45/12	210/3000	MV15-MV16
	GA0205	C08-2	2 Position, 2 Way, N.C. Poppet, Air Pilot or Pull to Open, Free Reverse Flow	45/12	210/3000	MV15-MV16

General Description

2-Way Manual Poppet Valve. The DL081 Series Valves are suited for emergency lowering applications and on-off flow applications.

Operation

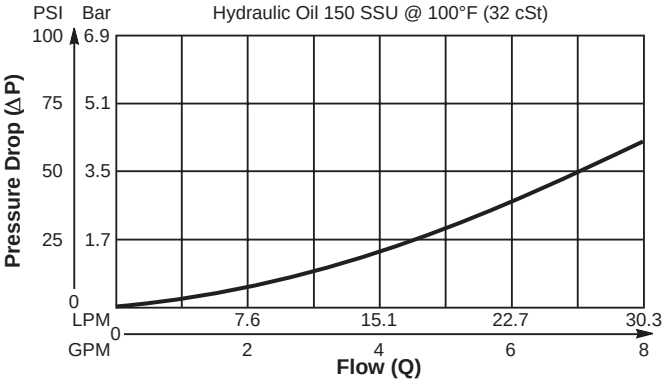
The DL081 Series Valves are mechanically operated check valves. Hydraulic force on the poppet is balanced by having equal area between the poppet seat and the valve stem, allowing the poppet to be manually pulled off the seat. When released, the bias spring will return the valve poppet to its closed position. Back pressure of more than 5.5 Bar (80 PSI) will prevent the bias spring from closing the poppet and must be avoided.

Features

- Low leakage design
- Flip lever, pull handle, or detented pin design
- All external parts zinc plated

Performance Curve

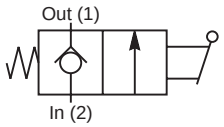
Flow vs. Pressure Drop (Through cartridge only)

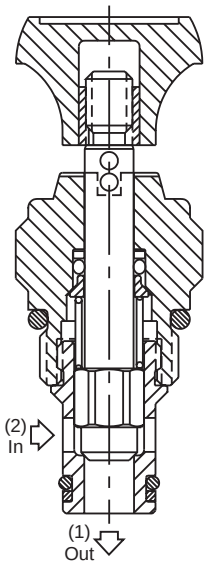


Specifications

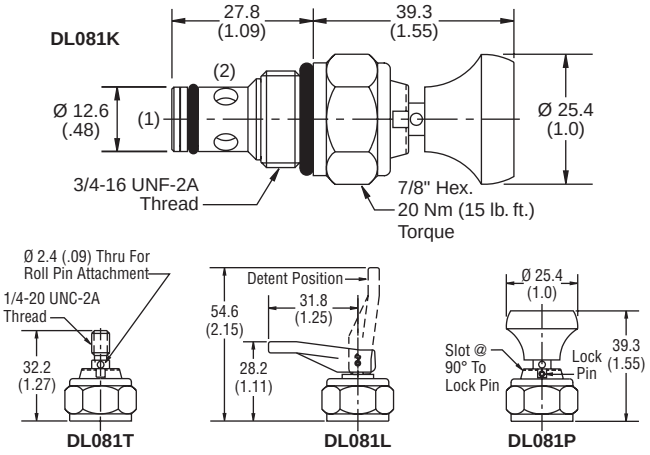
Nominal Flow	30 LPM (8 GPM)
Max. Inlet Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) at 210 Bar (3000 PSI)
Max. Allowable Tankline Pressure	5.5 Bar (80 PSI)
Operating Temp. Range (Ambient)	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Cartridge Material	Stem, stainless steel. All other parts hardened steel.
Fliltration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	0.08 kg (0.17 lbs.)
Cavity	C08-2
Form Tool	Rougher None Finisher NFT08-2F







Dimensions Millimeters (Inches)



Ordering Information

DL081			—		
08 Size Manual Poppet Valve	Actuator Type	Seals		Body Material	Port Size

Code	Actuator Type
K	Knob (852525)
T	Stem
L	Lever
P	Lock Pin

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
Omit	Nitrile / (SK08-2N)
V	Fluorocarbon / (SK08-2V)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-2-*4P)
6P	3/8″ NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8″ BSPG	(B08-2-*6B)

**** Add "A" for aluminum, omit for steel.***

General Description

2-Way Manual Poppet Valve. The DL101 Series Valves are suited for emergency lowering applications and on-off flow applications.

Operation

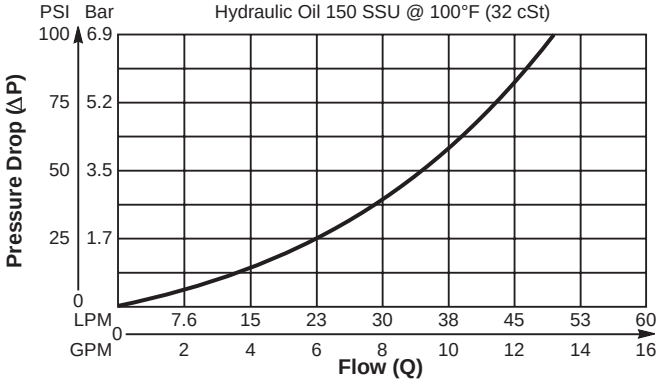
The DL101 Series Valves are mechanically operated check valves. Hydraulic force on the poppet is balanced by having equal area between the poppet seat and the valve stem, allowing the poppet to be manually pulled off the seat. When released, the bias spring will return the valve poppet to its closed position. Back pressure of more than 17.3 Bar (250 PSI) will prevent the bias spring from closing the poppet and must be avoided.

Features

- Low shut-off leakage
- Cartridge design
- Pull-to-Open design
- All external parts zinc plated

Performance Curve

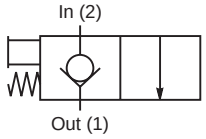
Pressure Drop vs. Flow (Through cartridge only)

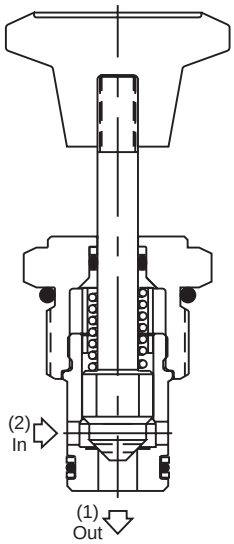


Specifications

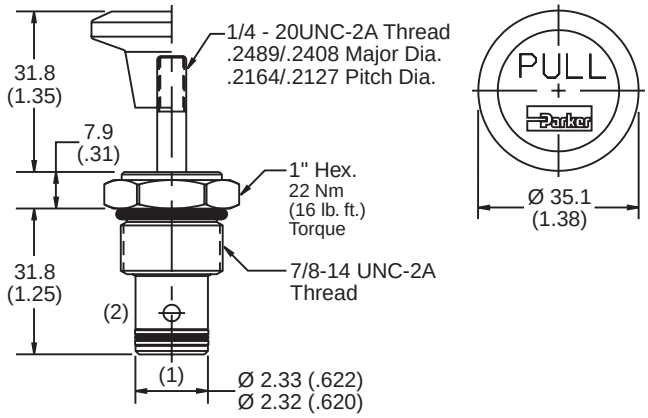
Nominal Flow	48.8 LPM (13 GPM)
Max. Inlet Pressure	240 Bar (3500 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) at 240 Bar (3500 PSI)
Max. Allowable Tankline Pressure	17.3 Bar (250 PSI)
Operating Temp. Range (Ambient)	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Cartridge Material	Stem, stainless steel. All other parts hardened steel.
Fliltration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	0.09 kg (0.21 lbs.)
Cavity	C10-2
Form Tool	Rougher None Finisher NFT10-2F







Dimensions Millimeters (Inches)



Ordering Information

DL101			—		
10 Size Manual Poppet Valve	Actuator Type	Seals		Body Material	Port Size

Code	Actuator Type
K	Knob (850020K)
T	Stem

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
Omit	Nitrlie / (SK10-2N)
V	Fluorocarbon / (SK10-2V)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

2-Way, 2 Position, Normally Open Manual Poppet Valve.

Features

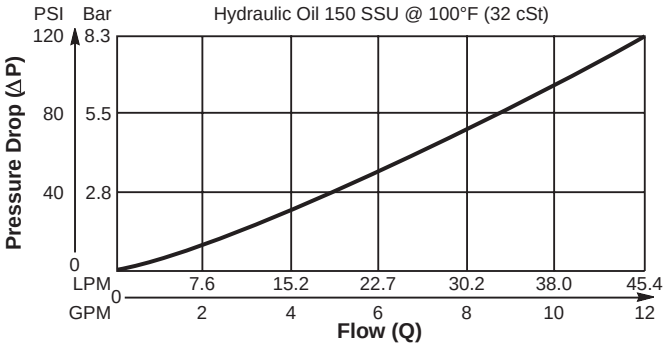
- Hardened poppet for minimal wear and greater durability
- Poppet type construction for minimal internal leakage
- Internal pilot operation provides “power leverage”
- Cavity common with solenoid operated valves
- Screw-on detent is optional
- All external parts zinc plated

Operation

In neutral position, pressure applied to port 2 creates pilot flow across the pilot seat causing poppet to lift. Flow passes from port 2 to port 1 until manual operator is pushed forcing pilot into its seat preventing pilot flow to firmly close the poppet. In neutral position, flow is restricted from port 1 to port 2.

Performance Curve

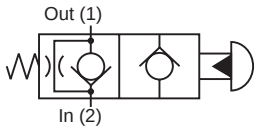
Pressure Drop vs. Flow (Through cartridge only)

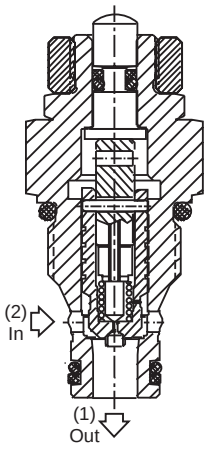


Specifications

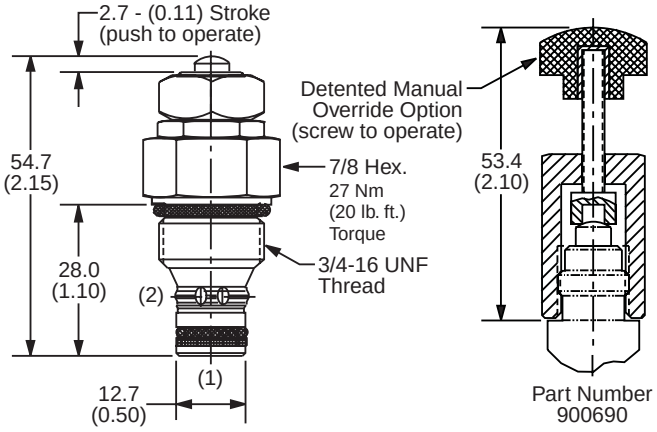
Rated Flow	45 LPM (12 GPM)
Maximum Input Pressure @ Port 2	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	0.33 ml/min. (5 drops/min.) @ 210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.13 kg (.31 lbs.)
Cavity	C08-2 (See BC Section for more details)







Dimensions Millimeters (Inches)



Ordering Information

GM02 12				–		
08 Size Manual Valve Poppet Type Normally Open	Manual Button	Filter Screen	Seals		Body Material	Port Size

Code	Manual Button
0	Non-Detented (Std.)
1	Detented (With use of part #900690

Code	Filter Screen
0	Not required
1	60 mesh screen

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30065N-1)
V	Fluorocarbon / (SK30065V-1)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-2-*4P)
6P	3/8″ NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8″ BSPG	(B08-2-*6B)

**** Add “A” for aluminum, omit for steel.***

General Description

3-Way, 2 Position Manual Spool Valve. Designed to operate single acting cylinders, pilot circuits and uni-directional motors.

Features

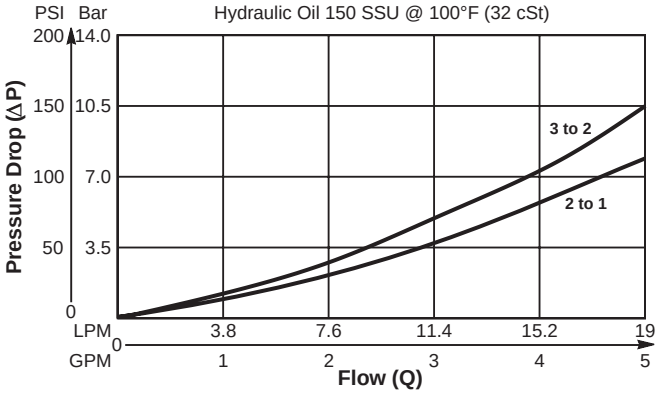
- High flow capacity with reduced space requirements
- One piece cartridge housing ensures internal concentricity
- Low mechanical operating force required
- Detented option available
- All external parts zinc plated

Operation

Neutral flow is 2 to 1. Pull to shift for flow from 3 to 2.

Performance Curve

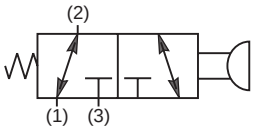
Pressure Drop vs. Flow (Through cartridge only)

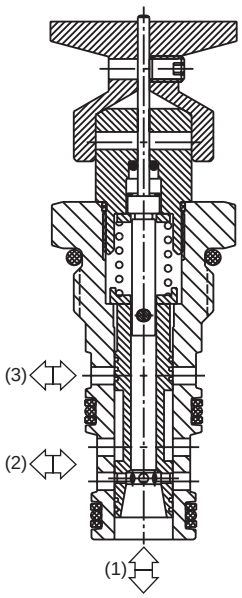


Specifications

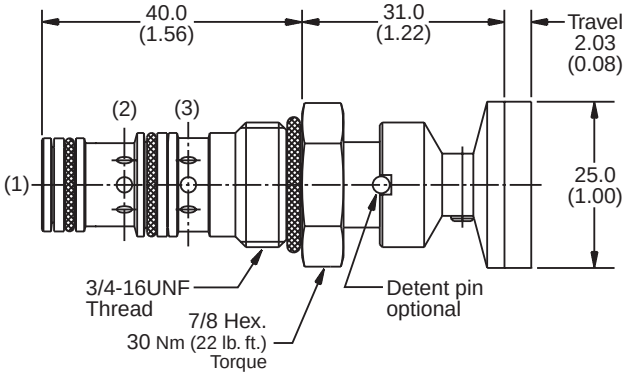
Rated Flow	19 LPM (5 GPM)
Operating Pressure	**Side Ports -** 350 Bar (5000 PSI) **Bottom Port -** 35 Bar (500 PSI)
Max. Operating Pushing or Pulling Force Required	5 kg (11 lbs.)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.10 kg (.20 lbs.)
Cavity	C08-3 (See BC Section for more details)







Dimensions Millimeters (Inches)



Ordering Information

GM02 33			–		
08 Size Manual Valve Spool Type	Detent Option	Seals		Body Material	Port Size

Code	Detent Option
Omit	Non-Detented (Std.)
1	Detented

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30077N-1)
V	Fluorocarbon / (SK30077V-1)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-3-*4P)
4T	SAE-4	(B08-3-*4T)
6T	SAE-6	(B08-3-*6T)
6B	3/8″ BSPG	(B08-3-*6B)

**** Add "A" for aluminum, omit for steel.***

General Description

3-Way Rotary Spool Valve. The DM103 Series Valves are suited for any 3-way application (such as a selector function) where manual operation is desired. For additional information see Technical Tips pages MV1-MV2.

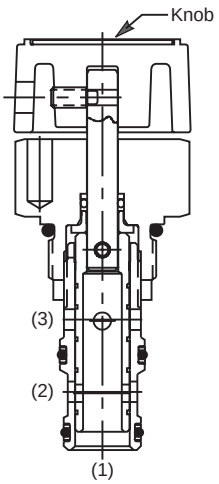
Features

- Several lever and knob options available
- Detented versions available
- Serviceable cartridge design
- All external parts zinc plated

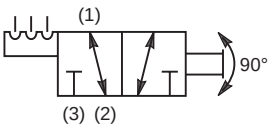
Operation

The K, LD, and FKD options require a full 90° rotation to shift the spool from one offset position to the other. The LN and FKN options require a full 45° rotation from center to either offset position. The knob (or lever) position indicator can be positioned anywhere within the 360° circle.





DM103LD

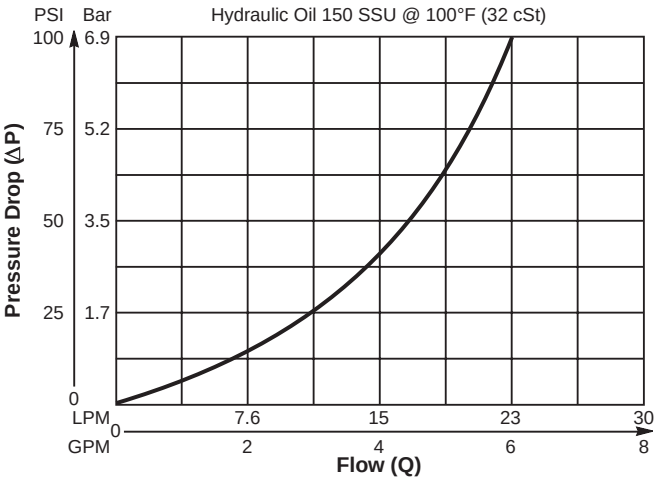


Specifications

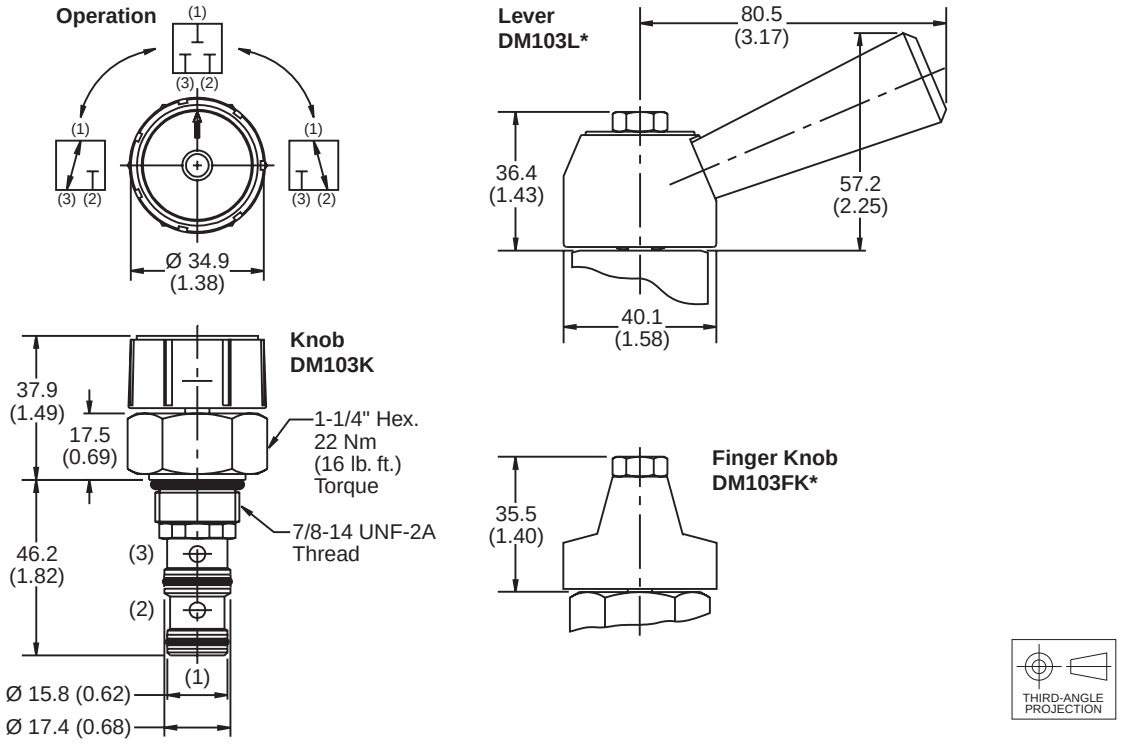
Nominal Flow	22.5 LPM (6 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Degrees of Rotation	K, LD, and FKD Styles: 90° from Offset to Offset (2 positions) LN, FKN Style: 45° from center to either Offset (3 positions)
Leakage at 150 SSU (32 cSt)	164 cc/min. at 240 Bar (3500 PSI)
Cartridge Material	Stem, stainless steel. All other parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Fliltration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	0.11 kg (.30 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

Performance Curve

Flow vs. Pressure Drop
(Through cartridge only)

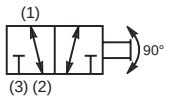
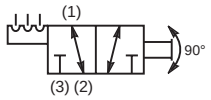
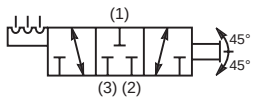
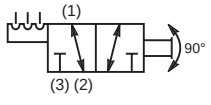
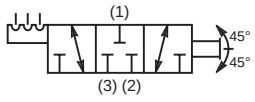


Dimensions Millimeters (Inches)



Ordering Information

DM103			—		
10 Size Rotary Spool Valve	Acuator Type	Seals		Body Material	Port Size

Code / Actuator Type	
K Knob	
LD Lever with 2 position detent	
LN Lever with 3 position detent	
FKD Finger Knob with 2 position detent	
FKN Finger Knob with 3 position detent	

Code	Seals / Kit. No.
Omit	Nitrlie / (SK10-3N)
V	Fluorocarbon / (SK10-3V)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
4T	SAE - 4	(B10-3-*4T)
6T	SAE - 6	(B10-3-*6T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8B)

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

4-Way Rotary Spool Valve. The DM104 Series Valves are suited for all 4-way directional control applications where manual operation is desired.

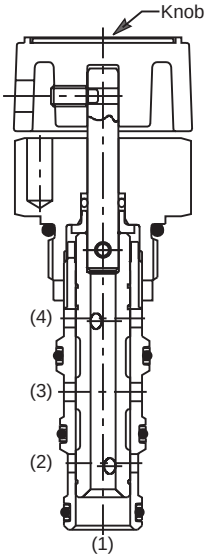
Features

- Several lever and knob options available
- Detented versions available
- Serviceable cartridge design
- All external parts zinc plated

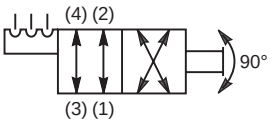
Operation

The K, LD, and FKD options require a full 90° rotation to shift the spool from one offset position to the other. The LN and FKN options require a full 45° rotation from center to either offset position. The knob (or lever) position indicator can be positioned anywhere within the 360° circle.





DM104LD



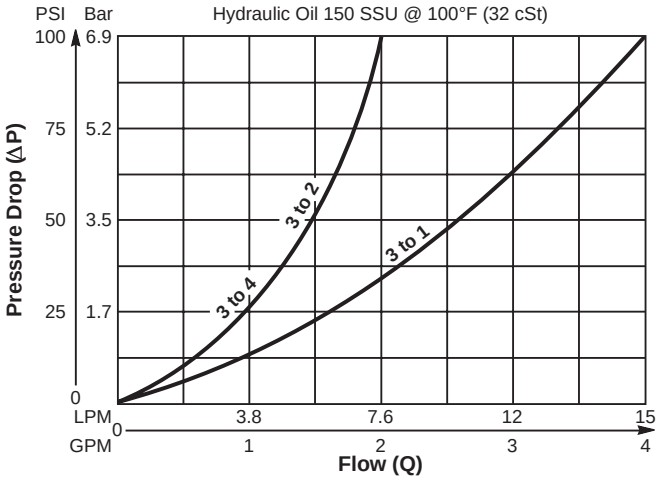
Specifications

Nominal Flow	7.5 LPM (2 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Degrees of Rotation	K, LD, and FKD Styles: 90° from Offset to Offset (2 positions) LN and FKN Styles: 45° from center to either Offset (3 positions)
Leakage at 150 SSU (32 cSt)	164 cc/min. at 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Fliltration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	0.11 kg (.30 lbs.)
Cavity	C10-4 (See BC Section for more details)
Form Tool	Rougher NFT10-4R Finisher NFT10-4F

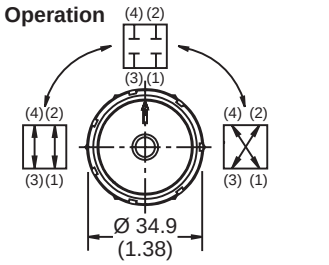
Performance Curve

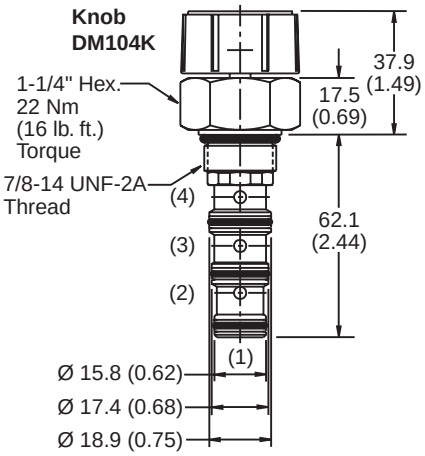
Flow vs. Pressure Drop

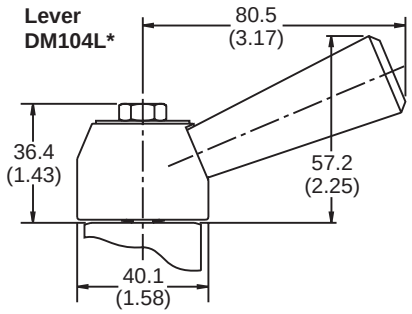
(Through cartridge only)

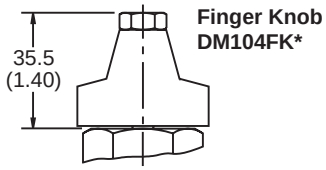


Dimensions Millimeters (Inches)





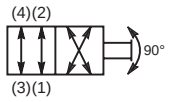
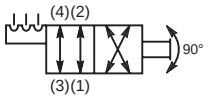
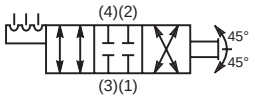
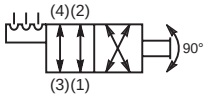
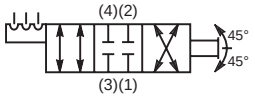


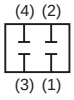
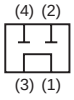


THIRD-ANGLE PROJECTION

Ordering Information

DM104				—		
10 Size Rotary Spool Valve	Acuator Type	Spool Option	Seals		Body Material	Port Size

Code / Actuator Type	
K Knob	
LD Lever with 2 position detent	
LN Lever with 3 position detent	
FKD Finger Knob with 2 position detent	
FKN Finger Knob with 3 position detent	

Code / Spool Option	
1 Closed Center	
8 Tandem Center	

Code	Seals / Kit. No.
Omit	Nitrile / (SK10-4N)
V	Fluorocarbon / (SK10-4V)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6P	3/8″ NPTF	(B10-4-*6P)
6T	SAE - 6	(B10-4-*6T)
8T	SAE - 8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

4-Way, 2 Position, Reversing Manual Spool Valve. Designed to operate double acting cylinders, pilot circuits and bi-directional motors.

Features

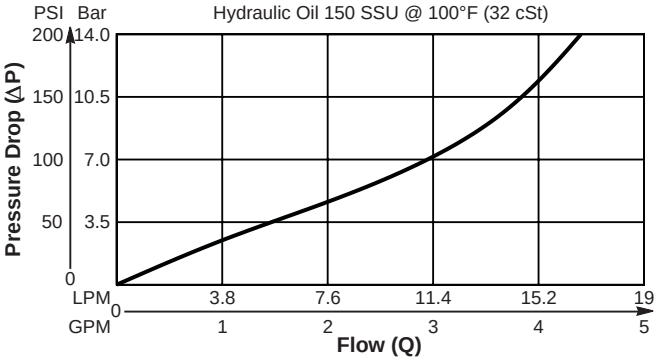
- High flow capacity with reduced space requirements
- One piece cartridge housing ensures internal concentricity
- Low mechanical operating force required
- Detented option available
- All external parts zinc plated

Operation

Neutral, flow is 3 to 4 and 2 to 1. Push to shift for flow 3 to 2 and 4 to 1

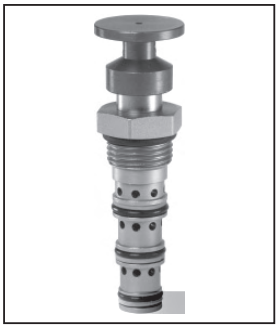
Performance Curve

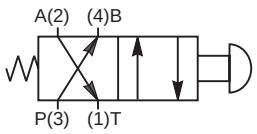
Pressure Drop vs. Flow (Through cartridge only)

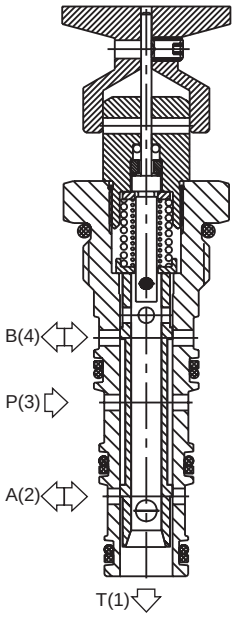


Specifications

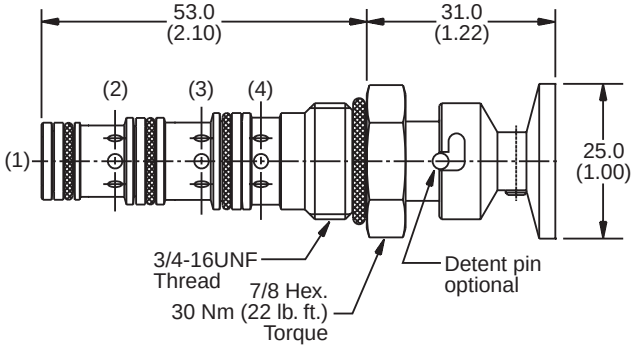
Rated Flow	15 LPM (4 GPM)
Operating Pressure	**Side Ports -** 350 Bar (5000 PSI) **Bottom Port -** 35 Bar (500 PSI)
Max. Operating Pushing or Pulling Force Required	5 kg (11 lbs.)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.10 kg (.20 lbs.)
Cavity	C08-4 (See BC Section for more details)







Dimensions Millimeters (Inches)



Ordering Information

GM02 40XS			–		
08 Size Manual Valve Spool Type Reversing	Detent Option	Seals		Body Material	Port Size

Code	Detent Option
Omit	Non-Detented (Std.)
1	Detented

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30078N-1)
V	Fluorocarbon / (SK30078V-1)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4T	SAE-4	(B08-4-*4T)
6T	SAE-6	(B08-4-*6T)
6B	3/8″ BSPG	(B08-4-*6B)

**** Add "A" for aluminum, omit for steel.***

General Description

4-Way, 2 Position, Normally Closed Manual Spool Valve. Designed to operate double acting cylinders, pilot circuits and bi-directional motors.

Features

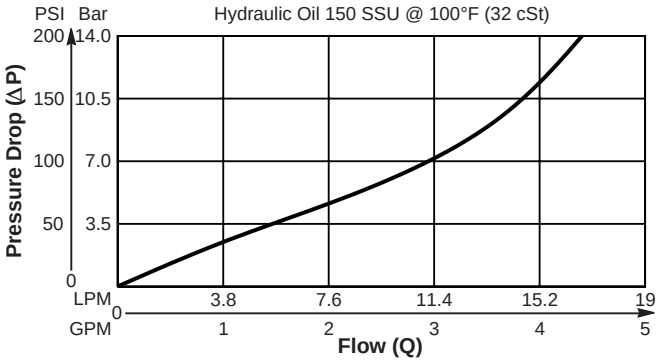
- High flow capacity with reduced space requirements
- One piece cartridge housing ensures internal concentricity
- Low mechanical operating force required
- Detented option available
- All external parts zinc plated

Operation

Neutral, all ports blocked. Push to shift for flow 3 to 2 and 4 to 1.

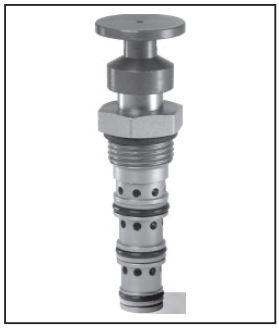
Performance Curve

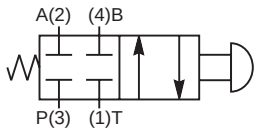
Pressure Drop vs. Flow (Through cartridge only)

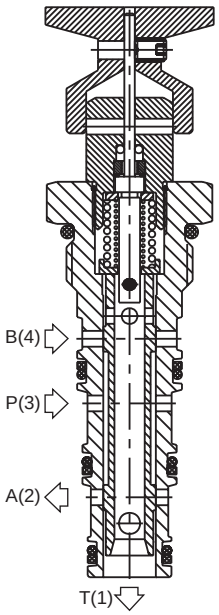


Specifications

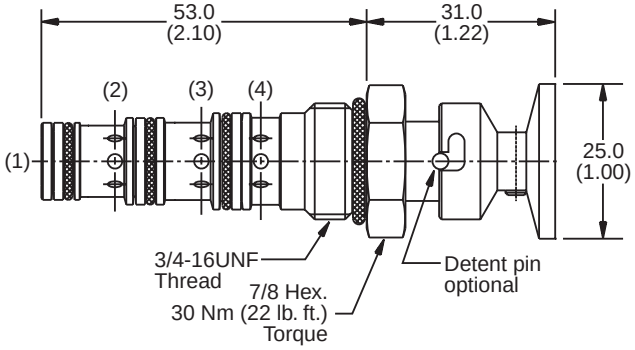
Rated Flow	15 LPM (4 GPM)
Operating Pressure	**Side Ports -** 350 Bar (5000 PSI) **Bottom Port -** 35 Bar (500 PSI)
Max. Operating Pushing or Pulling Force Required	5 kg (11 lbs.)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.12 kg (.25 lbs.)
Cavity	C08-4 (See BC Section for more details)







Dimensions Millimeters (Inches)



Ordering Information

GM02 40CS [ ] [ ] – [ ] [ ]

08 Size Manual Valve Spool Type Normally Closed | **Detent Option** | **Seals** | **Body Material** | **Port Size**

Code	Detent Option
Omit	Non-Detented (Std.)
1	Detented

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30078N-1)
V	Fluorocarbon / (SK30078V-1)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4T	SAE-4	(B08-4-*4T)
6T	SAE-6	(B08-4-*6T)
6B	3/8″ BSPG	(B08-4-*6B)

**** Add "A" for aluminum, omit for steel.***

General Description

4-Way, 3 Position, Closed Center Manual Spool Valve. Designed to operate double acting cylinders, pilot circuits and bi-directional motors.

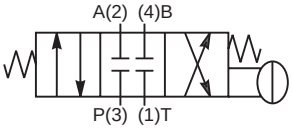
Features

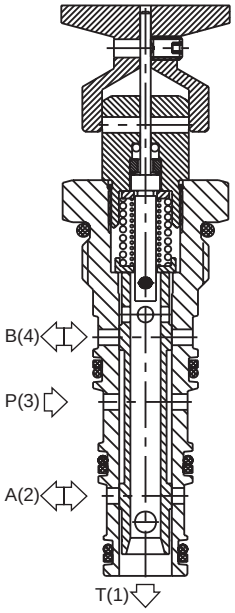
- High flow capacity with reduced space requirements
- One piece cartridge housing ensures internal concentricity
- Low mechanical operating force required
- Detented option available
- All external parts zinc plated

Operation

Neutral, all ports are blocked. Push to shift for flow 3 to 2 and 4 to 1. Pull to shift for flow 3 to 4 and 2 to 1.

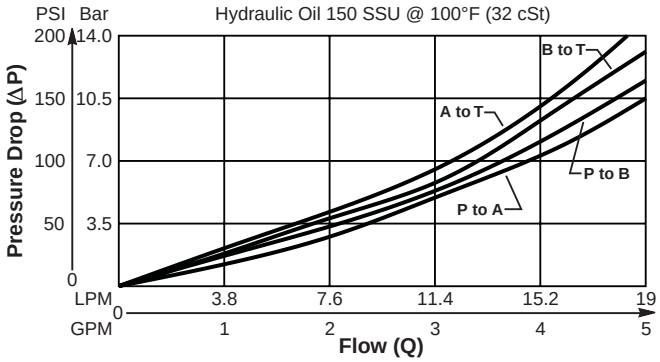






Performance Curve

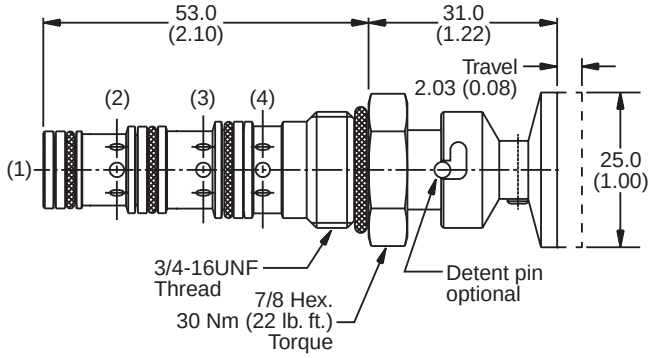
Pressure Drop vs. Flow (Through cartridge only)



Specifications

Rated Flow	17 LPM (4.5 GPM)
Operating Pressure	**Side Ports -** 350 Bar (5000 PSI) **Bottom Port -** 35 Bar (500 PSI)
Max. Operating Pushing or Pulling Force Required	5 kg (11 lbs.)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.12 kg (.25 lbs.)
Cavity	C08-4 (See BC Section for more details)

Dimensions Millimeters (Inches)



Ordering Information

GM02 51			–		
08 Size Manual Valve Spool Type Closed Center	Detent Option	Seals		Body Material	Port Size

Code	Detent Option
Omit	Non-Detented (Std.)
1	Detented

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30078N-1)
V	Fluorocarbon / (SK30078V-1)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4T	SAE-4	(B08-4-*4T)
6T	SAE-6	(B08-4-*6T)
6B	3/8″ BSPG	(B08-4-*6B)

**** Add "A" for aluminum, omit for steel.***

General Description

4-Way, 3 Position, Floating Center Manual Spool Valve. Designed to operate double acting cylinders, pilot circuits and bi-directional motors.

Features

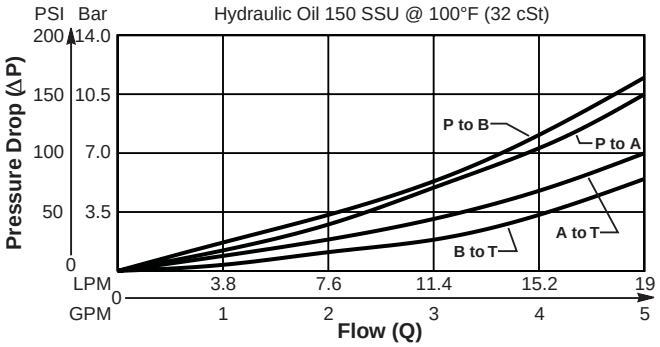
- High flow capacity with reduced space requirements
- One piece cartridge housing ensures internal concentricity
- Low mechanical operating force required
- Detented option available
- All external parts zinc plated

Operation

Neutral port 3 blocked, ports 2 and 4 open to port 1. Push to shift for flow, port 3 to 2 and port 4 to 1. Pull to shift for flow, port 3 to 4 and port 2 to 1.

Performance Curve

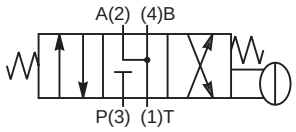
Pressure Drop vs. Flow (Through cartridge only)

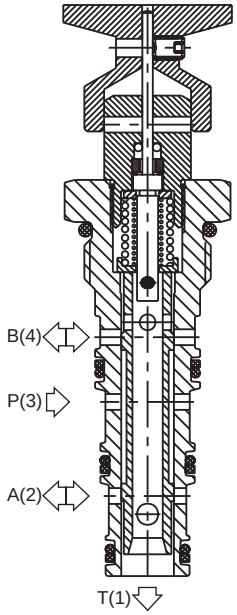


Specifications

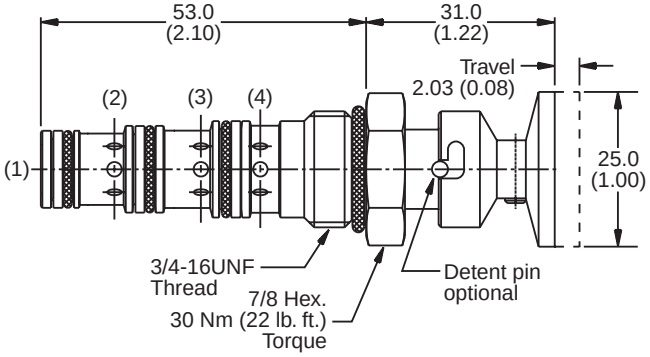
Rated Flow	19 LPM (5 GPM)
Operating Pressure	**Side Ports -** 350 Bar (5000 PSI) **Bottom Port -** 35 Bar (500 PSI)
Max. Operating Pushing or Pulling Force Required	5 kg (11 lbs.)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.12 kg (.25 lbs.)
Cavity	C08-4 (See BC Section for more details)







Dimensions Millimeters (Inches)



Ordering Information

GM02 53			–		
08 Size Manual Valve Spool Type Floating Center	Detent Option	Seals		Body Material	Port Size

Code	Detent Option
Omit	Non-Detented (Std.)
1	Detented

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30078N-1)
V	Fluorocarbon / (SK30078V-1)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4T	SAE-4	(B08-4-*4T)
6T	SAE-6	(B08-4-*6T)
6B	3/8″ BSPG	(B08-4-*6B)

**** Add "A" for aluminum, omit for steel.***

General Description

4-Way, 3 Position, Tandem Center Manual Spool Valve. Designed to operate double acting cylinders, pilot circuits and bi-directional motors.

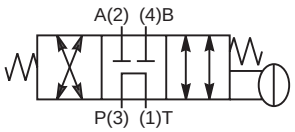
Features

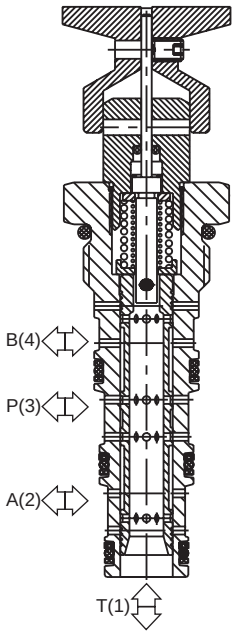
- High flow capacity with reduced space requirements
- One piece cartridge housing ensures internal concentricity
- Low mechanical operating force required
- Detented option available
- All external parts zinc plated

Operation

Neutral, flow is allowed 3 to 1 with ports 4 and 2 blocked. Push to shift for flow 3 to 4 and 2 to 1. Pull to shift for flow 3 to 2 and 4 to 1.

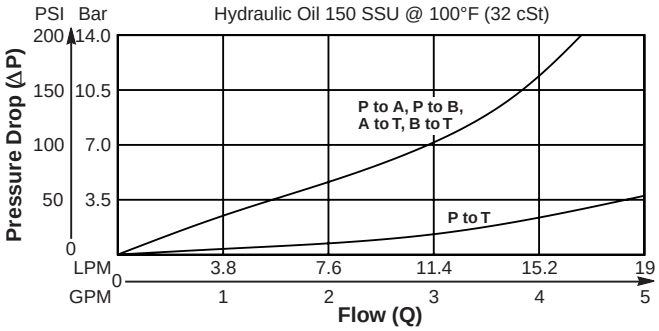




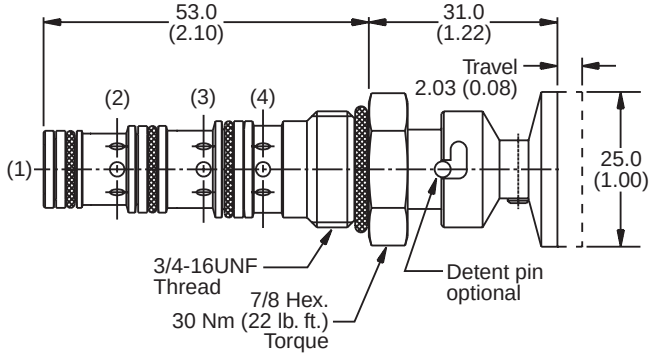


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	15 LPM (4 GPM)
Operating Pressure	**Side Ports -** 350 Bar (5000 PSI) **Bottom Port -** 35 Bar (500 PSI)
Max. Operating Pushing or Pulling Force Required	5 kg (11 lbs.)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.12 kg (.25 lbs.)
Cavity	C08-4 (See BC Section for more details)

Ordering Information

GM02 57			–		
08 Size Manual Valve Spool Type Tandem Center	Detent Option	Seals		Body Material	Port Size

Code	Detent Option
Omit	Non-Detented (Std.)
1	Detented

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30078N-1)
V	Fluorocarbon / (SK30078V-1)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4T	SAE-4	(B08-4-*4T)
6T	SAE-6	(B08-4-*6T)
6B	3/8″ BSPG	(B08-4-*6B)

**** Add "A" for aluminum, omit for steel.***

General Description

4-Way, 3 Position, Open Center Manual Spool Valve. Designed to operate double acting cylinders, pilot circuits and bi-directional motors.

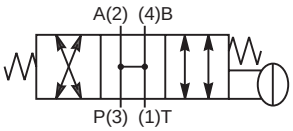
Features

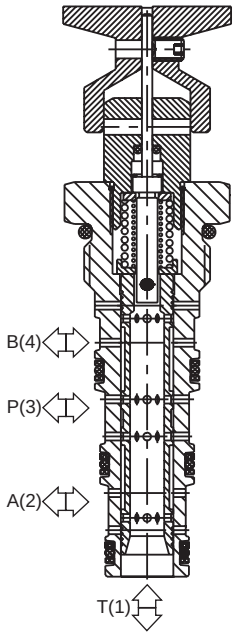
- High flow capacity with reduced space requirements
- One piece cartridge housing ensures internal concentricity
- Low mechanical operating force required
- Detented option available
- All external parts zinc plated

Operation

Neutral, all ports open. Push to shift for flow 3 to 4 and 2 to 1. Pull to shift for flow 3 to 2 and 4 to 1.

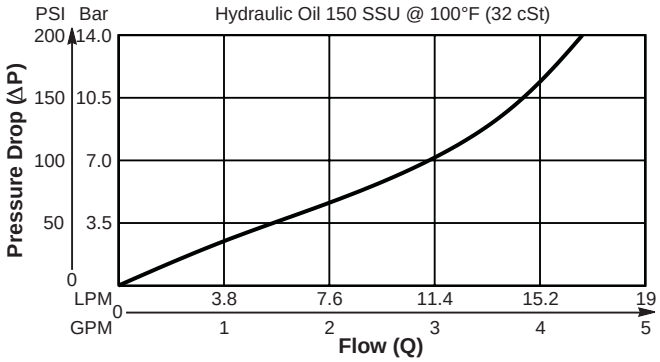




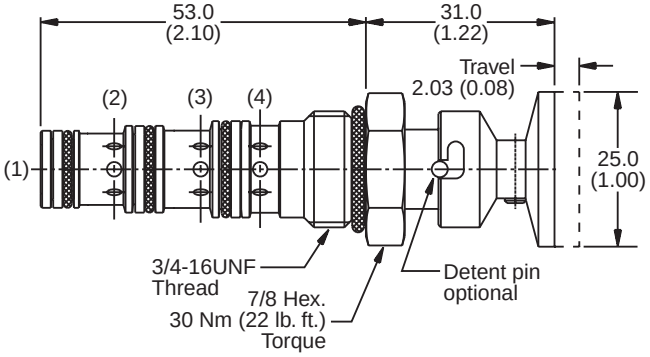


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	15 LPM (4 GPM)
Operating Pressure	**Side Ports -** 350 Bar (5000 PSI) **Bottom Port -** 35 Bar (500 PSI)
Max. Operating Pushing or Pulling Force Required	5 kg (11 lbs.)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.12 kg (.25 lbs.)
Cavity	C08-4 (See BC Section for more details)

Ordering Information

GM02 59			–		
08 Size Manual Valve Spool Type Open Center	Detent Option	Seals		Body Material	Port Size

Code	Detent Option
Omit	Non-Detented (Std.)
1	Detented

Code	Body Material
Omit	Steel
A	Aluminum

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30078N-1)
V	Fluorocarbon / (SK30078V-1)

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4T	SAE-4	(B08-4-*4T)
6T	SAE-6	(B08-4-*6T)
6B	3/8″ BSPG	(B08-4-*6B)

**** Add "A" for aluminum, omit for steel.***

General Description

Air Piloted Poppet Type Manual Directional Valve. 2-Way, 2 Position, Normally Closed.

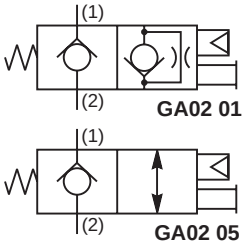
Features

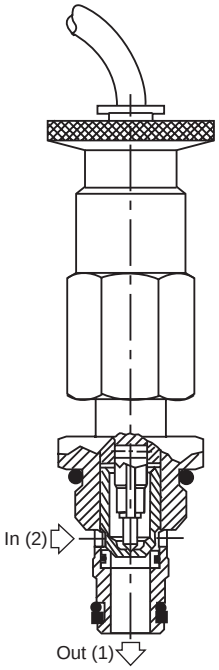
- Two way on-off poppet valve with exceptional operating characteristics
- High flow capacity with reduced space requirements
- One piece cartridge housing ensures internal concentricity
- Manual override is standard
- All external parts zinc plated

Operation

With air pilot off, pressure acts on port 2 to firmly close the main poppet on the seat. Pressure acting on port 1 allows free flow, port 1 to port 2. With air pilot on, the main poppet lifts allowing flow from port 2 to port 1 and restricted flow from port 1 to port 2 (unless free reverse flow option is used).





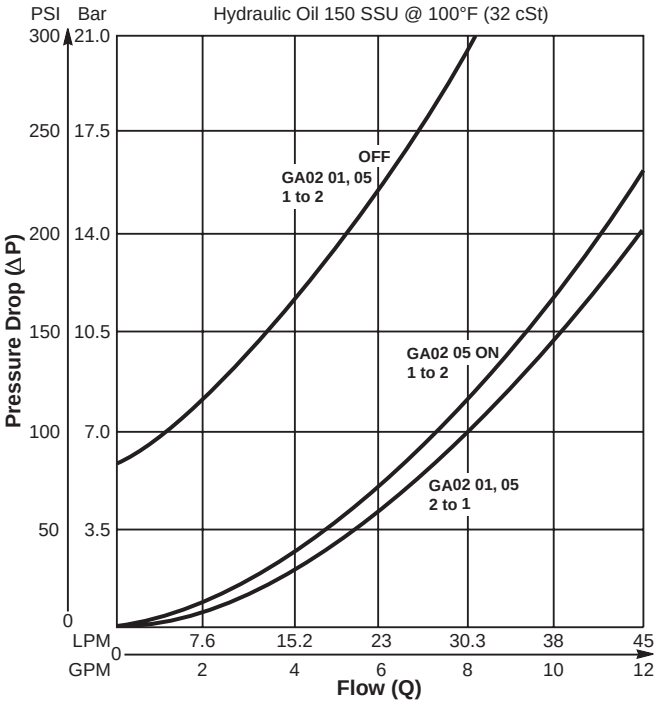


Specifications

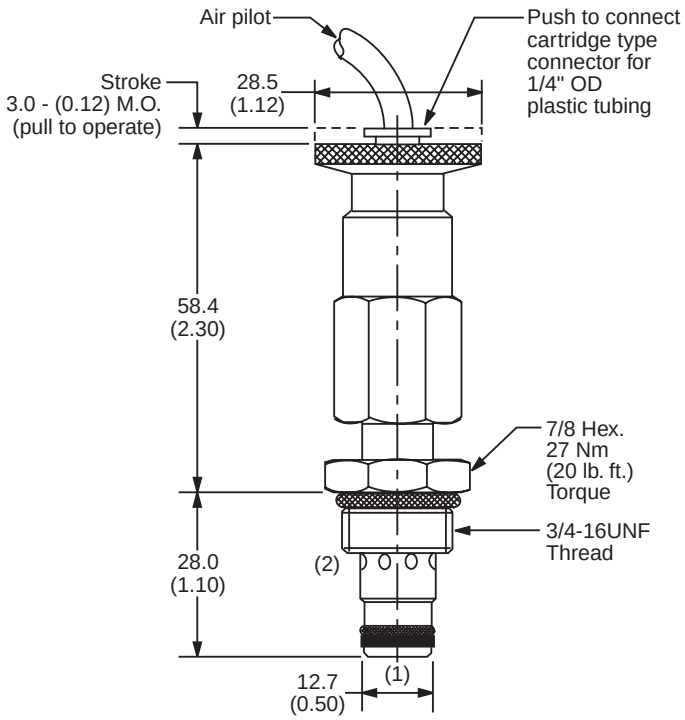
Rated Flow	45 LPM (12 GPM)
Nominal Flow @ 7 Bar (100 PSI)	26.5 LPM (7 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Air Pilot Pressure Range	5.0 Bar (70 PSI) to 8.6 Bar (120 PSI)
Leakage at 150 SSU (32 cSt)	0.33 ml/min. (5 drops/min.)
Response Time Measured at Nominal Flow, Max. Hydraulic Pressure and 5 Bar (70 PSI) Air Pilot	To Open 35 m. sec. To Close 50 m. sec.
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile, Buna-N) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C08-2 (See BC Section for more details)

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

GA02		2			—		
08 Size Manual Directional Valve	Pressure and Performance	Manual Override	Filter Screen	Seals		Body Material	Port Size

Code	Pressure and Performance
01	Restricted Reverse Flow
05	Free Reverse Flow

Code	Manual Override
2	Non-Detented (Standard)

Code	Filter Screen
0	Not Required (Std.)
1	60 Mesh Screen

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30006N-1)
V	Fluorocarbon / (SK30006V-1)

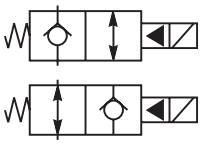
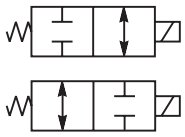
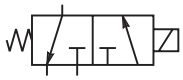
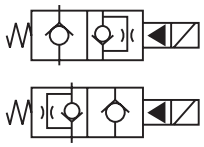
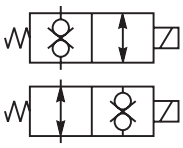
Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-2-*4P)
6P	3/8″ NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8″ BSPG	(B08-2-*6B)

**** Add "A" for aluminum, omit for steel.***

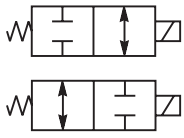
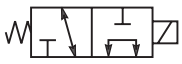
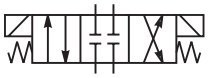
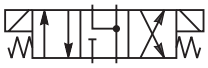
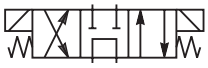
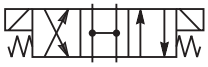
Contents

Solenoid Valves

	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
HIGH FLOW VALVE FAMILY			*See individual catalog pages for exact specifications.*			
	**2 WAY POPPET TYPE**					
	GS02 08	C08-2	2 Position, 2 Way, N.C.	38/10	350/5000	SV7-SV8
	GS04 08	C10-2	2 Position, 2 Way, N.C.	75/20	350/5000	SV9-SV10
	GS06 08	C16-2	2 Position, 2 Way, N.C.	285/75	350/5000	SV11-SV12
	GS06 07	C16-2	2 Position, 2 Way, N.C.	190/50	350/5000	SV13-SV14
	GS04 17	C10-2	2 Position, 2 Way, N.O.	68/18	210/3000	SV15-SV16
	GS06 18	C16-2	2 Position, 2 Way, N.O.	285/75	350/5000	SV17-SV18
	GS06 17	C16-2	2 Position, 2 Way, N.O.	228/60	350/5000	SV19-SV20
	**2 WAY SPOOL TYPE**					
	GS02 22*	2X / C09-2	2 Position, 2 Way, N.C. Spool	19/5	350/5000	SV21-SV22
	GS02 27*	2X / C09-2	2 Position, 2 Way, N.O. Spool	19/5	350/5000	SV23-SV24
	GS04 27	C10-2	2 Position, 2 Way, N.O. Spool	30/8	350/5000	SV25-SV26
	**These valves fit the C09-2 Parker cavity.*					
	**3 WAY SPOOL TYPE**					
	GS02 31/32	C08-3	2 Position, 3 Way	19/5	350/5000	SV27-SV28
	GS04 31/32	C10-3	2 Position, 3 Way	30/8	350/5000	SV29-SV30
	**4 WAY, 2 POSITION SPOOL TYPE**					
	GS02 42	C08-4	2 Position, 4 Way	19/5	350/5000	SV31-SV32
	**2 WAY POPPET TYPE**					
	DSL081	C08-2	2 Position, 2 Way, N.C. or N.O.	30/8	250/3600	SV33-SV34
	DSH081	C08-2	2 Position, 2 Way, N.C. or N.O.	30/8	350/5000	SV35-SV36
	DSL101	C10-2	2 Position, 2 Way, N.C. or N.O.	60/15	250/3600	SV37-SV38
	DSH101	C10-2	2 Position, 2 Way, N.C. or N.O.	60/15	350/5000	SV39-SV40
	DSH121	C12-2	2 Position, 2 Way, N.C. or N.O.	90/24	350/5000	SV41-SV42
	DS161	C16-2	2 Position, 2 Way, N.C. or N.O.	150/40	210/3000	SV43-SV44
	DS201	C20-2	2 Position, 2 Way, N.C. or N.O.	260/70	210/3000	SV45-SV46
	GH02 01	C08-2	2 Position, 2 Way, N.C., with Flow Adj.	11/3	285/4000	SV47-SV48
	GS02 72/73	C08-2	Bi-Directional Poppet, N.C.	1.7/.45	210/3000	SV49-SV50
	GS02 80*/81	C08-2	Bi-Directional Poppet, N.C.	58/15	350/5000	SV51-SV52
	GS04 80*/81	2R	Bi-Directional Poppet, N.C.	76/20	350/5000	SV53-SV54
	GS06 80*/81	C16-2	Bi-Directional Poppet, N.C.	285/75	350/5000	SV55-SV56
	GS02 77/78	C08-2	Bi-Directional Poppet, N.O.	1.7/.45	210/3000	SV57-SV58
	GS02 85*/86	C08-2	Bi-Directional Poppet, N.O.	58/15	350/5000	SV59-SV60
	GS04 85*/86	2R	Bi-Directional Poppet, N.O.	76/20	350/5000	SV61-SV62
	GS06 85*/86	C16-2	Bi-Directional Poppet, N.O.	285/75	350/5000	SV63-SV64
	**210/3000 psi rating*					

Contents

Solenoid Valves

	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
	**2 WAY SPOOL TYPE**					
	DSL082	C08-2	2 Position, 2 Way	15/4	250/3600	SV65-SV66
	DSH082	C08-2	2 Position, 2 Way	15/4	350/5000	SV67-SV68
	DSL102	C10-2	2 Position, 2 Way	30/8	250/3600	SV69-SV70
	DSH102	C10-2	2 Position, 2 Way	30/8	350/5000	SV71-SV72
	DS162	C16-2	2 Position, 2 Way	75/20	210/3000	SV73-SV74
	**3 WAY SPOOL TYPE**					
	DSL083	C08-3	2 Position, 3 Way	15/4	250/3600	SV75-SV77
	DSH083	C08-3	2 Position, 3 Way	15/4	350/5000	SV78-SV80
	DSL103	C10-3	2 Position, 3 Way	30/8	250/3600	SV81-SV83
	DSH103	C10-3	2 Position, 3 Way	30/8	350/5000	SV84-SV86
	DS163	C16-3	2 Position, 3 Way	57/15	210/3000	SV87-SV88
	**4 WAY, 2 POSITION SPOOL TYPE**					
	DSL084	C08-4	2 Position, 4 Way	15/4	250/3600	SV89-SV90
	DSH084	C08-4	2 Position, 4 Way	15/4	350/5000	SV91-SV92
	DSL104	C10-4	2 Position, 4 Way	30/8	250/3600	SV93-SV94
	DSH104	C10-4	2 Position, 4 Way	30/8	350/5000	SV95-SV96
	**4 WAY, 3 POSITION SPOOL TYPE**					
	GS02 51	C08-4	3 Position, 4 Way	17/4.5	350/5000	SV97-SV98
	GS04 52D	C10-4	3 Position, 4 Way	20/8	350/5000	SV99-SV100
	GS02 53	C08-4	3 Position, 4 Way	15/4	350/5000	SV101-SV102
	GS04 54D	C10-4	3 Position, 4 Way	38/10	350/5000	SV103-SV104
	GS02 57	C08-4	3 Position, 4 Way	13/3.5	350/5000	SV105-SV106
	GS04 57D	C10-4	3 Position, 4 Way	42/11	350/5000	SV107-SV108
	GS02 59	C08-4	3 Position, 4 Way	13/3.5	350/5000	SV109-SV110
	GS04 59D	C10-4	3 Position, 4 Way	42/11	350/5000	SV111-SV112

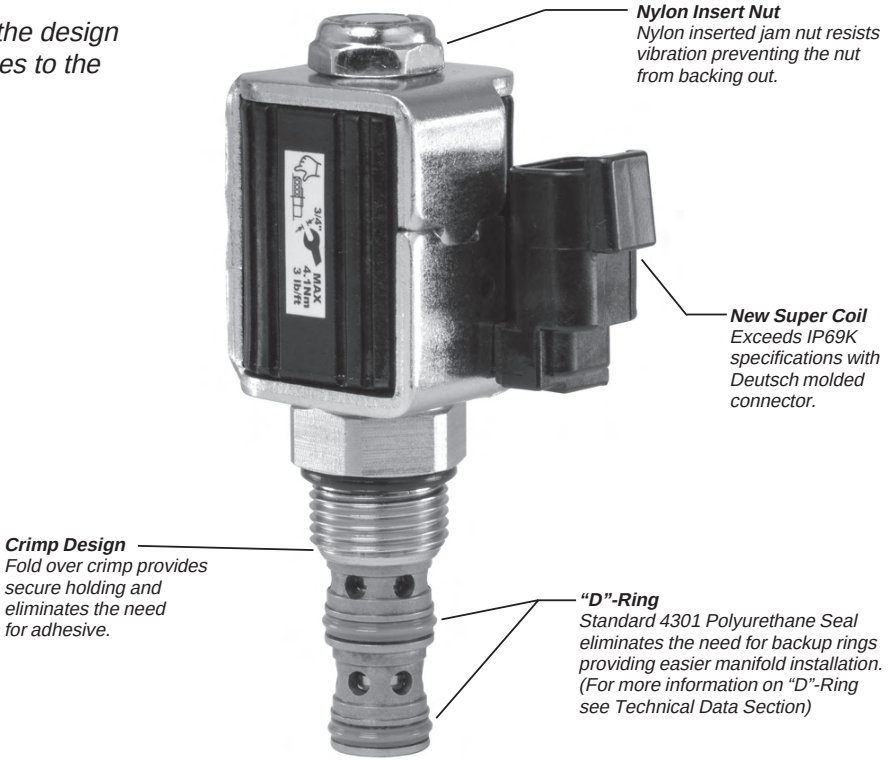
INTRODUCTION

This technical tips section is designed to help familiarize you with the Parker line of Solenoid Valves. In this section we highlight new products to this catalog as well as some design features of our solenoid valves. In addition we present common options available to help you in selecting products for your application. Finally, we give a brief synopsis of the operation and applications of the various products offered in this section. Some tips in applying and selecting our products are provided throughout this guide.

NEW PRODUCTS

There are several new additions and product improvements to our Solenoid Valve product line.

Here are just some of the design features and advantages to the product line.



Nylon Insert Nut
Nylon inserted jam nut resists vibration preventing the nut from backing out.

New Super Coil
Exceeds IP69K specifications with Deutsch molded connector.

Crimp Design
Fold over crimp provides secure holding and eliminates the need for adhesive.

"D"-Ring
Standard 4301 Polyurethane Seal eliminates the need for backup rings providing easier manifold installation. (For more information on "D"-Ring see Technical Data Section)

New Parker *SUPER COIL* Now Available!

Exceeds IP69k Specifications

After exhaustive testing, the new Super Coil has clearly distanced itself from the competition. This coil was subjected to the rigors of this environmental standard and the results were excellent. This coil stands up to most rugged of environmental conditions including weather, dust, and extreme temperature variations.

Water Dunk Test Qualified

The Super Coil was taken to task in a repeated water dunk thermal cycle test program with alternate exposure to high and low temperature, only to perform with outstanding results.

Endurance Tested

The goal of this test was to cycle the coil to high temperature extremes in order to validate the coils ability to perform in extreme temperature environments.

Water Spray and Chemical Solvent Compatibility

The Super Coil was subjected to numerous chemical solvents in a rigorous test which established the fact that these coils can withstand harsh and unusual environments. Also, the coils were subjected to a high pressure water spray test. Once again, the Super Coil passed this test.

Deutsch molded connector is highly recommended.

COMMON OPTIONS

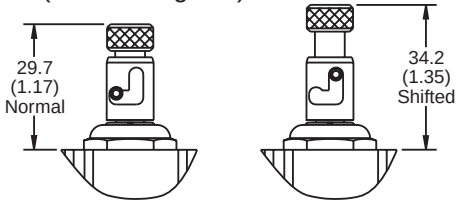
As you will see, Parker offers a variety of solenoid valve products. As such, some of the options mentioned below may not be available on all valves. Consult the model coding and dimensions for each valve for more specifics. Here are some of the common options available.

Seals: The Winner's Circle products feature a standard Polyurethane "D"-Ring. The "D"-Ring eliminates the need for backup rings. For more information on the "D"-Ring see the Technical Data section of the catalog. The majority of the products are available in Nitrile or Fluorocarbon Seals. You should always match the seal compatibility to the temperature and fluid being used in your application.

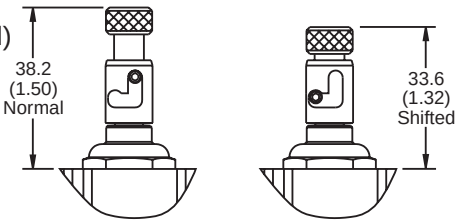
Coils: Coils can be ordered as part of the full assembly or separately. Various terminations and voltages are available. For detailed information on the coil options consult the coil section of the catalog. The ordering information for each valve will direct you to the proper coil.

Manual Overrides: Many of our solenoid valves are also offered with a manual override. The override allows the user to shift the valve when coil force is not available. They provide a means of shifting the solenoid valve due to a loss of power or a coil failure. Overrides are intended for infrequent usage and are not designed to be used as a primary method of valve actuation.

The most common override option for the 2 Position valves is the push & twist style shown below. With a normally closed valve or a pull style tube, the valve is in normal operation (or de-energized) when the pin is seated in the slotted groove at the lowest position. To shift the valve manually, the operator pushes down on the knob and twists it counterclockwise. When the pressure is removed from the knob, an internal spring pushes the pin up the slotted groove to the upper position of the override. With a normally open valve, or push style tube, the actuation is reversed. The valve is in the normal position (or de-energized) when the pin is in the upper position of the override. To shift the valve manually, the operator pushes down on the knob and twists is clockwise. Once the pin is seated in the slotted groove, the operator can remove pressure and the valve will stay actuated.

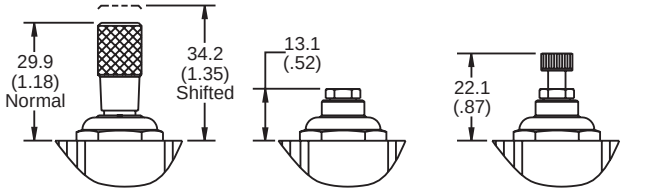


Normally Closed Pull Type Tube



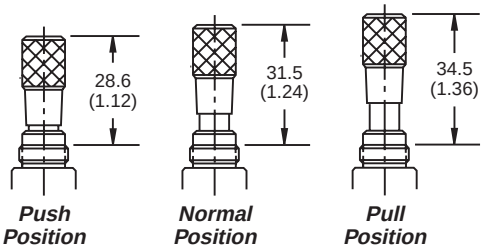
Normally Open Push Type Tube

In addition to the push and twist style override, normally closed (pull style tube) 2 position valves can be ordered with a pull and release override. Normally open (push style) 2 position valves are available with flush style and extended style overrides. These overrides are not detented. Each style is shown below.



Pull and Release Manual Override ***Flush Manual Override*** ***Extended Manual Override***

3 Position valves are offered with a Push / Pull style override. This override is not detented. Springs hold the spool of the valve in the center position of the valve. When the knob is pulled, the spool is moved upward simulating the action of the upper coil. When the override is pushed, the spool moves downward simulating the action of the lower coil. When no pressure is applied to the knob, it centers the spool.



Push Position ***Normal Position*** ***Pull Position***

Screens: 2 way valves can be ordered with a small mesh screen (60 x 60 mesh) placed over the cage of the cartridge valve. This screen is intended for cursory protection of the internal components of the solenoid valve. It should not be used as the primary method of filtration. The mesh catches small pieces of debris that could impede spool or poppet movement. Note that a screen will trap debris from both directions. Thus, any debris coming from the nose of the cartridge would be trapped inside the valve. As such, we recommend that screens be implemented in only applications where hydraulic fluid passes through the cartridge from the side of the cage to the nose. It should also be noted that the pressure drop through the cartridge will be increased slightly due to the small restriction of the mesh. As the screen fills with debris, pressure drop will continue to rise.

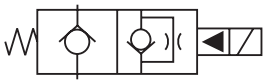


PRODUCT TYPES / APPLICATIONS

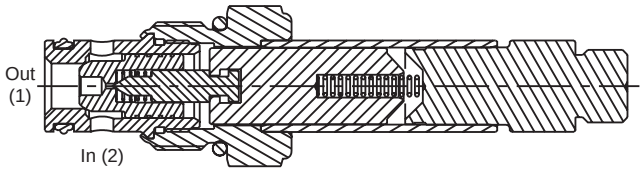
Two Way Poppet Valves

Two way poppet valves are pilot operated, low leakage solenoid actuated valves. Two way poppet valves control the flow of a two way function by blocking flow in one direction (similar to a check valve). They are generally selected due to their low leakage and ability to meet higher flow requirements. Poppet valves are often used on single operation actuators or in unloading functions. They are available in normally closed and normally open types. In addition, free reverse flow and fast response versions are available.

Normally Closed Poppet

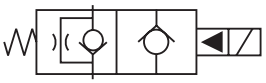


Normally closed two way poppet valves act as a check valve when de-energized, blocking flow from one direction and allowing restricted free flow in the reverse condition. When energized, the poppet lifts allowing free flow from the side to the nose of the cartridge. Should the application require free flow in both directions, the free reverse flow option should be chosen.

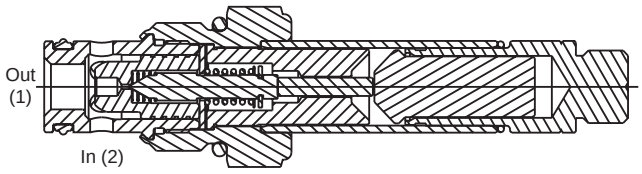


OPERATION - The valve pilot is held on its seat by spring force, blocking pilot flow. This allows pressure at the inlet (port 2) to hold the poppet on its seat, thus, preventing flow through the valve (2-1). If the nose of the cartridge (port 1) is pressurized, the pressure will overcome the spring force, pushing the poppet off of its seat, allowing free flow through the cartridge (1-2). When the coil is energized, the valve pilot is pulled off of its seat. This vents the pressure inside the poppet to port 1, creating a pressure imbalance across the main poppet. This differential lifts the poppet allowing flow from the side to nose (2-1). Since poppet valves are piloted operated, a minimum amount of pressure differential (25-50 psi) and flow between ports 2 and 1 must be present to overcome the spring and lift the poppet.

Normally Open Poppet



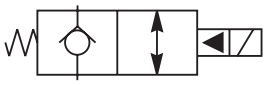
Normally open two way poppet valves, when de-energized, allow free flow from the side (port 2) of the cartridge to the nose (port 1). Flow in the reverse direction is restricted. Should free flow be required in both directions, the free reverse flow option should be specified. Once the coil is energized the normally open poppet valve acts as a check valve, blocking flow from one direction and allowing restricted free flow in the reverse condition.

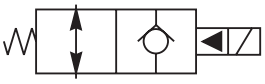


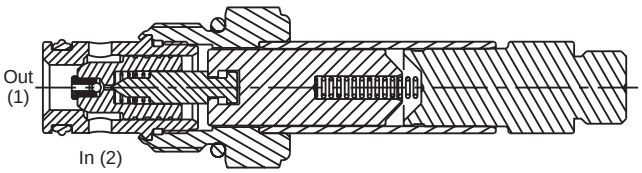
OPERATION - The valve pilot is held off its seat by spring force. Pilot flow is vented to port 1, creating a pressure imbalance that moves the main poppet. This differential lifts the poppet allowing flow from the side to nose (2-1). Since poppet valves are piloted operated, a minimum amount of pressure differential (25-50 psi) between ports 2 and 1 must be present to overcome the spring and lift the poppet. When the coil is energized, the coil force overcomes the spring force to drive the valve pilot and main poppet into their seats, thus blocking flow from port 2-1. If the nose of the cartridge (port 1) is pressurized, the pressure will overcome the spring force and solenoid force, pushing the poppet off of its seat, allowing restricted flow through the cartridge (1-2).

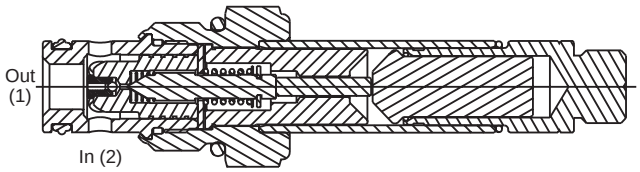
Free Reverse Flow

The free reverse flow versions are available on both the normally closed and normally open poppet valves. As mentioned above, the operation is the same as the standard poppet valve except flow through the reverse direction is not restricted. The free reverse flow option is only needed if the application requires flow to pass through the cartridge valve from the nose to side (port 1 to port 2).









Fast Response

Since poppet valves are pilot operated valves, a few milliseconds are needed to move the pilot and allow the poppet to lift. Should a faster response time be required on normally closed poppet valves, this option can be chosen. The fast response is accomplished by reducing the movement of the pilot. Thus, the flow capacity of the poppet valve is also decreased.

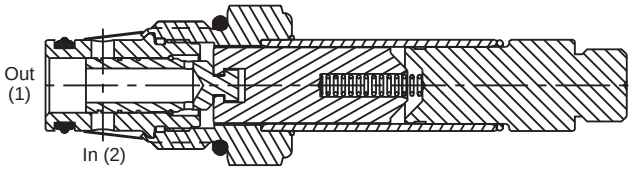
Two Way Spool Valves

Two way spool valves are direct acting, fast responding solenoid actuated valves. Like the poppet valves described earlier, they block the flow of a two way function. Unlike two way poppet valves, spool valves block flow from both the side port and the nose port. They do not have the check like function of the poppet valve, thus they are either open or closed. Spool valves are directed operated, so they respond more quickly to coil voltage than poppet valves. Spool valves operate via a sliding spool, thus, some leakage will be present due to the required spool clearance. Spool valves block flow in both directions, but the preferred flow path is still from the side of the cartridge to the nose due to the flow forces acting on the spool. Two way spool valves are available in normally open and normally closed types.

Normally Closed Spool



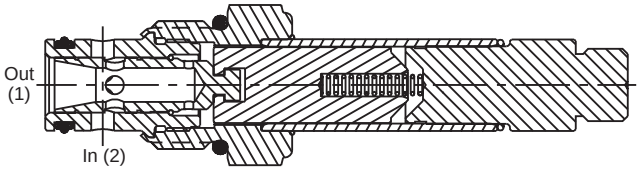
When de-energized, the spool is positioned by the spring force to cover both the side (2) and nose (1) ports of the valve. Thus, no flow is allowed from either direction. Once the coil is energized, the spool shifts exposing a flow path between the two ports. Flow can then be passed through the valve from either direction.



Normally Open Spool



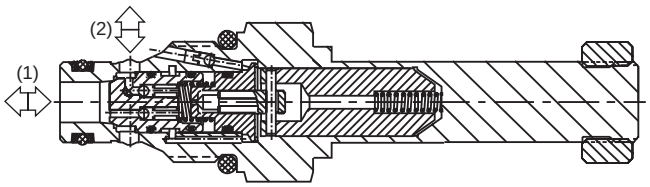
When de-energized, the spool is positioned by the spring force so that a flow path between the side (2) and nose (1) ports is exposed, allowing flow through the valve from either direction. Once the coil is energized, the spool shifts to cover both the side (2) and nose (1) ports of the valve. Thus, no flow is allowed from either direction.



Bi-Directional Poppet Valve



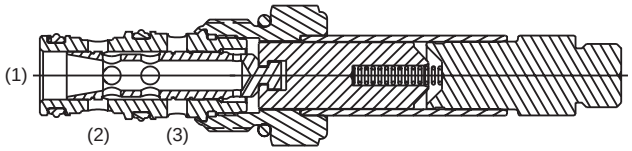
Bi-directional poppet valves combine the dual blocking function of spool valves with the lower leakage capabilities of poppet valves. Bi-directional poppet valves are not recommended for load holding applications. These valves also have a limited flow capacity compared to standard poppet or spool valves.



Two Position, Three Way Spool Valve

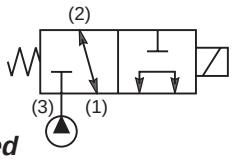


Three way spool solenoid valves provide directional control of flow. Each three way valve has a special internal spool which connects two of the three valve ports. When actuated, the spool connects a different combination of valve ports. These valves are often used for raise and lower functions of a single acting cylinder, control of a uni-directional motor, or as a circuit selector.

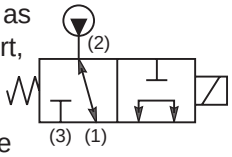


OPERATION - In the de-energized mode, the spool is positioned by spring force. When energized, the coil force directly shifts the spool against the spring, thus changing the flow through the valve. Each spool type can be used as a normally open, normally closed, or selector valve. To explain this we will review the DSL103A which is pictured here. When the valve is de-energized, ports 1 and 2 are open to one another. When energized, ports 1 and 3 are connected.

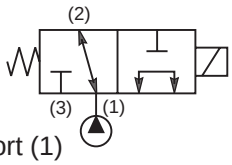
Thus, if we use port 3 as our pressure port, we have a ***normally closed valve***. The pressure port (3) is blocked, while the actuator port (1) is drained to tank (2).



If we use port 2 as our pressure port, we have a ***normally open valve***. The pressure port (2) is connected to the actuator port (1), and the tank port (3) is blocked.



If we use port 1 as our pressure port, we have a ***selector valve***. The pressure port (1) is either connected to port (2) or port (3). Thus, it is "selecting" which port will get the system pressure and flow.

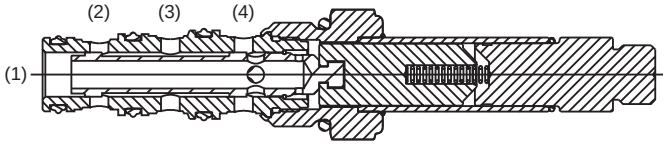


Note that in all three examples, we were using the same valve. The flow forces acting on the spool change depending on which port is pressurized. Thus, if you will be shifting the three way valve under full flow and pressure, it is important to review the shift limit characteristics for the flow paths you have chosen to be sure the coil has enough force to shift the spool. Various spools are available in this catalog to maximize the flow and pressure capacities for the desired flow function.

Two Position, Four Way Spool Valve

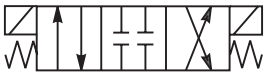


Four way spool solenoid valves provide directional control of flow. Each four way valve has a special internal spool which connects some combination of the four valve ports together. When actuated, the spool connects a different combination of valve ports. These valves are often used for the raise / lower function of a double acting cylinder, or as a forward / reverse function of bi-directional motors.

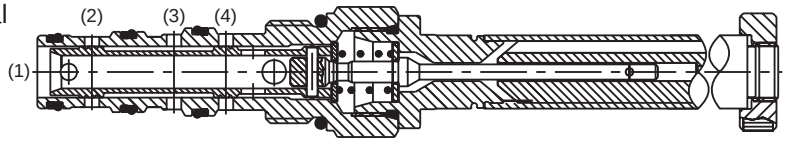


OPERATION - In the de-energized mode, the spool is positioned by spring force. When energized, the coil force directly shifts the spool against the spring, thus changing the flow through the valve. Each spool type is customized to provide the flow combination desired. The flow forces acting on the spool change depending on which port is pressurized. Thus, if you will be shifting the four way valve under full flow and pressure, it is important to review the shift limit characteristics for the flow paths you have chosen to ensure the coil has enough force to shift the spool. Various spools are shown in this catalog to maximize the flow and pressure capacities for the desired flow function.

Three Position, Four Way Spool Valve



Three position, four way spool solenoid valves provide directional control of flow. Each four way valve has a special internal spool which connects some combination of the four ports together. When one coil is actuated, the spool connects a different combination of valve ports. When the other coil is actuated a third combination of valve ports are connected. These valves are often used for the raise / lower function of a double acting cylinder, or as a forward / reverse function of bi-directional motors. The center position can be used to stop the actuator in mid-stroke, or dump the pump flow.

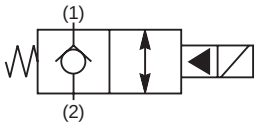


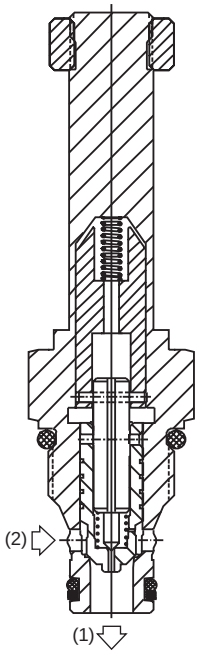
OPERATION - In the de-energized mode, the spool is positioned by spring force. When energized, the coil force directly shifts the against the spring, thus changing the flow through the valve. Each spool type is customized to provide the flow combination desired. The flow forces acting on the spool change depending on which port is pressurized. Thus, if you will be shifting the four way valve under full flow and pressure, it is important to review the shift limit characteristics for the flow paths you chosen to ensure the coil has enough force to shift the spool. Various spools are shown in this catalog to maximize the flow and pressure capacities for the desired flow function.

General Description

2-Way, 2 Position, Normally Closed, High Pressure Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.







Features

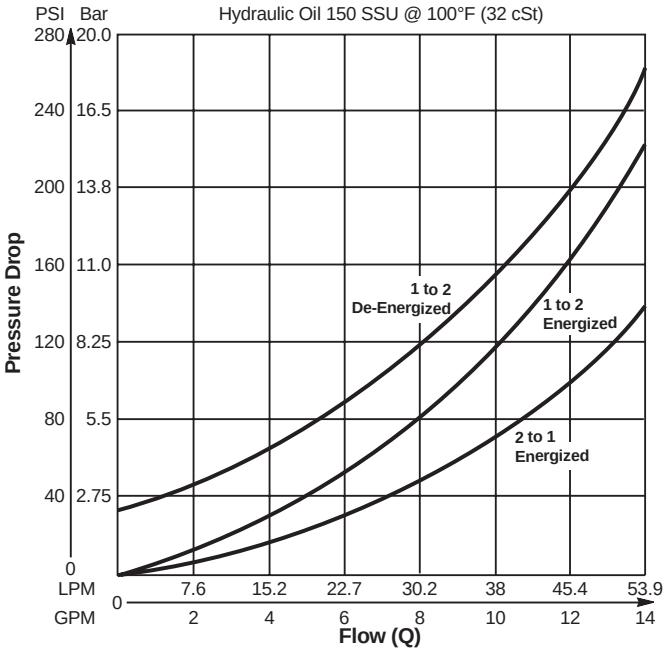
- High flow capacity with reduced space requirements
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 04 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated

Specifications

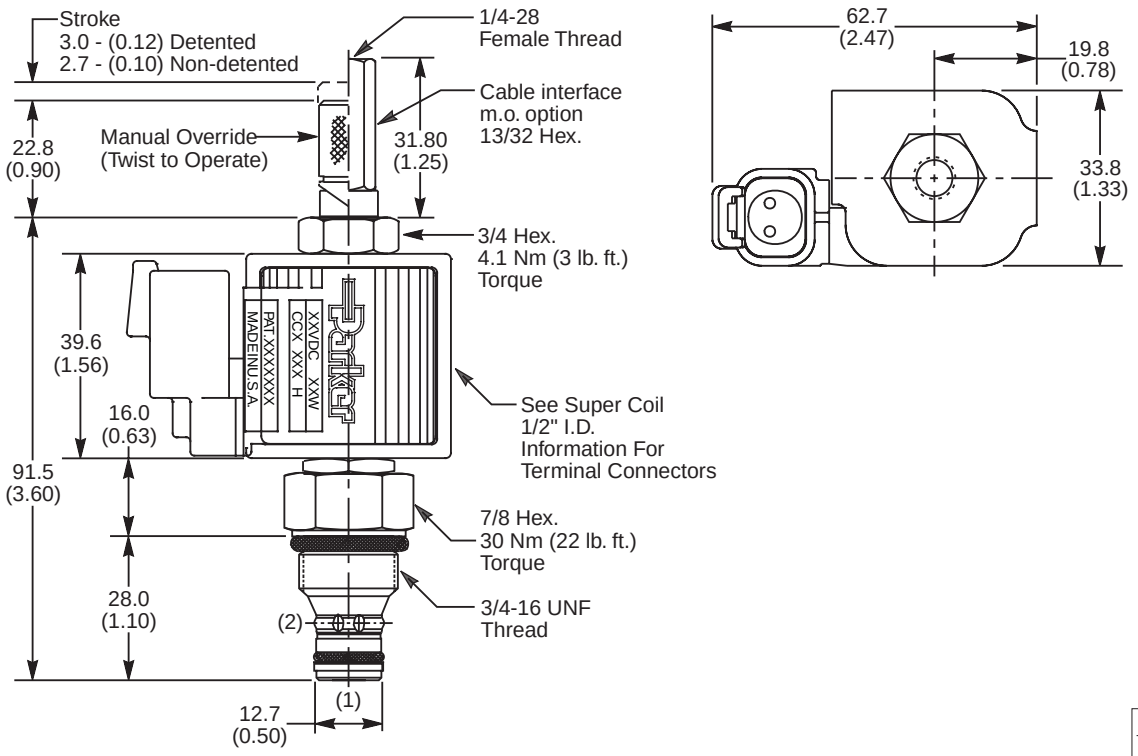
Rated Flow (At 70 PSI ΔP)	38 LPM (10 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 30 ms **Close** 40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C08-2 (See BC Section for more details)

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

GS02	08							–		
08 Size Solenoid Valve	Style Normally Closed	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
08	High Pressure, High Flow ('SP' Coil) Free Reverse Flow

Code	Override Options
0	None
1	Detented
2	Non Detented
3	Cable Interface 210 Bar (3000 PSI)

Code	Screen
0	None
1	60 Mesh Screen

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30006N-1)
V	Fluorocarbon / (SK30006V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

22 Watts

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
DC Only

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6T	SAE-6	(B08-2-*6T)
6B	3/8" BSPG	(B08-2-*6B)

**** Add "A" for aluminum, omit for steel.***

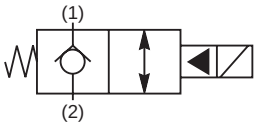
General Description

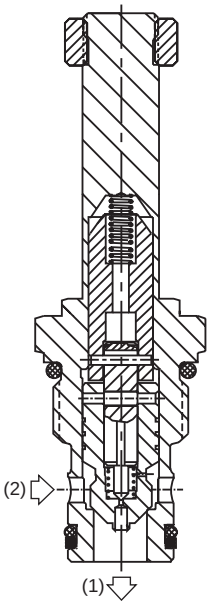
2-Way, 2 Position, Normally Closed Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity with reduced space requirements
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 02 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated





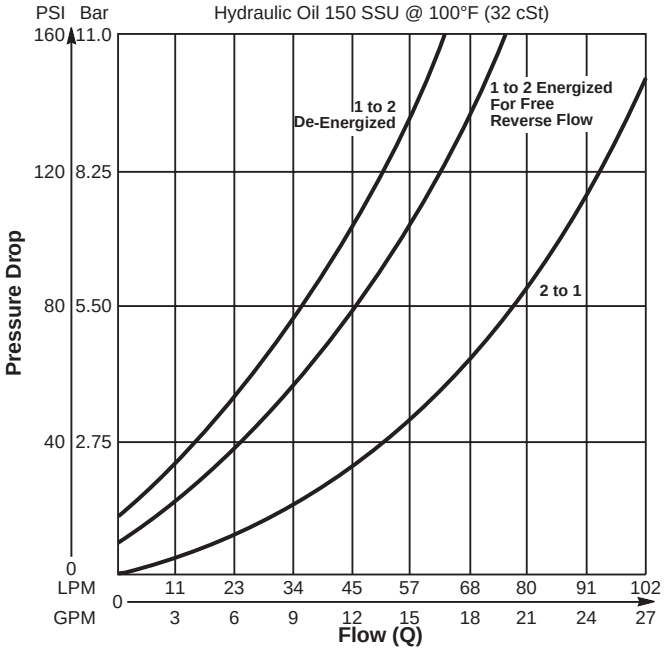


Specifications

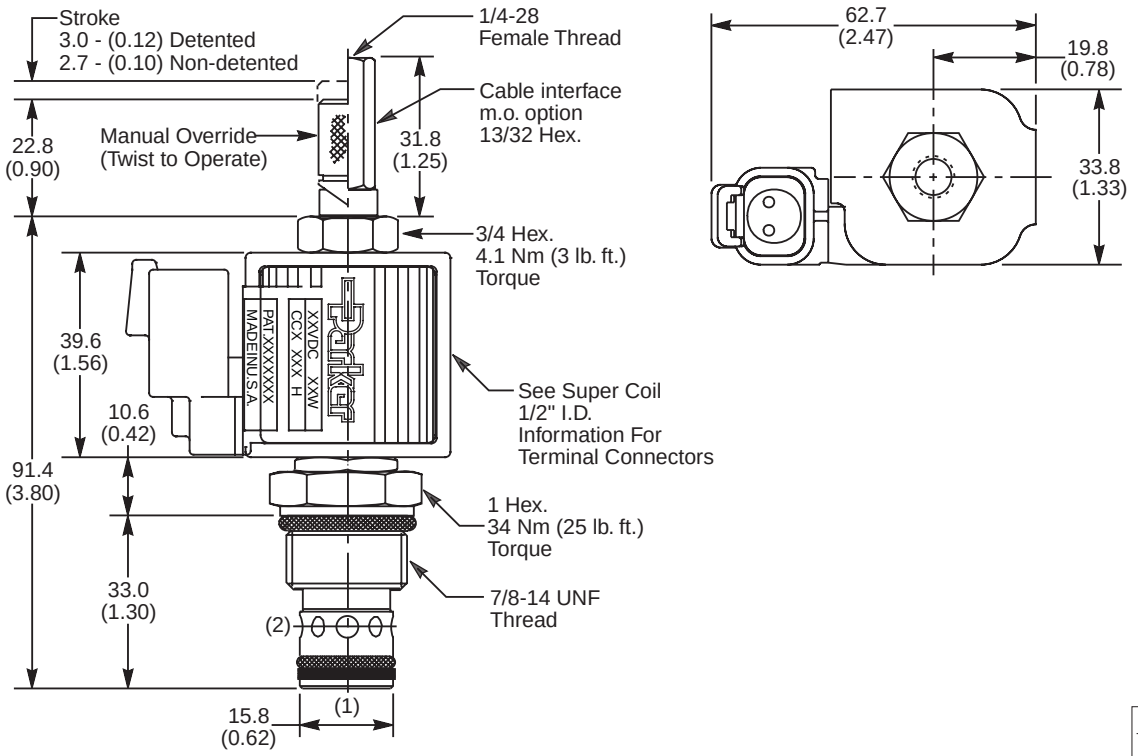
Rated Flow (At 70 PSI ΔP)	75 LPM (20 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 80 ms **Close** 70 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.15 kg (.34 lbs.)
Cavity	C10-2 (See BC Section for more details)

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

GS04	08				C				–		
10 Size Solenoid Valve	Style Normally Closed	Override Option	Screen	Seals		Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
08	High Pressure, ('SP' Coil) Free Reverse Flow

Code	Override Options
0	None
1	Detented
2	Non Detented
3	Cable Interface 210 Bar (3000 PSI)

Code	Screen
0	None

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30503N-1)
V	Fluorocarbon / (SK30503V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

**22 Watts*

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
**DC Only*

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6T	SAE-6	(B10-2-*6T)
8T	SAE-8	(B10-2-*8T)
6B	3/8" BSPG	(B10-2-*6B)
8B	1/2" BSPG	(B10-2-*8B)

** Add "A" for aluminum, omit for steel.*

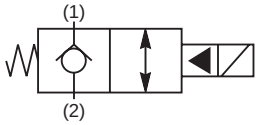
General Description

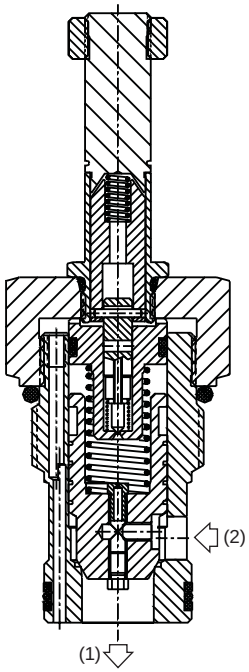
2-Way, 2 Position, Normally Closed Poppet Valve. Side-In, Nose-Out Operation. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity with reduced space requirements
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 02 and 04 series poppet valves; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated





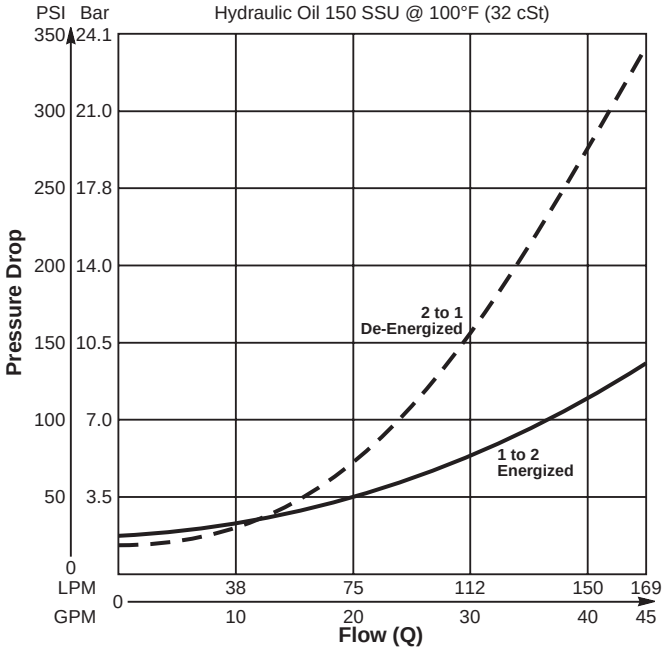


Specifications

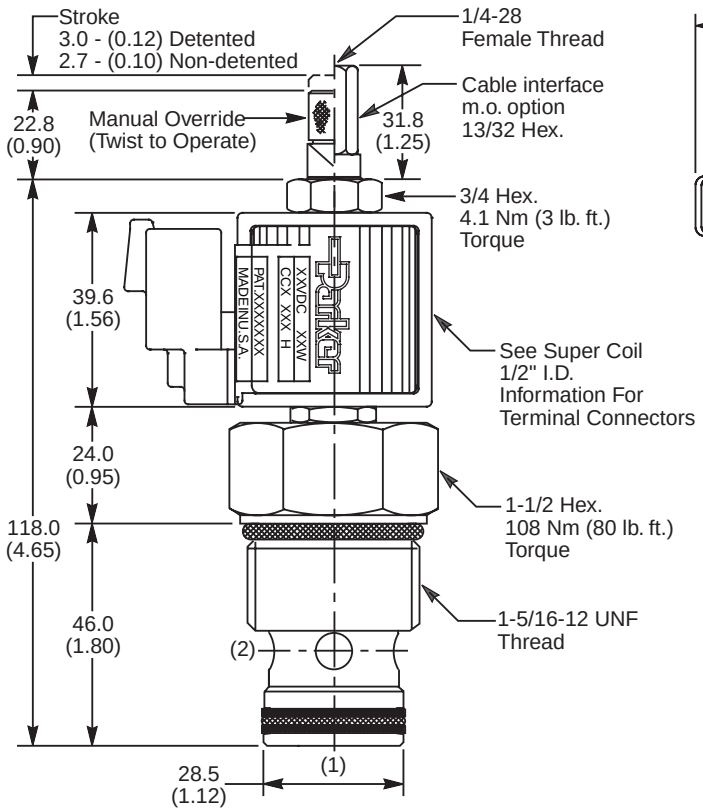
Rated Flow (At 70 PSI ΔP)	190 LPM (50 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	8 drops/min. (0.5 ml./min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 40 ms **Close** 50 to 280 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.4 kg (.88 lbs.)
Cavity	C16-2 (See BC Section for more details)

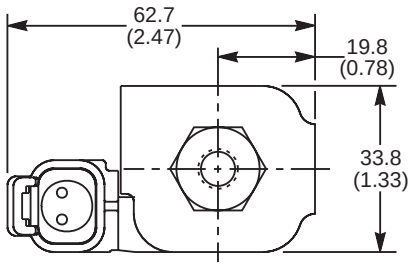
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)





THIRD-ANGLE PROJECTION

Ordering Information

GS06	08							–		
16 Size Solenoid Valve	Style Normally Closed	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
08	High Pressure, ('SP' Coil) Free Reverse Flow

Code	Override Options
0	None
1	Detented
2	Non Detented
3	Cable Interface 210 Bar (3000 PSI)

Code	Screen
0	None

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30503N-1)
V	Fluorocarbon / (SK30503V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

22 Watts

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
****DC Only***

Code	Body Material
Omit	Steel
A	Aluminum

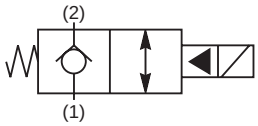
Code	Port Size	Body Part No.
Omit	Cartridge Only	
12T	SAE-12	(B16-2-*12T)
16T	SAE-16	(B16-2-*16T)
12B	3/4" BSPG	(B16-2-*12B)
16B	1" BSPG	(B16-2-16B)†

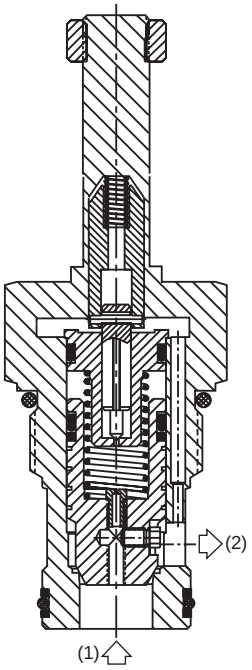
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

2-Way, 2 Position, Normally Closed Poppet Valve. Nose-In, Side-Out Operation. For additional information see Technical Tips on pages SV1-SV6.







Features

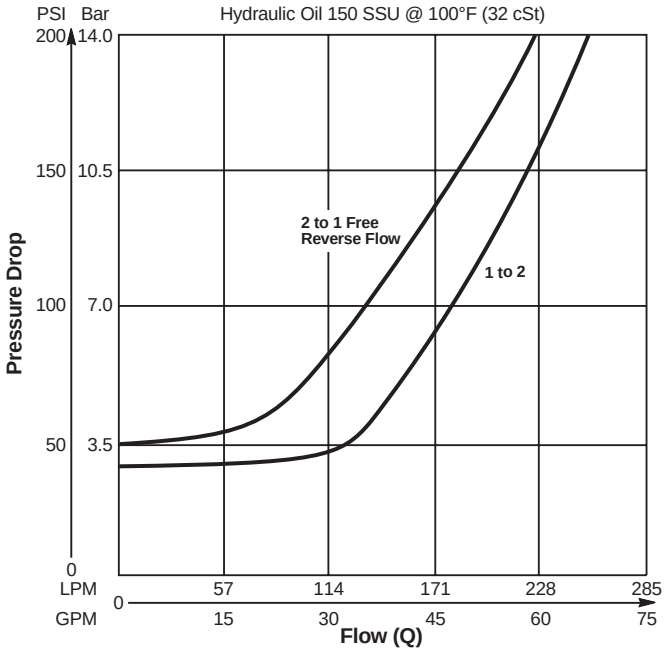
- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 02 and 04 series poppet valves; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated

Specifications

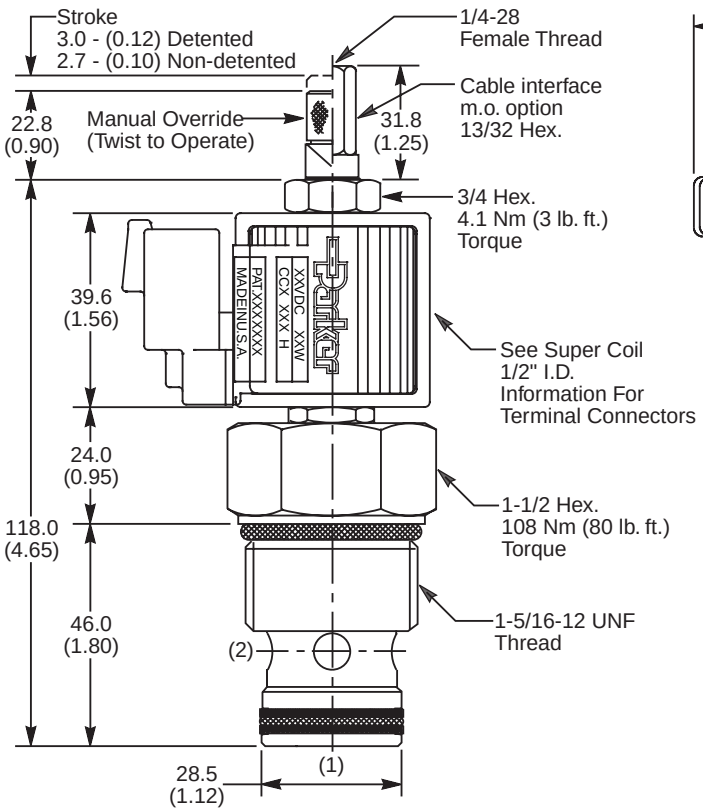
Rated Flow (At 70 PSI ΔP)	190 LPM (50 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	8 drops/min. (0.5 ml./min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 40 ms **Close** 50 to 280 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.4 kg (.88 lbs.)
Cavity	C16-2 (See BC Section for more details)

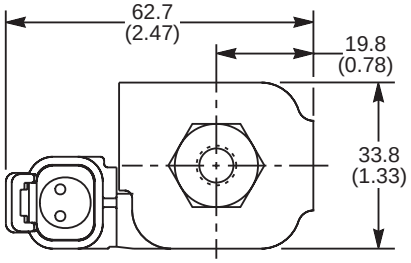
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)





THIRD-ANGLE PROJECTION

Ordering Information

GS06	07							–		
16 Size Solenoid Valve	Style Normally Closed	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
07	High Pressure, ('SP' Coil) Free Reverse Flow

Code	Override Options
0	None
1	Detented
2	Non Detented
3	Cable Interface 210 Bar (3000 PSI)

Code	Screen
0	None

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30089N-1)
V	Fluorocarbon / (SK30089V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

22 Watts

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
****DC Only***

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
12T	SAE-12	(B16-2-*12T)
16T	SAE-16	(B16-2-*16T)
12B	3/4" BSPG	(B16-2-*12B)
16B	1" BSPG	(B16-2-16B)†

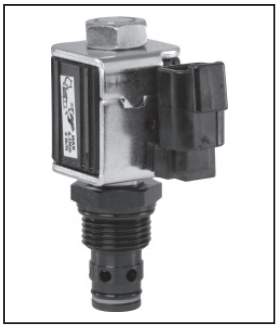
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

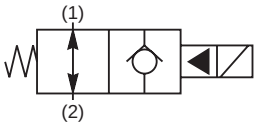
General Description

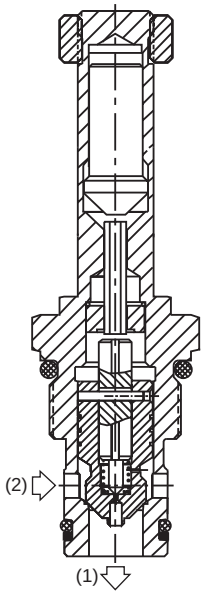
2-Way, 2 Position, Normally Open Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity with reduced space requirements
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 02 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated





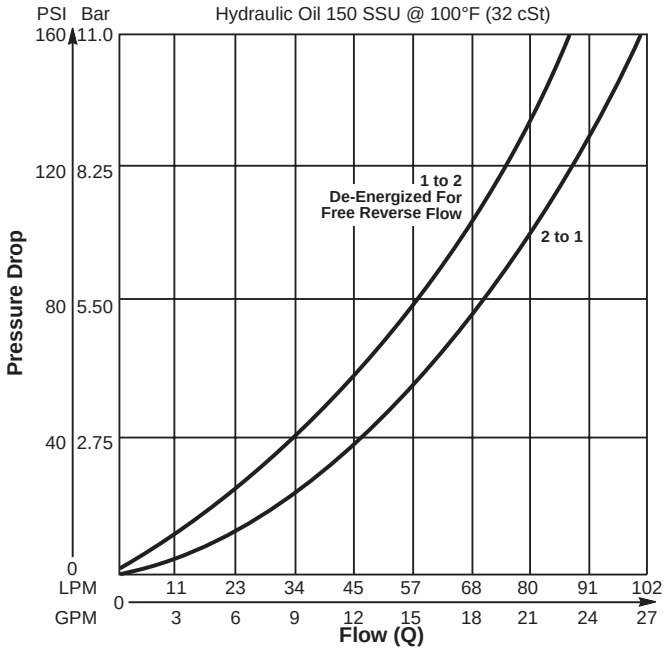


Specifications

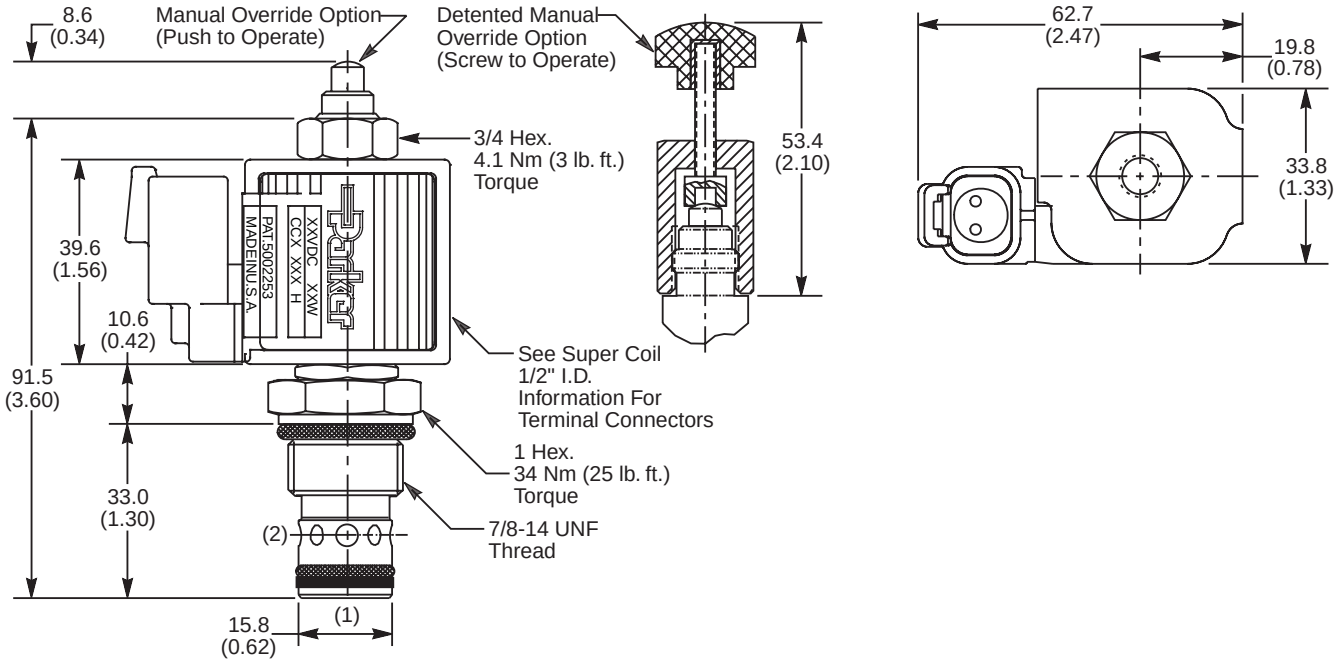
Rated Flow (At 70 PSI ΔP)	68 LPM (18 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 100 ms **Close** 70 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.15 kg (.34 lbs.)
Cavity	C10-2 (See BC Section for more details)

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

GS04	17				C					–		
10 Size Solenoid Valve	Style Normally Open	Override Option	Screen	Seals		Coil Type	Coil Voltage	Coil Termination	Body Material		Port Size	

Code	Style
17	High Flow, ('SP' Coil) Free Reverse Flow

Code	Override Options
0	None
1	Manual Override
2	Detented Part No. 900690

Code	Screen
0	None

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30503N-1)
V	Fluorocarbon / (SK30503V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

**22 Watts*

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
**DC Only*

Code	Body Material
Omit	Steel
A	Aluminum

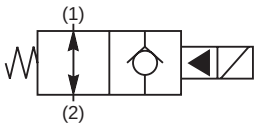
Code	Port Size	Body Part No.
Omit	Cartridge Only	
6T	SAE-6	(B10-2-*6T)
8T	SAE-8	(B10-2-*8T)
6B	3/8" BSPG	(B10-2-*6B)
8B	1/2" BSPG	(B10-2-*8B)

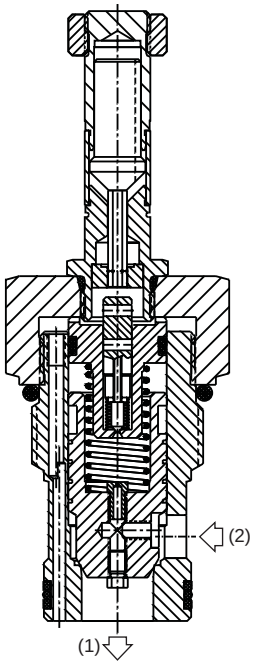
** Add "A" for aluminum, omit for steel.*

General Description

2-Way, 2 Position, Normally Open Poppet Valve. Side-In, Nose-Out Operation. For additional information see Technical Tips on pages SV1-SV6.







Features

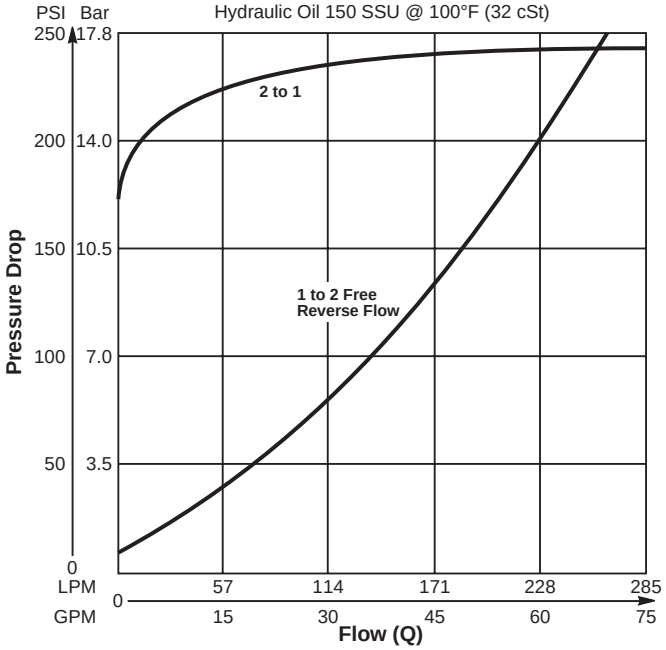
- High flow capacity with reduced space requirements
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 02 and 04 series poppet valves; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated

Specifications

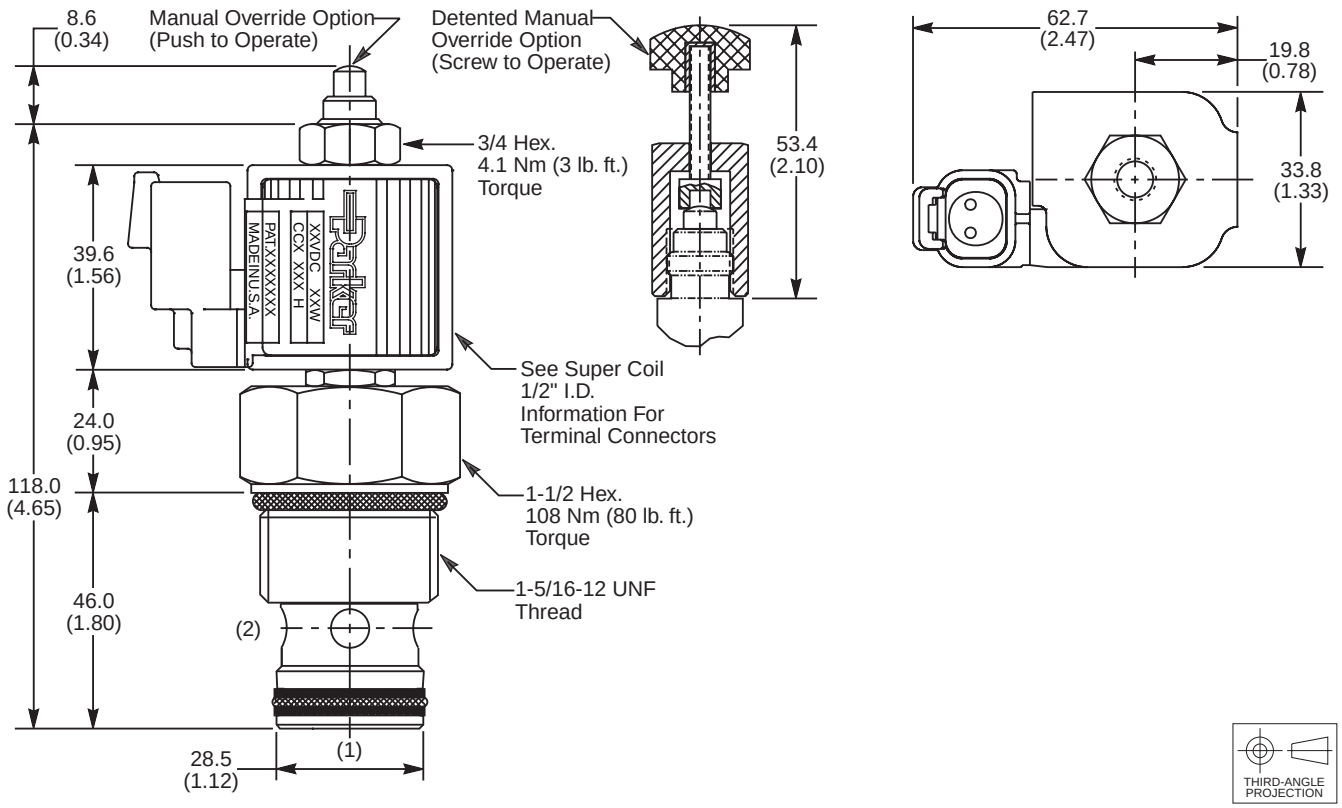
Rated Flow (At 70 PSI ΔP)	190 LPM (50 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	8 drops/min. (0.5 ml./min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 40 ms **Close** 50 to 280 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.4 kg (.88 lbs.)
Cavity	C16-2 (See BC Section for more details)

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

GS06	18							–		
16 Size Solenoid Valve	Style Normally Open	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
18	High Pressure, ('SP' Coil) Free Reverse Flow

Code	Override Options
0	None
1	Manual Override
2	Detented Part No. 900690

Code	Screen
0	None
1	60 Mesh Screen

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30089N-1)
V	Fluorocarbon / (SK30089V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

22 Watts

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
****DC Only***

Code	Body Material
Omit	Steel
A	Aluminum

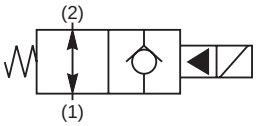
Code	Port Size	Body Part No.
Omit	Cartridge Only	
12T	SAE-12	(B16-2-*12T)
16T	SAE-16	(B16-2-*16T)
12B	3/4" BSPG	(B16-2-*12B)
16B	1" BSPG	(B16-2-16B)†

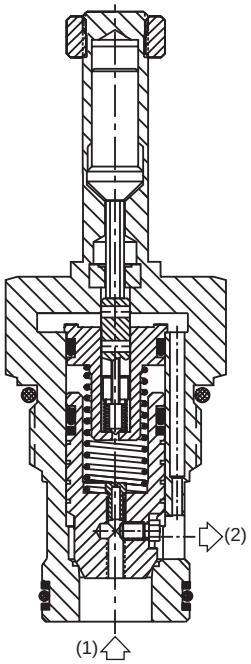
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

2-Way, 2 Position, Normally Open Poppet Valve. Nose-In, Side-Out Operation. For additional information see Technical Tips on pages SV1-SV6.







Features

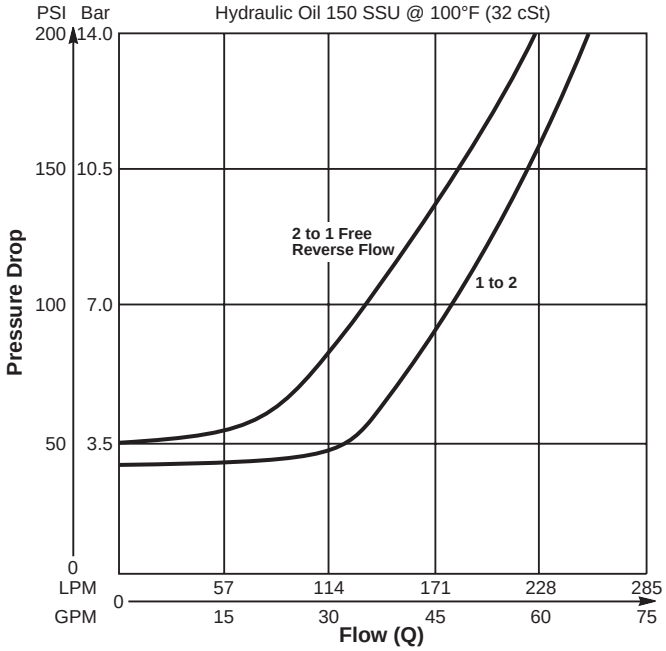
- High flow capacity with reduced space requirements
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 02 and 04 series poppet valves; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated

Specifications

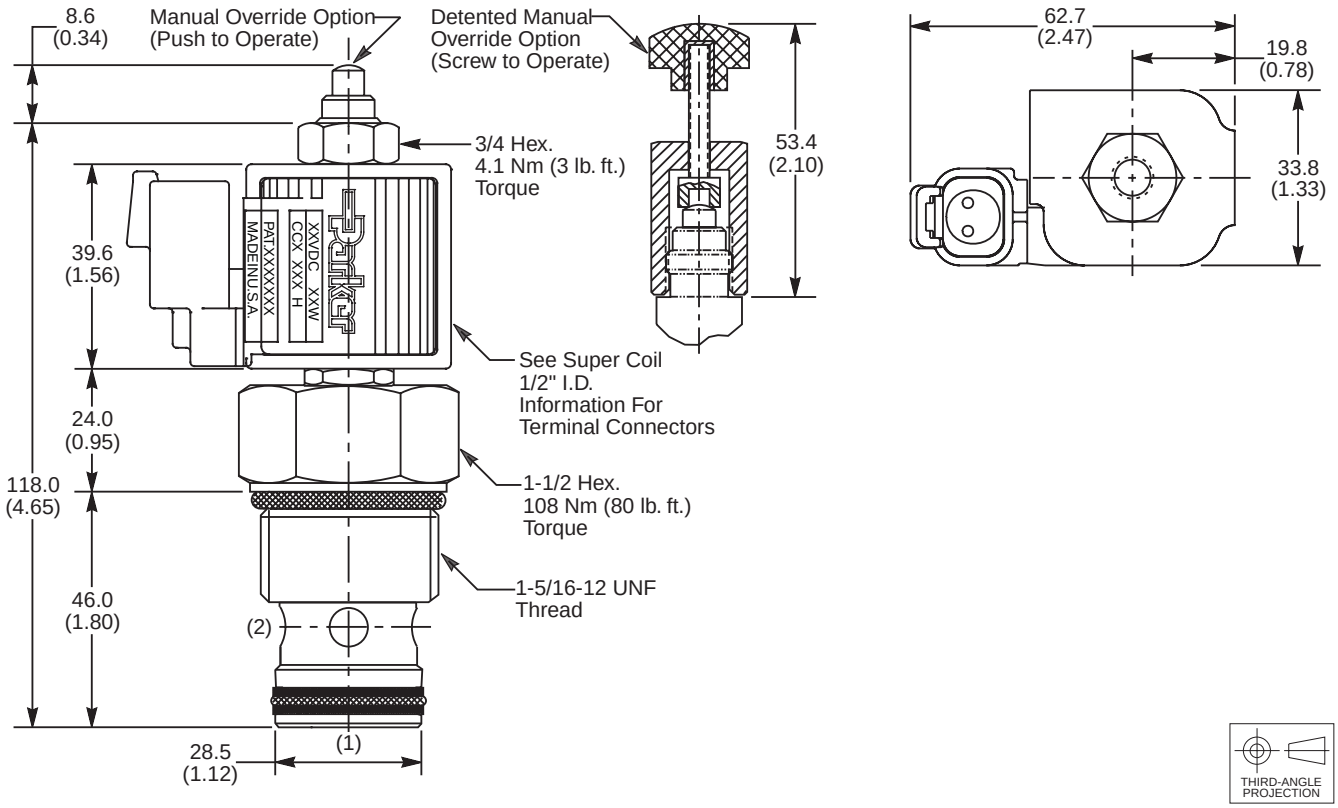
Rated Flow (At 70 PSI ΔP)	152 LPM (40 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	8 drops/min. (0.5 ml./min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 40 ms **Close** 50 to 280 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.4 kg (.88 lbs.)
Cavity	C16-2 (See BC Section for more details)

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

GS06	17							–		
16 Size Solenoid Valve	Style Normally Open	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
17	High Pressure, ('SP' Coil) Free Reverse Flow

Code	Override Options
0	None
1	Manual Override
2	Detented Part No. 900690

Code	Screen
0	None
1	60 Mesh Screen

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30089N-1)
V	Fluorocarbon / (SK30089V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

**22 Watts*

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
**DC Only*

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
12T	SAE-12	(B16-2-*12T)
16T	SAE-16	(B16-2-*16T)
12B	3/4" BSPG	(B16-2-*12B)
16B	1" BSPG	(B16-2-16B)†

** Add "A" for aluminum, omit for steel.*
† Steel body only.

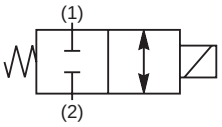
General Description

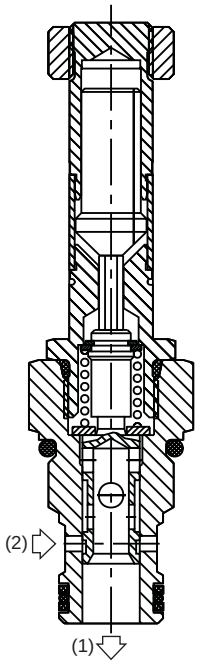
2-Way, 2 Position, Normally Closed Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated





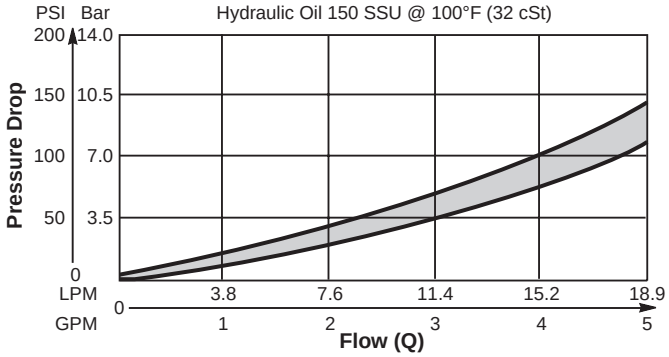


Specifications

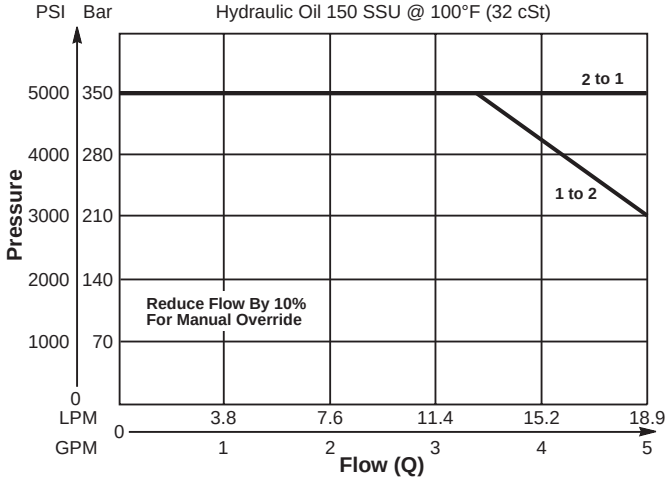
Rated Flow (At 70 PSI ΔP)	13 LPM (3.5 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	82 cc/min @ 210 Bar (3000 PSI)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C09-2 (See BC Section for more details)

Performance Curves

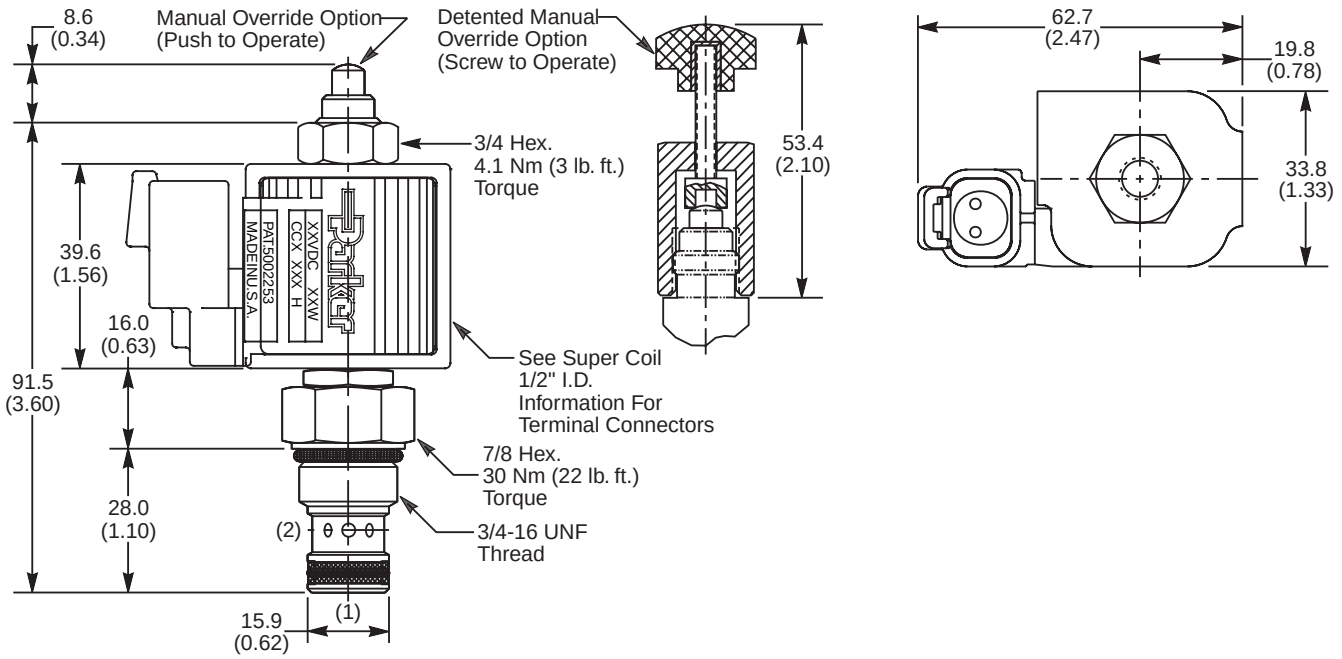
Pressure Drop vs. Flow (Through cartridge only)



Opreating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)



THIRD-ANGLE PROJECTION

Ordering Information

GS02	22							–		
09 Size Solenoid Valve	Style Normally Closed	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
22	High Pressure ('SP' Coil)

Code	Override Options
0	None
1	Manual Override
2	Detented Part No. 900690

Code	Screen
0	None

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30076N-1)
V	Fluorocarbon / (SK30076V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

***22 Watts**

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
***DC Only**

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6T	SAE-6	(B09-2-*6T)
6B	3/8" BSPG	(B09-2-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

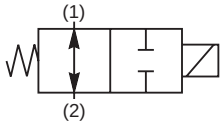
General Description

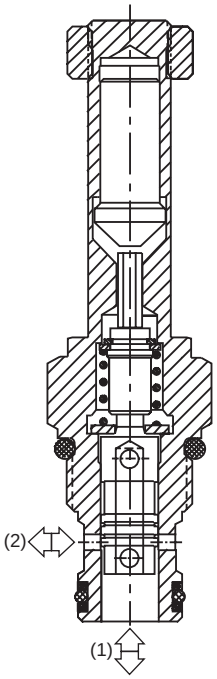
2-Way, 2 Position, Normally Open Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated





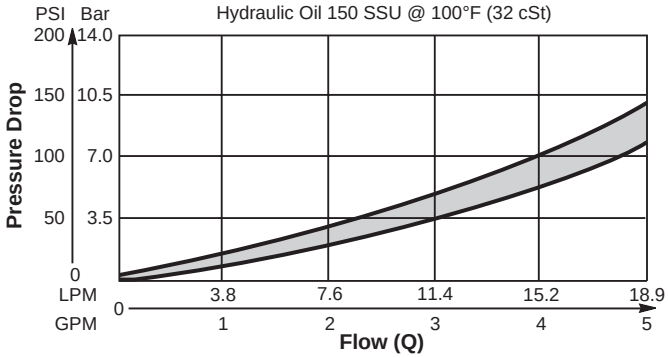


Specifications

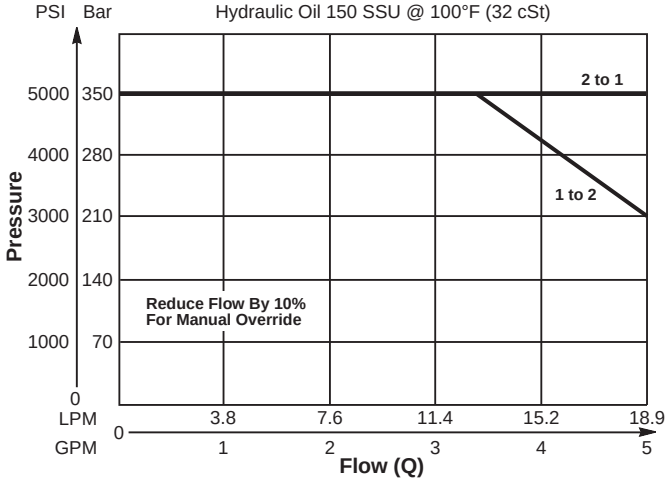
Rated Flow (At 70 PSI ΔP)	15 LPM (4 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	82 cc/min @ 210 Bar (3000 PSI)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C09-2 (See BC Section for more details)

Performance Curves

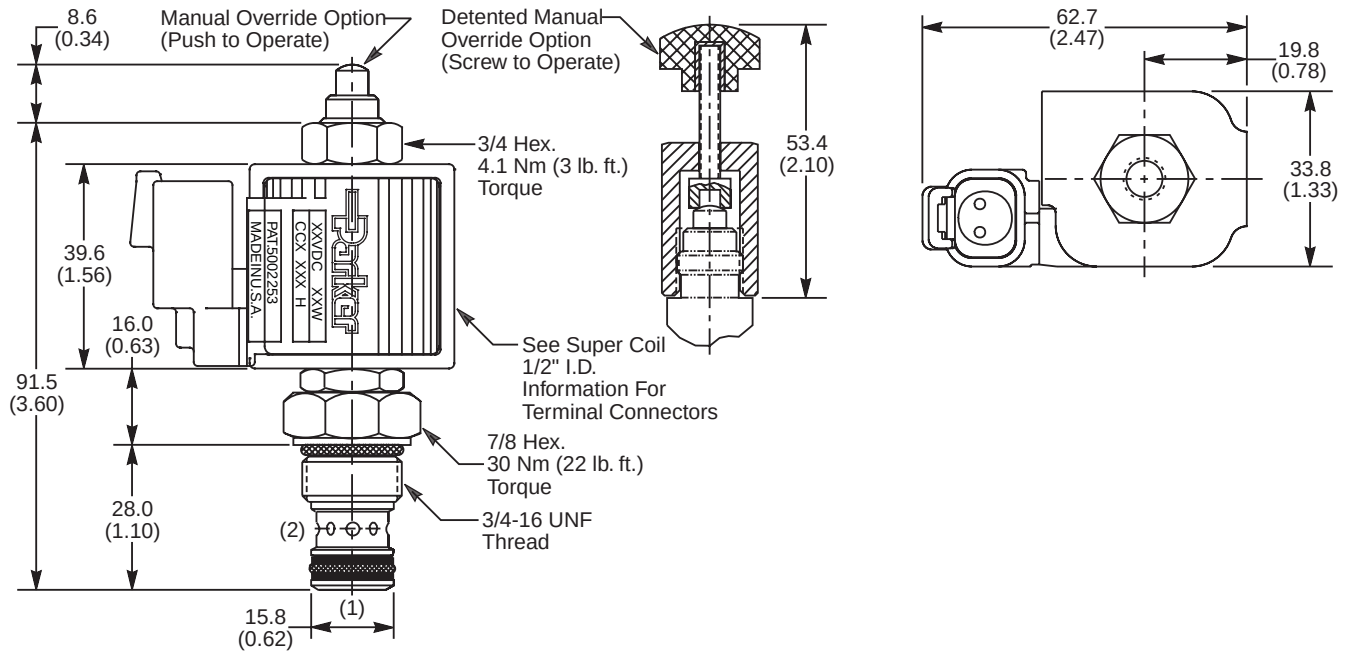
Pressure Drop vs. Flow (Through cartridge only)



Opreating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)



Ordering Information

GS02	27							–		
09 Size Solenoid Valve	Style Normally Open	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
27	High Pressure ('SP' Coil)

Code	Override Options
0	None
1	Manual Override
2	Detented Part No. 900690

Code	Screen
0	None

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30076N-1)
V	Fluorocarbon / (SK30076V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

**22 Watts*

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
**DC Only*

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6T	SAE-6	(B09-2-*6T)
6B	3/8" BSPG	(B09-2-6B)†

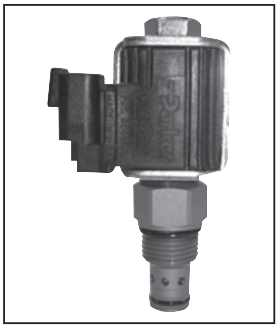
** Add "A" for aluminum, omit for steel.*
† Steel body only.

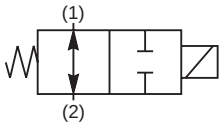
General Description

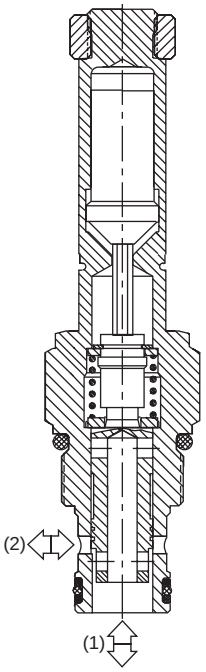
2-Way, 2 Position, Normally Open Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated





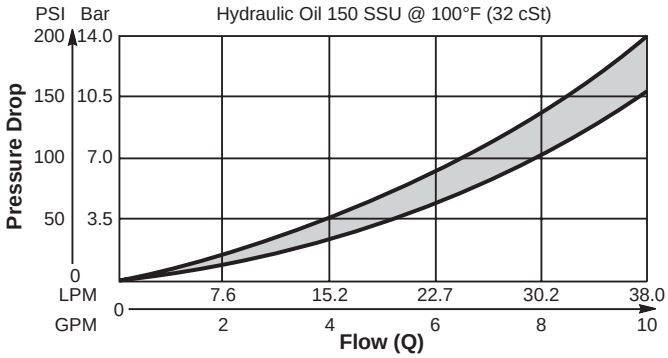


Specifications

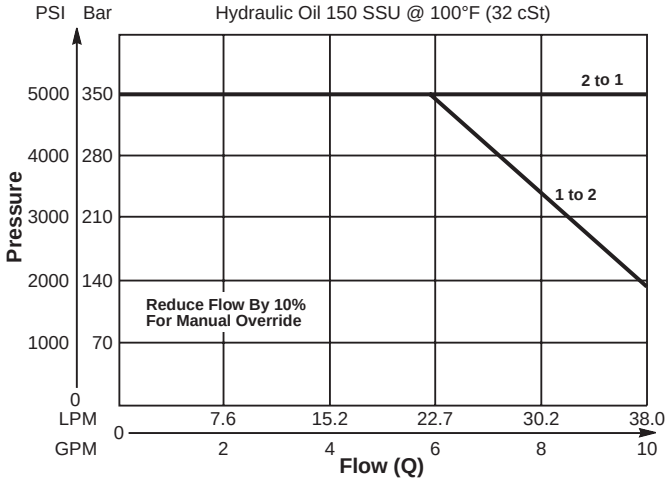
Rated Flow (At 70 PSI ΔP)	23 LPM (6 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	82 cc/min @ 210 Bar (3000 PSI)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.27 kg (.60 lbs.)
Cavity	C10-2 (See BC Section for more details)

Performance Curves

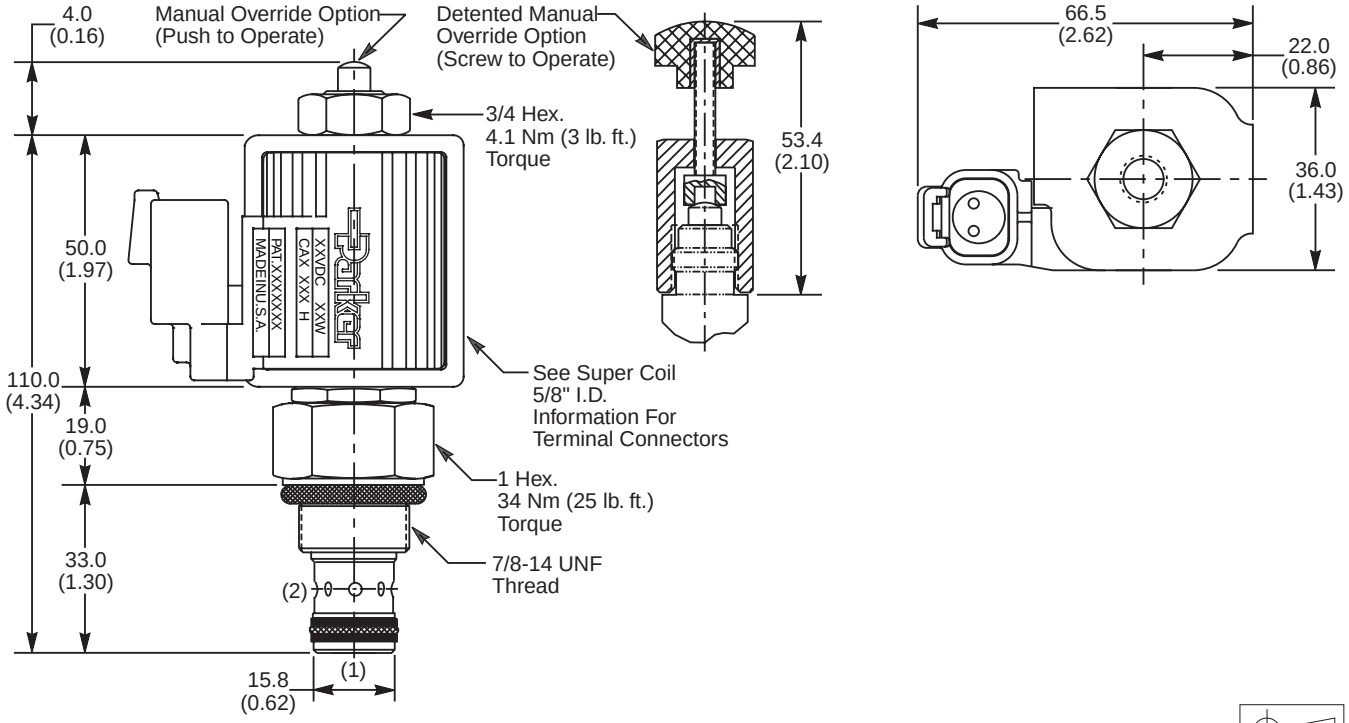
Pressure Drop vs. Flow (Through cartridge only)



Opreating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)



Ordering Information

GS04	27				C				–		
10 Size Solenoid Valve	Style Normally Open	Override Option	Screen	Seals		Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
27	High Pressure ('SP' Coil)

Code	Override Options
0	None
1	Manual Override
2	Detented Part No. 900690

Code	Screen
0	None

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30503N-1)
V	Fluorocarbon / (SK30503V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 28 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 5/8" I.D.
**DC Only*

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6T	SAE-6	(B10-2-*6T)
8T	SAE-8	(B10-2-*8T)
6B	3/8" BSPG	(B10-2-*6B)
8B	1/2" BSPG	(B10-2-*8B)

** Add "A" for aluminum, omit for steel.*

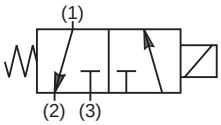
General Description

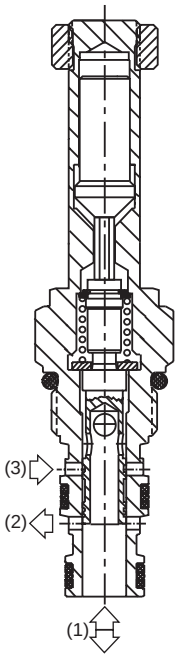
3-Way, 2 Position Spool Valve. Bottom Cylinder Port. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated





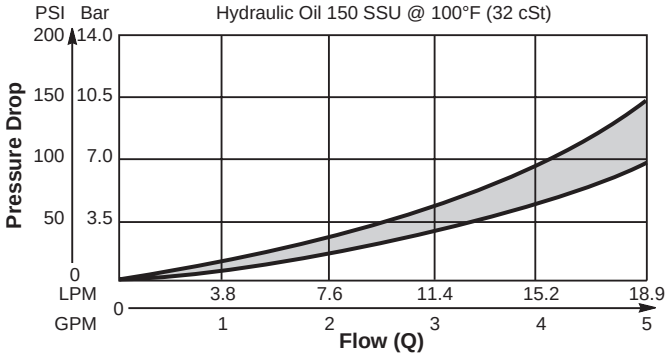


Specifications

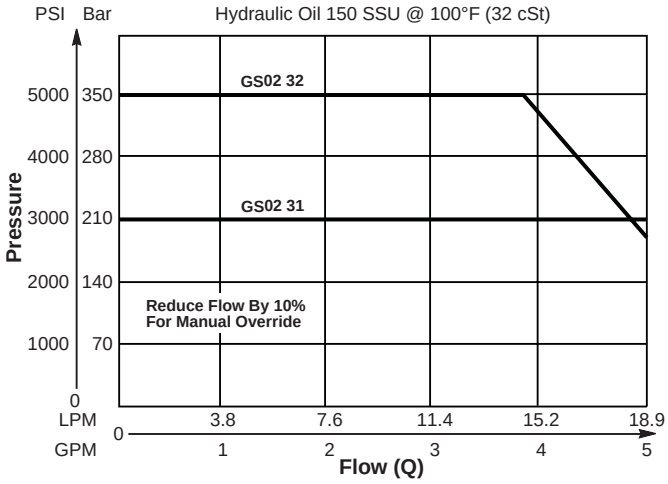
Rated Flow (At 70 PSI ΔP)	**31** 19 LPM (5 GPM) **32** 15 LPM (4 GPM)
Maximum Inlet Pressure	**31** 210 Bar (3000 PSI) **32** 350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	82 cc/min @ 210 Bar (3000 PSI)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.23 kg (.51 lbs.)
Cavity	C08-3 (See BC Section for more details)

Performance Curves

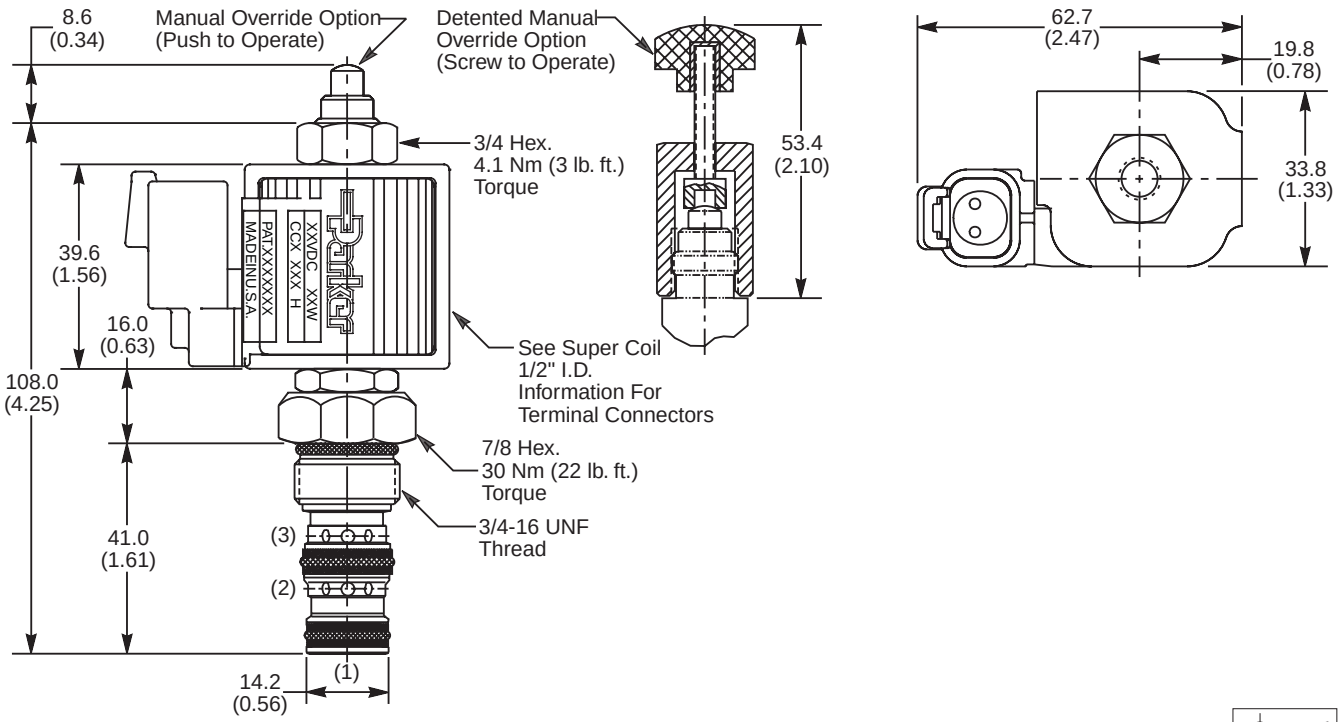
Pressure Drop vs. Flow (Through cartridge only)



Opreating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)



Ordering Information

GS02								–		
08 Size Solenoid Valve	Style	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
31	High Flow ('SP' Coil)
32	High Pressure ('SP' Coil)

Code	Override Options
0	None
1	Manual Override
2	Detented Part No. 900690

Code	Screen
0	None

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30077N-1)
V	Fluorocarbon / (SK30077V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

**22 Watts*

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
**DC Only*

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4T	SAE-4	(B08-3-*4T)
6T	SAE-6	(B08-3-*6T)
6B	3/8" BSPG	(B08-3-*6B)

** Add "A" for aluminum, omit for steel.*

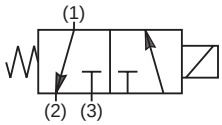
General Description

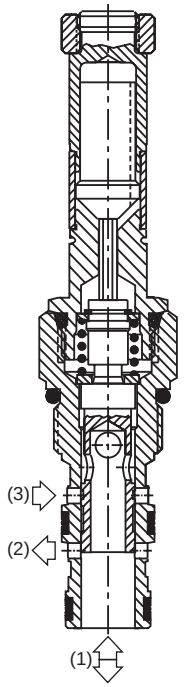
3-Way, 2 Position Spool Valve. Bottom Cylinder Port. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated





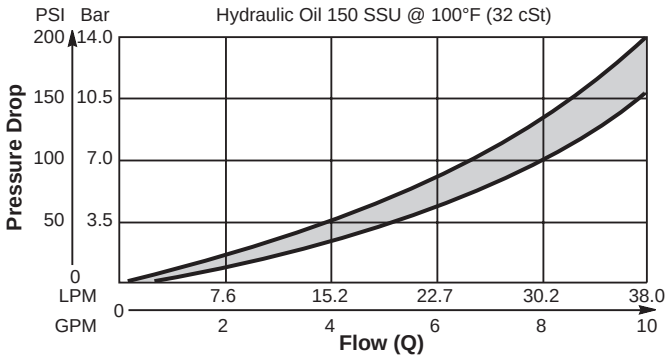


Specifications

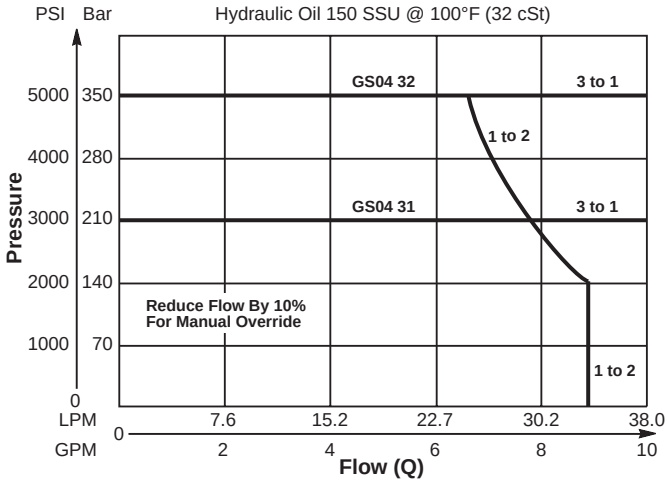
Rated Flow (At 70 PSI ΔP)	**31** 30 LPM (8 GPM) **32** 24 LPM (6.5 GPM)
Maximum Inlet Pressure	**31** 210 Bar (3000 PSI) **32** 350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	82 cc/min @ 210 Bar (3000 PSI)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.32 kg (.71 lbs.)
Cavity	C10-3 (See BC Section for more details)

Performance Curves

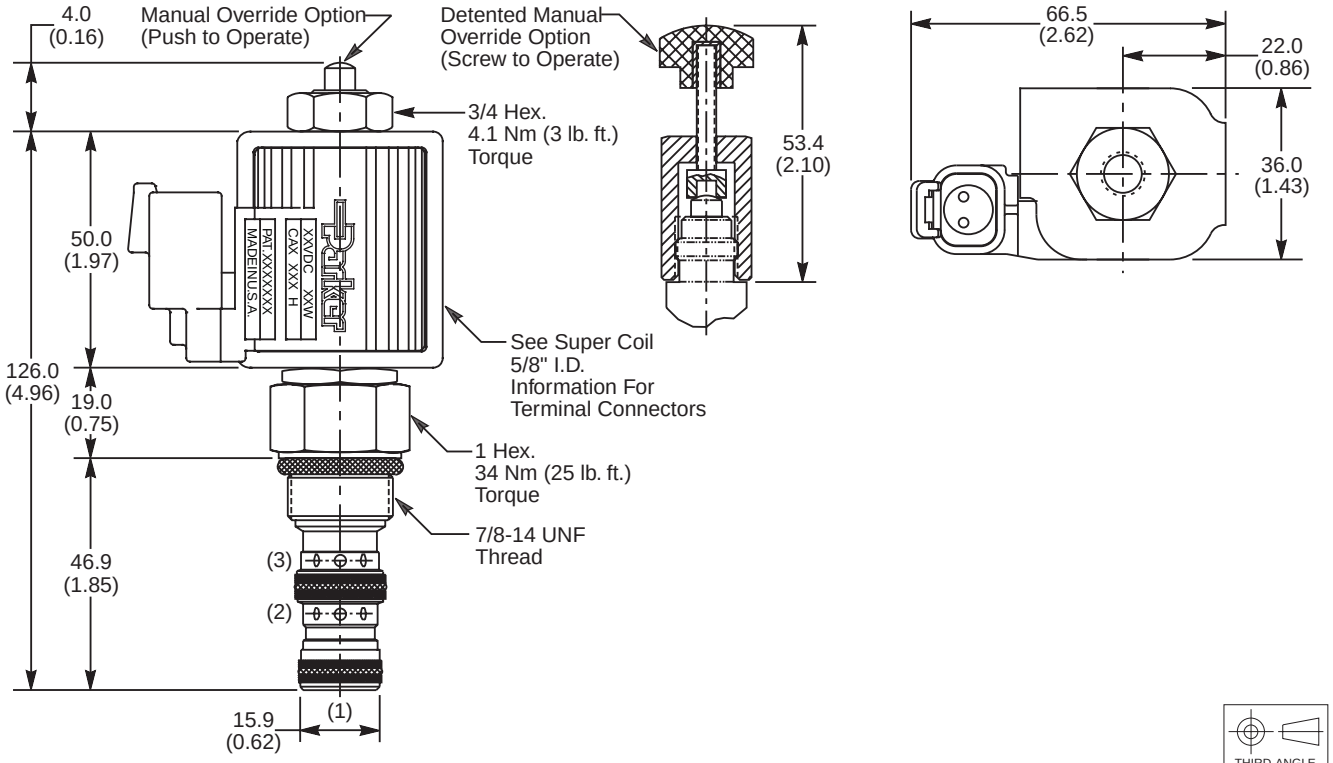
Pressure Drop vs. Flow (Through cartridge only)



Opreating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)



Ordering Information

GS04					C				–		
10 Size Solenoid Valve	Style	Override Option	Screen	Seals		Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
31	High Flow ('SP' Coil)
32	High Pressure ('SP' Coil)

Code	Override Options
0	None
1	Manual Override
2	Detented Part No. 900690

Code	Screen
0	None

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30505N-1)
V	Fluorocarbon / (SK30505V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 28 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 5/8" I.D.
****DC Only***

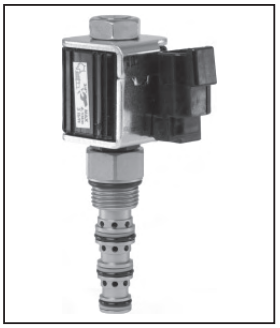
Code	Body Material
Omit	Steel
A	Aluminum

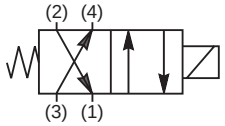
Code	Port Size	Body Part No.
Omit	Cartridge Only	
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8" BSPG	(B10-3-6B)†
8B	1/2" BSPG	(B10-3-*8B)

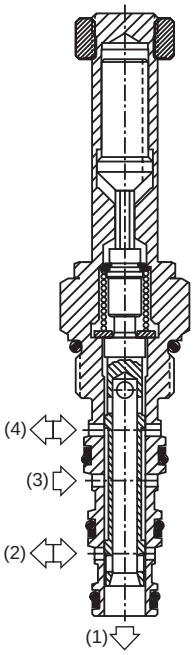
**** Add "A" for aluminum, omit for steel.***
† Steel bodies only.

General Description

4-Way, 2 Position, Reversing Spool Valve. For additional information see Technical Tips on pages SV1-SV6.







Features

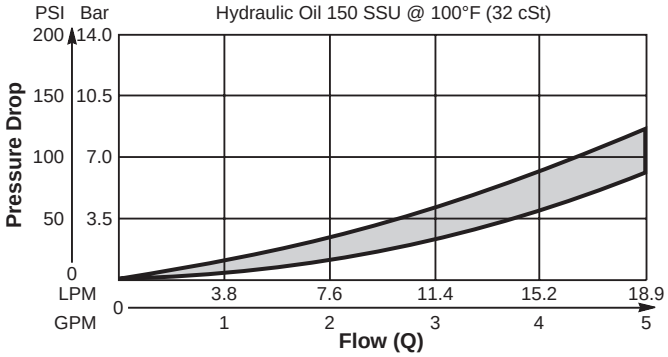
- Designed to operate double and single acting cylinders, pilot circuits and bi-directional motors, etc.
- High flow capacity with reduced space requirements
- High pressure capacity to 350 Bar (5000 PSI)
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Manual override available
- All external parts zinc plated

Specifications

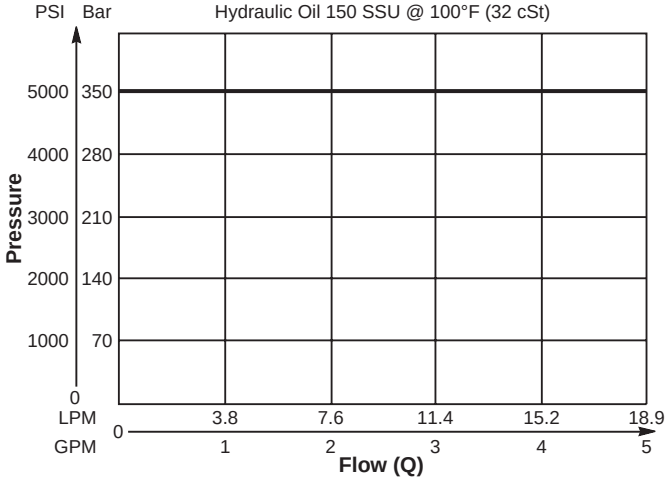
Rated Flow (At 70 PSI ΔP)	19 LPM (5 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.30 kg (.66 lbs.)
Cavity	C08-4 (See BC Section for more details)

Performance Curves

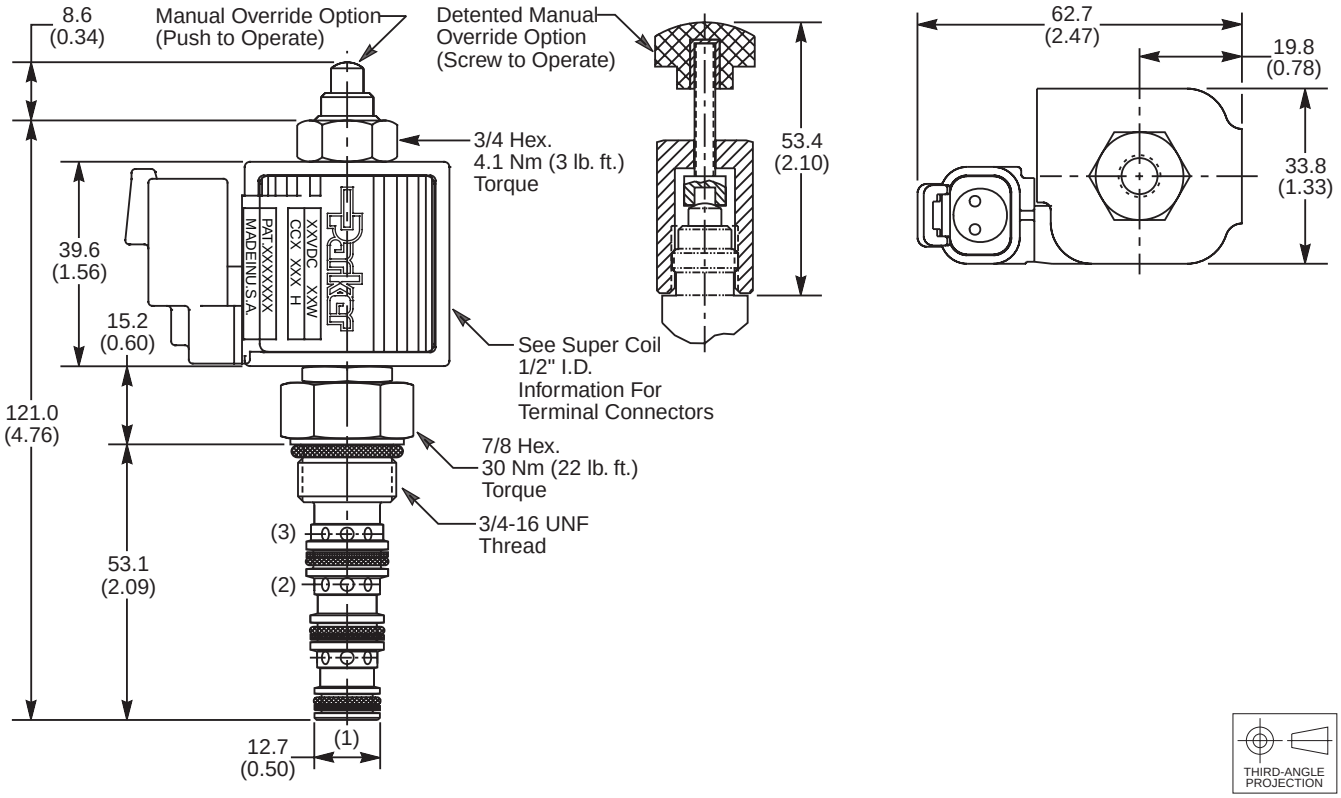
Pressure Drop vs. Flow (Through cartridge only)



Opreating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)



Ordering Information

GS02	42							–		
08 Size Solenoid Valve	Style	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
42	High Pressure ('SP' Coil)

Code	Override Options
0	None
1	Manual Override
2	Detented Part No. 900690

Code	Screen
0	Not Available

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30078N-1)
V	Fluorocarbon / (SK30078V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

22 Watts

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
DC Only

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6T	SAE-6	(B08-4-*6T)
6B	3/8" BSPG	(B08-4-*6B)

**** Add "A" for aluminum, omit for steel.***

General Description

2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

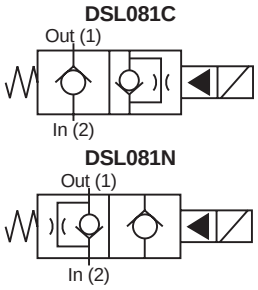
Features

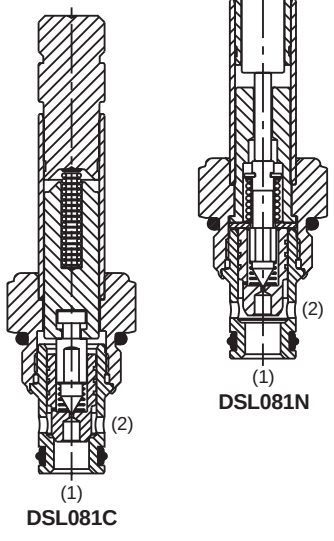
- Replaceable, one piece encapsulated, coils with minimal amperage draw
- Variety of coil terminations and voltages
- Variety of manual override options available
- Fast response available, (CH and CHR) rated at 15 LPM (4.0 GPM)
- Polyurethane “D”-Ring eliminates need for backup rings
- Spherical poppet for low leakage
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

Specifications

Rated Flow (At 70 PSI ΔP)	30 LPM (8 GPM)
Maximum Inlet Pressure	250 Bar (3600 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Energized / De-Energized** **C, CR** 50 ms / 50 ms **CH, CHR** 30 ms / 50 ms **N, NR** 50 ms / 40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.11 kg (.25 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F



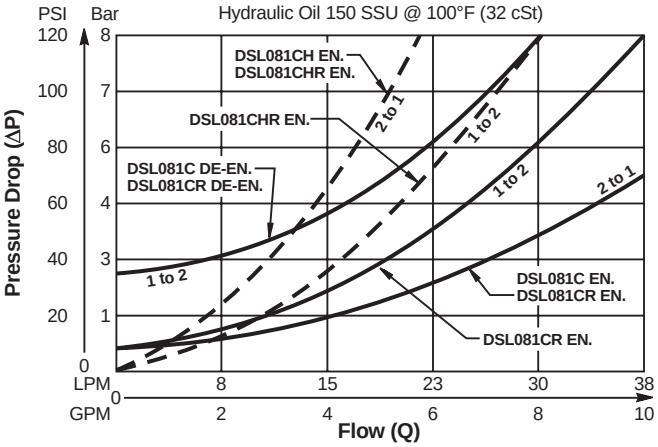




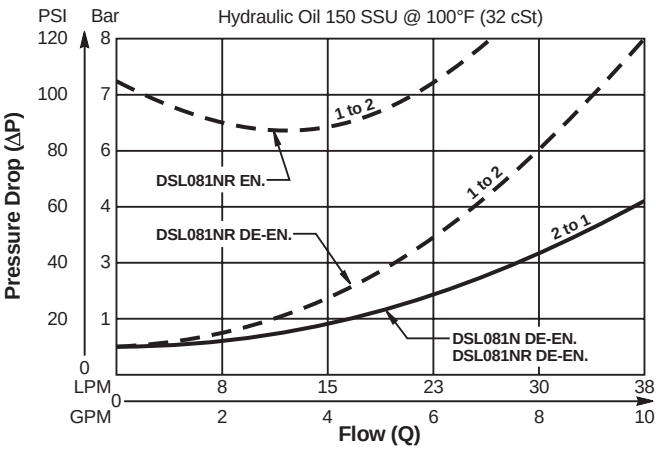
Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

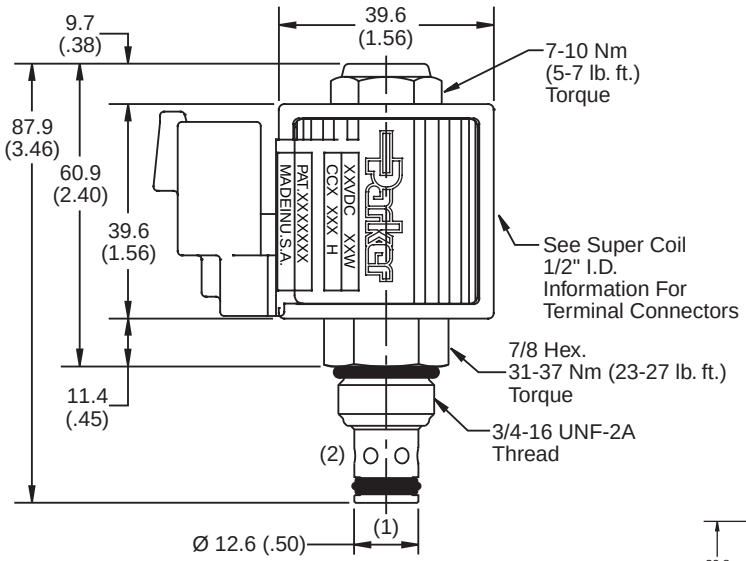
Normally Closed

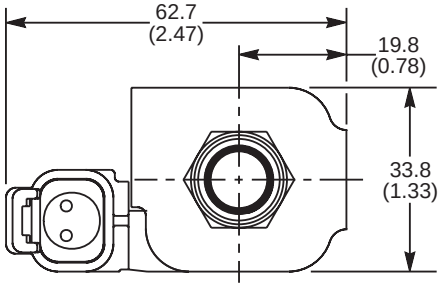


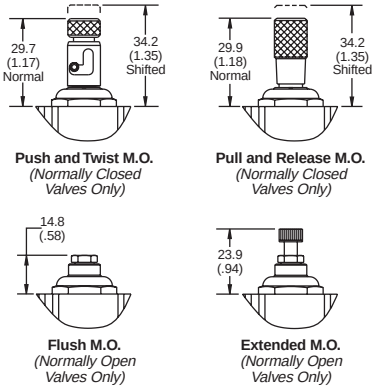
Normally Open



Dimensions Millimeters (Inches)





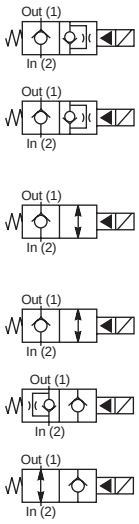


THIRD-ANGLE PROJECTION

Ordering Information

DSL081										—		
08 Size Solenoid Valve	Style	Override Option	Seals	Screen	Coil Type	Coil Voltage	Coil Termination	Diode		Body Material	Port Size	

Code / Style	
C	Normally Closed Metered reverse flow
CH	Normally Closed Metered reverse flow (Fast response)
CHR	Normally Closed Full reverse flow (Fast response)
CR	Normally Closed Free reverse flow
N	Normally Open Metered reverse flow
NR	Normally Open Free reverse flow



Code	Override Options
Omit	None
E	Push Type with Extended Rod (N.O. Only)
M	Push Type with Flush Rod (N.O. Only)
P	Pull & Release (N.C. Only)
T	Push & Twist (N.C. & N.O.)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK08-2)
N	Nitrile / (SK08-2N)
V	Fluorocarbon / (SK08-2V)

Code	Screen
Omit	None
S	Screen

Code	Coil Type
Omit	Without Coil
SP*	Super Coil - 19 Watts
U	Unicoil - 14 Watts

Recommended

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

SP* Coil	Coil Termination	U Coil
Omit	Without Coil	**Omit**
C	Conduit With Leads	**C**
D	DIN Plug Face	**D**
A	Amp Jr. Timer†	**–**
S	Dual Spade†	**–**
W	Dual Screw†	**–**
L	Dual Lead Wire†	**W**
H	Molded Deutsch†	**–**

Recommended †DC Only

Code	Diode
Omit	None
R	Diode

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-2-*4P)
6P	3/8″ NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8″ BSPG	(B08-2-*6B)

**** Add "A" for aluminum, omit for steel.***

General Description

2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

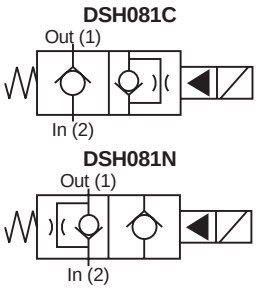
Features

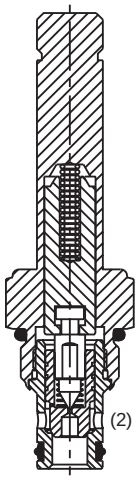
- Replaceable, one piece encapsulated, coils with minimal amperage draw
- Variety of coil terminations and voltages
- Variety of manual override options available
- Fast response available, (CH and CHR) rated at 15 LPM (4.0 GPM)
- Polyurethane “D”-Ring eliminates need for backup rings
- Spherical poppet for low leakage
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

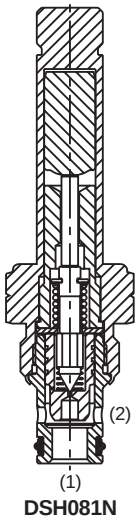
Specifications

Rated Flow (At 70 PSI ΔP)	30 LPM (8 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Energized / De-Energized** **C, CR** 50 ms / 50 ms **CH, CHR** 30 ms / 50 ms **N, NR** 50 ms / 40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.11 kg (.25 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F





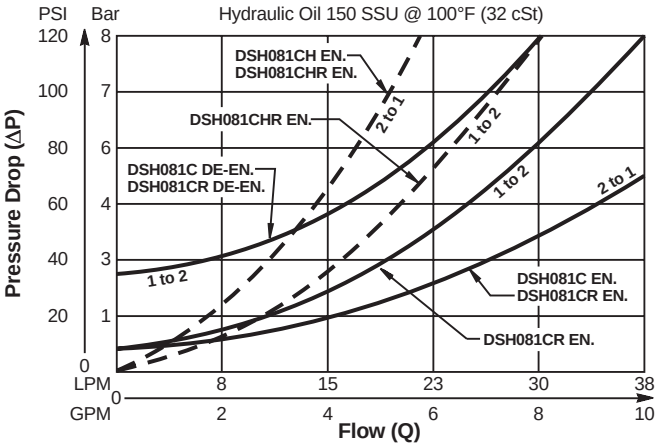




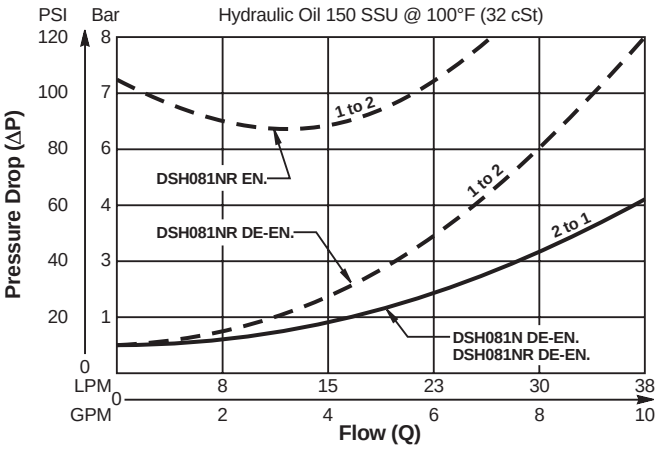
Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

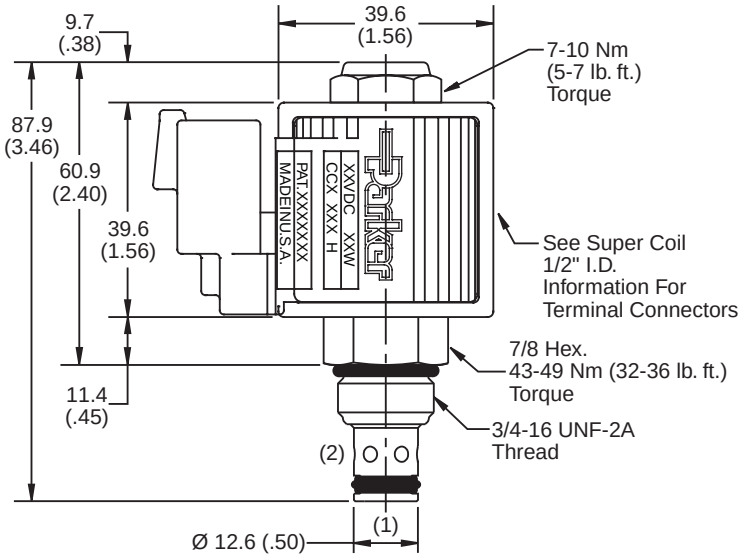
Normally Closed

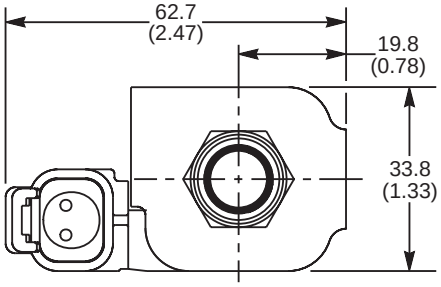


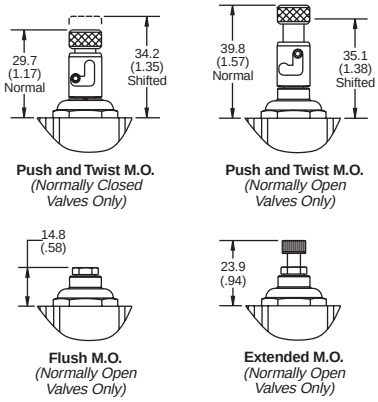
Normally Open



Dimensions Millimeters (Inches)



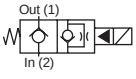
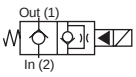
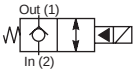
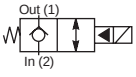
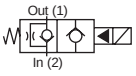
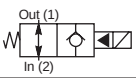




THIRD-ANGLE PROJECTION

Ordering Information

DSH081											
08 Size Solenoid Valve	Style	Override Option	Seals	Screen	Coil Type	Coil Voltage	Coil Termination	Diode	—	Body Material	Port Size

Code / Style	
C Normally Closed Metered reverse flow	
CH Normally Closed Metered reverse flow (Fast response)	
CHR Normally Closed Free reverse flow (Fast response)	
CR Normally Closed Free reverse flow	
N Normally Open Metered reverse flow	
NR Normally Open Free reverse flow	

Code	Override Options
Omit	None
E	Push Type with Extended Rod (N.O. Only)
M	Push Type with Flush Rod (N.O. Only)
T	Push & Twist (N.C.* & N.O.)

***Requires Super Coil**

Code	Seals / Kit No.
Omit	"D"-Ring / (SK08-2)
N	Nitrile / (SK08-2N)
V	Fluorocarbon / (SK08-2V)

Code	Screen
Omit	None
S	Screen

Code	Coil Type
Omit	Without Coil
SP*	Super Coil - 19 Watts
U	Unicoil - 14 Watts

Recommended

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

SP* Coil	Coil Termination	U Coil
Omit	Without Coil	**Omit**
C	Conduit With Leads	**C**
D	DIN Plug Face	**D**
A	Amp Jr. Timer†	**–**
S	Dual Spade†	**–**
W	Dual Screw†	**–**
L	Dual Lead Wire†	**W**
H	Molded Deutsch†	**–**

***Recommended †DC Only**

Code	Diode
Omit	None
R	Diode

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-2-*4P)
6P	3/8″ NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8″ BSPG	(B08-2-*6B)

***Add "A" for aluminum, omit for steel.**

General Description

2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

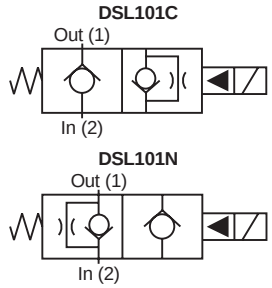
Features

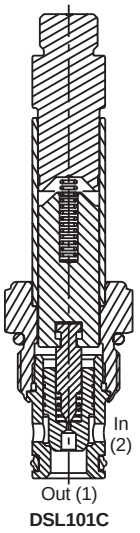
- Low hysteresis
- Replaceable, one piece encapsulated coils with minimal amperage draw
- Various coil terminations and voltages
- Various manual override options
- Fast response available, (CH and CHR) rated at 11 LPM (3.0 GPM)
- Polyurethane “D”-Ring
- All external parts zinc plated

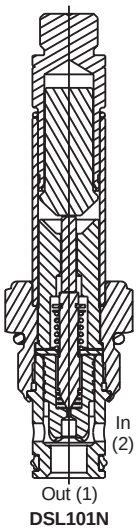
Specifications

Rated Flow (At 70 PSI ΔP)	60 LPM (15 GPM)
Maximum Inlet Pressure	250 Bar (3600 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Energized / De-Energized** **C, CR** 80 ms / 150 ms **CH, CHR** 50 ms / 50 ms **N, NR** 35 ms / 175 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.20 kg (0.41 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F





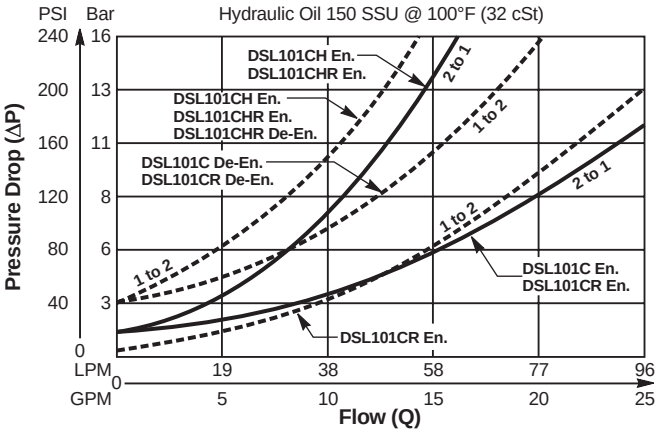




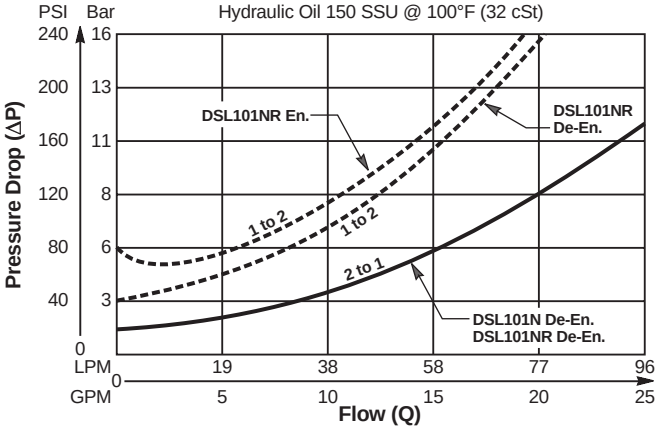
Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

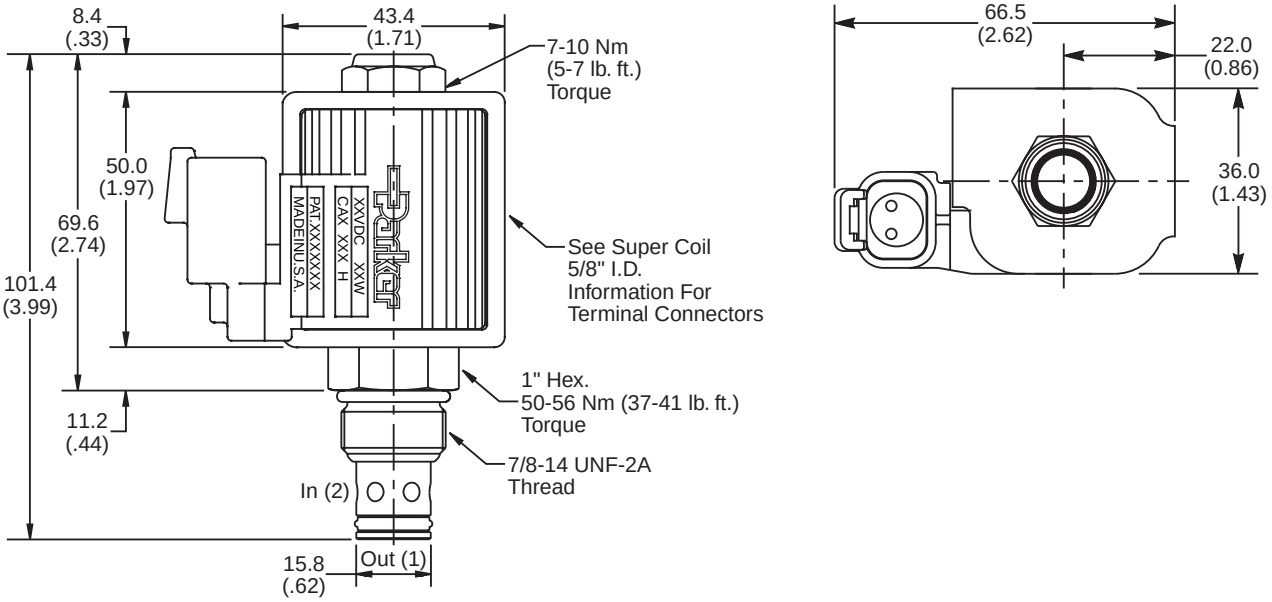
Normally Closed



Normally Open



Dimensions Millimeters (Inches)



Ordering Information

DSL101											
10 Size Solenoid Valve	Style	Override Option	Seals	Screen	Coil Type	Coil Voltage	Coil Termination	Diode	—	Body Material	Port Size

Code / Style	
C	Normally Closed Metered reverse flow
CH	Normally Closed Metered reverse flow (Fast response)
CHR	Normally Closed Free reverse flow (Fast response)
CR	Normally Closed Free reverse flow
N	Normally Open Metered reverse flow
NR	Normally Open Free reverse flow

Code	Override Options
Omit	None
E	Push Type with Extended Rod (N.O. Only)
M	Push Type with Flush Rod (N.O. Only)
P	Pull & Release (N.C. Only)
T	Push & Twist (N.C. & N.O.)

Code	Seals / Kit. No.
Omit	"D"-Ring / (SK10-2)
N	Nitrile / (SK10-2N)
V	Fluorocarbon / (SK10-2V)

Code	Screen
Omit	None
S	Screen

Code	Coil Type
Omit	Without Coil
SP*	Super Coil - 28 Watts
U	Unicoil - 20 Watts

Recommended

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

SP* Coil	Coil Termination	U Coil
Omit	Without Coil	**Omit**
C	Conduit With Leads	**C**
D	DIN Plug Face	**D**
A	Amp Jr. Timer†	**–**
S	Dual Spade†	**–**
W	Dual Screw†	**–**
L	Dual Lead Wire†	**W**
H	Molded Deutsch†	**–**

Recommended** **†DC Only

Code	Diode
Omit	None
R	Diode

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

**** Add "A" for aluminum. omit for steel.***
† Steel body only.

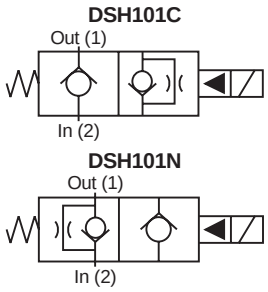
General Description

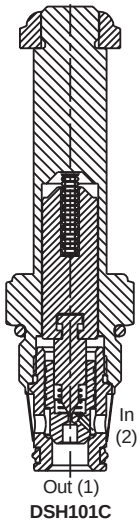
2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

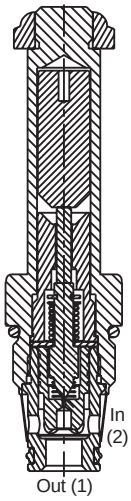
Features

- Low hysteresis
- Replaceable, one piece encapsulated coils with minimal amperage draw
- Various coil terminations and voltages
- Various manual override options
- Fast response available, (CH and CHR) rated at 30 LPM (8 GPM)
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated









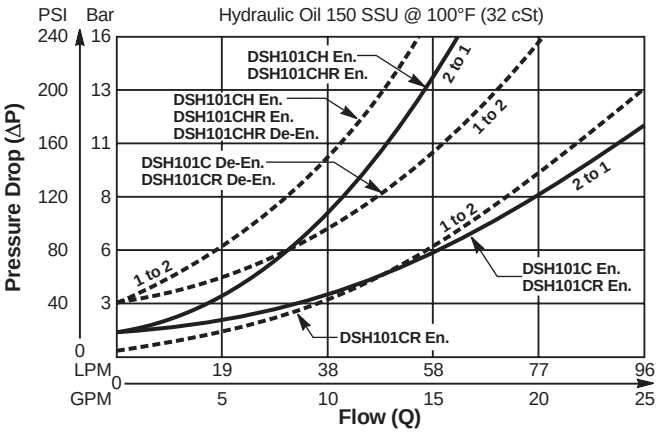
Specifications

Rated Flow (At 70 PSI ΔP)	60 LPM (15 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Energized / De-Energized** **C, CR** 80 ms / 150 ms **CH, CHR** 50 ms / 50 ms **N, NR** 70 ms / 35 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.20 kg (0.41 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

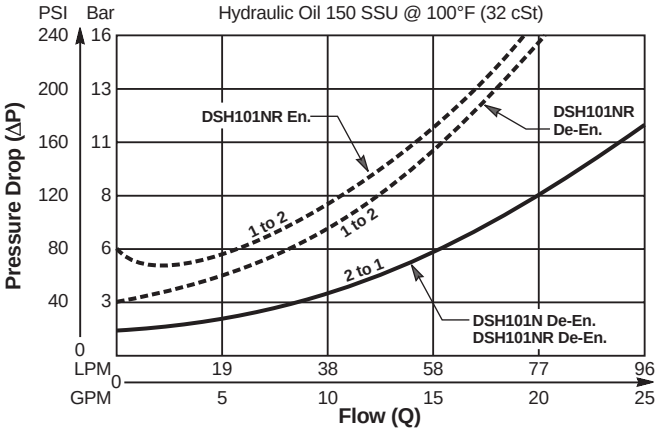
Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

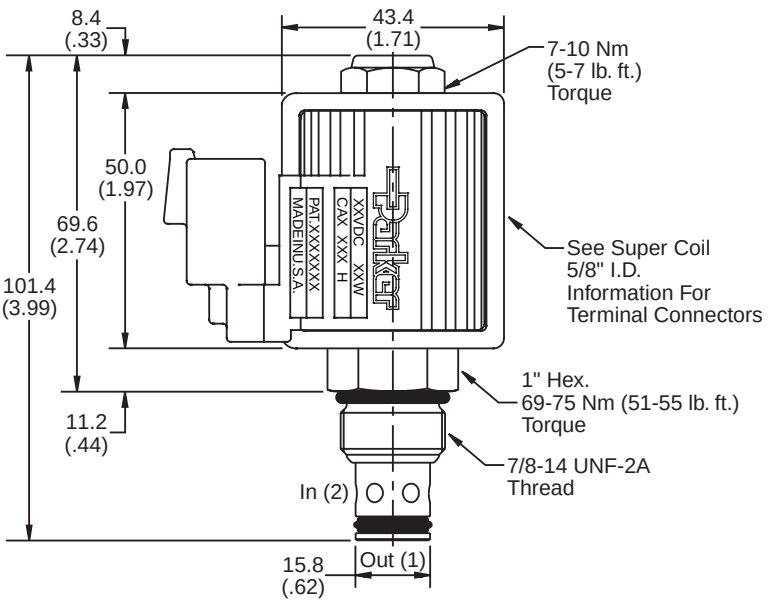
Normally Closed

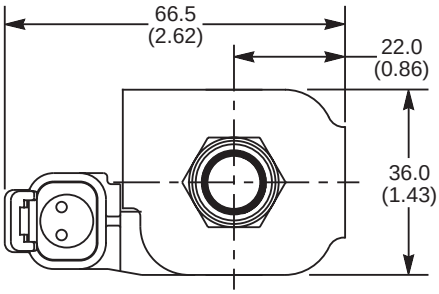


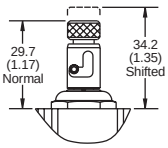
Normally Open



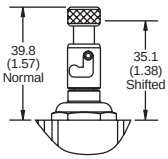
Dimensions Millimeters (Inches)



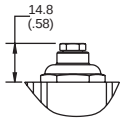




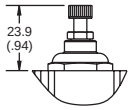
Push and Twist M.O.
(Normally Closed Valves Only)



Push and Twist M.O.
(Normally Open Valves Only)



Flush M.O.
(Normally Open Valves Only)

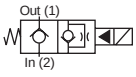
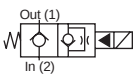
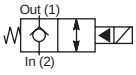
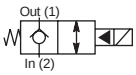
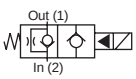
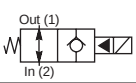


Extended M.O.
(Normally Open Valves Only)

THIRD-ANGLE PROJECTION

Ordering Information

DSH101											
10 Size Solenoid Valve	Style	Override Option	Seals	Screen	Coil Type	Coil Voltage	Coil Termination	Diode		Body Material	Port Size

Code / Style	
C Normally Closed Metered reverse flow	
CH Normally Closed Metered reverse flow (Fast response)	
CHR Normally Closed Free reverse flow (Fast response)	
CR Normally Closed Free reverse flow	
N Normally Open Metered reverse flow	
NR Normally Open Free reverse flow	

Code	Override Options
Omit	None
E	Push Type with Extended Rod (N.O. Only)
M	Push Type with Flush Rod (N.O. Only)
T	Push & Twist (N.C. & N.O.)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK10-2)
N	Nitrile / (SK10-2N)
V	Fluorocarbon / (SK10-2V)

Code	Screen
Omit	None
S	Screen

Code	Coil Type
Omit	Without Coil
SP*	Super Coil - 28 Watts
U	Unicoil - 20 Watts

Recommended

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

SP* Coil	Coil Termination	U Coil
Omit	Without Coil	Omit
C	Conduit With Leads	C
D	DIN Plug Face	D
A	Amp Jr. Timer†	–
S	Dual Spade†	–
W	Dual Screw†	–
L	Dual Lead Wire†	W
H	Molded Deutsch†	–

Recommended** **†DC Only

Code	Diode
Omit	None
R	Diode

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4" NPTF	(B10-2-*4P)
6P	3/8" NPTF	(B10-2-*6P)
8P	1/2" NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8" BSPG	(B10-2-6B)†

**** Add "A" for aluminum. omit for steel.***
† Steel body only.

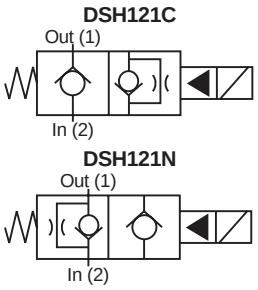
General Description

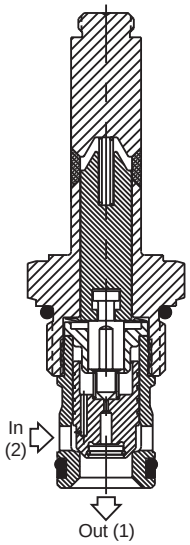
2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

- Low hysteresis
- Replaceable, one piece encapsulated coils with minimal amperage draw
- Various coil terminations and voltages
- Various manual override options
- All external parts zinc plated







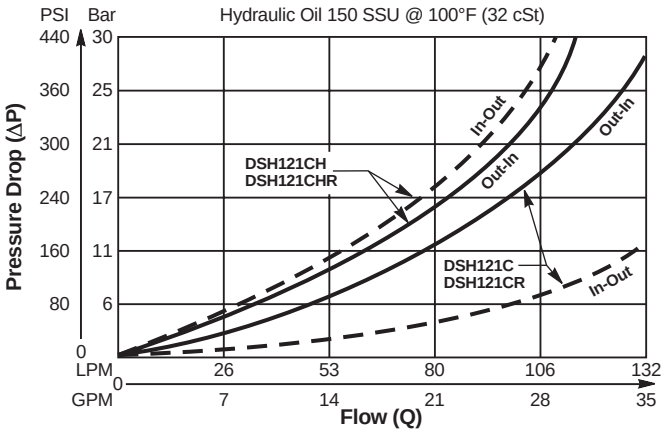
Specifications

Rated Flow	90 LPM (24 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	8 drops/min. (.54 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Energized / De-Energized** **C, CR** 100 ms / 150 ms **CH, CHR** 60 ms / 60 ms **N, NR** 70 ms / 150 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.29 kg (.65 lbs.)
Cavity	C12-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT12-2F

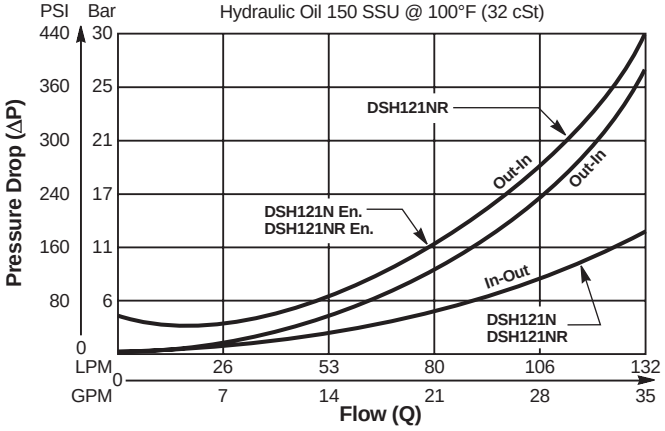
Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

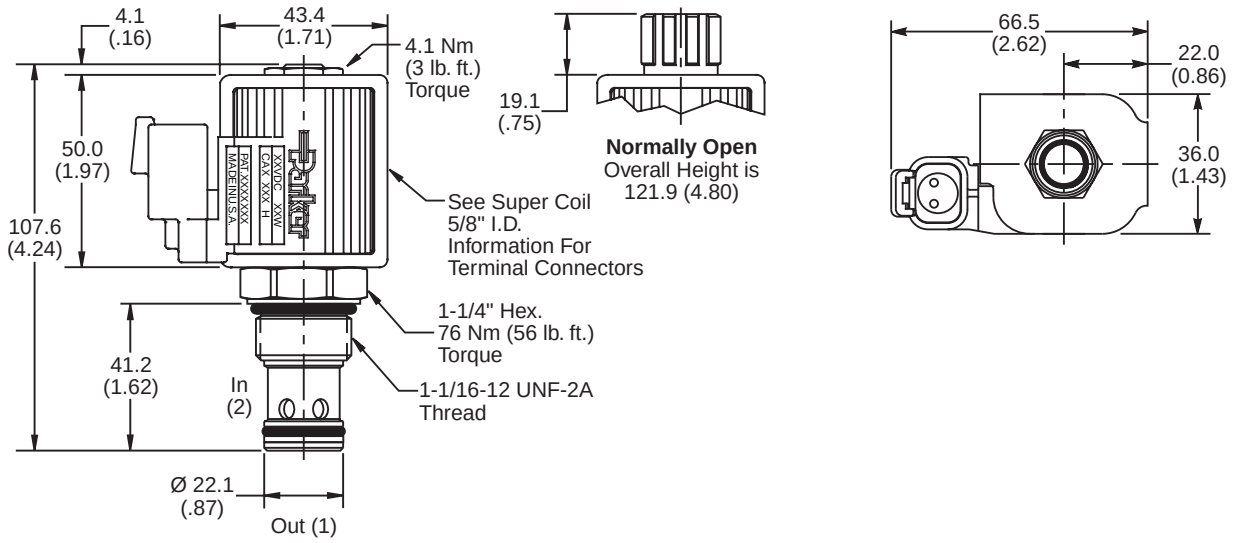
Normally Closed



Normally Open



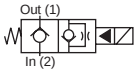
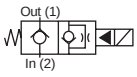
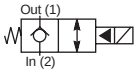
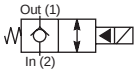
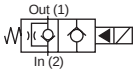
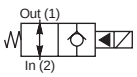
Dimensions Millimeters (Inches)



THIRD-ANGLE PROJECTION

Ordering Information

DSH121									—		
12 Size Solenoid Valve	Style	Override Option	Seals	Coil Type	Coil Voltage	Coil Termination	Diode		Body Material	Port Size	

Code / Style	
C Normally Closed Metered reverse flow	
CH Normally Closed Metered reverse flow (Fast response)	
CHR Normally Closed Full reverse flow (Fast response)	
CR Normally Closed Free reverse flow	
N Normally Open Metered reverse flow	
NR Normally Open Free reverse flow	

Code	Override Options
Omit	None
E	Push Type with Extended Rod (N.O. Only)
M	Push Type with Flush Rod (N.O. Only)
T	Push & Twist (N.C. & N.O.)

Code	Seals / Kit No.
Omit	Nitrile / (SK12-2)
V	Fluorocarbon / (SK12-2V)

Code	Coil Type
Omit	Without Coil
SP*	Super Coil - 28 Watts
U	Unicoil - 20 Watts

Recommended

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

SP* Coil	Coil Termination	U Coil
Omit	Without Coil	**Omit**
C	Conduit With Leads	**C**
D	DIN Plug Face	**D**
A	Amp Jr. Timer†	**–**
S	Dual Spade†	**–**
W	Dual Screw†	**–**
L	Dual Lead Wire†	**W**
H	Molded Deutsch†	**–**

Recommended †DC Only

Code	Diode
Omit	None
R	Diode

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
12P	3/4″ NPTF	(B12-2-*12P)
8T	SAE-8	(B12-2-*8T)
12T	SAE-12	(B12-2-*12T)

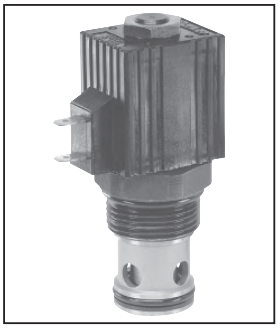
**** Add "A" for aluminum, omit for steel.***

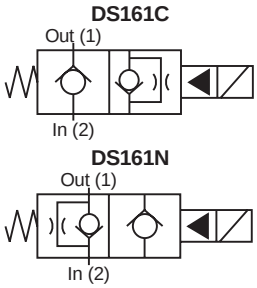
General Description

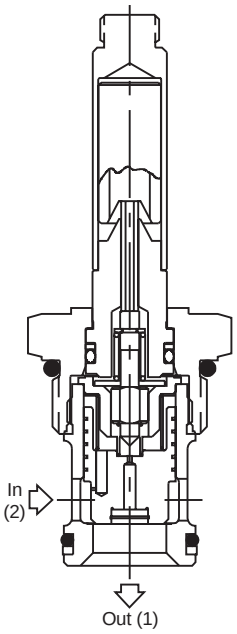
2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

- Low hysteresis
- Replaceable, one piece encapsulated coils with minimal amperage draw
- Various coil terminations and voltages
- Various manual override options
- Fast response available, (CH) rated at 60 LPM (15 GPM)
- All external parts zinc plated







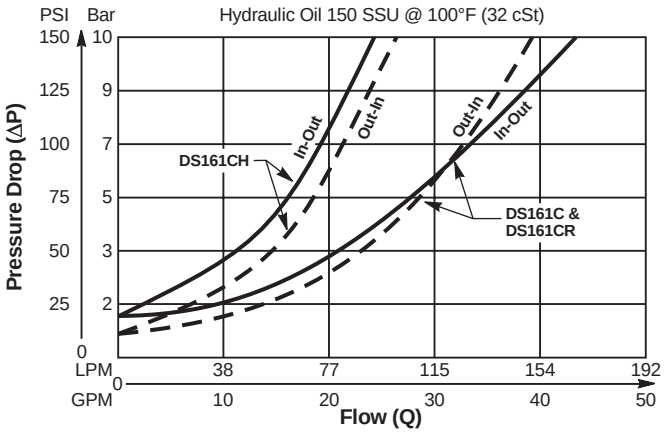
Specifications

Rated Flow	150 LPM (40 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	20 drops/min. (1.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Energized / De-Energized** **C, CR** 50 ms / 130 ms **CH** 40 ms / 60 ms **N, NR** 45 ms / 75 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.34 kg (.75 lbs.)
Cavity	C16-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT16-2F

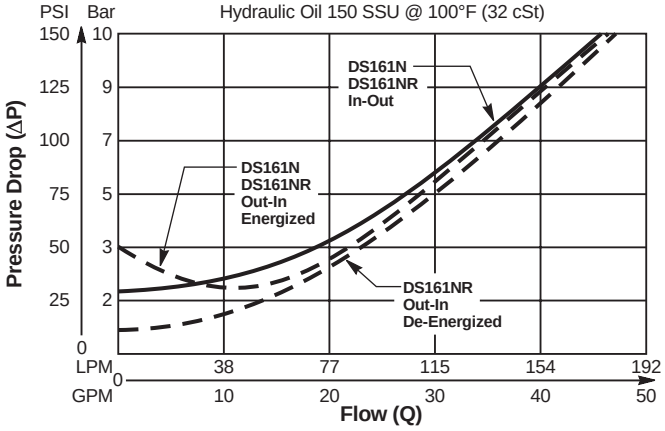
Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

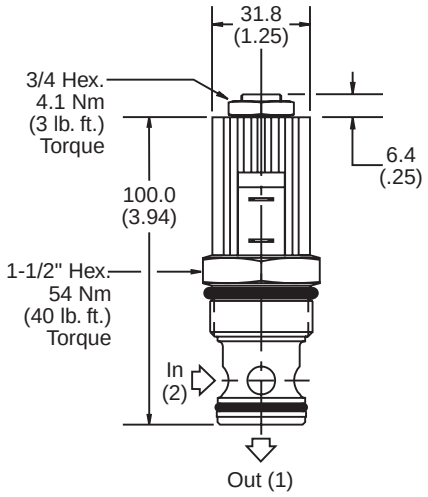
Normally Closed



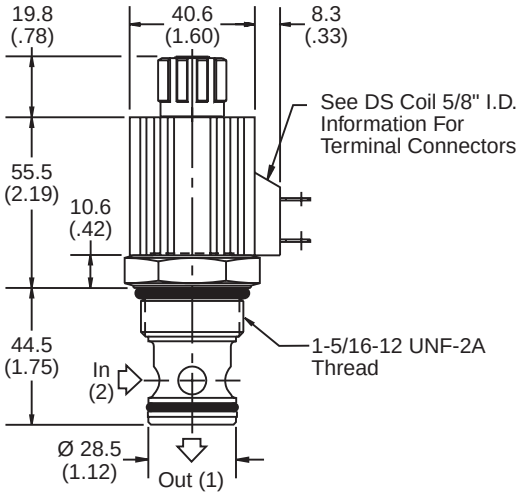
Normally Open



Dimensions Millimeters (Inches)



Normally Closed

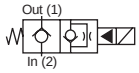
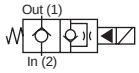
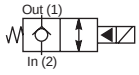
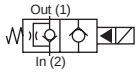
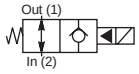


Normally Open

THIRD-ANGLE PROJECTION

Ordering Information

DS161							—		
16 Size Solenoid Valve	Style	Override Option	Seals	Coil Voltage	Coil Wattage	Coil Termination		Body Material	Port Size

Code / Style	
C Normally Closed Metered reverse flow	
CH Normally Closed Metered reverse flow (Fast response)	
CR Normally Closed Free reverse flow	
N Normally Open Metered reverse flow	
NR Normally Open Free reverse flow	

Code	Override Options
Omit	None
E	Push Type with Extended Rod (N.O. Only)
M	Push Type with Flush Rod (N.O. Only)
P	Pull & Release (N.C. Only)
T	Push & Twist (N.C. Only)

Code	Seals / Kit. No.
Omit	Nitrile / (SK16-2)
V	Fluorocarbon / (SK16-2V)

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

Code	Wattage
Omit	Without Coil
L	17 Watts
H	30 Watts

Code	Coil Termination
Omit	Without Coil
C	Conduit (AC Only)
D	DIN Plug Face
P	Dual Spade (DC Only)
S	Dual Screw (DC Only)
W	Dual Lead (DC Only)

See DS coil 5/8″ I.D.

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
12T	SAE-12	(B16-2-*12T)
16T	SAE-16	(B16-2-*16T)
12B	3/4″ BSPG	(B16-2-*12B)
16B	1″ BSPG	(B16-2-16B)†

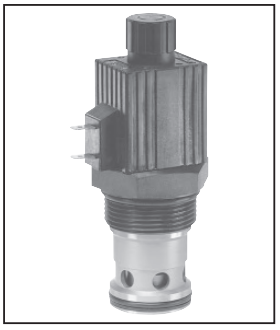
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

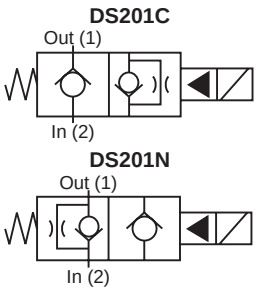
General Description

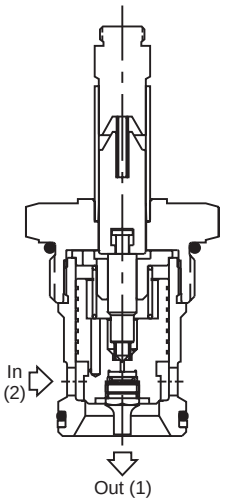
2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

- Low hysteresis
- Replaceable, one piece encapsulated coils with minimal amperage draw
- Various coil terminations and voltages
- Various manual override options
- All external parts zinc plated





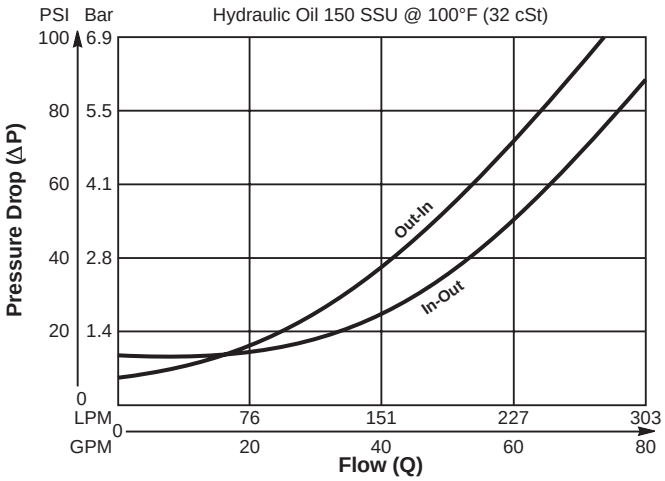


Specifications

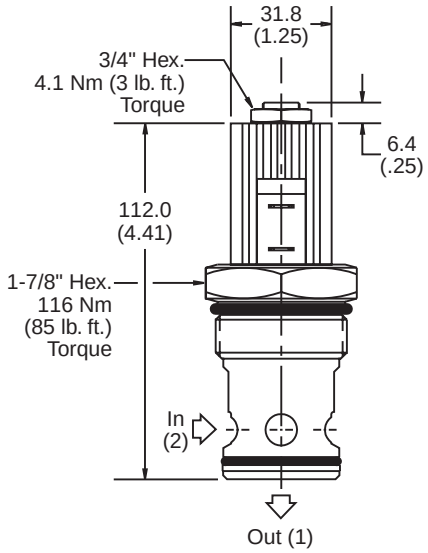
Rated Flow (At 70 PSI ΔP)	260 LPM (70 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	20 drops/min. (1.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Energized / De-Energized** **C, CR** 160 ms / 350 ms **N, NR** 45 ms / 300 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.34 kg (.75 lbs.)
Cavity	C20-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT20-2F

Performance Curve

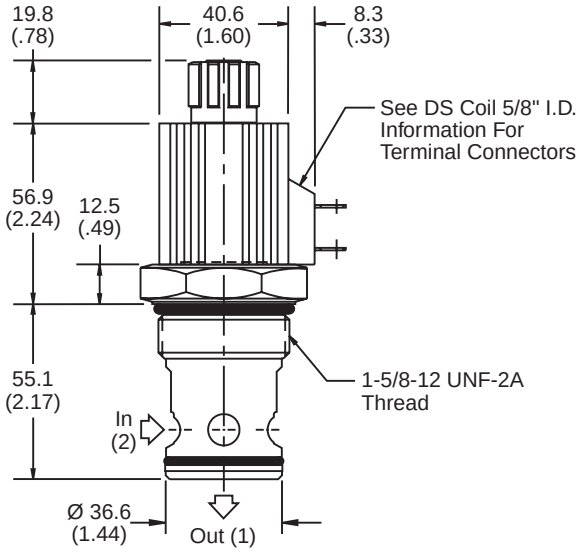
Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Normally Closed

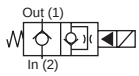
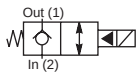
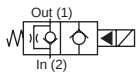
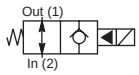


Normally Open

THIRD-ANGLE PROJECTION

Ordering Information

DS201							—		
16 Size Solenoid Valve	Style	Override Option	Seals	Coil Voltage	Coil Wattage	Coil Termination		Body Material	Port Size

Code / Style	
C Normally Closed Metered reverse flow	
CR Normally Closed Free reverse flow	
N Normally Open Metered reverse flow	
NR Normally Open Free reverse flow	

Code	Override Options
Omit	None
E	Push Type with Extended Rod (N.O. Only)
M	Push Type with Flush Rod (N.O. Only)
P	Pull & Release (N.C. Only)
T	Push & Twist (N.C. Only)

Code	Seals / Kit. No.
Omit	Nitrile / (SK20-2)
V	Fluorocarbon / (SK20-2V)

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

Code	Wattage
Omit	Without Coil
L	17 Watts
H	30 Watts

Code	Coil Termination
Omit	Without Coil
C	Conduit (AC Only)
D	DIN Plug Face
P	Dual Spade (DC Only)
S	Dual Screw (DC Only)
W	Dual Lead (DC Only)

See DS coil 5/8″ I.D.

Code	Body Material
Omit	Steel

Code	Port Size	Body Part No.
Omit	Cartridge Only	
20T	SAE-20	(B20-2-20T)
20B	1-1/4″ BSPG	(B20-2-20B)

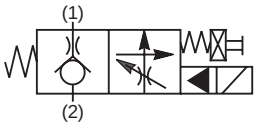
General Description

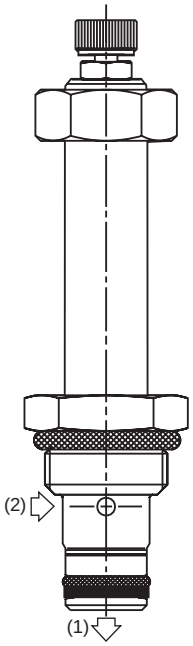
2-Way, 2 Position, Normally Closed Poppet Valve With Flow Control Adjustment. This valve maintains constant flow at $\Delta P \geq 20$ Bar (300 PSI) regardless of load pressure changes upstream of the valve at port 2.

Features

- Light weight alloy housing with hardened steel moving parts
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 04 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated







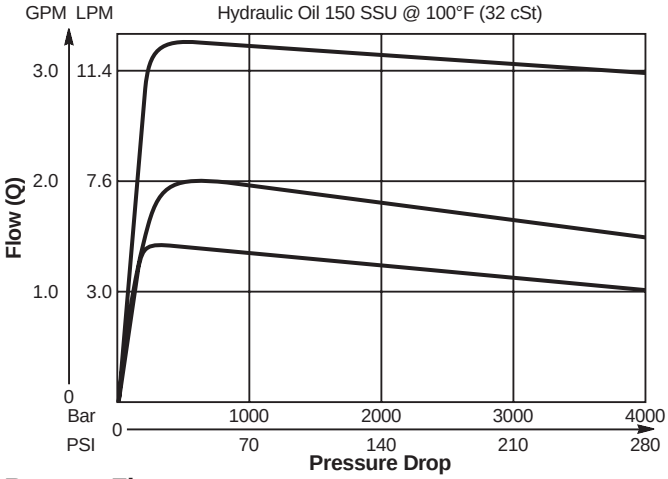
Specifications

Rated Flow (At 70 PSI ΔP)	9.5 LPM (2.5 GPM)
Maximum Inlet Pressure	**High Pressure** 285 Bar (4000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 20 ms **Close** 25 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.09 kg (.19 lbs.)
Cavity	C08-2 (See BC Section for more details)

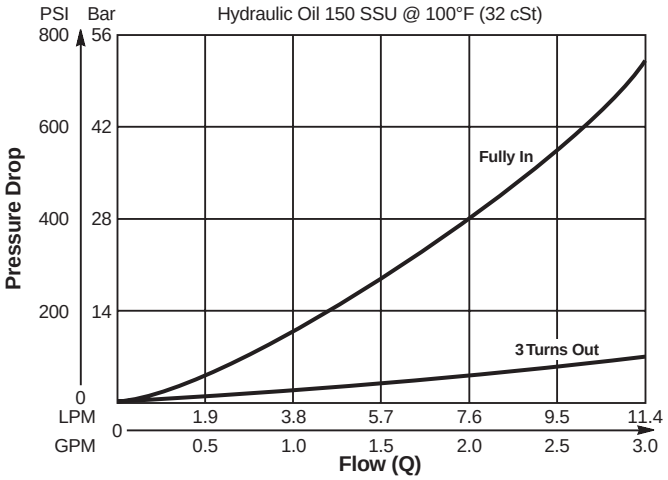
Performance Curves

(Through cartridge only)

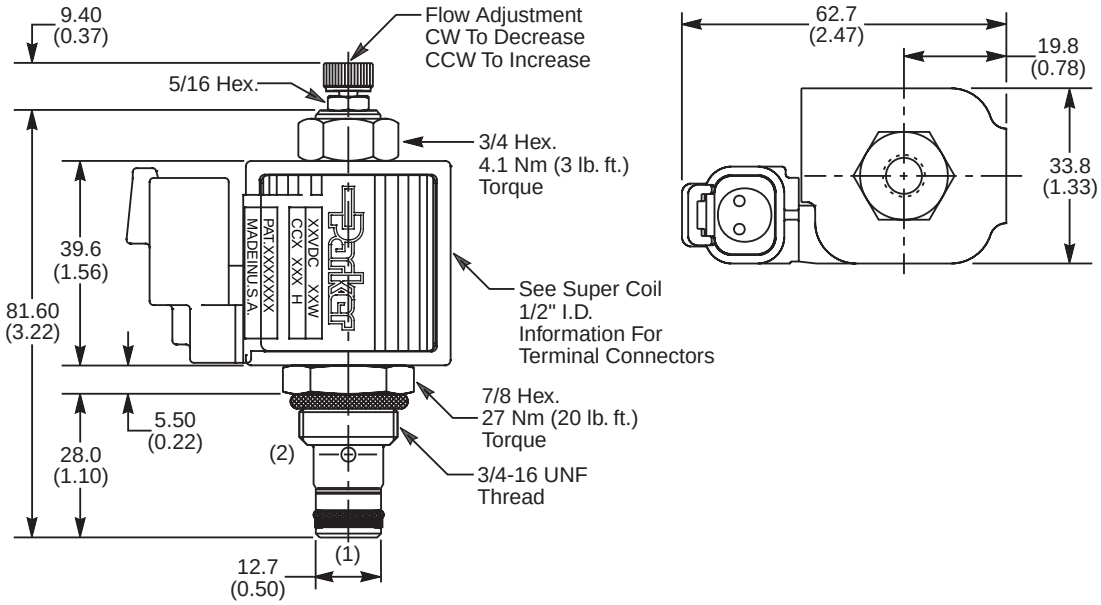
Pressure Compensation For Different Flow Settings



Reverse Flow



Dimensions Millimeters (Inches)



THIRD-ANGLE PROJECTION

Ordering Information

GH02	01						–		
08 Size Solenoid Valve	Style Normally Closed	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
01	High Pressure ('SP' Coil)

Code	Screen
0	None
1	60 Mesh Screen

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30006N-1)
V	Fluorocarbon / (SK30006V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

**22 Watts*

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
**DC Only*

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6T	SAE-6	(B08-2-*6T)
6B	3/8" BSPG	(B08-2-*6B)

** Add "A" for aluminum, omit for steel.*

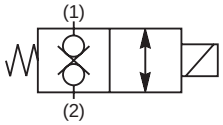
General Description

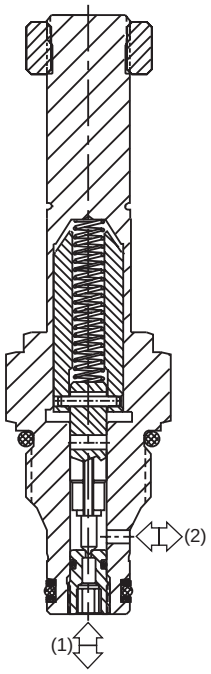
2-Way, 2 Position, Normally Closed Poppet Valve. Bi-Directional Direct Acting. For additional information see Technical Tips on pages SV1-SV6.

Features

- Fast Response
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 04 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated





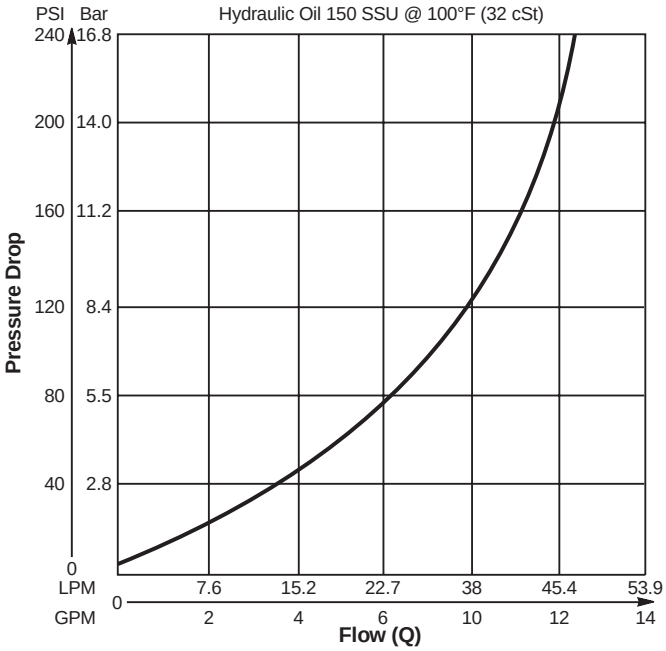


Specifications

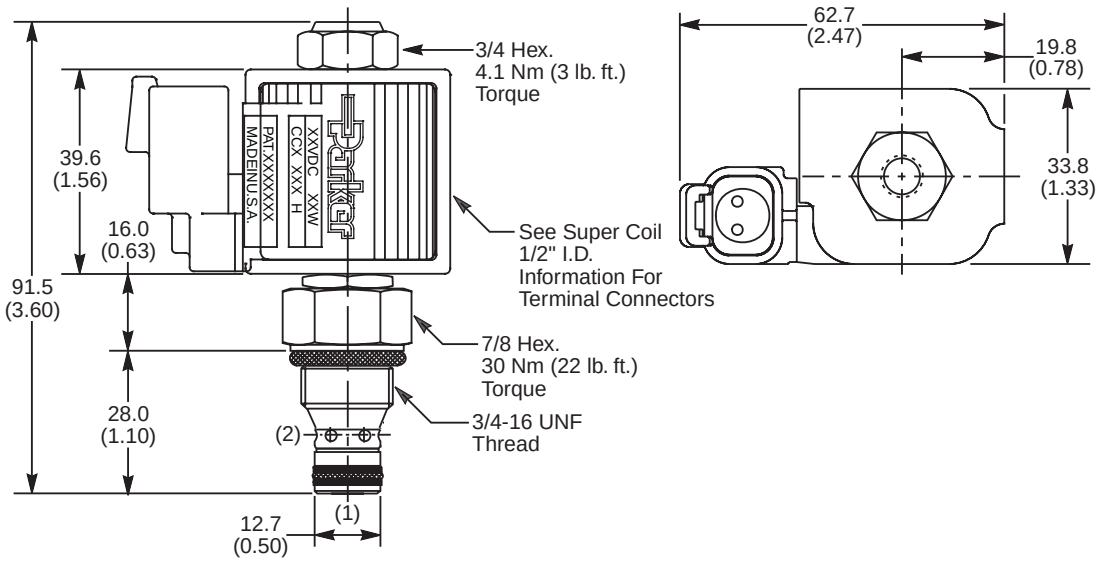
Rated Flow (At 70 PSI ΔP)	1 LPM (0.26 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	**72** 5 drops/min. (.33 cc/min.) **73** Zero Drops Soft (Delrin) Seat
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 10 ms **Close** 10 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C08-2 (See BC Section for more details)

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



THIRD-ANGLE PROJECTION

Ordering Information

GS02								–		
08 Size Solenoid Valve	Style Normally Closed	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
72	Standard ('SP' Coil)
73	Zero Drops ('SP' Coil)

Code	Override Options
0	None

Code	Screen
0	None
1	60 Mesh Screen

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30088N-1)
V	Fluorocarbon / (SK30088V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

22 Watts

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
DC Only

Code	Body Material
Omit	Steel
A	Aluminum

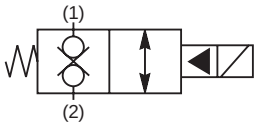
Code	Port Size	Body Part No.
Omit	Cartridge Only	
6T	SAE-6	(B08-2-*6T)
6B	3/8" BSPG	(B08-2-*6B)

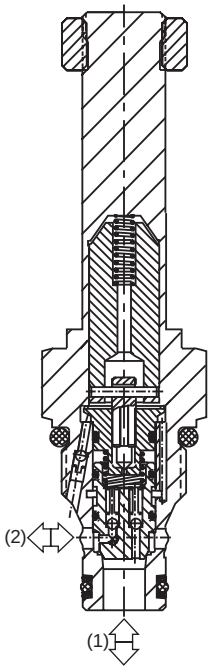
**** Add "A" for aluminum, omit for steel.***

General Description

2-Way, 2 Position, Normally Closed, Bi-Directional Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.







Features

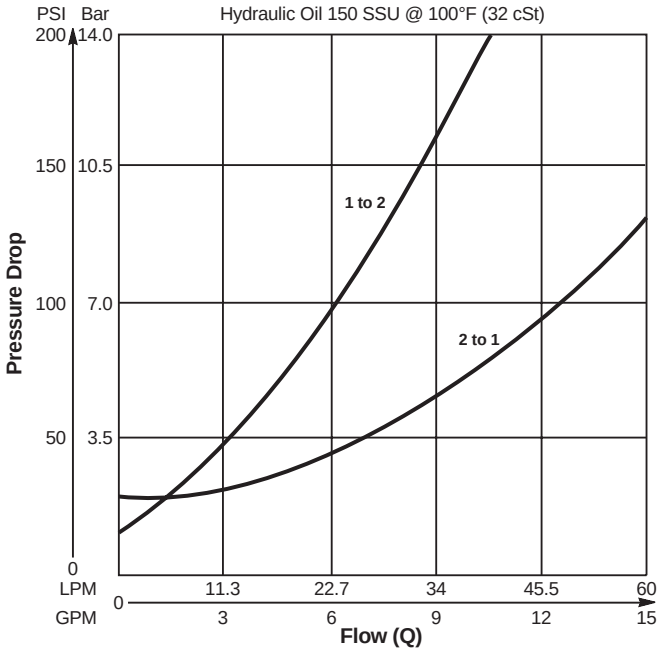
- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 04 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated

Specifications

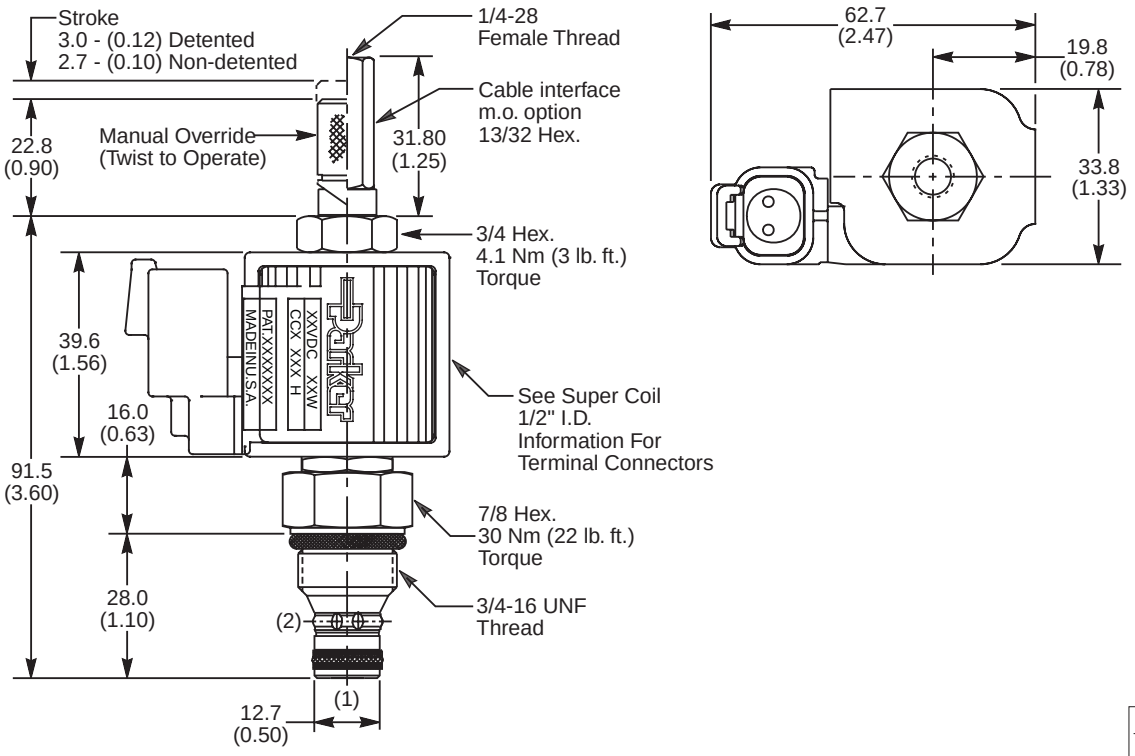
Rated Flow (At 70 PSI ΔP)	**2 to 1** 34 LPM (9 GPM) **1 to 2** 19 LPM (5 GPM)
Maximum Inlet Pressure	**80** 210 Bar (3000 PSI) **81** 350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 40 ms **Close** 40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C08-2 (See BC Section for more details)

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

GS02								–		
08 Size Solenoid Valve	Style Normally Closed	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
80	Standard ('SS' Coil)
81	High Pressure ('SP' Coil)

Code	Override Options
0	None
1	Detented
2	Non-Detented
3	Cable Interface 210 Bar (3000 PSI)

Code	Screen
0	None
1	60 Mesh Screen

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30088N-1)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 14 Watts
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

**22 Watts*

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
**DC Only*

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6T	SAE-6	(B08-2-*6T)
6B	3/8" BSPG	(B08-2-*6B)

** Add "A" for aluminum, omit for steel.*

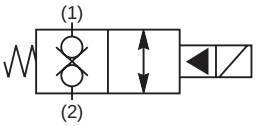
General Description

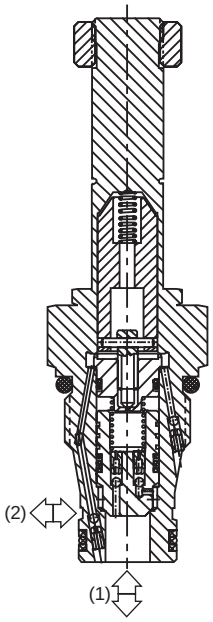
2-Way, 2 Position, Normally Closed, Bi-Directional Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 02 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated





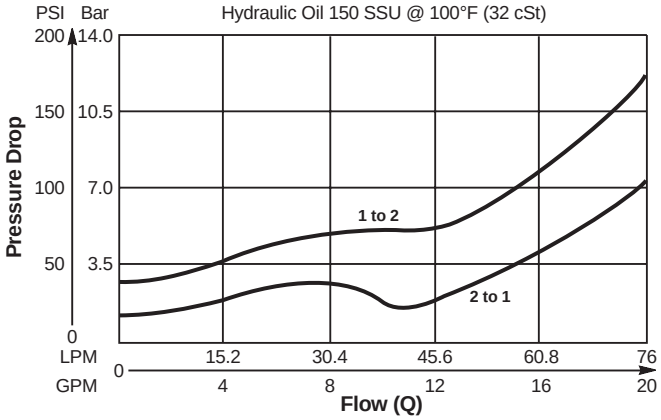


Specifications

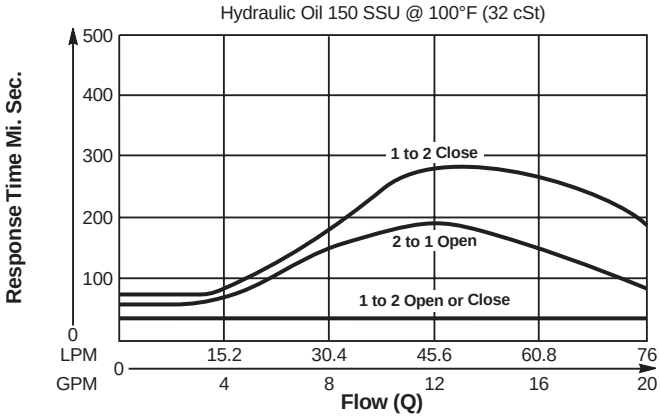
Rated Flow (At 70 PSI ΔP)	**2 to 1** 68 LPM (18 GPM) **1 to 2** 46 LPM (12 GPM)
Maximum Inlet Pressure	**80** 210 Bar (3000 PSI) **81** 350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	See Performance Curves
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.17 kg (.37 lbs.)
Cavity	2R (See BC Section for more details)

Performance Curves

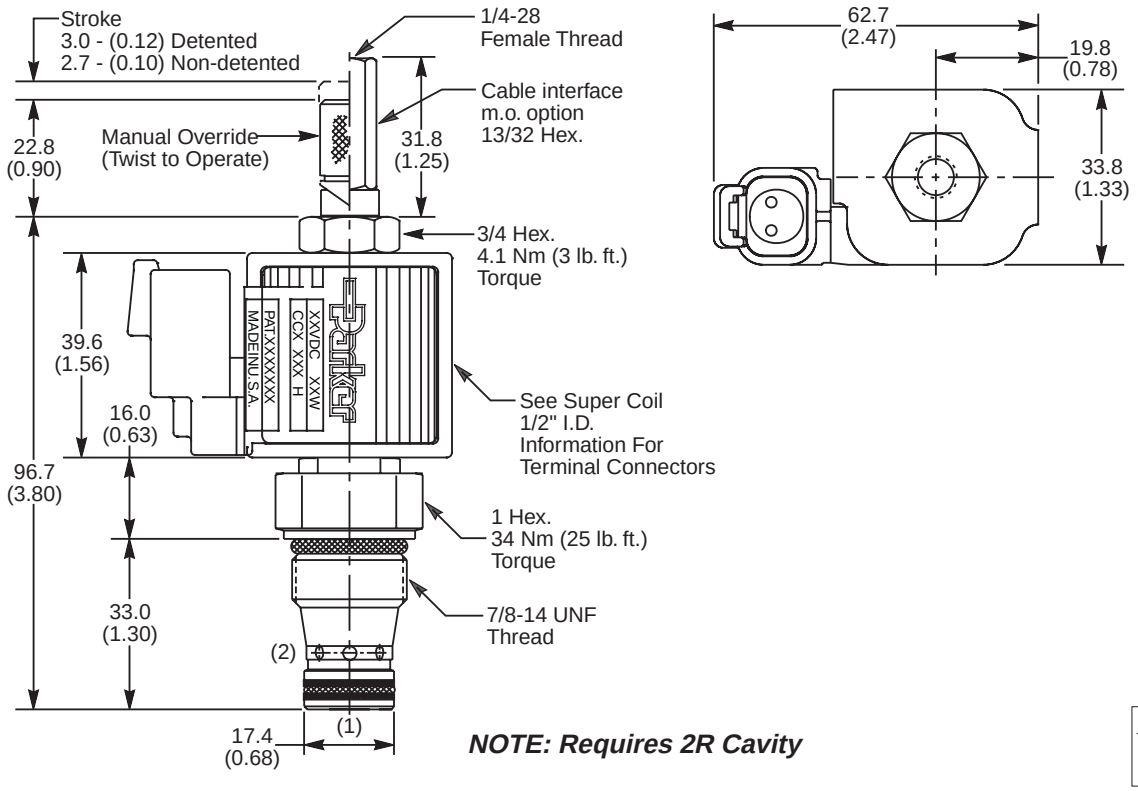
Pressure Drop vs. Flow (Through cartridge only)



Response Time vs. Flow



Dimensions Millimeters (Inches)



NOTE: Requires 2R Cavity

THIRD-ANGLE PROJECTION

Ordering Information

GS04							
10 Size Solenoid Valve	Style Normally Closed	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination

Code	Style
80	Standard ('SS' Coil)
81	High Pressure ('SP' Coil)

Code	Override Options
0	None
1	Detented
2	Non-Detented
3	Cable Interface 210 Bar (3000 PSI)

Code	Screen
0	None

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30113N-1)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 14 Watts
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

**22 Watts*

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
**DC Only*

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
543	1/2" SAE
545	1/2" BSP

Code	Body Material
A	Aluminum
S	Steel

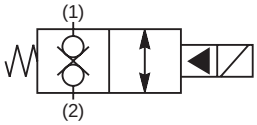
General Description

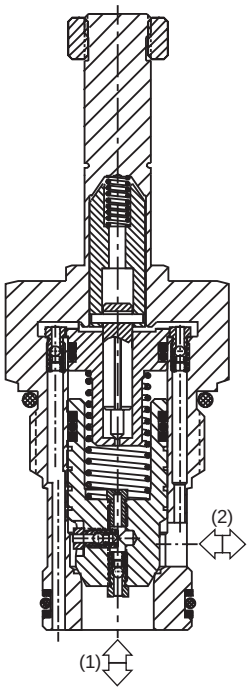
2-Way, 2 Position, Normally Closed, Bi-Directional Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 02 and 04 series poppet valves; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated





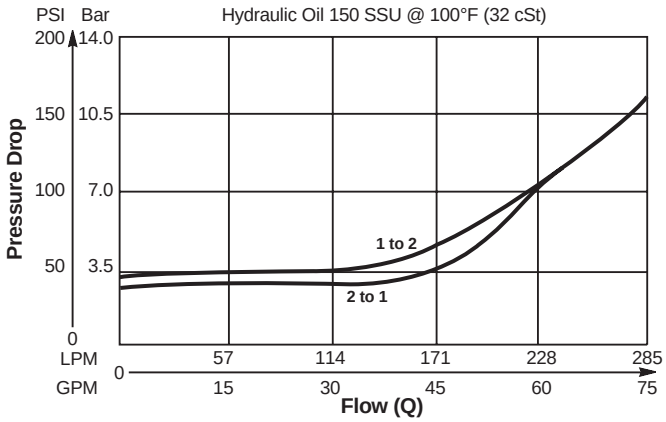


Specifications

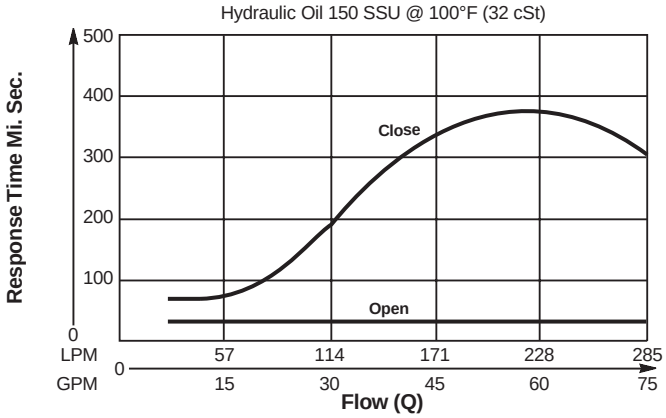
Rated Flow (At 70 PSI ΔP)	190 LPM (50 GPM)
Maximum Inlet Pressure	**80** 210 Bar (3000 PSI) **81** 350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	See Performance Curves
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.4 kg (.88 lbs.)
Cavity	C16-2 (See BC Section for more details)

Performance Curves

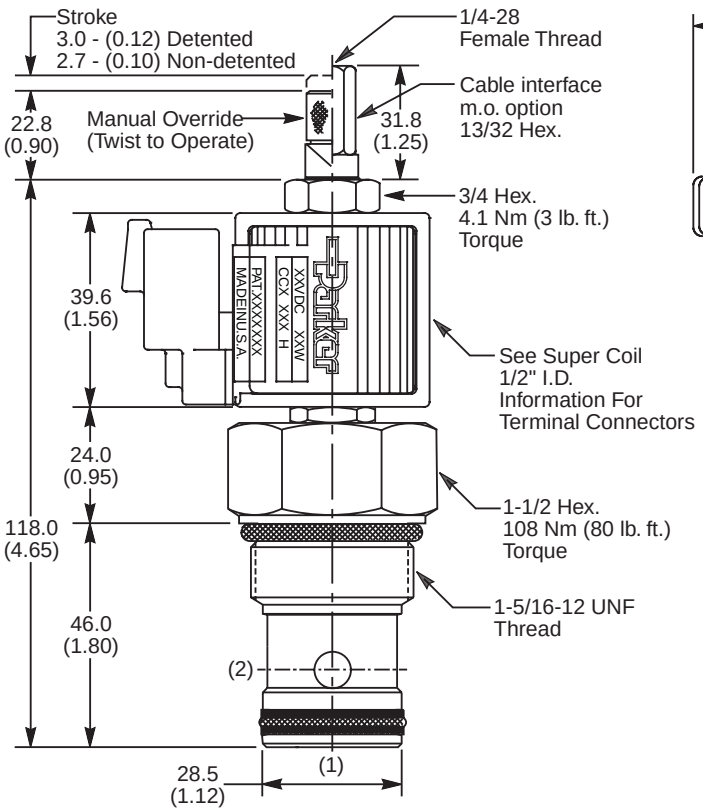
Pressure Drop vs. Flow (Through cartridge only)

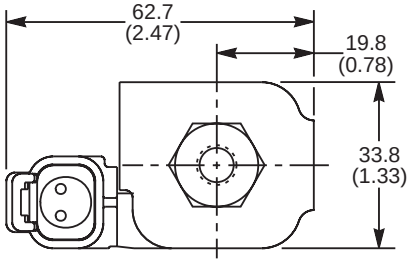


Response Time vs. Flow



Dimensions Millimeters (Inches)





THIRD-ANGLE PROJECTION

Ordering Information

GS06								–		
16 Size Solenoid Valve	Style Normally Closed	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
80	Standard ('SS' Coil)
81	High Pressure ('SP' Coil)

Code	Override Options
0	None
1	Detented
2	Non-Detented
3	Cable Interface 210 Bar (3000 PSI)

Code	Screen
0	None

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30089N-1)
V	Fluorocarbon / (SK30089V-1)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 14 Watts
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

**22 Watts*

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
**DC Only*

Code	Body Material
Omit	Steel
A	Aluminum

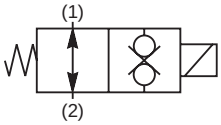
Code	Port Size	Body Part No.
Omit	Cartridge Only	
16T	SAE-16	(B16-2-*16T)
16B	1" BSPG	(B16-2-16B)†

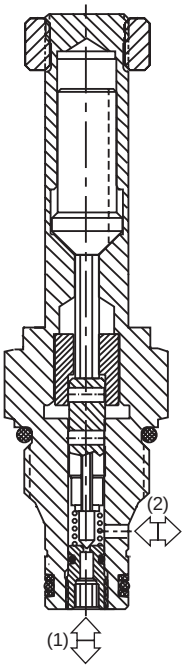
** Add "A" for aluminum, omit for steel.*
† Steel body only.

General Description

2-Way, 2 Position, Normally Open Poppet Valve. Bi-Directional Direct Acting. For additional information see Technical Tips on pages SV1-SV6.







Features

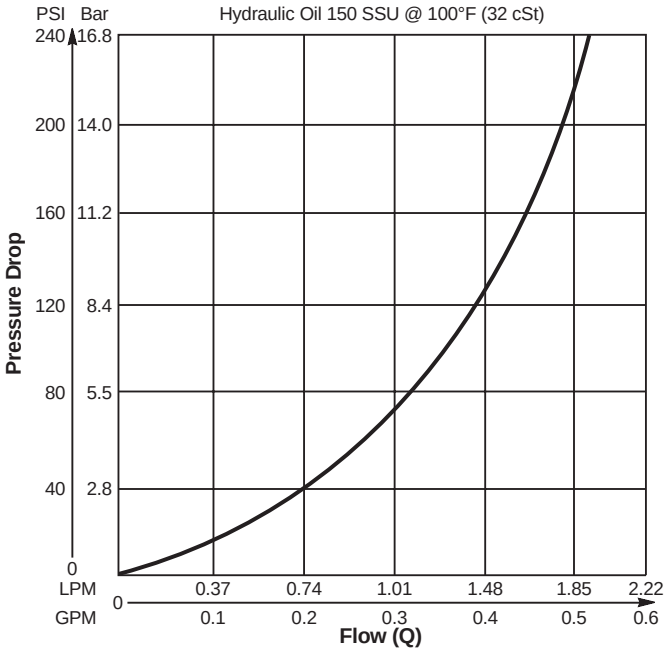
- Fast Response
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 04 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated

Specifications

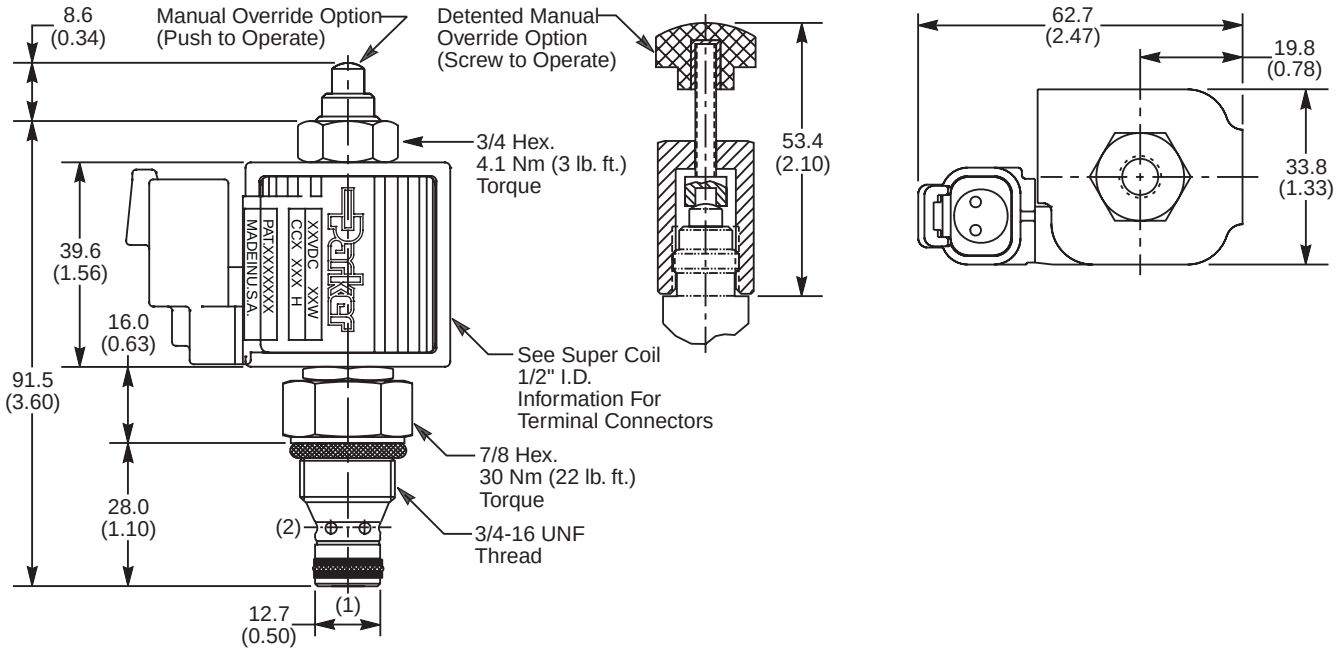
Rated Flow (At 70 PSI ΔP)	1 LPM (0.26 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	**77** 5 drops/min. (.33 cc/min.) **78** Zero Drops Soft (Delrin) Seat
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 10 ms **Close** 10 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C08-2 (See BC Section for more details

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

GS02								–		
08 Size Solenoid Valve	Style Normally Open	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
77	Standard ('SP' Coil)
78	Zero Drops ('SP' Coil)

Code	Override Options
0	None
1	Manual Override
2	Detented Part No. 900690

Code	Screen
0	None
1	60 Mesh Screen

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30088N-1)
V	Fluorocarbon / (SK30088V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

22 Watts

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
DC Only

Code	Body Material
Omit	Steel
A	Aluminum

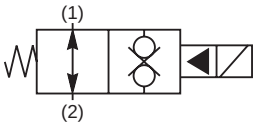
Code	Port Size	Body Part No.
Omit	Cartridge Only	
6T	SAE-6	(B08-2-*6T)
6B	3/8" BSPG	(B08-2-*6B)

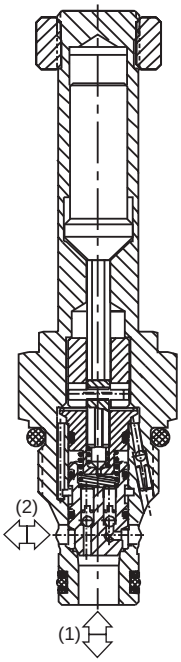
**** Add "A" for aluminum, omit for steel.***

General Description

2-Way, 2 Position, Normally Open, Bi-Directional Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.







Features

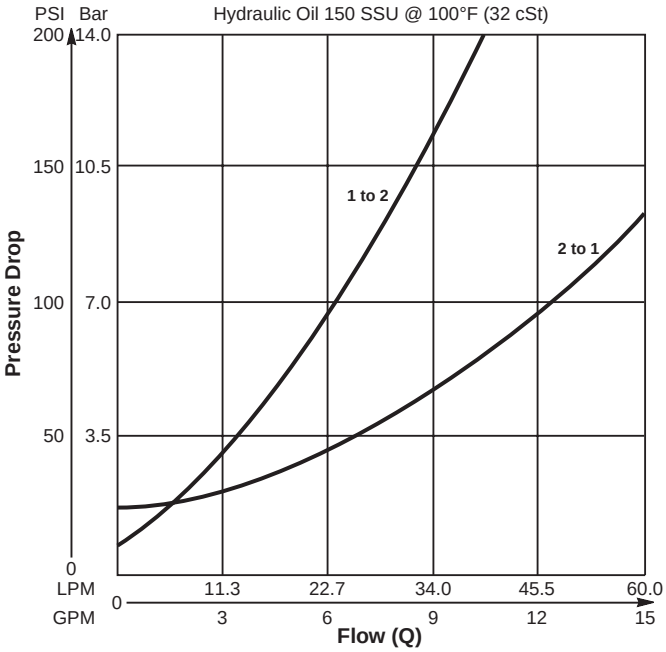
- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 04 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated

Specifications

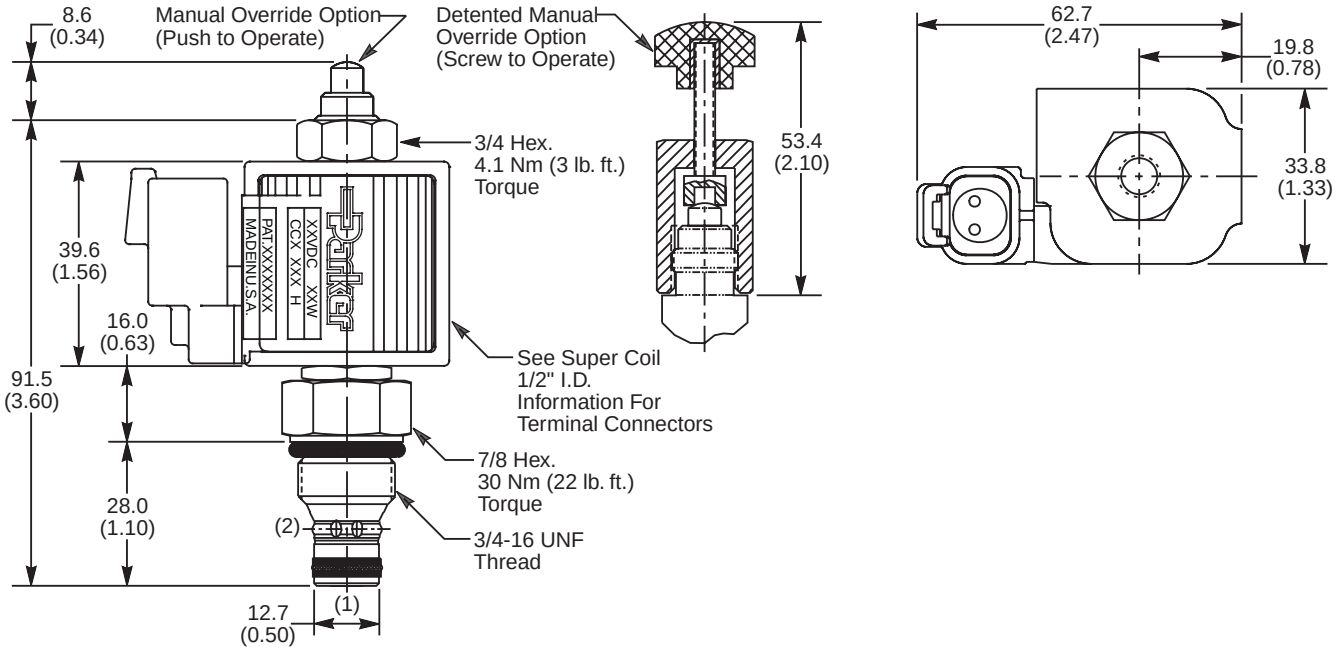
Rated Flow (At 70 PSI ΔP)	**2 to 1** 34 LPM (9 GPM) **1 to 2** 19 LPM (5 GPM)
Maximum Inlet Pressure	**85** 210 Bar (3000 PSI) **86** 350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 40 ms **Close** 40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C08-2 (See BC Section for more details)

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

GS02								–		
08 Size Solenoid Valve	Style Normally Open	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
85	Standard ('SS' Coil)
86	High Pressure ('SP' Coil)

Code	Override Options
0	None
1	Manual Override
2	Detented Part No. 900690

Code	Screen
0	None

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30088N-1)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 14 Watts
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

**22 Watts*

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
**DC Only*

Code	Body Material
Omit	Steel
A	Aluminum

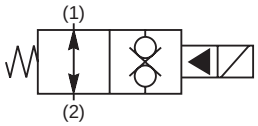
Code	Port Size	Body Part No.
Omit	Cartridge Only	
6T	SAE-6	(B08-2-*6T)
6B	3/8" BSPG	(B08-2-*6B)

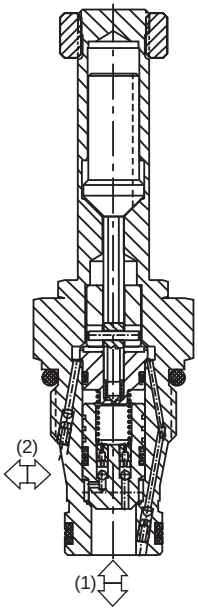
** Add "A" for aluminum, omit for steel.*

General Description

2-Way, 2 Position, Normally Open, Bi-Directional Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.







Features

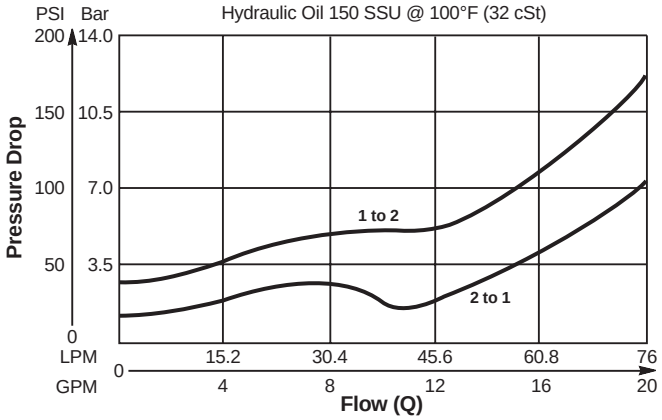
- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 02 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated

Specifications

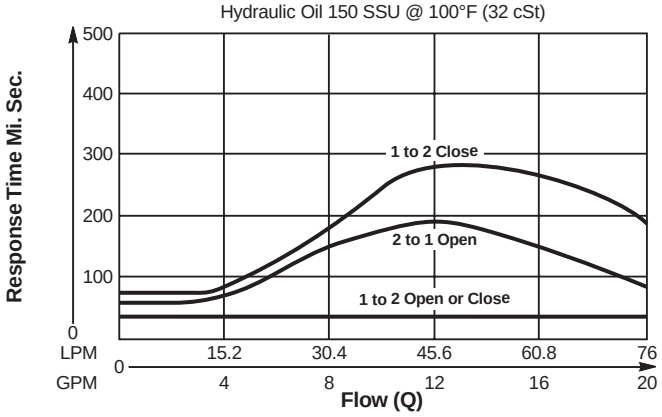
Rated Flow (At 70 PSI ΔP)	**2 to 1** 68 LPM (18 GPM) **1 to 2** 46 LPM (12 GPM)
Maximum Inlet Pressure	**85** 210 Bar (3000 PSI) **86** 350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	See Performance Curves
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.17 kg (.37 lbs.)
Cavity	2R (See BC Section for more details)

Performance Curves

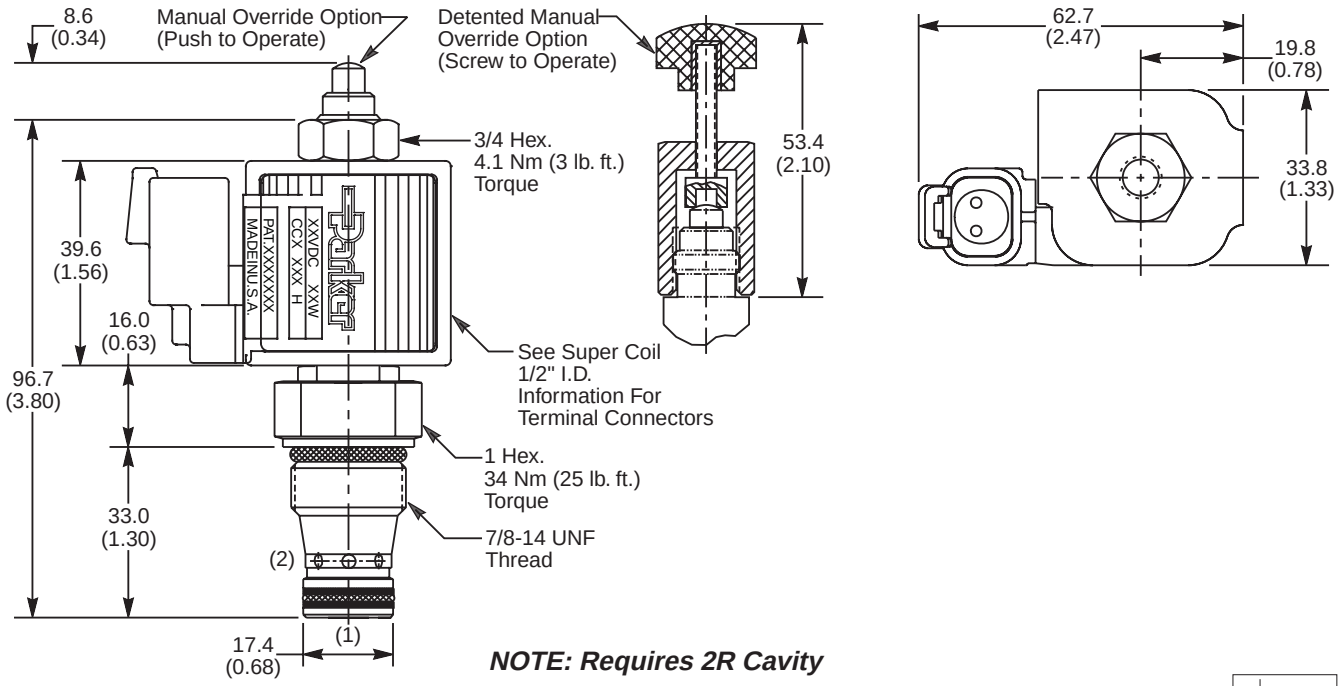
Pressure Drop vs. Flow (Through cartridge only)



Response Time vs. Flow



Dimensions Millimeters (Inches)



NOTE: Requires 2R Cavity

THIRD-ANGLE PROJECTION

Ordering Information

GS04							
10 Size Solenoid Valve	Style Normally Open	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination

Code	Style
85	Standard ('SS' Coil)
86	High Pressure ('SP' Coil)

Code	Override Options
0	None
1	Manual Override
2	Detented Part No. 900690

Code	Screen
0	None

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30113N-1)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 14 Watts
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

***22 Watts**

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
***DC Only**

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
543	1/2" SAE
545	1/2" BSP

Code	Body Material
A	Aluminum
S	Steel

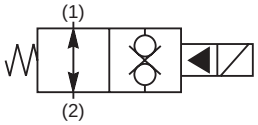
General Description

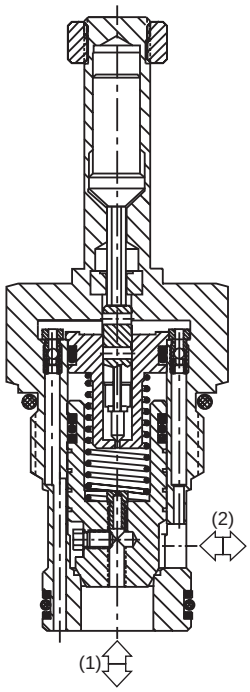
2-Way, 2 Position, Normally Open, Bi-Directional Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 02 and 04 series poppet valves; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated





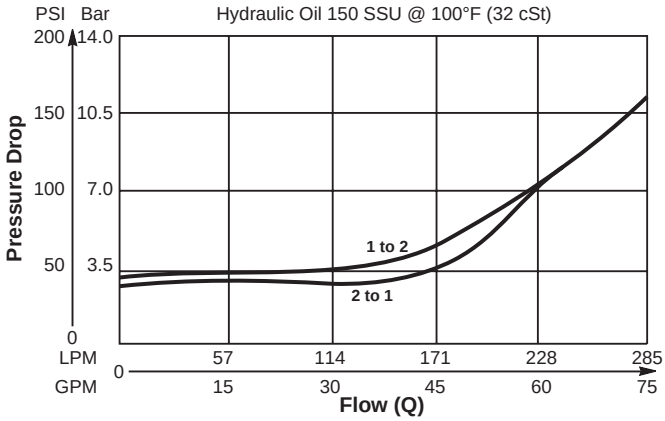


Specifications

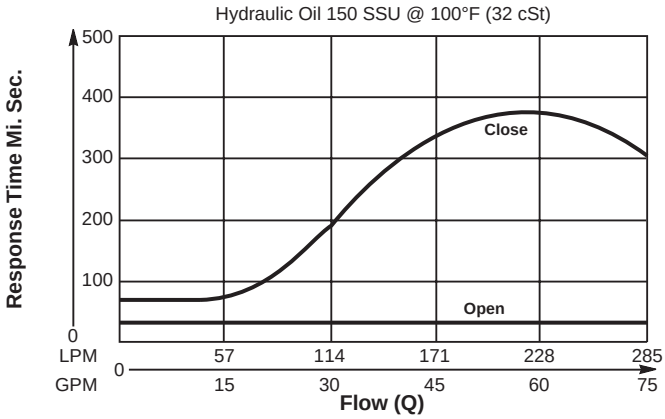
Rated Flow (At 70 PSI ΔP)	190 LPM (50 GPM)
Maximum Inlet Pressure	**85** 210 Bar (3000 PSI) **86** 350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	See Performance Curves
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	0.4 kg (.88 lbs.)
Cavity	C16-2 (See BC Section for more details)

Performance Curves

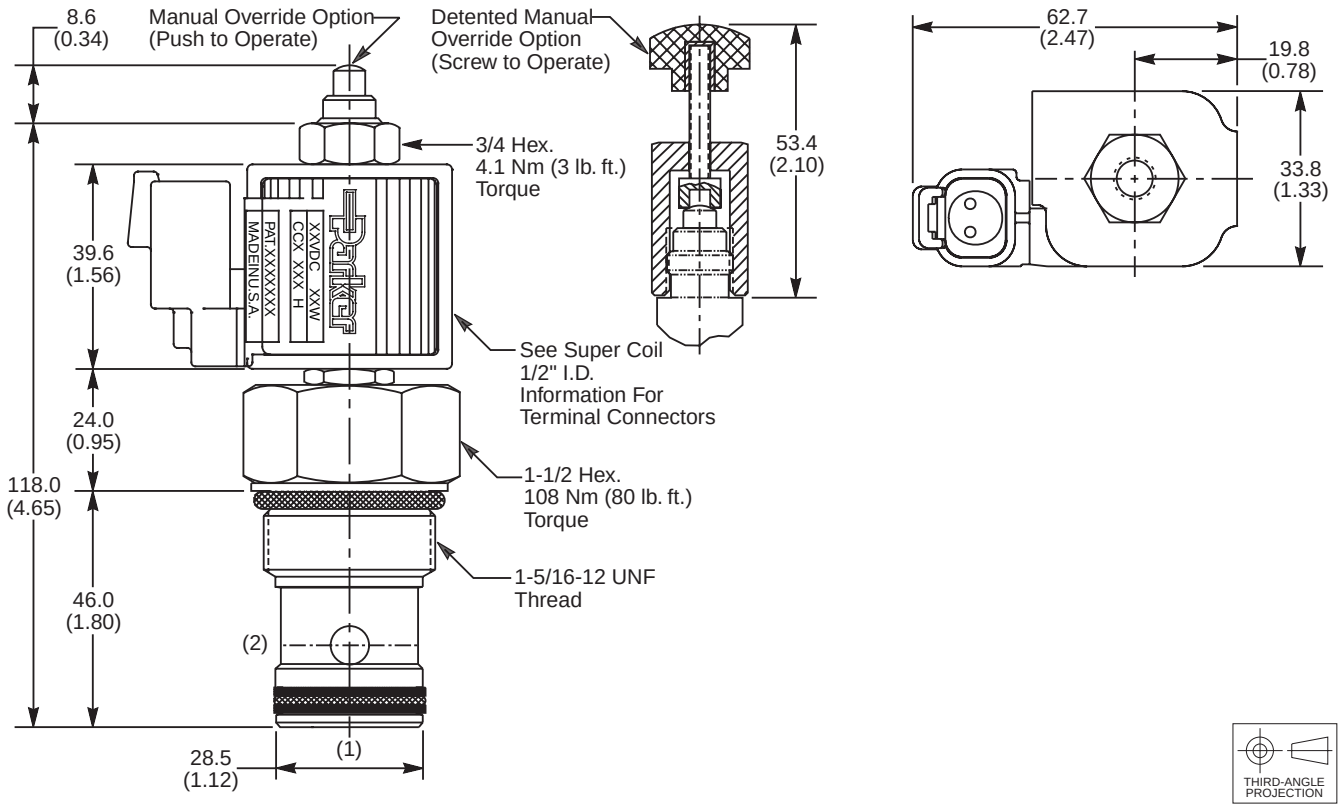
Pressure Drop vs. Flow (Through cartridge only)



Response Time vs. Flow



Dimensions Millimeters (Inches)



Ordering Information

GS06								–		
16 Size Solenoid Valve	Style Normally Open	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
85	Standard ('SS' Coil)
86	High Pressure ('SP' Coil)

Code	Override Options
0	None
1	Manual Override
2	Detented Part No. 900690

Code	Screen
0	None

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30089N-1)
V	Fluorocarbon / (SK30089V-1)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 14 Watts
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

**22 Watts*

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
**DC Only*

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
16T	SAE-16	(B16-2-*16T)
16B	1" BSPG	(B16-2-16B)†

** Add "A" for aluminum, omit for steel.*
† Steel body only.

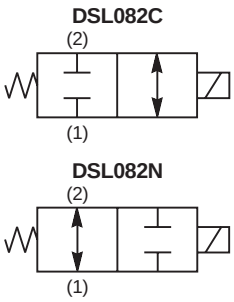
General Description

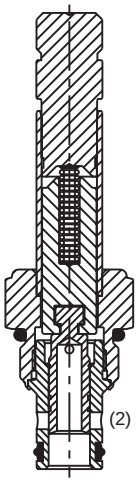
2-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

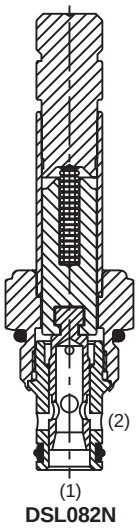
Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated







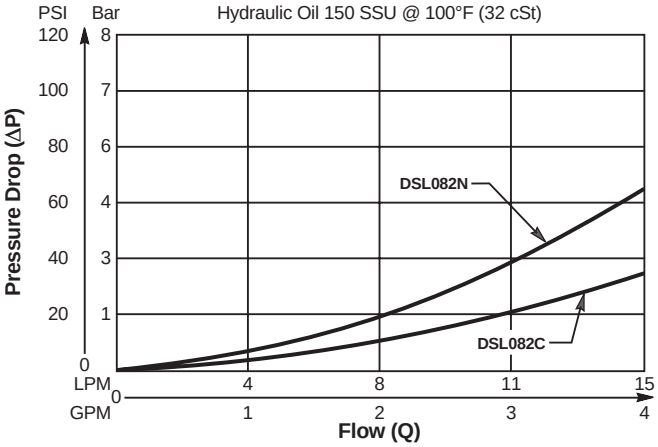


Specifications

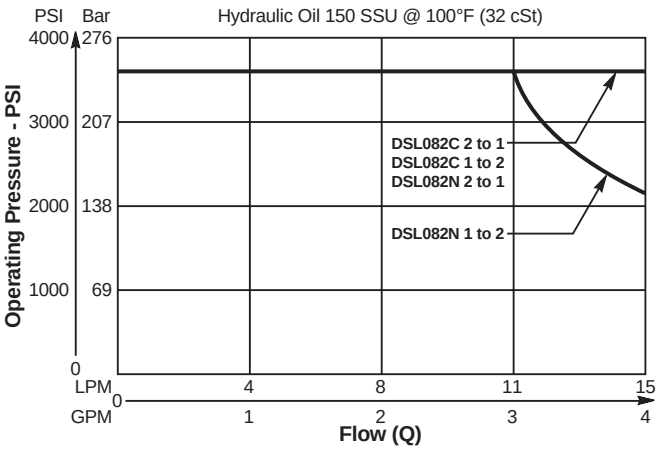
Rated Flow	**C** - 15 LPM (4 GPM) **N** - 11 LPM (3 GPM)
Maximum Inlet Pressure	250 Bar (3600 PSI)
Leakage at 150 SSU (32cSt)	120 cc/min. (7.5 in³/min.) at 250 Bar (3600 PSI)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Energized** / **De-Energized** **C** 40 ms / 40 ms **N** 40 ms / 40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.11 kg (.25 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

Performance Curves

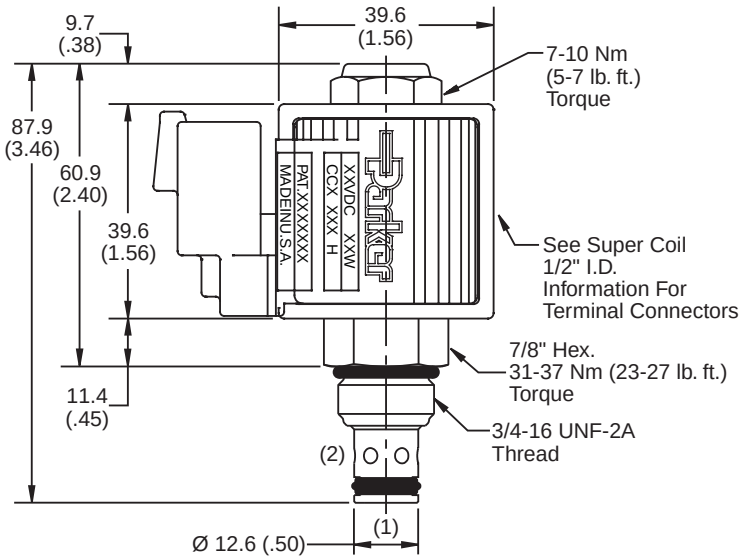
Pressure Drop vs. Flow (Through cartridge only)

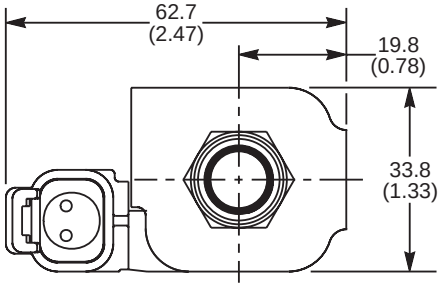


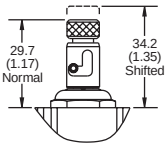
Shift Limit Characteristics (Min. Operating Voltage)



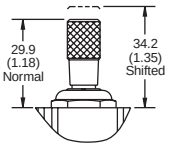
Dimensions Millimeters (Inches)



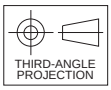




Push and Twist M.O.

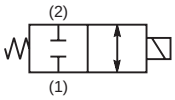
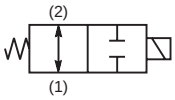


Pull and Release M.O.



Ordering Information

DSL082											
08 Size Solenoid Valve	Style	Override Option	Seals	Screen	Coil Type	Coil Voltage	Coil Termination	Diode	—	Body Material	Port Size

Code / Style	
C Normally Closed	
N Normally Open	

Code	Override Options
Omit	None
P	Pull & Release
T	Push & Twist

Code	Seals / Kit No.
Omit	"D"-Ring / (SK08-2)
N	Nitrile / (SK08-2N)
V	Fluorocarbon / (SK08-2V)

Code	Screen
Omit	None
S	Screen

Code	Coil Type
Omit	Without Coil
SP*	Super Coil - 19 Watts
U	Unicoil - 14 Watts

Recommended

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

SP* Coil	Coil Termination	U Coil
Omit	Without Coil	**Omit**
C	Conduit With Leads	**C**
D	DIN Plug Face	**D**
A	Amp Jr. Timer†	**–**
S	Dual Spade†	**–**
W	Dual Screw†	**–**
L	Dual Lead Wire†	**W**
H	Molded Deutsch†	**–**

Recommended
†DC Only

Code	Diode
Omit	None
R	Diode

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-2-*4P)
6P	3/8″ NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8″ BSPG	(B08-2-*6B)

**** Add "A" for aluminum, omit for steel.***

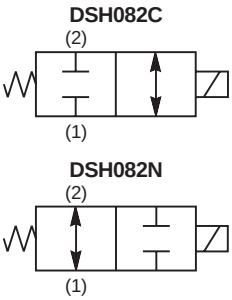
General Description

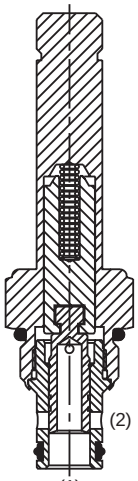
2-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

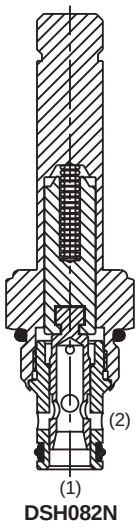
Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated







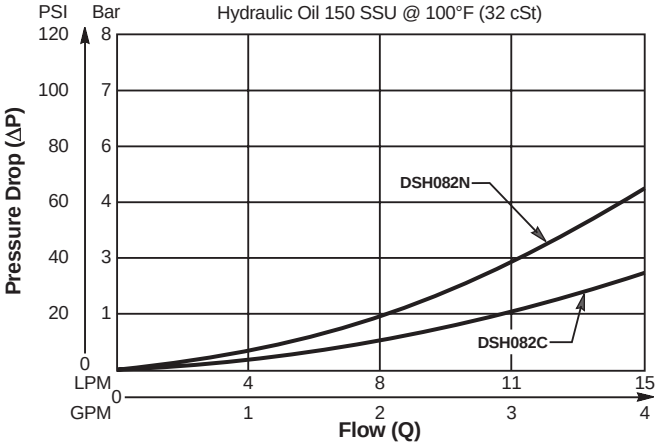


Specifications

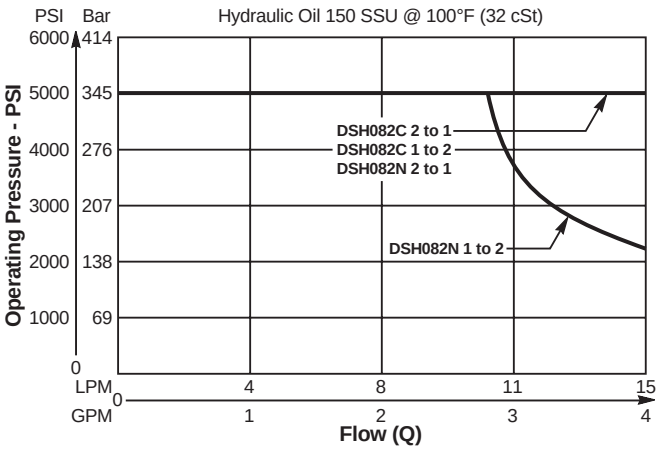
Rated Flow	**C -** 15.0 LPM (4 GPM) **N -** 8.4 LPM (2.8 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min. (10 in^3/min.) at 350 Bar (5000 PSI)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Energized** / **De-Energized** **C** 40 ms / 40 ms **N** 40 ms / 40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.11 kg (.25 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

Performance Curves

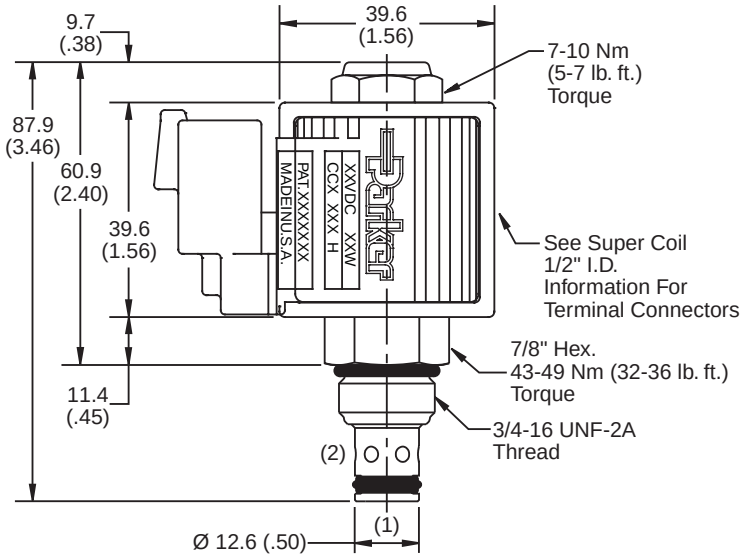
Pressure Drop vs. Flow (Through cartridge only)

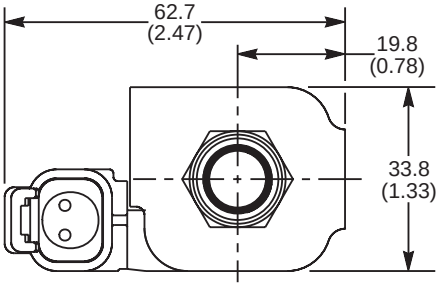


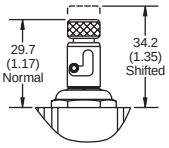
Shift Limit Characteristics (Min. Operating Voltage)



Dimensions Millimeters (Inches)





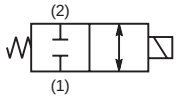
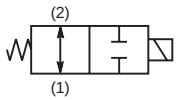


Push and Twist M.O.

THIRD-ANGLE PROJECTION

Ordering Information

DSH082											
08 Size Solenoid Valve	Style	Override Option	Seals	Screen	Coil Type	Coil Voltage	Coil Termination	Diode	—	Body Material	Port Size

Code / Style	
C Normally Closed	
N Normally Open	

Code	Override Options
Omit	None
T	Push & Twist* (N.C. & N.O.)

Requires Super Coil

Code	Seals / Kit. No.
Omit	"D"-Ring / (SK08-2)
N	Nitrile / (SK08-2N)
V	Fluorocarbon / (SK08-2V)

Code	Screen
Omit	None
S	Screen

Code	Coil Type
Omit	Without Coil
SP*	Super Coil - 19 Watts
U	Unicoil - 14 Watts

Recommended

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

SP* Coil	Coil Termination	U Coil
Omit	Without Coil	**Omit**
C	Conduit With Leads	**C**
D	DIN Plug Face	**D**
A	Amp Jr. Timer†	**–**
S	Dual Spade†	**–**
W	Dual Screw†	**–**
L	Dual Lead Wire†	**W**
H	Molded Deutsch†	**–**

Recommended
†DC Only

Code	Diode
Omit	None
R	Diode

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-2-*4P)
6P	3/8″ NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8″ BSPG	(B08-2-*6B)

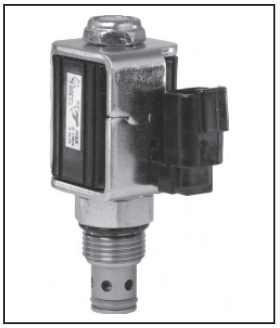
**** Add "A" for aluminum, omit for steel.***

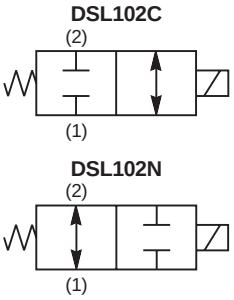
General Description

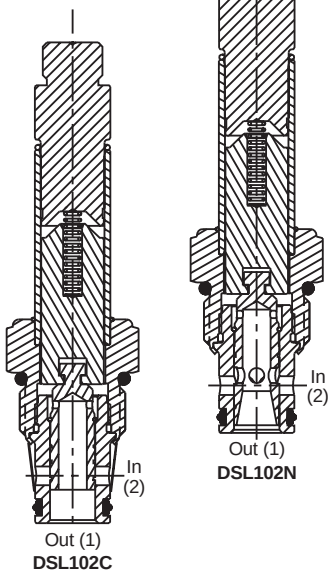
2-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring
- All external parts zinc plated





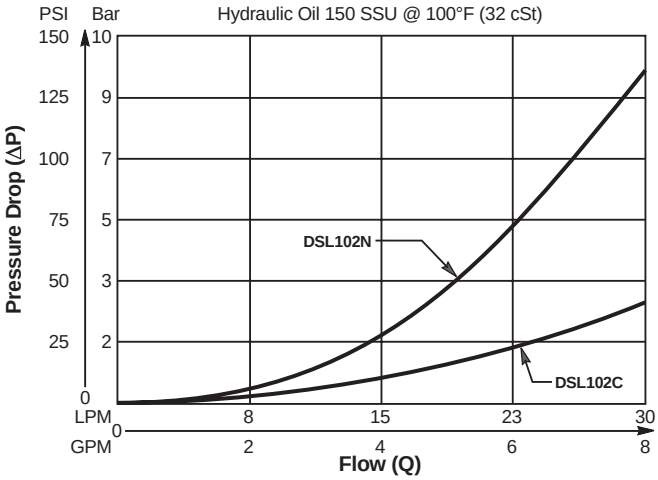


Specifications

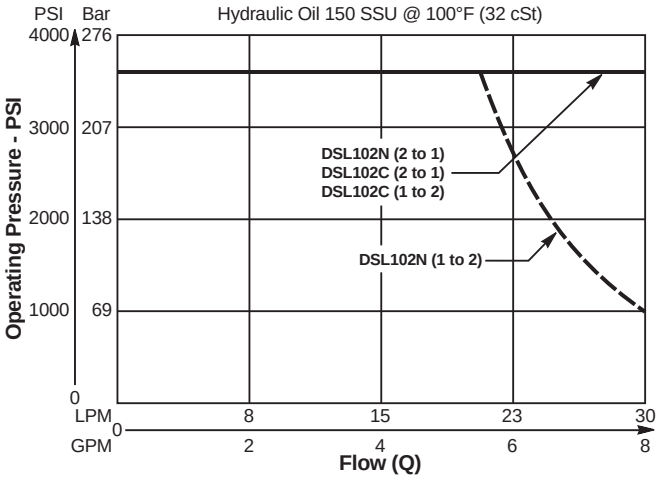
Rated Flow	**C -** 30 LPM (8.0 GPM) **N -** 21 LPM (5.5 GPM)
Maximum Inlet Pressure	250 Bar (3600 PSI)
Leakage at 150 SSU (32 cSt)	120 cc/min. (7.5 in³/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Energized** / **De-Energized** **C** 30 ms / 20 ms **N** 50 ms / 25 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.20 kg (.41 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

Performance Curves

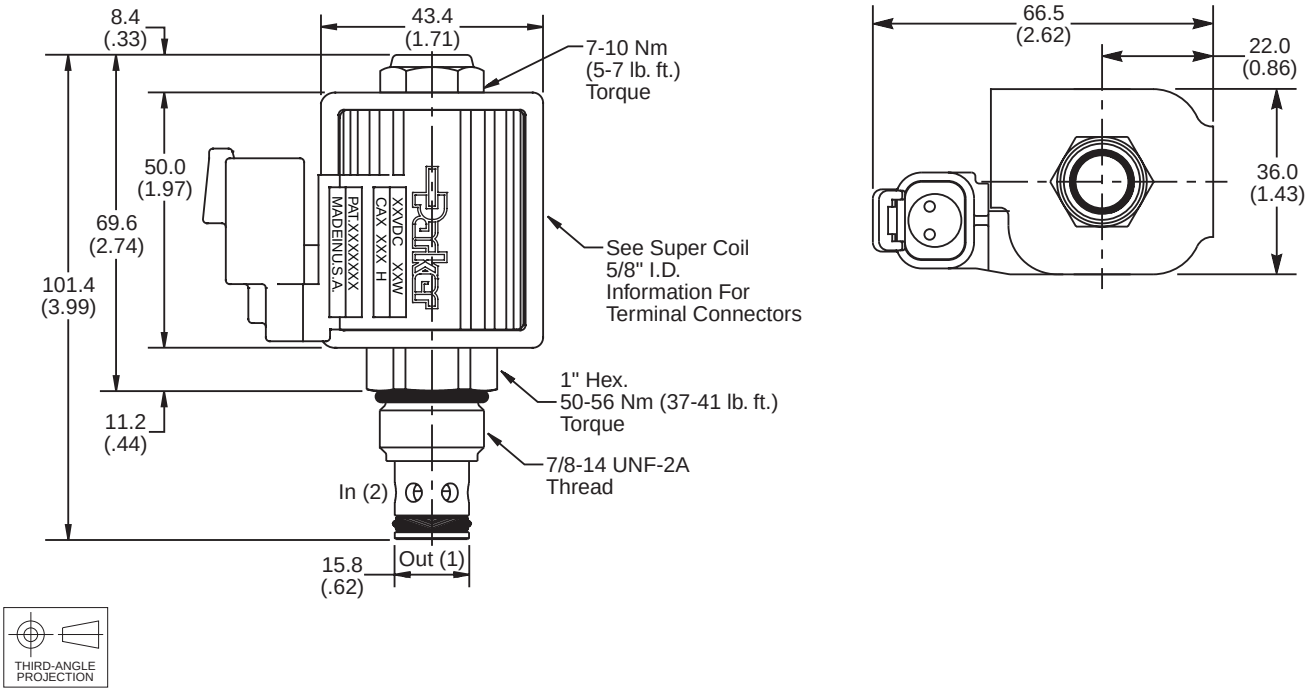
Pressure Drop vs. Flow (Through cartridge only)



Shift Limit Characteristics (Min. Operating Voltage)

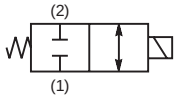
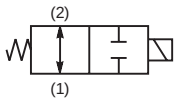


Dimensions Millimeters (Inches)



Ordering Information

DSL102											
10 Size Solenoid Valve	Style	Override Option	Seals	Screen	Coil Type	Coil Voltage	Coil Termination	Diode	—	Body Material	Port Size

Code / Style	
C Normally Closed	
N Normally Open	

Code	Override Options
Omit	None
P	Pull & Release
T	Push & Twist

Code	Seals / Kit No.
Omit	"D"-Ring / (SK10-2)
N	Nitrile / (SK10-2N)
V	Fluorocarbon / (SK10-2V)

Code	Screen
Omit	None
S	Screen

Code	Coil Type
Omit	Without Coil
SP*	Super Coil - 28 Watts
U	Unicoil - 20 Watts

Recommended

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

SP* Coil	Coil Termination	U Coil
Omit	Without Coil	**Omit**
C	Conduit With Leads	**C**
D	DIN Plug Face	**D**
A	Amp Jr. Timer†	**–**
S	Dual Spade†	**–**
W	Dual Screw†	**–**
L	Dual Lead Wire†	**W**
H	Molded Deutsch†	**–**

Recommended
†DC Only

Code	Diode
Omit	None
R	Diode

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

**** Add "A" for aluminum. omit for steel.***
† Steel body only.

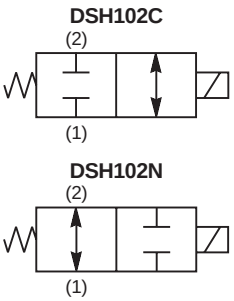
General Description

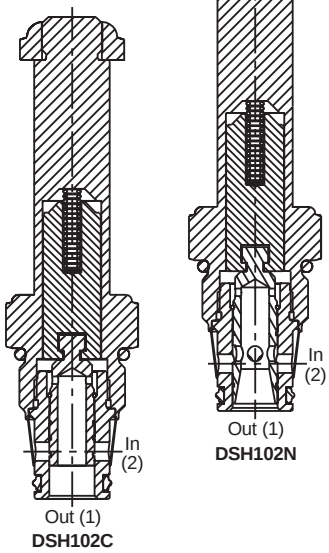
2-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated





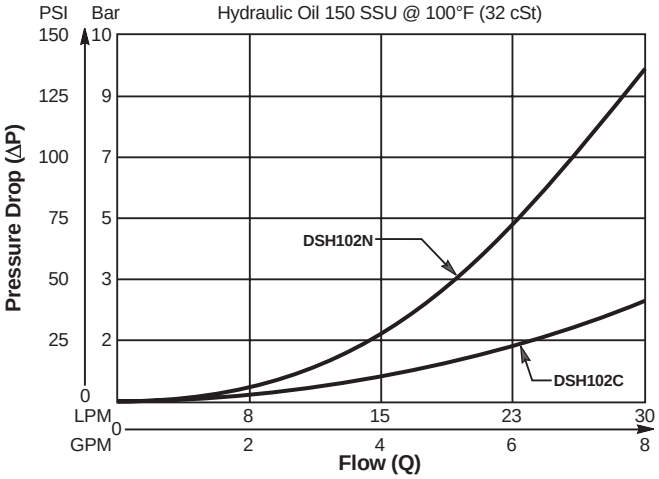


Specifications

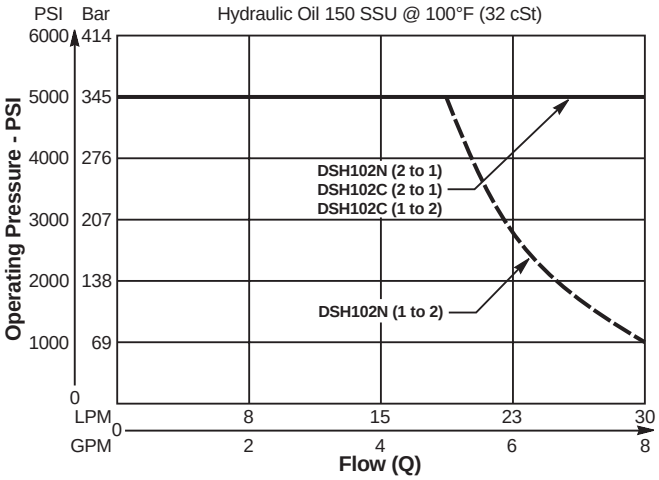
Rated Flow	**C** - 30 LPM (8.0 GPM) **N** - 19 LPM (5.0 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min. (10 in^3/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Energized** / **De-Energized** **C** 30 ms / 20 ms **N** 50 ms / 25 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.20 kg (.41 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

Performance Curves

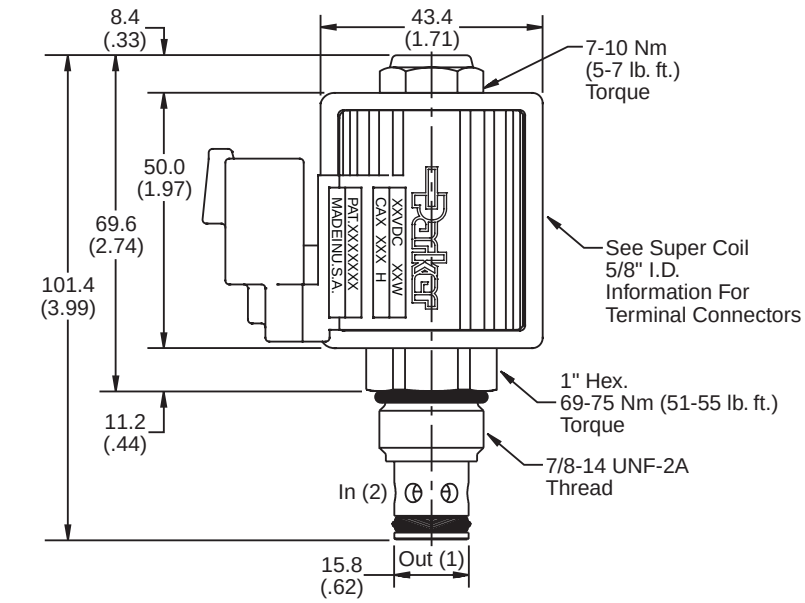
Pressure Drop vs. Flow (Through cartridge only)

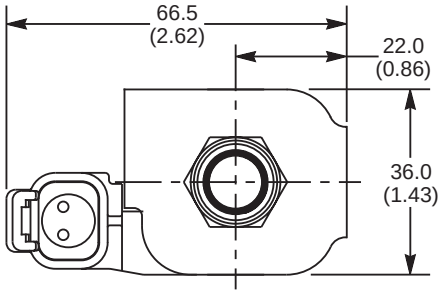


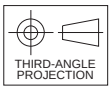
Shift Limit Characteristics (Min. Operating Voltage)

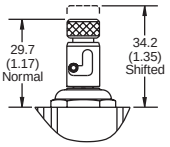


Dimensions Millimeters (Inches)





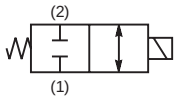
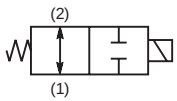




Push and Twist M.O.

Ordering Information

DSH102											
10 Size Solenoid Valve	Style	Override Option	Seals	Screen	Coil Type	Coil Voltage	Coil Termination	Diode		Body Material	Port Size

Code / Style	
C Normally Closed	
N Normally Open	

Code	Override Options
Omit	None
T	Push & Twist (N.C. & N.O.)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK10-2)
N	Nitrile / (SK10-2N)
V	Fluorocarbon / (SK10-2V)

Code	Screen
Omit	None
S	Screen

Code	Coil Type
Omit	Without Coil
SP*	Super Coil - 28 Watts
U	Unicoil - 20 Watts

***Recommended**

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

SP* Coil	Coil Termination	U Coil
Omit	Without Coil	**Omit**
C	Conduit With Leads	**C**
D	DIN Plug Face	**D**
A	Amp Jr. Timer†	**–**
S	Dual Spade†	**–**
W	Dual Screw†	**–**
L	Dual Lead Wire†	**W**
H	Molded Deutsch†	**–**

***Recommended**
†DC Only

Code	Diode
Omit	None
R	Diode

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-6B)†

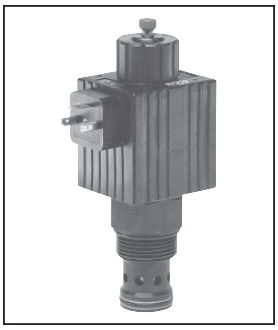
***Add "A" for aluminum. omit for steel.**
† Steel body only.

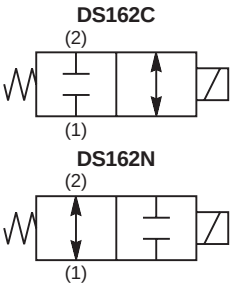
General Description

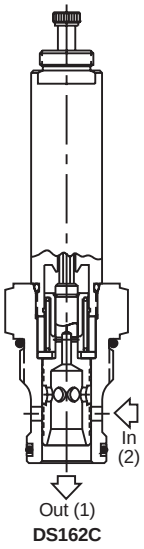
2-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

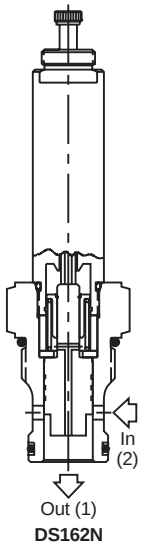
Features

- Low hysteresis
- One-piece encapsulated coil with minimal amperage draw
- Variety of coil terminations and voltages
- Manual override standard
- All external parts zinc plated







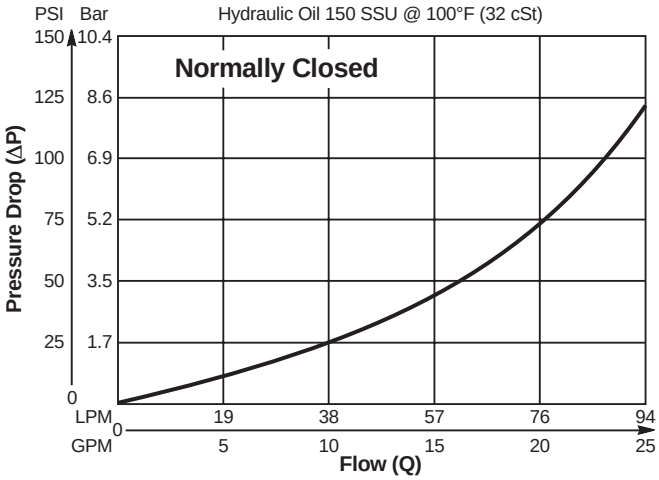


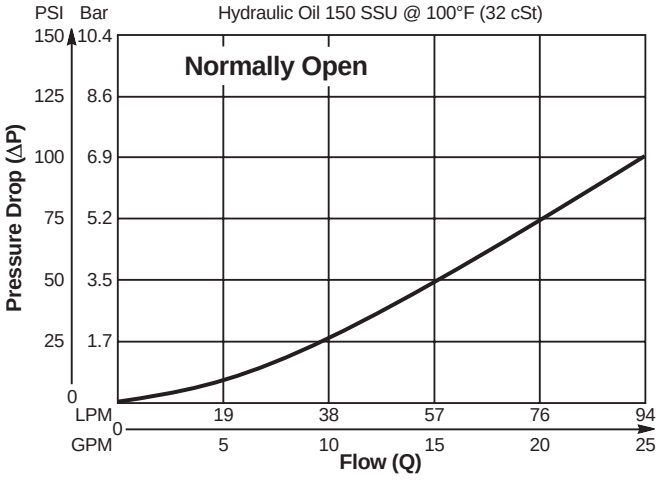
Specifications

Rated Flow	75 LPM (20 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	82 cc/min. (5 in^3/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**C -** 90 ms **N -** 100 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.59 kg (1.3 lbs.)
Cavity	C16-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT16-2F

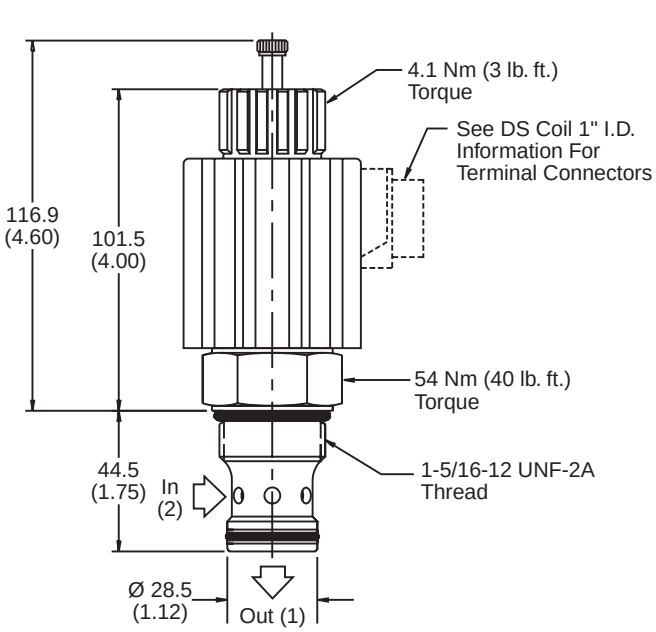
Performance Curves

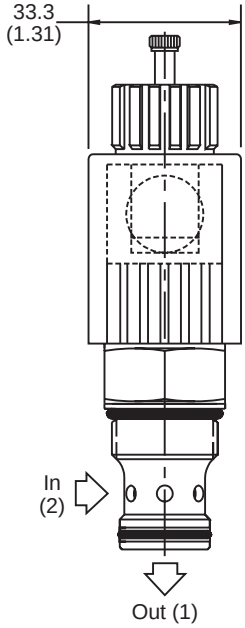
Pressure Drop vs. Flow (Through cartridge only)





Dimensions Millimeters (Inches)

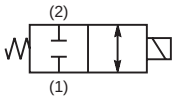
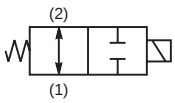




THIRD-ANGLE PROJECTION

Ordering Information

DS162					—		
16 Size Solenoid Valve	Style	Seals	Coil Voltage	Coil Termination		Body Material	Port Size

Code / Style	
C Normally Closed	
N Normally Open	

Code	Seals / Kit No.
Omit	Nitrile / (SK16-2)
V	Fluorocarbon / (SK16-2V)

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz

Code	Coil Termination
Omit	Without Coil
C	Conduit (AC Only)
D	DIN Plug Face
P	Dual Spade (DC Only)
S	Dual Screw (DC Only)
W	Dual Lead (DC Only)

See DS coil 1" I.D.

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
12T	SAE-12	(B16-2-*12T)
16T	SAE-16	(B16-2-*16T)
12B	3/4" BSPG	(B16-2-*12B)
16B	1" BSPG	(B16-2-16B)†

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

General Description

3-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

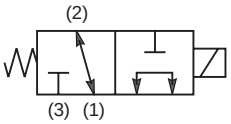
- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One piece encapsulated coils with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

Specifications

Rated Flow	**DSL083A** N.O. 13.2 LPM (3.5 GPM) N.C. 8.4 LPM (2.25 GPM) Selector 8.4 LPM (2.25 GPM) **DSL083B** N.C. 15.0 LPM (4.0 GPM) Selector 15.0 LPM (4.0 GPM) **DSL083C** N.O. 15.0 LPM (4.0 GPM) **DSL083N** N.O. 12.3 LPM (3.25 GPM) Selector 15.0 LPM (4.0 GPM)
Maximum Inlet Pressure	250 Bar (3600 PSI)
Leakage at 150 SSU (32 cSt)	120 cc/min. (7.5 in^3/min.) at 250 Bar (3600 PSI) DSL083B - 180 cc/min. (11 in^3/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	50 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.13 kg (.28 lbs.)
Cavity	C08-3 (See BC Section for more details)
Form Tool	Rougher NFT08-3R Finisher NFT08-3F

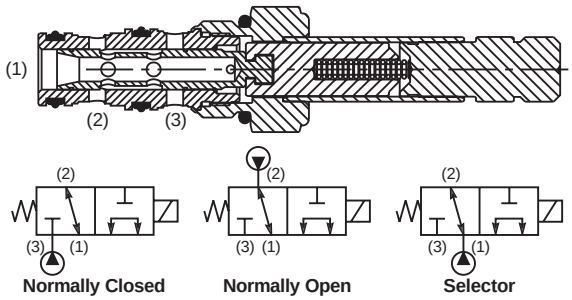


DSL083A

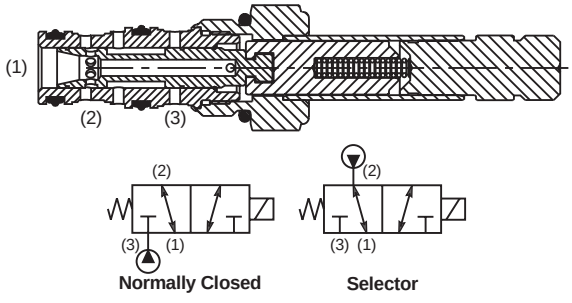


Construction/Symbols

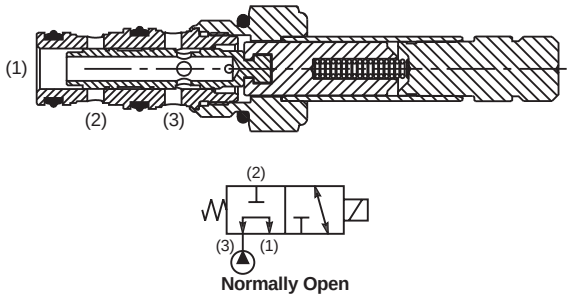
DSL083A



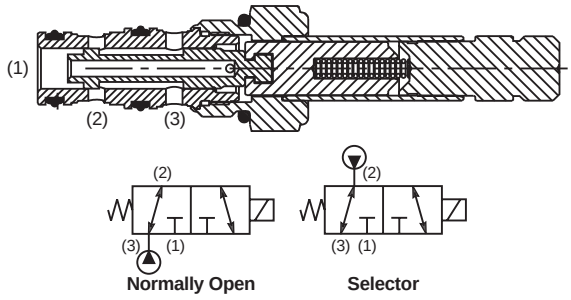
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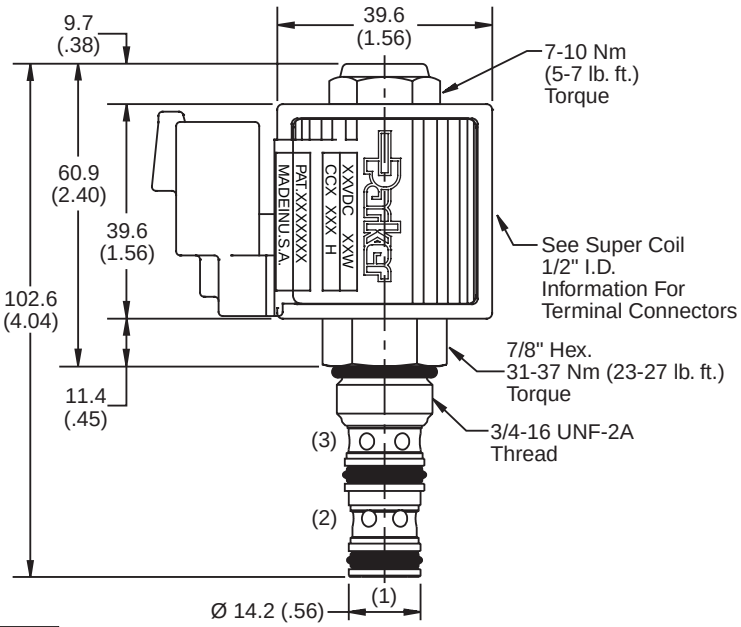
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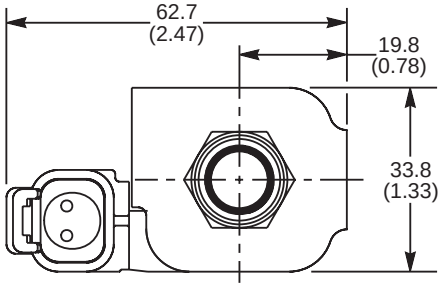


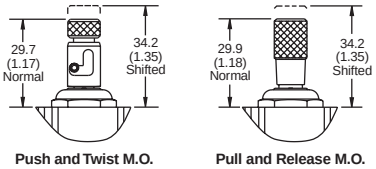
DSL083N



Dimensions Millimeters (Inches)



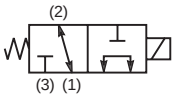
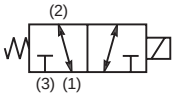
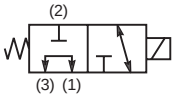
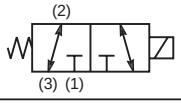




Push and Twist M.O. | Pull and Release M.O.

Ordering Information

DSL083									—		
08 Size Solenoid Valve	Style	Override Option	Seals	Coil Type	Coil Voltage	Coil Termination	Diode		Body Material	Port Size	

Code	Style
A	
B	
C	
N	

Code	Override Options
Omit	None
P	Pull & Release
T	Push & Twist

Code	Seals / Kit No.
Omit	"D"-Ring / (SK08-3)
N	Nitrile / (SK08-3N)
V	Fluorocarbon / (SK08-3V)

Code	Coil Type
Omit	Without Coil
SP*	Super Coil - 19 Watts
U	Unicoil - 14 Watts

***Recommended**

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

SP* Coil	Coil Termination	U Coil
Omit	Without Coil	Omit
C	Conduit With Leads	C
D	DIN Plug Face	D
A	Amp Jr. Timer†	–
S	Dual Spade†	–
W	Dual Screw†	–
L	Dual Lead Wire†	W
H	Molded Deutsch†	–

***Recommended**
†DC Only

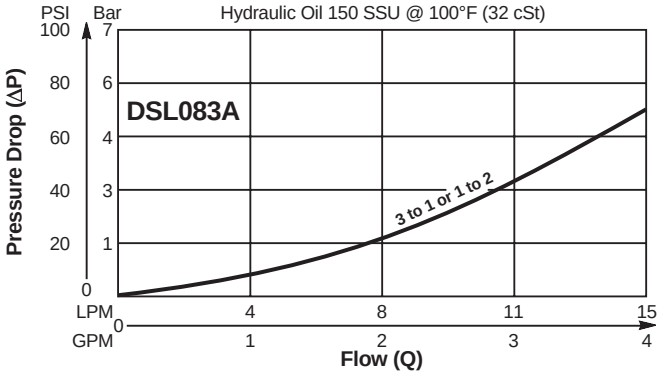
Code	Diode
Omit	None
R	Diode

Code	Body Material
Omit	Steel
A	Aluminum

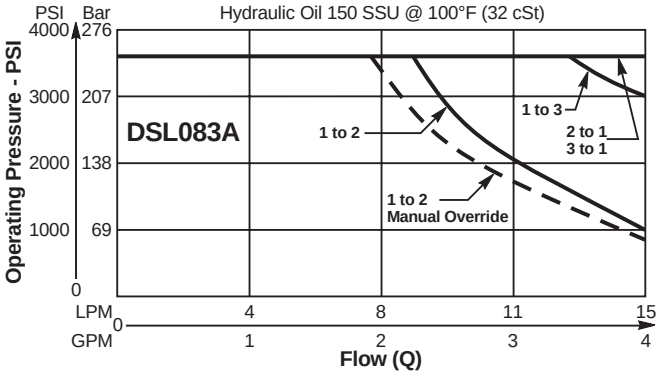
Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-3-*4P)
4T	SAE-4	(B08-3-*4T)
6T	SAE-6	(B08-3-*6T)
6B	3/8″ BSPG	(B08-3-*6B)

**** Add "A" for aluminum, omit for steel.***

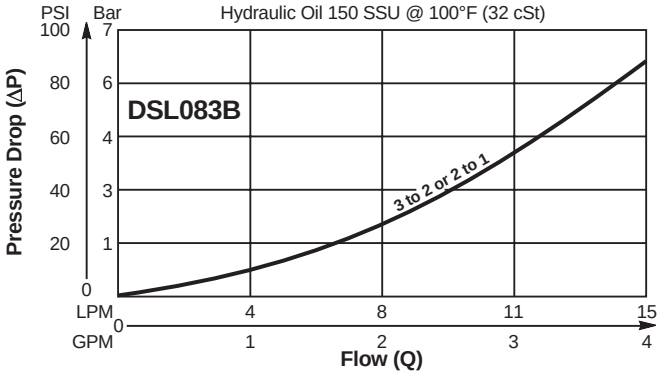
Pressure Drop vs. Flow (Through cartridge only)



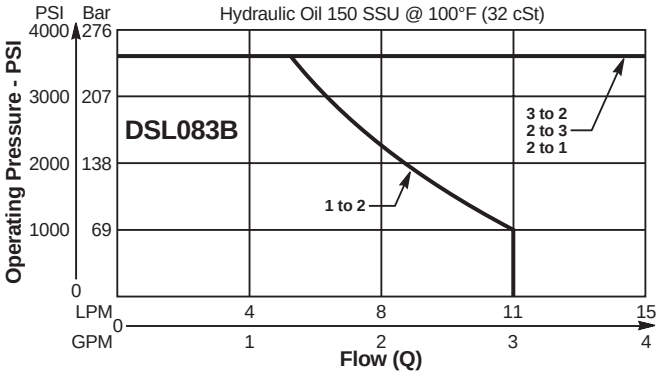
Shift Limit Characteristics (Min. Operating Voltage)



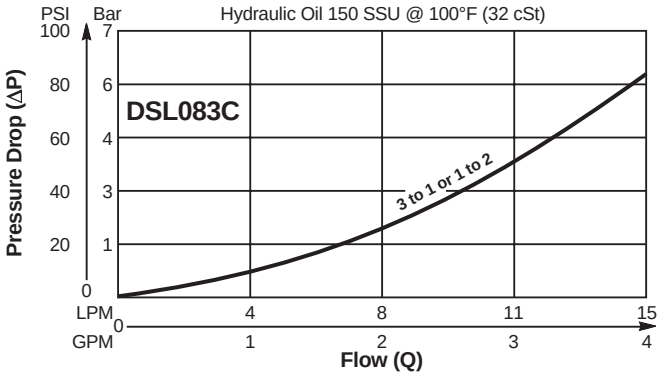
Pressure Drop vs. Flow (Through cartridge only)



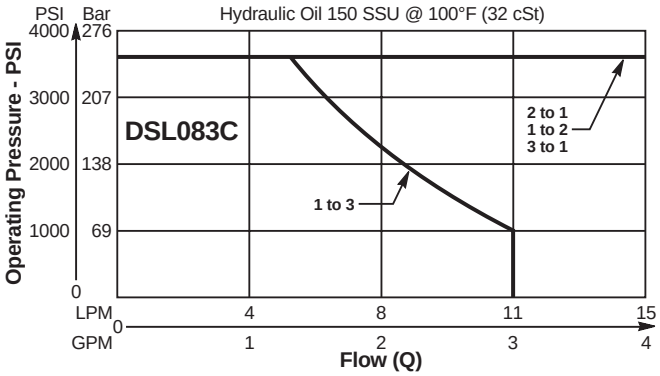
Shift Limit Characteristics (Min. Operating Voltage)



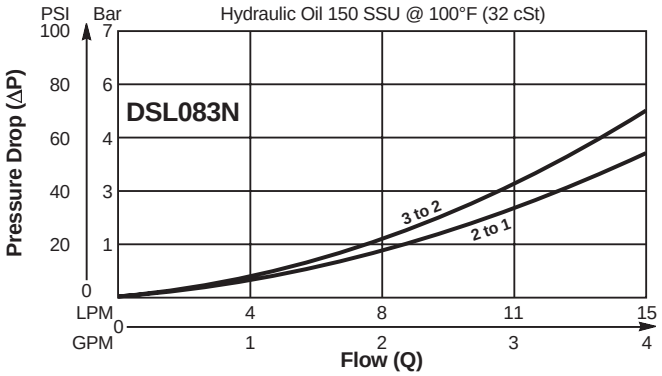
Pressure Drop vs. Flow (Through cartridge only)



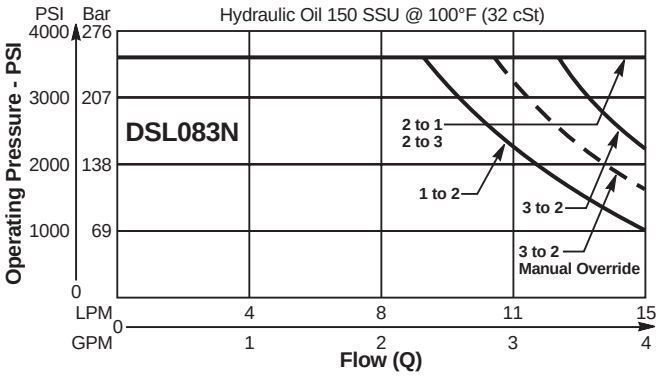
Shift Limit Characteristics (Min. Operating Voltage)



Pressure Drop vs. Flow (Through cartridge only)



Shift Limit Characteristics (Min. Operating Voltage)



General Description

3-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

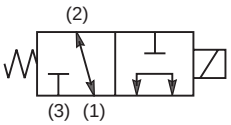
- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One piece encapsulated coils with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

Specifications

Rated Flow	**DSH083A** N.O. 11.3 LPM (3.0 GPM) N.C. 7.5 LPM (2.0 GPM) Selector 7.5 LPM (2.0 GPM) **DSH083B** N.C. 15.0 LPM (4.0 GPM) Selector 15.0 LPM (4.0 GPM) **DSH083C** N.O. 15.0 LPM (4.0 GPM) **DSH083N** N.O. 11.3 LPM (3.0 GPM) Selector 15.0 LPM (4.0 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min. (10 in³/min.) at 350 Bar (5000 PSI) DSH083B - 250 cc/min. (15 in³/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	50 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.13 kg (.28 lbs.)
Cavity	C08-3 (See BC Section for more details)
Form Tool	Rougher NFT08-3R Finisher NFT08-3F

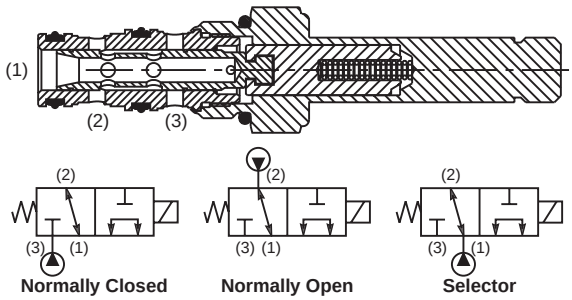


DSH083A

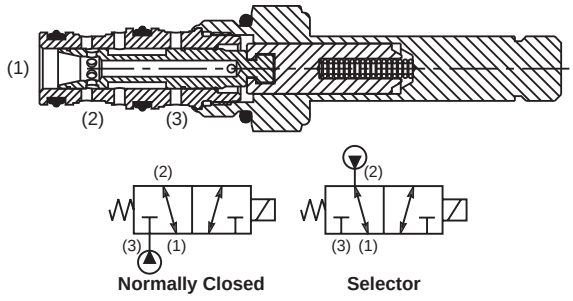


Construction/Symbols

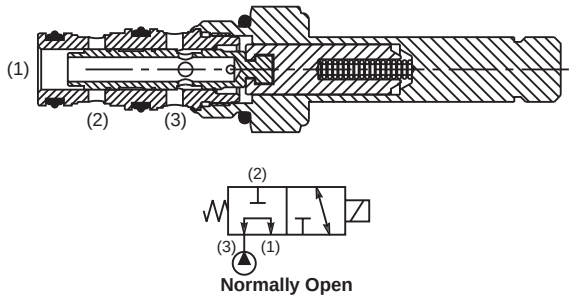
DSH083A



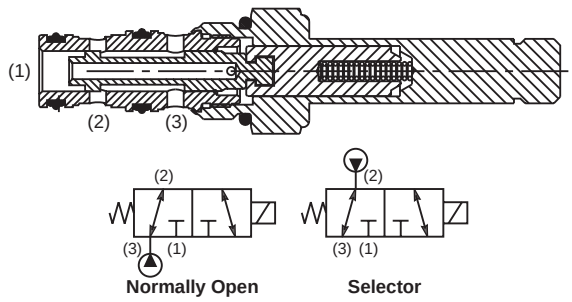
DSH083B



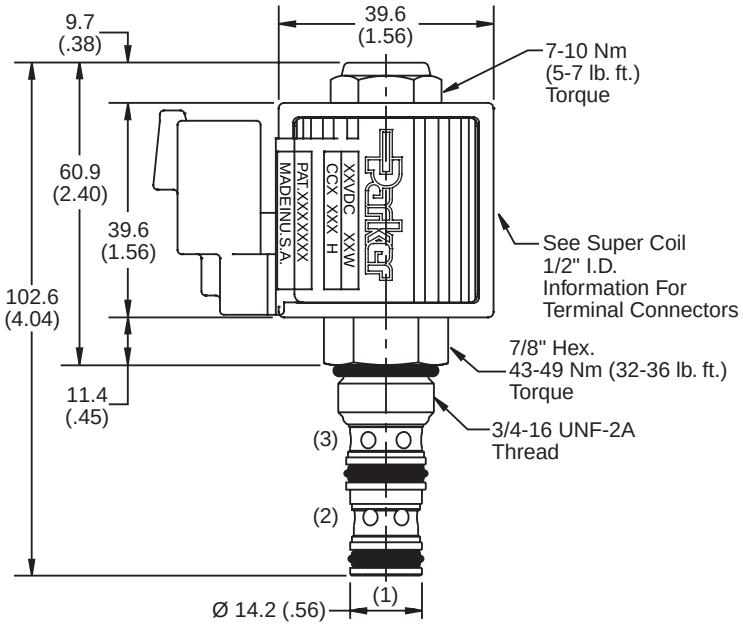
DSH083C

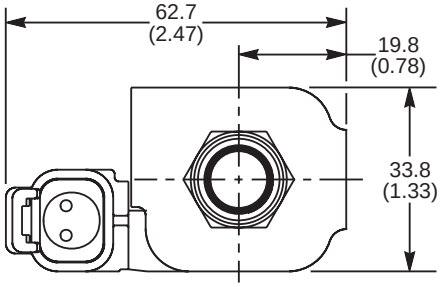


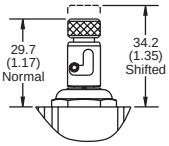
DSH083N



Dimensions Millimeters (Inches)





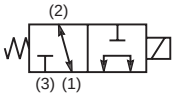
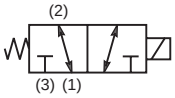
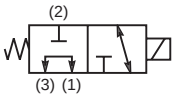
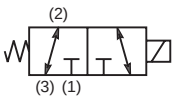


Push and Twist M.O.

THIRD-ANGLE PROJECTION

Ordering Information

DSH083									—		
08 Size Solenoid Valve	Style	Override Option	Seals	Coil Type	Coil Voltage	Coil Termination	Diode		Body Material	Port Size	

Code	Style
A	
B	
C	
N	

Code	Override Options
Omit	None
T	Push & Twist* (N.C. & N.O.)

Requires Super Coil

Code	Seals / Kit No.
Omit	"D"-Ring / (SK08-3)
N	Nitrile / (SK08-3N)
V	Fluorocarbon / (SK08-3V)

Code	Coil Type
Omit	Without Coil
SP*	Super Coil - 19 Watts
U	Unicoil - 14 Watts

Recommended

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

SP* Coil	Coil Termination	U Coil
Omit	Without Coil	Omit
C	Conduit With Leads	C
D	DIN Plug Face	D
A	Amp Jr. Timer†	–
S	Dual Spade†	–
W	Dual Screw†	–
L	Dual Lead Wire†	W
H	Molded Deutsch†	–

Recommended
†DC Only

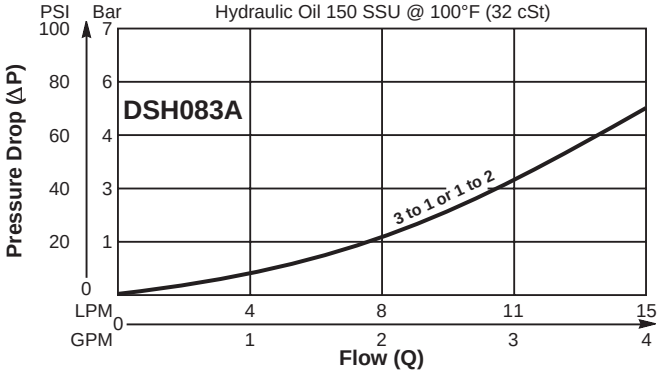
Code	Diode
Omit	None
R	Diode

Code	Body Material
Omit	Steel
A	Aluminum

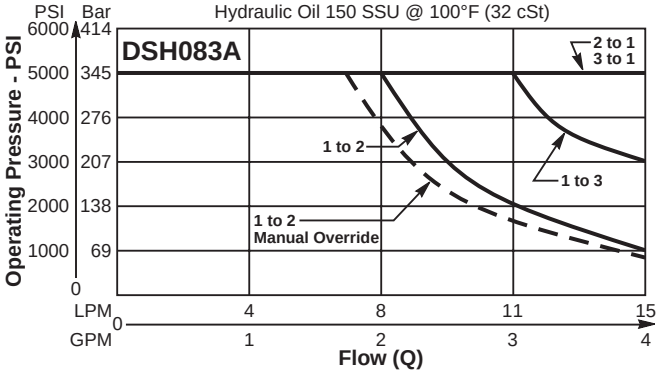
Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-3-*4P)
4T	SAE-4	(B08-3-*4T)
6T	SAE-6	(B08-3-*6T)
6B	3/8″ BSPG	(B08-3-*6B)

**** Add "A" for aluminum, omit for steel.***

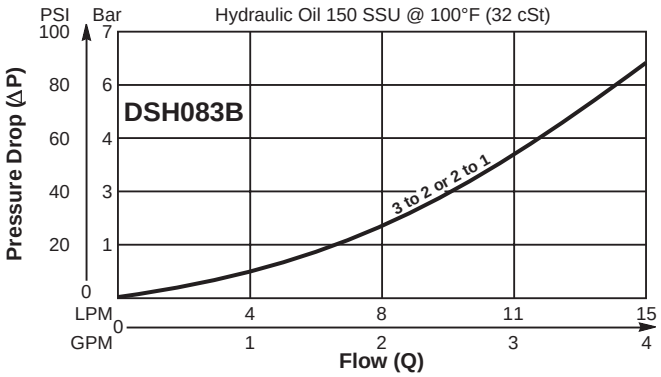
Pressure Drop vs. Flow (Through cartridge only)



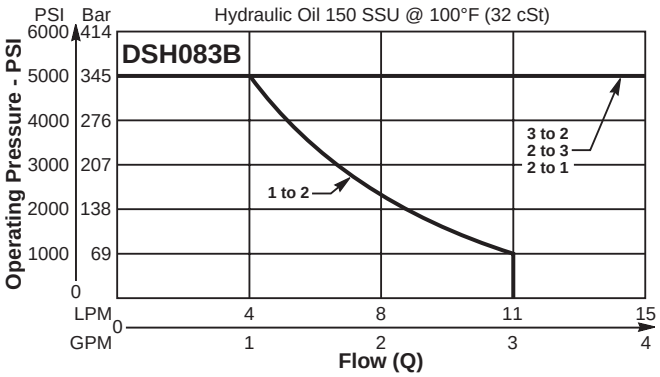
Shift Limit Characteristics (Min. Operating Voltage)



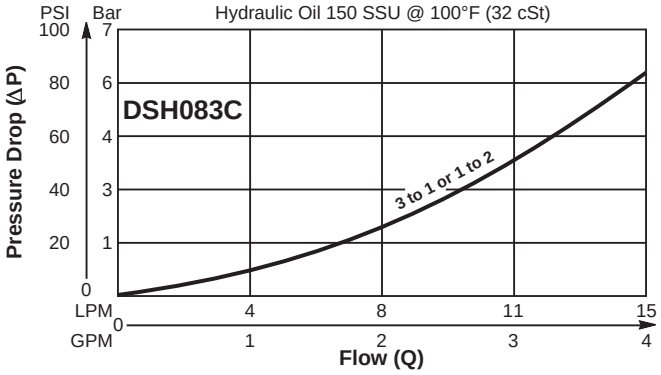
Pressure Drop vs. Flow (Through cartridge only)



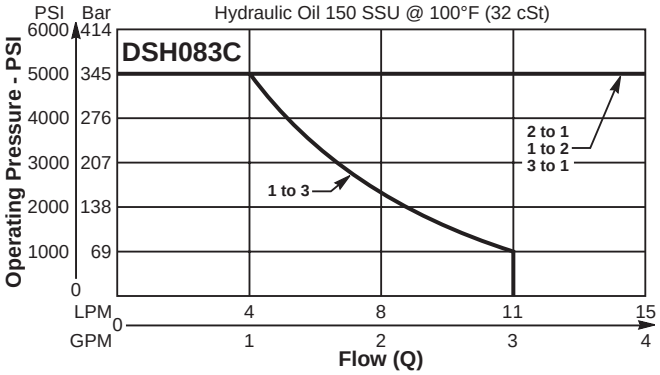
Shift Limit Characteristics (Min. Operating Voltage)



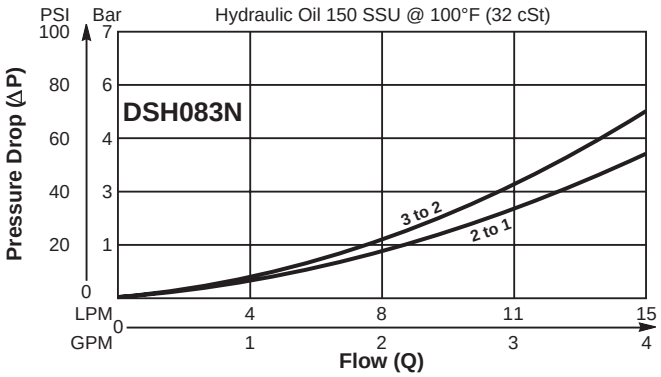
Pressure Drop vs. Flow (Through cartridge only)



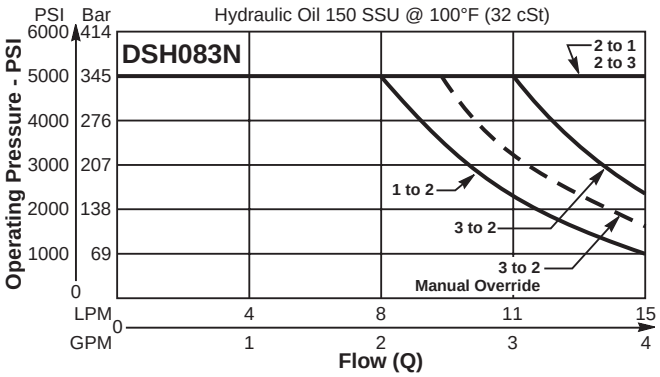
Shift Limit Characteristics (Min. Operating Voltage)



Pressure Drop vs. Flow (Through cartridge only)



Shift Limit Characteristics (Min. Operating Voltage)



General Description

3-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

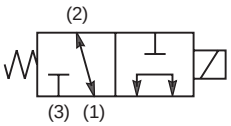
- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring
- All external parts zinc plated

Specifications

Rated Flow	**DSL103A** N.O. 22.7 LPM (6.0 GPM) N.C. 17.0 LPM (4.5 GPM) Selector 17.0 LPM (4.5 GPM) **DSL103B** N.C. 30.2 LPM (8.0 GPM) Selector 30.2 LPM (8.0 GPM) **DSL103C** N.O. 30.2 LPM (8.0 GPM) **DSL103N** N.O. 18.8 LPM (5.0 GPM) N.C. 18.8 LPM (5.0 GPM) Selector 30.2 LPM (8.0 GPM)
Maximum Inlet Pressure	250 Bar (3600 PSI)
Leakage at 150 SSU (32 cSt)	120 cc/min. (7.5 in³/min.) DSL103B - 180 cc/min. (11 in³/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	50 ms to 100 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.19 kg (.42 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

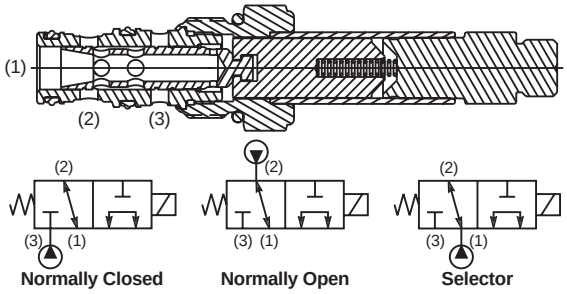


DSL103A

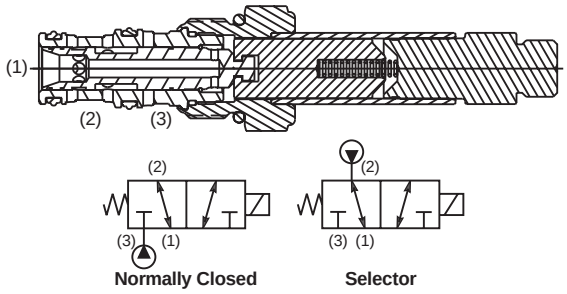


Construction/Symbols

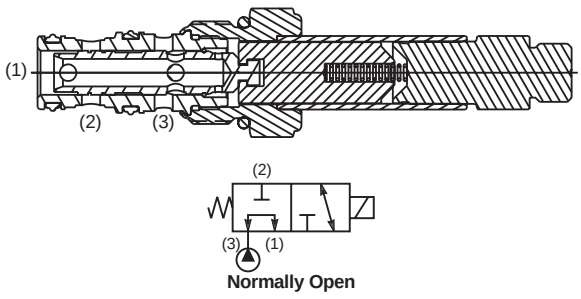
DSL103A



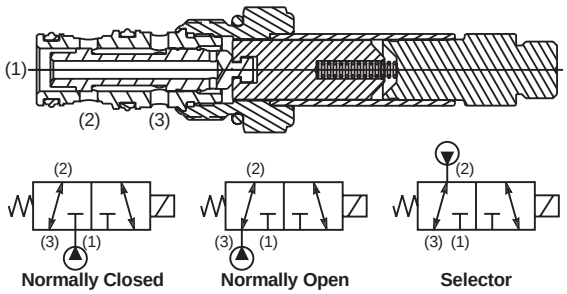
DSL103B



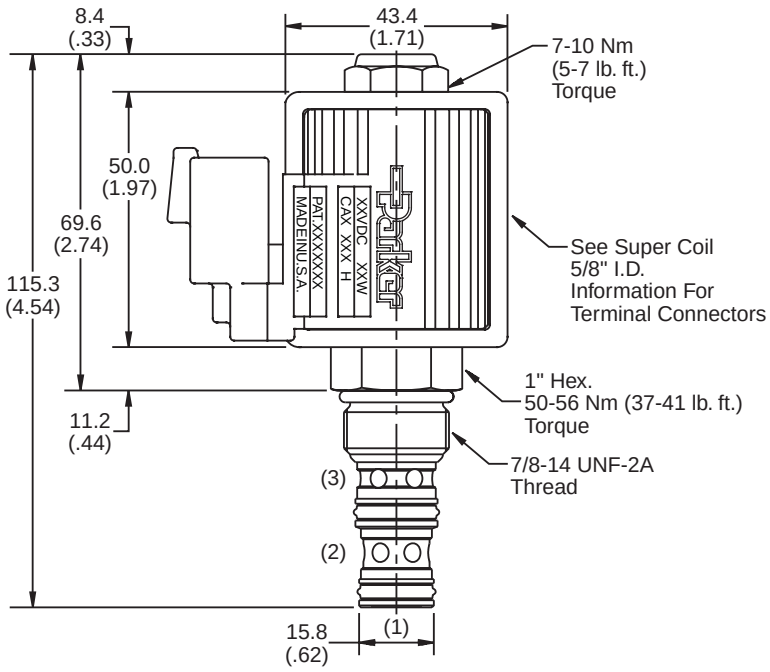
DSL103C

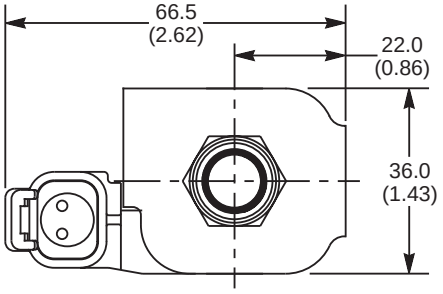


DSL103N



Dimensions Millimeters (Inches)

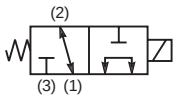
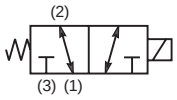
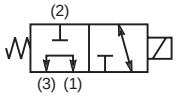
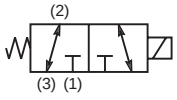




THIRD-ANGLE PROJECTION

Ordering Information

DSL103									—		
10 Size Solenoid Valve	Style	Override Option	Seals	Coil Type	Coil Voltage	Coil Termination	Diode		Body Material	Port Size	

Code	Style
A	
B	
C	
N	

Code	Override Options
Omit	None
P	Pull & Release
T	Push & Twist

Code	Seals / Kit No.
Omit	"D"-Ring / (SK10-3)
N	Nitrile / (SK10-3N)
V	Fluorocarbon / (SK10-3V)

Code	Coil Type
Omit	Without Coil
SP*	Super Coil - 28 Watts
U	Unicoil - 20 Watts

Recommended

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

SP* Coil	Coil Termination	U Coil
Omit	Without Coil	Omit
C	Conduit With Leads	C
D	DIN Plug Face	D
A	Amp Jr. Timer†	–
S	Dual Spade†	–
W	Dual Screw†	–
L	Dual Lead Wire†	W
H	Molded Deutsch†	–

Recommended
†DC Only

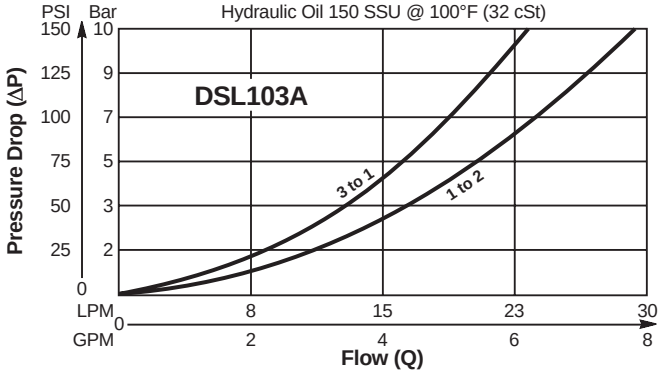
Code	Diode
Omit	None
R	Diode

Code	Body Material
Omit	Steel
A	Aluminum

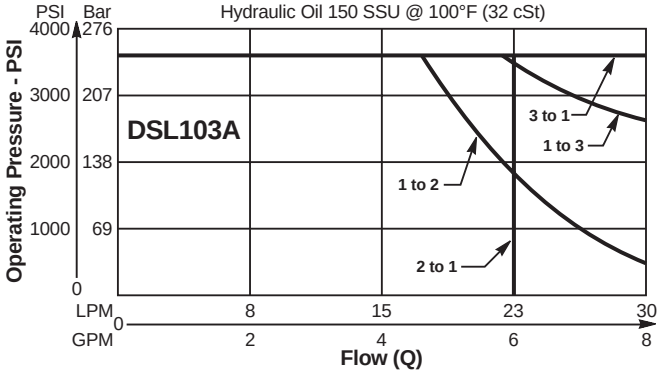
Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8B)

**** Add "A" for aluminum, omit for steel.***
† Steel bodies only.

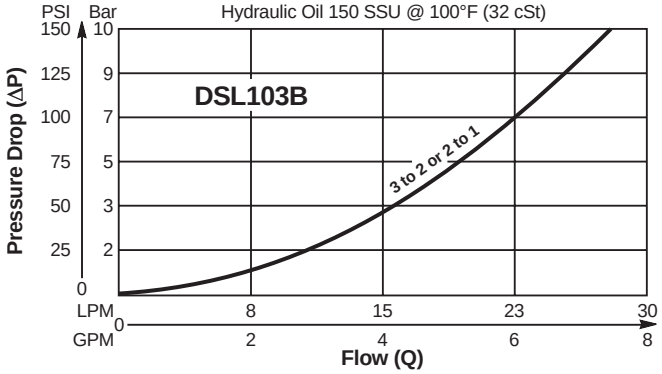
Pressure Drop vs. Flow (Through cartridge only)



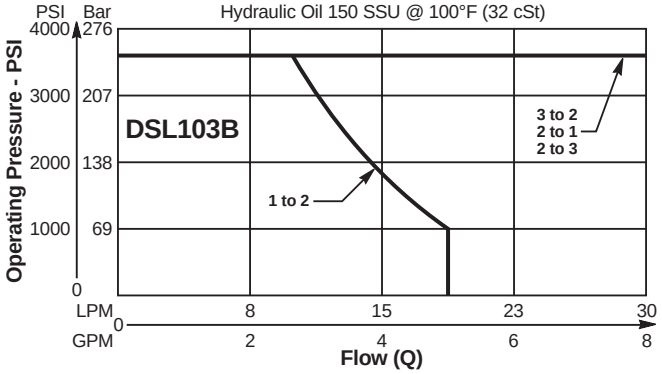
Shift Limit Characteristics (Min. Operating Voltage)



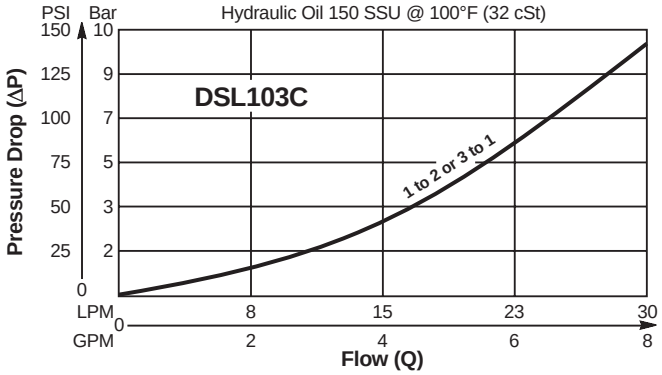
Pressure Drop vs. Flow (Through cartridge only)



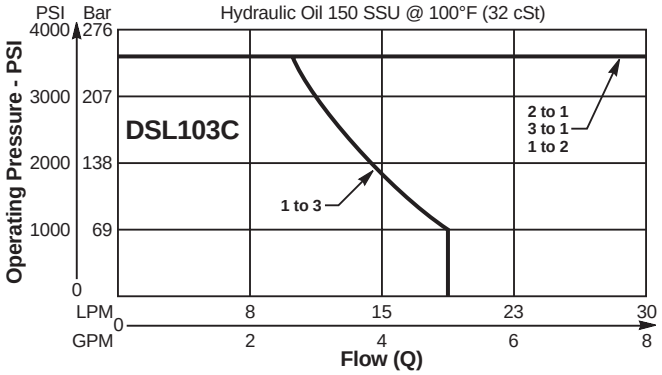
Shift Limit Characteristics (Min. Operating Voltage)



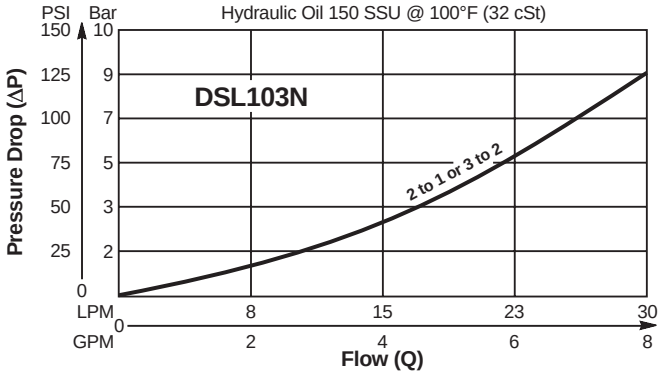
Pressure Drop vs. Flow (Through cartridge only)



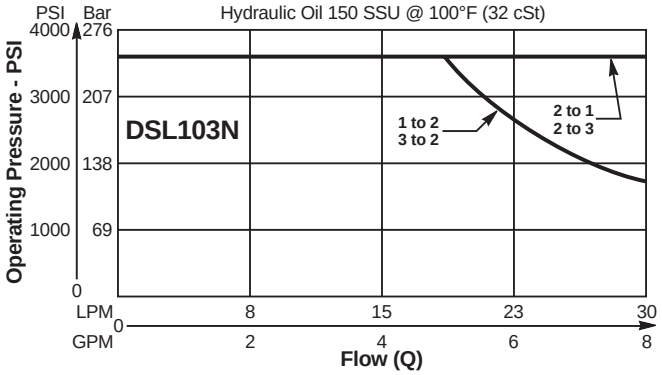
Shift Limit Characteristics (Min. Operating Voltage)



Pressure Drop vs. Flow (Through cartridge only)



Shift Limit Characteristics (Min. Operating Voltage)



General Description

3-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

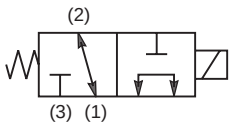
- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

Specifications

Rated Flow	**DSH103A** N.O. 17.0 LPM (4.5 GPM) N.C. 15.0 LPM (4.0 GPM) Selector 15.0 LPM (4.0 GPM) **DSH103B** N.C. 30.0 LPM (8.0 GPM) Selector 30.0 LPM (8.0 GPM) **DSH103C** N.O. 30.0 LPM (8.0 GPM) **DSH103N** N.O. 15.0 LPM (4.0 GPM) N.C. 15.0 LPM (4.0 GPM) Selector 30.0 LPM (8.0 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min. (10 in³/min.) DSH103B - 250 cc/min. (15 in³/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	50 ms to 100 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.19 kg (.42 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

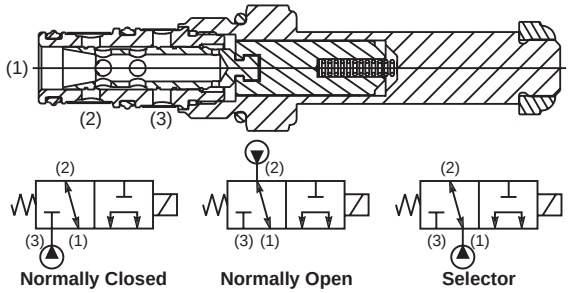


DSH103A

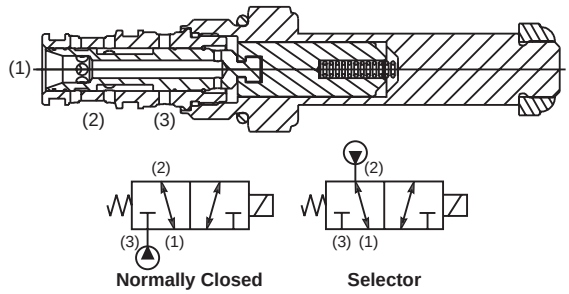


Construction/Symbols

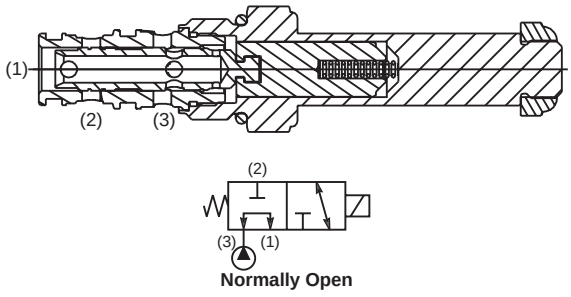
DSH103A



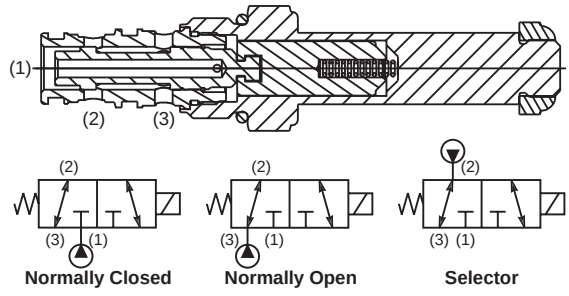
DSH103B



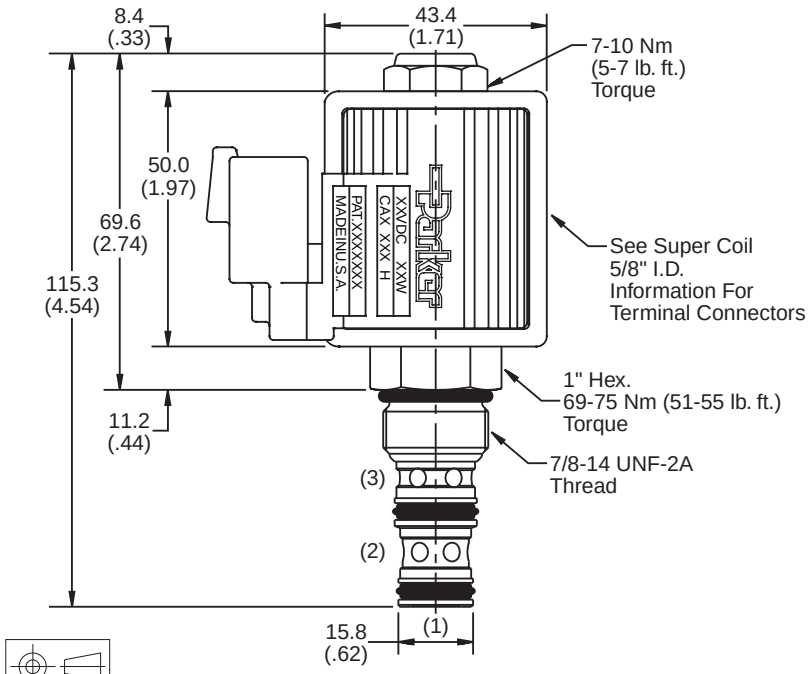
DSH103C

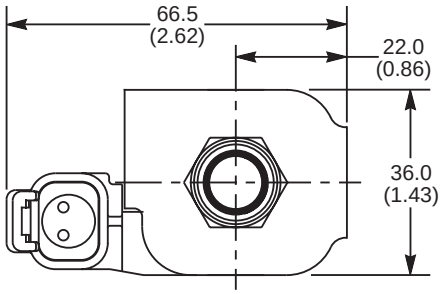


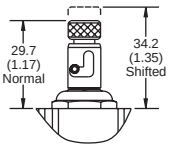
DSH103N



Dimensions Millimeters (Inches)



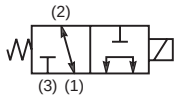
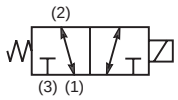
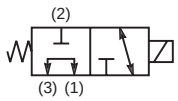
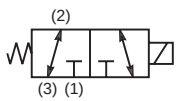




Push and Twist M.O.

Ordering Information

DSH103									—		
10 Size Solenoid Valve	Style	Override Option	Seals	Coil Type	Coil Voltage	Coil Termination	Diode		Body Material	Port Size	

Code	Style
A	
B	
C	
N	

Code	Override Options
Omit	None
T	Push & Twist (N.C. & N.O.)

Code	Seals / Kit No.
Omit	"D"-Ring / (SK10-3)
N	Nitrile / (SK10-3N)
V	Fluorocarbon / (SK10-3V)

Code	Coil Type
Omit	Without Coil
SP*	Super Coil - 28 Watts
U	Unicoil - 20 Watts

***Recommended**

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

SP* Coil	Coil Termination	U Coil
Omit	Without Coil	Omit
C	Conduit With Leads	C
D	DIN Plug Face	D
A	Amp Jr. Timer†	–
S	Dual Spade†	–
W	Dual Screw†	–
L	Dual Lead Wire†	W
H	Molded Deutsch†	–

***Recommended**
†DC Only

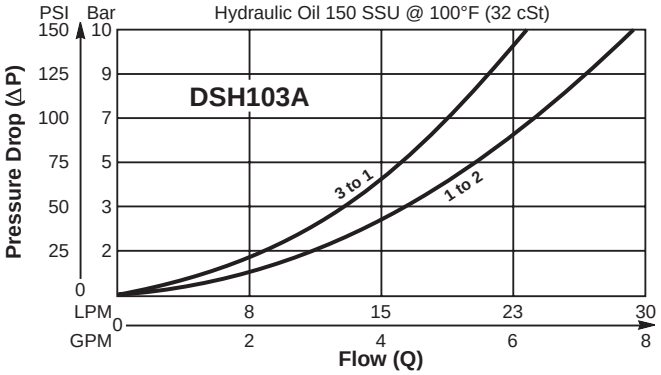
Code	Diode
Omit	None
R	Diode

Code	Body Material
Omit	Steel
A	Aluminum

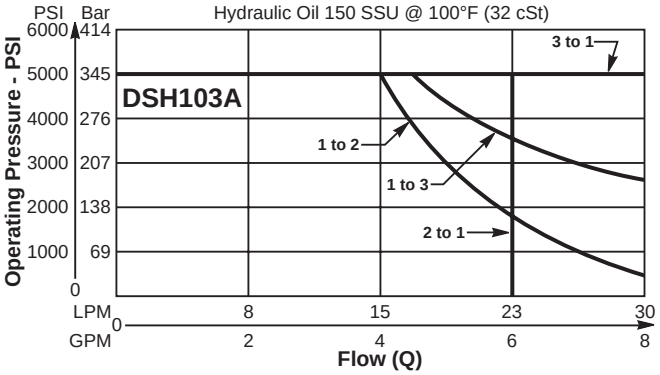
Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-3-*4P)
6P	3/8″ NPTF	(B10-3-*6P)
8P	1/2″ NPTF	(B10-3-*8P)
6T	SAE-6	(B10-3-*6T)
8T	SAE-8	(B10-3-*8T)
6B	3/8″ BSPG	(B10-3-6B)†
8B	1/2″ BSPG	(B10-3-*8B)

**** Add "A" for aluminum, omit for steel.***
† Steel bodies only.

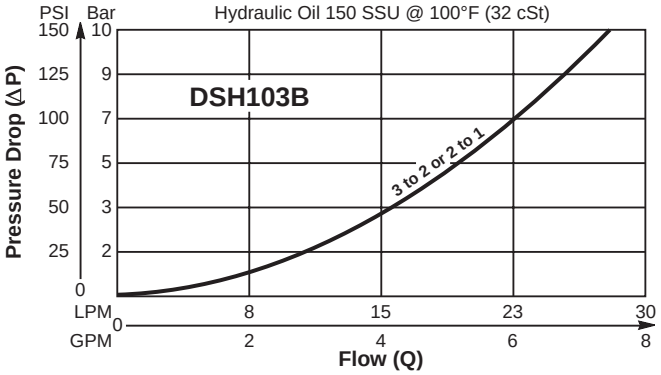
Pressure Drop vs. Flow (Through cartridge only)



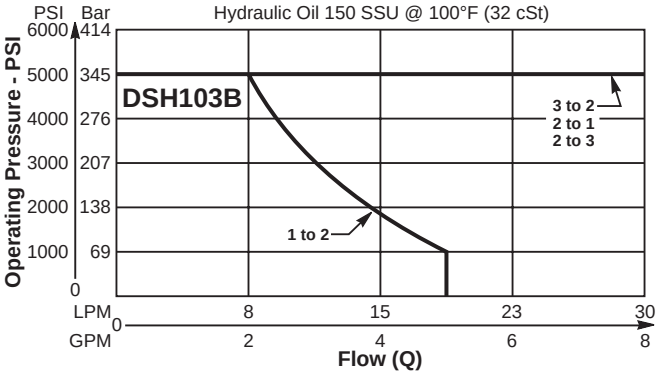
Shift Limit Characteristics (Min. Operating Voltage)



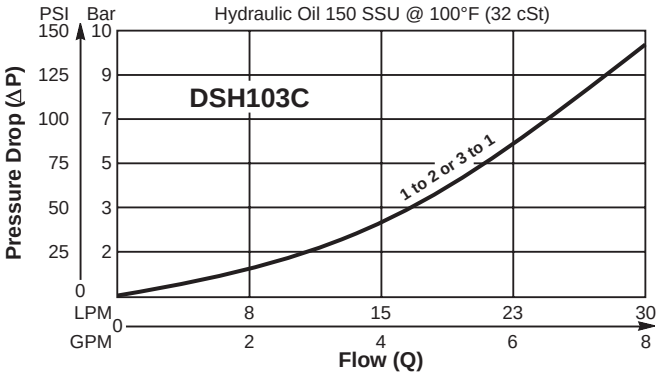
Pressure Drop vs. Flow (Through cartridge only)



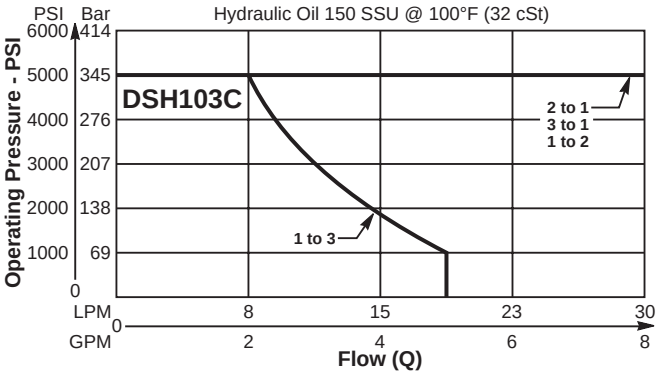
Shift Limit Characteristics (Min. Operating Voltage)



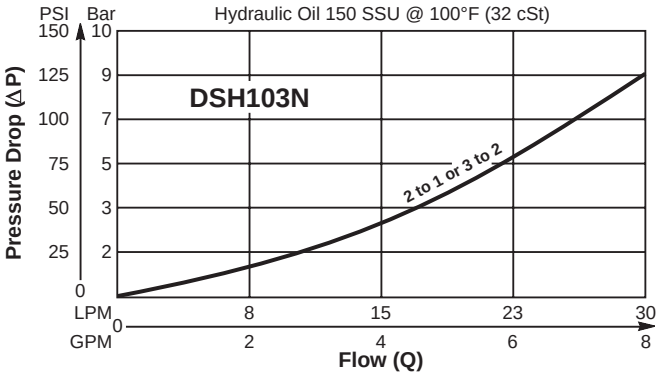
Pressure Drop vs. Flow (Through cartridge only)



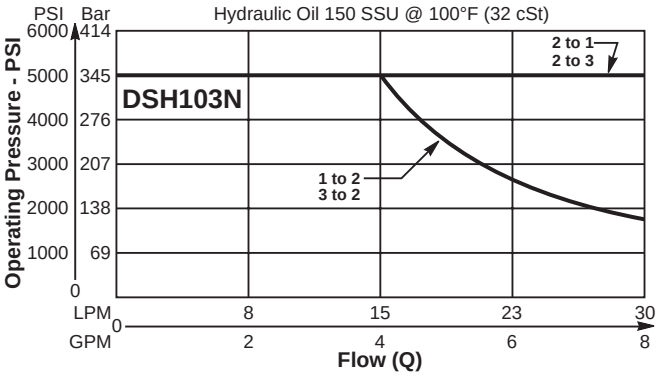
Shift Limit Characteristics (Min. Operating Voltage)



Pressure Drop vs. Flow (Through cartridge only)



Shift Limit Characteristics (Min. Operating Voltage)



General Description

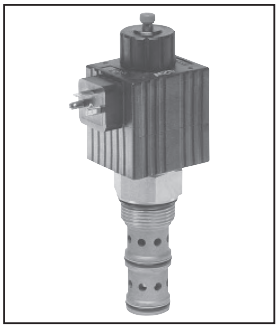
3-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

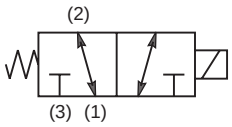
Features

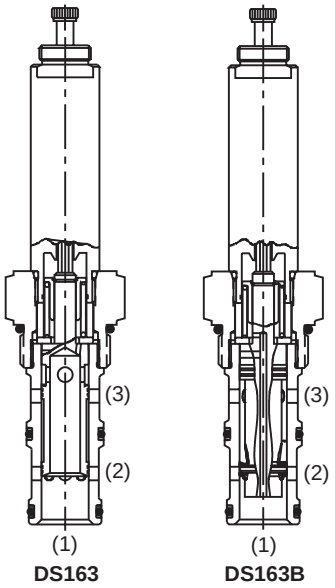
- High flow capacity with reduced space requirements
- Standard valve bodiew and common cavities
- One-piece encapsulated coil with minimal amperage draw
- No dynamic seals
- Variety of coil terminations
- All external parts zinc plated

Specifications

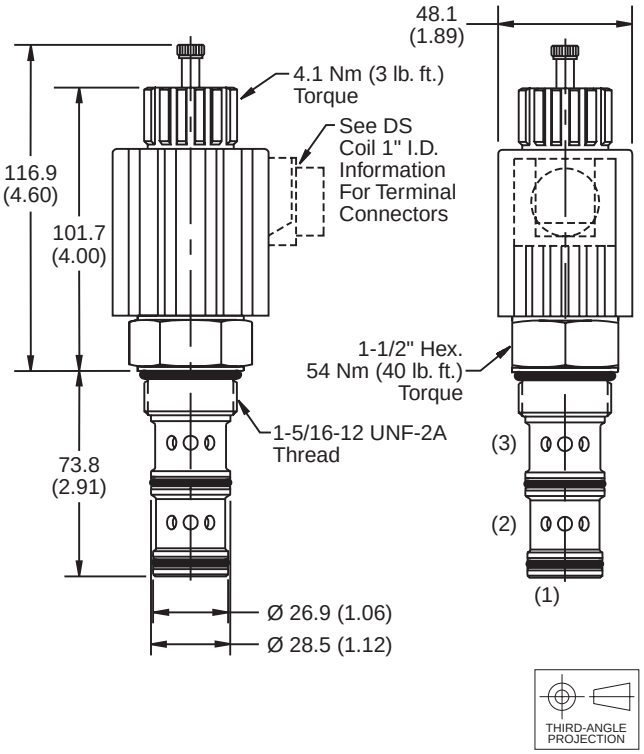
Rated Flow	**DS163** N.O. 45.4 LPM (12 GPM) N.C. 49.2 LPM (13 GPM) Selector 41.6 LPM (11 GPM) **DS163B** N.O. 26.5 LPM (7 GPM) N.C. 53.0 LPM (14 GPM) Selector 56.8 LPM (15 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	82 cc/min. (5 in^3/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	Normally Closed up to 90 ms Normally Open up to 100 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.59 kg (1.3 lbs.)
Cavity	C16-3 (See BC Section for more details)
Form Tool	Rougher NFT16-3R Finisher NFT16-3F





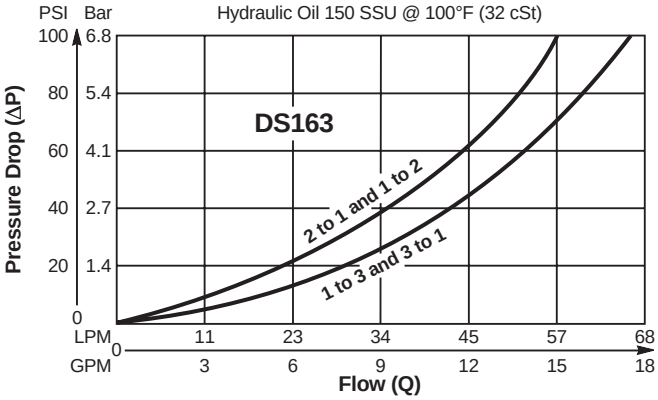


Dimensions Millimeters (Inches)

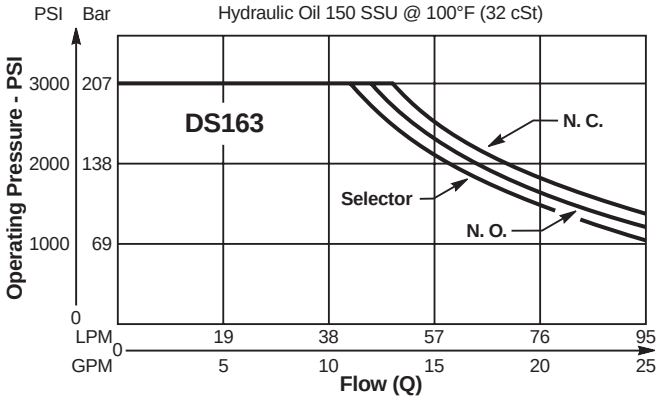


Performance Curves

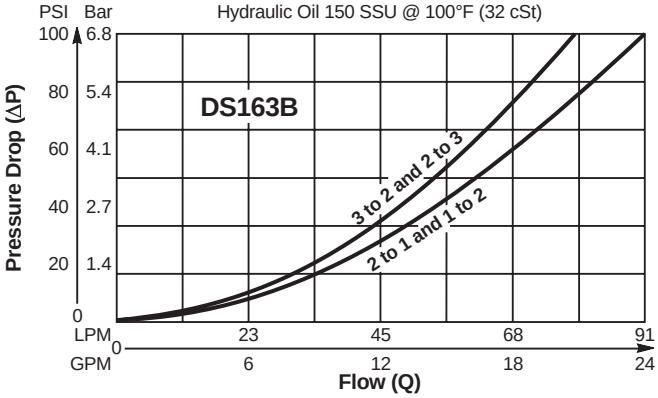
Pressure Drop vs. Flow (Through cartridge only)



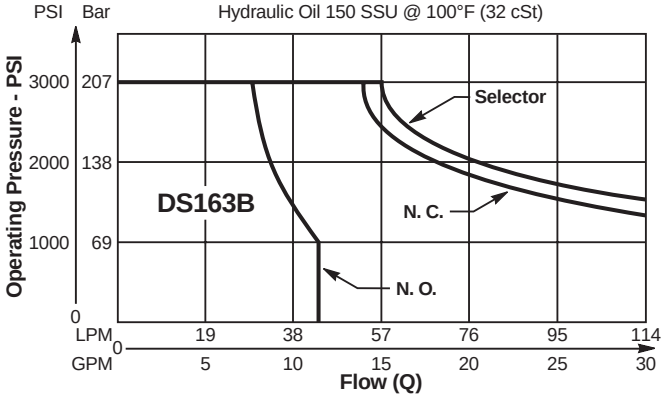
Shift Limit Characteristics (Min. Operating Voltage)



Pressure Drop vs. Flow (Through cartridge only)

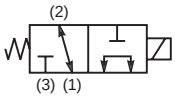
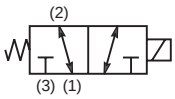


Shift Limit Characteristics (Min. Operating Voltage)



Ordering Information

DS163					—		
16 Size Solenoid Valve	Style	Seals	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
Omit	
B	

Code	Seals / Kit No.
Omit	Nitrile / (SK16-3)
V	Fluorocarbon / (SK16-3V)

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz

Code	Coil Termination
Omit	Without Coil
C	Conduit (AC Only)
D	DIN Plug Face
S	Dual Screw (DC Only)
W	Dual Lead (DC Only)

See DS coil 1" I.D. (42 watt)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
12T	SAE-12	(B16-3-*12T)
16T	SAE-16	(B16-3-*16T)

** Add "A" for aluminum, omit for steel.*

General Description

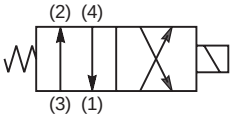
4-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

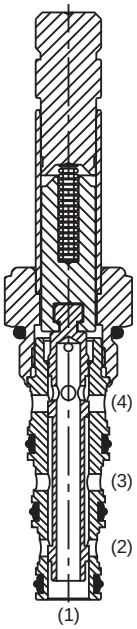
Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated



DSL084B





DSL084B

Specifications

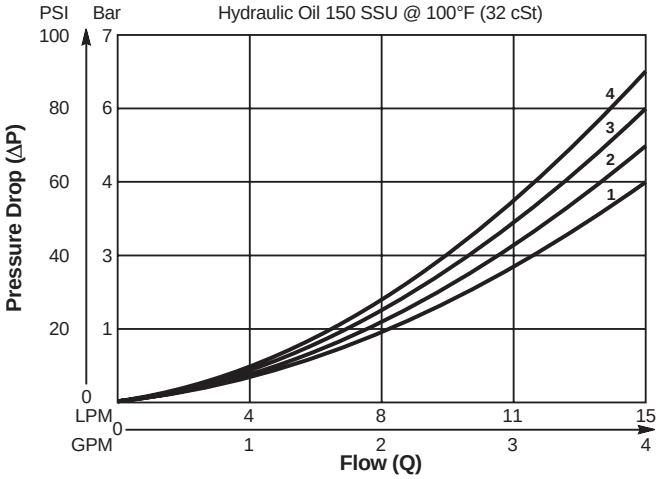
Rated Flow	11-15 LPM (3-4 GPM)
Maximum Inlet Pressure	250 Bar (3600 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min. (10 in³/min.) at 250 Bar (3600 PSI)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	Energized - 50 ms De-energized - 30 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.13 kg (.29 lbs.)
Cavity	C08-4 (See BC Section for more details)
Form Tool	Rougher NFT08-4R Finisher NFT08-4F

Curve Selection Chart

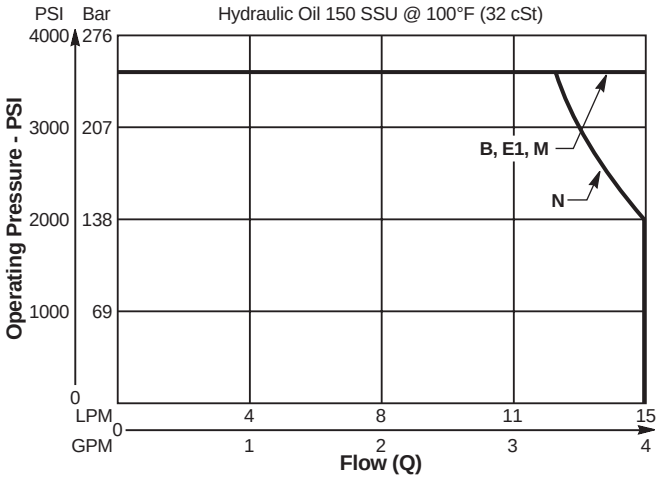
SPOOL CODE	NEUTRAL					SHIFTED			
	4 to 1	3 to 2	2 to 1	3 to 1	3 to 4	4 to 1	3 to 2	2 to 1	3 to 4
B	4	3	—	—	—	—	—	2	4
E1	—	—	—	—	—	—	—	2	3
M	—	—	3	—	1	—	—	—	—
N	—	—	—	—	—	4	3	—	—

Performance Curves

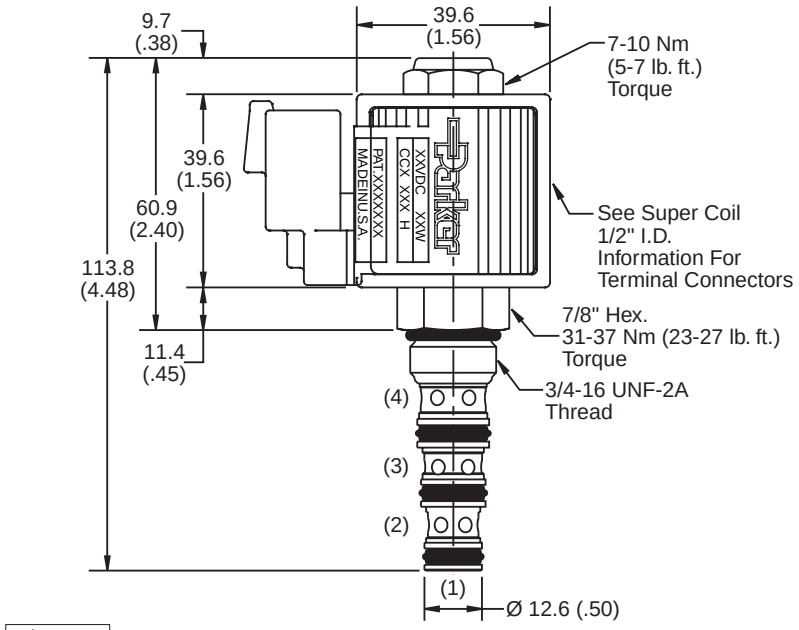
Pressure Drop vs. Flow (Through cartridge only)

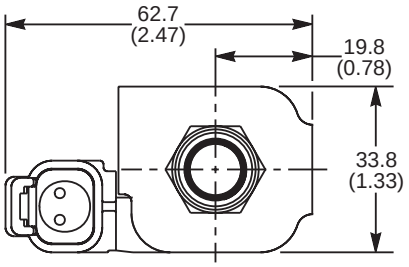


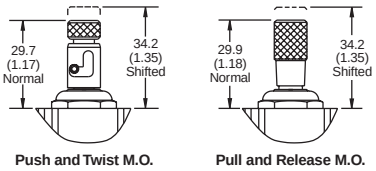
Shift Limit Characteristics (Min. Operating Voltage)



Dimensions Millimeters (Inches)

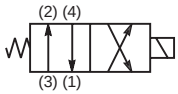
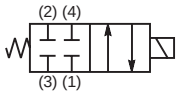
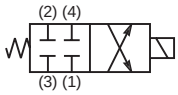
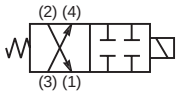






Ordering Information

DSL084									—		
08 Size Solenoid Valve	Style	Override Option	Seals	Coil Type	Coil Voltage	Coil Termination	Diode		Body Material	Port Size	

Code	Style
B	
N	
E1	
M	

Code	Override Options
Omit	None
P	Pull & Release
T	Push & Twist

Code	Seals / Kit No.
Omit	"D"-Ring / (SK08-4)
N	Nitrile / (SK08-4N)
V	Fluorocarbon / (SK08-4V)

Code	Coil Type
Omit	Without Coil
SP*	Super Coil - 19 Watts
U	Unicoil - 14 Watts

***Recommended**

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

SP* Coil	Coil Termination	U Coil
Omit	Without Coil	Omit
C	Conduit With Leads	C
D	DIN Plug Face	D
A	Amp Jr. Timer†	–
S	Dual Spade†	–
W	Dual Screw†	–
L	Dual Lead Wire†	W
H	Molded Deutsch†	–

***Recommended**
***†DC Only**

Code	Diode
Omit	None
R	Diode

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4T	SAE-4	(B08-4-*4T)
6T	SAE-6	(B08-4-*6T)
6B	3/8" BSPG	(B08-4-*6B)

**** Add "A" for aluminum, omit for steel.***

General Description

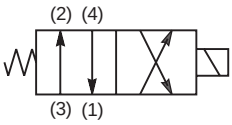
4-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

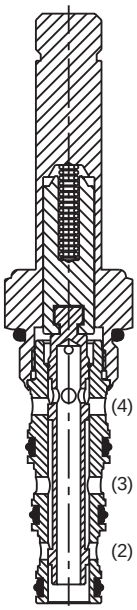
Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated



DSH084B





DSH084B

Specifications

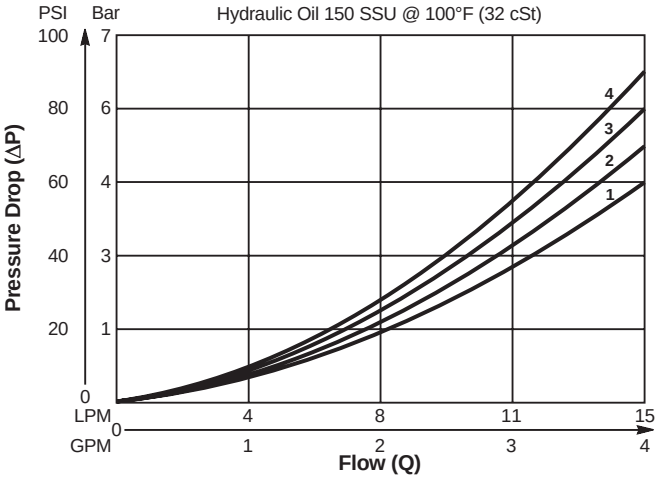
Rated Flow	11-15 LPM (3-4 GPM)
Max. Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min. (10 in^3/min.) at 350 Bar (5000 PSI) DSH084B - 240 cc/min. (15 in^3/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	Energized - 50 ms De-energized - 30 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.13 kg (.29 lbs.)
Cavity	C08-4 (See BC Section for more details)
Form Tool	Rougher NFT08-4R Finisher NFT08-4F

Curve Selection Chart

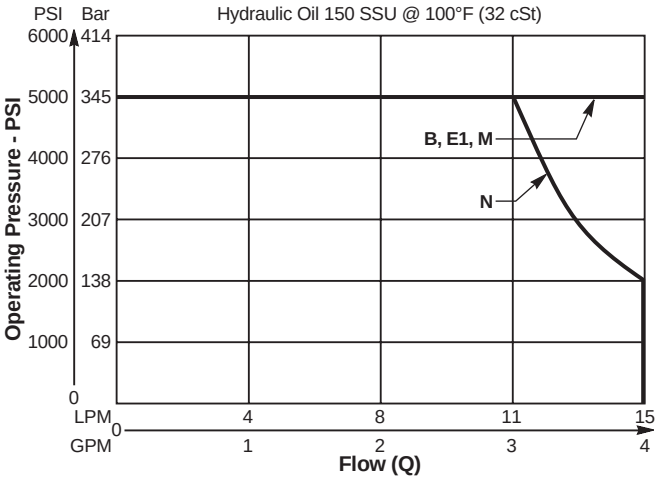
SPOOL CODE	NEUTRAL					SHIFTED			
	4 to 1	3 to 2	2 to 1	3 to 1	3 to 4	4 to 1	3 to 2	2 to 1	3 to 4
B	4	3	—	—	—	—	—	2	4
E1	—	—	—	—	—	—	—	2	3
M	—	—	3	—	1	—	—	—	—
N	—	—	—	—	—	4	3	—	—

Performance Curves

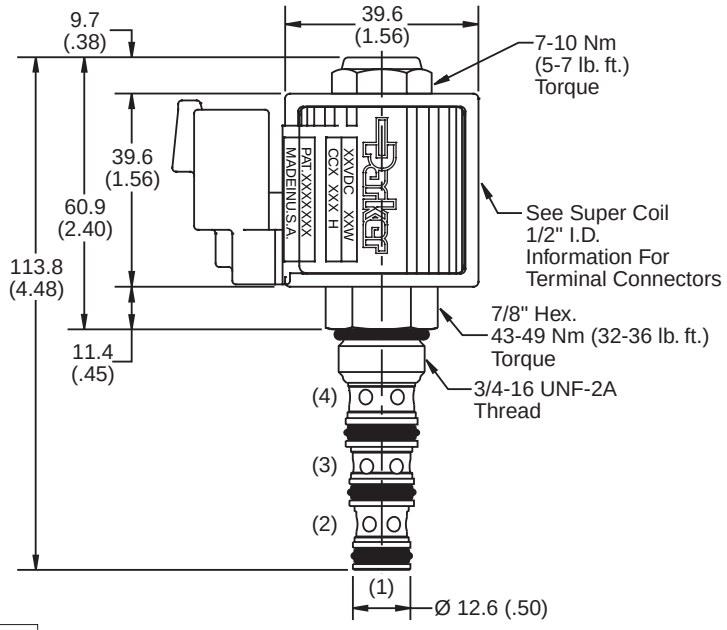
Pressure Drop vs. Flow (Through cartridge only)

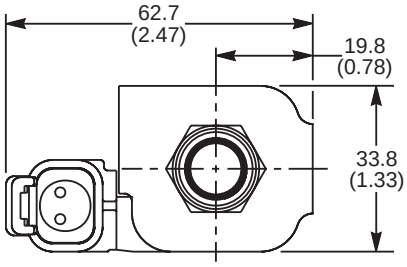


Shift Limit Characteristics (Min. Operating Voltage)

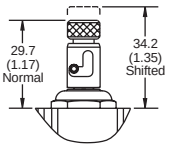


Dimensions Millimeters (Inches)





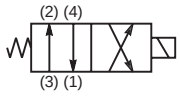
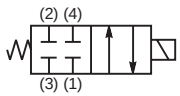
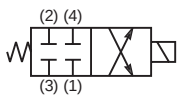
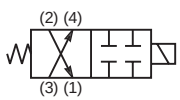
THIRD-ANGLE PROJECTION



Push and Twist M.O.

Ordering Information

DSH084									—		
08 Size Solenoid Valve	Style	Override Option	Seals	Coil Type	Coil Voltage	Coil Termination	Diode		Body Material	Port Size	

Code	Style
B	
N	
E1	
M	

Code	Override Options
Omit	None
T	Push & Twist*

Requires Super Coil

Code	Seals / Kit No.
Omit	"D"-Ring / (SK08-4)
N	Nitrile / (SK08-4N)
V	Fluorocarbon / (SK08-4V)

Code	Coil Type
Omit	Without Coil
SP*	Super Coil - 19 Watts
U	Unicoil - 14 Watts

***Recommended**

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

SP* Coil	Coil Termination	U Coil
Omit	Without Coil	Omit
C	Conduit With Leads	C
D	DIN Plug Face	D
A	Amp Jr. Timer†	–
S	Dual Spade†	–
W	Dual Screw†	–
L	Dual Lead Wire†	W
H	Molded Deutsch†	–

***Recommended**
†DC Only

Code	Diode
Omit	None
R	Diode

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4T	SAE-4	(B08-4-*4T)
6T	SAE-6	(B08-4-*6T)
6B	3/8" BSPG	(B08-4-*6B)

**** Add "A" for aluminum, omit for steel.***

General Description

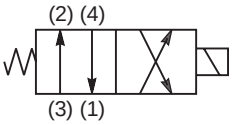
4-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

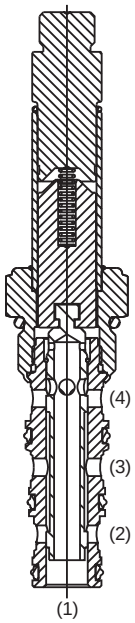
Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring
- All external parts zinc plated



DSL104B





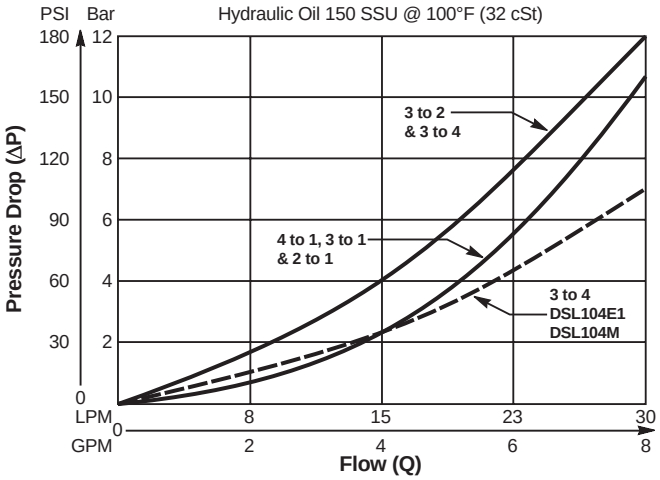
DSL104B

Specifications

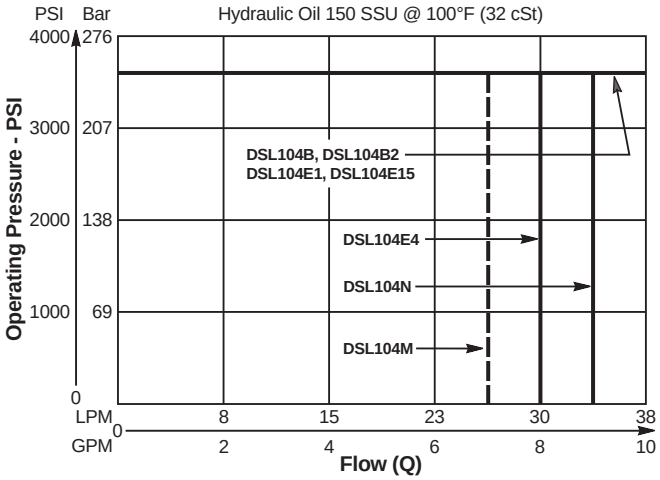
Rated Flow	27-38 LPM (7-10 GPM) See Shift Limit Characteristics
Maximum Inlet Pressure	250 Bar (3600 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min (10 in^3/min)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	Energized - 30 - 60 ms De-energized - 30 - 60 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.20 kg (.44 lbs.)
Cavity	C10-4 (See BC Section for more details)
Form Tool	Rougher NFT10-4R Finisher NFT10-4F

Performance Curves

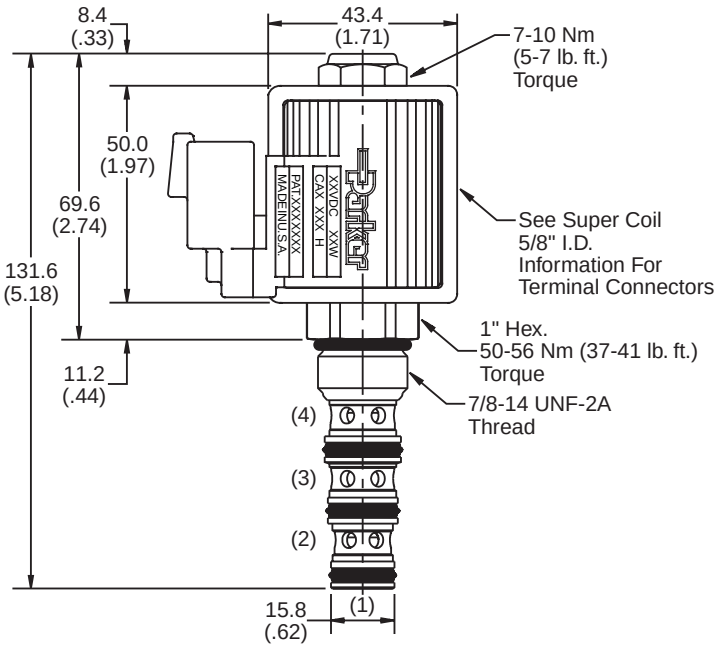
Pressure Drop vs. Flow (Through cartridge only)

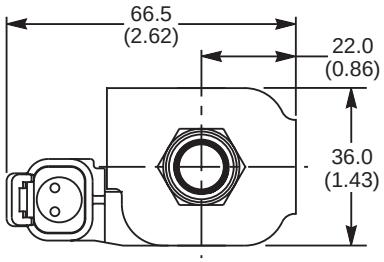


Shift Limit Characteristics (Min. Operating Voltage)



Dimensions Millimeters (Inches)

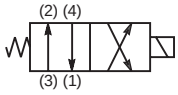
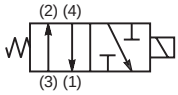
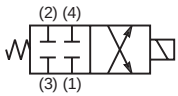
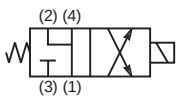
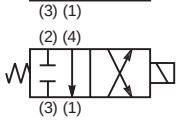
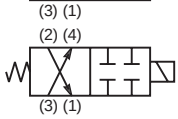
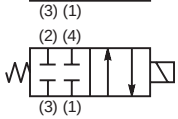




THIRD-ANGLE PROJECTION

Ordering Information

DSL104										
10 Size Solenoid Valve	Style	Override Option	Seals	Coil Type	Coil Voltage	Coil Termination	Diode	—	Body Material	Port Size

Code	Style
B	
B2	
E1	
E4	
E15	
M	
N	

Code	Override Options
Omit	None
P	Pull & Release
T	Push & Twist

Code	Seals / Kit No.
Omit	"D"-Ring / (SK10-4)
N	Nitrile / (SK10-4N)
V	Fluorocarbon / (SK10-4V)

Code	Coil Type
Omit	Without Coil
SP*	Super Coil - 28 Watts
U	Unicoil - 20 Watts

***Recommended**

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

SP* Coil	Coil Termination	U Coil
Omit	Without Coil	Omit
C	Conduit With Leads	C
D	DIN Plug Face	D
A	Amp Jr. Timer†	–
S	Dual Spade†	–
W	Dual Screw†	–
L	Dual Lead Wire†	W
H	Molded Deutsch†	–

***Recommended**
†DC Only

Code	Diode
Omit	None
R	Diode

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6P	3/8″ NTPF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel bodies only

General Description

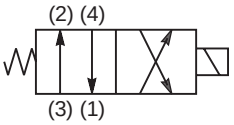
4-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

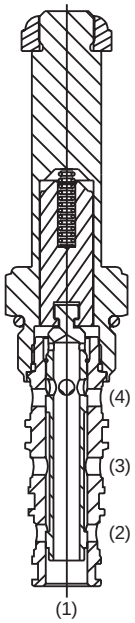
Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated



DSH104B





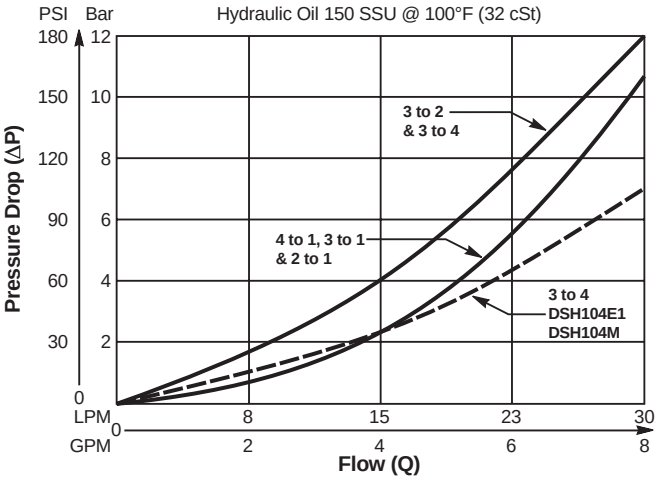
DSH104B

Specifications

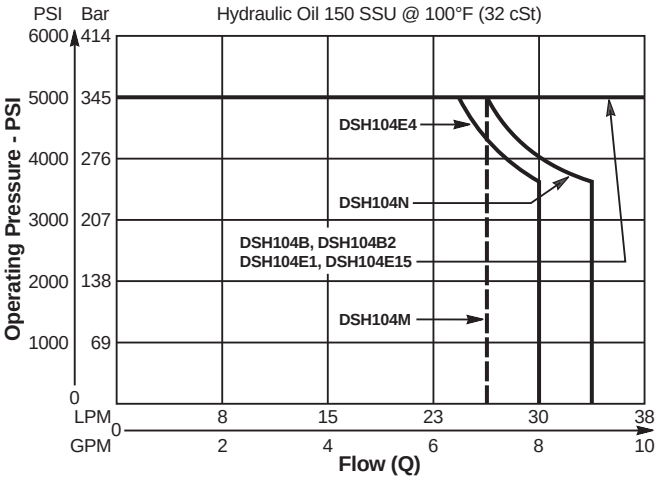
Rated Flow	25 - 38 LPM (6.5 - 10 GPM) See Shift Limit Characteristics
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min (10 in^3/min) DSH104B - 240 cc/min (15 in^3/min)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	Energized - 30 - 60 ms De-energized - 30 - 60 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.20 kg (.44 lbs.)
Cavity	C10-4 (See BC Section for more details)
Form Tool	Rougher NFT10-4R Finisher NFT10-4F

Performance Curves

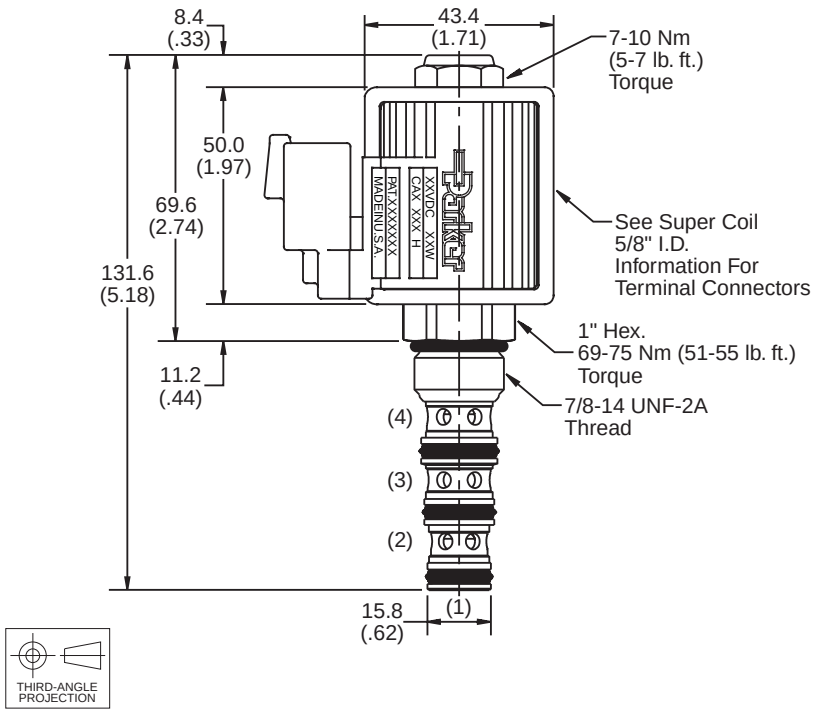
Pressure Drop vs. Flow (Through cartridge only)

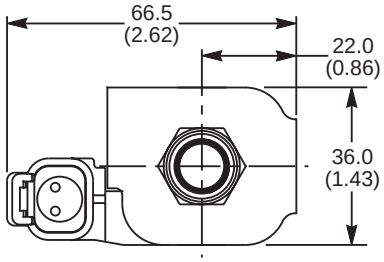


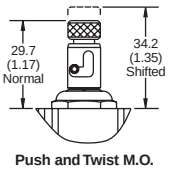
Shift Limit Characteristics (Min. Operating Voltage)



Dimensions Millimeters (Inches)







Push and Twist M.O.

Ordering Information

DSH104									—		
10 Size Solenoid Valve	Style	Override Option	Seals	Coil Type	Coil Voltage	Coil Termination	Diode		Body Material	Port Size	

Code	Style
B	(2) (4) / (3) (1)
B2	(2) (4) / (3) (1)
E1	(2) (4) / (3) (1)
E4	(2) (4) / (3) (1)
E15	(2) (4) / (3) (1)
M	(2) (4) / (3) (1)
N	(2) (4) / (3) (1)

Code	Override Options
Omit	None
T	Push & Twist

Code	Seals / Kit No.
Omit	"D"-Ring / (SK10-4)
N	Nitrile / (SK10-4N)
V	Fluorocarbon / (SK10-4V)

Code	Coil Type
Omit	Without Coil
SP*	Super Coil - 28 Watts
U	Unicoil - 20 Watts

**Recommended*

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120/110 VAC, 60/50 Hz
A240	240/220 VAC, 60/50 Hz

SP* Coil	Coil Termination	U Coil
Omit	Without Coil	Omit
C	Conduit With Leads	C
D	DIN Plug Face	D
A	Amp Jr. Timer†	–
S	Dual Spade†	–
W	Dual Screw†	–
L	Dual Lead Wire†	W
H	Molded Deutsch†	–

**Recommended*
†DC Only

Code	Diode
Omit	None
R	Diode

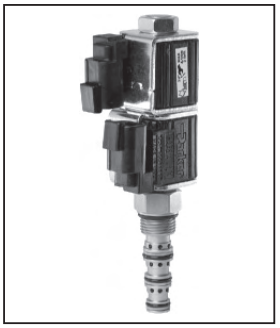
Code	Body Material
Omit	Steel
A	Aluminum

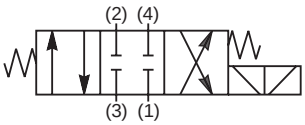
Code	Port Size	Body Part No.
Omit	Cartridge Only	
6P	3/8″ NTPF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

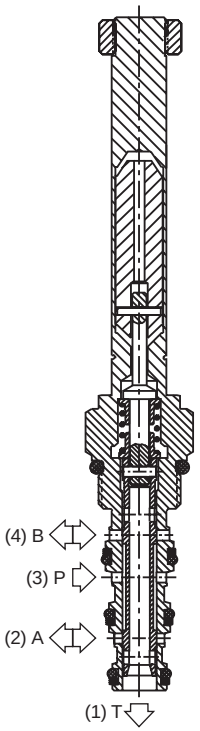
** Add "A" for aluminum, omit for steel.*
† Steel bodies only

General Description

4-Way, 3 Position, Closed Center Spool Valve.
For additional information see Technical Tips on pages SV1-SV6.







Features

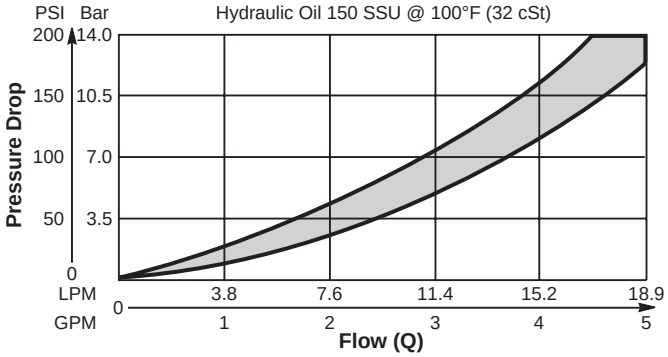
- Designed to operate double acting cylinders, pilot circuits and bi-directional motors, etc.
- High flow capacity with reduced space requirements
- High pressure capability to 350 Bar (5000 PSI)
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Manual override available
- All external parts zinc plated

Specifications

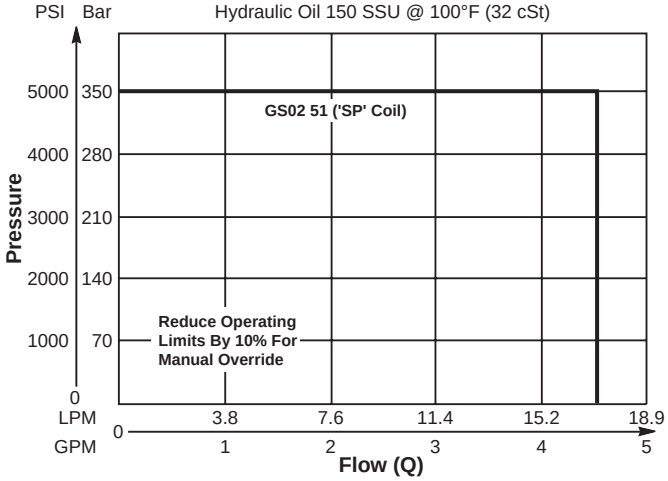
Rated Flow (At 70 PSI ΔP)	**High Flow/Pressure ('SP' Coil)** 17 LPM (4.5 GPM)
Maximum Inlet Pressure	**'SP' Coil** 350 Bar (5000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Campatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.18 kg (.40 lbs.)
Cavity	C08-4 (See BC Section for more details)

Performance Curves

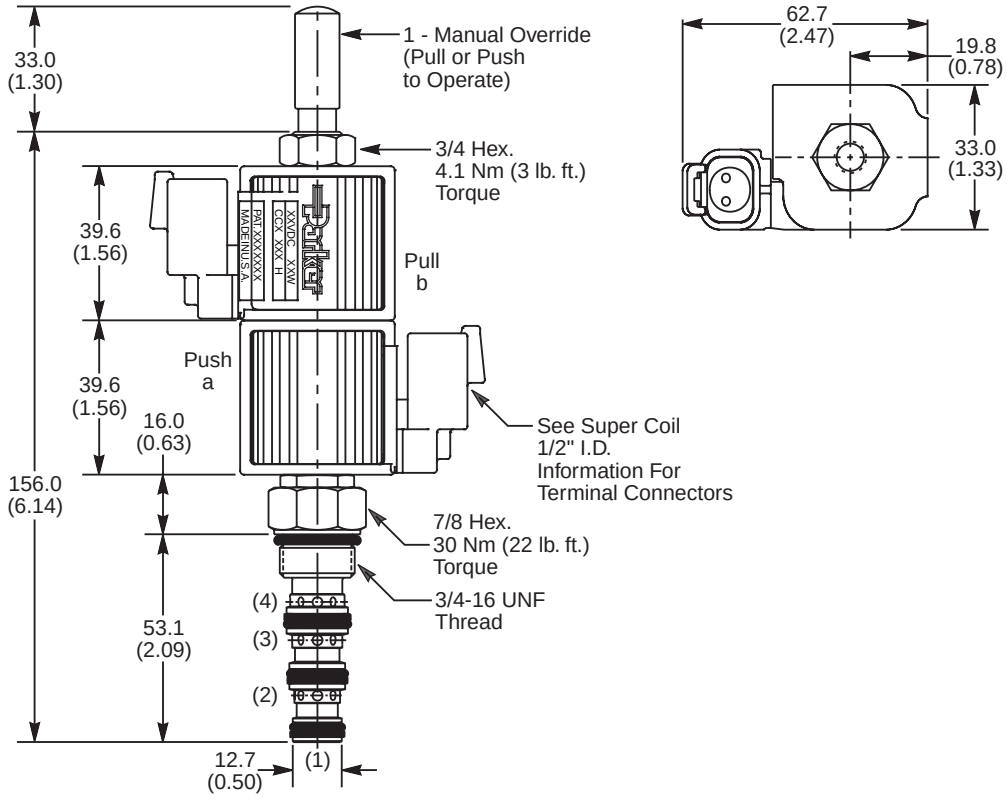
Pressure Drop vs. Flow (Through cartridge only)



Operating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)



Ordering Information

GS02	51							–		
08 Size Solenoid Valve	Style	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
51	High Flow and Pressure ('SP' Coil)

Code	Override Options
0	Not Required
1	Manual Override
2	Detented M.O.

Code	Screen
0	Not Available

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30078N-1)
V	Fluorocarbon / (SK30078V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

**22 Watts*

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
**DC Only*

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6T	SAE-6	(B08-4-*6T)
6B	3/8" BSPG	(B08-4-*6B)

** Add "A" for aluminum, omit for steel.*

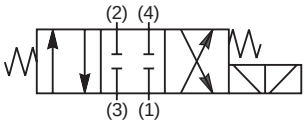
General Description

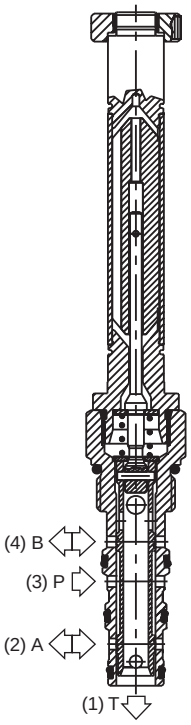
4-Way, 3 Position, Closed Center Spool Valve.
For additional information see Technical Tips on pages SV1-SV6.

Features

- Four way closed center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated





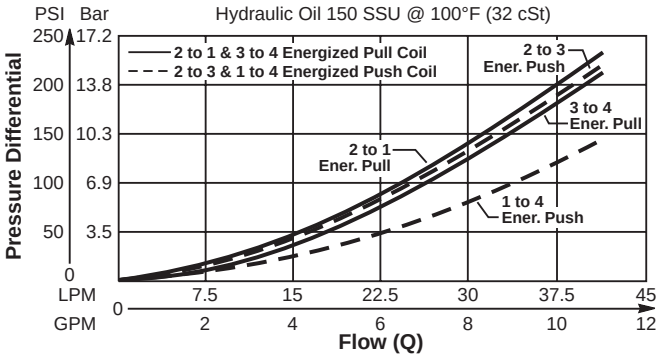


Specifications

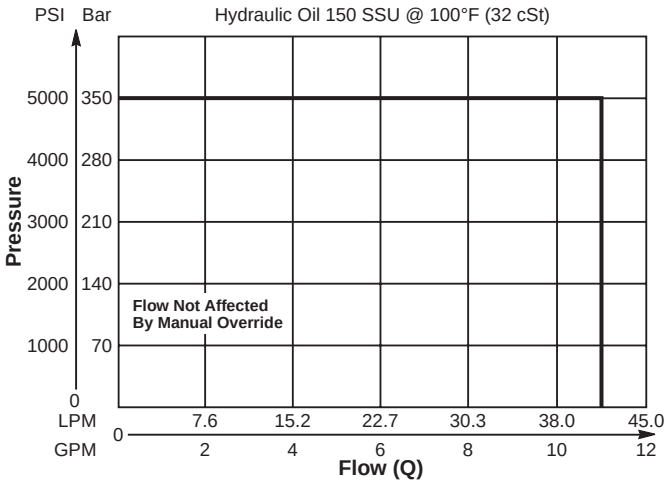
Rated Flow (At 70 PSI ΔP)	42 LPM (11 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min @ 210 Bar (3000 PSI)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 30-60 ms **Close** 20-40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.26 kg (.58 lbs.)
Cavity	C10-4 (See BC Section for more details)

Performance Curves

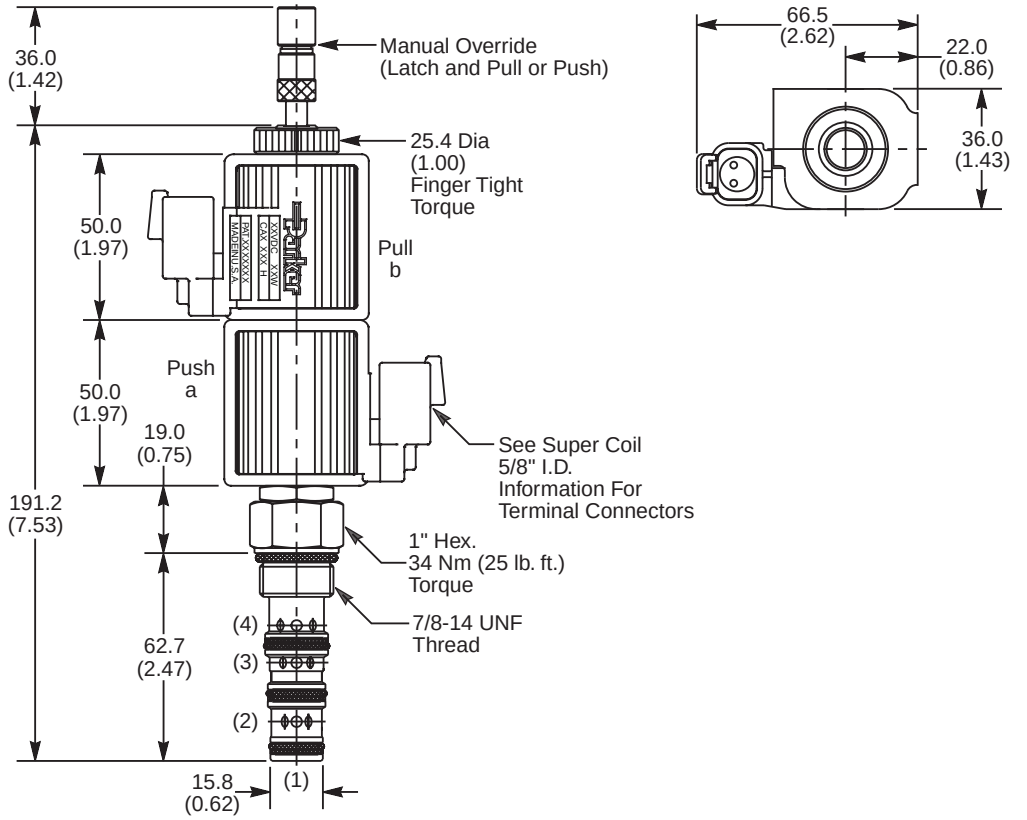
Pressure Drop vs. Flow Energized - GS045250ND
(Through cartridge only)



Operating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)



Ordering Information

GS04	52				D				–		
10 Size Solenoid Valve	Style	Override Option	Screen	Seals	Design Level	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
52	High Flow and Pressure ('SP' Coil)

Code	Override Options
0	None
1	Spring Centered (*111 nt/25 lbs.)
3	Cable Operated (*111 nt/25 lbs.)
5	Standard - Latch Operated, Pull and Push (*40 nt/9 lbs.)
6	Latch Operated Detented (*40 nt/9 lbs.)
7	1″ Knob, Pull or Push (*111 nt/25 lbs.)

Force to push at 210 Bar (3000 PSI). Less to Pull.

Code	Screen
0	None (*Contact factory for OEM requirements)*

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30506N-1)
V	Fluorocarbon / (SK30506V-1)

Code	Design Level
D	Includes Industry Common Cavity

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 28 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

22 Watts

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 5/8″ I.D.
DC Only

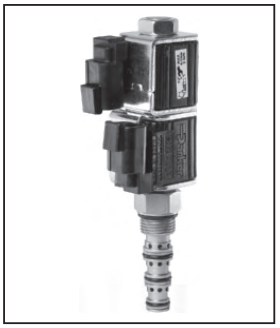
Code	Body Material
Omit	Steel
A	Aluminum

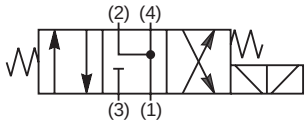
Code	Port Size	Body Part No.
Omit	Cartridge Only	
8T	SAE-8	(B10-4-*8T)
8B	1/2″ BSPG	(B10-4-*8B)

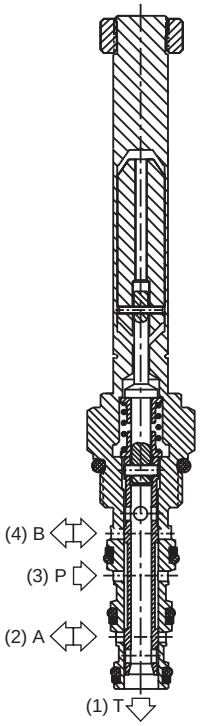
**** Add "A" for aluminum, omit for steel.***

General Description

4-Way, 3 Position, Floating Center Spool Valve.
For additional information see Technical Tips on pages SV1-SV6.







Features

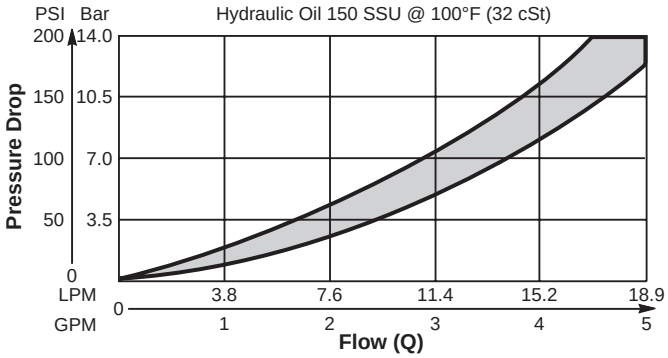
- Designed to operate double acting cylinders, pilot circuits and bi-directional motors, etc.
- High flow capacity with reduced space requirements
- High pressure capability to 350 Bar (5000 PSI)
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Manual override available
- All external parts zinc plated

Specifications

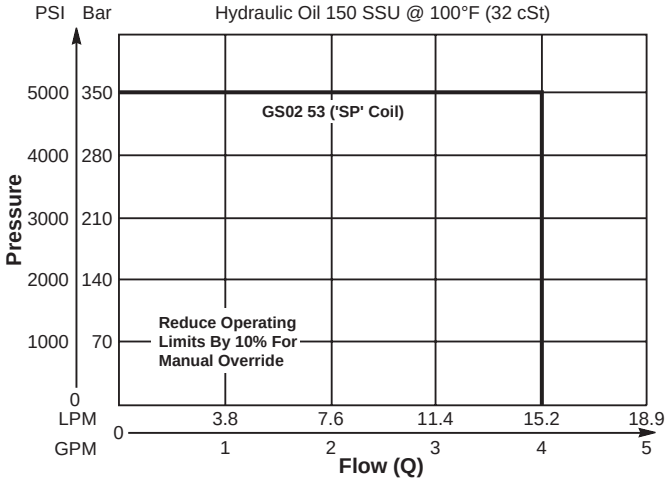
Rated Flow (At 70 PSI ΔP)	**High Flow/Pressure ('SP' Coil)** 15 LPM (4.0 GPM)
Maximum Inlet Pressure	**'SP' Coil** 350 Bar (5000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.18 kg (.40 lbs.)
Cavity	C08-4 (See BC Section for more details)

Performance Curves

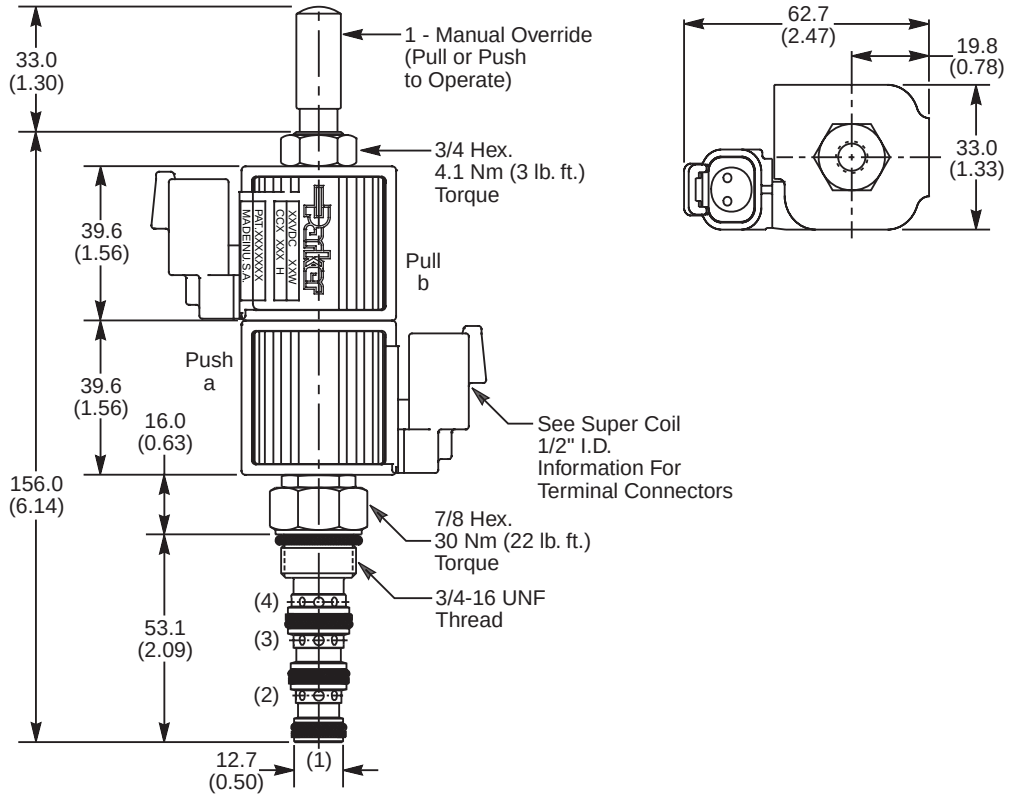
Pressure Drop vs. Flow (Through cartridge only)



Operating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)



Ordering Information

GS02	53							–		
08 Size Solenoid Valve	Style	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
53	High Flow and Pressure ('SP' Coil)

Code	Override Options
0	Not Required
1	Manual Override
2	Detented M.O.

Code	Screen
0	Not Available

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30078N-1)
V	Fluorocarbon / (SK30078V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

**22 Watts*

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
**DC Only*

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6T	SAE-6	(B08-4-*6T)
6B	3/8" BSPG	(B08-4-*6B)

** Add "A" for aluminum, omit for steel.*

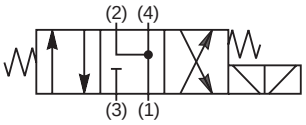
General Description

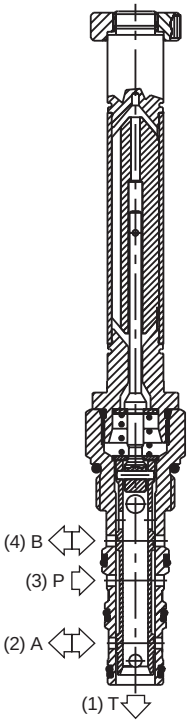
4-Way, 3 Position, Floating Center Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- Four way floating center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated





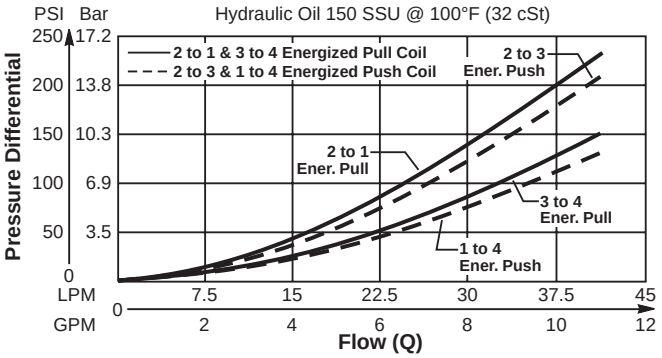


Specifications

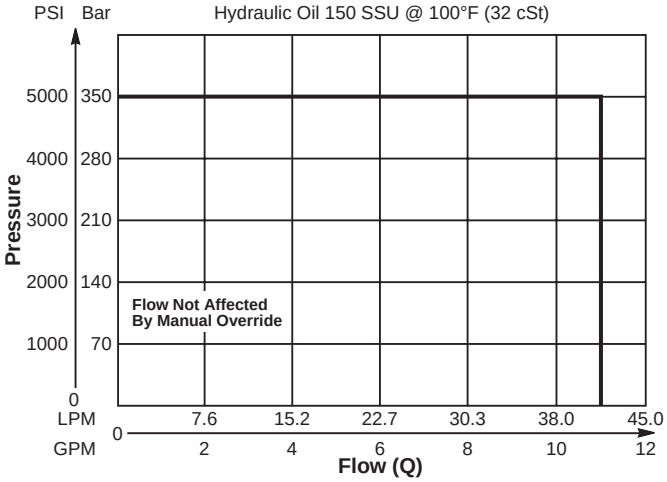
Rated Flow (At 70 PSI ΔP)	42 LPM (11 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min @ 210 Bar (3000 PSI)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 30-60 ms **Close** 20-40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.26 kg (.58 lbs.)
Cavity	C10-4 (See BC Section for more details)

Performance Curves

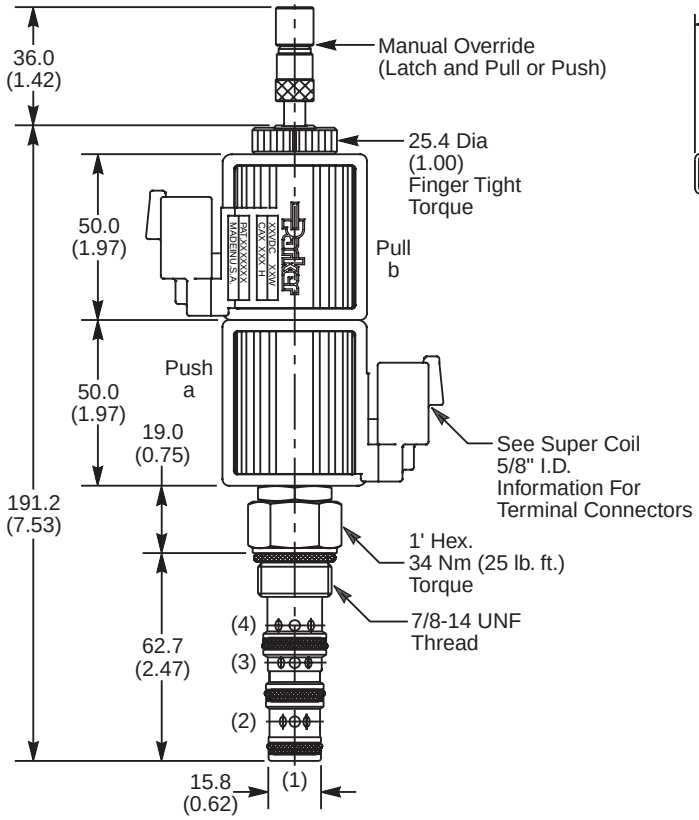
Pressure Drop vs. Flow Energized - GS045450ND
(Through cartridge only)

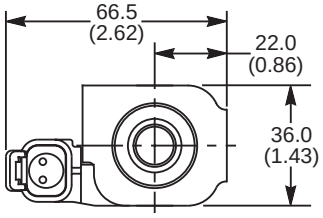


Operating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)





THIRD-ANGLE PROJECTION

Ordering Information

GS04	54				D				–		
10 Size Solenoid Valve	Style	Override Option	Screen	Seals	Design Level	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
54	High Flow and Pressure ('SP' Coil)

Code	Override Options
0	None
1	Spring Centered (*111 nt/25 lbs.)
3	Cable Operated (*111 nt/25 lbs.)
5	Standard - Latch Operated, Pull and Push (*40 nt/9 lbs.)
6	Latch Operated Detented (*40 nt/9 lbs.)
7	1″ Knob, Pull or Push (*111 nt/25 lbs.)

Force to push at 210 Bar (3000 PSI). Less to Pull.

Code	Screen
0	None (*Contact factory for OEM requirements)*

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30506N-1)
V	Fluorocarbon / (SK30506V-1)

Code	Design Level
D	Includes Industry Common Cavity

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 28 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

22 Watts

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 5/8″ I.D.
DC Only

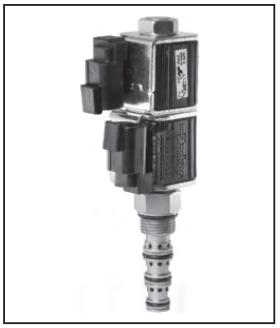
Code	Body Material
Omit	Steel
A	Aluminum

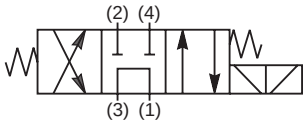
Code	Port Size	Body Part No.
Omit	Cartridge Only	
8T	SAE-8	(B10-4-*8T)
8B	1/2″ BSPG	(B10-4-*8B)

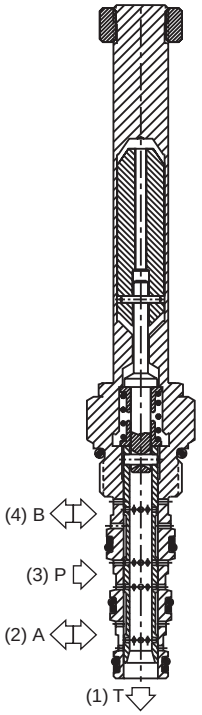
**** Add "A" for aluminum, omit for steel.***

General Description

4-Way, 3 Position, Tandem Center Spool Valve.
For additional information see Technical Tips on pages SV1-SV6.







Features

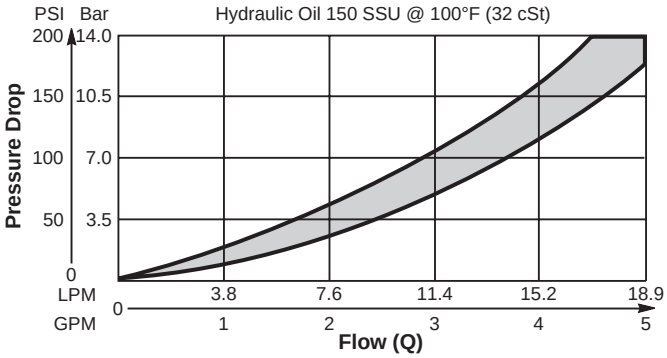
- Designed to operate double acting cylinders, pilot circuits and bi-directional motors, etc.
- High flow capacity with reduced space requirements
- High pressure capability
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Manual override available
- All external parts zinc plated

Specifications

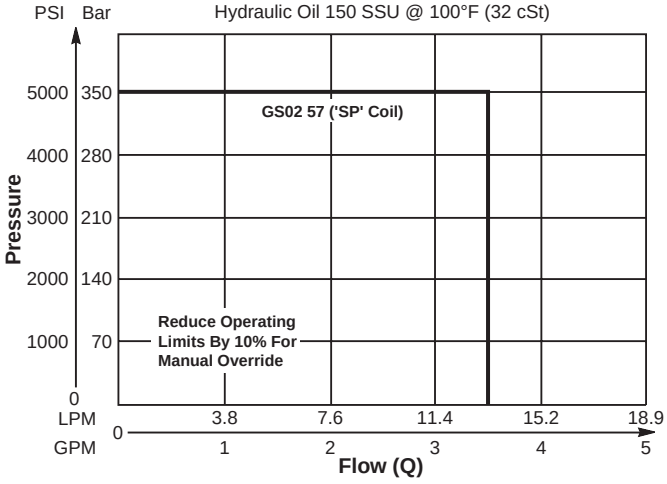
Rated Flow (At 70 PSI ΔP)	13.3 LPM (3.5 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.18 kg (.40 lbs.)
Cavity	C08-4 (See BC Section for more details)

Performance Curves

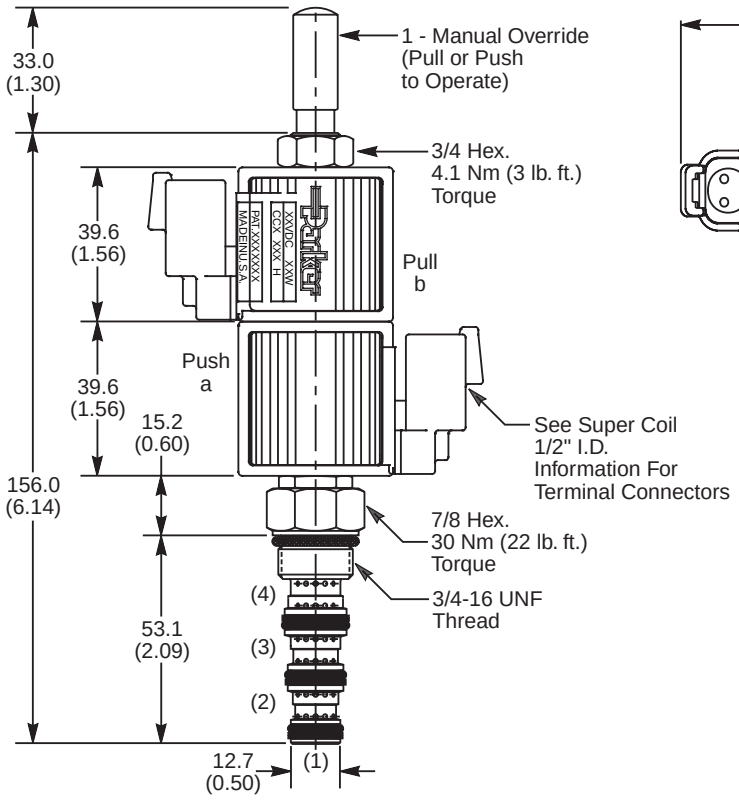
Pressure Drop vs. Flow (Through cartridge only)



Operating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)



Ordering Information

GS02	57							–		
08 Size Solenoid Valve	Style	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
57	High Flow ('SP' Coil)

Code	Override Options
0	Not Required
1	Manual Override
2	Detented M.O.

Code	Screen
0	Not Available

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30078N-1)
V	Fluorocarbon / (SK30078V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

**22 Watts*

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
**DC Only*

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6T	SAE-6	(B08-4-*6T)
6B	3/8" BSPG	(B08-4-*6B)

** Add "A" for aluminum, omit for steel.*

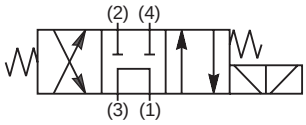
General Description

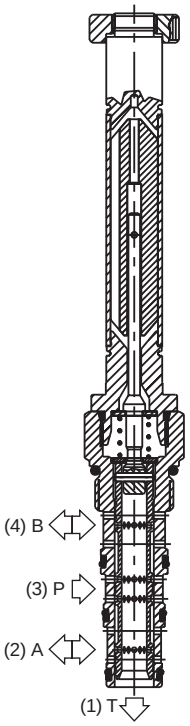
4-Way, 3 Position, Tandem Center Spool Valve.
For additional information see Technical Tips on pages SV1-SV6.

Features

- Four way tandem center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated





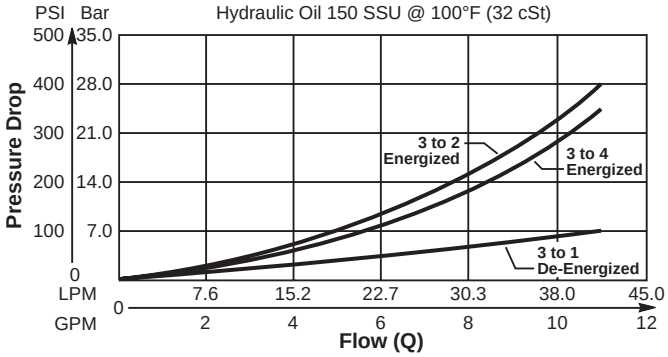


Specifications

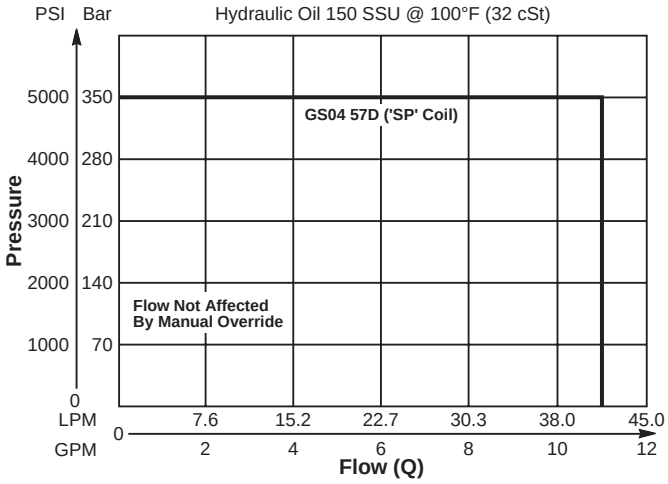
Rated Flow (At 70 PSI ΔP)	42 LPM (11 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min @ 210 Bar (3000 PSI)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 30-60 ms **Close** 20-40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.26 kg (.58 lbs.)
Cavity	C10-4 (See BC Section for more details)

Performance Curves

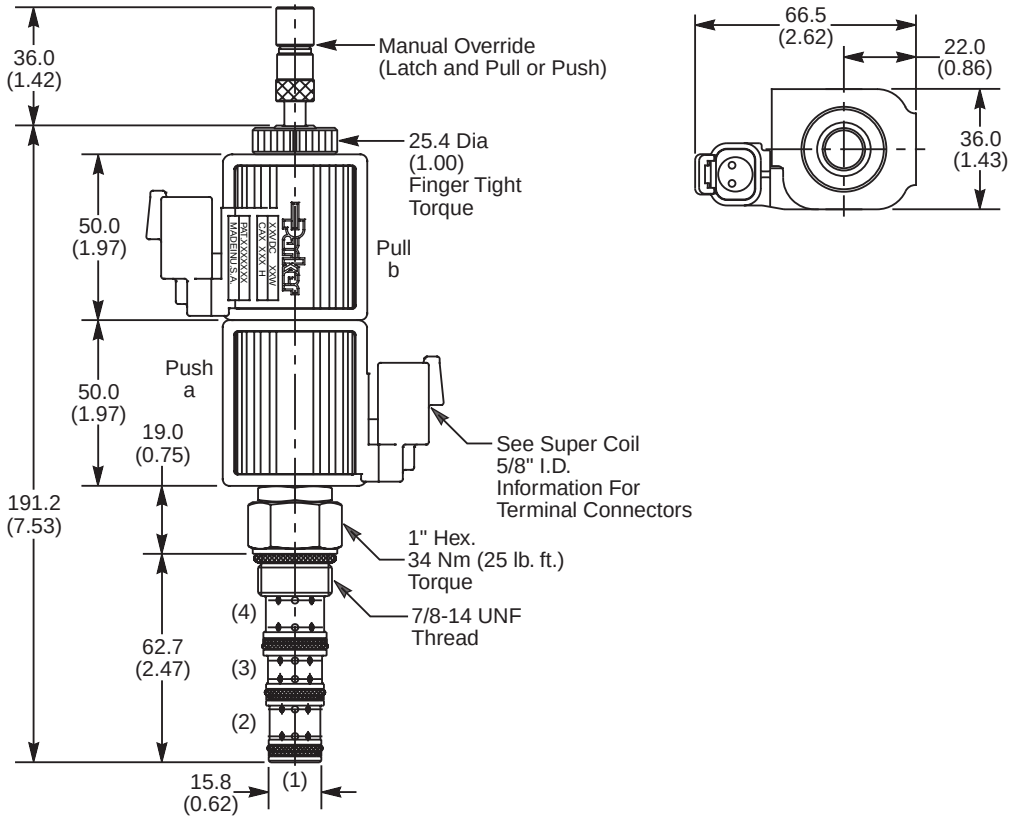
Pressure Drop vs. Flow (Through cartridge only)



Operating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)



Ordering Information

GS04	57				D				–		
10 Size Solenoid Valve	Style	Override Option	Screen	Seals	Design Level	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
57	High Flow and Pressure ('SP' Coil)

Code	Override Options
0	None
1	Spring Centered (*111 nt/25 lbs.)
3	Cable Operated (*111 nt/25 lbs.)
5	Standard - Latch Operated, Pull and Push (*40 nt/9 lbs.)
6	Latch Operated Detented (*40 nt/9 lbs.)
7	1″ Knob, Pull or Push (*111 nt/25 lbs.)

Force to push at 210 Bar (3000 PSI). Less to Pull.

Code	Screen
0	None (*Contact factory for OEM requirements)*

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30506N-1)
V	Fluorocarbon / (SK30506V-1)

Code	Design Level
D	Includes Industry Common Cavity

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 28 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

22 Watts

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 5/8″ I.D.
DC Only

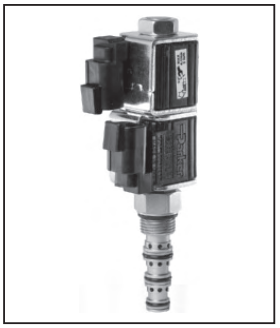
Code	Body Material
Omit	Steel
A	Aluminum

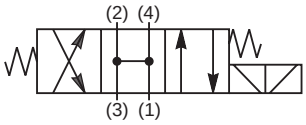
Code	Port Size	Body Part No.
Omit	Cartridge Only	
8T	SAE-8	(B10-4-*8T)
8B	1/2″ BSPG	(B10-4-*8B)

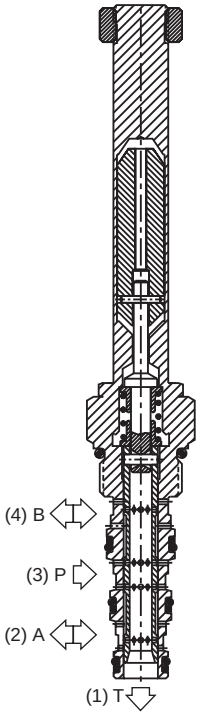
**** Add "A" for aluminum, omit for steel.***

General Description

4-Way, 3 Position, Open Center Spool Valve.
For additional information see Technical Tips on pages SV1-SV6.







Features

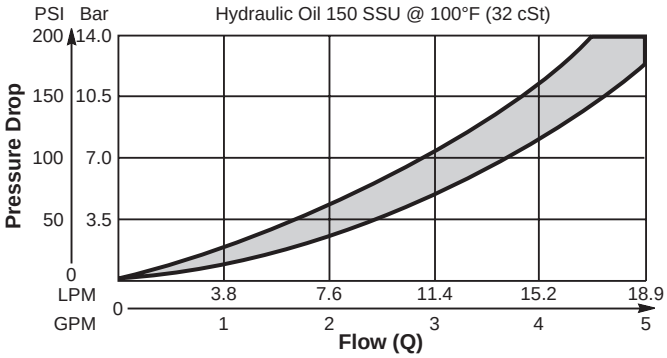
- Designed to operate double acting cylinders, pilot circuits and bi-directional motors, etc.
- High flow capacity with reduced space requirements
- High pressure capability
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Manual override available
- All external parts zinc plated

Specifications

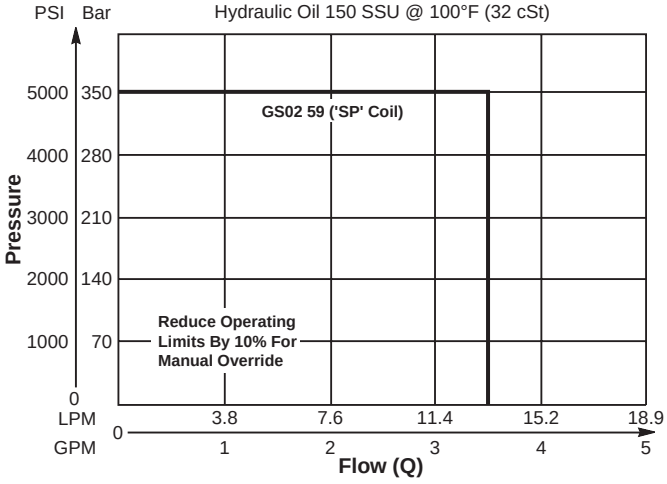
Rated Flow (At 70 PSI ΔP)	13.3 LPM (3.5 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.18 kg (.40 lbs.)
Cavity	C08-4 (See BC Section for more details)

Performance Curves

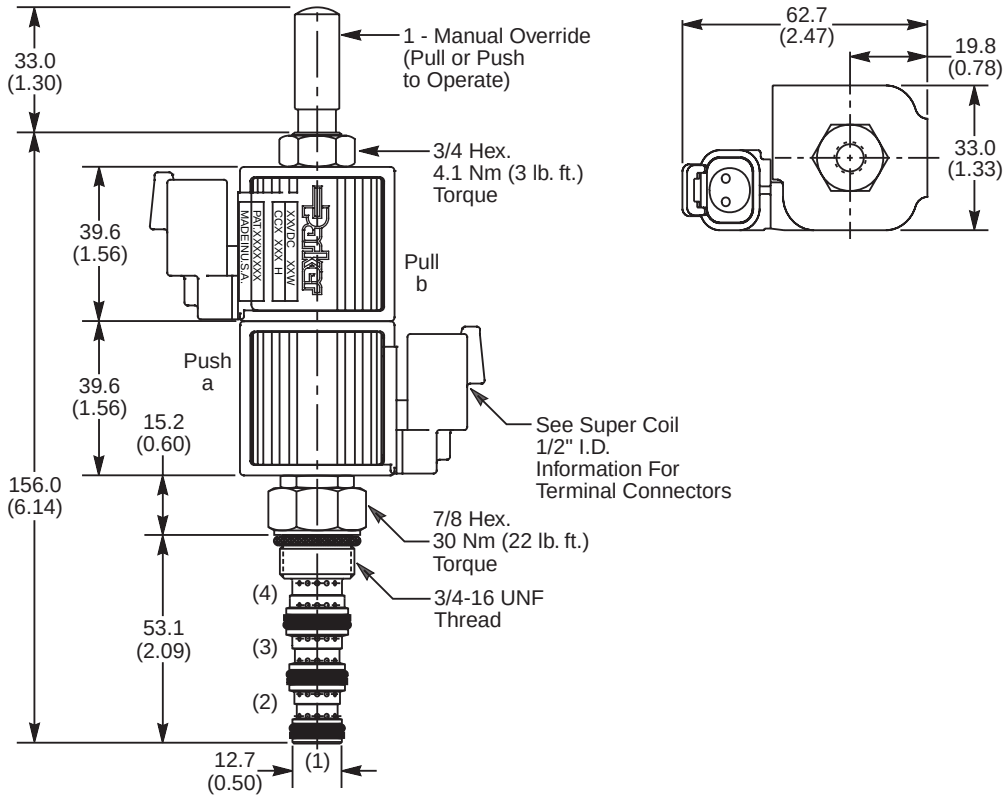
Pressure Drop vs. Flow (Through cartridge only)



Operating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)



Ordering Information

GS02	59							–		
08 Size Solenoid Valve	Style	Override Option	Screen	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
59	High Flow ('SP' Coil)

Code	Override Options
0	Not Required
1	Manual Override
2	Detented M.O.

Code	Screen
0	Not Available

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30078N-1)
V	Fluorocarbon / (SK30078V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

**22 Watts*

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
**DC Only*

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6T	SAE-6	(B08-4-*6T)
6B	3/8" BSPG	(B08-4-*6B)

** Add "A" for aluminum, omit for steel.*

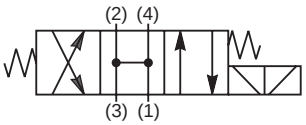
General Description

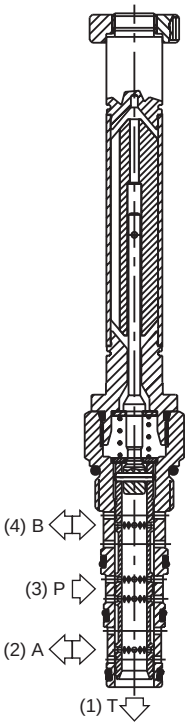
4-Way, 3 Position, Open Center Spool Valve.
For additional information see Technical Tips on pages SV1-SV6.

Features

- Four way open center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated





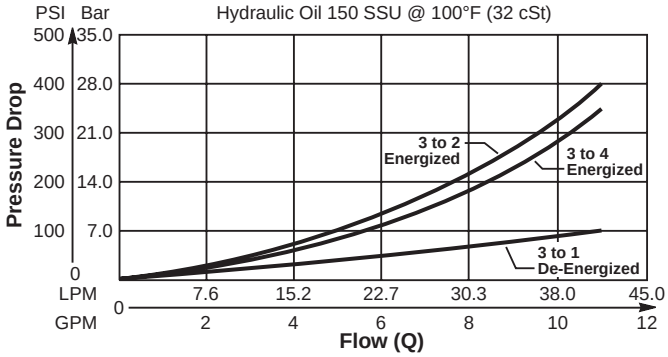


Specifications

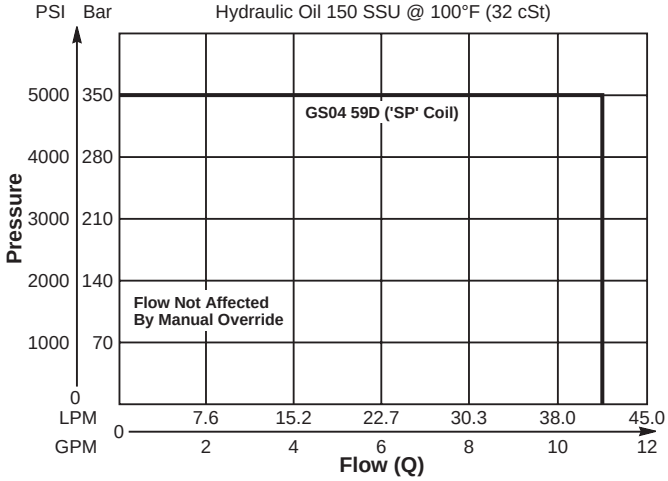
Rated Flow (At 70 PSI ΔP)	42 LPM (11 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min @ 210 Bar (3000 PSI)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 30-60 ms **Close** 20-40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.26 kg (.58 lbs.)
Cavity	C10-4 (See BC Section for more details)

Performance Curves

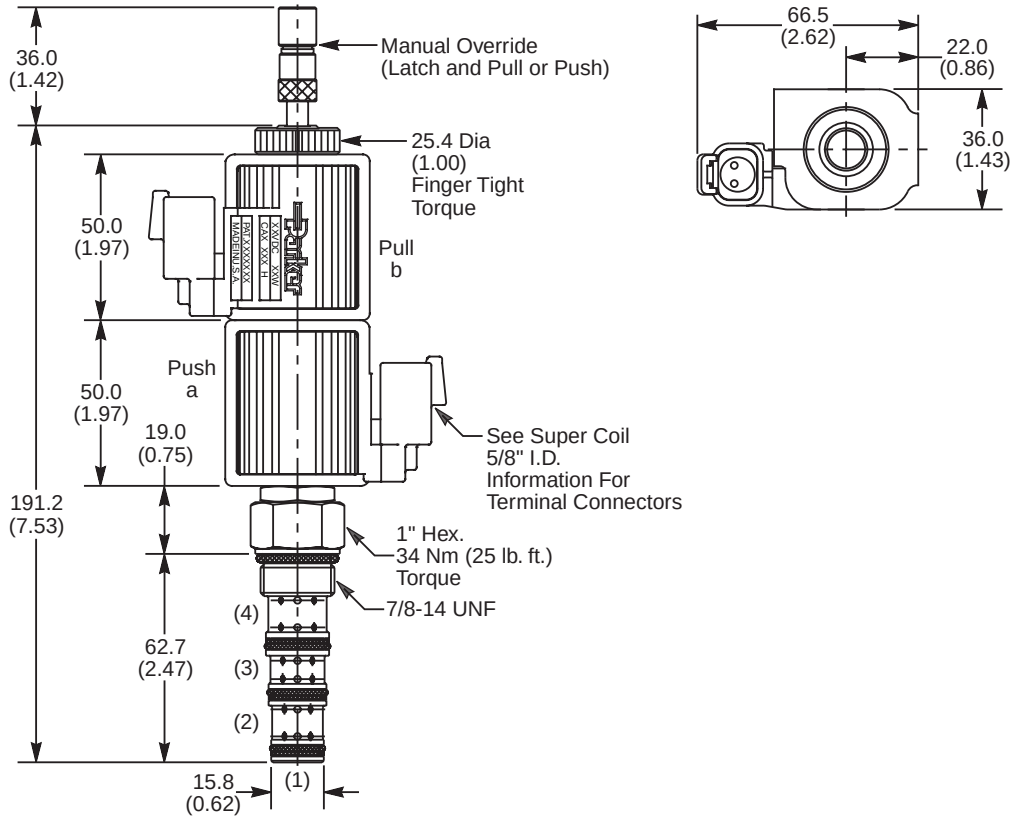
Pressure Drop vs. Flow (Through cartridge only)



Operating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)



Ordering Information

GS04	59				D				–		
10 Size Solenoid Valve	Style	Override Option	Screen	Seals	Design Level	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style
59	High Flow and Pressure ('SP' Coil)

Code	Override Options
0	None
1	Spring Centered (*111 nt/25 lbs.)
3	Cable Operated (*111 nt/25 lbs.)
5	Standard - Latch Operated, Pull and Push (*40 nt/9 lbs.)
6	Latch Operated Detented (*40 nt/9 lbs.)
7	1″ Knob, Pull or Push (*111 nt/25 lbs.)

Force to push at 210 Bar (3000 PSI). Less to Pull.

Code	Screen
0	None (*Contact factory for OEM requirements)*

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30506N-1)
V	Fluorocarbon / (SK30506V-1)

Code	Design Level
D	Includes Industry Common Cavity

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 28 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC
A120	120 VAC, 60/50 Hz
A240	240 VAC, 60/50 Hz*

22 Watts

Code	Coil Termination
Omit	Without Coil
C	Conduit With Leads
D	DIN Plug Face
A	Amp Jr. Timer*
S	Dual Spade*
W	Dual Screw*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 5/8″ I.D.
DC Only

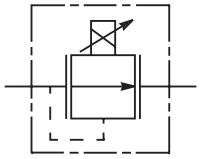
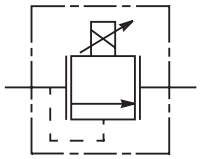
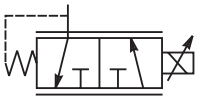
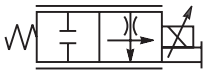
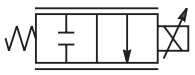
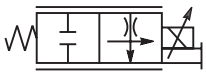
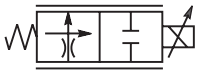
Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
8T	SAE-8	(B10-4-*8T)
8B	1/2″ BSPG	(B10-4-*8B)

**** Add "A" for aluminum, omit for steel.***

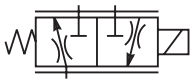
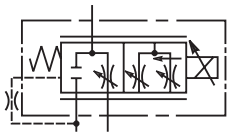
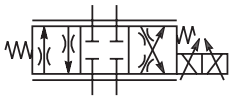
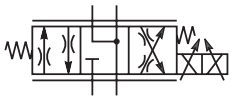
Contents

Proportional Valves

	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
	**PRESSURE RELIEVING**					
	AP01B2YP	2G	Increase Pressure/Increase Current	5.3/1.4	350/5000	PV7-PV8
	AP02A2	C08-2	Increase Pressure/Increase Current	30/8	350/5000	PV9-PV10
	AP04G2YP	C10-2	Increase Pressure/Increase Current	45/12	350/5000	PV11-PV12
	ERV121N	C12-2	Increase Pressure/Increase Current	100/25	210/3000	PV13-PV14
	ERV161N	C16-2	Increase Pressure/Increase Current	150/40	210/3000	PV15-PV16
	AP01B2YR	2G	Decrease Pressure/Increase Current	5.3/1.4	350/5000	PV17-PV18
	AP02B2YR	C08-2	Decrease Pressure/Increase Current	5.3/1.4	350/5000	PV19-PV20
	AP04G2YR	C10-2	Decrease Pressure/Increase Current	95/25	350/5000	PV21-PV22
	**PRESSURE REDUCING**					
	GP01 30	54-1	Pressure Reducing Valve	1.9/.5	210/3000	PV23-PV24
	GTP02 34	C08-3	Pressure Reducing Valve	19/5	210/3000	PV25-PV26
	GTP04 34	3X	Pressure Reducing Valve	30/8	210/3000	PV27-PV28
	**FLOW CONTROLS**					
	DF122C	C12-2	Flow Control, N.C.	53/14	210/3000	PV29-PV30
	DF161C	C16-2	Flow Control, N.C.	150/40	210/3000	PV31-PV32
	DF201C	C20-2	Flow Control, N.C.	325/60	210/3000	PV33-PV34
	HP02C	2X	Flow Control, N.C.	23/6	210/3000	PV35-PV36
	JP02C	C08-3	Flow Control, N.C.	23/6	210/3000	PV37-PV38
	HP04C	C10-2	Flow Control, N.C.	36/9.5	210/3000	PV39-PV40
	JP04C 21	3X	Flow Control, N.C.	36/9.5	210/3000	PV41-PV42
	HP02P	2X	Flow Control, N.O.	19/5	210/3000	PV43-PV44
	JP02P	C08-3	Flow Control, N.O.	19/5	210/3000	PV45-PV46
	HP04P	C10-2	Flow Control, N.O.	30/8	210/3000	PV47-PV48
	JP04P	3X	Flow Control, N.O.	36/9.5	210/3000	PV49-PV50
	DF122N	C12-2	Flow Control, N.O.	53/14	210/3000	PV51-PV52

Contents

Proportional Valves

	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
	**FLOW CONTROL, 3-WAY**					
	DF083N	C08-3	Flow Control, 3-Way	11/3	210/3000	PV53-PV54
	JP04C 31	4C	Priority Flow Control, N.C.	30/8	210/3000	PV55-PV56
	**DIRECTIONAL CONTROL**					
	GP02 51	C08-4	4 Way, 3 Pos - Closed Center	21/5.5	350/5000	PV57-PV58
	GP04 51	C10-4	4 Way, 3 Pos - Closed Center	32/8.5	350/5000	PV59-PV60
	GP02 53	C08-4	4 Way, 3 Pos - Float Center	17/4.5	350/5000	PV61-PV62
	GP04 53	C10-4	4 Way, 3 Pos - Float Center	38/10	350/5000	PV63-PV64

INTRODUCTION

This technical tips section is designed to help familiarize you with the Parker line of Proportional Valves. In this section we present common options, technical terms, as well as a brief synopsis of the operation and applications of the various products offered in this section. The intent of this section is to help you in selecting the best products for your application.

COMMON OPTIONS

As you will see, Parker offers a variety of Proportional Valve products. As such, some of the options mentioned below may not be available on all valves. Consult the model coding and dimensions for each valve for specifics. Here are some of the common options available.

Seals: The majority of the products are available in Nitrile or Fluorocarbon Seals. The Winner's Circle products feature a standard 4301 Polyurethane "D"-Ring. The "D"-Ring eliminates the need for backup rings. You should match the seal compatibility to the temperature and fluid being used in your application.

Overrides: Overrides are standard on many of the Parker proportional valves. The override is generally a push type that is flush with the end of the tube. Consult the individual catalog pages for more details.

TECHNICAL TERMS

To help in applying our proportional valve line of product, we have listed some technical terms below, as well as some helpful hints in applying our valves.

Ohm's Law: Electrical current is generated as a result of the relationship between input voltage and the resistance to the flow of electrical current. It is represented in equation form by I = V/R (or V=IR), where I is current, V is voltage and R is resistance. This is an important relationship to remember when dealing with any electrically operated valves. Proportional valves allow varying control of flow or pressure, dependant on the current signal provided. As coils heat up, their resistance rises. This means a higher voltage must be available to maintain the same amount of pressure or flow. Thus, the application needs to be designed such that the full on position is about 70% of the initial current draw. On the individual catalog pages a maximum control current is specified to help in applying our proportional valves.

PWM: Pulse Width Modulation (PWM) is the preferred signal for controlling electrical current. PWM is on / off voltage in a square wave form. The percent "on" time or duty cycle provides the average voltage. The valve driver adjusts the duty cycle to obtain current control. We recommend valve drivers with current control for optimum performance. PWM signals also usually provide dither for the proportional valve. Dither is a small back and forth movement of the valve spool around its set position. This rapid movement reduces the friction of the valve and leads to faster, more accurate response.

PWM Frequency: The frequency of a PWM signal is the rate at which the signal is turned on and off. Parker's analog proportional valves are designed to work with low frequency responses between 100-400 Hz. The performance curves on our catalog pages were performed with a PWM signal at 200 Hz.

Hysteresis: Due to various factors, the performance of a proportional valve will show a slightly different performance when the current signal is increasing than it will when the signal is being decreased. This difference is usually expressed as a percentage of total input change and is referred to as the hysteresis of the valve.

Deadband: Cracking or deadband refers to the amount of the control signal that is needed to produce any movement of the spool. Thus, a 20% deadband means that 20% of the control signal is needed before the spool will move.

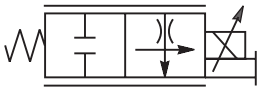
PRODUCT TYPES / APPLICATIONS

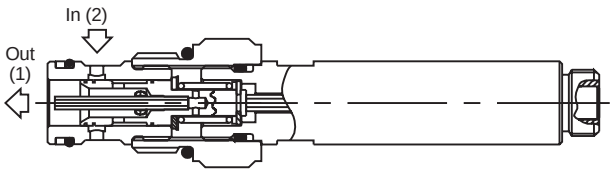
Proportional valves are nothing more than electrically adjustable hydraulic valves. They give the operator nearly infinite adjustment control and flexibility. Parker Hannifin offers various types of proportional flow control, pressure reducing, and relief valves.

Proportional Flow Control Valve

Proportional flow control valves provide pseudo pressure compensation and are used on systems requiring variable electronic control of flow. They allow the operator to vary the control signal to accelerate or decelerate an actuator. A compensator valve can be added to the circuit for enhanced compensation. Some typical applications would include the hoist control for a lift, or the speed control for a winch circuit. Parker offers both normally closed and normally open versions of proportional flow controls.

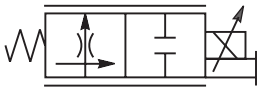
Normally Closed Proportional Flow Control

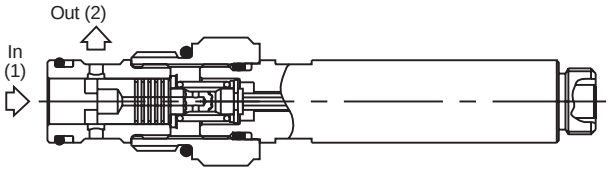




OPERATION - With the solenoid coil de-energized, the spool is held in a closed position by the spring force. When the solenoid coil is energized, the amperage of the signal moves the spool into an open position. The spool is held in this position by a balance between spring force and electrical force. As the current increases, the spools opens further; allowing more flow. As the current decreases, the spool begins closing; allowing less flow. Pseudo compensation is obtained by the pressure drop across the orifices in the spool.

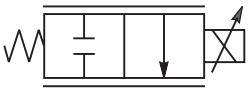
Normally Open Proportional Flow Control

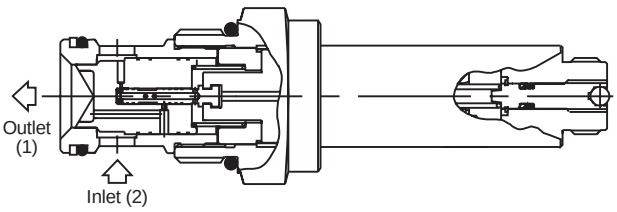




OPERATION - With the solenoid coil de-energized, the spool is held in an open position by spring force; allowing full flow to pass. As the solenoid coil is energized, the spool begins to move away from a full open position; allowing less flow to pass. Once a full electronic signal is given, the spool is held in a closed position; allowing no flow to pass. As the electronic signal is then reduced, the spool begins to open; allowing flow to pass again. Once a constant electronic signal is given, the spool is held in that position by a balance between electronic force and spring force. Pseudo compensation is obtained by the pressure drop across the orifices in the spool.

Normally Closed Proportional Needle Valve

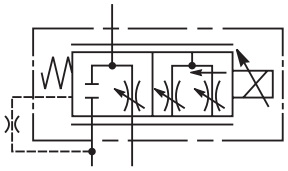


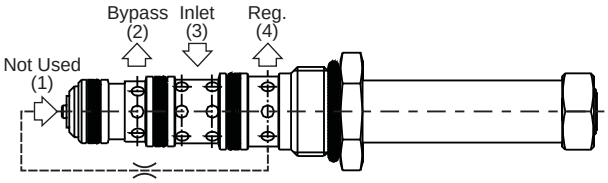


The proportional needle valves are electronic controlled variable needle valves. They are designed specifically for bleed off or unloading circuits as back pressure will affect performance.

OPERATION - With the solenoid de-energized, the main poppet is held in the closed position by spring force. When the solenoid is energized, the sensing spool moves into a partially open position relative to the percentage of rated current flowing through the coil. This action allows the main poppet to move away from the valve seat to a degree that corresponds to sensing spool position. The valve will maintain a fixed amount of opening as long as the electrical current remains constant and will vary proportionally with an increase or decrease in current.

Proportional Priority Bypass Flow Control

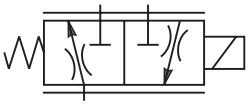


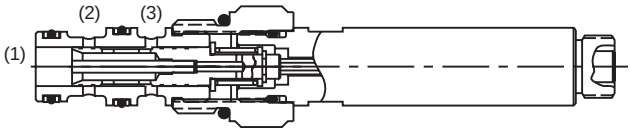


The proportional priority bypass flow controls allow electronic control of the flow setting for the priority flow circuit. The priority flow remains constant regardless of changes in load or pressure. The excess inlet flow is diverted or bypassed to tank. The bypass port must not have any restrictions or performance will be hindered.

OPERATION - Flow enters the valve through port 3. With the coil de-energized, flow is bypassed to port 2. When the coil is energized, the internal orifice is increased allowing pressure compensated flow to the priority port (port 4). The excess flow is bypassed to port 2. As input current is increased, the priority flow increases and the bypass flow decreases. As the current is decreased, priority flow decreases and bypass flow is increased.

Proportional 3-Way Flow Control

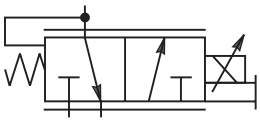


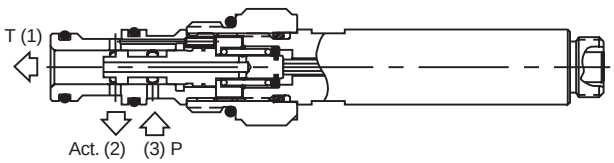


Proportional 3-Way flow controls allow the user to control the flow on a three way circuit. It can be used as either a normally open or normally closed three way valve. They are well suited for circuits requiring acceleration or deceleration control.

OPERATION - *Normally Closed* (Port 2 to Port 1) With the solenoid coil de-energized, the spool is held in a closed position by the spring force. When the solenoid coil is energized, the amperage of the signal moves the spool to an open position. The spool is held in this position by a balance between spring force and electrical force. As the electrical force increases, the spool opens further; allowing more flow. As the electrical force decreases, the spool begins closing; allowing less flow.
Normally Open (Port 1 to Port 3) With the solenoid coil de-energized, the spool is held in an open position by the spring force; allowing full flow to pass. As the solenoid coil is energized, the spool begins to move away from a full open position; allowing less flow to pass. Once a full electronic signal is given, the spool is held in a closed position; allowing no flow to pass. As the electrical signal is then reduced, the spool begins to open; allowing flow to pass once again. Once a constant electronic signal is given, the spool is held in that position by a balance between electronic force and spring force.

Direct Acting, Normally Closed Proportional Pressure Reducing Valve





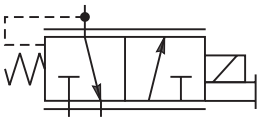
Direct acting, normally closed proportional pressure reducing valves are used to electronically reduce the inlet pressure to one leg of a hydraulic circuit. This valve is used when a fixed regulated pressure is required regardless of the inlet pressure. This valve could be used as a clutch control for power shift transmissions and PTO, or as a pilot control for directional control valves.

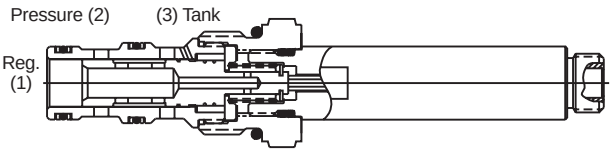
OPERATION - With the solenoid coil de-energized, the spool is held in a closed position by spring force. In this mode, the regulated pressure port is open to tank and the pressure inlet is blocked. As current is applied to the solenoid coil, the spool will begin to travel to a position where the pressure inlet port is connected to the regulated pressure port. At this point, reduced pressure becomes a function of the current signal. As long as the current signal is constant, the reduced pressure at the regulated pressure port will remain fixed regardless of any changes in inlet flow or inlet pressure. As the current signal increases or decreases, the reduced pressure at the regulated pressure port will change with respect to the changes in signal. Once the coil is fully energized, the reduced pressure of the regulated pressure port will be at the maximum reduced pressure for that valve.

Normally Closed Proportional Pressure Reducing / Relieving Valve

Normally Closed Proportional Pressure Reducing/Relieving Valves are used to electronically reduce the inlet pressure to one leg of a hydraulic circuit. In addition these valves act as a relief valve, relieving any shocks or surges that occur between its regulating port and the actuator. Parker offers direct acting and pilot operated versions of this valve. The direct acting valves are faster responding and generally have lower hysteresis, but are limited to smaller reduced pressures (generally below 800 psi depending on the valve.) Pilot operated are generally slower on response due to the two stage performance, but can have a reduced pressure as high as 3000 psi.

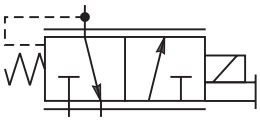
Direct Acting

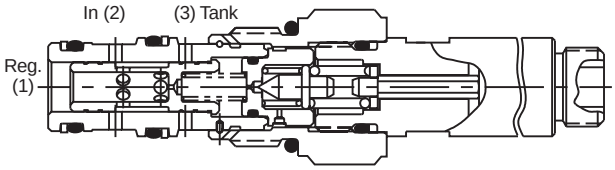




OPERATION - With the solenoid coil de-energized, the spool is held in a closed position by spring force. In this mode, the regulated pressure port is open to tank and the pressure inlet port is blocked. As an electronic signal is applied to the solenoid coil, the spool will begin to travel to a position where the pressure inlet port is connected to the regulated pressure port. At this point, reduced pressure becomes a function of the voltage signal. As long as the electronic signal is constant, the reduced pressure at the regulated pressure port will remain fixed regardless of any changes in inlet flow or inlet pressure. As the electronic signal increases or decreases, the reduced pressure at the regulated port will change with respect to the change in electronic signal. Once a full signal is given, the reduced pressure of the regulated pressure port will be at the maximum reduced pressure for that valve.

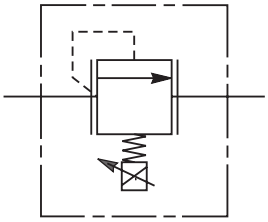
Pilot Operated

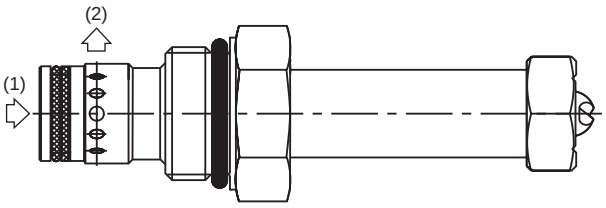




OPERATION - With the solenoid coil de-energized, the pilot dart is held open by the spring force. This allows the main spool to close and restricts flow from going from the inlet (2) port to the regulated port (1). As the electronic signal is applied to the coil, the pilot dart is moved towards the pilot seat restricting pilot flow. This restriction raises the effective pressure inside the chamber between the spool and the pilot seat, allowing the spool to travel away from the pilot seat to a position where the pressure at inlet (2) is connected to the regulated pressure port (1). At this point, reduced pressure becomes a function of the electronic signal. As long as the electronic signal is constant, the reduced pressure at the regulated pressure port (2) will remain fixed regardless of any changes in inlet flow or inlet pressure. As the electronic signal increases or decreases, the reduced pressure at port (1) will change with respect to the change in the electronic signal.

Normally Closed Proportional Relief Valve

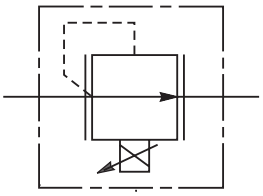


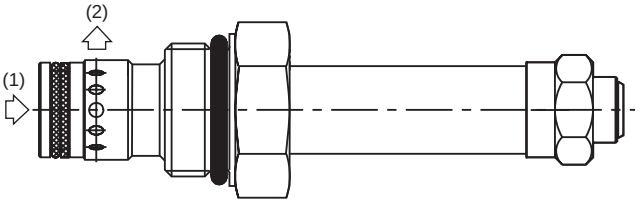


Normally closed proportional relief valves are used to electronically control the system pressure. These valves are ideal for circuits with varying system pressures demands. A small flow pilot version of the normally closed proportional relief is also offered for piloting a larger logic element or vented relief valve. The normally closed relief defaults to a maximum pressure setting (i.e. 3000 psi) when there is no current applied.

OPERATION - With the solenoid coil de-energized, the pilot dart is held closed by the spring. As current is applied to the coil, the pilot dart is moved creating less restriction of the pilot flow. As this restriction is reduced with the increasing current, the pressure setting also decreases. Once a constant electronic signal is given, the pilot dart is held in a given position, holding the pressure setting. This is maintained by the balance between the electronic spring force and the inlet pressure.

Normally Open Proportional Relief Valve





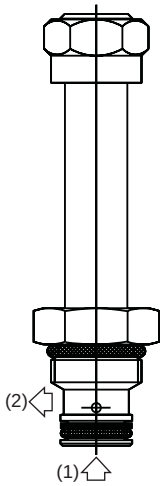
Normally open proportional relief valves are used to electronically control the system pressure. These valves are ideal for circuits with varying system pressure demands. A small flow pilot version of the normally open proportional relief is also offered for piloting a larger logic element or vented relief valve. The normally open relief defaults to minimum system pressure (i.e. 150 psi) when there is no current applied. Normally closed versions are also available upon request.

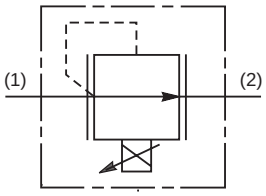
OPERATION - With the solenoid coil de-energized, the pilot dart is held open by the spring. This allows the main spool to open at minimum pressure 10.4 Bar (150 psi). As current is applied to the coil, the pilot dart is moved towards the pilot seat restricting pilot flow. This restriction raises the effective pressure setting of the valve. Once a constant electronic signal is given, the pilot dart is held in a given position, holding the pressure setting. This is maintained by a balance between electronic spring force and inlet pressure. As the electronic signal is reduced, the pilot dart is moved away from the pilot seat. This lowers the effective pressure setting of the valve.

General Description

Proportional Relief Valve. Increasing Pressure With Increasing Current. For additional information see Technical Tips on pages PV1-PV6.







Features

- Analog Proportional Relief Valve regulates pressure proportionally to the solenoid current
- Direct acting poppet design
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated

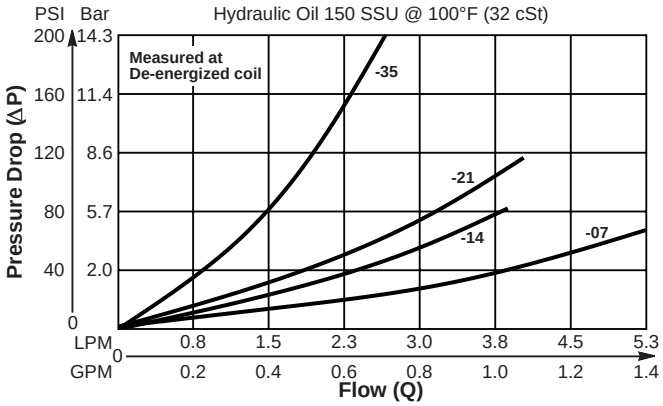
Specifications

Rated Flow (At 70 PSI ΔP)	**07C** 5.3 LPM (1.4 GPM) **14C** 3.4 LPM (0.9 GPM) **21C** 3.0 LPM (0.8 GPM) **35C** 1.3 LPM (.35 GPM)
Max. Pressure At Port 1 @ 75% Input Current	**07C** 70 Bar (1000 PSI) **14C** 140 Bar (2000 PSI) **21C** 210 Bar (3000 PSI) **35C** 350 Bar (5000 PSI)
Hysteresis @ 200 Hz PWM	5%
Cracking Pressure	**07C** .07 Bar (1 PSI) **14C** .14 Bar (2 PSI) **21C** .21 Bar (3 PSI) **35C** .35 Bar (4 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.06 kg (.14 lbs.)
Cavity	2G (See BC Section for more details)

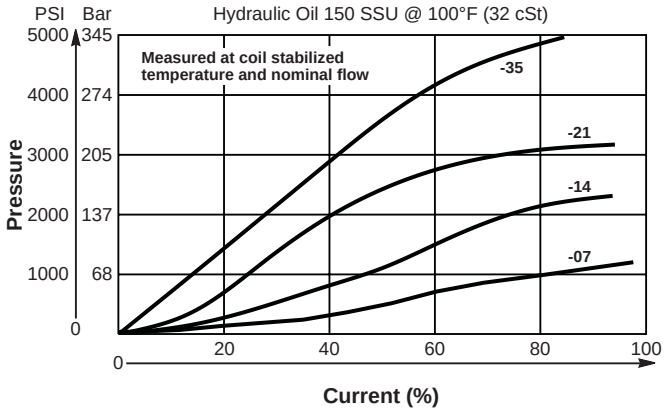
Performance Curves

▲PWM Current Regulator Recommended

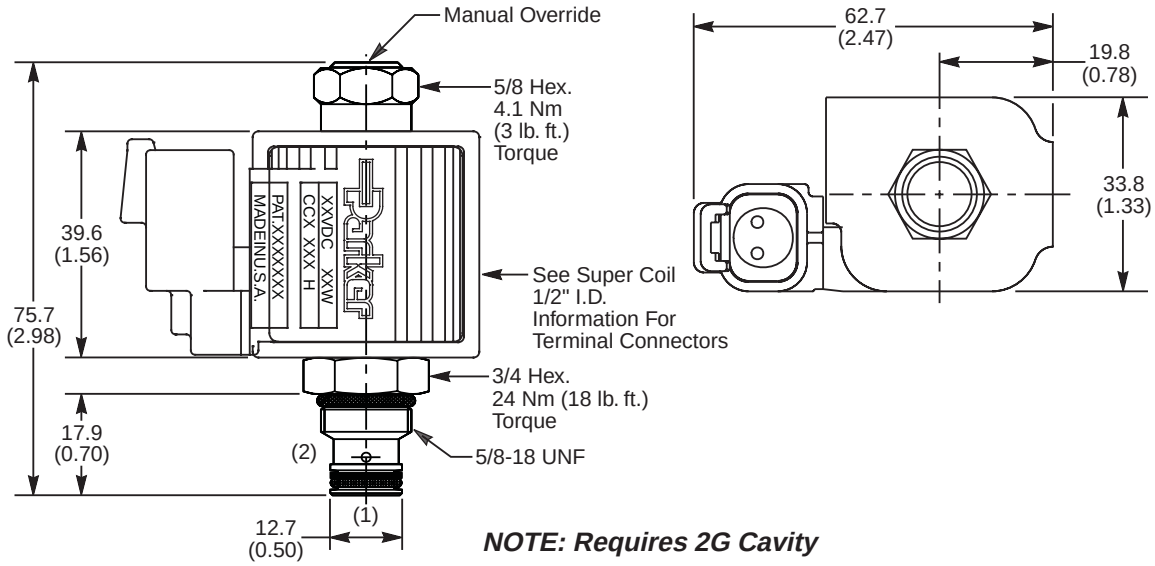
Pressure Drop vs. Flow



Pressure vs. Input Signal (Current)



Dimensions Millimeters (Inches)



NOTE: Requires 2G Cavity

THIRD-ANGLE PROJECTION

Ordering Information

AP01B2YP						
08 Size Proportional Relief Valve	Style	Override Option	Seals	Coil Type	Coil Voltage	Coil Termination

Code	Style (Maximum Relief Pressure)
07C	70 Bar (1000 PSI)
14C	140 Bar (2000 PSI)
21C	210 Bar (3000 PSI)
35C	350 Bar (5000 PSI)

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30129N-1)
V	Fluorocarbon / (SK30129V-1)
E	Ethylene Propylene

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
****DC Only***

Code	Override Option
Omit	Not Required (Std.)
1	Manual Override

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
324	1/4" SAE
325	1/4" BSP

Code	Body Material
A	Aluminum
S	Steel

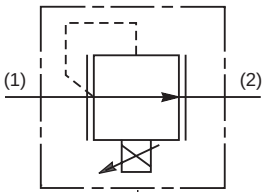
General Description

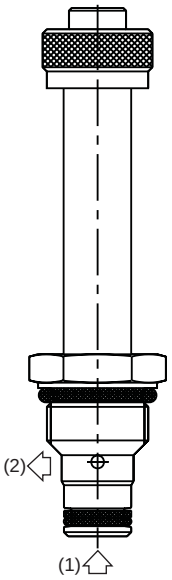
Proportional Relief Valve. Increasing Pressure With Increasing Current. For additional information see Technical Tips on pages PV1-PV6.

Features

- Analog Proportional Relief Valve regulates pressure proportionally to the solenoid current
- Direct acting poppet design
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated







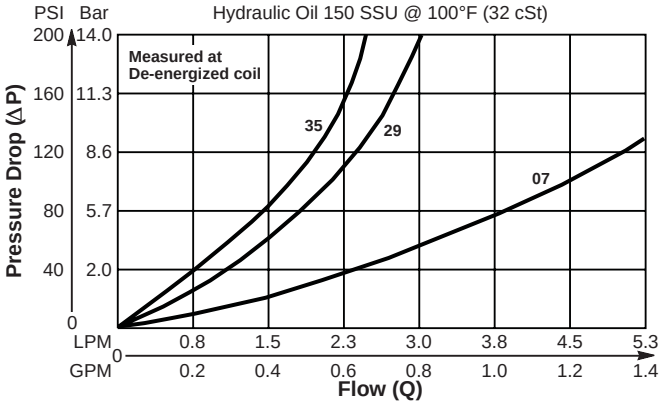
Specifications

Rated Flow (At 70 PSI ΔP)	**07** 5.3 LPM (1.4 GPM) **29** 3.0 LPM (0.8 GPM) **35** 2.3 LPM (0.6 GPM)
Max. Pressure At Port 1	**07** 70 Bar (1000 PSI) 'SS' Coil 100 Bar (1400 PSI) 'SP' Coil **29** 210 Bar (3000 PSI) 'SS' Coil 276 Bar (4000 PSI) 'SP' Coil **35** 350 Bar (5000 PSI) 'SP' Coil
Hysteresis @ 200 Hz PWM	< 5%
Cracking Pressure	10 Bar (140 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.08 kg (.17 lbs.)
Cavity	C08-2 (See BC Section for more details)

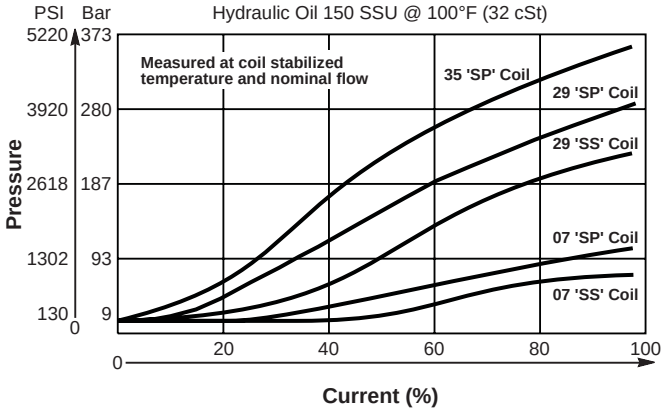
Performance Curves

▲PWM Current Regulator Recommended

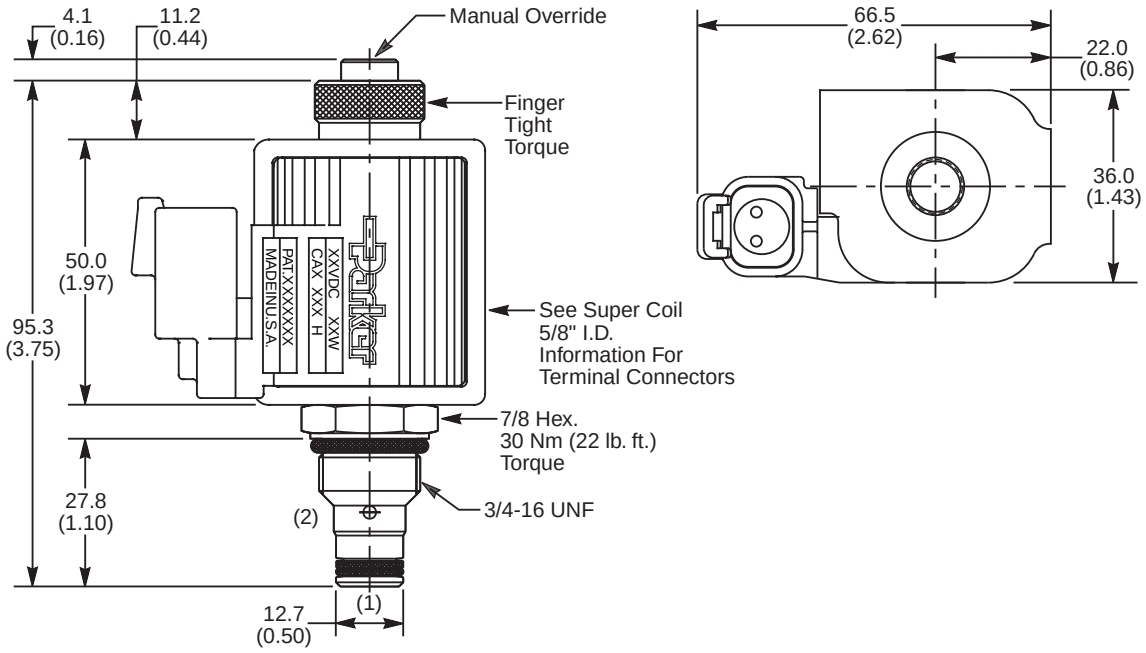
Pressure Drop vs. Flow



Pressure vs. Input Current (%)



Dimensions Millimeters (Inches)



Ordering Information

AP02A2 [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] — [ ] [ ]

08 Size Proportional Relief Valve	Style	Override Option	Filter Screen	Seals	Coil Type	Coil Voltage	Coil Termination	Body Material	Port Size

Code	Style (Maximum Relief Pressure)
07	70 Bar (1000 PSI) 'SS' Coil 100 Bar (1400 PSI) 'SP' Coil
29	210 Bar (3000 PSI) 'SS' Coil 290 Bar (4000 PSI) 'SP' Coil
35	350 Bar (5000 PSI) 'SP' Coil

Code	Override Options
0	Not Required
1	Non-Detented

Code	Filter Screen
0	None

Code	Seals / Kit. No.
N	Nitrile / Buna-N (Std.) (SK30006N-1)
V	Fluorocarbon / (SK30006V-1)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 18 Watts
SP	Super Coil - 28 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 5/8" I.D.
****DC Only***

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4" NPTF	(B08-2-*4P)
6P	3/8" NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8" BSPG	(B08-2-*6B)

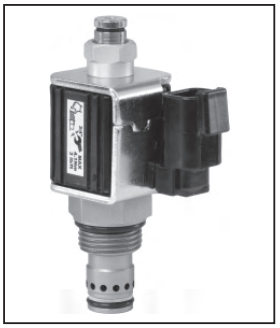
**** Add "A" for aluminum, omit for steel.***

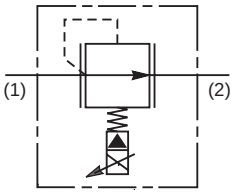
General Description

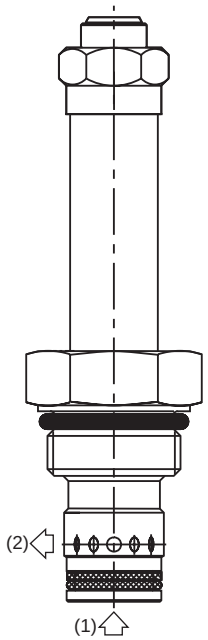
Proportional Relief Valve. Increasing Pressure With Increasing Current. For additional information see Technical Tips on pages PV1-PV6.

Features

- Pilot operated spool-type design fits industry common cavity (10-2)
- Relieving pressure output is proportional to DC current input
- Precise setting of factory preset pressure in energized mode
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated







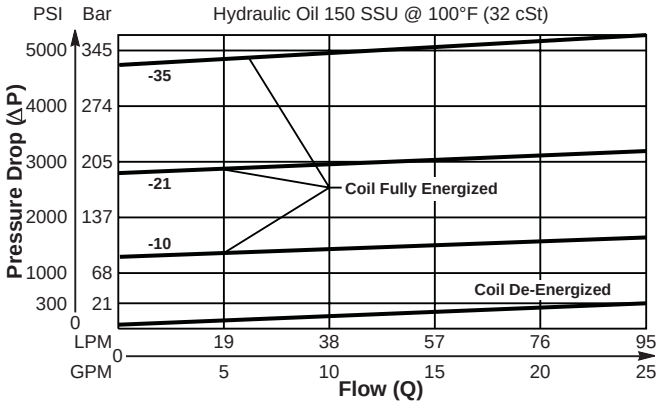
Specifications

Rated Flow (At 300 PSI ΔP) When Coil is Fully De-Energized	95 LPM (25 GPM)
Factory Set Relief Pressure When Coil De-Energized Measured at 45 LPM (12 GPM)	**10C** 103 Bar (1500 PSI) **21C** 210 Bar (3000 PSI) **35C** 350 Bar (5000 PSI)
Hysteresis @ 250 Hz PWM	< 7% of Maximum Pressure Setting
Response Time At 75% of Nominal Voltage Change (Measured To 90% of Press. Change)	**To Unload** 10ms **To Load** **10C** 45 ms **21C** 60 ms **35C** 80 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C10-2 (See BC Section for more details)

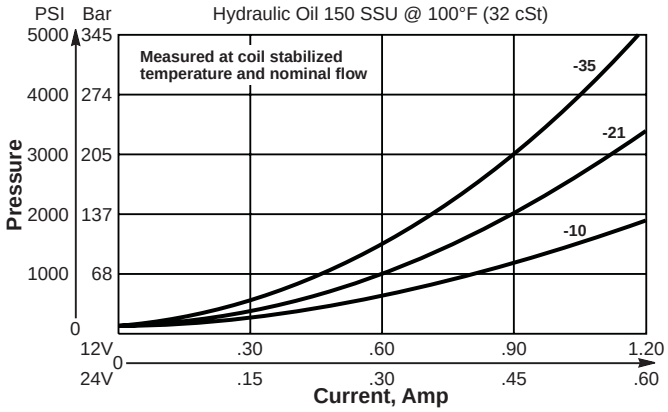
Performance Curves

▲PWM Current Regulator Recommended

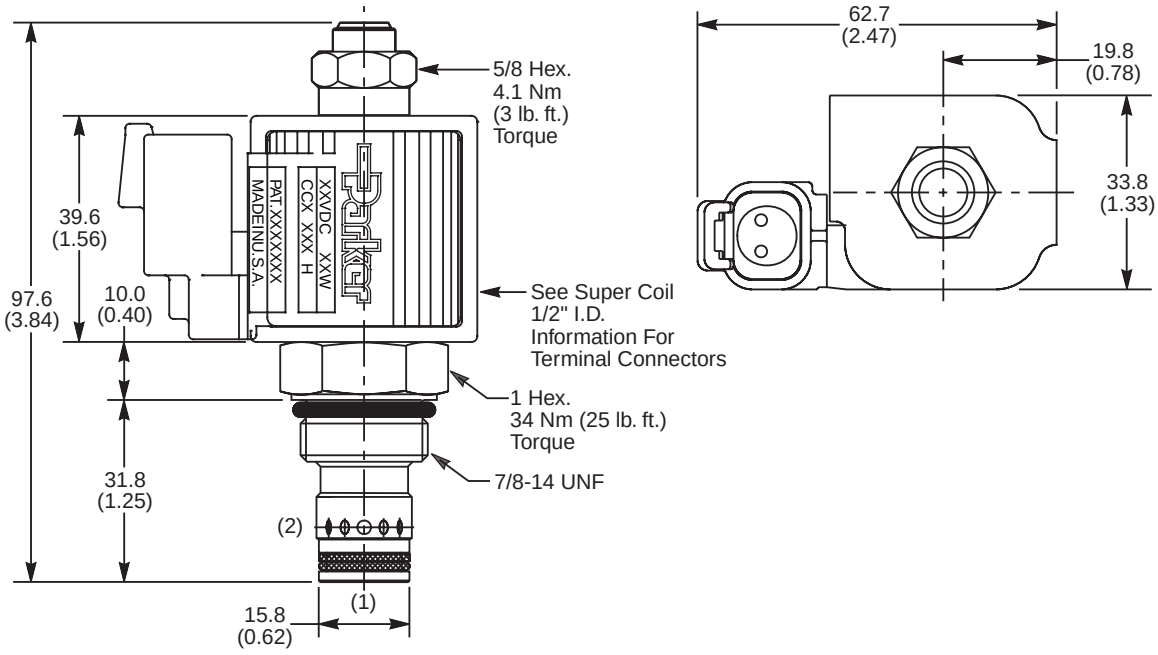
Relief Performance



Pressure vs. Input Current



Dimensions Millimeters (Inches)



THIRD-ANGLE PROJECTION

Ordering Information

AP04G2YP								
10 Size Proportional Relief Valve	Style	Seals	Coil Type	Coil Voltage	Coil Termination	—	Body Material	Port Size

Code	Style (Maximum Relief Pressure)
10C	104 Bar (1500 PSI)
21C	210 Bar (3000 PSI)
35C	350 Bar (5000 PSI)
XXC*	Custom Pressure Setting Expressed in 1/10 of Bar (Optional)

**** Set at .94 LPM (.25 GPM)***

Code	Seals / Kit. No.
N	Nitrile / Buna-N (Std.) (SK30503N-1)
V	Fluorocarbon / (SK30503V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
****DC Only***

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-*6B)

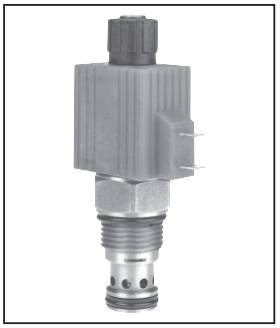
**** Add "A" for aluminum, omit for steel.***
† Steel body only.

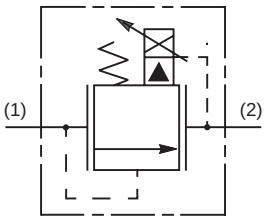
General Description

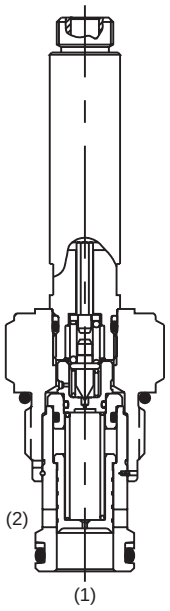
Normally Open Proportional Relief Valve. For normally closed version, consult factory. For additional information see Technical Tips on pages PV1-PV6.

Features

- On-off type solenoids
- Low hysteresis
- PWM signal preferred
- Manual override standard
- All external parts zinc plated

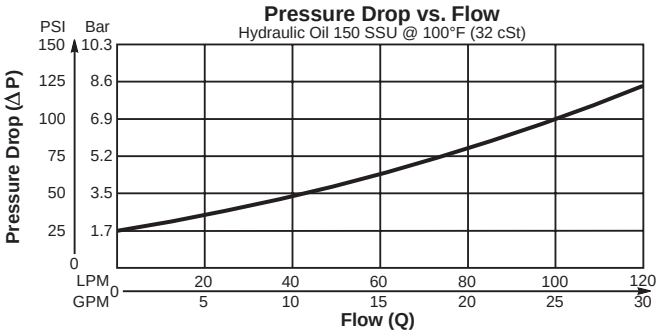




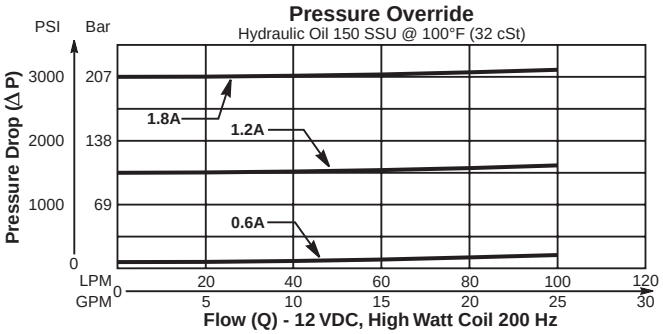


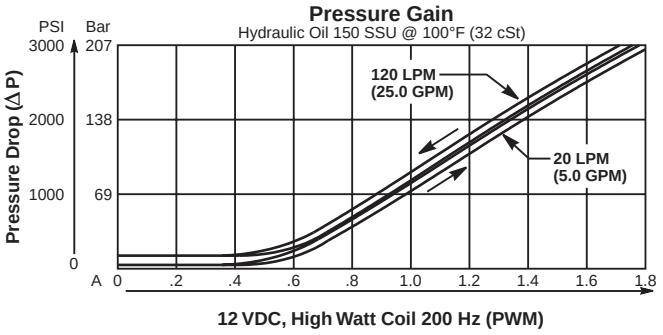
Specifications

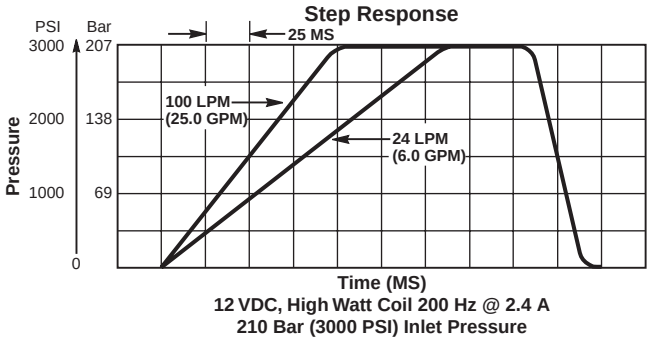
Rated Flow Valve Fully Open (De-energized)	100 LPM (25 GPM) at 7 Bar (100 PSI) ΔP
Maximum Inlet Pressure	210 psi (3000 PSI)
Hysteresis @ 200 Hz PWM	8%
Cracking (Dead band)	10% - 25% of Input signal
Frequency	100 - 400 Hz (200 Hz Preferred)
Maximum Control Current	**12VDC** 1.61A **24VDC** .84A
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.32 kg (0.7 lbs.)
Cavity	C12-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT12-2F



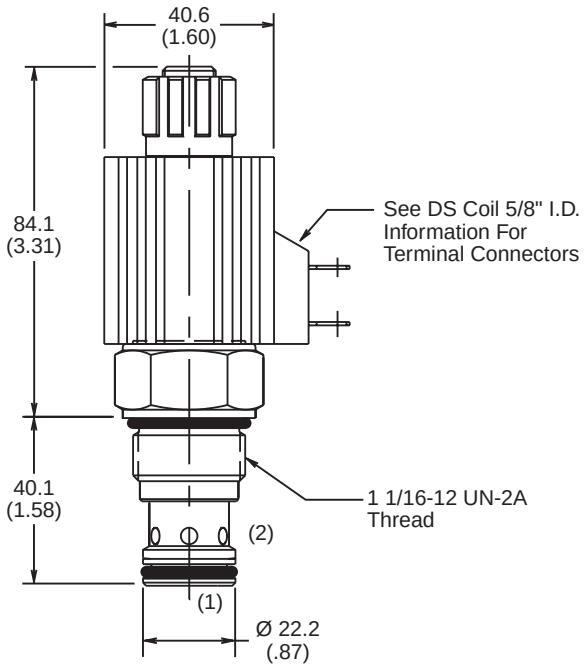
Performance Curves

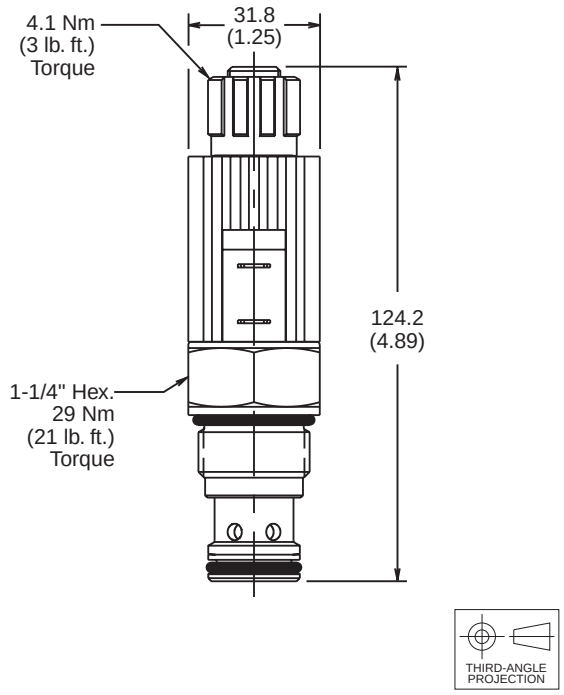






Dimensions Millimeters (Inches)





Ordering Information

ERV121N25	M				—		
Size 12 N.O. Proportional Relief Valve	Override Option	Seals	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Override Options
M	Push Type with Flush Rod

Code	Seals / Kit. No.
Omit	Nitrile / (SK12-2)
V	Fluorocarbon / (SK12-2V)

Code	Coil Voltage
Omit	Cartridge without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Cartridge without Coil
D	DIN
P	Dual Spade
S	Dual Screw
W	Dual Wire

See DS Coil 5/8" I.D. (High Watt)

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
12P	3/4" NTPF	(B12-2-*12P)
8T	SAE - 8	(B12-2-*8T)
12T	SAE - 12	(B12-2-*12T)

**** Add "A" for aluminum, omit for steel.***

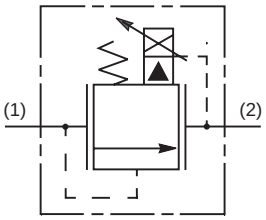
General Description

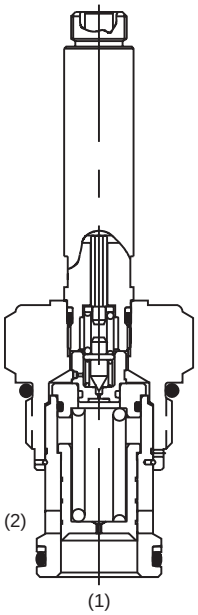
Normally Open Proportional Relief Valve. For normally closed version, consult factory. For additional information see Technical Tips on pages PV1-PV6.

Features

- On-off type solenoids
- Low hysteresis
- PWM signal preferred
- Manual override standard
- All external parts zinc plated

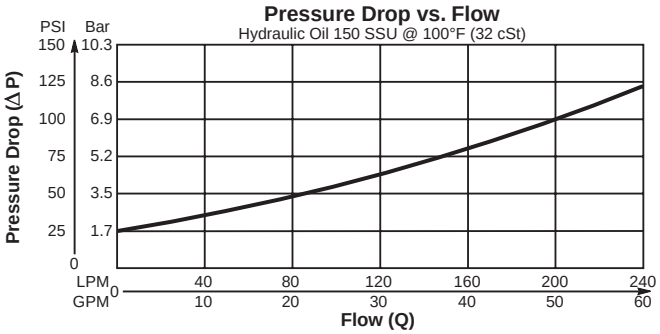




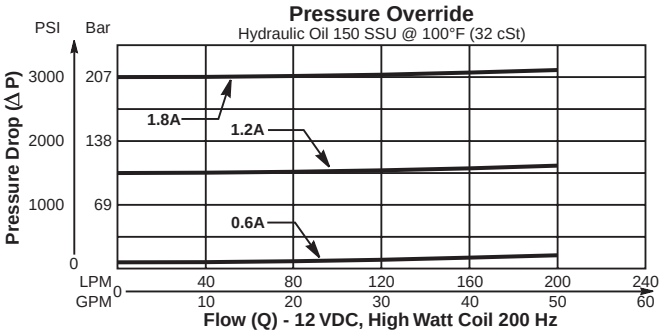


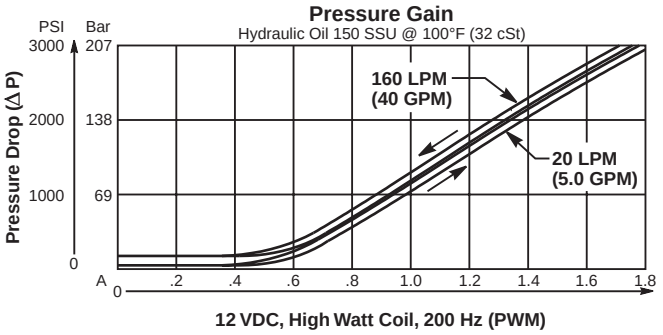
Specifications

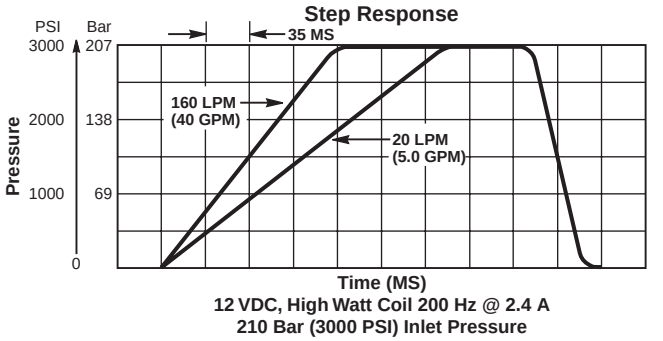
Rated Flow Valve Fully Open (De-energized)	150 LPM (40 GPM) at 7 Bar (100 PSI) ΔP
Maximum Inlet Pressure	210 psi (3000 PSI)
Hysteresis @ 200 Hz PWM	8%
Cracking (Dead band)	10% - 25% of Input signal
Frequency	100 - 400 Hz (200 Hz Preferred)
Maximum Control Current	**12VDC** 1.61A **24VDC** .84A
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.39 kg (0.86 lbs.)
Cavity	C16-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT16-2F



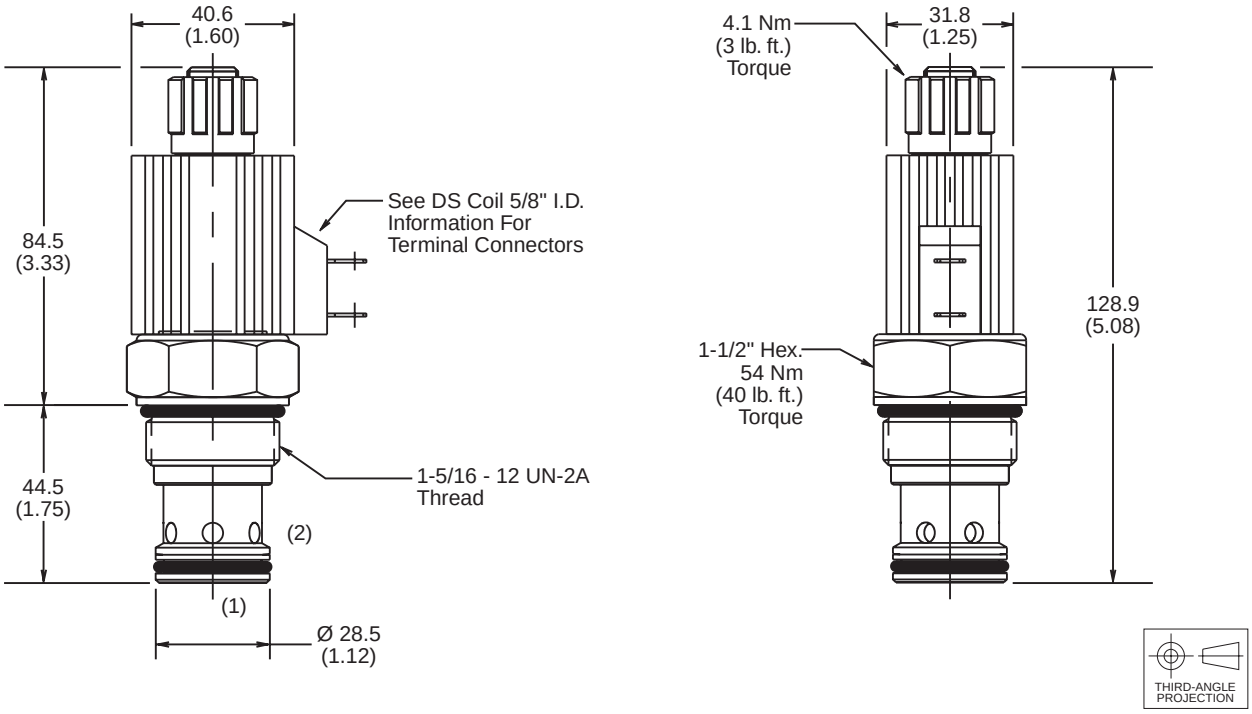
Performance Curves







Dimensions Millimeters (Inches)



Ordering Information

ERV161N40	M						
Size 16 N.O. Proportional Relief Valve	Override Option	Seals	Coil Voltage	Coil Termination	—	Body Material	Port Size

Code	Override Options
M	Push Type with Flush Rod

Code	Seals / Kit. No.
Omit	Nitrile / (SK16-2)
V	Fluorocarbon / (SK16-2V)

Code	Coil Voltage
Omit	Cartridge without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Cartridge without Coil
D	DIN
P	Dual Spade
S	Dual Screw
W	Dual Wire

See DS Coil 5/8" I.D. (High Watt)

Code	Body Material
Omit	Steel
A	Aluminum

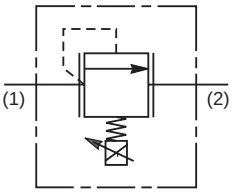
Code	Port Size	Body Part No.
12P	3/4" NTPF	(B16-2-*12P)
16P	1" NTPF	(B16-2-*16P)
8T	SAE - 8	(B16-2-*8T)
12T	SAE - 12	(B16-2-*12T)
16T	SAE - 16	(B16-2-*16T)
12B	3/4" BSPG	(B16-2-12B)†
16B	1" BSPG	(B16-2-*16B)

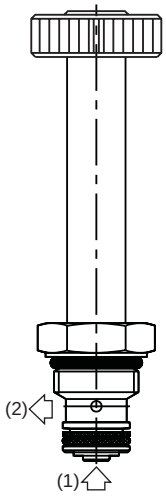
** Add "A" for aluminum, omit for steel.*
† Steel bodies only.

General Description

Proportional Relief Valve. Decreasing Pressure With Increasing Current. For additional information see Technical Tips on pages PV1-PV6.







Features

- Analog Proportional Relief Valve regulates pressure proportionally to the input solenoid current
- Direct acting poppet design
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated

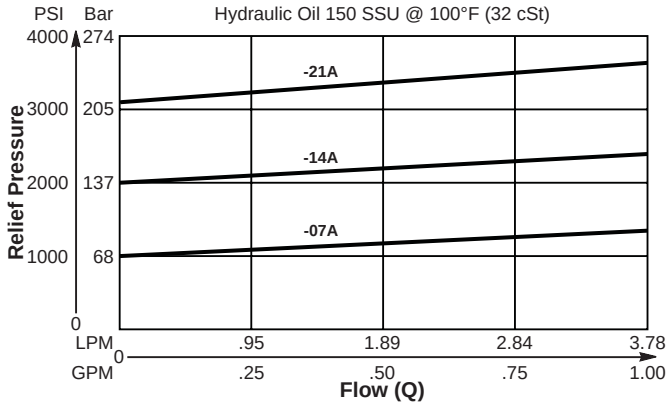
Specifications

Rated Flow (At 70 PSI ΔP)	**07A** 5.3 LPM (1.4 GPM) **14A** 3.4 LPM (0.9 GPM) **21A** 3.0 LPM (0.8 GPM)
Factory Set Relief Pressure When De-Energized (±5% -Std. ±2% - Low Variation)	**07A** 70 Bar (1000 PSI) **14A** 140 Bar (2000 PSI) **21A** 235 Bar (3400 PSI)
Hysteresis @ 200 Hz PWM	< 10%
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.09 kg (.19 lbs.)
Cavity	2G (See BC Section for more details)

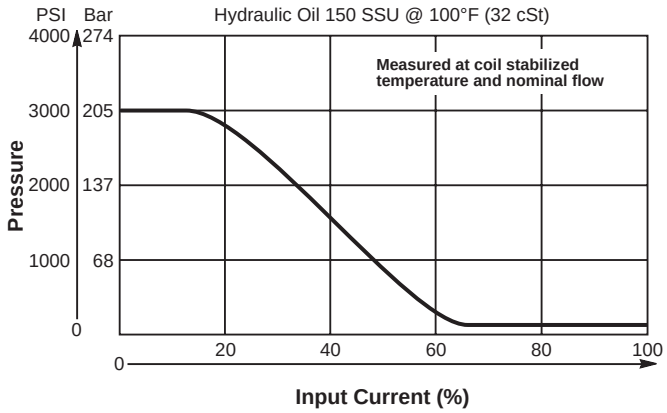
Performance Curves

▲PWM Current Regulator Recommended

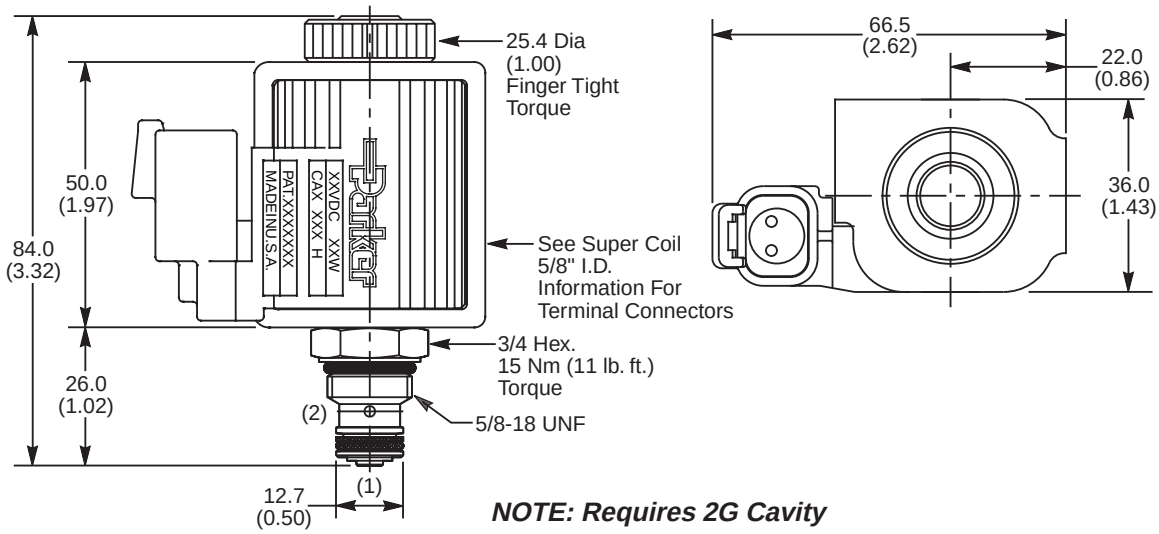
Relief Performance



Pressure vs. Input Current



Dimensions Millimeters (Inches)



NOTE: Requires 2G Cavity

THIRD-ANGLE PROJECTION

Ordering Information

AP01B2YR						
08 Size Proportional Relief Valve	Style	Seals	Factory Set Relief Pressure	Coil Type	Coil Voltage	Coil Termination

Code	Style (Maximum Relief Pressure)
07A	70 Bar (1000 PSI)
14A	140 Bar (2000 PSI)
21A	235 Bar (3400 PSI)

Code	Factory Set Relief Pressure Variation
Omit	±15% Std.
L	±2% Low Variation

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 28 Watts

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 5/8″ I.D.
****DC Only***

Code	Seals / Kit. No.
N	Nitrile / Buna-N (Std.) (SK30129N-1)
V	Fluorocarbon / (SK30129V-1)
E	Ethylene Propylene

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
324	1/4″ SAE
325	1/4″ BSP

Code	Body Material
A	Aluminum
S	Steel

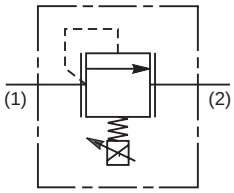
General Description

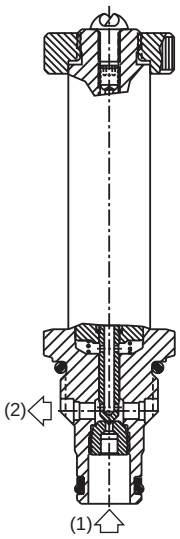
Proportional Relief Valve. Decreasing Pressure With Increasing Current. For additional information see Technical Tips on pages PV1-PV6.

Features

- Analog Proportional Relief Valve regulates pressure proportionally to the input solenoid current
- Direct acting poppet design
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated







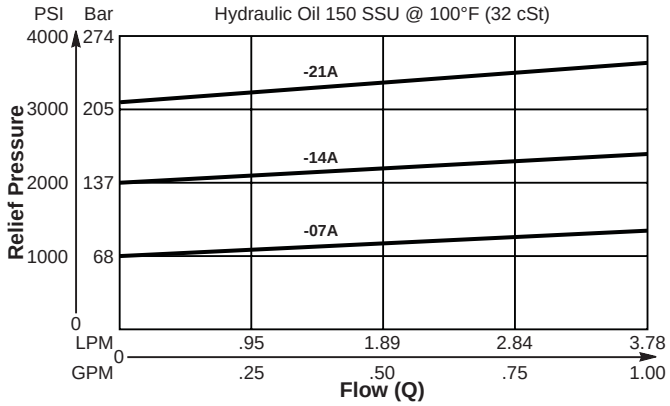
Specifications

Rated Flow (At 70 PSI ΔP)	**07A** 5.3 LPM (1.4 GPM) **14A** 3.4 LPM (0.9 GPM) **21A** 3.0 LPM (0.8 GPM)
Factory Set Relief Pressure When De-Energized (±5% -Std. ±2% - Low Variation)	**07A** 70 Bar (1000 PSI) **14A** 140 Bar (2000 PSI) **21A** 235 Bar (3400 PSI)
Hysteresis @ 200 Hz PWM	< 10%
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.09 kg (.19 lbs.)
Cavity	C08-2 (See BC Section for more details)

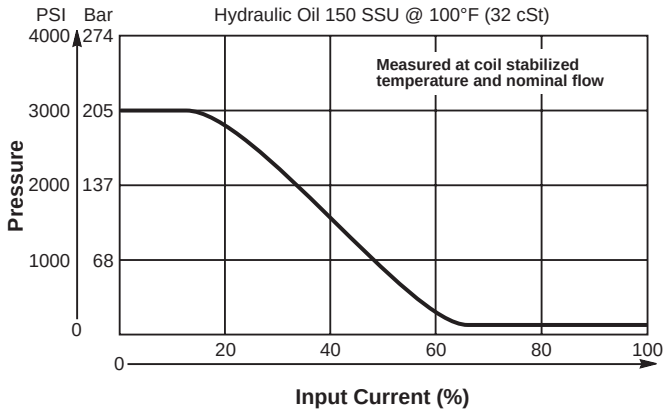
Performance Curves

▲PWM Current Regulator Recommended

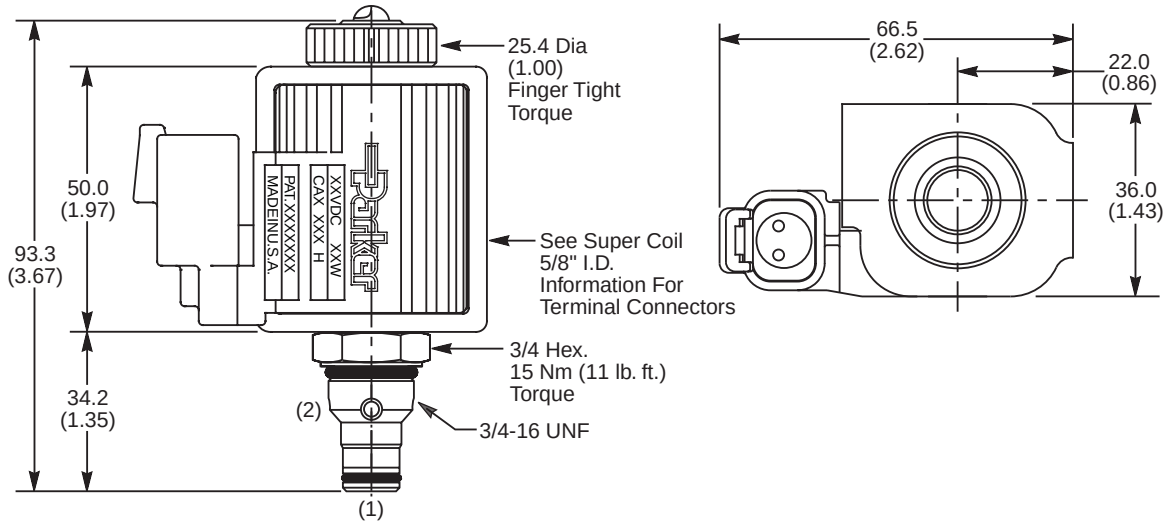
Relief Performance



Pressure vs. Input Current



Dimensions Millimeters (Inches)



THIRD-ANGLE PROJECTION

Ordering Information

AP02B2YR							—		
08 Size Proportional Relief Valve	Style	Seals	Factory Set Relief Pressure	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style (Maximum Relief Pressure)
07A	70 Bar (1000 PSI)
14A	140 Bar (2000 PSI)
21A	235 Bar (3400 PSI)

Code	Seals / Kit. No.
N	Nitrile / Buna-N (Std.) (SK30129N-1)
V	Fluorocarbon / (SK30129V-1)
E	Ethylene Propylene

Code	Factory Set Relief Pressure Variation
Omit	±15% Std.
L	±2% Low Variation

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 28 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 5/8" I.D.
****DC Only***

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B08-2-*4P)
6P	3/8″ NPTF	(B08-2-*6P)
4T	SAE-4	(B08-2-*4T)
6T	SAE-6	(B08-2-*6T)
6B	3/8″ BSPG	(B08-2-*6B)

**** Add "A" for aluminum, omit for steel.***

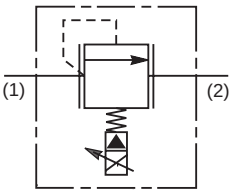
General Description

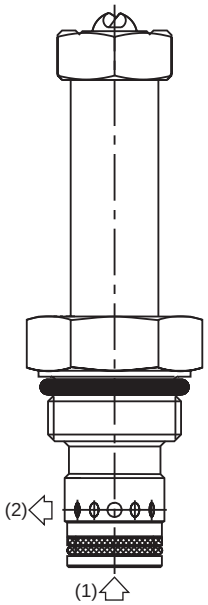
Proportional Relief Valve. Decreasing Pressure With Increasing Current. For additional information see Technical Tips on pages PV1-PV6.

Features

- Pilot operated spool-type design
- Precise setting of factory preset pressure in de-energized mode
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated







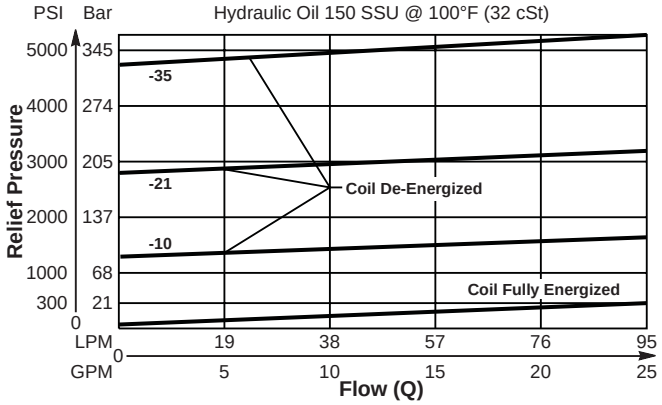
Specifications

Rated Flow (At 300 PSI ΔP) When Coil is Fully Energized	95 LPM (25 GPM)
Factory Set Relief Pressure When Coil De-Energized Measured at 45 LPM (12 GPM)	**10C** 103 Bar (1500 PSI) **21C** 210 Bar (3000 PSI) **35C** 350 Bar (5000 PSI)
Hysteresis @ 250 Hz PWM	< 7% of Maximum Pressure Setting
Response Time At 75% of Nominal Voltage Change (Measured To 90% of Press. Change)	**To Unload** 45ms **To Load** 25ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.30 lbs.)
Cavity	C10-2 (See BC Section for more details)

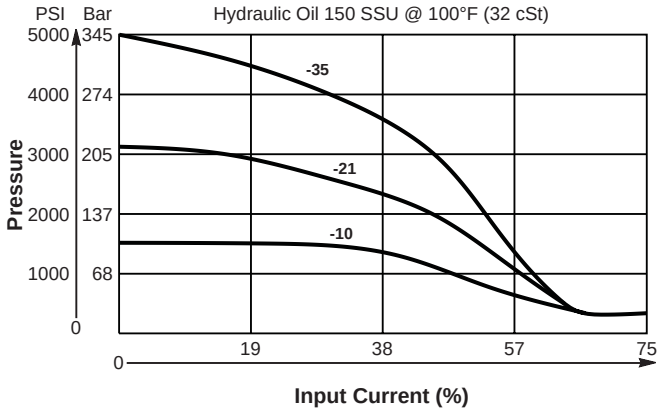
Performance Curves

▲PWM Current Regulator Recommended

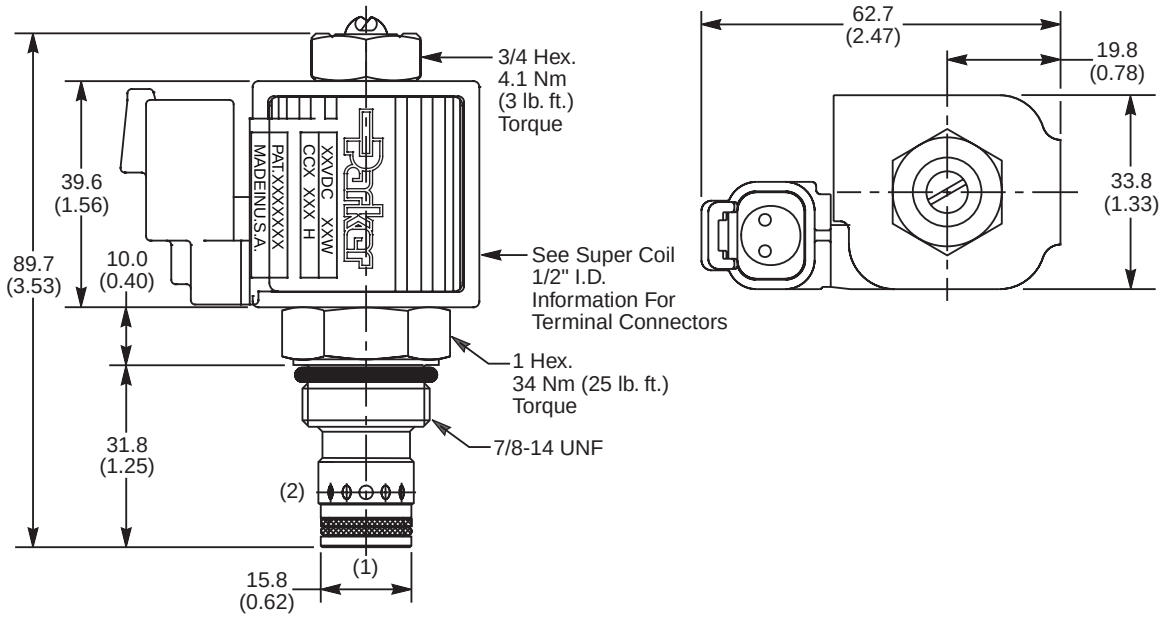
Relief Performance



Pressure vs. Input Current



Dimensions Millimeters (Inches)



THIRD-ANGLE PROJECTION

Ordering Information

AP04G2YR								
10 Size Proportional Relief Valve	Style	Seals	Coil Type	Coil Voltage	Coil Termination	—	Body Material	Port Size

Code	Style (Maximum Relief Pressure)
10C	104 Bar (1500 PSI)
21C	210 Bar (3000 PSI)
35C	350 Bar (5000 PSI)
XXC	Custom Pressure Setting Expressed in 1/10 of Bar (Optional)

** Set at .94 LPM (.25 GPM)*

Code	Seals / Kit. No.
N	Nitrile / Buna-N (Std.) (SK30503N-1)
V	Fluorocarbon / (SK30503V-1)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
**DC Only*

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4″ NPTF	(B10-2-*4P)
6P	3/8″ NPTF	(B10-2-*6P)
8P	1/2″ NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8″ BSPG	(B10-2-*6B)

** Add "A" for aluminum, omit for steel.*
† Steel body only.

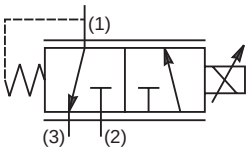
General Description

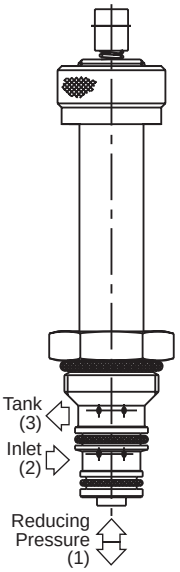
3 Way, 2 Position, Proportional Pressure Reducing Valve. Bottom Cylinder Port. For additional information see Technical Tips on pages PV1-PV6.

Features

- Designed for pilot control of directional valves
- Low Hysteresis
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated







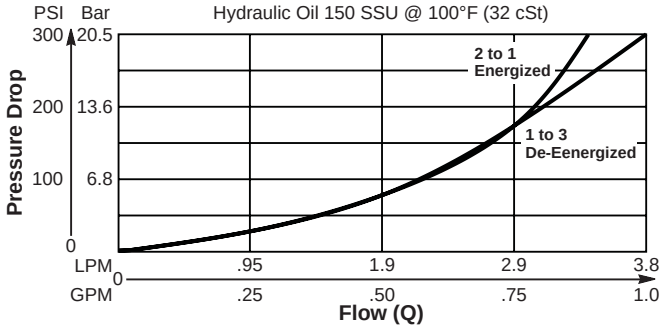
Specifications

Rated Flow (At 70 PSI ΔP)	1.9 LPM (0.5 GPM)
Max. Regulated Pressure @ 75% Current	**Standard** 17 Bar (250 PSI) **High Pressure** 22 Bar (320 PSI)
Max. Input Press. At Port 1	210 Bar (3000 PSI)
Max. Tank Press.	30 Bar (440 PSI)
Max. Drainage Flow In Regulating Zone	5 cc/min. When De-Energized 200 cc/min. In Regulating Zone At 68 Bar (1000 PSI) Input Pressure
Hysteresis @ 200 Hz PWM	2%
Dead End Response Time	t on = 30 ms t off = 10 ms At Step Signal 0 To 75% of Nominal Voltage
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.08 kg (.17 lbs.)
Cavity	54-1 (See BC Section for more details)

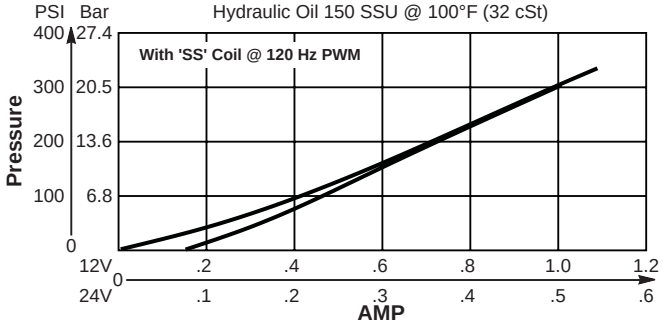
Performance Curves

▲PWM Current Regulator Recommended

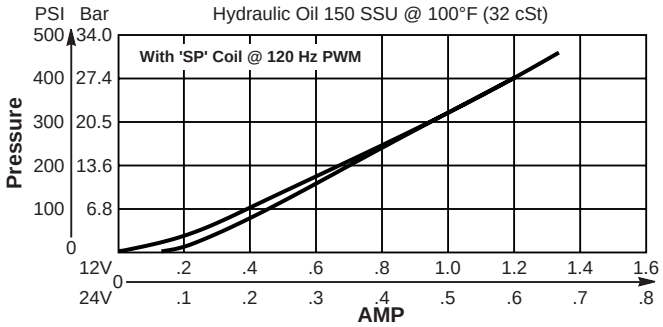
Pressure Drop vs. Flow



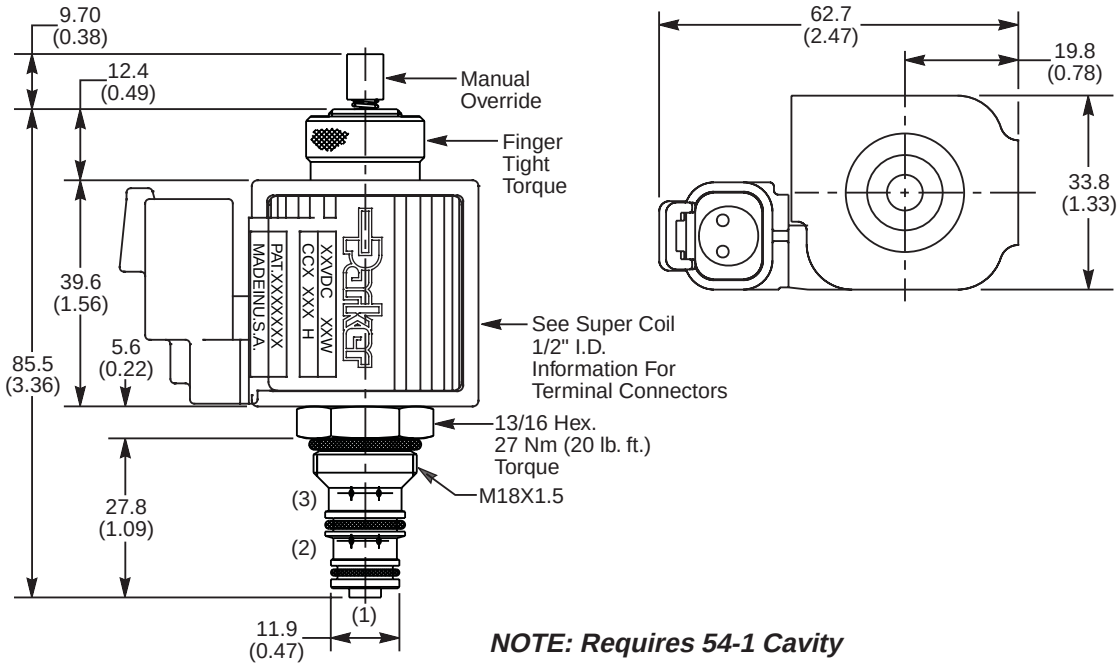
Pressure @ Port 1 vs. Input Current



Pressure @ Port 1 vs. Input Current



Dimensions Millimeters (Inches)



NOTE: Requires 54-1 Cavity

THIRD-ANGLE PROJECTION

Ordering Information

GP01	30						
08 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Coil Type	Coil Voltage	Coil Termination

Code	Style
30	Standard ('SS' Coil)
30	High Pressure ('SP' Coil)

Code	Filter Screen
Omit	Not Required
F	60 Mesh Screen on Inlet Port

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 14 Watts
SP	Super Coil - 19 Watts

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
****DC Only***

Code	Override Option
Omit	If No M.O.
1	Manual Override

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30122N-1)
V	Fluorocarbon / (SK30122V-1)

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
591	1/4" SAE

Code	Body Material
A	Aluminum
S	Steel

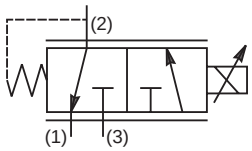
General Description

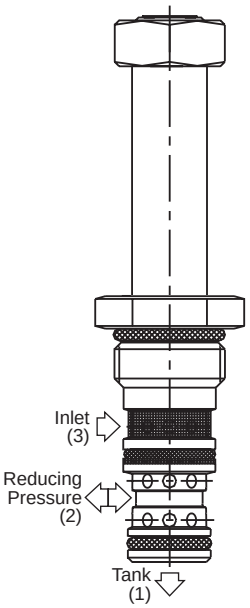
3 Way, 2 Position, Proportional Pressure Reducing Valve. Side Cylinder Port. For additional information see Technical Tips on pages PV1-PV6.

Features

- Minimal Hysteresis
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- All external parts zinc plated







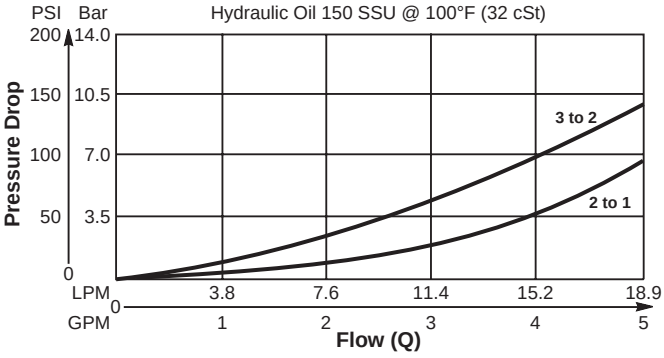
Specifications

Rated Flow (At 70 PSI ΔP)	19 LPM (5 GPM)
Max. Regulated Pressure @ 75% Current	**02** 8 Bar (120 PSI) 'SS' Coil 10 Bar (150 PSI) 'SP' Coil **03** 17 Bar (240 PSI) 'SS' Coil 21 Bar (300 PSI) 'SP' Coil **05** 33 Bar (480 PSI) 'SS' Coil 41 Bar (600 PSI) 'SP' Coil **09** 50 Bar (720 PSI) 'SS' Coil 62 Bar (900 PSI) 'SP' Coil **18** 100 Bar (1440 PSI) 'SS' Coil 124 Bar (1800 PSI) 'SP' Coil
Max. Input Press. At Port 3	210 Bar (3000 PSI)
Max. Drainage Flow In Regulating Zone	100 cc/min. When De-Energized 750 cc/min. In Regulating Zone At 21 Bar (300 PSI) Input Pressure
Hysteresis @ 100 Hz PWM	3.5%
Dead End Response Time	10 ms At Step Signal 0 To 75% of Nominal Voltage
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.08 kg (.17 lbs.)
Cavity	C08-3 (See BC Section for more details)

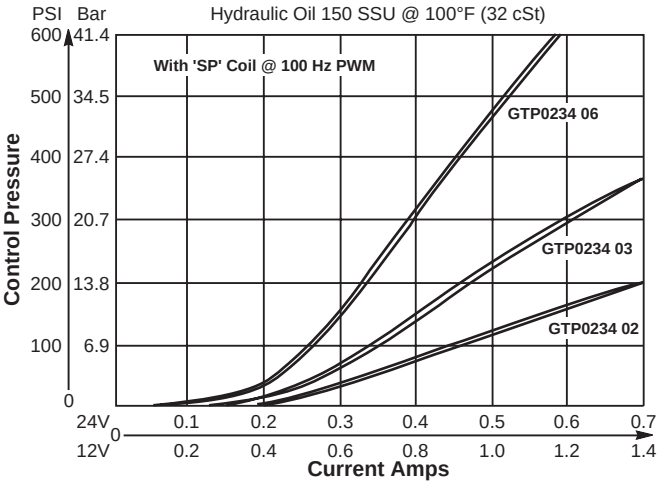
Performance Curves

▲PWM Current Regulator Recommended

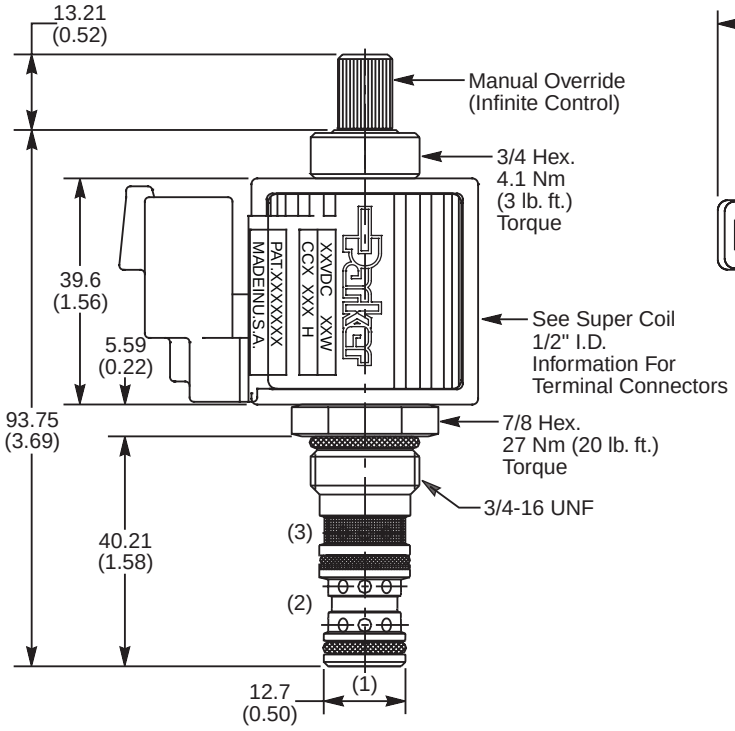
Pressure Drop vs. Flow

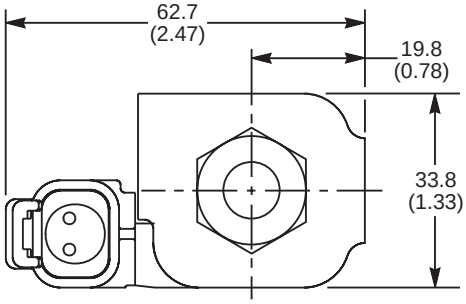


Pressure @ Port 2 vs. Input Current



Dimensions Millimeters (Inches)





THIRD-ANGLE PROJECTION

Ordering Information

GTP0234			1							
08 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Coil Type	Coil Voltage	Coil Termination	—	Body Material	Port Size

Code	Style (Maximum Regulated Pressure)
02	8 Bar (120 PSI) 'SS' Coil 10 Bar (150 PSI) 'SP' Coil
03	17 Bar (240 PSI) 'SS' Coil 21 Bar (300 PSI) 'SP' Coil
05	33 Bar (480 PSI) 'SS' Coil 41 Bar (600 PSI) 'SP' Coil
09	50 Bar (720 PSI) 'SS' Coil 62 Bar (900 PSI) 'SP' Coil
18	100 Bar (1440 PSI) 'SS' Coil 124 Bar (1800 PSI) 'SP' Coil

Code	Override Option
0	Not Required
5	Detented M.O.

Code	Filter Screen
1	60 Mesh Screen on Inlet Port

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30081N-1)
V	Fluorocarbon / (SK30081V-1)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 14 Watts
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
****DC Only***

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4" NPTF	(B08-3-*4P)
4T	SAE-4	(B08-3-*4T)
6T	SAE-6	(B08-3-*6T)
6B	3/8" BSPG	(B08-3-*6B)

**** Add "A" for aluminum, omit for steel.***

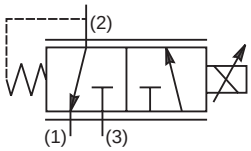
General Description

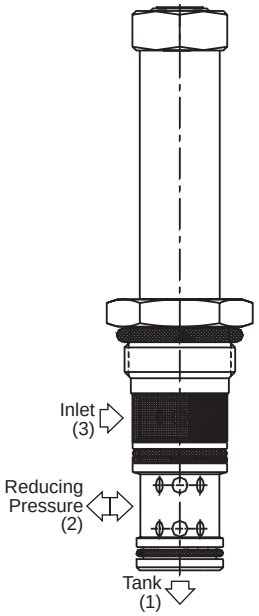
3 Way, 2 Position, Proportional Pressure Reducing Valve. Side Cylinder Port. For additional information see Technical Tips on pages PV1-PV6.

Features

- Minimal Hysteresis
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- All external parts zinc plated







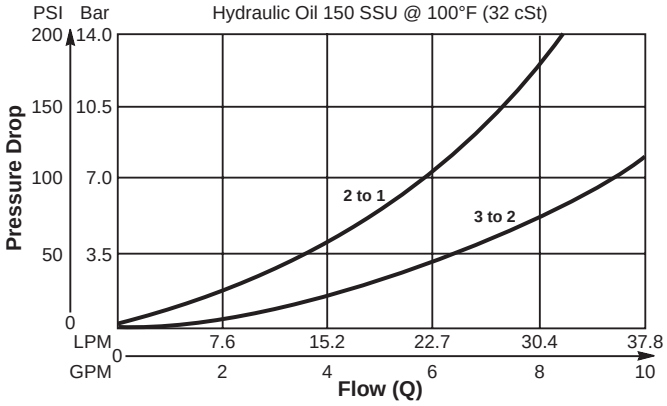
Specifications

Rated Flow (At 70 PSI ΔP)	30 LPM (8 GPM)
Max. Regulated Pressure @ 75% Current	**02** 12 Bar (170 PSI) 'SS' Coil 14 Bar (200 PSI) 'SP' Coil **03** 19 Bar (280 PSI) 'SS' Coil 24 Bar (350 PSI) 'SP' Coil **05** 28 Bar (400 PSI) 'SS' Coil 35 Bar (500 PSI) 'SP' Coil **09** 52 Bar (750 PSI) 'SS' Coil 62 Bar (900 PSI) 'SP' Coil
Max. Input Press. At Port 3	210 Bar (3000 PSI)
Max. Drainage Flow In Regulating Zone	25 cc/min. When De-Energized 800 cc/min. In Regulating Zone At 21 Bar (300 PSI) Input Pressure
Hysteresis @ 200 Hz PWM	3.5%
Dead End Response Time	40 ms At Step Signal 0 To 75% of Nominal Voltage
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.13 kg (.28 lbs.)
Cavity	3X (See BC Section for more details)

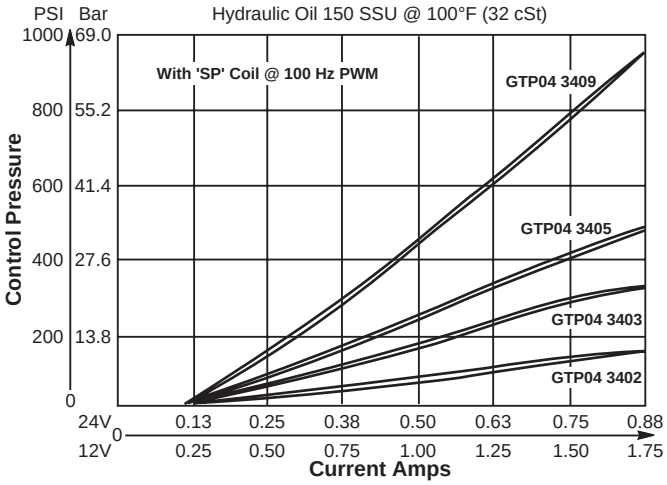
Performance Curves

▲PWM Current Regulator Recommended

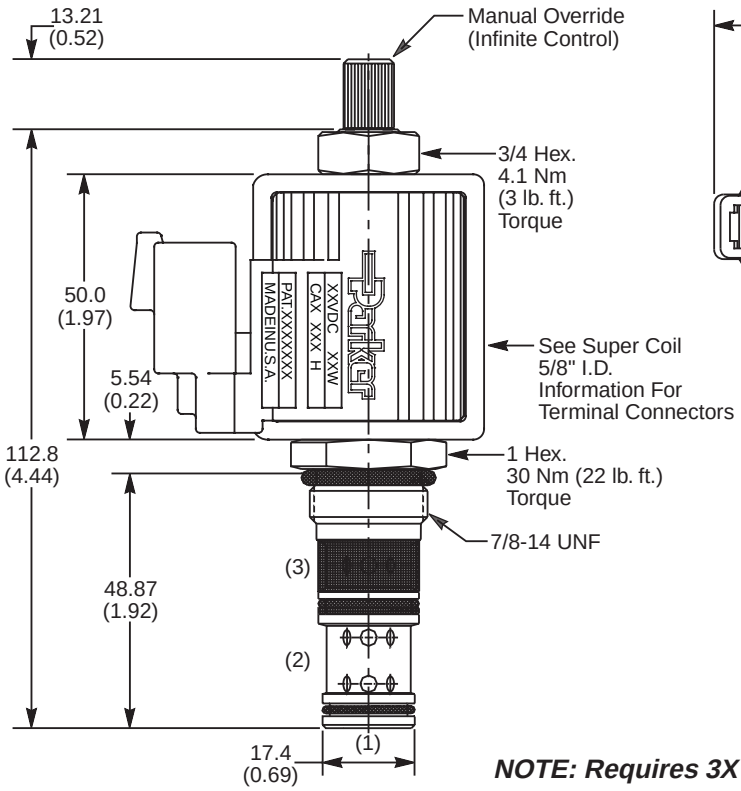
Pressure Drop vs. Flow

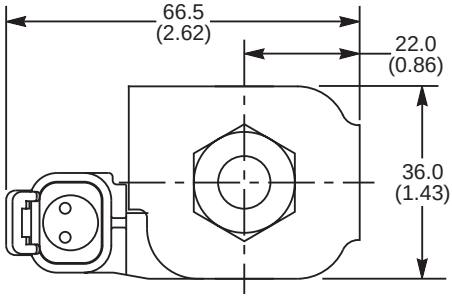


Pressure @ Port 2 vs. Input Current



Dimensions Millimeters (Inches)





NOTE: Requires 3X Cavity

THIRD-ANGLE PROJECTION

Ordering Information

GTP0434			1				
10 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Coil Type	Coil Voltage	Coil Termination

Code	Style (Maximum Regulated Pressure)
02	12 Bar (170 PSI) 'SS' Coil 14 Bar (200 PSI) 'SP' Coil
03	19 Bar (280 PSI) 'SS' Coil 24 Bar (350 PSI) 'SP' Coil
05	28 Bar (400 PSI) 'SS' Coil 35 Bar (500 PSI) 'SP' Coil
09	52 Bar (750 PSI) 'SS' Coil 62 Bar (900 PSI) 'SP' Coil

Contact factory for other regulated pressure to 124 Bar (1800 PSI)

Code	Override Option
0	Not Required
5	Detented M.O.

Code	Filter Screen
1	60 Mesh Screen on Inlet Port

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30081N-1)
V	Fluorocarbon / (SK30081V-1)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 18 Watts
SP	Super Coil - 28 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 5/8" I.D.
****DC Only***

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
553	1/2" SAE
554	3/8" BSP

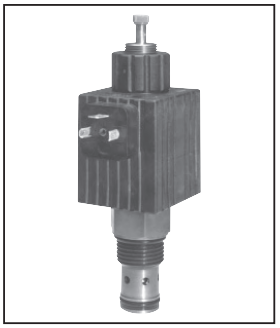
Code	Body Material
A	Aluminum
S	Steel

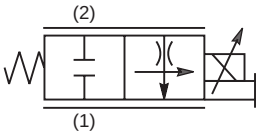
General Description

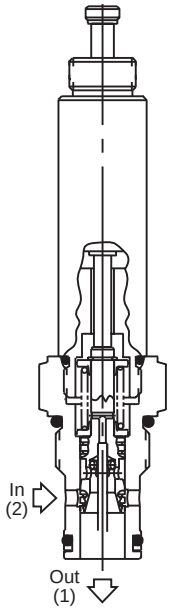
Normally Closed Proportional Flow Control Valve. For additional information see Technical Tips on pages PV1-PV6.

Features

- On-off type solenoids
- Low hysteresis
- PWM signal preferred
- Manual override standard
- All external parts zinc plated



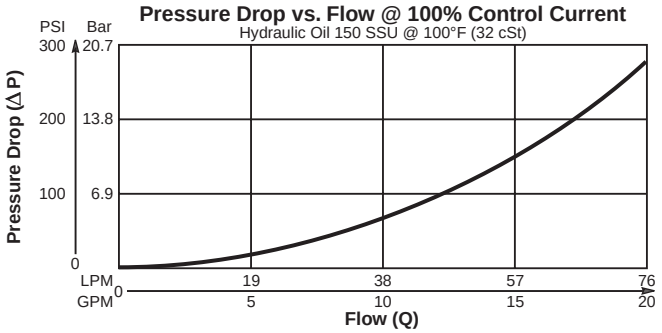


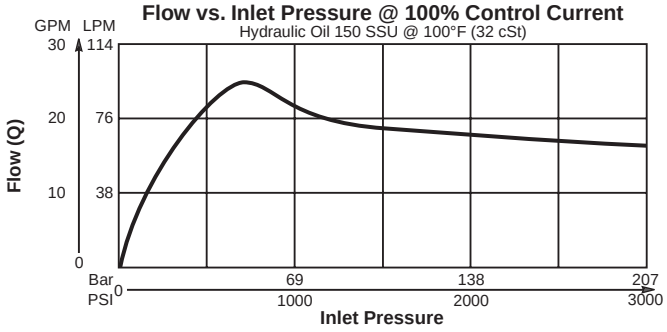


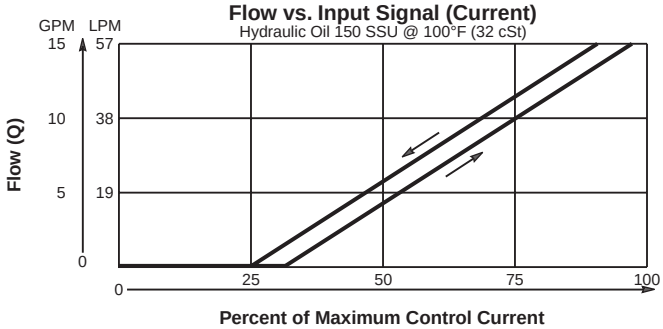
Specifications

Rated Flow Valve Fully Open (At 100 PSI ΔP)	53 LPM (14 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Hysteresis @ 200 Hz PWM	4%
Cracking (Dead band)	20% - 30% of Input Signal
Frequency	100 - 400 Hz (200 Hz Preferred)
Maximum Control Current	**12 VDC** 2.45A **24VDC** 1.23A
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.32 kg (0.7 lbs.)
Cavity	C12-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT12-2F

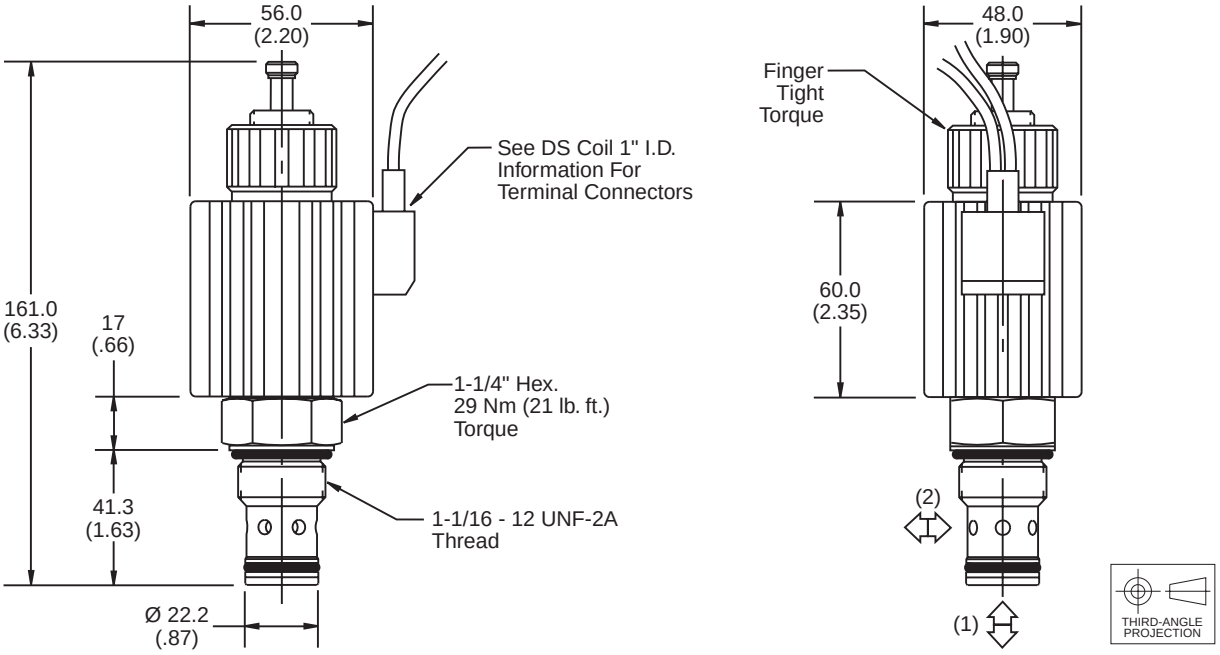
Performance Curves







Dimensions Millimeters (Inches)



Ordering Information

DF122C14 [ ] [ ] [ ] [ ] [ ] – [ ] [ ]

12 Size Normally Closed Proportional Flow Control Valve | **Override Options** | **Seals** | **Coil Voltage** | **Coil Wattage** | **Coil Termination** | **Body Material** | **Port Size**

Code	Override Options
Omit	Push Type with Extended Rod

Code	Seals / Kit. No.
Omit	Nitrile / (SK12-2)
V	Fluorocarbon / (SK12-2V)

Code	Coil Voltage
Omit	Cartridge without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Wattage
Omit	Cartridge without Coil
H	High Watt

Code	Coil Termination
Omit	Cartridge without Coil
D	DIN
P	Dual Spade
W	Dual Wire

See DS Coil 1" I.D.

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
12P	3/4" NTPF	(B12-2-*12P)
8T	SAE - 8	(B12-2-*8T)
12T	SAE - 12	(B12-2-*12T)

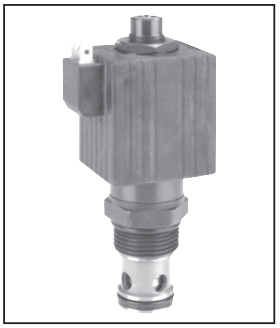
** Add "A" for aluminum, omit for steel.*

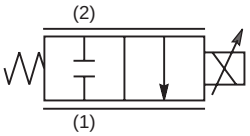
General Description

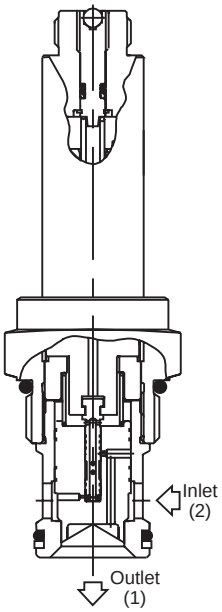
Normally Closed Proportional Needle Valve. This valve is designed specifically for bleed off or unloading circuits. Back pressure will affect performance. For additional information see Technical Tips on pages PV1-PV6.

Features

- On-off type solenoids
- Low hysteresis
- PWM signal preferred
- All external parts zinc plated





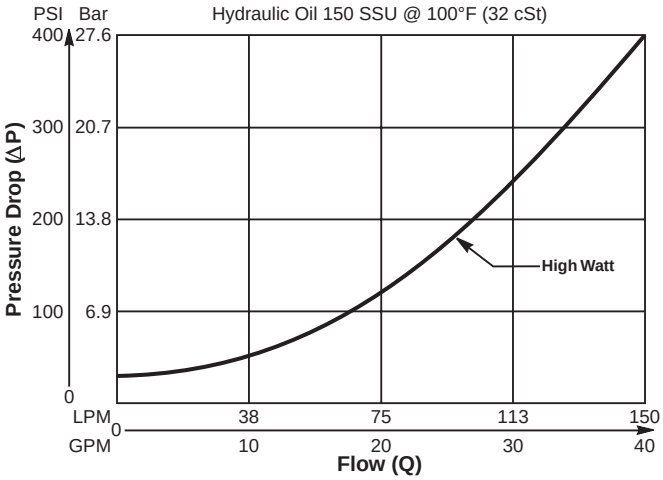


Specifications

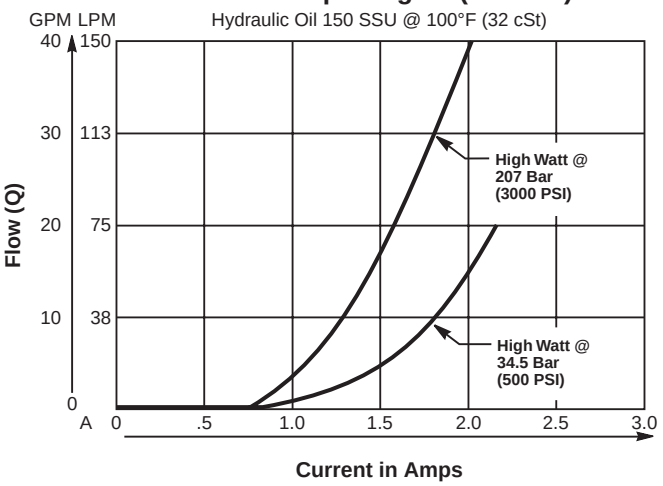
Rated Flow Valve Fully Open (At 100 PSI ΔP)	**High Watt Coil** 150 LPM (40 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	125 cc/min. (7.6 in^3/min.)
Hysteresis @ 200 Hz PWM	4%
Cracking (Dead band)	20% - 30% of Input Signal
Frequency	100 - 400 Hz (200 Hz Preferred)
Maximum Control Current	**12 VDC** **24VDC** **High Watt** 2.45A 1.23A
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.34 kg (0.75 lbs.)
Cavity	C16-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT16-2F

Performance Curves

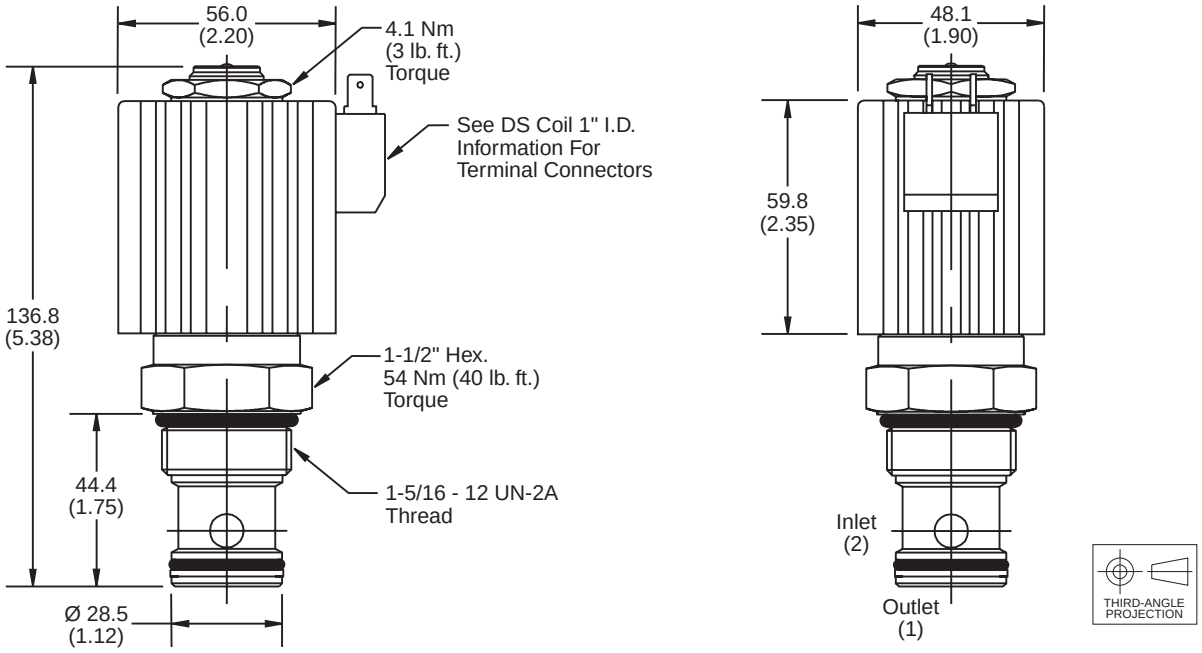
Pressure Drop vs. Flow @ 100% Current



Flow vs. Input Signal (Current)



Dimensions Millimeters (Inches)



Ordering Information

DF161C40						
16 Size Normally Closed Proportional Flow Control Valve	Seals	Coil Voltage	Coil Termination	—	Body Material	Port Size

Code	Seals / Kit. No.
Omit	Nitrile / (SK16-2)
V	Fluorocarbon / (SK16-2V)

Code	Coil Voltage
Omit	Cartridge without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Cartridge without Coil
D	DIN
P	Dual Spade
W	Dual Wire

See DS Coil 1" I.D

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
12P	3/4" NTPF	(B16-2-*12P)
16P	1" NTPF	(B16-2-*16P)
8T	SAE - 8	(B16-2-*8T)
12T	SAE - 12	(B16-2-*12T)
16T	SAE - 16	(B16-2-*16T)
12B	3/4" BSPG	(B16-2-12B)†
16B	1" BSPG	(B16-2-*16B)

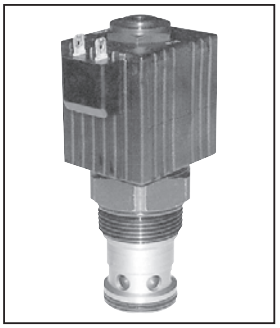
** Add "A" for aluminum, omit for steel.*
† Steel body only.

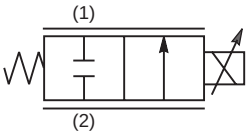
General Description

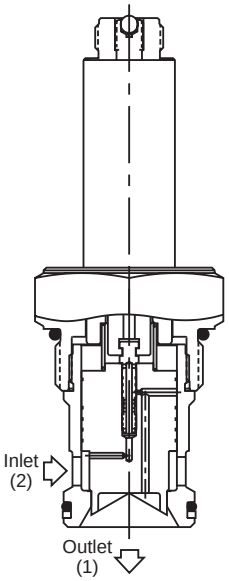
Normally Closed Proportional Needle Valve. This valve is designed specifically for bleed off or unloading circuits. Back pressure will affect performance. For additional information see Technical Tips on pages PV1-PV6.

Features

- On-off type solenoids
- Low hysteresis
- PWM signal preferred
- All external parts zinc plated





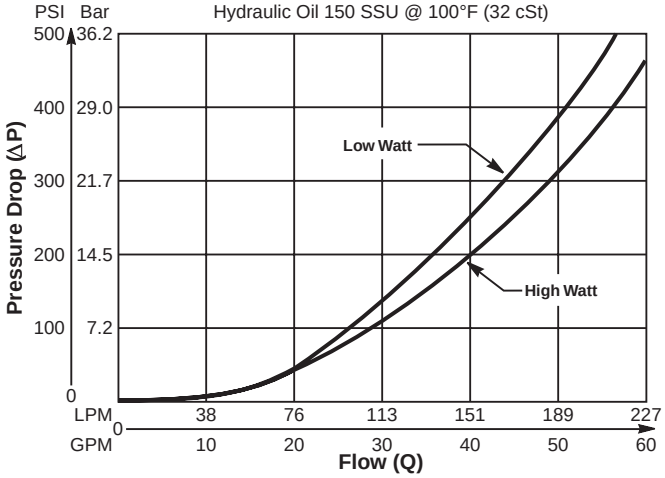


Specifications

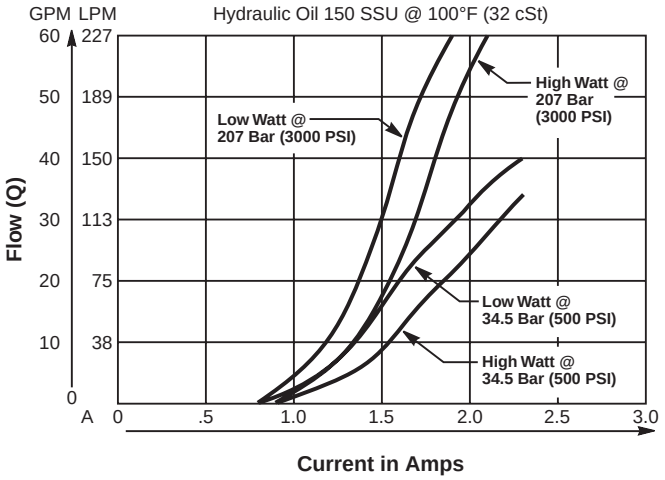
Rated Flow Valve Fully Open (At 100 PSI ΔP)	**Low Watt** 180 LPM (48 GPM) **High Watt** 325 LPM (60 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	125 cc/min. (7.6 in³/min.)
Hysteresis @ 200 Hz PWM	4%
Cracking (Dead band)	20% - 30% of Input Signal
Frequency	100 - 400 Hz (200 Hz Preferred)
Maximum Control Current	**12 VDC** **24VDC** **Low Watt** 1.75A .91A **High Watt** 2.45A 1.23A
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.34 kg (0.75 lbs.)
Cavity	C20-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT20-2F

Performance Curves

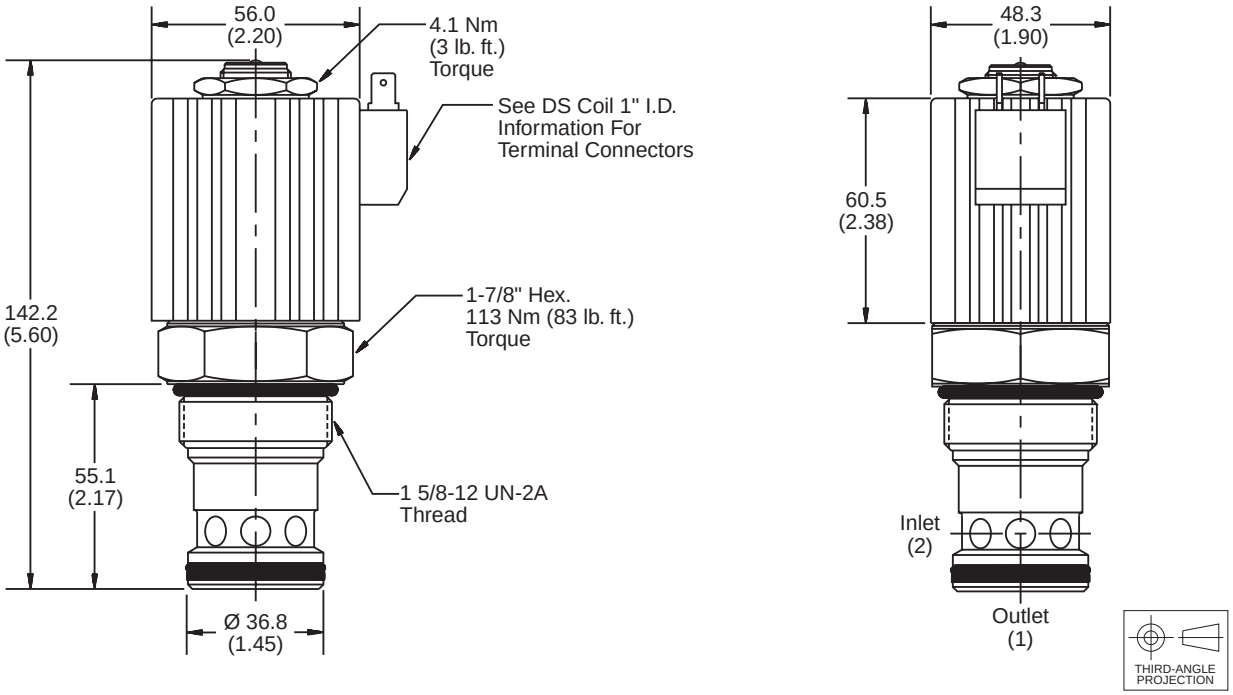
Pressure Drop vs. Flow @ 100% Current



Flow vs. Input Signal (Current)



Dimensions Millimeters (Inches)



Ordering Information

DF201C60							
20 Size Normally Closed Proportional Flow Control Valve	Seals	Coil Voltage	Coil Wattage	Coil Termination	—	Body Material	Port Size

Code	Seals / Kit. No.
Omit	Nitrile / (SK20-2)
V	Fluorocarbon / (SK20-2V)

Code	Coil Voltage
Omit	Cartridge without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Wattage
Omit	Cartridge without Coil
L	Low Watt
H	High Watt

Code	Coil Termination
Omit	Cartridge without Coil
D	DIN
P	Dual Spade
W	Dual Wire

See DS Coil 1" I.D.

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
20T	SAE - 20	(B20-2-*20T)
20B	1-1/4" BSPG	(B20-2-*20B)

** Add "A" for aluminum, omit for steel.*

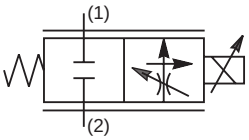
General Description

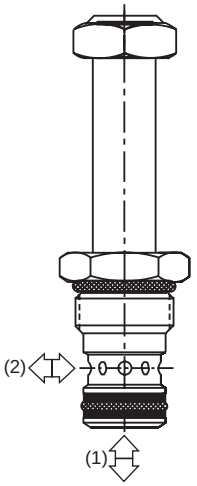
2 Way, Normally Closed, Proportional Flow Regulator Valve. Partially Pressure Compensated. For additional information see Technical Tips on pages PV1-PV6.

Features

- Analog Proportional Partially Pressure Compensated Flow Regulator regulates flow proportionally to the input solenoid current.
- A low cost valve designed to be used in applications where fine pressure compensation is not required.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- Factory-adjusted low variation option (Model "L") is available for applications where low variation of flow from valve to valve is essential at a given current or when an external pressure compensator is used.
- All external parts zinc plated







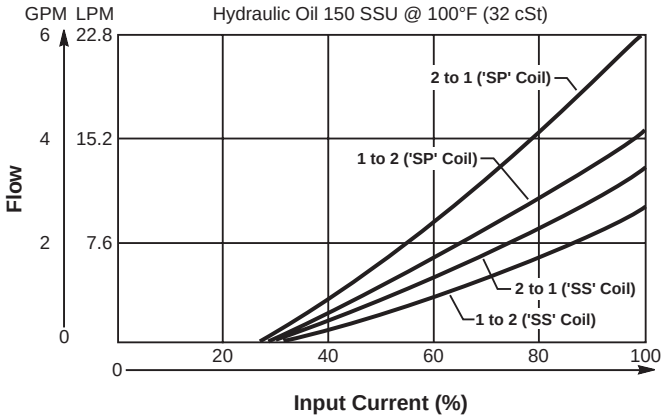
Specifications

Rated Flow @ 210 Bar (3000 PSI)	**Standard ('SS' Coil)** **2 to 1** 13.3 LPM (3.5 GPM) **1 to 2** 9.5 LPM (2.5 GPM) **High Flow ('SP' Coil)** **2 to 1** 22.8 LPM (6.0 GPM) **1 to 2** 15.0 LPM (4.0 GPM)
Preferable Input Port For Best Hysteresis	Port 1
Hysteresis @ 100 Hz PWM	<10%
Cracking Pressure	25% of Input Current
Variation of Flow @ 35% of Rated Current & Constant ΔP Maintained By Pressure Compensator	**Standard Model** Up To ±20% Of Rated Flow **Model "L"** ±7% Of Rated Flow
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.08 kg (.17 lbs.)
Cavity	2X (See BC Section for more details)

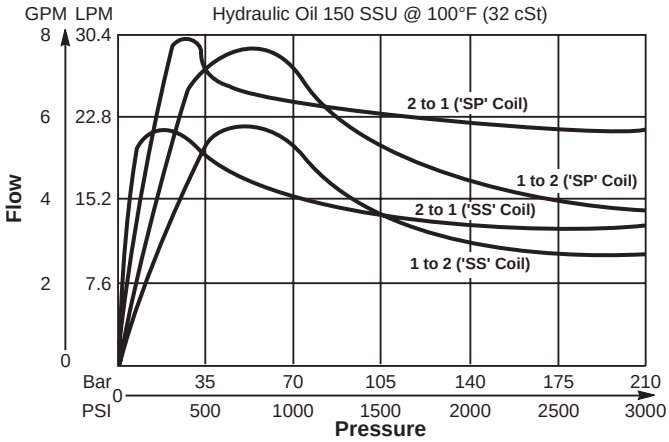
Performance Curves

▲PWM Current Regulator Recommended

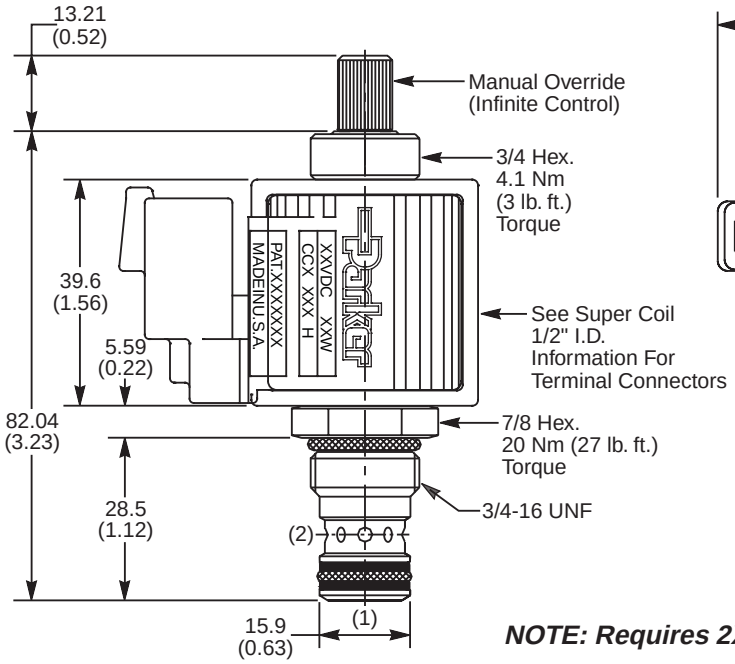
Flow vs. Input Current

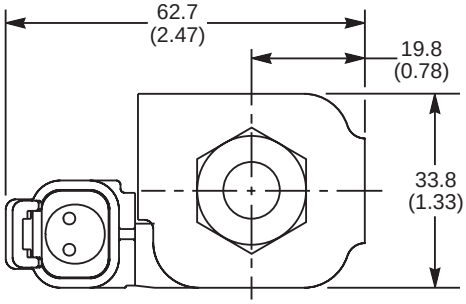


Flow Regulation (Measured at 75% of Rated Current)



Dimensions Millimeters (Inches)





NOTE: Requires 2X Cavity

THIRD-ANGLE PROJECTION

Ordering Information

HP02C	21							
08 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Flow Variation	Coil Type	Coil Voltage	Coil Termination

Code	Style (Maximum Regulated Flow)
21	Standard ('SS' Coil) 13.3 LPM (3.5 GPM)
21	High Flow ('SP' Coil) 22.8 LPM (6.0 GPM)

Code	Override Option
0	Not Required
5	Detented M.O. (Infinite Control)

Code	Filter Screen
0	Not Available

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30076N-1)
V	Fluorocarbon / (SK30076V-1)

Code	Flow Variation
Omit	Standard Up to ±20% of Rated Flow
L	Low Variation (±7% of Rated Flow)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 14 Watts
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
****DC Only***

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
513	3/8" SAE
515	1/4" BSP

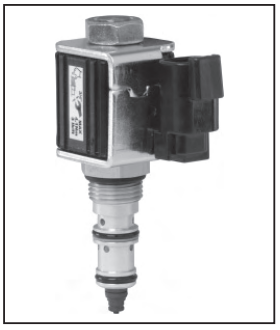
Code	Body Material
A	Aluminum
S	Steel

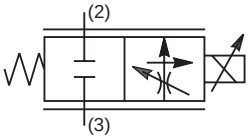
General Description

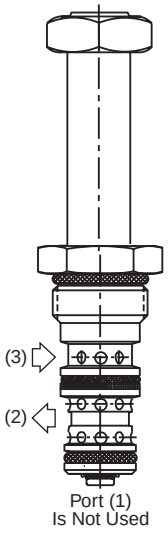
2 Way, Normally Closed, Proportional Flow Regulator Valve. Pressure Compensated. For additional information see Technical Tips on pages PV1-PV6.

Features

- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- Factory-adjusted low variation option (Model "L") is available for applications where low variation of flow from valve to valve is essential at a given current.
- All external parts zinc plated







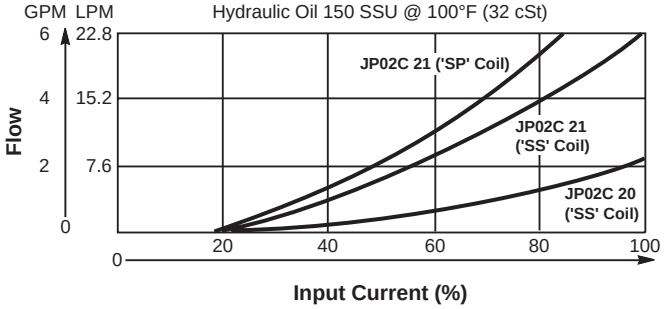
Specifications

Rated Flow	**20** 7.5 LPM (2 GPM) Low Flow ('SS' Coil) **21** 15 LPM (4 GPM) Standard ('SS' Coil) **21** 23 LPM (6 GPM) High Flow ('SP' Coil)
Maximum Input Pressure At Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	**20** 6.9 Bar (150 PSI) Low Flow **21** 13.8 Bar (200 PSI) Standard **21** 20.7 Bar (300 PSI) High Flow
Maximum Internal Leakage	570 cc (35 cu. in.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<10% (Low Flow and Standard) <3% (High Flow)
Cracking Pressure	25% of Input Signal
Variation of Flow @ 35% of Rated Current	**Standard Model** Up To ±20% Of Rated Flow **Model "L"** ±7% Of Rated Flow
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.08 kg (.17 lbs.)
Cavity	C08-3 (See BC Section for more details)

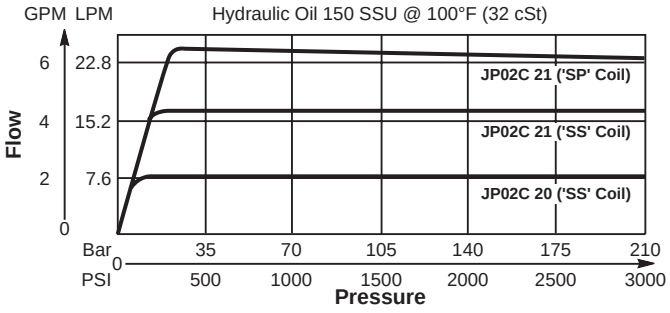
Performance Curves

▲PWM Current Regulator Recommended

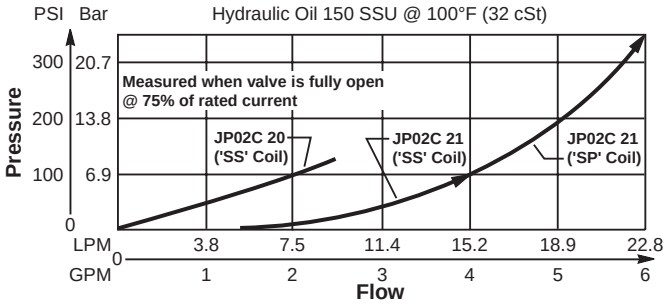
Flow vs. Input Current



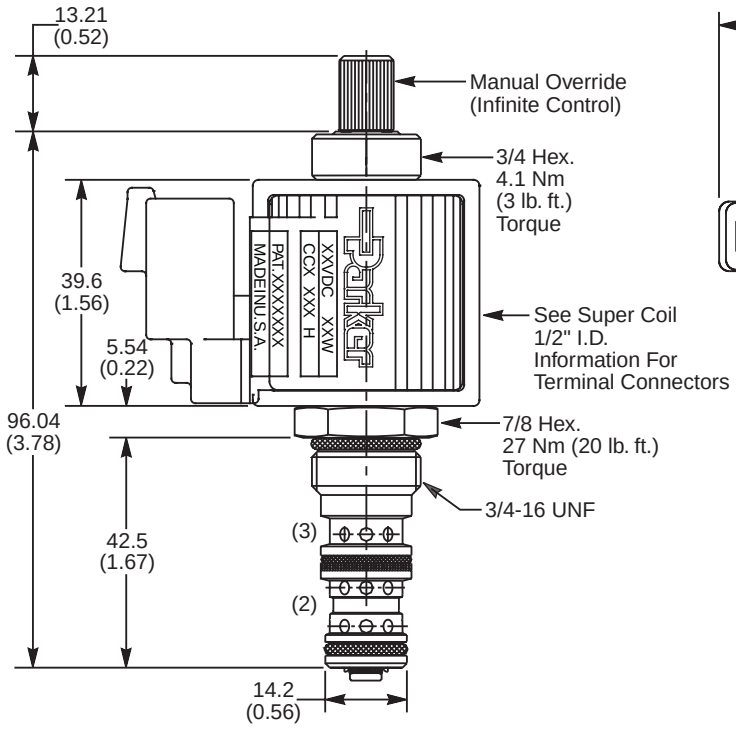
Flow Regulation (Measured 75% of Rated Current)

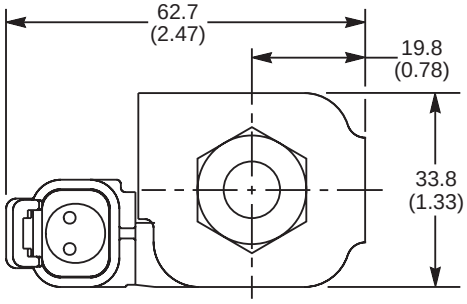


Pressure Drop vs. Flow



Dimensions Millimeters (Inches)





THIRD-ANGLE PROJECTION

Ordering Information

JP02C									—		
08 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Flow Variation	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style (Maximum Regulated Flow)
20	Low Flow ('SS' Coil) 7.5 LPM (2 GPM)
21	Standard ('SS' Coil) 15 LPM (4 GPM)
21	High Flow ('SP' Coil) 23 LPM (6 GPM)

Code	Override Option
0	Not Required
5	Detented M.O. (Infinite Control)

Code	Filter Screen
0	Not Available
1	60 Mesh Screen on Port 2

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30105N-1)
V	Fluorocarbon / (SK30105V-1)

Code	Flow Variation
Omit	Standard Up to ±20% of Rated Flow
L	Low Variation (±7% of Rated Flow)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 14 Watts
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
****DC Only***

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4" NPTF	(B08-3-*4P)
4T	SAE-4	(B08-3-*4T)
6T	SAE-6	(B08-3-*6T)
6B	3/8" BSPG	(B08-3-*6B)

**** Add "A" for aluminum, omit for steel.***

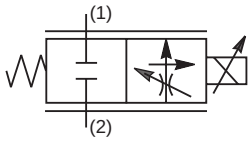
General Description

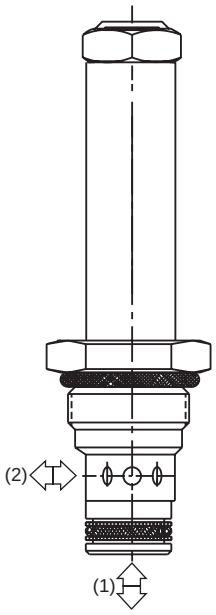
2 Way, Normally Closed, Proportional Flow Regulator Valve. Partially Pressure Compensated. For additional information see Technical Tips on pages PV1-PV6.

Features

- Analog Proportional Partially Pressure Compensated Flow Regulator regulates flow proportionally to the input solenoid current.
- A low cost valve designed to be used in applications where fine pressure compensation is not required.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- Factory-adjusted low variation option (Model "L") is available for applications where low variation of flow from valve to valve is essential at a given current or when an external pressure compensator is used.
- All external parts zinc plated







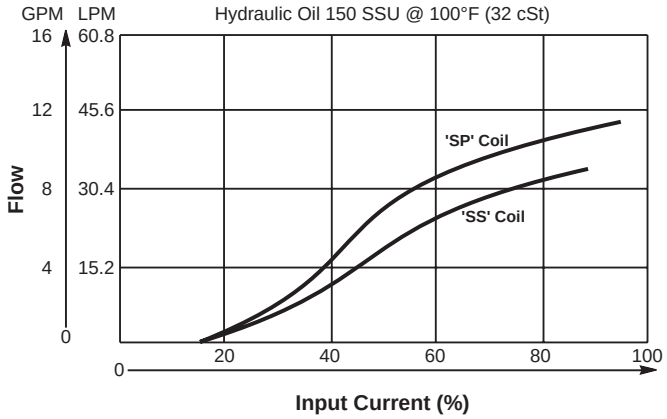
Specifications

Rated Flow 2 to 1 @ 210 Bar (3000 PSI)	**Standard ('SS' Coil)** 30 LPM (8 GPM) **High Flow ('SP' Coil)** 36 LPM (9.5 GPM)
Preferable Input Port For Best Hysteresis	Port 1
Hysteresis @ 100 Hz PWM	<10%
Cracking Pressure	21% of Rated Current (Standard) 17% of Rated Current (High Flow)
Variation of Flow @ 35% of Rated Current & Constant ΔP Maintained By Pressure Compensator	**Standard Model** Up To ±5% Of Rated Flow **Model "L"** ±2% Of Rated Flow
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.12 kg (.26 lbs.)
Cavity	C10-2 (See BC Section for more details)

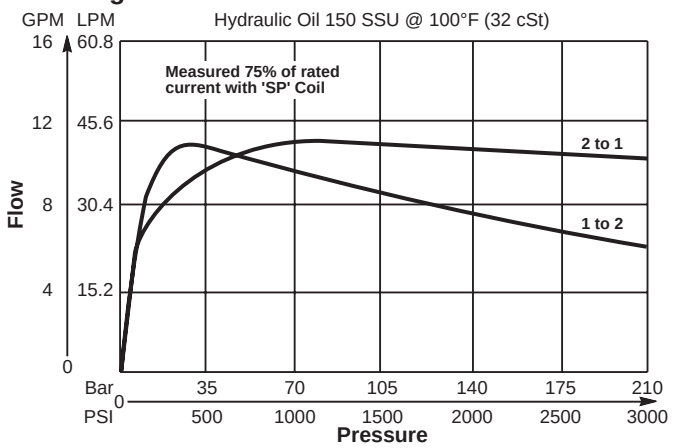
Performance Curves

▲PWM Current Regulator Recommended

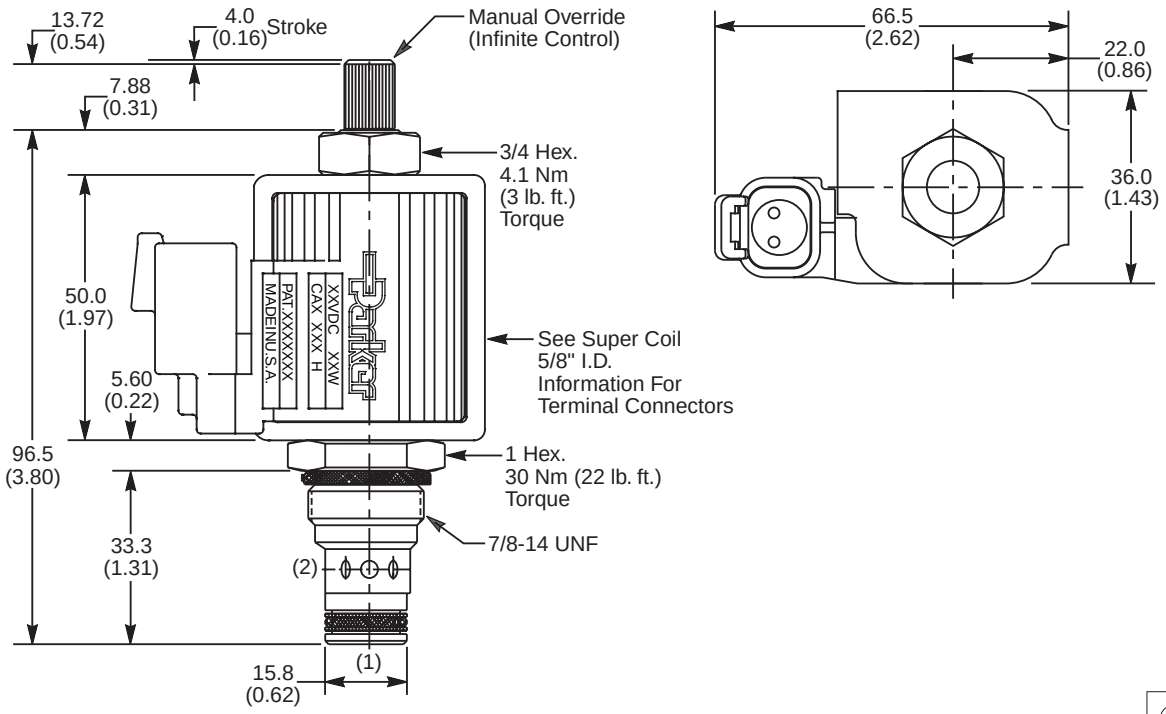
Flow vs. Input Current



Flow Regulation



Dimensions Millimeters (Inches)



Ordering Information

HP04C	21										
10 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Opening Point Variation	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style (Maximum Regulated Flow)
21	Standard ('SS' Coil) 30 LPM (8 GPM)
21	High Flow ('SP' Coil) 36 LPM (9.5 GPM)

Code	Override Option
0	Not Required
5	Detented M.O. (Infinite Control)

Code	Filter Screen
0	Not Available

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30503N-1)
V	Fluorocarbon / (SK30503V-1)

Code	Flow Variation
Omit	Standard Up to ±5% of Current
L	Low Variation (±2% of Current Flow)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 18 Watts
SP	Super Coil - 28 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 5/8" I.D.
****DC Only***

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4" NPTF	(B10-2-*4P)
6P	3/8" NPTF	(B10-2-*6P)
8P	1/2" NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8" BSPG	(B10-2-*6B)

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

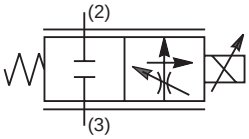
General Description

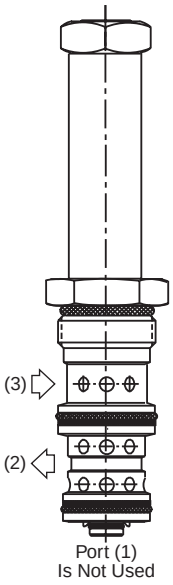
2 Way, Normally Closed, Proportional Flow Regulator Valve. Pressure Compensated. For additional information see Technical Tips on pages PV1-PV6.

Features

- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- Factory-adjusted low variation option (Model "L") is available for applications where low variation of flow from valve to valve is essential at a given current.
- All external parts zinc plated







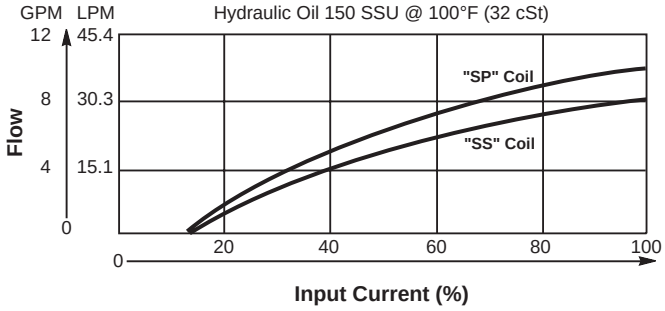
Specifications

Rated Flow	**21** 30 LPM (8 GPM) Standard ('SS' Coil) **21** 36 LPM (9.5 GPM) High Flow ('SP' Coil)
Maximum Input Pressure At Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	**21** 13.8 Bar (200 PSI) Standard **21** 20.7 Bar (300 PSI) High Flow
Maximum Internal Leakage	780 cc (46 cu. in.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	7%
Cracking Pressure	25% of Input Signal
Variation of Flow @ 35% of Rated Current	**Standard Model** Up To ±20% Of Rated Flow **Model "L"** ±7% Of Rated Flow
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.13 kg (.28 lbs.)
Cavity	3X (See BC Section for more details)

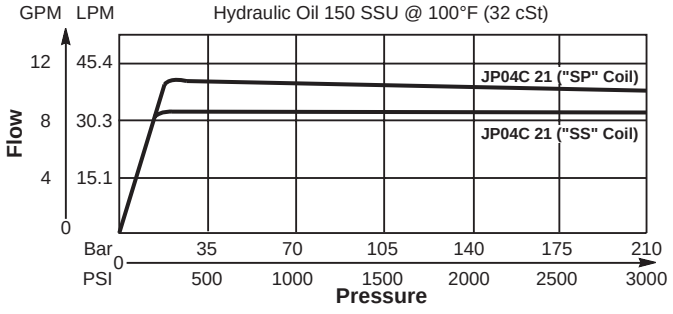
Performance Curves

▲PWM Current Regulator Recommended

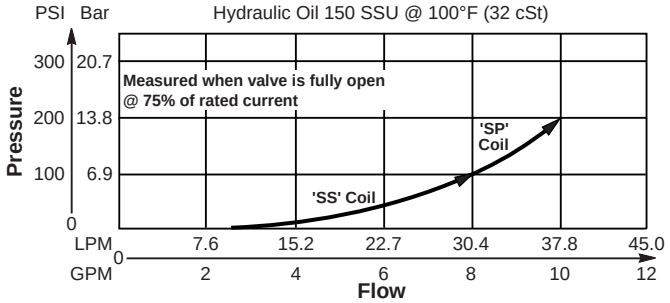
Flow vs. Input Signal



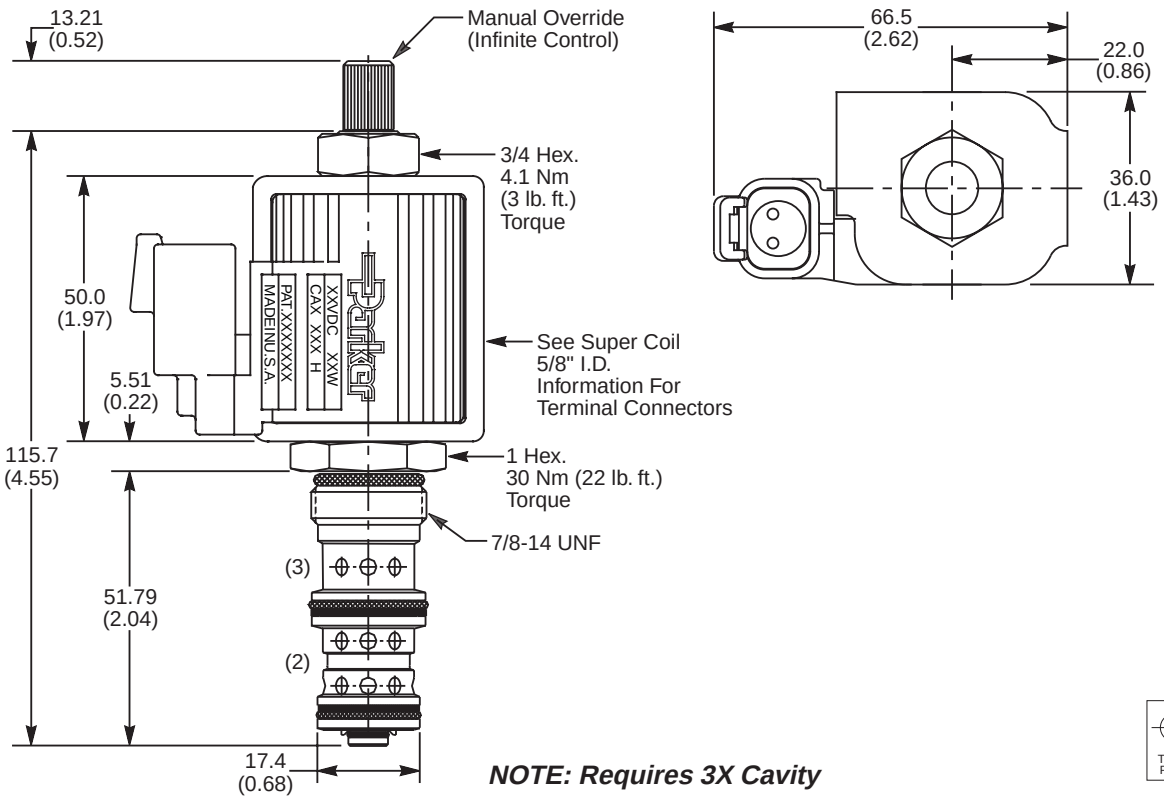
Flow Regulation (Measured 75% of Rated Current)



Pressure Drop vs. Flow



Dimensions Millimeters (Inches)



NOTE: Requires 3X Cavity

Ordering Information

JP04C	21							
10 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Flow Variation	Coil Type	Coil Voltage	Coil Termination

Code	Style (Maximum Regulated Flow)
21	Standard ('SS' Coil) 30 LPM (8 GPM)
21	High Flow ('SP' Coil) 36 LPM 9.5 GPM)

Code	Override Option
0	Not Required
5	Detented M.O. (Infinite Control)

Code	Filter Screen
0	Not Required
1	60 Mesh Screen on Port 2

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30106N-1)
V	Fluorocarbon / (SK30106V-1)

Code	Flow Variation
Omit	Standard Up to ±20% of Rated Flow
L	Low Variation (±7% of Rated Flow)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 18 Watts
SP	Super Coil - 28 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 5/8" I.D.
****DC Only***

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
553	1/2" SAE
554	3/8" BSP

Code	Body Material
A	Aluminum
S	Steel

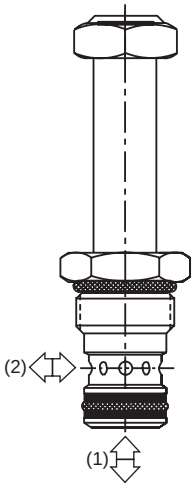
General Description

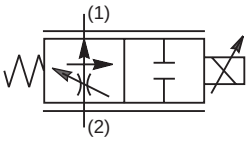
2 Way, Normally Open, Proportional Flow Regulator Valve. Partially Pressure Compensated. For additional information see Technical Tips on pages PV1-PV6.

Features

- Analog Proportional Partially Pressure Compensated Flow Regulator regulates flow proportionally to the input solenoid current
- The valve is designed to be used in applications where fine pressure compensation is not required and an economical solution is important
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- Factory-adjusted low variation option (Model "L") is available for applications where low variation of flow from valve to valve is essential at a given current or when an external pressure compensator is used.
- All external parts zinc plated







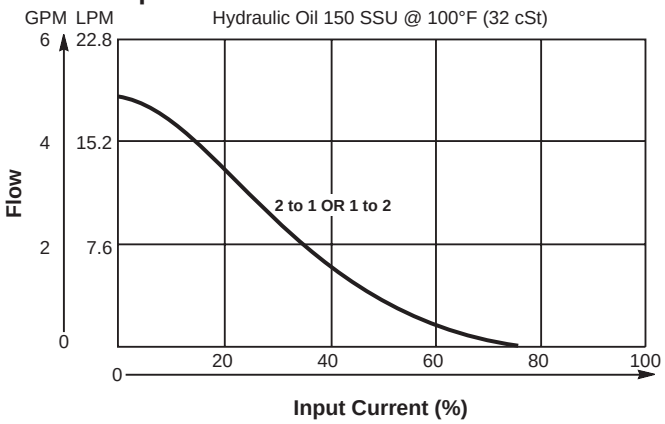
Specifications

Rated Flow @ 210 Bar (3000 PSI)	**2 to 1** 19 LPM (5 GPM)
Preferable Input Port For Best Hysteresis	Port 1
Hysteresis @ 100 Hz PWM	<10%
Variation of Flow @ 35% of Rated Current & Constant ΔP Maintained By Pressure Compensator	**Standard Model** Up To ±20% Of Rated Flow **Model "L"** ±7% Of Rated Flow
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.08 kg (.17 lbs.)
Cavity	2X (See BC Section for more details)

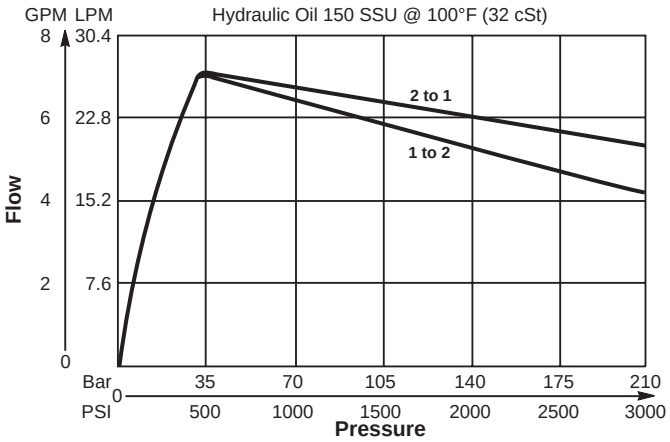
Performance Curves

▲PWM Current Regulator Recommended

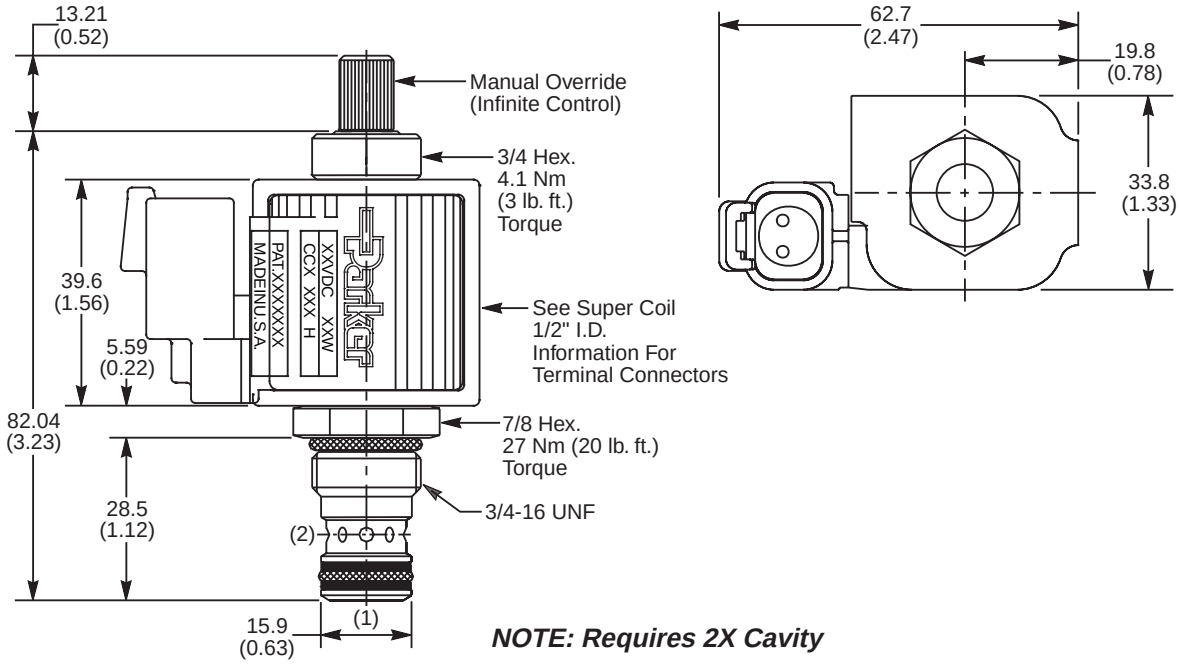
Flow vs. Input Current



Flow Regulation (Measured at De-Energized Coil)



Dimensions Millimeters (Inches)



NOTE: Requires 2X Cavity

THIRD-ANGLE PROJECTION

Ordering Information

HP02P	21							
08 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Flow Variation	Coil Type	Coil Voltage	Coil Termination

Code	Style (Maximum Regulated Flow)
21	High Flow ('SP' Coil) 19 LPM (5 GPM)

Code	Override Option
0	Not Required
5	Detented M.O. (Infinite Control)

Code	Filter Screen
0	Not Available

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30076N-1)
V	Fluorocarbon / (SK30076V-1)

Code	Flow Variation
Omit	Standard Up to ±20% of Rated Flow
L	Low Variation (±7% of Rated Flow)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
****DC Only***

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
513	3/8" SAE
515	1/4" BSP

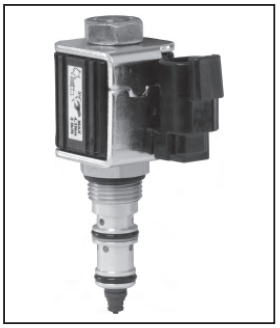
Code	Body Material
A	Aluminum
S	Steel

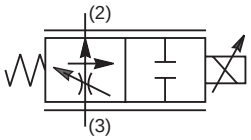
General Description

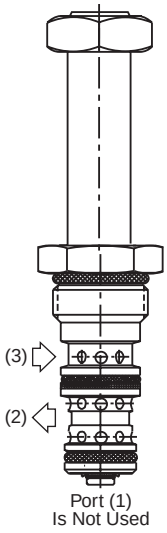
2 Way, Normally Open, Proportional Flow Regulator Valve. Pressure Compensated. For additional information see Technical Tips on pages PV1-PV6.

Features

- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- Factory-adjusted low variation option (Model "L") is available for applications where low variation of flow from valve to valve is essential at a given current.
- All external parts zinc plated







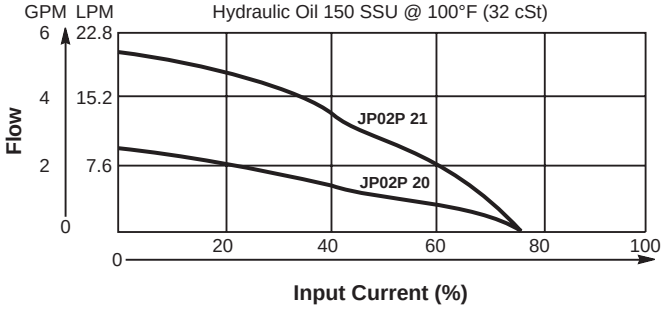
Specifications

Rated Flow	**20** 9.5 LPM (2.5 GPM) Standard ('SS' Coil) **21** 19 LPM (5 GPM) High Flow ('SP' Coil)
Maximum Input Pressure At Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	**20** 6.9 Bar (150 PSI) Standard **21** 20.7 Bar (300 PSI) High Flow
Maximum Internal Leakage	570 cc (35 cu. in.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<3%
Variation of Flow @ 35% of Rated Current	**Standard Model** Up To ±20% Of Rated Flow **Model "L"** ±7% Of Rated Flow
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.08 kg (.17 lbs.)
Cavity	C08-3 (See BC Section for more details)

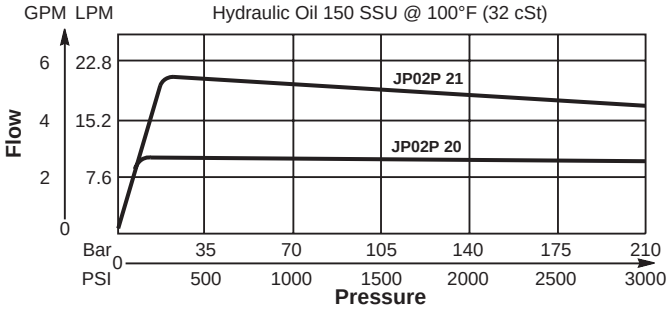
Performance Curves

▲PWM Current Regulator Recommended

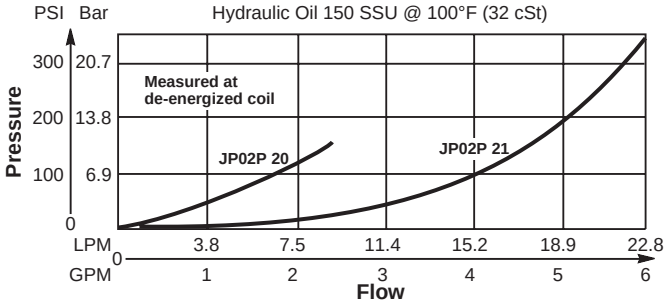
Flow vs. Input Current



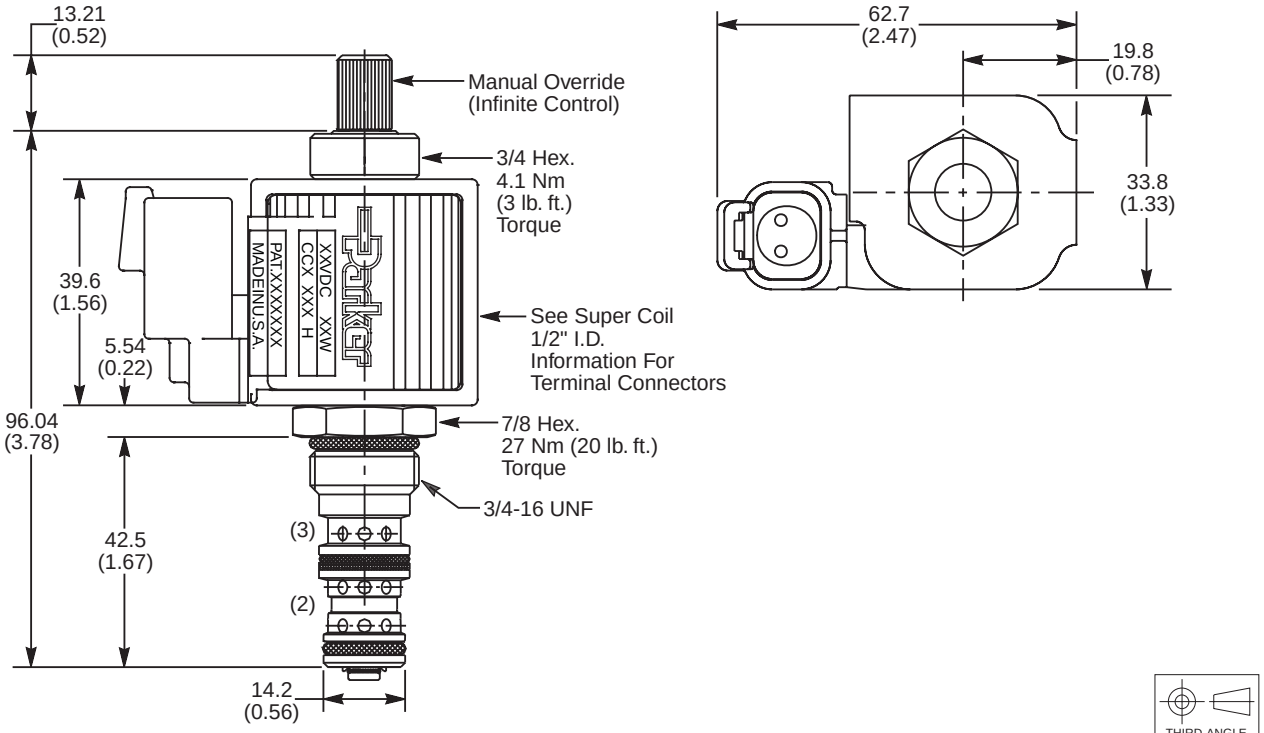
Flow Regulation (Measured 75% of Rated Current)



Pressure Drop vs. Flow



Dimensions Millimeters (Inches)



Ordering Information

JP02P											
08 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Flow Variation	Coil Type	Coil Voltage	Coil Termination	—	Body Material	Port Size

Code	Style (Maximum Regulated Flow)
20	Standard ('SS' Coil) 9.5 LPM (2.5 GPM)
21	High Flow ('SP' Coil) 19 LPM (5 GPM)

Code	Override Option
0	Not Required
5	Detented M.O. (Infinite Control)

Code	Filter Screen
0	Not Required
1	60 Mesh Screen on Port 2

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30105N-1)
V	Fluorocarbon / (SK30105V-1)

Code	Flow Variation
Omit	Standard Up to ±20% of Rated Flow
L	Low Variation (±7% of Rated Flow)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 14 Watts
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
****DC Only***

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4" NPTF	(B08-3-*4P)
4T	SAE-4	(B08-3-*4T)
6T	SAE-6	(B08-3-*6T)
6B	3/8" BSPG	(B08-3-*6B)

**** Add "A" for aluminum, omit for steel.***

General Description

2 Way, Normally Open, Proportional Flow Regulator Valve. Partially Pressure Compensated. For additional information see Technical Tips on pages PV1-PV6.

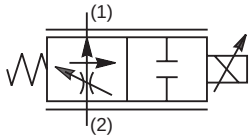
Features

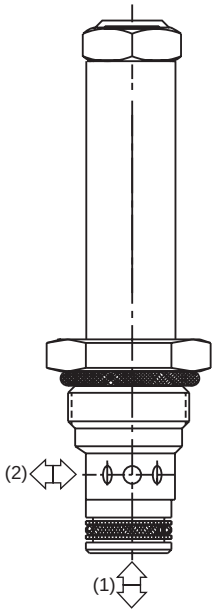
- Analog Proportional Partially Pressure Compensated Flow Regulator regulates flow proportionally to the input solenoid current
- The valve is designed to be used in applications where fine pressure compensation is not required and an exonomical solution is important
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- Factory-adjusted low variation option (Model "L") is available for applications where low variation of flow from valve to valve is essential at a given current or when an external pressure compensator is used.
- All external parts zinc plated

Specifications

Rated Flow @ 210 Bar (3000 PSI)	23 LPM (6 GPM)
Hysteresis @ 100 Hz PWM	<10%
Closing Point	65% of Rated Current
Variation of Closing Point	**Standard Model** Up To ±5% Of Rated Current **Model "L"** ±2% Of Rated Current
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.12 kg (.26 lbs.)
Cavity	C10-2 (See BC Section for more details)



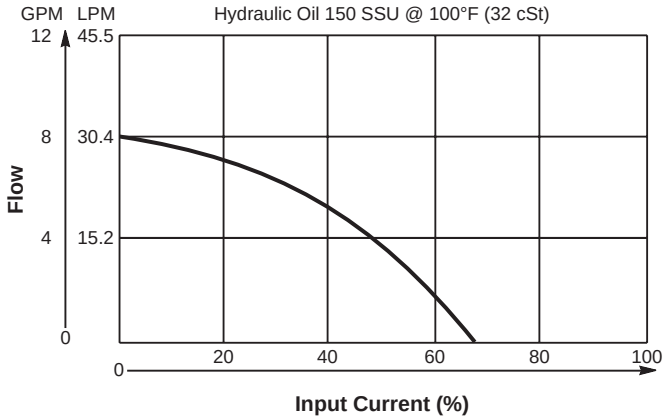




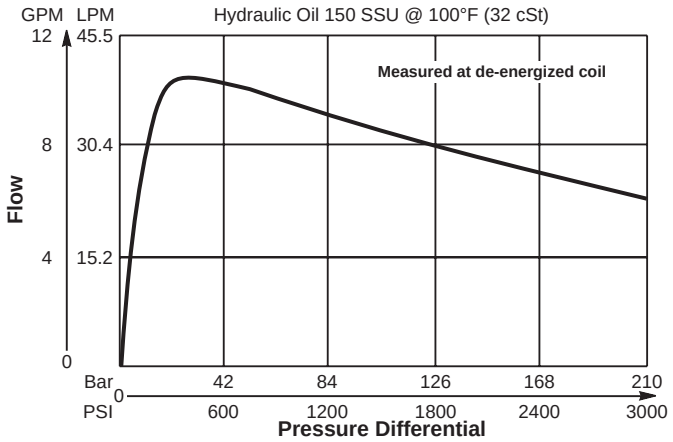
Performance Curves

▲PWM Current Regulator Recommended

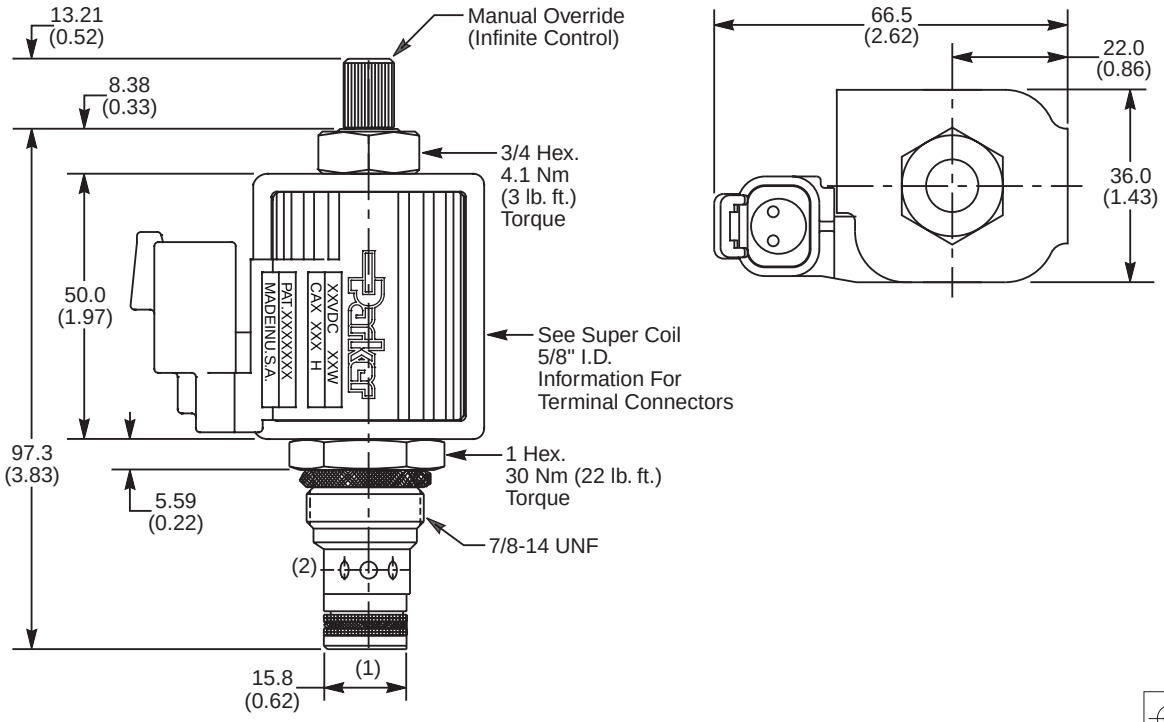
Flow vs. Input Current



Flow Regulation



Dimensions Millimeters (Inches)



Ordering Information

HP04P	21								—		
10 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Opening Point Variation	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style (Maximum Regulated Flow)
21	High Flow ('SP' Coil) 30 LPM (8 GPM)

Code	Override Option
0	Not Required
5	Detented M.O. (Infinite Control)

Code	Filter Screen
0	Not Available

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30503N-1)
V	Fluorocarbon / (SK30503V-1)

Code	Flow Variation
Omit	Standard Up to ±5% of Current Flow
L	Low Variation (±2% of Current Flow)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 28 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 5/8" I.D.
****DC Only***

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4P	1/4" NPTF	(B10-2-*4P)
6P	3/8" NPTF	(B10-2-*6P)
8P	1/2" NPTF	(B10-2-*8P)
6T	SAE-6	(B10-2-*6T)
T6T	SAE-6	(B10-2-T6T)†
8T	SAE-8	(B10-2-*8T)
T8T	SAE-8	(B10-2-T8T)†
6B	3/8" BSPG	(B10-2-*6B)

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

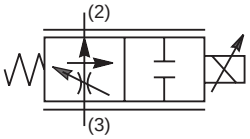
General Description

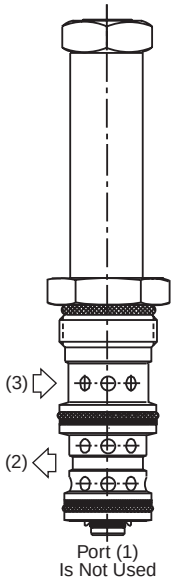
2 Way, Normally Open, Proportional Flow Regulator Valve. Pressure Compensated. For additional information see Technical Tips on pages PV1-PV6.

Features

- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- Factory-adjusted low variation option (Model "L") is available for applications where low variation of flow from valve to valve is essential at a given current.
- All external parts zinc plated







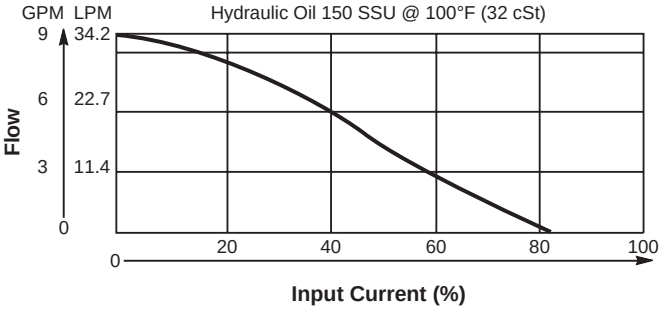
Specifications

Rated Flow	36 LPM (9.5 GPM) High Flow ('SP' Coil)
Maximum Input Pressure At Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	14 Bar (200 PSI)
Maximum Internal Leakage	780 cc (46 cu. in.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	7%
Variation of Flow @ 35% of Rated Current	**Standard Model** Up To ±20% Of Rated Flow **Model "L"** ±7% Of Rated Flow
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.13 kg (.28 lbs.)
Cavity	3X (See BC Section for more details)

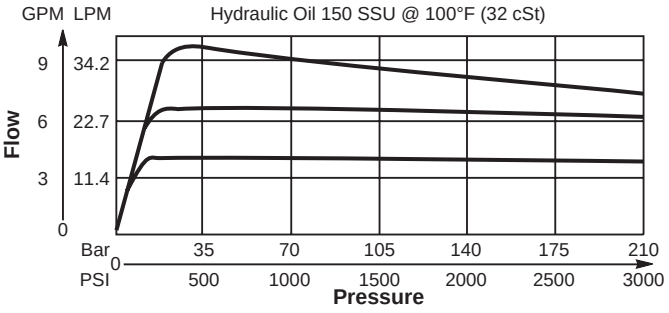
Performance Curves

▲PWM Current Regulator Recommended

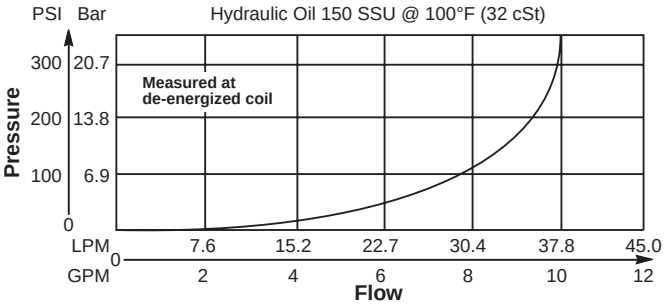
Flow vs. Input Current



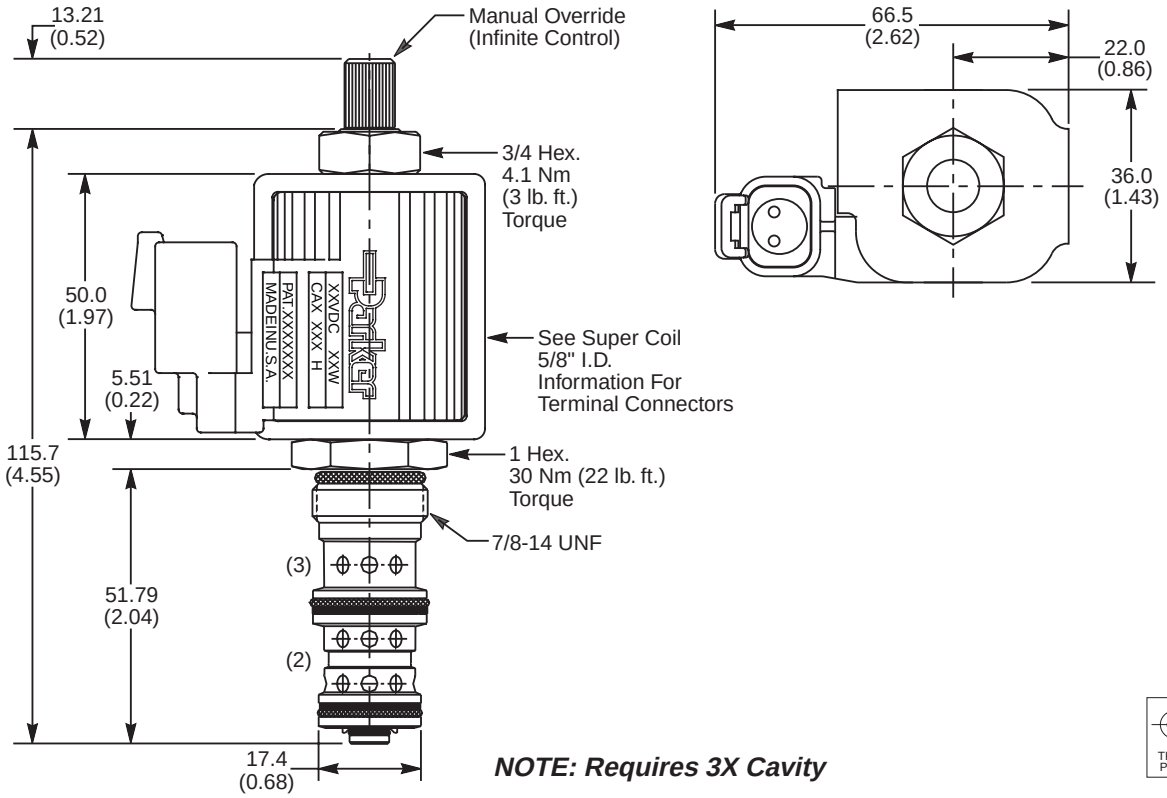
Flow Regulation



Pressure Drop vs. Flow



Dimensions Millimeters (Inches)



NOTE: Requires 3X Cavity

THIRD-ANGLE PROJECTION

Ordering Information

JP04P	21							
10 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Flow Variation	Coil Type	Coil Voltage	Coil Termination

Code	Style (Maximum Regulated Flow)
21	High Flow ('SP' Coil) 36 LPM 9.5 GPM)

Code	Override Option
0	Not Required
5	Detented M.O. (Infinite Control)

Code	Filter Screen
0	Not Required
1	60 Mesh Screen on Port 2

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30106N-1)
V	Fluorocarbon / (SK30106V-1)

Code	Flow Variation
Omit	Standard Up to ±20% of Rated Flow
L	Low Variation (±7% of Rated Flow)

Code	Coil Type
Omit	Without Coil
SP	Super Coil - 28 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 5/8" I.D.
****DC Only***

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
553	1/2" SAE
554	3/8" BSP

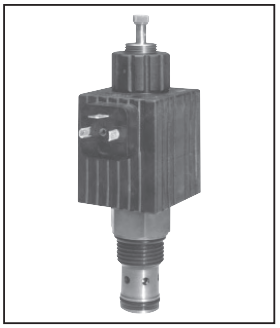
Code	Body Material
A	Aluminum
S	Steel

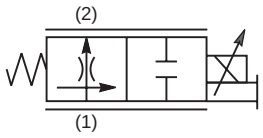
General Description

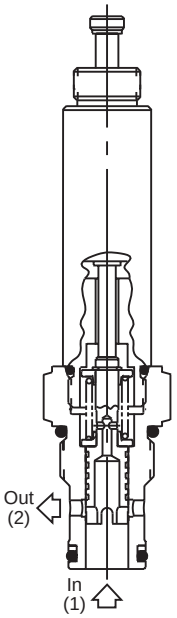
Normally Open Proportional Flow Control Valve. For additional information see Technical Tips on pages PV1-PV6.

Features

- On-off type solenoids
- Low hysteresis
- PWM signal preferred
- Manual override standard
- All external parts zinc plated





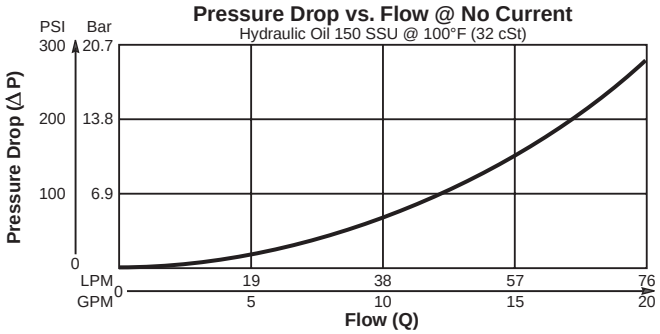


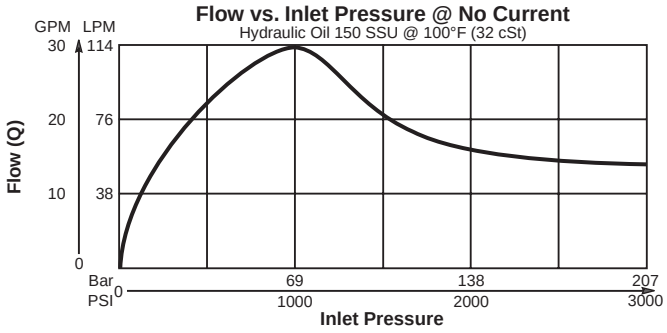
Specifications

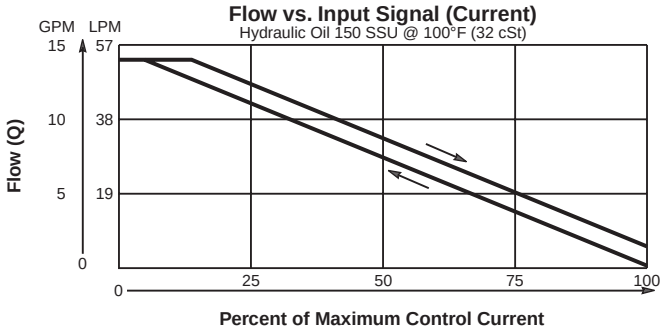
Rated Flow Valve Fully Open (At 100 PSI ΔP)	53 LPM (14 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Hysteresis @ 200 Hz PWM	4%
Frequency	100 - 400 Hz (200 Hz Preferred)
Maximum Control Current	**12 VDC** 2.45A **24VDC** 1.23A
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.32 kg (0.7 lbs.)
Cavity	C12-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT12-2F

Note: 4.1 Bar (60psi) is required at port 1 to fully return Manual override.

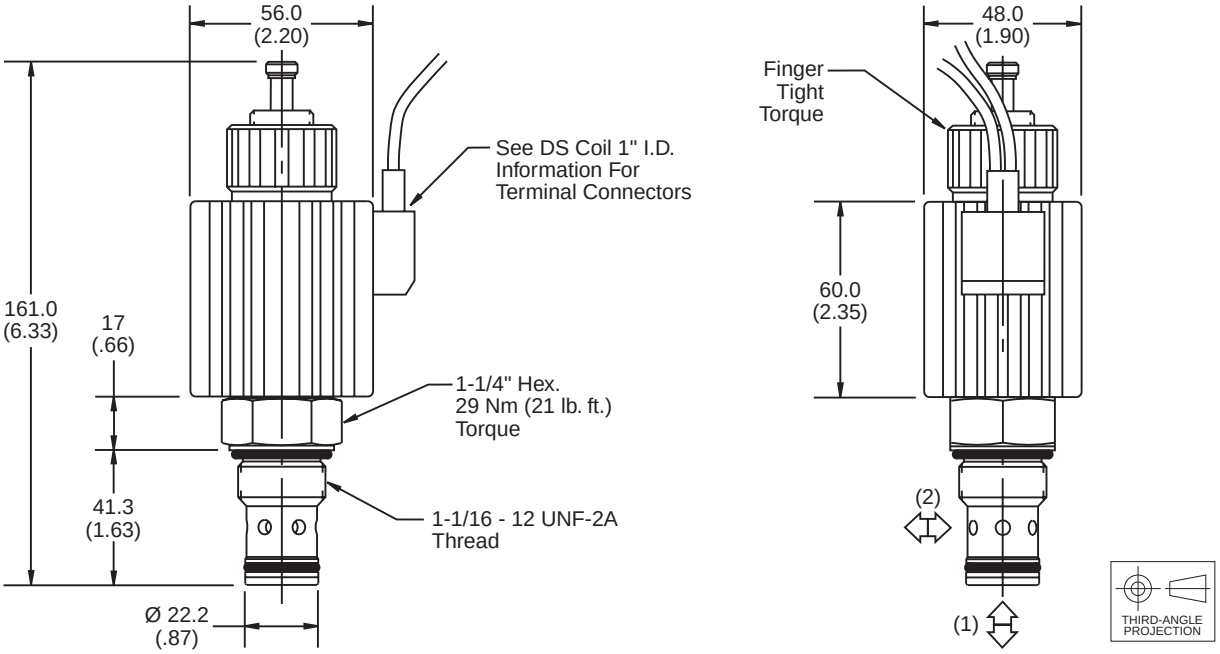
Performance Curves







Dimensions Millimeters (Inches)



Ordering Information

DF122N14								
12 Size Normally Open Proportional Flow Control Valve	Override Options	Seals	Coil Voltage	Coil Wattage	Coil Termination	—	Body Material	Port Size

Code	Override Options
Omit	Push Type with Extenden Rod

Code	Seals / Kit. No.
Omit	Nitrile / (SK12-2)
V	Fluorocarbon / (SK12-2V)

Code	Coil Voltage
Omit	Cartridge without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Wattage
Omit	Cartridge without Coil
H	High Watt

Code	Coil Termination
Omit	Cartridge without Coil
D	DIN
P	Dual Spade
W	Dual Wire

See DS Coil 1" I.D.

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
12P	3/4" NTPF	(B12-2-*12P)
8T	SAE - 8	(B12-2-*8T)
12T	SAE - 12	(B12-2-*12T)

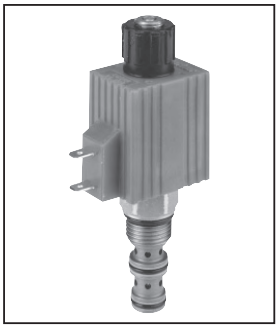
**** Add "A" for aluminum, omit for steel.***

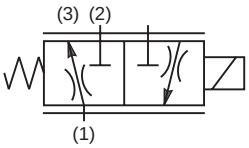
General Description

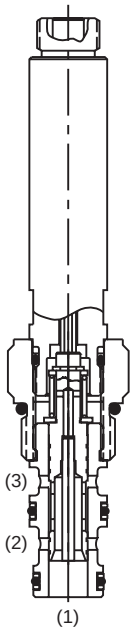
Proportional 3-Way Flow Control Valve. Valve can be used as normally open, or normally closed. For additional information see Technical Tips on pages PV1-PV6.

Features

- On-off type solenoids
- Low hysteresis
- PWM signal preferred
- Manual override standard
- All external parts zinc plated





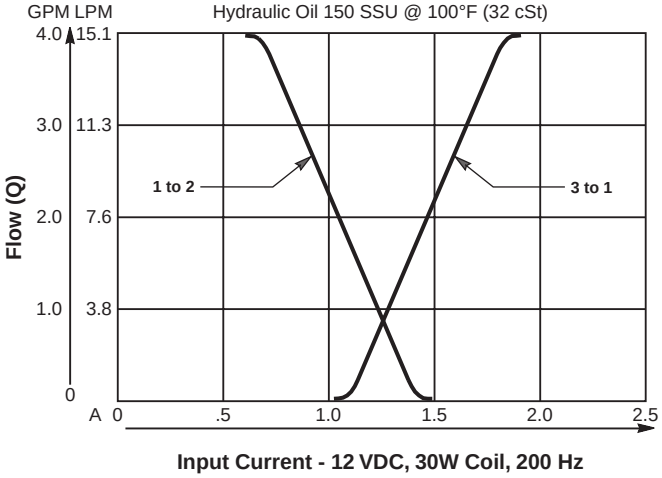


Specifications

Rated Flow Valve Fully Open (At 100 PSI ΔP)	11 LPM (3 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Hysteresis @ 200 Hz PWM	4%
Cracking (Dead band)	20% - 30% of Input Signal
Frequency	100 - 400 Hz (200 Hz Preferred)
Maximum Control Current	**12 VDC** 1.61A **24VDC** .84A
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.31 kg (0.69 lbs.)
Cavity	C08-3 (See BC Section for more details)
Form Tool	Rougher NFT08-3R Finisher NFT08-3F

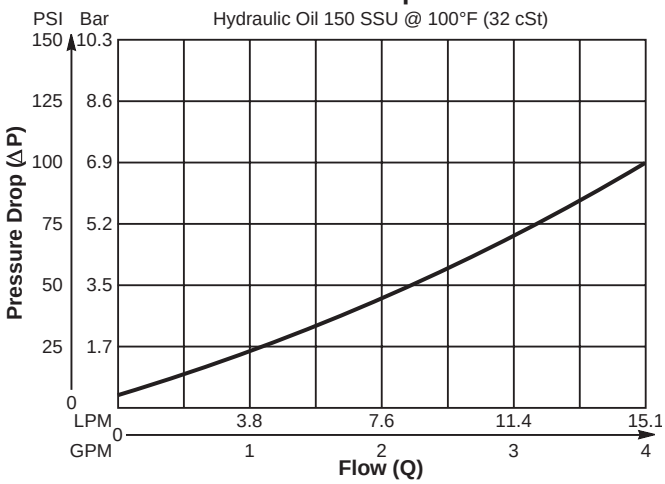
Performance Curves

Flow Gain

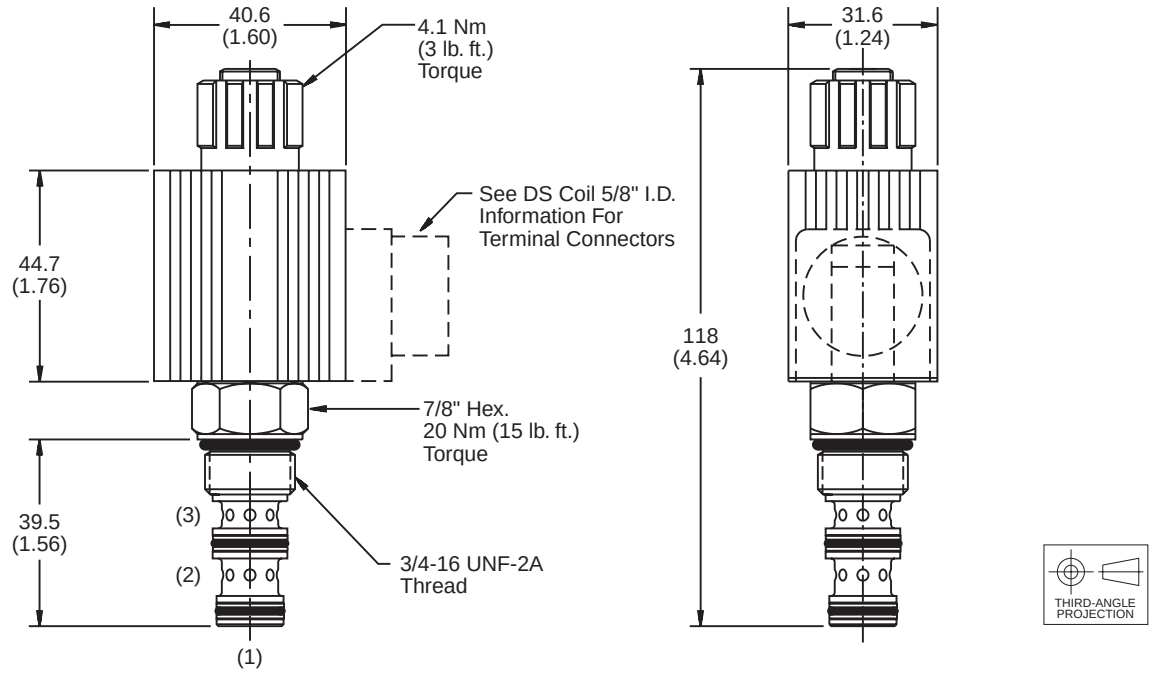


Input Current - 12 VDC, 30W Coil, 200 Hz

Pressure Drop vs. Flow



Dimensions Millimeters (Inches)



Ordering Information

DF083N3	M						—	
08 Size Proportional 3-Way Flow Control Valve	Override Option	Seals	Coil Voltage	Coil Wattage	Coil Termination	Body Material		Port Size

Code	Override Options
M	Push Type with Flush Rod

Code	Seals / Kit. No.
Omit	Nitrile / (SK08-3N)
V	Fluorocarbon / (SK08-3V)

Code	Coil Voltage
Omit	Cartridge without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Wattage
Omit	Cartridge without Coil
H	High Watt

Code	Coil Termination
Omit	Cartridge without Coil
D	DIN
P	Dual Spade
S	Dual Screw
W	Dual Wire

See DS Coil 5/8" I.D.

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
4P	1/4" NPTF	(B08-3-*4P)
4T	SAE - 4	(B08-3-*4T)
6T	SAE - 6	(B08-3-*6T)
6B	3/8" BSPG	(B08-3-*6B)

**** Add "A" for aluminum, omit for steel.***

General Description

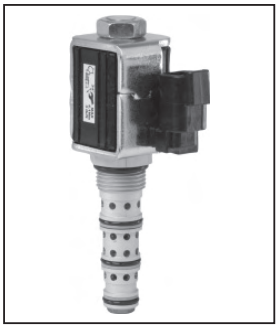
3 Way, Normally Closed, Proportional Flow Regulator Valve. Pressure Compensated. For additional information see Technical Tips on pages PV1-PV6.

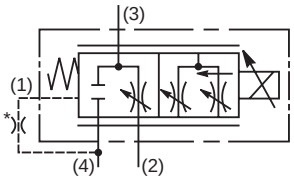
Features

- Analog proportional pressure compensated flow control valve regulates flow proportionally to the input solenoid current
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- Factory-adjusted low variation option (Model "L") is available for applications where low variation of flow from valve to valve is essential at a given current.
- All external parts zinc plated

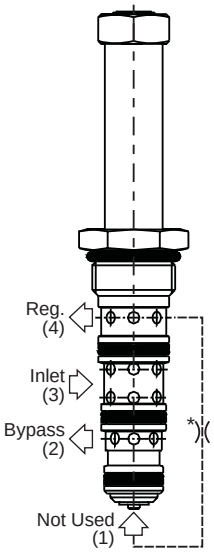
Specifications

Rated Inlet Flow	60 LPM (16 GPM)
Rated Regulated Flow	**31** 26 LPM (7 GPM) Standard ('SS' Coil) **31** 30 LPM (8 GPM) High Flow ('SP' Coil)
Maximum Input Pressure At Port 3	210 Bar (3000 PSI)
Minimum Pressure Differential	**31** 13.8 Bar (200 PSI) Standard **31** 20.7 Bar (300 PSI) High Flow
Maximum Internal Leakage	780 cc (46 cu. in.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	7%
Opening Point	**Standard** 21% of Nominal Amperage **High Flow** 17% of Nominal Amperage
Variation of Opening Point	**Standard Model** Up To ±50% Of Amperage **Model "L"** ±20% Of Amperage
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.14 kg (.31 lbs.)
Cavity	3X (See BC Section for more details)





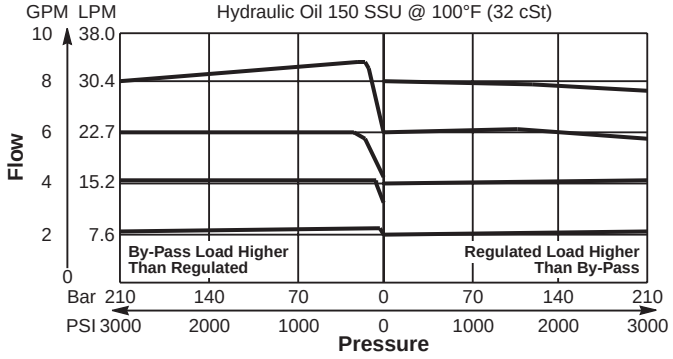
*Always connect Port (1) to Port (4) through .039" orifice.



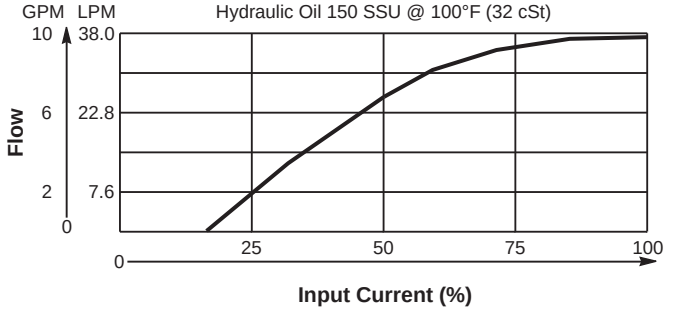
Performance Curves

▲PWM Current Regulator Recommended

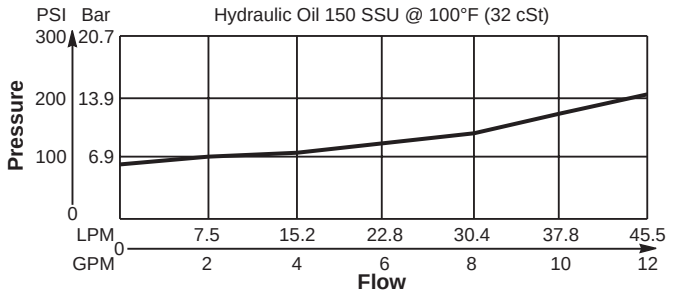
Pressure Compensation of Regulated Flow (Port 4)



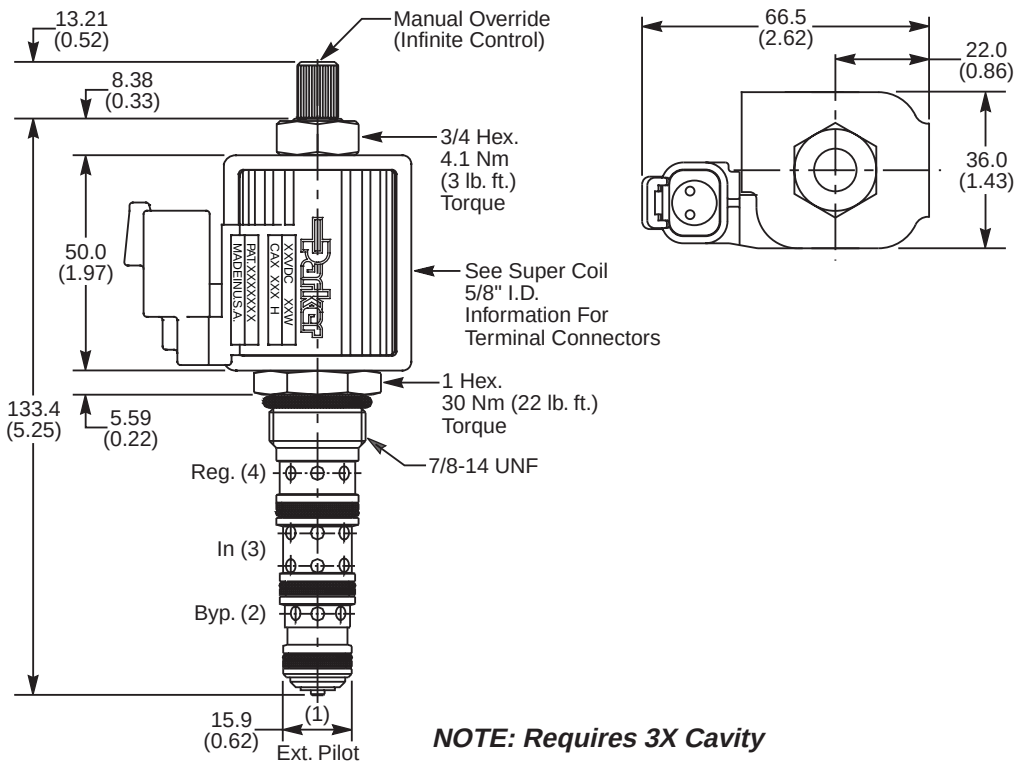
Regulated Flow vs. Input Current Stabilized



Pressure Drop vs. Flow at Coil Fully Energized



Dimensions Millimeters (Inches)



NOTE: Requires 3X Cavity

THIRD-ANGLE PROJECTION

Ordering Information

JP04C	31							
10 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Flow Variation	Coil Type	Coil Voltage	Coil Termination

Code	Style (Maximum Regulated Flow)
31	Standard ('SS' Coil) 26 LPM (7 GPM)
31	High Flow ('SP' Coil) 30 LPM (8 GPM)

Code	Override Option
0	Not Required
5	Detented M.O. (Infinite Control)

Code	Filter Screen
0	Not Available

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30082N-1)
V	Fluorocarbon / (SK30082V-1)

Code	Flow Variation
Omit	Standard Up to ±50% of Opening Amps
L	Low Variation (±20% of Opening Amps)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 18 Watts
SP	Super Coil - 28 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 5/8" I.D.
****DC Only***

Order Bodies Separately

LB10		
Line Body	Porting	Body Material

Code	Porting
562	1/2" SAE
563	3/8" BSP

Code	Body Material
A	Aluminum
S	Steel

General Description

4 Way, 3 Position, Proportional Directional Control Valve. Closed Center Spool. For additional information see Technical Tips on pages PV1-PV6.

Features

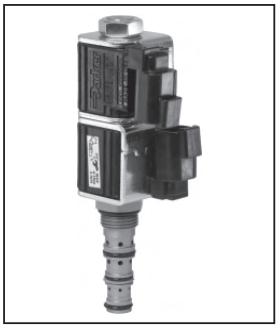
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated

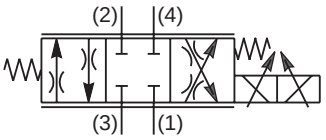
Specifications

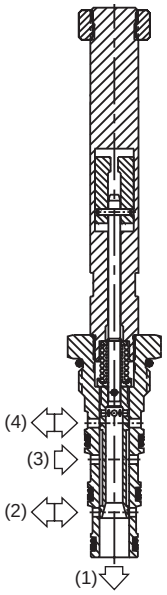
Operating Pressure	**Ports 2, 3 and 4** 350 Bar (5000 PSI) **Port 1** 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<6%
Cracking Flow	25% to 30% of Input Signal
Variation of Flow	±15% @ 75% of Nominal Current and Constant ΔP Maintained by Pressure Compensator
Port to Port Leakage	10 cu. in. @ 3000 PSI
Step Response Time at 75% of Amps	On 50 ms Off 40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.15 kg (.34 lbs.)
Cavity	C08-4

Typical Performance

SPOOL TYPE AND FLOW	RATED FLOW AT 75% OF NOMINAL CURRENT LPM - (GPM)		SUPER COIL TYPE		Compensator ΔP Bar (PSI)
	'a' SOLENOID PUSH P to A, B to T	'b' SOLENOID PULL P to B, A to T	PUSH	PULL	
51L Low Flow	5.3 - (1.4)	5.3 - (1.4)	SP	SP	10 (150)
	3.4 - (0.9)	3.4 - (0.9)	SS	SS	5 (75)
51 Standard	13.3 - (3.5)	17 - (4.5)	SP	SP	15 (220)
	11.4 - (3.0)	15.2 - (4.0)	SS	SS	15 (220)
52 High Flow	21 - (5.5)	17 - (4.5)	SP	SP	20 (290)
	17.4 - (4.5)	13 - (3.5)	SP	SP	15 (220)



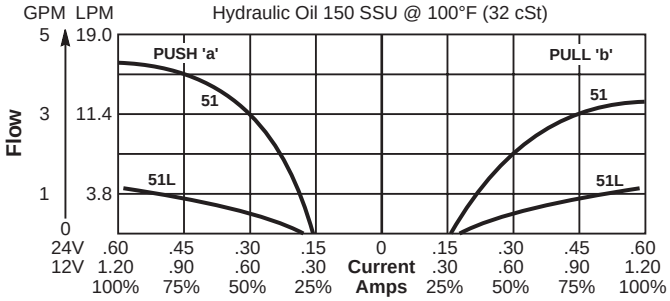




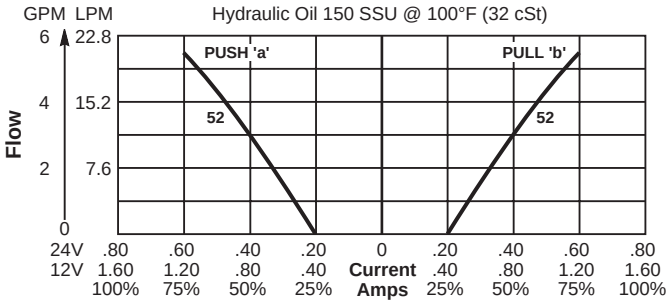
Performance Curves

▲PWM Current Regulator Recommended

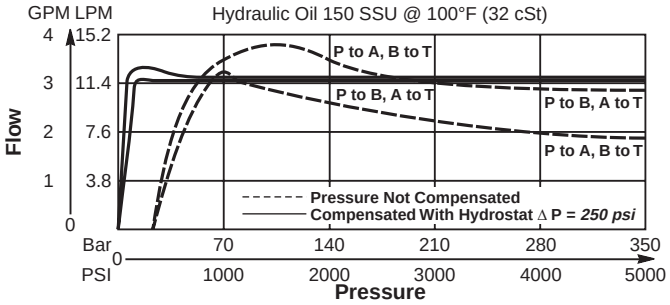
51L With 5 Bar, 75 PSI Compensator
51 With 15 Bar, 220 PSI Compensator and SS Coil



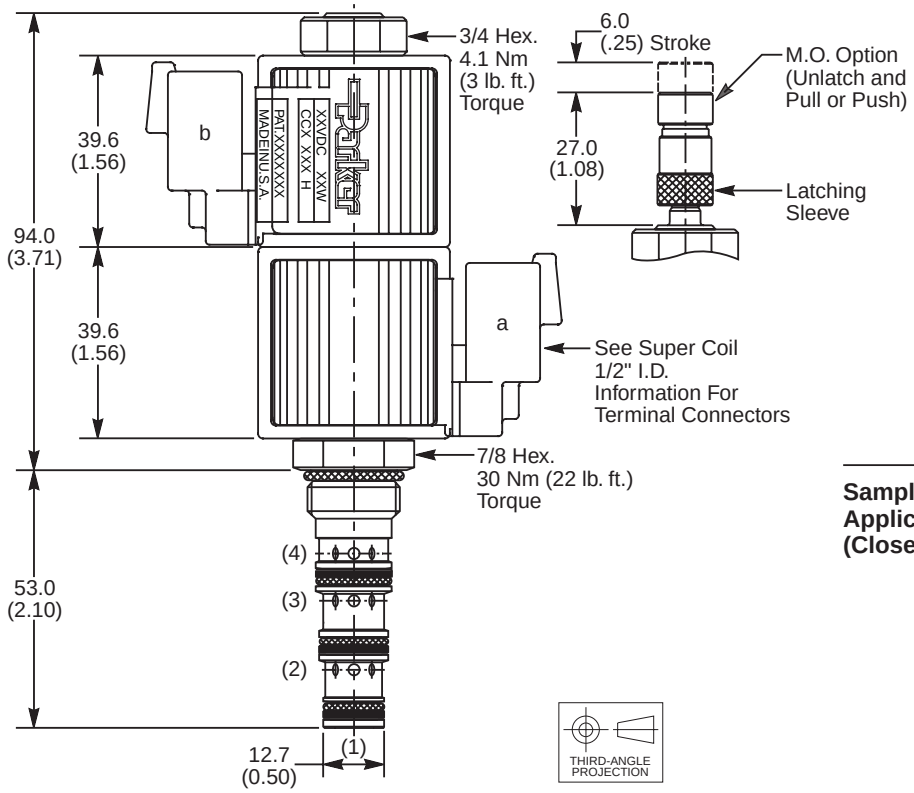
52 With 20 Bar, 290 PSI Compensator and SP Coil

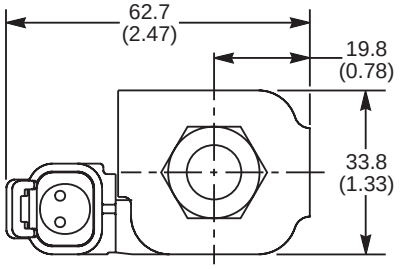


Flow vs. Load

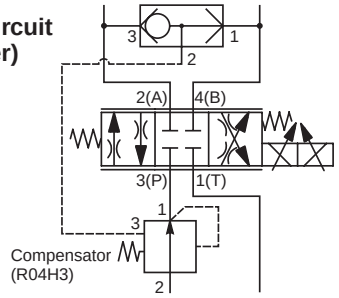


Dimensions Millimeters (Inches)





Sample Application Circuit (Closed Center)



Ordering Information

GP02							—		
08 Size Proportional Valve	Style	Override Option	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style - Closed Center (Flow Pressure and Performance)
51	Standard
51L	Low Flow
52	High Flow

Code	Override Option
Omit	Not Required
1	Manual Override
2	Detented M.O.

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30078N-1)
V	Fluorocarbon / (SK30078V-1)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 14 Watts
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
**DC Only*

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4T	SAE-4	(B08-4-*4T)
6T	SAE-6	(B08-4-*6T)
6B	3/8" BSPG	(B08-4-*6B)

*** Add "A" for aluminum, omit for steel.***

General Description

4 Way, 3 Position, Proportional Directional Control Valve. Closed Center Spool. For additional information see Technical Tips on pages PV1-PV6.

Features

- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated

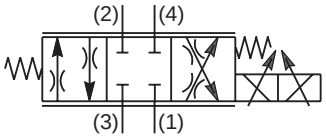
Specifications

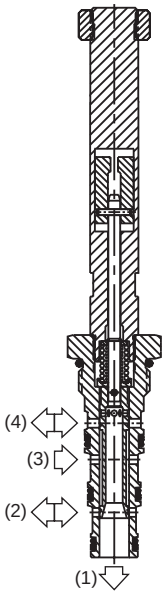
Operating Pressure	**Ports 2, 3 and 4** 350 Bar (5000 PSI) **Port 1** 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<6%
Cracking Flow	25% to 30% of Input Signal
Variation of Flow	±15% @ 75% of Nominal Current and Constant ΔP Maintained by Pressure Compensator
Port to Port Leakage	10 cu. in. @ 3000 PSI
Step Response Time at 75% of Amps	On 50 ms Off 40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscostiy	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.28 kg (.57 lbs.)
Cavity	C10-4

Typical Performance

SPOOL TYPE AND FLOW	RATED FLOW AT 75% OF NOMINAL CURRENT LPM - (GPM)		SUPER COIL TYPE		Compensator ΔP Bar (PSI)
	'a' SOLENOID PUSH P to A, B to T	'b' SOLENOID PULL P to B, A to T	PUSH	PULL	
51	32 - (8.5)	44 - (11.5)	SP	SP	15 (220)
	28 - (7.5)	38 - (10.0)	SS	SS	15 (220)
51HL High - Low Standard	15 - (4.0)	30 - (8.0)	SP	SP	10 (150)
	13 - (3.5)	26 - (7.0)	SS	SS	10 (150)
51HLH High - Low High Flow	19 - (5.0)	38 - (10.0)	SP	SP	15 (220)
	15 - (4.0)	34 - (9.0)	SS	SS	15 (220)



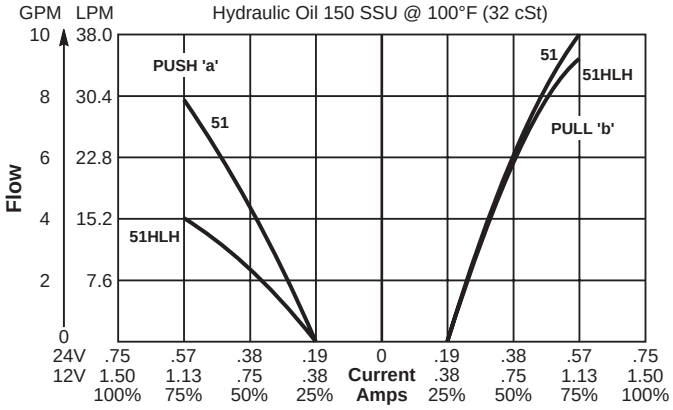




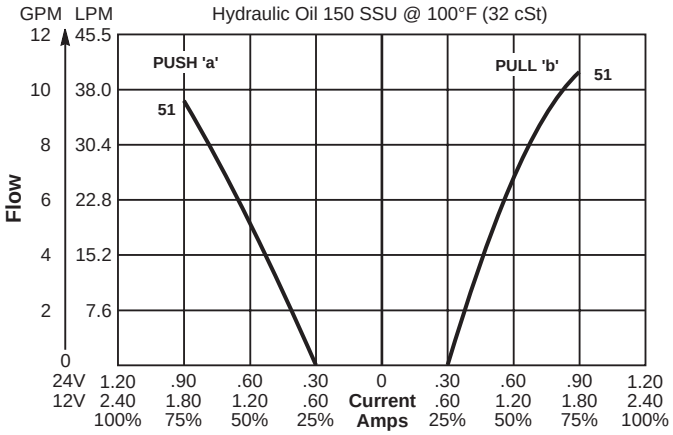
Performance Curves

▲PWM Current Regulator Recommended

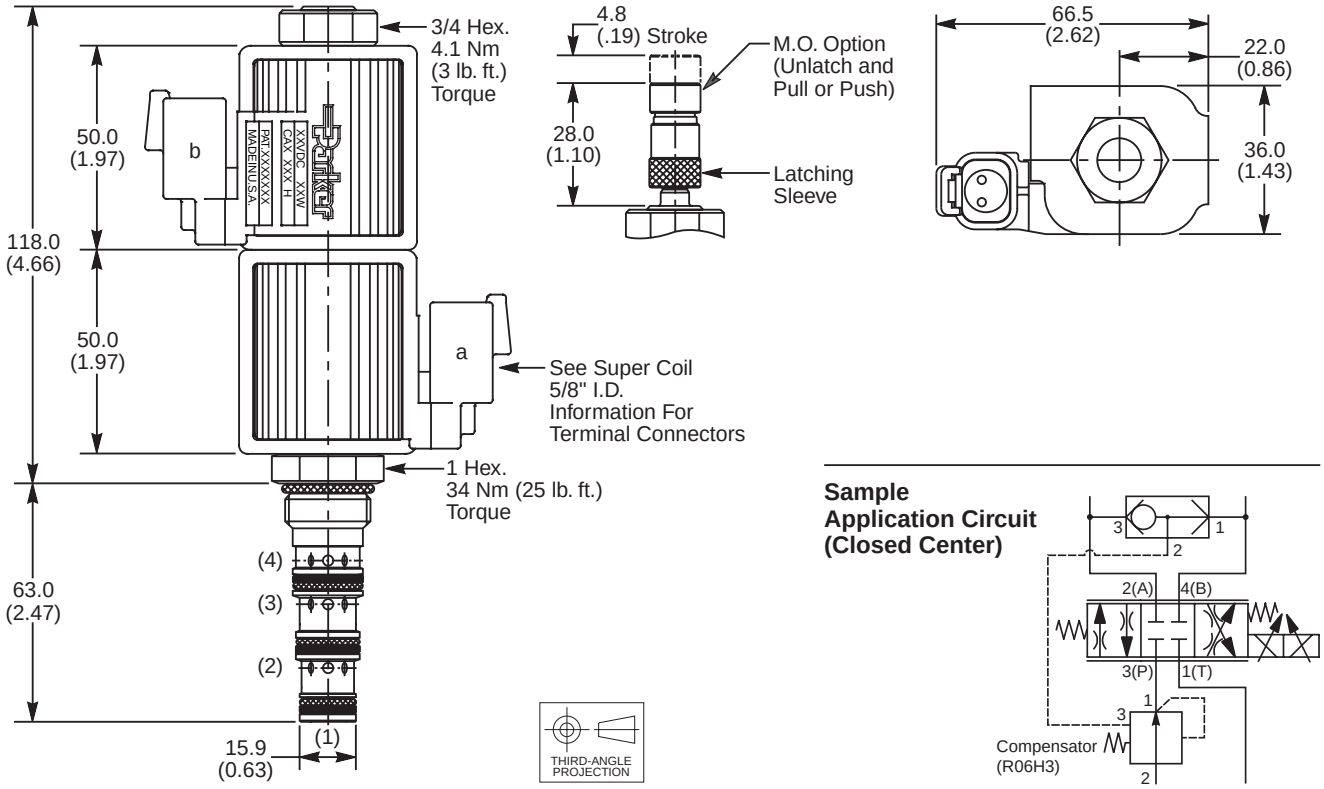
51 and 51HLH With 15 Bar, 220 PSI Compensator and SS Coil



51 With 15 Bar, 220 PSI Compensator and SP Coil



Dimensions Millimeters (Inches)



Sample Application Circuit (Closed Center)

Ordering Information

GP04							—		
10 Size Proportional Valve	Style	Override Option	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style - Closed Center (Flow Pressure and Performance)
51	Standard
51HL	High - Low
51HLH	High - Low, High Flow

Code	Override Option
Omit	Not Required
1	Manual Override
2	Detented M.O.

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30506N-1)
V	Fluorocarbon / (SK30506V-1)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 18 Watts
SP	Super Coil - 28 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 5/8" I.D.
**DC Only*

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6P	3/8" NPTF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8" BSPG	(B10-4-6B)†

** Add "A" for aluminum, omit for steel.*
† Steel body only.

General Description

4 Way, 3 Position, Proportional Directional Control Valve. Floating Center Spool. For additional information see Technical Tips on pages PV1-PV6.

Features

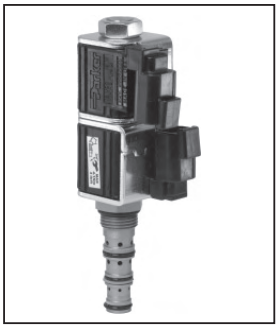
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated

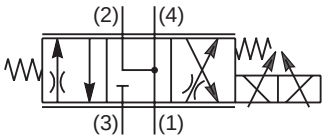
Specifications

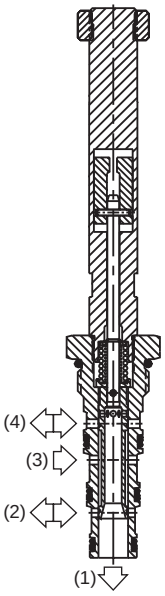
Operating Pressure	**Ports 2, 3 and 4** 350 Bar (5000 PSI) **Port 1** 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<6%
Cracking Flow	25% to 30% of Input Signal
Variation of Flow	±15% @ 75% of Nominal Current and Constant ΔP Maintained by Pressure Compensator
Port to Port Leakage	10 cu. in. @ 3000 PSI
Step Response Time at 75% of Amps	On 50 ms Off 40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.15 kg (.34 lbs.)
Cavity	C08-4

Typical Performance

SPOOL TYPE AND FLOW	RATED FLOW AT 75% OF NOMINAL CURRENT LPM - (GPM)		SUPER COIL TYPE		Compensator ΔP Bar (PSI)
	'a' SOLENOID PUSH P to A, B to T	'b' SOLENOID PULL P to B, A to T	PUSH	PULL	
53L Low Flow	5.3 - (1.4)	5 - (1.4)	SP	SP	10 (150)
	4 - (1.0)	4 - (1.0)	SS	SS	5 (75)
53 Standard	14 - (3.8)	15 - (4.0)	SP	SP	10 (150)
	9 - (2.5)	10 - (2.7)	SS	SS	5 (75)
54 High Flow	17 - (4.5)	19 - (5.0)	SP	SP	20 (290)
	15 - (4.0)	15 - (4.0)	SS	SS	15 (220)



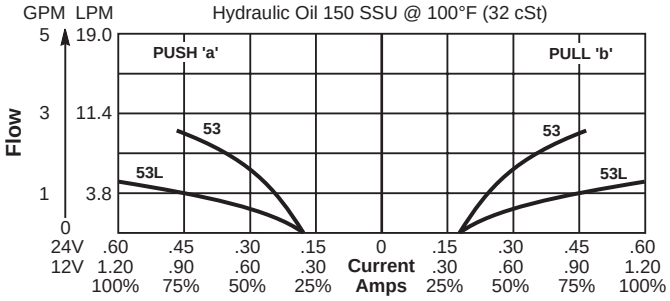




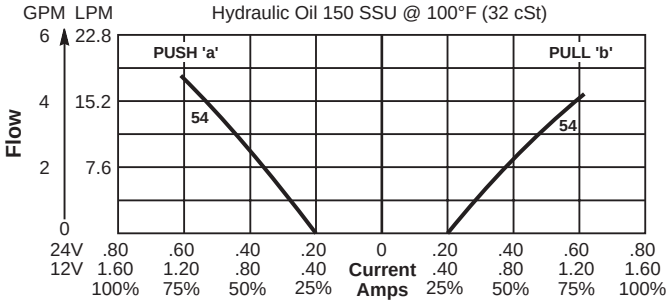
Performance Curves

▲PWM Current Regulator Recommended

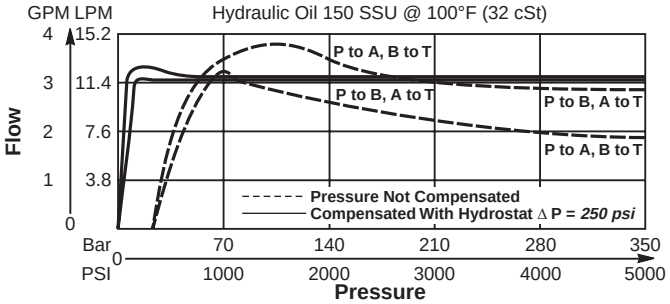
53 and 53L With 5 Bar, 75 PSI Compensator and SS Coil



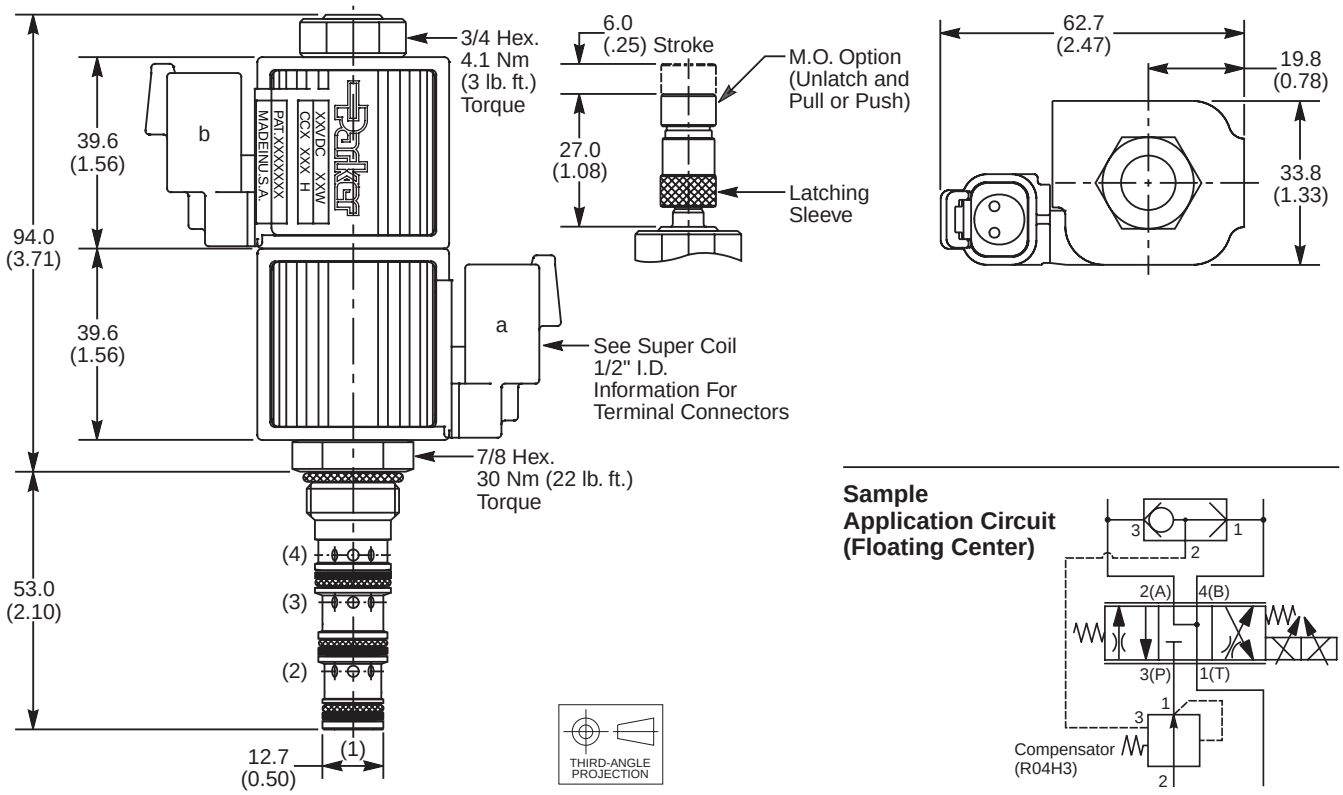
54 With 20 Bar, 290 PSI Compensator and SP Coil



Flow vs. Load



Dimensions Millimeters (Inches)



Sample Application Circuit (Floating Center)

Ordering Information

GP02							—		
08 Size Proportional Valve	Style	Override Option	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style - Floating Center (Flow Pressure and Performance)
53	Standard
53L	Low Flow
54	High Flow

Code	Override Option
Omit	Not Required
1	Manual Override
2	Detented M.O.

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30078N-1)
V	Fluorocarbon / (SK30078V-1)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 14 Watts
SP	Super Coil - 19 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 1/2" I.D.
****DC Only***

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
4T	SAE-4	(B08-4-*4T)
6T	SAE-6	(B08-4-*6T)
6B	3/8" BSPG	(B08-4-*6B)

**** Add "A" for aluminum, omit for steel.***

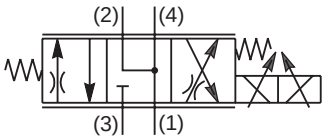
General Description

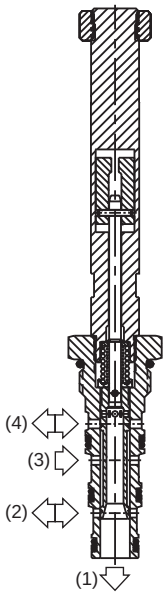
4 Way, 3 Position, Proportional Directional Control Valve. Floating Center Spool. For additional information see Technical Tips on pages PV1-PV6.

Features

- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated







Specifications

Operating Pressure	**Ports 2, 3 and 4 -** 350 Bar (5000 PSI) **Port 1 -** 210 Bar (3000 PSI)
Hysteresis @	<6% @ 100 Hz PWM
Cracking Flow	25% to 30% of Input Signal
Variation of Flow	±15% @ 75% of Nominal Current and Constant ΔP Maintained by Pressure Compensator
Port to Port Leakage	10 cu. in. @ 3000 PSI
Step Response Time at 75% of Amps	On 50 ms Off 40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Operating Temp. Range/Seals	-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
Fluid Compatibility Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 16/13, SAE Class 4 or better
Approx. Weight	.28 kg (.57 lbs.)
Cavity	C10-4

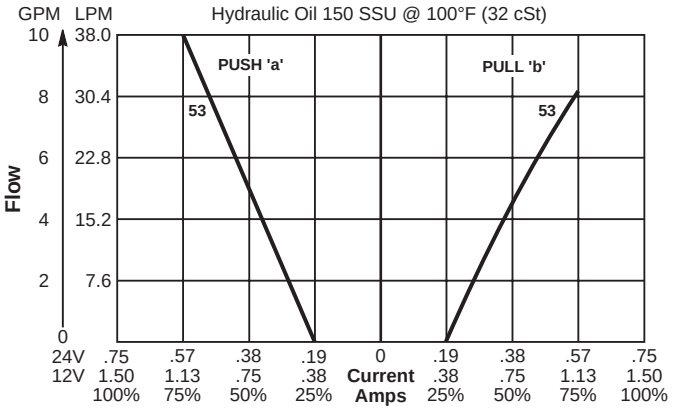
Typical Performance

SPOOL TYPE AND FLOW	RATED FLOW AT 75% OF NOMINAL CURRENT LPM - (GPM)		SUPER COIL TYPE		Compensator ΔP Bar (PSI)
	'a' SOLENOID PUSH P to A, B to T	'b' SOLENOID PULL P to B, A to T	PUSH	PULL	
53	45 - (12.0)	45 - (12.0)	SP	SP	15 (220)
	38 - (10.0)	32 - (8.5)	SS	SS	15 (220)
	32 - (8.5)	36 - (9.5)	SP	SP	10 (150)
	26 - (7.0)	34 - (9.0)	SS	SS	10 (150)
53HL High - Low Standard	13 - (3.5)	30 - (8.0)	SP	SP	10 (150)
	-	-	-	-	-
53HLH High - Low High Flow	15 - (4.0)	38 - (10.0)	SP	SP	15 (220)
	-	-	-	-	-

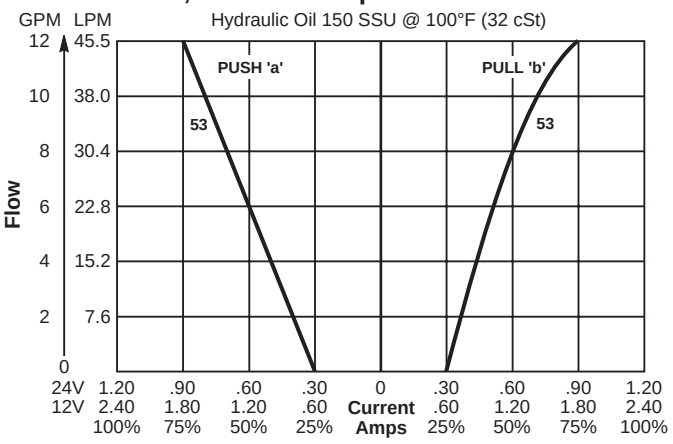
Performance Curves

▲PWM Current Regulator Recommended

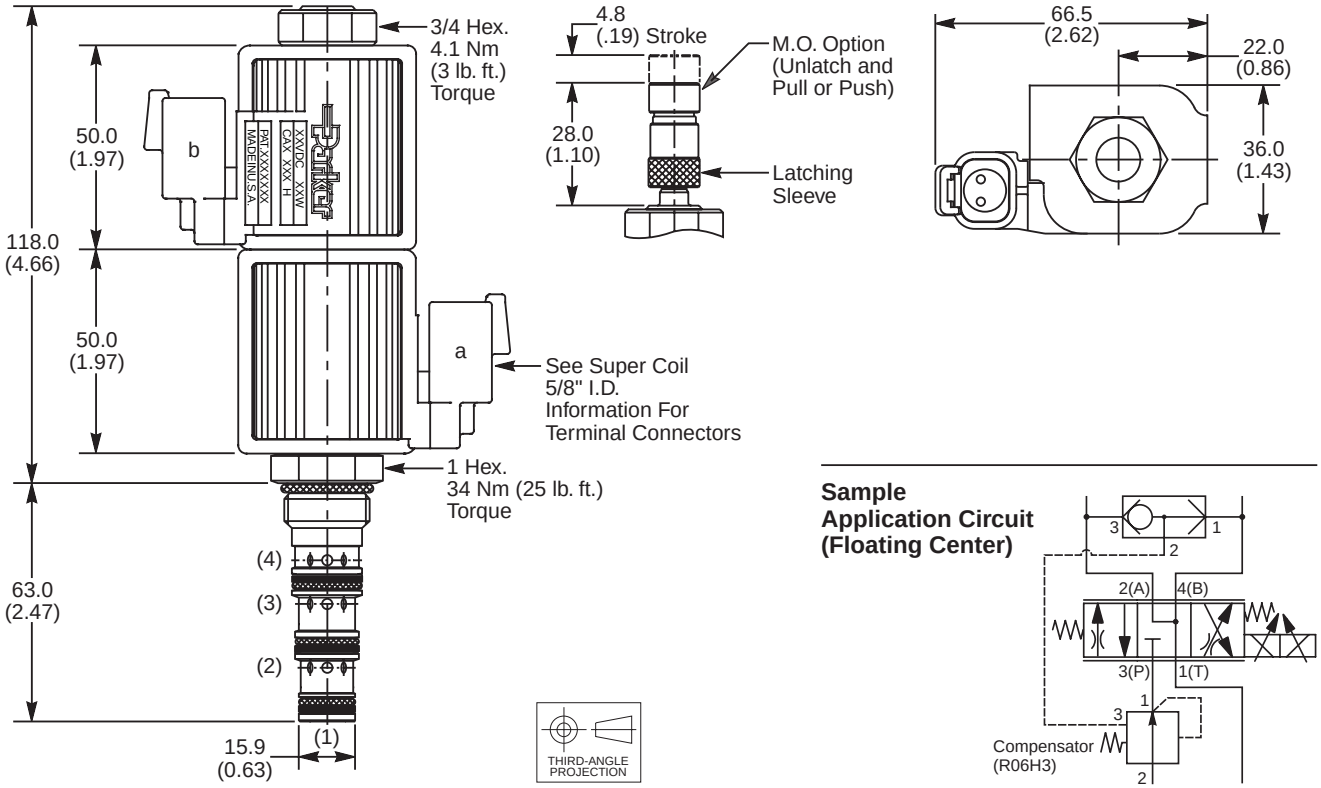
53 With 15 Bar, 220 PSI Compensator and SS Coil



53 With 15 Bar, 220 PSI Compensator and SP Coil



Dimensions Millimeters (Inches)



Sample Application Circuit (Floating Center)

Ordering Information

GP04							—		
10 Size Proportional Valve	Style	Override Option	Seals	Coil Type	Coil Voltage	Coil Termination		Body Material	Port Size

Code	Style - Floating Center (Flow Pressure and Performance)
53	Standard
53HL	High - Low
53HLH	High - Low, High Flow

Code	Override Option
Omit	Not Required
1	Manual Override
2	Detented M.O.

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30506N-1)
V	Fluorocarbon / (SK30506V-1)

Code	Coil Type
Omit	Without Coil
SS	Super Coil - 18 Watts
SP	Super Coil - 28 Watts

Code	Coil Voltage
Omit	Without Coil
D012	12 VDC
D024	24 VDC

Code	Coil Termination
Omit	Without Coil
D	DIN Plug Face
A	Amp Jr. Timer*
L	Dual Lead Wire*
H	Molded Deutsch*

See Super Coil 5/8″ I.D.
****DC Only***

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size	Body Part No.
Omit	Cartridge Only	
6P	3/8″ NPTF	(B10-4-*6P)
6T	SAE-6	(B10-4-*6T)
8T	SAE-8	(B10-4-*8T)
6B	3/8″ BSPG	(B10-4-6B)†

**** Add "A" for aluminum, omit for steel.***
† Steel body only.

BLANK
PAGE

Contents

Coils and Electronics

SERIES	DESCRIPTION	PAGE NO.
SUPER COILS		
CC	1/2″ Solenoid Tubes	CE3-CE4
CA	5/8″ Solenoid Tubes	CE5-CE6
STANDARD COILS		
Unicoil	1/2″ Solenoid Tubes	CE7-CE8
Unicoil	5/8″ Solenoid Tubes	CE9-CE10
DS	1/2″ Solenoid Tubes	CE11-CE12
DS	5/8″ Solenoid Tubes	CE13-CE14
DS	1″ Solenoid Tubes	CE15
ELECTRONICS		
XPRO902	12 VDC PWM Controller, 110Hz, 19W	CE17-CE18
XPRO932	12 VDC PWM Controller, 110Hz, 30W	CE17-CE18
XPRO904	24 VDC PWM Controller, 110Hz, 19W	CE17-CE18
XPRO934	24 VDC PWM Controller, 110Hz, 30W	CE17-CE18
XPRO902d	12 VDC PWM Controller, 95-230Hz, 19W	CE19-CE20
XPRO932d	12 VDC PWM Controller, 95-230Hz, 30W	CE19-CE20
XPRO904d	24 VDC PWM Controller, 95-230Hz, 19W	CE19-CE20
XPRO934d	24 VDC PWM Controller, 95-230Hz, 30W	CE19-CE20
XPRO902rid	12 VDC PWM Controller, 95-230Hz, 19W, Multi-adj.	CE21-CE22
XPRO932rid	12 VDC PWM Controller, 95-230Hz, 30W, Multi-adj.	CE21-CE22
XPRO904rid	24 VDC PWM Controller, 95-230Hz, 19W, Multi-adj.	CE21-CE22
XPRO934rid	24 VDC PWM Controller, 95-230Hz, 30W, Multi-adj.	CE21-CE22
XPRO704	Soft Start Valve Controller, 12/24 VDC	CE23
XPRO704b	Soft Start and Stop Valve Controller, 12/24 VDC	CE24
XPRO804	Power Saver Controller, 12/24 VDC PWM	CE25

INTRODUCTION

This technical tips section is designed to help familiarize you with the Parker line of Coils. In this section we highlight the features and discuss some of the available options. We also use this section to present some common terminology related to coil and coil technology.

New Parker *SUPER COIL* Now Available!

Class N Magnetic Wire
Internal wires have a class N rating, providing longer life at typical temperatures.

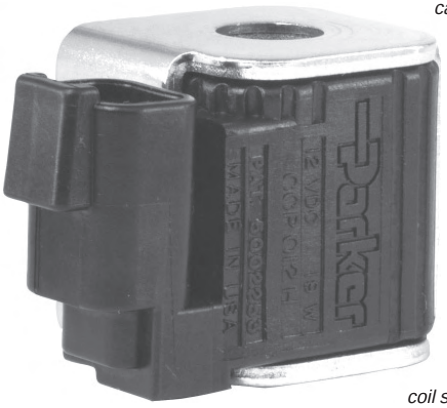
DC Windings
All coils are DC wound. An internal full wave rectifier is added for AC current, eliminating inrush current, and allowing for voltage interchangeability.

Variety of Terminations
Coils are offered in a wide variety of terminations, including integrally molded connectors and voltages to meet your system requirements.

Rugged Thermoplastic Encapsulation
Coil is encased in a thermoplastic polyester resin. This allows for higher temperature exposure and less flexural creep. Also, this resin is resistant to moisture, caustic solutions, and fungus providing protection for coil windings.



Low Carbon Steel Frame
Zinc plated low carbon steel frame surrounds coil, increasing flux density. Low carbon steel provides better magnetic properties and greater permeability.



Diodes
Internally molded diodes are available. Polarity is molded into coil for ease of installation.

Ribbed Surface
External ridges provide a larger coil surface area, which allows for better heat dissipation.

****Exceeds IP69k Specifications***

After exhaustive testing, the new Super Coil has clearly distanced itself from the competition. This coil was subjected to the rigors of this environmental standard and the results were excellent. This coil stands up to most rugged of environmental conditions including weather, dust, and extreme temperature variations.

****Water Dunk Test Qualified***

The Super Coil was taken to task in a repeated water dunk thermal cycle test program with alternate exposure to high and low temperature, only to perform with outstanding results.

****Endurance Tested***

The goal of this test was to cycle the coil to high temperature extremes in order to validate the coils ability to perform in extreme temperature environments.

****Water Spray and Chemical Solvent Compatibility***

The Super Coil was subjected to numerous chemical solvents in a rigorous test which established the fact that these coils can withstand harsh and unusual environments. Also, the coils were subjected to a high pressure water spray test. Once again, the Super Coil passed this test.

****Deutsch connector required.***

COMMON OPTIONS

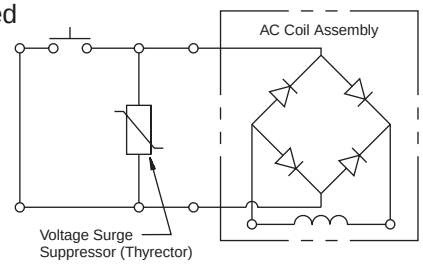
Below are some of the common options to the Unicoil product offering.

Continuous Duty: Parker's standard line of coils are rated for continuous duty operation. This means the coil can be left on continuously without fear of the magnet wire insulation breakdown, when used in standard climate conditions. The Unicoils and Super Coils are made of a high quality Class N magnet wire. This Class N rating signifies the internal wires are rated to 200°C (392°F).

Continuous duty does not mean the coil will have the same amount of power after hours of operation as it had at initial actuation. Coils do heat up during use. This internal heat rise increases the resistance of the coil and thus, decreases the current (V = IR). The performance curves presented on the solenoid valve pages are based on a coil at room temperature and 85% of voltage. Thus, when using a valve in continuous duty applications, you may need to derate the performance. In short, the continuous duty rating signifies that while the coil will get hot during use and resistance will increase, it will not generate enough heat to damage the coil.

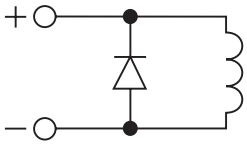
Terminations: Parker offers a wide variety of coil terminations for all coils to meet the demands of your application. Over the years, the dual lead wire and dual spade offerings have been popular due to their ease of installation and availability. In the past few years, the demand for more secure termination connections has increased. In addition, the integral connectors reduce cost and improve integrity by reducing the number of connections. As such, the Amp Junior, Weatherpack, Metri-Pack, and Deutsch have increased in popularity. We offer these connectors on a lead wire coil, as well as an internally molded version of the DIN, Amp Junior, and Metri-Pack coils. If you do not find your desired coil termination in our catalog, contact your factory sales representative. We entertain special requests and have several special terminations not listed in this catalog.

Current Types: Both direct current (DC) and alternating current (AC) versions are available for the Parker line of coils. The AC versions are essentially DC coils with a full wave rectifier integrally molded into the coil. The rectifiers are rated for voltage peaks up to 1000 volts maximum. For voltage transients greater than 1000 volts, a Harris Thyrector is recommended. The AC coils operate at 50/60 cycles (Hz). Since the AC versions are rectified DC coils, there is no inrush current like with "true" AC coils. It also means DC coils and AC coils are interchangeable.



Voltages: Parker has a wide selection of coils available to meet your needs. Most coil terminations are available with our standard voltages of 12V and 24V in DC, and 120V and 240V in AC. Voltages 6V, 10V, 18V, 36V, 48V DC and 440V AC are also available for many termination types at a slight premium. Contact your Parker representative should your application call for voltages other than our standard offering.

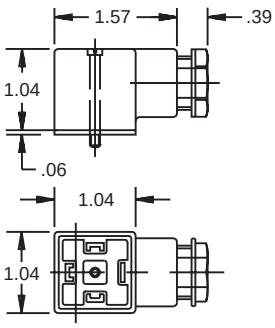
Diodes: The Parker Coils can be ordered with a diode molded internally. Parker Unicoils use a IN5062 diode. The Super Coils use a IN5627 diode. Diodes are sometimes used to protect sensitive, downstream electrical components from potential surges from the coil. By internally molding the diode into the coil, you can reduce the assembly time and cost associated with externally wiring a diode. One should be careful not to switch the polarity ("+" and "-" terminals), when wiring a coil with an internal diode. If these terminals are switched, the first time voltage is applied to the coil; the short circuit will destroy the diode and render the coil use-less. Parker coils with diodes have "+" and "-" molded near the termination outlet to help identify polarity.



DIN Connectors: Parker does offer connectors for use with the DIN style coils. As shown below, the DIN connectors are available in both rectified and non-rectified forms. The cable gland versions can be ordered for type PG9 or PG11.

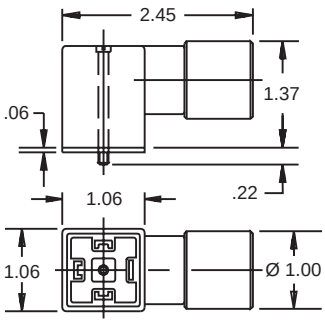
Cable Gland

Type	Non-Rectified	Rectified
PG9	710549-00	712126-01
PG11	710549-01	712126-00



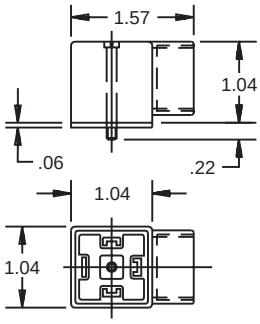
Conduit

Rectified
712704-00



Conduit

Non-Rectified
710549-02



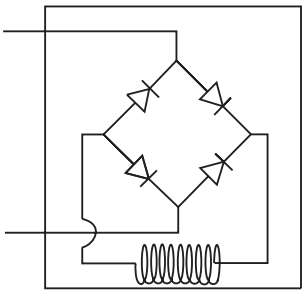
Features

- **Integral Deutsch connector coil exceeds IP69K standards**
- Integral Deutsch connector coil thermal shock dunk test rated
- Integral Amp Jr. coil exceeds IP67 standards for thermal shock, water resistance and “dunk capability”
- Universal 50/60 Hz operation
- Waterproof coil hermetically sealed, requires no O-rings or waterproofing kits
- External plated steel flux-carrying band (unlike encapsulated band) enables coil to withstand severe thermal shocks without cracking
- Symmetrical coil can be reversed without affecting performance

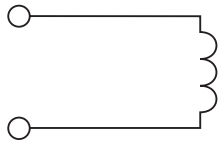
Specifications

Coil Type	**S** Standard **P** Puissant
Nominal Wattage (See Ordering Information For Exact Wattage)	**S** 14 Watts **P** 19 Watts
Duty Cycle	Continuous @ 100% voltage
Magnetic Wire Insulation Class	‘N’ Rated at 200°C (392°F)
Temperature Range	-40°C to +200°C (-40°F to +392°F)
Temperature Rise At Nominal Voltage And Natural Ventilation	**S** 75°C (135°F) **P** 95°C (172°F)
Dielectric Strength Maximum Current Leakage (Amps)	.0005 In dry lab condition at 1000V AC for 30 seconds .001 After being immersed in 23°C (77°F) water with waterproof connector for 24 hours at 500V AC
Encapsulating Material	Glass filled rynite
Color Identification On The Terminal Boss	**S** Black Ring **P** Red Ring
Weight	0.20 kg (0.44 lbs.)

AC Coil Assembly







Ordering Information

CC			
Super Coil 1/2″ I.D.	Wattage	Voltage	Termination

Code	Wattage
S	Standard
P	Puissant

Code	Voltage						
		Watts		Amps		Ohms**	
	Volts	S	P	S	P	S	P
010	10 VDC	14	19	1.38	1.90	7.25	5.26
012*	12 VDC	14	19	1.15	1.58	10.43	7.58
018	18 VDC	14	19	0.77	1.06	23.48	17.05
024*	24 VDC	14	19	0.58	0.79	41.74	30.30
048	48 VDC	14	19	0.29	0.40	167.0	121.3
115*	115 VAC	16	19	0.17	0.20	680	576
230	230 VAC	17	22	0.09	0.12	2596	1919

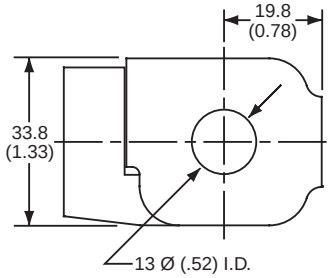
Standard** ****Resistance ±10% at 68°F

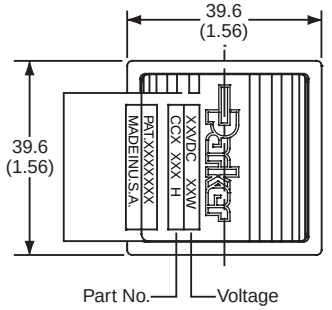
Code	Termination
A	Amp Jr. (DC Only)
AD	Amp Jr. with 3 Amp Diode (DC Only)
C	Double Lead Wire with Conduit Connector (AC Only)
D	DIN 43650 (AC or DC, Supplied without DIN Connector)
H	Integral Deutsch
HE	Integral Deutsch with 3 Amp Diode
L	Double Lead (DC Only)
LD	Double Lead with Deutsch Connector DT04-2P-EP04 (DC Only) (Use ‘H’ series if possible)
LE	Double Lead with 3 Amp Diode (DC Only)
PF	Double Lead Wire with Packard Female Weather Pack Connector 1201 5792 (DC Only)
PM	Double Lead Wire with Packard Male Weather Pack Connector 1201 0973 (DC Only)
S	Double Spade (DC Only)
W	Double Screw (DC only)
WE	Double Screw with 3 Amp Diode (DC Only)
Y	Single Screw (Internally Grounded, DC Only)

***Note:** Additional voltages and other terminals are available. Some coils are UL approved. For details please consult factory.*

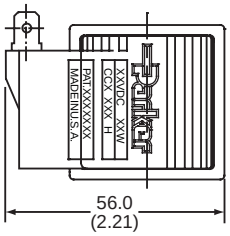
DIN Female Mating Connector: See page CE2
Deutsch Mating Connector: # DT06-2S
Packard Male Weather Pack Connector: 12010973
Packard Female Weather Pack Connector: 12015792

Terminal Styles and Dimensions

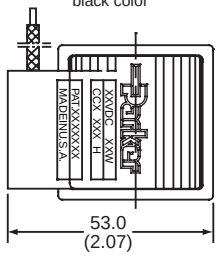




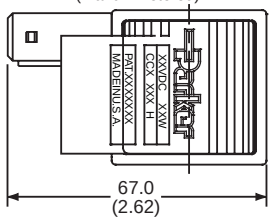
S - Double Spade



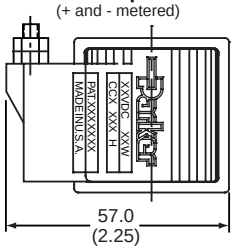
L - Double Lead
18 gauge 457mm *18″* long
black color



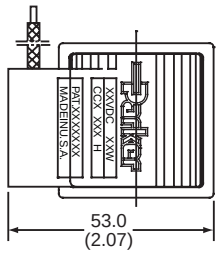
A - Amp Junior
AD - Amp Junior
with 3 Amp Diode
(+ and - metered)



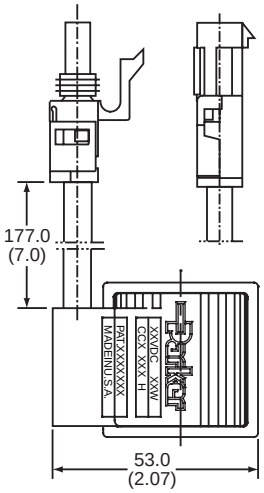
Y - Single Screw
(Internal ground)
8-32 UNC screw & nut
W - Double Screw
8-32 UNC screw & nut
WE - Double Screw
with 3 Amp Diode
(+ and - metered)



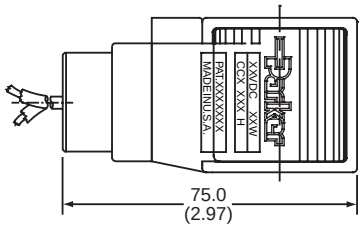
LE - Double Lead
with 3 Amp Diode
18 gauge 457mm (18") long
Red wire positive,
Black wire negative
Diode protection from
positive to negative



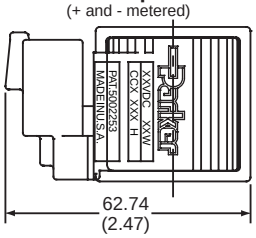
PF - Female Packard Connector
PM - Male Packard Connector



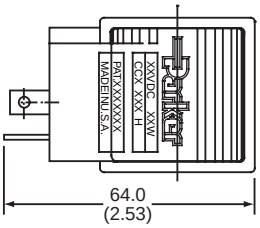
C - Double Lead
Conduit (1/2" NPTF)
18 gauge 457mm *18″* long, black color



H - Integral Deutsch
DT04 - 2P - EP04
HE - Integral Deutsch
with 3 Amp Diode
(+ and - metered)



D - DIN 43650
(ground wire on AC only)



NOTES:
1. The standard A.C. coil includes a molded-in full wave rectifier rated for 800 peak reverse voltage.
2. All P Puissant (high wattage) coils use a red ring as an indiction marker on the terminal boss.

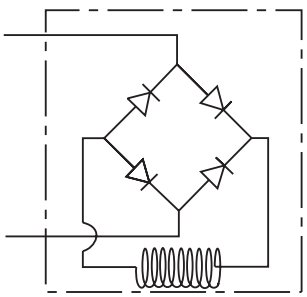
Features

- **Integral Deutsch connector coil exceeds IP69K standards**
- Integral Deutsch connector coil thermal shock dunk test rated
- Integral Amp Jr. coil exceeds IP67 standards for thermal shock, water resistance and “dunk capability”
- Universal 50/60 Hz operation
- Coil hermetically sealed, requires no O-rings or waterproofing kits
- External plated steel flux-carrying band (unlike encapsulated band) enables coil to withstand severe thermal shocks without cracking
- Symmetrical coil can be reversed without affecting performance

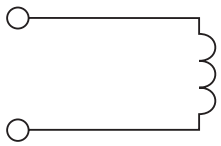
Specifications

Coil Type	**S** Standard **P** Puissant
Nominal Wattage (See Ordering Information For Exact Wattage)	**S** 18 Watts **P** 28 Watts
Duty Cycle	Continuous @ 100% voltage
Magnetic Wire Insulation Class	‘N’ Rated at 200°C (392°F)
Temperature Range	-40°C to +200°C (-40°F to +392°F)
Temperature Rise At Nominal Voltage And Natural Ventilation	**S** 75°C (135°F) **P** 95°C (172°F)
Dielectric Strength Maximum Current Leakage (Amps)	.0005 In dry lab condition at 1000V AC for 30 seconds .001 After being immersed in 23°C (77°F) water with waterproof connector for 24 hours at 500V AC
Encapsulating Material	Glass filled rynite
Color Identification On The Terminal Boss	**S** Black Ring **P** Red Ring
Weight	0.29 kg (0.64 lbs.)

AC Coil Assembly







Ordering Information

CA			
Super Coil 5/8″ I.D.	Wattage	Voltage	Termination

Code	Wattage
S	Standard
P	Puissant

Code	Voltage						
		Watts		Amps		Ohms**	
	Volts	S	P	S	P	S	P
010	10 VDC	18	28	1.80	2.80	5.56	3.57
012*	12 VDC	18	28	1.50	2.33	8.00	5.14
018	18 VDC	18	28	1.00	1.56	18.0	11.6
024*	24 VDC	18	28	0.75	1.17	32.0	20.6
048	48 VDC	18	28	0.38	0.58	128.0	82.3
115*	115 VAC	18	28	0.20	0.26	554	417
230	230 VAC	18	28	0.10	0.15	2100	1430

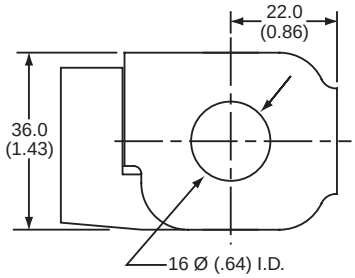
Standard** ****Resistance ±10% at 68°F

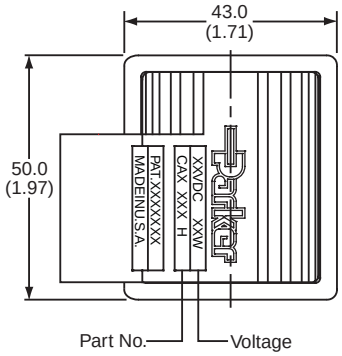
Code	Termination
A	Amp Jr. (DC Only)
AD	Amp Jr. with 3 Amp Diode (DC Only)
C	Double Lead Wire with Conduit Connector (AC Only)
D	DIN 43650 (AC or DC, Supplied without DIN Connector)
H	Integral Deutsch
HE	Integral Deutsch with 3 Amp Diode
HS	Integral Deutsch with Internal Seal
L	Double Lead (DC Only)
LD	Double Lead with Deutsch Connector DT04-2P-EP04 (DC Only) (Use ‘H’ series if possible)
LE	Double Lead with 3 Amp Diode (DC Only)
PF	Double Lead Wire with Packard Female Weather Pack Connector 1201 5792 (DC Only)
PM	Double Lead Wire with Packard Male Weather Pack Connector 1201 0973 (DC Only)
S	Double Spade (DC Only)
W	Double Screw (DC only)
WE	Double Screw with 3 Amp Diode (DC Only)
Y	Single Screw (Internally Grounded, DC Only)

***Note:** Additional voltages and other terminals are available. Some coils are UL approved. For details please consult factory.*

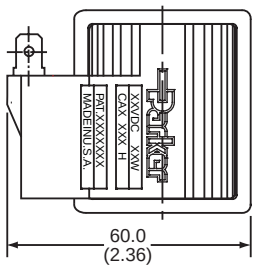
DIN Female Mating Connector: See page CE2
Deutsch Mating Connector: # DT06-2S
Packard Male Weather Pack Connector: 12010973
Packard Female Weather Pack Connector: 12015792

Terminal Styles and Dimensions

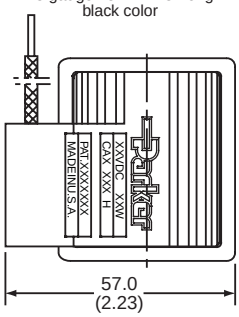




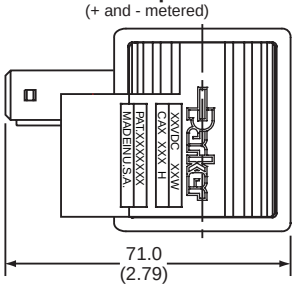
S - Double Spade



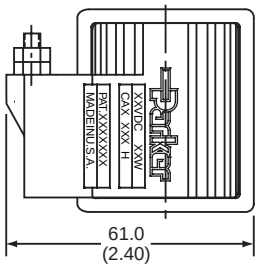
L - Double Lead
18 gauge 457mm *18″* long
black color



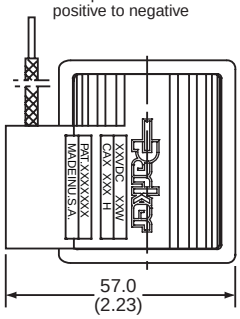
A - Amp Junior
AD - Amp Junior
with 3 Amp Diode
(+ and - metered)



Y - Single Screw
(Internal ground)
8-32 UNC screw & nut
W - Double Screw
8-32 UNC screw & nut
WE - Double Screw
with 3 Amp Diode
(+ and - metered)

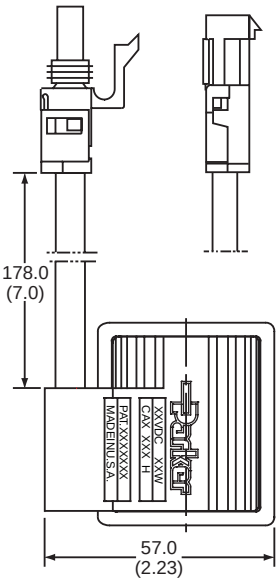


LE - Double Lead
with 3 Amp Diode
18 gauge 457mm *18″* long
Red wire positive,
Black wire negative
Diode protection from
positive to negative

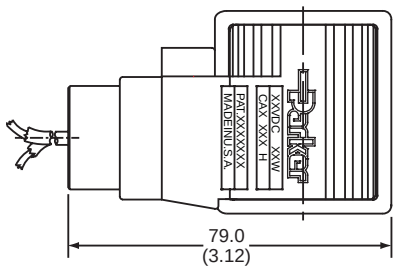


PF - Female
Packard
Connector

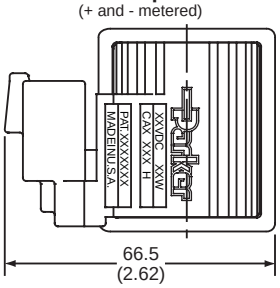
PM - Male
Packard
Connector



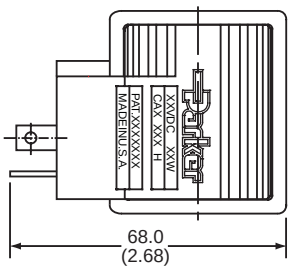
C - Double Lead
Conduit (1/2" NPTF)
18 gauge 457mm *18″* long, black color



H - Integral Deutsch
DT04 - 2P - EP04
HE - Integral Deutsch
with 3 Amp Diode
(+ and - metered)



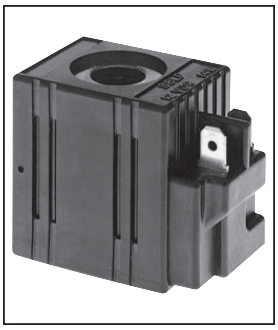
D - DIN 43650
(ground wire on AC only)

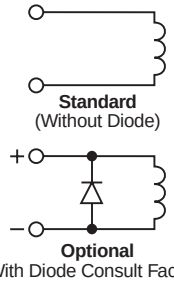


NOTES:
1. The standard A.C. coil includes a molded-in full wave rectifier rated for 800 peak reverse voltage.
2. All P Puissant (high wattage) coils use a red ring as an indiction marker on the terminal boss. (No ring on Integral Deutsch connector.)

Features

- Compact one piece encapsulated design
- Minimal amperage draw
- Numerous terminals and voltages
- Coil designed for use with series DSL and DSH type valves only
- Coils made with high quality Class N magnet wire
- Superior thick internal iron frame surrounding copper windings to increase the flux density
- More ampere turns to deliver more magnetic flux per input voltage
- A.C. coil operates @ 50/60 cycle (Hz)





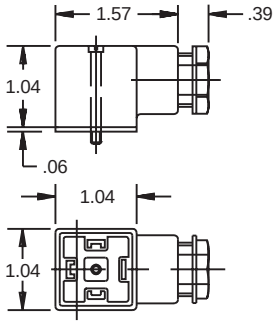
Specifications

Wattage	14 Watts
Duty Rating	Continuous @ 100% voltage
Wire Class	Class N - 200°C (392°F)
Heat Rise	45°C (115°F) over ambient
A.C. Rectifier	Integral full wave bridge
Lead Wire	18 gauge 24″ long, 600 volt rating
Lead Wire Strain Relief	34 kg (75 lbs.) @ 21°C (70°F) & 18 kg (40 lbs.) @ 93°C (200°F)
Encapsulating Material	Rynite, resistant to moisture, caustic solutions, fungus, and temperatures from -40°C (-40°F) to 200°C (392°F)
Finish	Coil - Black Frame - Yellow zinc dichromate

Coil Accessories For DIN Connector 43650

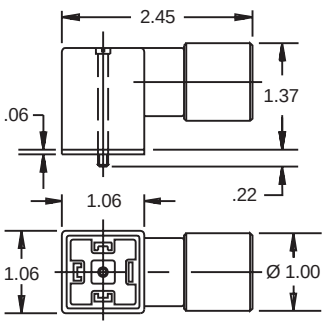
Cable Gland

Type	Non-Rectified	Rectified
PG9	710549-00	712126-01
PG11	710549-01	712126-00



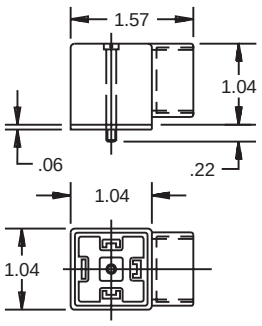
Conduit

Rectified
712704-00



Conduit

Non-Rectified
710549-02



Ordering Information

S8	L			
Unicoil 1/2″ I.D.	Wattage	Termination	Diode	Voltage

Code	Wattage
L	14 Watt

Code	Diode
Omit	Without Diode
R	Diode

Diode not available with all connectors.

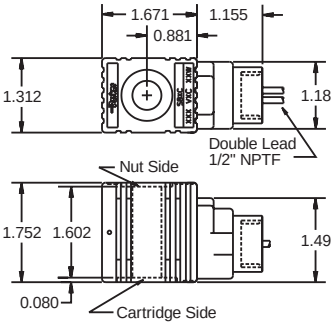
Code	Termination
C	*Conduit
D	*DIN Plug Face
J	Amp Jr.
M	Metri-Pack
P	*Dual Spade
S	*Dual Screw
W	Dual Lead
WS	Weather Pack Shroud 24″

***Diode not available**

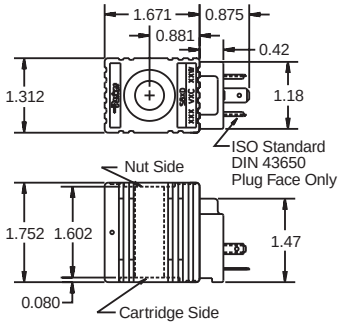
Code	Voltage	Current Amps	Resistance Ohms	Lead Color
***D006**	6 VDC	2.40	2.5	Black
***D010**	10 VDC	1.45	6.9	Yellow
D012	12 VDC	1.17	10.2	Red
***D018**	18 VDC	0.84	21.5	Gray
D024	24 VDC	0.57	41.8	Blue
***D036**	36 VDC	0.45	80.5	Orange
***D048**	48 VDC	0.32	150.6	Green
A120	120 VAC	0.16	663	Brown
A240	240 VAC	0.07	3032	White

**** Consult Factory.***

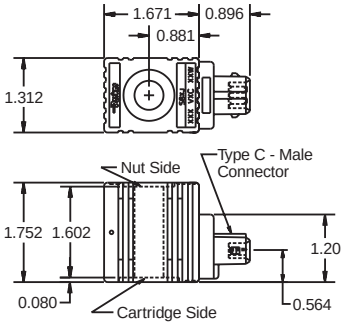
Terminal Styles and Dimensions



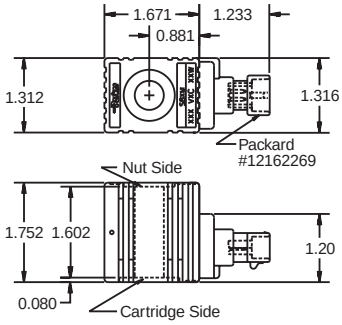
Type C
Conduit



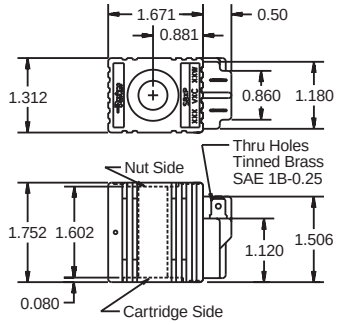
Type D
DIN Plug Face 43650



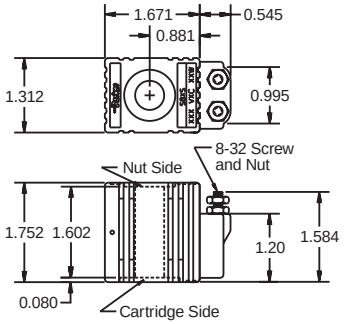
Type J
Amp Jr.



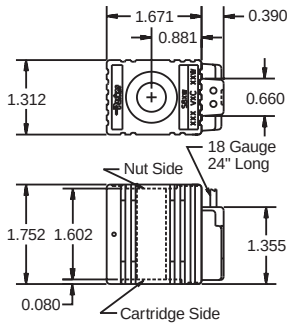
Type M
Metri-Pack 150.2 Series
Mating Connector 12162193



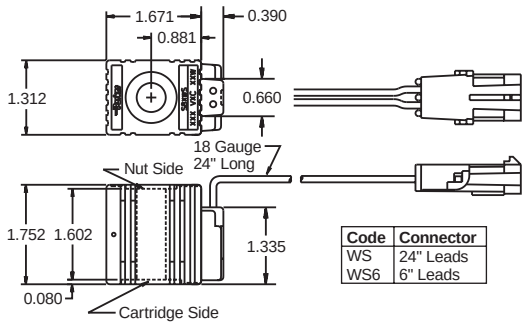
Type P
Dual Spade



Type S
Double Screw



Type W
Dual Lead

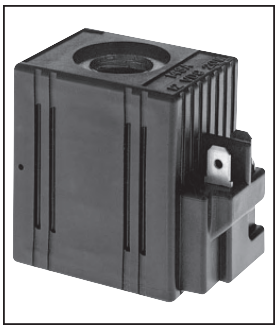


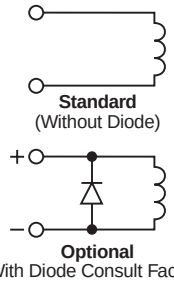
Code	Connector
WS	24" Leads
WS6	6" Leads

Type WS
Weather Pack Shroud 12010973
Mating Connector 12015792

Features

- Compact one piece encapsulated design
- Minimal amperage draw
- Numerous terminals and voltages
- Coil designed for use with series DSL and DSH type valves only
- Coils made with high quality Class N magnet wire
- Superior thick internal iron frame surrounding copper windings to increase the flux density
- More ampere turns to deliver more magnetic flux per input voltage
- A.C. coil operates @ 50/60 cycle (Hz)





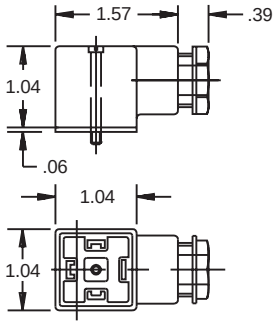
Specifications

Wattage	20 Watts
Duty Rating	Continuous @ 100% voltage
Wire Class	Class N - 200°C (392°F)
Heat Rise	45°C (115°F) over ambient
A.C. Rectifier	Integral full wave bridge
Lead Wire	18 gauge 24″ long, 600 volt rating
Lead Wire Strain Relief	34 kg (75 lbs.) @ 21°C (70°F) & 18 kg (40 lbs.) @ 93°C (200°F)
Encapsulating Material	Rynite, resistant to moisture, caustic solutions, fungus, and temperatures from -40°C (-40°F) to 200°C (392°F)
Finish	Coil - Black Frame - Yellow zinc dichromate

Coil Accessories For DIN Connector 43650

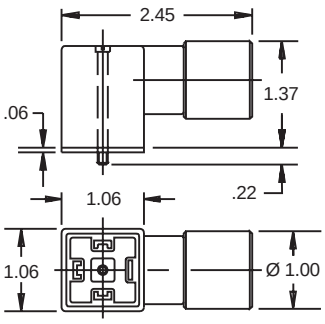
Cable Gland

Type	Non-Rectified	Rectified
PG9	710549-00	712126-01
PG11	710549-01	712126-00



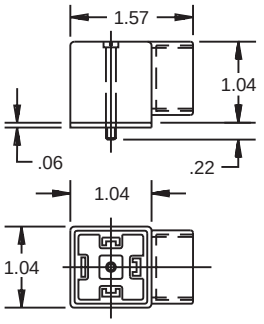
Conduit

Rectified
712704-00



Conduit

Non-Rectified
710549-02



Ordering Information

S10	L			
Unicoil 5/8″ I.D.	Wattage	Termination	Diode	Voltage

Code	Wattage
L	20 Watt

Code	Diode
Omit	Without Diode
R	Diode

Diode not available with all connectors.

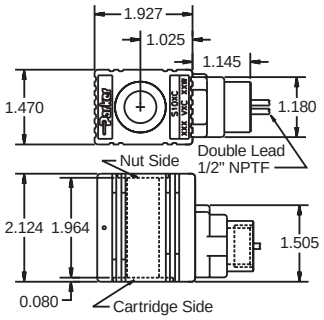
Code	Termination
C	*Conduit
D	*DIN Plug Face
J	Amp Jr.
M	Metri-Pack
P	*Dual Spade
S	*Dual Screw
W	Dual Lead
WS	Weather Pack Shroud 24″

***Diode not available**

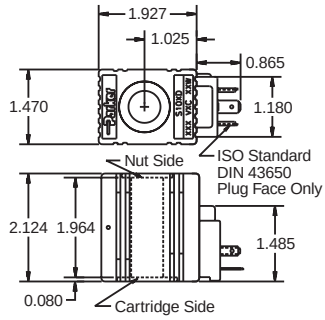
Code	Voltage	Current Amps	Resistance Ohms	Lead Color
*D006	6 VDC	3.33	1.8	Black
*D010	10 VDC	2.10	4.8	Yellow
D012	12 VDC	1.67	7.2	Red
*D018	18 VDC	1.21	14.9	Gray
D024	24 VDC	0.88	27.4	Blue
*D036	36 VDC	0.61	58.9	Orange
*D048	48 VDC	0.47	102.4	Green
A120	120 VAC	0.192	626	Brown
A240	240 VAC	0.10	2400	White

**** Consult Factory.***

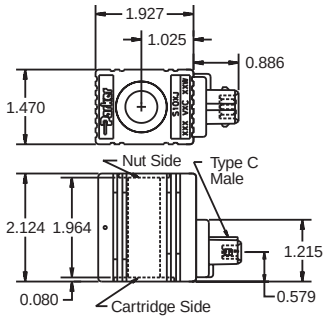
Terminal Styles and Dimensions



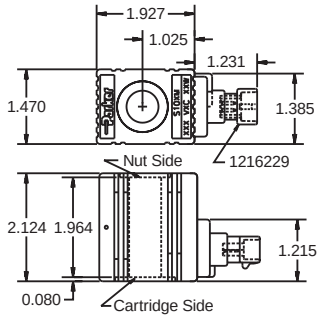
Type C
Conduit



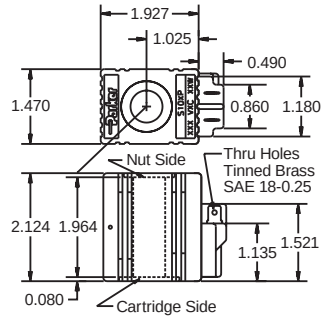
Type D
DIN Plug Face 43650



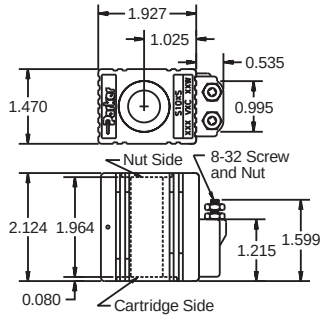
Type J
Amp Jr.



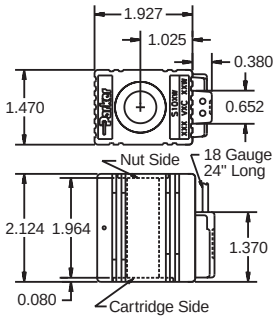
Type M
Metri-Pack 150.2 Series
Mating Connector 12162193



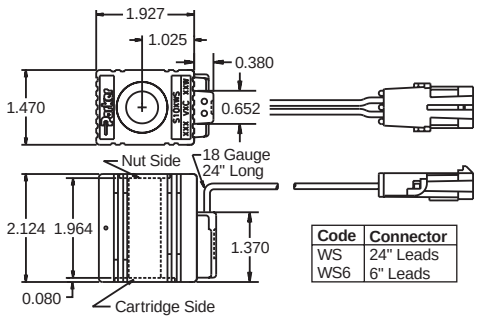
Type P
Dual Spade



Type S
Double Screw



Type W
Dual Lead

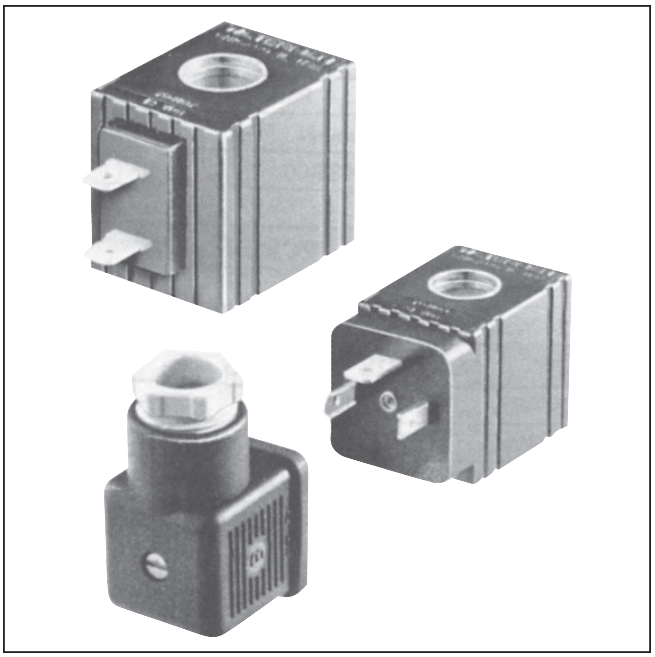


Code	Connector
WS	24" Leads
WS6	6" Leads

Type WS
Weather Pack Shroud 12010973
Mating Connector 12015792

Features

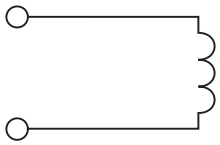
- Compact one piece encapsulated design
- Minimal amperage draw
- Numerous terminals and voltages
- High watt design available for intermittent operation
- Heavy gauge color coded lead wire with built-in strain relief
- 180°C Class H wire standard
- 200°C Class N wire on high watt models



Specifications

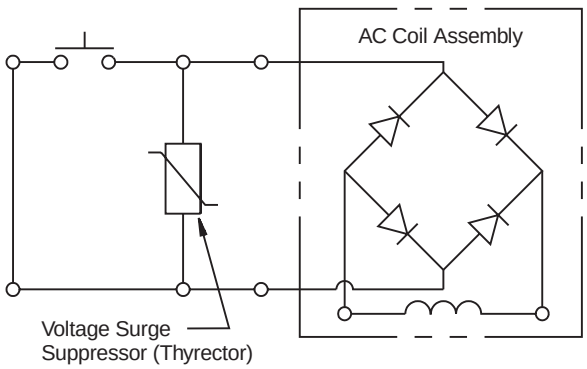
Wattage	12 Watts — Standard - Black Coil 25 Watts — High Watt - Red Coil
Duty Rating	Continuous @ 100% voltage
Wire Class	Class H for all voltages 12 Watt Class N for all voltages 25 Watt
A.C. Rectifier	Integral full wave bridge
Lead Wire	18 gauge 24″ long, 600 volt rating
Lead Wire Strain Relief	34 kg (75 lbs.) @ 21°C (70°F) & 18 kg (40 lbs.) @ 93°C (200°F)
Encapsulating Material	Glass filled nylon, resistant to moisture, caustic solutions, fungus, and temperatures from -40°C (-40°F) to 200°C (392°F)

Symbol



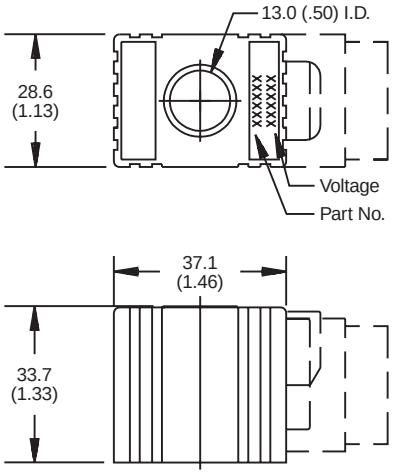
AC Coil Assembly

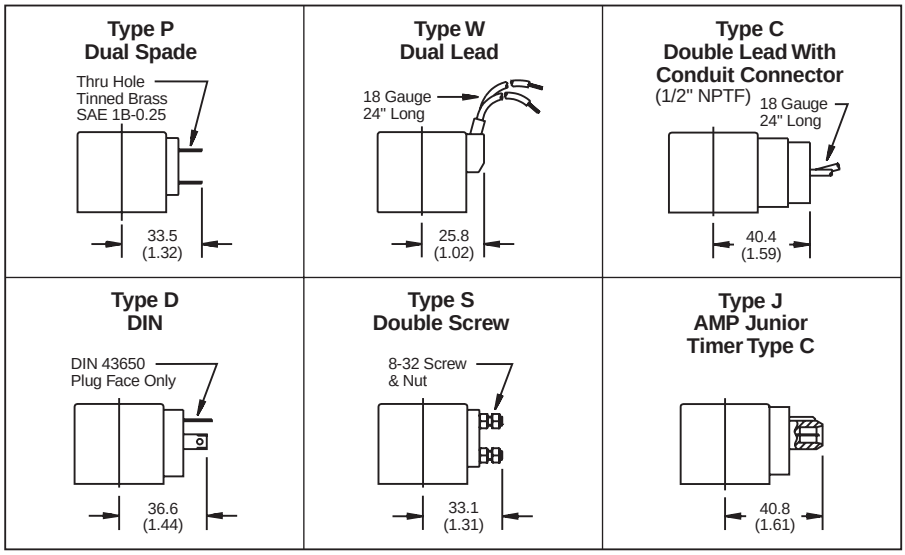
No inductive or capacitive loads can be installed between surge suppressor and rectified valves.



NOTE:
Parker A.C. Coils incorporate integrally molded full wave rectifiers which are rated for reverse voltage peaks of 1000 volts maximum. For voltage transients greater than 1000 volts P.I.V., Harris Thyrector V150LA10A or V150LA20A for 115 VAC and V250LA15A or V250LA40A for 200 VAC is recommended.

Terminal Styles and Dimensions





NOTES:

1. Coil to be installed with part number on nut side.

2. For additional terminals, voltages and wattages, consult factory for details.

Coil Part Numbers

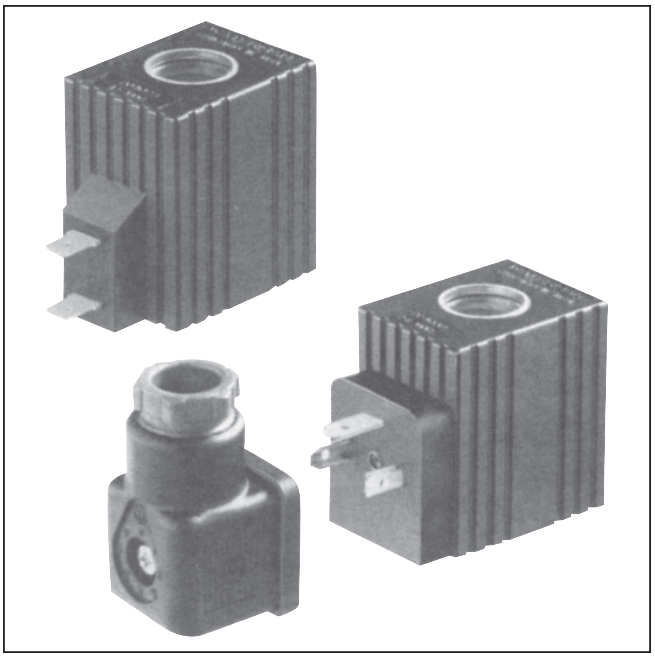
Voltage	Watts	Type P Double Spade	Type W Double Lead	Type C Conduit Connector	Type D DIN Plug Face	Type S Double Screw	Amps†	Lead Wire Color
**6 VDC	12	851007-006	851009-006	851003-006*	851005-006*	851011-006	2.22	Black
	25	851008-006	851010-006	851004-006	851006-006	851012-006	3.90	
**10 VDC	12	851007-010	851009-010	851003-010*	851005-010*	851011-010	1.43	Yellow
	25	851008-010	851010-010	851004-010	851006-010	851012-010	2.48	
12 VDC	12	851007-012	851009-012	851003-012*	851005-012*	851011-012	1.05	Red
	25	851008-012	851010-012	851004-012	851006-012	851012-012	1.94	
**18 VDC	12	851007-018	851009-018	851003-018*	851005-018*	851011-018	0.75	Gray
	25	851008-018	851010-018	851004-018	851006-018	851012-018	1.42	
24 VDC	12	851007-024	851009-024	851003-024*	851005-024*	851011-024	0.52	Blue
	25	851008-024	851010-024	851004-024	851006-024	851012-024	1.17	
**36 VDC	12	851007-036	851009-036	851003-036*	851005-036*	851011-036	0.38	Orange
	25	851008-036	851010-036	851004-036	851006-036	851012-036	0.73	
**48 VDC	12	851007-048	851009-048	851003-048*	851005-048*	851011-048	0.26	Green
	25	851008-048	851010-048	851004-048	851006-048	851012-048	0.59	
120 VAC	12			851003-120	851005-120		0.14	Brown
	25			851004-120	851006-120		0.23	
230 VAC	12			851003-240	851005-240		0.08	White
	25			851004-240	851006-240		0.12	
**440 VAC	12			851003-480	851005-480		0.04	Violet
	25			851004-480	851006-480		0.07	

**Consult Factory *UL Listed

†Amperage draw @ 21°C (70°F)

Features

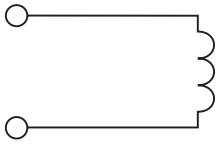
- Compact one piece encapsulated design
- Minimal amperage draw
- Numerous terminals and voltages
- High watt design optional
- Heavy gauge color coded lead wire with built-in strain relief
- 180°C Class H wire standard
- 200°C Class N wire on high watt models



Specifications

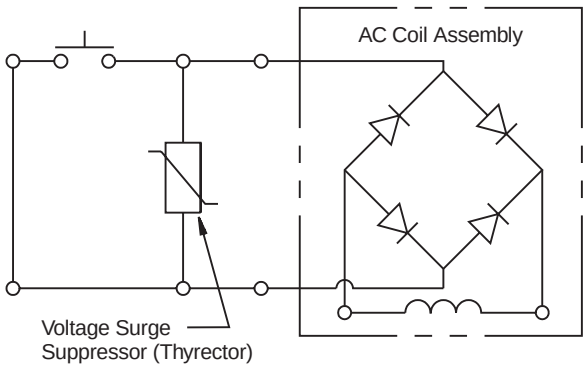
Wattage	17 Watts — Standard - Black Coil 30 Watts — High Watt - Red Coil
Duty Rating	Continuous @ 100% voltage
Wire Class	Class H for all voltages 17 Watt Class N for all voltages 30 Watt
A.C. Rectifier	Integral full wave bridge
Lead Wire	18 gauge 24″ long, 600 volt rating
Lead Wire Strain Relief	34 kg (75 lbs.) @ 21°C (70°F) & 18 kg (40 lbs.) @ 93°C (200°F)
Encapsulating Material	Glass filled nylon, resistant to moisture, caustic solutions, fungus, and temperatures from -40°C (-40°F) to 200°C (392°F)

Symbol



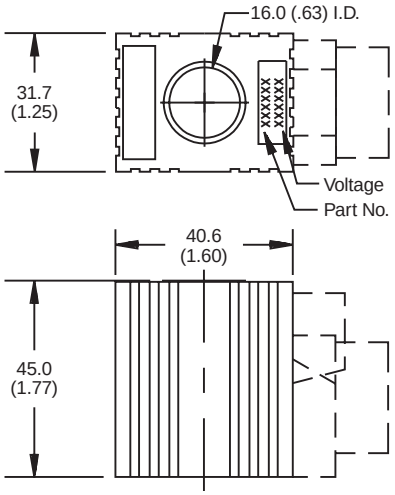
AC Coil Assembly

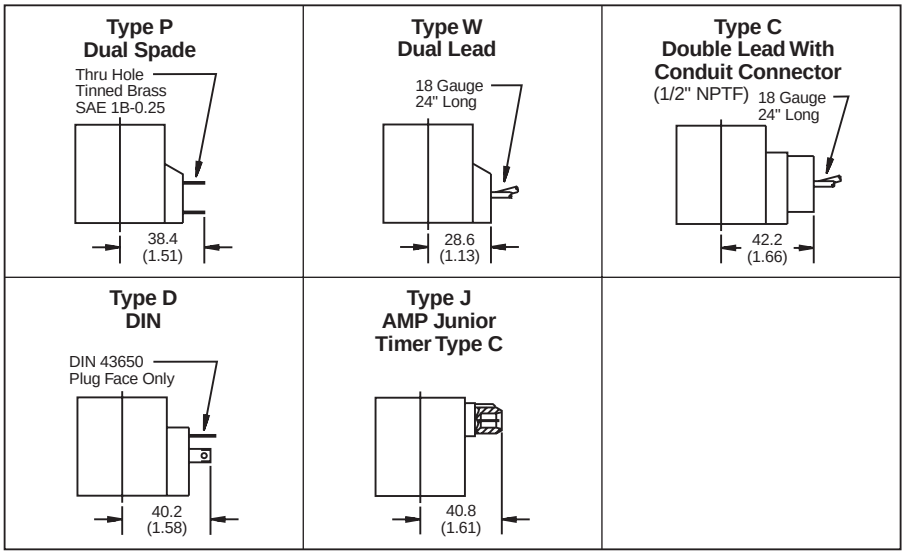
No inductive or capacitive loads can be installed between surge suppressor and rectified valves.



NOTE:
Parker A.C. Coils incorporate integrally molded full wave rectifiers which are rated for reverse voltage peaks of 1000 volts maximum. For voltage transients greater than 1000 volts P.I.V., Harris Thyrector V150LA10A or V150LA20A for 115 VAC and V250LA15A or V250LA40A for 200 VAC is recommended.

Terminal Styles and Dimensions





NOTES:

1. Coil to be installed with part number on nut side.

2. For additional terminals, voltages and wattages, consult factory for details.

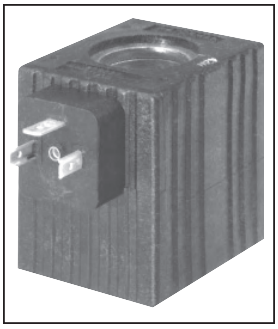
Coil Part Numbers

Voltage	Watts	Type P Double Spade	Type W Double Lead	Type C Conduit Connector	Type D DIN Plug Face	Amps*	Lead Wire Color
6 VDC	17	851021-006	851023-006	851017-006	851019-006	2.43	Black
	30	851022-006	851024-006	851018-006	851020-006	4.84	
10 VDC	17	851021-010	851023-010	851017-010	851019-010	1.58	Yellow
	30	851022-010	851024-010	851018-010	851020-010	3.28	
12 VDC	17	851021-012	851023-012	851017-012	851019-012	1.44	Red
	30	851022-012	851024-012	851018-012	851020-012	2.30	
18 VDC	17	851021-018	851023-018	851017-018	851019-018	0.94	Gray
	30	851022-018	851024-018	851018-018	851020-018	1.86	
24 VDC	17	851021-024	851023-024	851017-024	851019-024	0.72	Blue
	30	851022-024	851024-024	851018-024	851020-024	1.20	
36 VDC	17	851021-036	851023-036	851017-036	851019-036	0.43	Orange
	30	851022-036	851024-036	851018-036	851020-036	0.88	
48 VDC	17	851021-048	851023-048	851017-048	851019-048	0.30	Green
	30	851022-048	851024-048	851018-048	851020-048	0.58	
120 VAC	17			851017-120	851019-120	0.15	Brown
	30			851018-120	851020-120	0.24	
230 VAC	17			851017-240	851019-240	0.08	White
	30			851018-240	851020-240	0.13	
440 VAC	17			851017-480	851019-480	0.04	Violet
	30			851018-480	851020-480	0.07	

*Amperage draw @ 21°C (70°F)

Features

- Compact one piece encapsulated design
- Numerous terminals and voltages
- Heavy gauge color coded lead wire with built-in strain relief
- 200°C Class N wire standard
- U.L. recognized on most DC coils (consult factory)

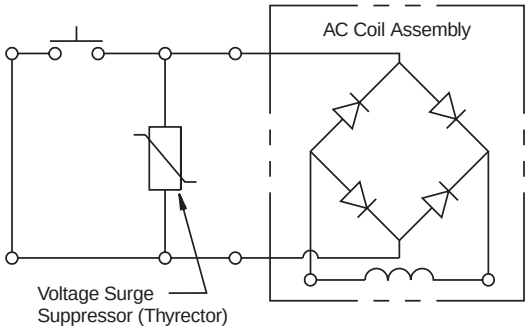


Specifications

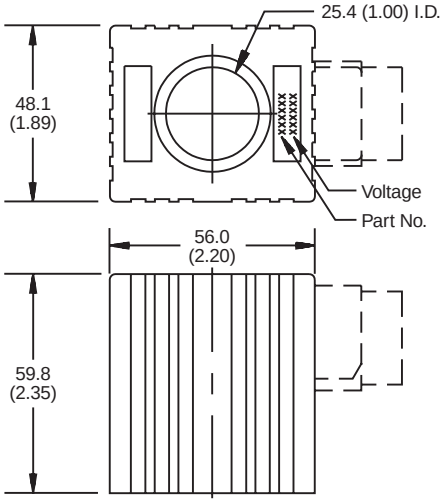
Wattage	42 Watts — Standard 30 Watts — Low Watt
Duty Rating	Continuous @ 100% voltage
Wire Class	Class N for all voltages
Lead Wire	18 gauge 24″ long, 600 volt rating
Lead Wire Strain Relief	34 kg (75 lbs.) @ 21°C (70°F) & 18 kg (40 lbs.) @ 93°C (200°F)
Encapsulating Material	Glass filled nylon, resistant to moisture, caustic solutions, fungus, and temperatures from -40°C (-40°F) to 200°C (392°F)
Color	Black

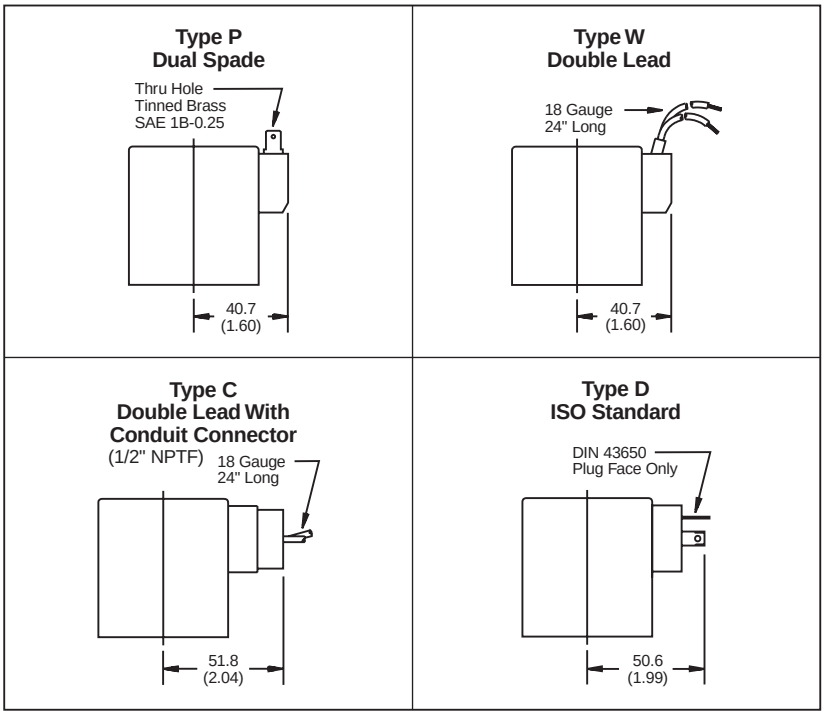
AC Coil Assembly

No inductive or capacitive loads can be installed between surge suppressor and rectified valves.



Terminal Styles and Dimensions





NOTES:

1. Coil to be installed with part number on nut side.

2. For additional terminals, voltages and wattages, consult factory for details.

Coil Part Numbers

Wattage	Voltage	Type P Double Spade	Type W Double Lead	Type D ISO STANDARD	Amps	Lead Wire Color
42 Watts	12 VDC	851060-012*	851062-012*	851058-012*	3.53	Red
42 Watts	24 VDC	851060-024*	851062-024*	851058-024*	1.79	Blue
30 Watts	12 VDC	853496-012	853497-012	853495-012	2.50	Red
30 Watts	24 VDC	853496-024	853497-024	853495-024	1.25	Blue

*UL Listed

Notes

General Description

Proportional Valve Controllers. 12 and 24 Volts, PWM. For additional information see Technical Tips on pages CE1-CE2.

Operation

The 902/932 and 904/934 are valve top mounted PWM controllers for proportional control valves. They can be used with an external potentiometer to give accurate current control using the units internal reference voltage. Alternatively these controllers can be used with a 0-10V command signal from a PLC or engine management system.

'I Max' adjustment is provided to allow the maximum output current to be set via a 12 turn potentiometer. Turn clockwise to increase the output current.

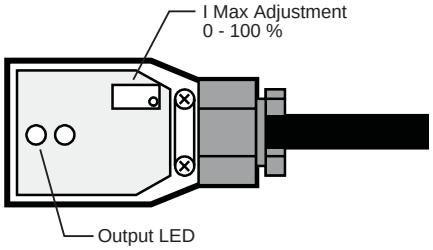
Notes:

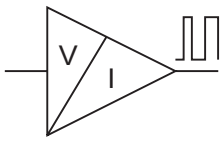
XPRO902 and XPRO932

In order to avoid damaging a controller the +8V (yellow) lead must not be shorted to the +12V (red) lead or to the 0V (blue) lead.

XPRO904 and XPRO934

In order to avoid damaging a controller the +15V (yellow) lead must not be shorted to the +24V (red) lead or to the 0V (blue) lead.





Features

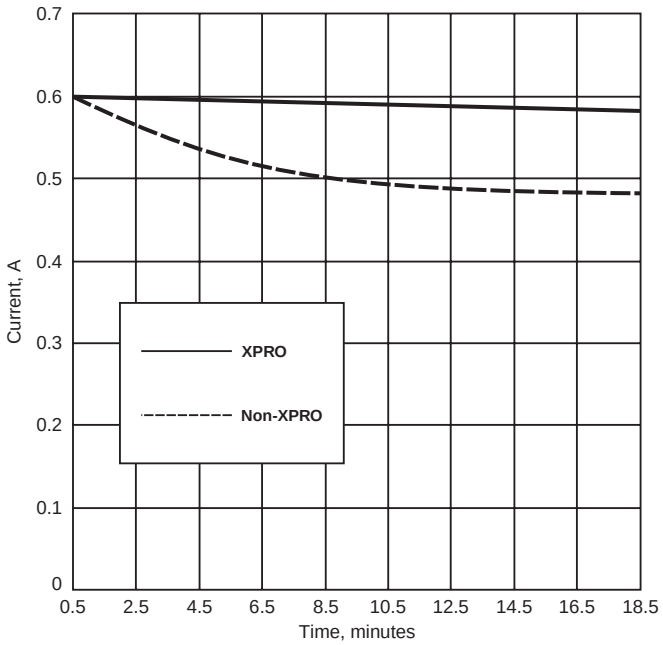
- Self contained DIN 'Plug Top'
- High impact resistant molded ABS
- Complies with current CE regulations

Specifications

Nominal Voltage	**XPRO902** 12V DC **XPRO932** 12V DC **XPRO904** 24V DC **XPRO934** 24V DC
Maximum Power	**XPRO902** 19W **XPRO932** 30W **XPRO904** 19W **XPRO934** 30W
(IP) Rating	IP 65
Maximum Current	**XPRO902** 1.6A **XPRO932** 2.6A **XPRO904** 1.0A **XPRO934** 1.4A
Command Voltage	0 - 10V
Input Resistance	10K ohms
Refference Voltage	**XPRO902** +8V (2mA) **XPRO932** +8V (2mA) **XPRO904** +15V (2mA) **XPRO934** +15V (2mA)
Cable Length	1 meter
Frequency	110 Hz ±5%

Output Regulation

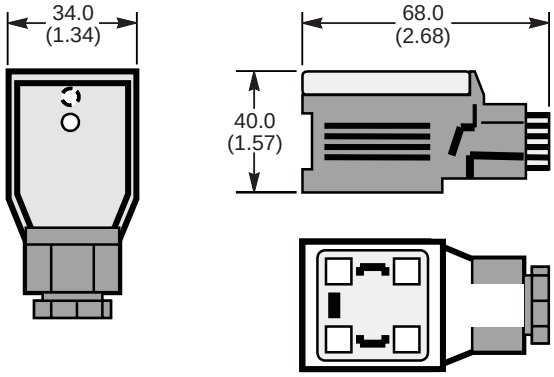
(Curve shows coil temperature compensation)



Application

For use with most proportional valves. GP, HP, JP, GTP and AP series valves.

Dimensions Millimeters (Inches)



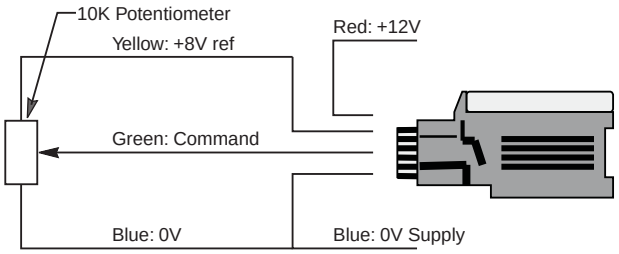
Ordering Information

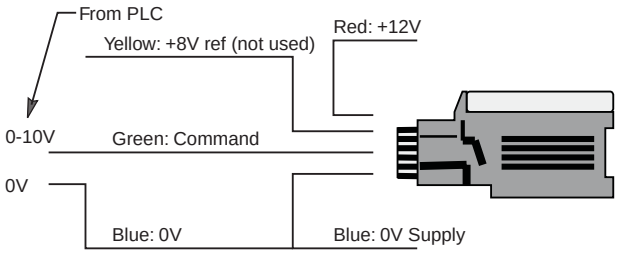
XPRO	
Controller	Maximum Current

Code	Maximum Current
902	1.6A
932	2.6A
904	1.0A
934	1.4A

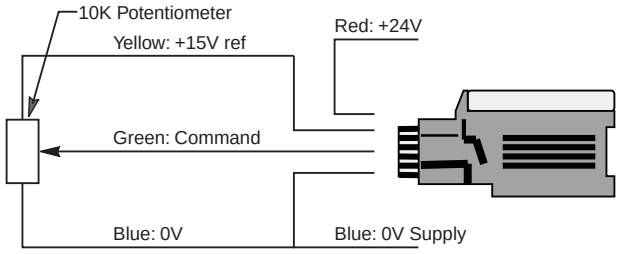
Connection Details

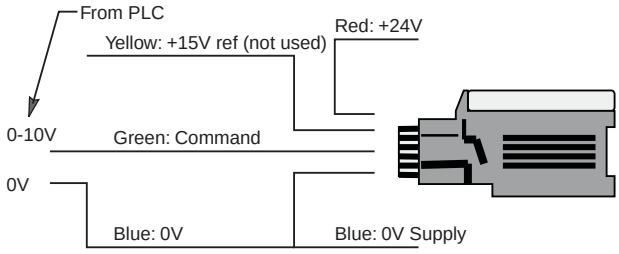
XPRO902 and XPRO932





XPRO904 and XPRO934





Controller / Coil Combination

Coil	Controller	
	XPRO 902	XPRO 932
CCS012D	X	
CCP012D	X	
CAS012D	X	
CAP012D		X

Coil	Controller	
	XPRO 904	XPRO 934
CCS024D	X	
CCP024D	X	
CAS024D	X	
CAP024D		X

General Description

Proportional Valve Controllers. 12 and 24 Volts, PWM with Adjustable Dither. For additional information see Technical Tips on pages CE1-CE2.

Operation

The 902d/932d and 904d/934d are valve top mounted PWM controllers for proportional control valves. They can be used with an external potentiometer to give accurate current control using the units internal reference voltage. Alternatively these controllers can be used with a 0-10V command signal from a PLC or engine management system.

'I Max' adjustment is provided to allow the maximum output current to be set via a 12 turn potentiometer. Turn clockwise to increase the output current.

Dither adjustment POT is used to alter the PWM frequency of the controller from 95 HZ to 230 Hz. By changing the frequency this pot controls the amount of dither imposed on the valve. Lower frequency = more dither, higher frequency = less dither. Turn clockwise to increase frequency.

Notes:

XPRO902d and XPRO932d

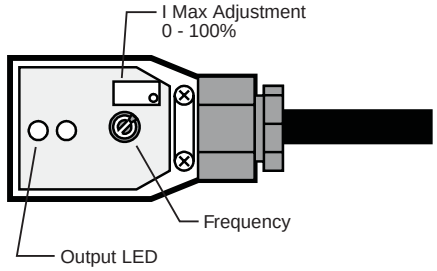
In order to avoid damaging a controller the +8V (yellow) lead must not be shorted to the +12V (red) lead or to the 0V (blue) lead.

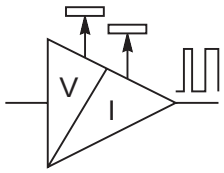
XPRO904d and XPRO934d

In order to avoid damaging a controller the +15V (yellow) lead must not be shorted to the +24V (red) lead or to the 0V (blue) lead.

Specifications

Nominal Voltage	**XPRO902d** **XPRO932d** **XPRO904d** **XPRO934d**	12V DC 12V DC 24V DC 24V DC
Maximum Power	**XPRO902d** **XPRO932d** **XPRO904d** **XPRO934d**	19W 30W 19W 30W
(IP) Rating	IP 65	
Maximum Current	**XPRO902d** **XPRO932d** **XPRO904d** **XPRO934d**	1.6A 2.6A 1.0A 1.4A
Command Voltage	0 - 10V	
Input Resistance	10K ohms	
Refference Voltage	**XPRO902d** **XPRO932d** **XPRO904d** **XPRO934d**	+8V (2mA) +8V (2mA) +15V (2mA) +15V (2mA)
Cable Length	1 meter	
Frequency	95 Hz - 230 Hz	



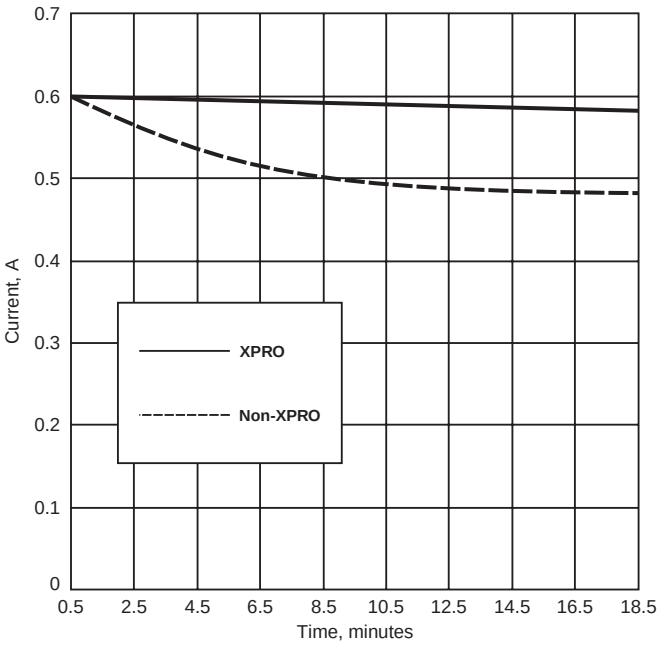


Features

- Self contained DIN 'Plug Top'
- High impact resistant molded ABS
- Complies with current CE regulations

Output Regulation

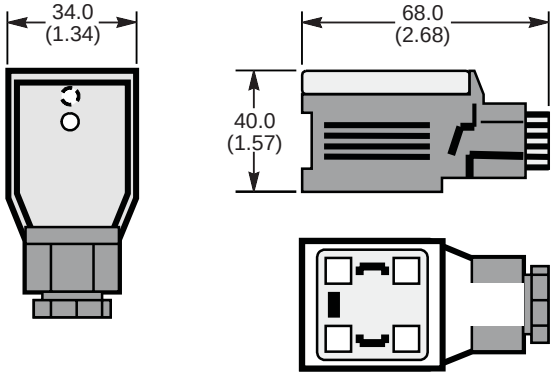
(Curve shows coil temperature compensation)



Application

For use with most proportional valves. GP, HP, JP, GTP and AP series valves.

Dimensions Millimeters (Inches)



Ordering Information

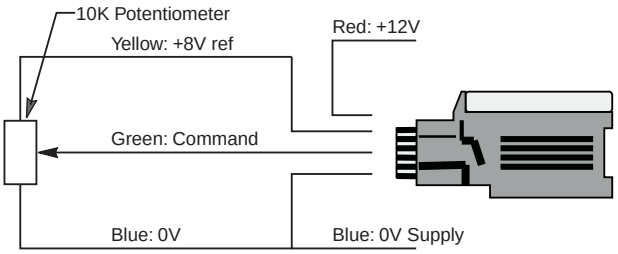
XPRO	
Controller	Maximum Current

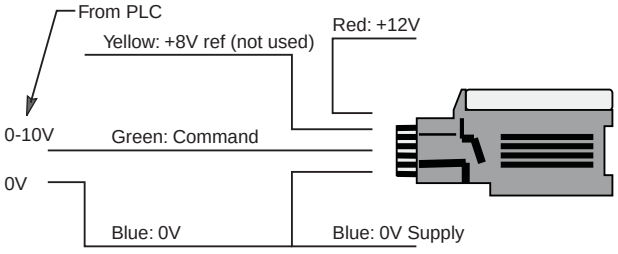
Code	Maximum Current
902d	1.6A
932d	2.6A
904d	1.0A
934d	1.4A

Setting for standard:
Dither frequency: 110 HZ

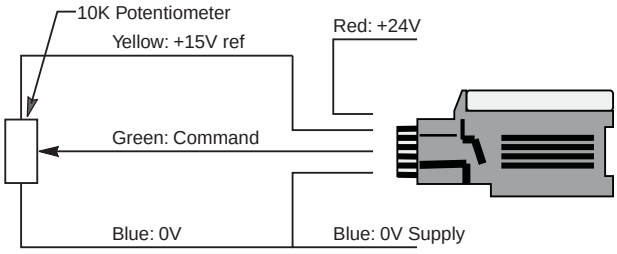
Connection Details

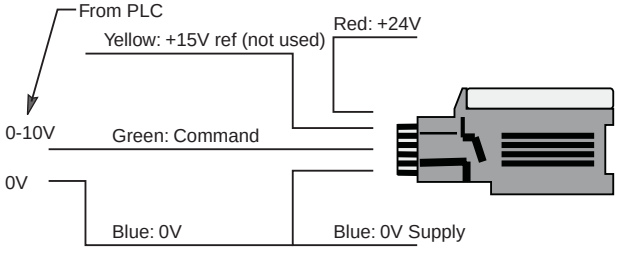
XPRO902d and XPRO932d





XPRO904d and XPRO934d





Controller / Coil Combination

	Controller	
Coil	**XPRO 902d**	**XPRO 932d**
CCS012D	X	
CCP012D	X	
CAS012D	X	
CAP012D		X

	Controller	
Coil	**XPRO 904d**	**XPRO 934d**
CCS024D	X	
CCP024D	X	
CAS024D	X	
CAP024D		X

General Description

Proportional Valve Controllers. 12 and 24 Volts, PWM with Multiple Adjustments. For additional information see Technical Tips on pages CE1-CE2.

Operation

The 902rid/932rid and 904rid/934rid are valve top mounted PWM controllers for proportional control valves. They can be used with an external potentiometer to give accurate current control using the units internal reference voltage. Alternatively these controllers can be used with a 0-10V command signal from a PLC or engine management system.

'I' Max adjustment is provided to allow the maximum output current to be set via a 12 turn potentiometer. Turn clockwise to increase the output current.

Ramp Up and Ramp Down adjustments provide independent, linear control of the time it takes, to reach 'I' Max and to switch off, up to 8 seconds of delay. Turn clockwise for slower ramps.

'I' Min adjustment Pot sets the minimum current the controller will jump to when a command signal is present, used to eliminate dead band in a slow ramp. Turn clockwise for a higher 'I' Min setting.

Dither adjustment Pot is used to alter the PWM frequency of the controller from 95 HZ to 230 Hz. By changing the frequency this pot controls the amount of dither imposed on the valve. Lower frequency = more dither, higher frequency = less dither. Turn clockwise to increase frequency.

Notes:

XPRO902rid and XPRO932rid

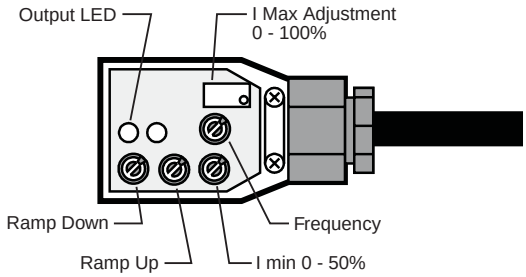
In order to avoid damaging a controller the +8V (yellow) lead must not be shorted to the +12V (red) lead or to the 0V (blue) lead.

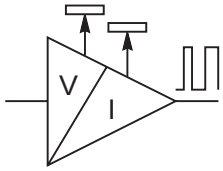
XPRO904rid and XPRO934rid

In order to avoid damaging a controller the +15V (yellow) lead must not be shorted to the +24V (red) lead or to the 0V (blue) lead.

Specifications

Nominal Voltage	**XPRO902rid & 932rid** 12V DC **XPRO904rid & 934rid** 24V DC
Maximum Power	**XPRO902rid & 904rid** 19W **XPRO932rid & 934rid** 30W
(IP) Rating	IP 65
Maximum Current	**XPRO902rid** 1.6A **XPRO932rid** 2.6A **XPRO904rid** 1.0A **XPRO934rid** 1.4A
Command Voltage	0 - 10V
Input Resistance	10K ohms
Refference Voltage	**XPRO902rid & 932rid** +8V (2mA) **XPRO904rid & 934rid** +15V (2mA)
Cable Length	1 meter
Ramp Up/Down	200ms - 8s



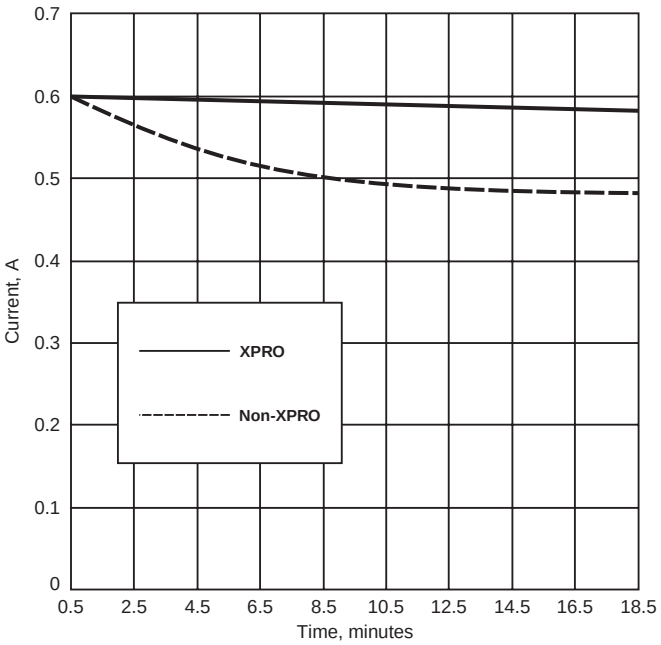


Features

- Self contained DIN 'Plug Top'
- High impact resistant molded ABS
- Complies with current CE regulations

Output Regulation

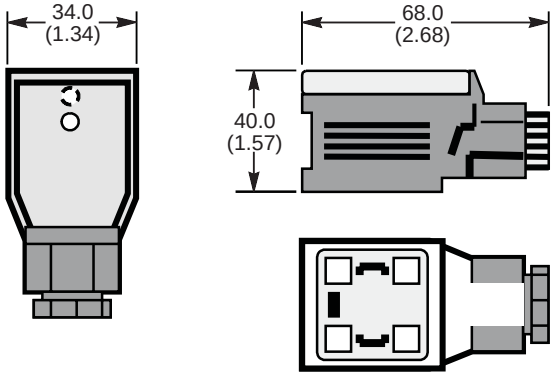
(Curve shows coil temperature compensation)



Application

For use with most proportional valves. GP, HP, JP, GTP and AP series valves.

Dimensions Millimeters (Inches)



Ordering Information

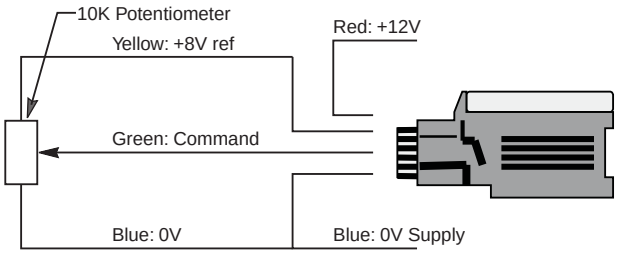
XPRO	
Controller	Maximum Current

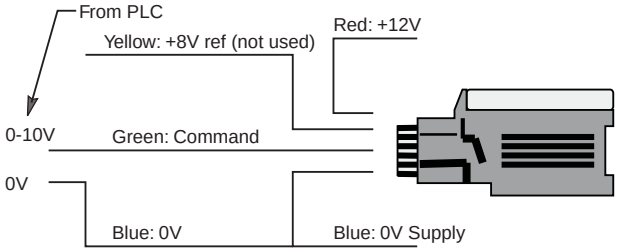
Code	Maximum Current
902rid	1.6A
932rid	2.6A
904rid	1.0A
934rid	1.4A

Setting for standard:
Dither frequency: 110 HZ

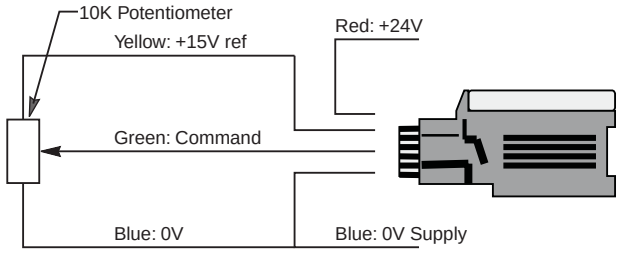
Connection Details

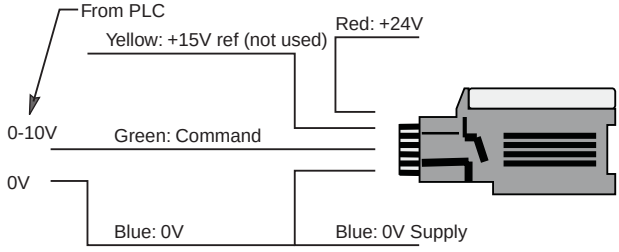
XPRO902rid and XPRO932rid





XPRO904rid and XPRO934rid





Controller / Coil Combination

	Controller	
Coil	XPRO 902rid	XPRO 932rid
CCS012D	X	
CCP012D	X	
CAS012D	X	
CAP012D		X

	Controller	
Coil	XPRO 904rid	XPRO 934rid
CCS024D	X	
CCP024D	X	
CAS024D	X	
CAP024D		X

General Description

Soft Start Valve Controller. 12 and 24 Volt PWM. For additional information see Technical Tips on pages CE1-CE2.

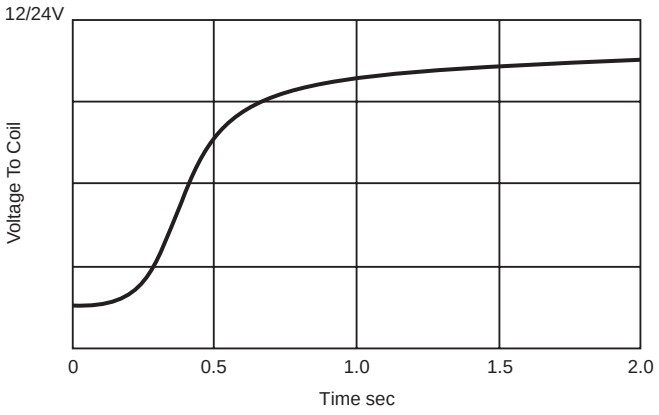
Features

- Self contained DIN PWM 'Plug Top'
- High impact resistant moulded ABS
- Supplied with approximately 1 meter of two color coded cables
- Can be used with 12V DC and 24V DC coils
- Fixed I-second ramp upon engagement

Operation

The 704 is a soft start plug top PWM controller used for reducing the hydraulic pressure peaks produced when a hydraulic valve is operated. It can simply be used in place of a standard DIN connector.

Output Voltage

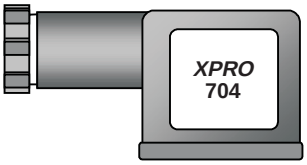


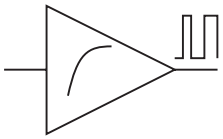
Application

For use with most proportional valves. GP, HP, JP, GTP and AP series valves.

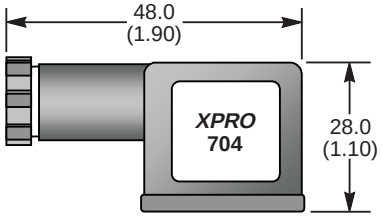
Specifications

Nominal Voltage	12V DC and 24V DC
Maximum Power	36W
(IP) Rating	IP 65
Maximum Current	3.0A
Coil Resistance	4.5 - 30 ohms
Ramp Up	Fixed 1000ms

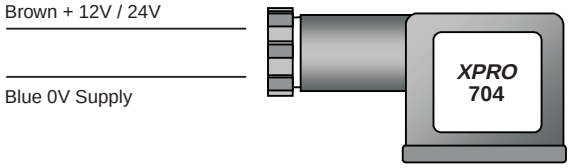




Dimensions Millimeters (Inches)



Connection Details



Controller / Coil Combination

XPRO 704 can be used with all 12V DC and 24V DC DIN coils.

Ordering Information

XPRO	704
Controller	Plug Type

Code	Plug Type
704	Soft Start

General Description

Soft Start/Stop Valve Controller. 12 and 24 Volts, PWM with Adjustable Ramps. For additional information see Technical Tips on pages CE1-CE2.

Features

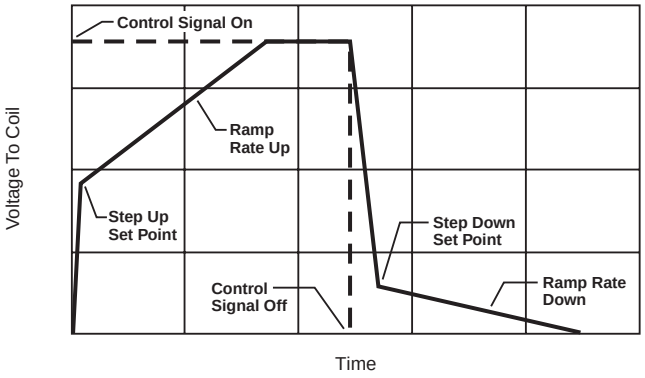
- Adjustable ramp to engage and disengage
- Self contained DIN 'Plug Top'
- High impact resistant moulded ABS

Operation

The 704b is a valve top mounted 'soft start, soft stop' controller for use with a range of valves.

The controller can be set to jump to a preset 'step' voltage then ramp up to maximum at a preset rate. It can also be set to jump down to a preset 'step' voltage and ramp down to zero. This can be used to eliminate 'bangs' or hydraulic shocks associated with operating a hydraulic valve.

Output Voltage

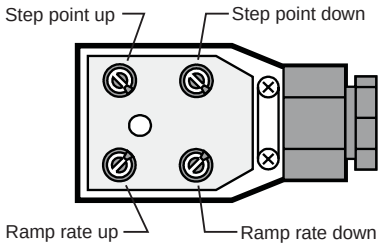


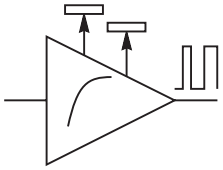
Application

For use with most proportional valves. GP, HP, JP, GTP and AP series valves.

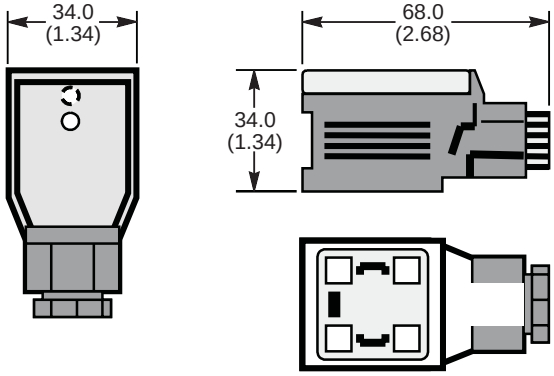
Specifications

Nominal Voltage	12V DC and 24V DC
Maximum Power	36W
(IP) Rating	IP 65
Maximum Current	3.0A
Coil Resistance	4.8 - 30 ohms
Coil Voltage	+V Supply
Control Resistance	820 ohms
Cable Length	1 meter
Step Up Adjust	10 - 80%
Step Down Adjust	10 - 80%
Ramp Up/Down	200ms - 4s

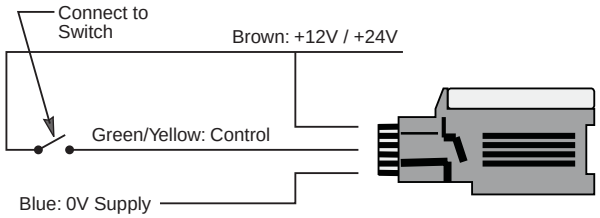




Dimensions Millimeters (Inches)



Connection Details



Controller / Coil Combination

XPRO 704b can be used with all 12V DC and 24V DC DIN coils.

Ordering Information

XPRO	704b
Controller	Plug Type

Code	Plug Type
704b	Soft Start, Soft Stop

General Description

Power Saver Controller. 12 and 24 Volt, PWM.
For additional information see Technical Tips on pages CE1-CE2.

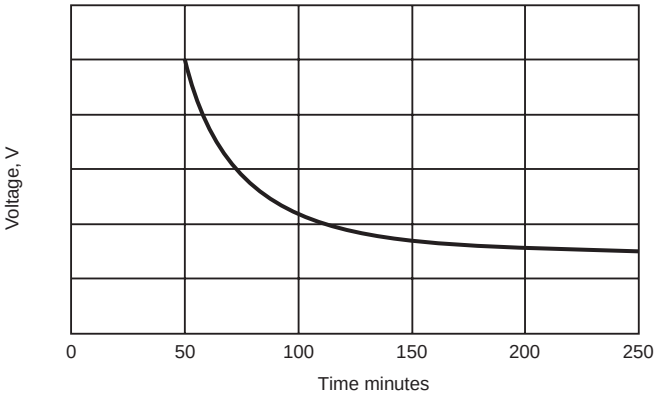
Features

- Reduced power consumption and heat generation
- Self contained DIN 'Plug Top'
- High impact resistant moulded ABS
- Supplied with approximately 1 meter of two color coded cables

Operation

The 804 is a power saver plug top PWM controller used for reducing the current consumption of a standard on/off valve. The plug will deliver full voltage to the valve for 50mS then drop down to a holding voltage of 30% of the applied voltage. This can be used where multiple valves are used and power consumption is a consideration. It can simply be used in place of a standard DIN connector.

Voltage Applied To Coil

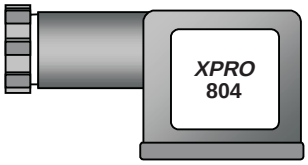


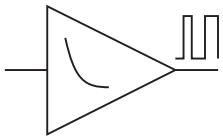
Application

For use with most on/off valves. GO, GS series valves.

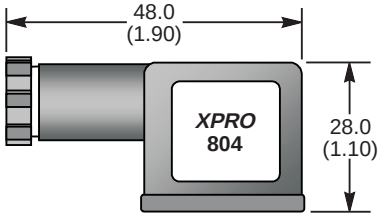
Specifications

Nominal Voltage	12V DC and 24V DC
Maximum Power	36W
(IP) Rating	IP 65
Maximum Current	3.0A
Coil Resistance	4.5 - 30 ohms
Current Reduction	30% of Max

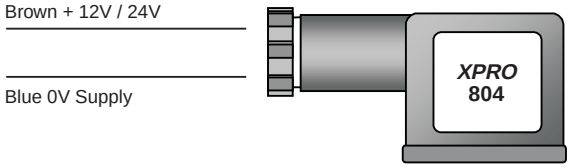




Dimensions Millimeters (Inches)



Connection Details



Controller / Coil Combination

XPRO 804 can be used with all 12V DC and 24V DC coils.

Ordering Information

XPRO	804
Controller	Plug Type

Code	Plug Type
804	Power Saver Plug

Notes

Contents

Bodies and Cavities

SERIES	DESCRIPTION	BODY NO.	PAGE NO.
PARKER STANDARD BODIES AND CAVITIES			
C04-2	04 Size, 2 Way	B04-2-*	BC7
C04-3	04 Size, 3 Way	B04-3-*	BC8
C08-2	08 Size, 2 Way	B08-2-*	BC9
C08-3	08 Size, 3 Way	B08-3-*	BC10
C08-4	08 Size, 4 Way	B08-4-*	BC11
C09-2	09 Size, 2 Way	B09-2-*	BC12
C10-2	10 Size, 2 Way	B10-2-*	BC13
C10-2T	10 Size, 2 Way, “T” Body	B10-2T-*	BC14
C10-3	10 Size, 3 Way	B10-3-*	BC15
C10-3S	10 Size, 3 Way, Short	B10-3S-*	BC16
C10-4	10 Size, 4 Way	B10-4-*	BC17
C11-3	11 Size, 3 Way	4082075	BC18
C12-2	12 Size, 2 Way	B12-2-*	BC19
C12-3	12 Size, 3 Way	B12-3-*	BC20
C12-3L	12 Size, 3 Way, Long	B12-3L-*	BC21
C12-4	12 Size, 4 Way	B12-4-*	BC22
C12-4L	12 Size, 4 Way, Long	B12-4L-*	BC23
C16-2	16 Size, 2 Way	B16-2-*	BC24
C16-3	16 Size, 3 Way	B16-3-*	BC25
C16-3S	16 Size, 3 Way, Short	B16-3S-*	BC26
C20-2	20 Size, 2 Way	B20-2-*	BC27
C20-3S	20 Size, 3 Way, Short	B20-3S-*	BC28
COUNTERBALANCE CAVITIES AND BODIES			
MHC-010	Single and Dual Counterbalance Bodies	MHC-010-*	BC29
MHC-022	Single and Dual Counterbalance Bodies	MHC-022-*	BC30
MHC-025	Single and Dual Counterbalance Bodies	MHC-025-*	BC31
MHC-050	Single and Dual Counterbalance Bodies	MHC-050-*	BC32
PILOT PISTON CAVITIES			
10 Size	10 Size Cavity for Single Check and Pilot Piston		BC33
16 Size	16 Size Cavity for Single Check and Pilot Piston		BC33
10 Size	10 Size Cavity for Dual Check and Pilot Piston		BC33
16 Size	16 Size Cavity for Dual Check and Pilot Piston		BC33
STANDARD CAVITY PLUGS			
Cavity Plugs			BC34
CARTPAK BODIES			
BD03-PN	P Port Interrupt, 2-Way, Body Only	BD03-PN-*	BC35
BD03-PN2	P Port Interrupt, 2-Way, Body Only	BD03-PN2-*	BC36
BD03-PNR	P Port Interrupt, Reducing Function, Body Only	BD03-PNR-*	BC37
BD03-PNS	P Port Interrupt, Sequencing Function, Body Only	BD03-PNS-*	BC38
BD03-PT	P to T, Body Only	BD03-PT-*	BC39
BD03-ABN	A and B Port Interrupt, Body Only	BD03-ABN-*	BC40
BD03-ABX	A and B Port Crossover, Body Only	BD03-ABX-*	BC41
BD03-ABT	A and B Ports to Tank, Body Only	BD03-ABT-*	BC42
BD03-DDX	Ports A and B Drain to Crossover Port, Body Only	BD03-DDX-*	BC43
BD03-BDA	B Port Drain to A, Body Only	BD03-BDA-*	BC44
BD03-ADB	A Port Drain to B, Body Only	BD03-ADB-*	BC45

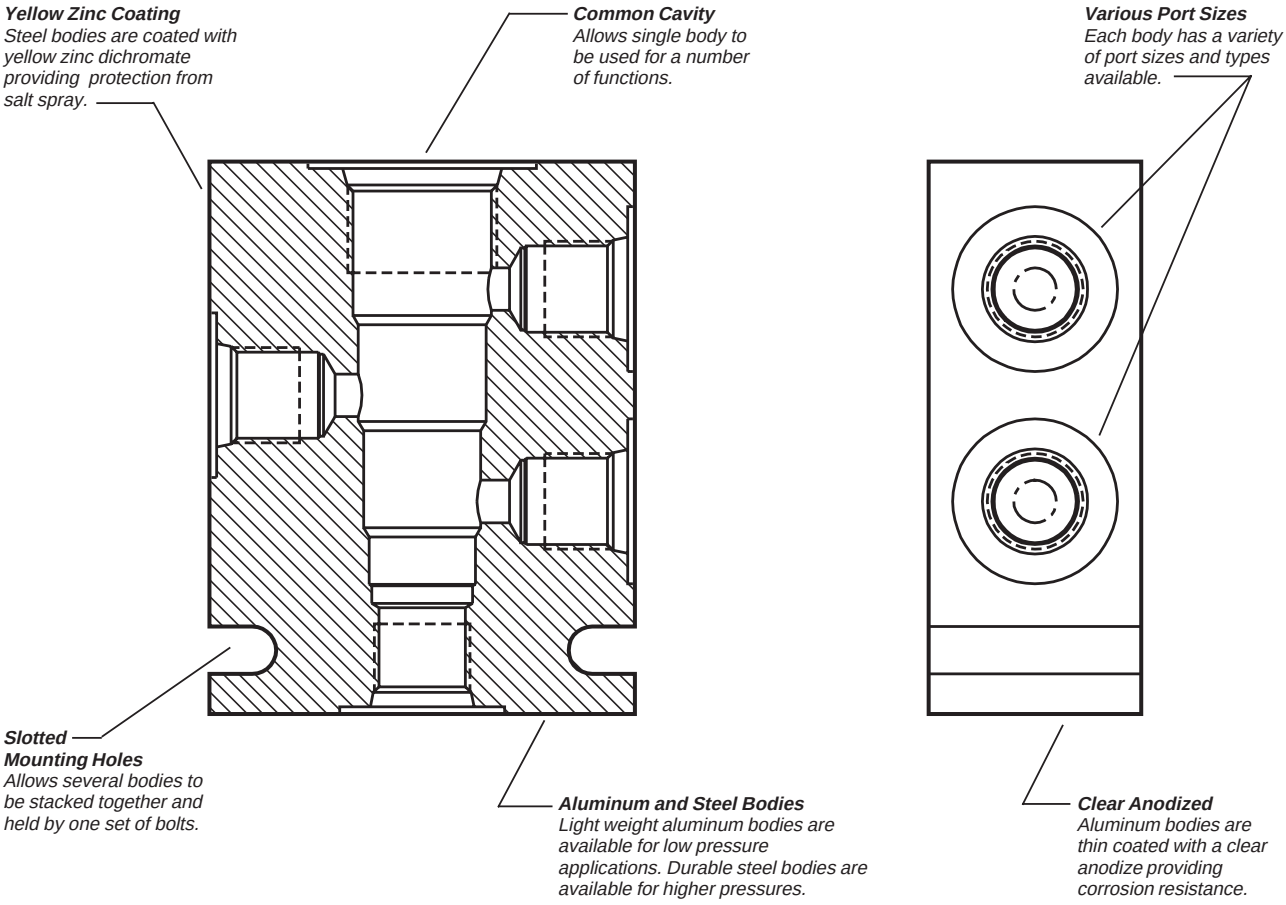
SERIES	DESCRIPTION	BODY NO.	PAGE NO.
SPECIAL BODIES AND CAVITIES			
CAV0W-2	2 Port	LB1079*	BC46
CAVSW-3	3 Port	LB1081*	BC47
CAVT11A	3 Port or 4 Port Dual	LB1082*	BC48
CAVT21A	4 Port	LB1083*	BC49
2C	2 Port	LB1021*	BC50
2G	2 Port	LB1032*	BC51
2R	2 Port	LB105**	BC52
2U	2 Port	LB102**	BC53
2X	2 Port	LB1051*	BC54
3A	3 Port	LB100**	BC55
3C	3 Port or 4 Port Dual	LB100**	BC56
3J	3 Port	LB1009*	BC57
3K	3 Port		BC58
3M	3 Port or 4 Port Dual	LB100**	BC59
3X	3 Port	LB1055*	BC60
3Z	3 Port	LB103**	BC61
4C	4 Port	LB1056*	BC62
5A	5 Port	LB103**	BC63
53-1	3 Port or 4 Port Dual	LB1031*	BC64
54-1	3 Port	LB10591	BC65
68-1	3 Port or 4 Port Dual	LB102**	BC66
91-1	3 Port	LB1015*	BC67
100-1	5 Port	LB1031*	BC68

INTRODUCTION

This Technical Tips section is split into three parts; Standard Line Bodies, Cavities, and Cartpaks. In the standard line bodies section, we highlight the features and options of our standard offering of line bodies. In the cavity section we discuss “common” cavities and form tools. In the Cartpak section, we present the features and options to Parker’s line of D03 style sandwich bodies. The Technical Tips are provided to help you become more familiar with Parker Hannifin’s line of product and assist you in applying our product.

STANDARD LINE BODIES

Parker offers standard line bodies for each valve and cavity size. Below are some of the features of Parker’s standard line bodies.



COMMON OPTIONS & FEATURES

Aluminum vs. Steel: Parker offers standard line bodies in both aluminum and steel. Aluminum bodies are most often used for general applications. They are lightweight and less costly than steel bodies. Parker’s aluminum bodies are coated with a clear anodize to provide a corrosion resistant protection. Aluminum bodies should never be used in applications above 210 bar (3000 psi.) Steel bodies are more durable and heavier than aluminum bodies. They are ideal for applications with elevated pressures or where rugged construction is desired. Steel bodies are suitable for applications up to 350 bar (5000 psi.) Parker’s steel bodies are coated with yellow zinc dichromate providing corrosion resistance. Yellow zinc dichromate even provides the steel body many hours of protection from salt spray.

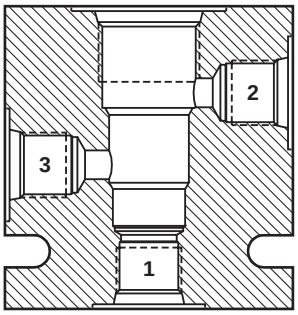
COMMON OPTIONS & FEATURES (Cont.)

Pressure Drop: The pressure drop through a line body is fairly minimal. Each catalog page shows a pressure drop curve. This should be added to the pressure drop through the cartridge when trying to estimate total pressure drop for a function.

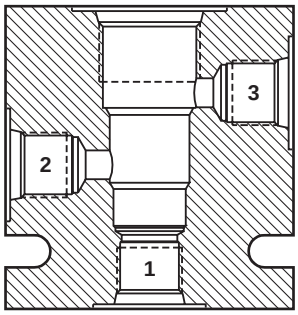
Porting: Parker offers a variety of port sizes and types for each line body. While NPT or pipe ports were once very popular and are still offered, we recommend SAE ports for new applications. SAE ports and fittings provide a more secure connection than pipe ports. BSPP ports are also available.

Port Numbering Change: With this catalog, we have re-numbered the ports on our 3-way line bodies. In the past, three way bodies were numbered with the nose being port 1, the middle port labeled (3), and the top port labeled (2). Over the years, this has caused some confusion, so we have relabeled the ports sequentially from the bottom. For identification, the current design will be marked with a Parker symbol like the one shown.





Previous Design



Current Design

CAVITIES

The hole that the cartridge valve is screwed into is called a cavity. Many cartridge producers manufacture valves that fit a “common” cavity. With a “common” cavity, a valve theoretically could be removed from a cavity and replaced by another manufacturer’s product. One should be careful though to check cross drill ports and thread depths when pursuing this activity. While it is true that many manufacturer’s products fit inside another’s cavity, the cross drills sometimes expose an o-ring to pressure, causing the o-ring to be extruded.

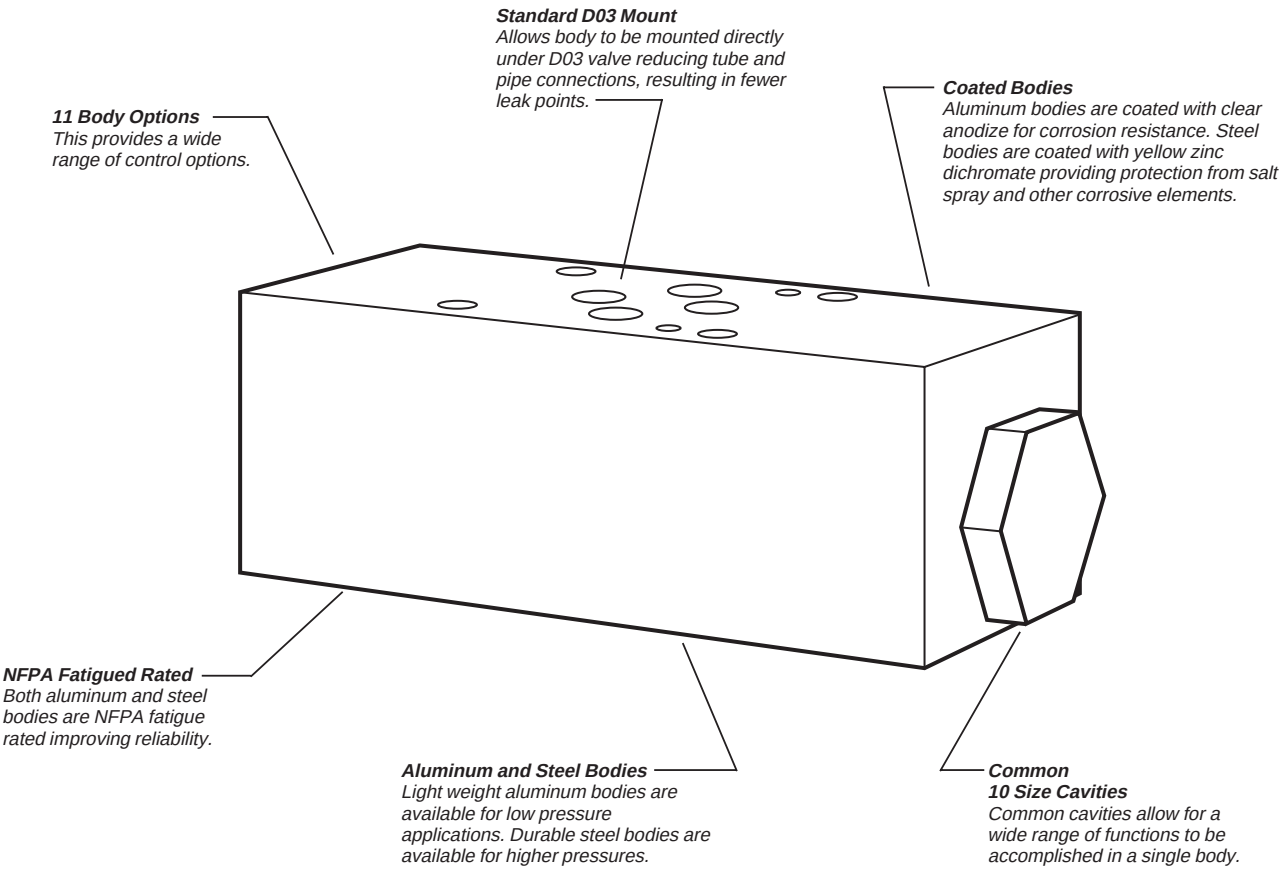
Valve / Cavity Compatibility Chart: Through acquisition, Parker Hannifin has accumulated a number of manufacturers with “common” cavities. To accommodate all of our product lines, we have released a new cavity for our Winner’s Circle product line. The cavities shown in this catalog are considered Winner’s Circle Cavities. The Winner’s Circle valves are downward and upward compatible with the Parker Series of product. On each catalog page, you will find a chart like the one shown on this page. The purpose of this chart is to help identify if a valve from one acquisition can be replaced by the Winner’s Circle valve, or another acquisition. The valves are designated by the columns of the chart and the cavities by the rows. If you have an existing cavity, you find it on the chart and follow across to see which valves you may put in the cavity. For instance, using the chart below, let’s say you have an existing manifold in which you had manufactured a FPS cavity (maybe you were using a SV2A-10). By finding the row labeled FPS and following across, you find that you could use the new Winner’s Circle product, an FPS product, or a CEC product of the same size in this cavity. A Parker or Waterman valve will not fit in this cavity without modifying the cavity. This chart is provided to help you in converting to the Winner’s Circle product line.

		VALVE				
		Winner’s Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner’s Circle	X	X	X	X	X
	Parker	X	X	X		
	Waterman	X	X	X		
	FPS	X			X	X
	CEC	X			X	X

Cavity Tools: On each catalog page, cavity tools are listed for your use in creating special manifolds. More is discussed on manifold construction in the Technical Data section of this catalog. For 3-way and 4-way valves, you will find a roughing and a finishing tool. The rougher is a step drill used to prep the cavity for the finishing tool. The rougher removes the mass of material and is necessary because the finisher is not designed for primary forming. The finisher is a precision tool used to provide the final dimensions of the cavity. No rougher is offered for 2-way cavities because a standard drill bit can be used to remove the mass of material.

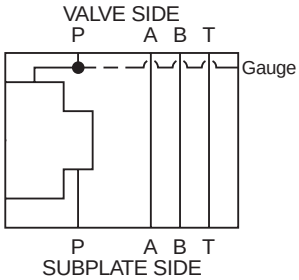
CARTPAK BODIES

Parker Cartpak sandwich mounted bodies are designed to be mounted under a standard ISO 4401-03, NFPA D03, CETOP 3 size valve, and provide a multitude of different functions. The bodies are designed to accept a common 10 size cartridge valve allowing the designer the flexibility to use a single body to provide pressure, directional, flow, or load control. One or more Cartpak bodies may be “sandwiched” underneath a Parker D1 Series directional valve to provide the control functions for all portions of a hydraulic circuit. The ISO standard fatigue rated bodies are available in either aluminum or ductile iron.



Catalog Pages: Each Cartpak catalog page is laid out in a similar format and is designed to help you select the proper body for your application. In the top left corner of the page there is a brief description and body schematic. The body schematic shows the cartridge cavity and the ports connecting to it. This schematic can be used to understand which valves can be used in the body. For instance, in the example shown here, flow from the subplate in port P is directed into the nose of the cartridge. The side port of the cartridge is connected to the valve side of port P. Thus, you want to choose cartridges providing the function desired, and use the nose as the inlet. For instance, a FC101 meters flow from its nose port to its side port and would be ideal for the p-port interrupt body shown.

UPRIGHT



In addition to the body schematic, we also provide a hydraulic schematic at the bottom of each catalog page. This schematic shows a variety of Parker cartridge part numbers that can be used with this body. This list is not intended to be comprehensive, but it is intended to show the wide variety of options that can be achieved with each body. You will also note, the product listing shows the orientation of the block (upright or inverted), the cavity for the cartridge, and cavity plugs (when necessary.) Once again, many options can be achieved with each body.

O-Ring Plates: Since many of the Cartpak bodies can be "flipped" to achieve extra functions, the faces of the bodies must be flat. Thus, an o-ring plate with o-rings must be used to seal the mounting surface. One plate with o-rings will be provided with any body that can be inverted. *Below are the kit numbers;*

Nitrile Kit - 717939 Fluorocarbon Kit - 717939V

Flipping Cartpaks: As mentioned before, many Cartpak bodies can be flipped to create extra options. The catalog pages show some of the functions that can be achieved by "flipping." The words "upright" and "inverted" are written on the bodies to help you identify which side you are looking at. To invert the body, while facing the long face of the body (in other words, the sides without any ports or cavities), rotate the valve 180 degrees away from your body in an upward fashion. By doing this, you have essentially switched the P port and T port.

Stacking Cartpaks: Cartpak bodies can be stacked on top of one another to provide a number of functions in a single assembly. When stacking Cartpak bodies though, you want to take some care in the order in which the bodies are stacked. In general, flow controls should be stacked as close to the subplate stack as possible, while pilot operated check valves or counterbalance valves should be stacked as close to the D03 valve as possible.

The D03 line of bodies has a common height of 40mm (1.58 in.). Below is a list of bolt kits available from Parker.

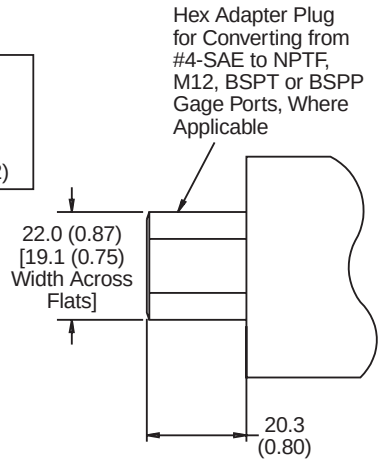
UNC Bolt Kits for use with D1V Directional Control Valves & Manapaks/Cartpaks (D1V*-75 Design, Solenoid Operated)					
	Number of Manapaks/Cartpaks @ 1.58" (40mm) thickness				
	0	1	2	3	4
D1V-75	BK209 1.25"	BK243 2.88"	BK225 4.38"	BK244 6.00"	BK245 7.50"
D1V-75 Plus Tapping Plate	BK176 2.25"	BK56 3.81"	BK212 5.38"	BK107 7.00"	BK106 8.50"

Note: All bolts are SAE grade 8, 10-24 UNC-2A thread, torque to 5.6 N.m. (50 in.-lbs.)

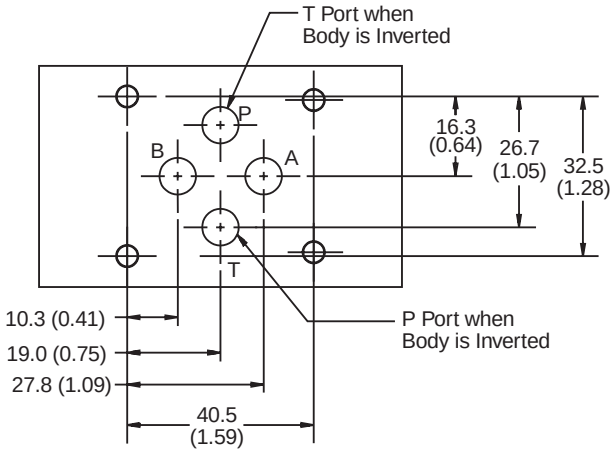
Gauge Ports: Several of the Cartpak bodies are equipped with a SAE #4 gauge port to assist the user during installation and troubleshooting. We offer hex adapter plugs, should your pressure gauge have a different thread type.

Hex Adapter Plug to convert from SAE #4

1830016	BSPP
1830017	BSPT
1830018	NPTF
1830019	Metric (M12)

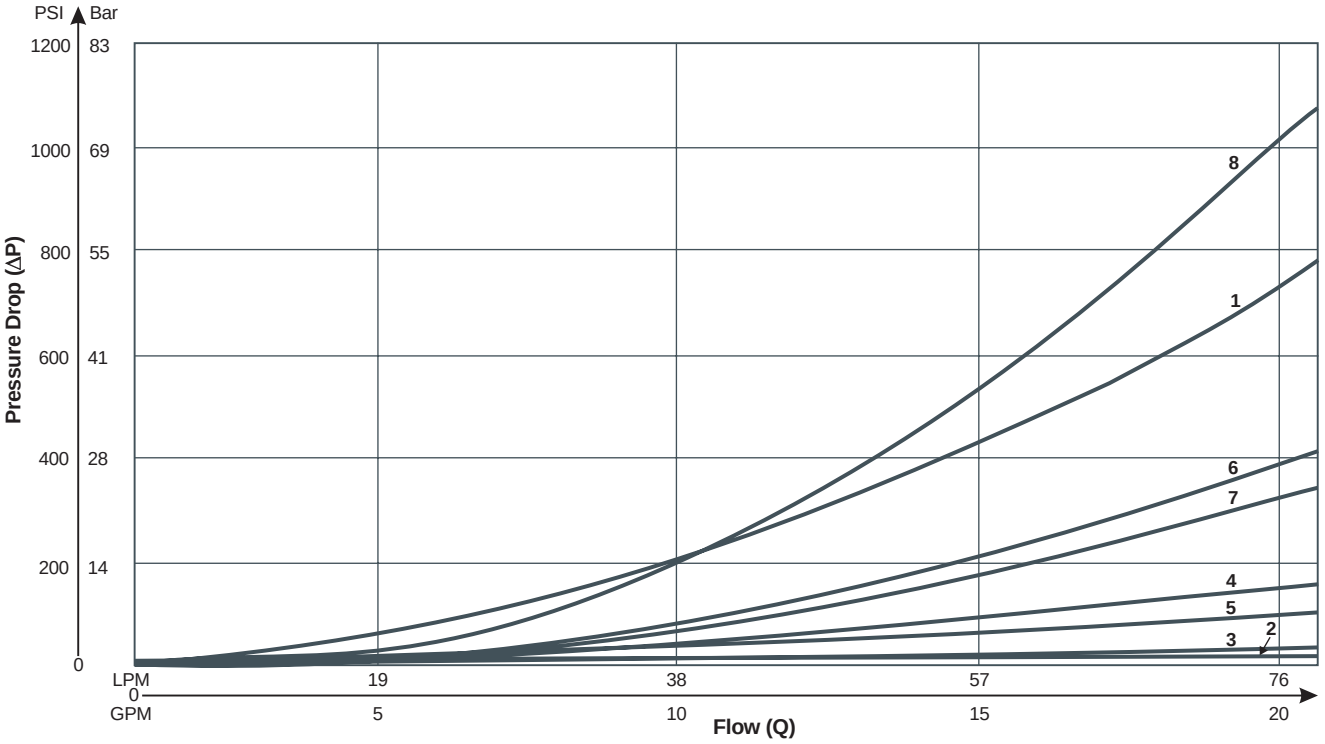


D03 Pad Dimensions: Below is the common dimensions of the standard D03 mount pad. Since these dimensions are common to all Cartpak bodies, we do not identify them on the individual valve pages.



PRESSURE DROP CHART

The following charts outline the pressure drop through the Parker Cartpak bodies.
The pressure drop is minus the cartridge valve.



Body	Orientation	P	T	A	B
BD03-PN	Upright Inverted	1 2	2 1	3 3	3 3
BD03-PT	Upright Inverted	3 3	3 3	3 3	3 3
BD03-ABN	Upright Inverted	3 3	3 3	4 4	4 4
BD03-ABT	Upright Inverted	3 3	3 3	3 3	3 3
BD03-ABX	Upright	5	5	3	3
BD03-PNR	Upright	6	3	3	3
BD03-PNS	Upright	7	3	3	3
BD03-DDX	Upright	3	3	1	1
BD03-BDA	Upright	6	3	3	3
BD03-ADB	Upright	6	3	3	3
BD03-PN2	Upright Inverted	8 3	3 8	3 3	3 3

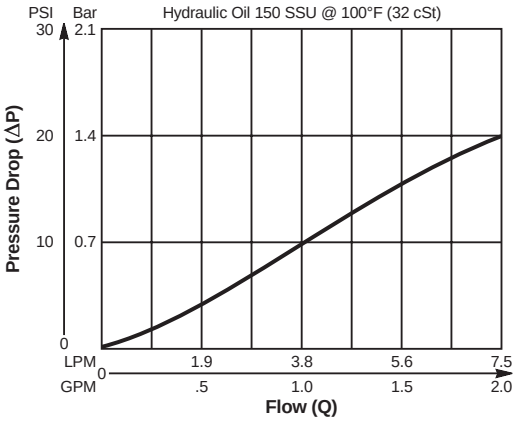
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

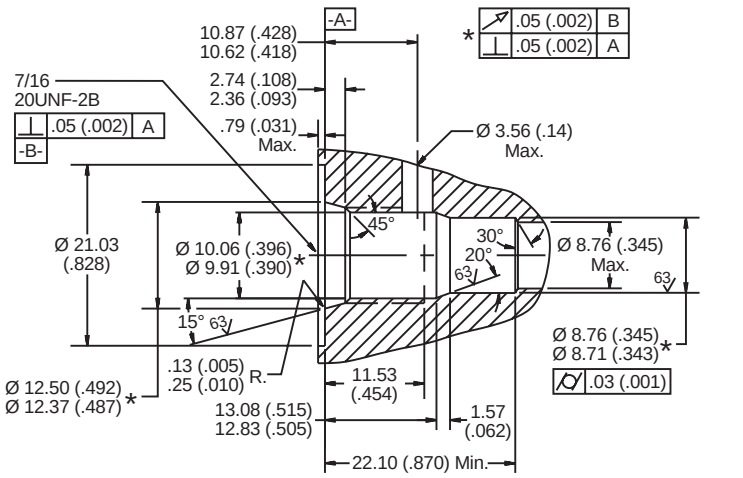
		VALVE				
		Winner's Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner's Circle	X	X	X		
	Parker	X	X	X		
	Waterman	X	X	X		
	FPS					
	CEC					

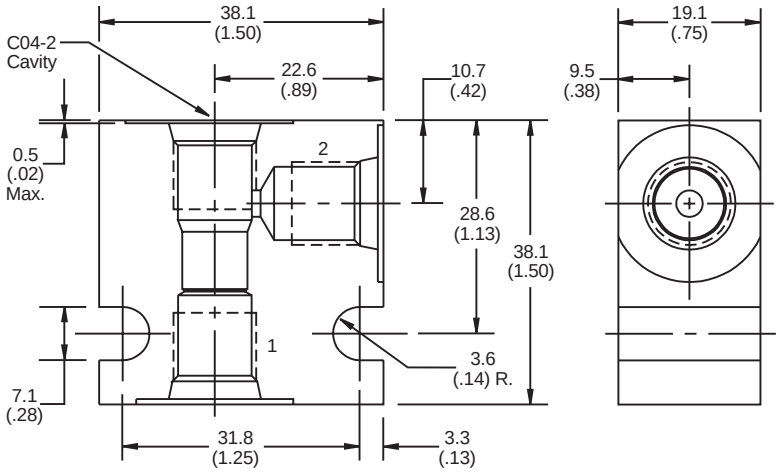
Performance Curve

Pressure Drop vs. Flow



Dimensions Millimeters (Inches)





Ordering Information

B04	—	2	—		
04 Size		2-Way Cavity		Body Material	Port Size

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size
4T	SAE - 4

Form Tool: Rougher None
Finisher NFT04-2F

Weight: .07 kg (.15 lbs.)

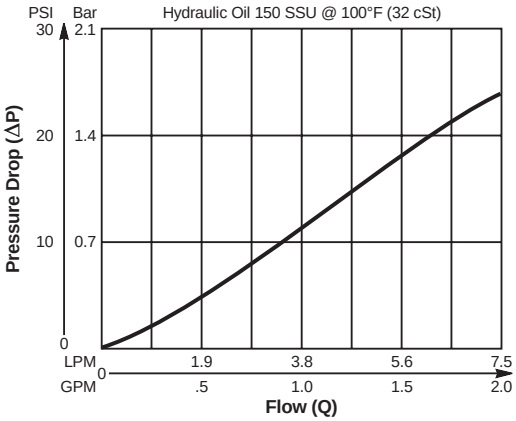
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

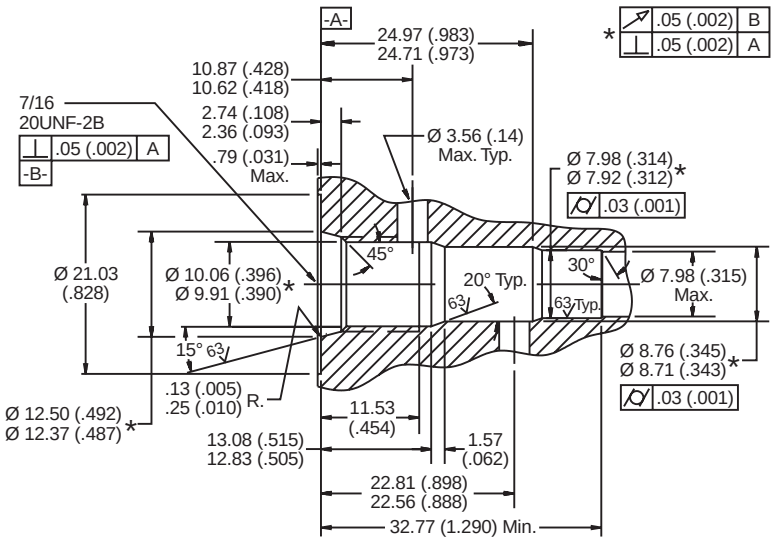
CAVITY	VALVE: Winner's Circle	Parker	Waterman	FPS	CEC
Winner's Circle	X	X	X		
Parker	X	X	X		
Waterman	X	X	X		
FPS					
CEC					

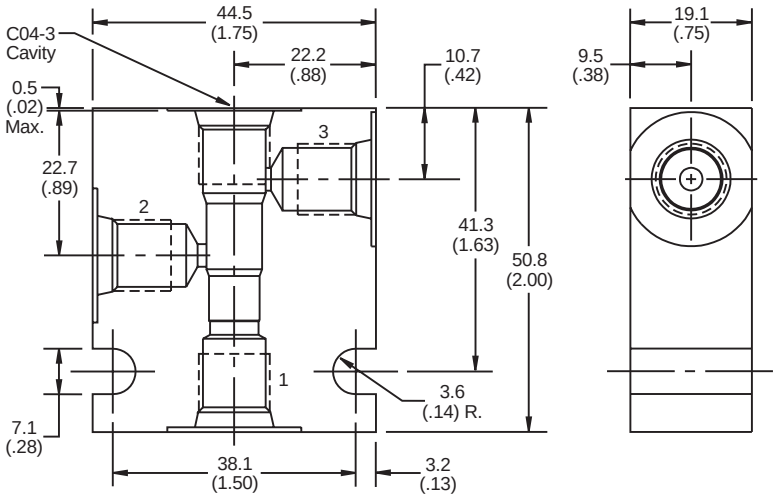
Performance Curve

Pressure Drop vs. Flow



Dimensions Millimeters (Inches)





Ordering Information

B04	—	3	—	
04 Size		3-Way Cavity		Port Size

Code	Port Size
A4T	SAE-4

A4T aluminum only.

Form Tool: Rougher NFT04-3R
Finisher NFT04-3F

Weight: .10 kg (.23 lbs.)

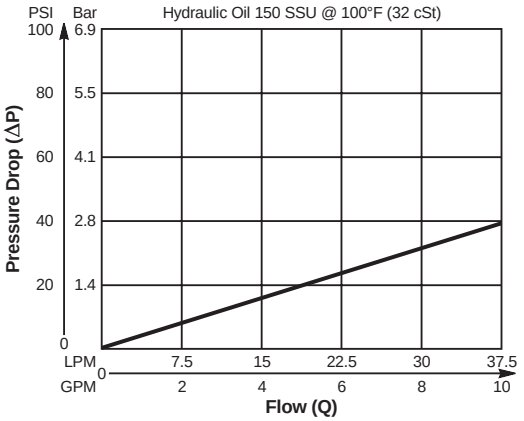
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

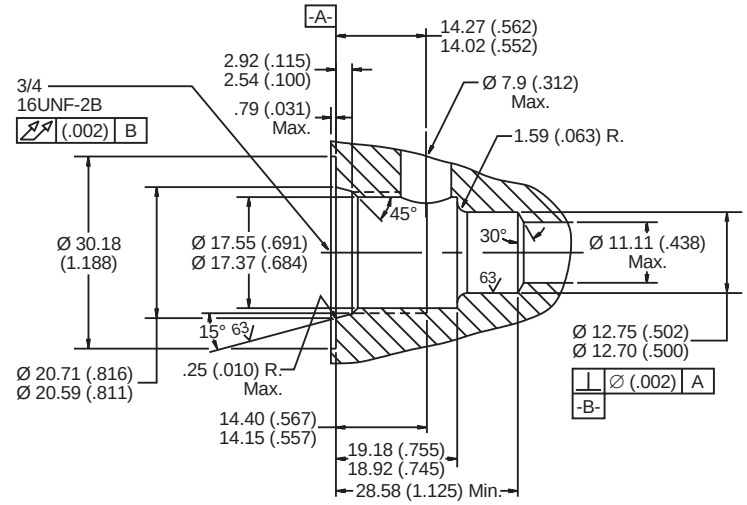
		VALVE				
		Winner's Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner's Circle	X	X	X	X	X
	Parker	X	X	X	X	X
	Waterman	X	X	X	X	X
	FPS	X	X	X	X	X
	CEC	X	X	X	X	X

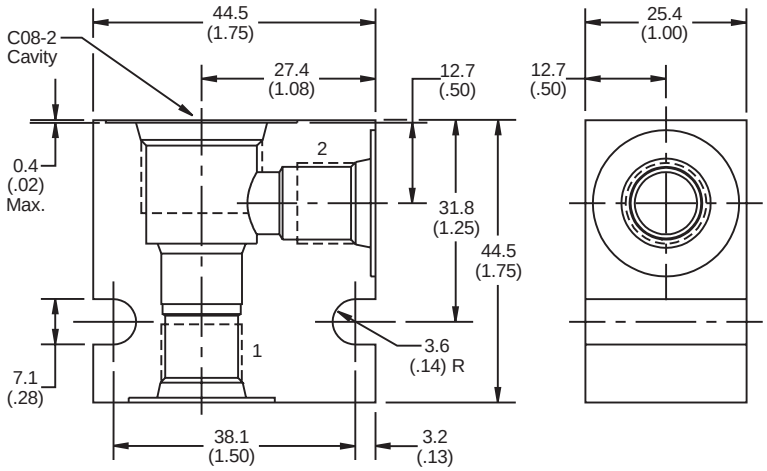
Performance Curve

Pressure Drop vs. Flow



Dimensions Millimeters (Inches)





Ordering Information

B08	—	2	—			
08 Size		2-Way Cavity		Body Material		Port Size

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size
4P	1/4″ NPTF
6P	3/8″ NPTF
4T	SAE - 4
6T	SAE - 6
6B	3/8″ BSPG

Form Tool: Rougher None
Finisher NFT08-2F

Weight: .11 kg (.25 lbs.)

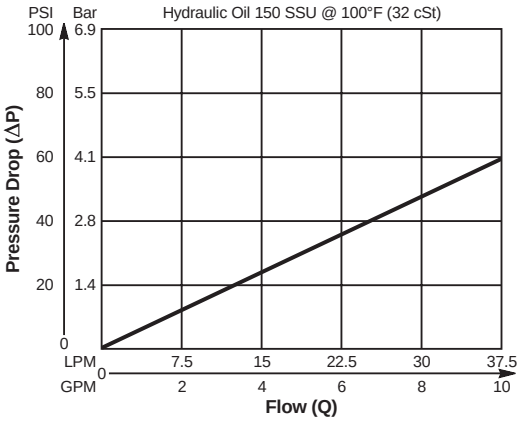
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

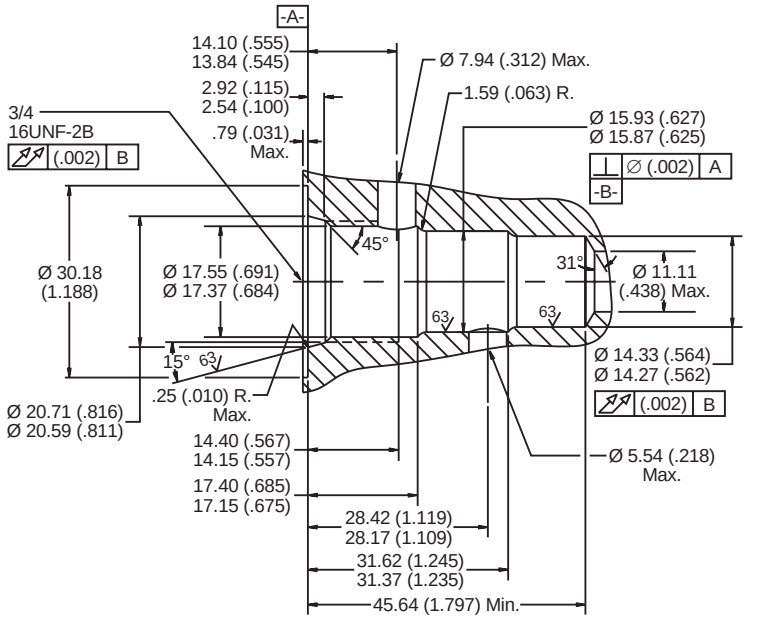
		VALVE				
		Winner's Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner's Circle	X	X	X		
	Parker	X	X	X		
	Waterman	X	X	X		
	FPS				X	X
	CEC				X	X

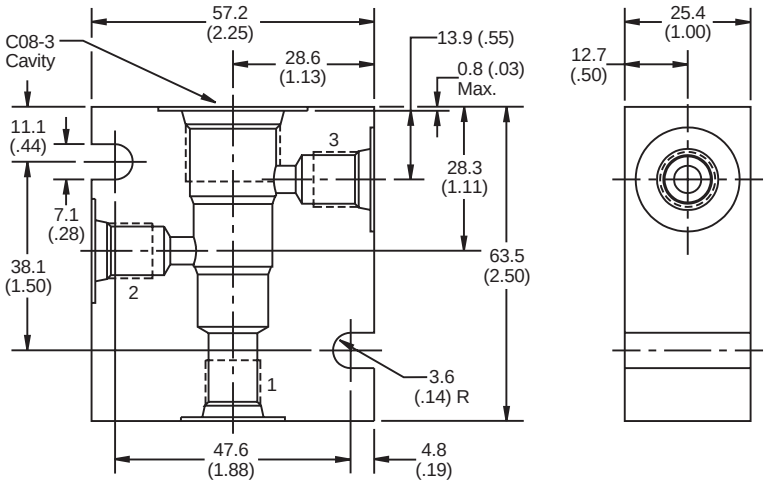
Performance Curve

Pressure Drop vs. Flow



Dimensions Millimeters (Inches)





Ordering Information

B08	—	3	—		
08 Size		3-Way Cavity		Body Material	Port Size

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size
4P	1/4″ NPTF
4T	SAE - 4
6T	SAE - 6
6B	3/8″ BSPG

Form Tool: Rougher NFT08-3R
Finisher NFT08-3F

Weight: .27 kg (.60 lbs.)

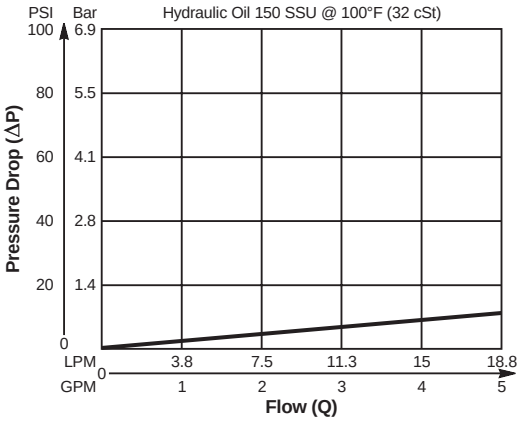
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

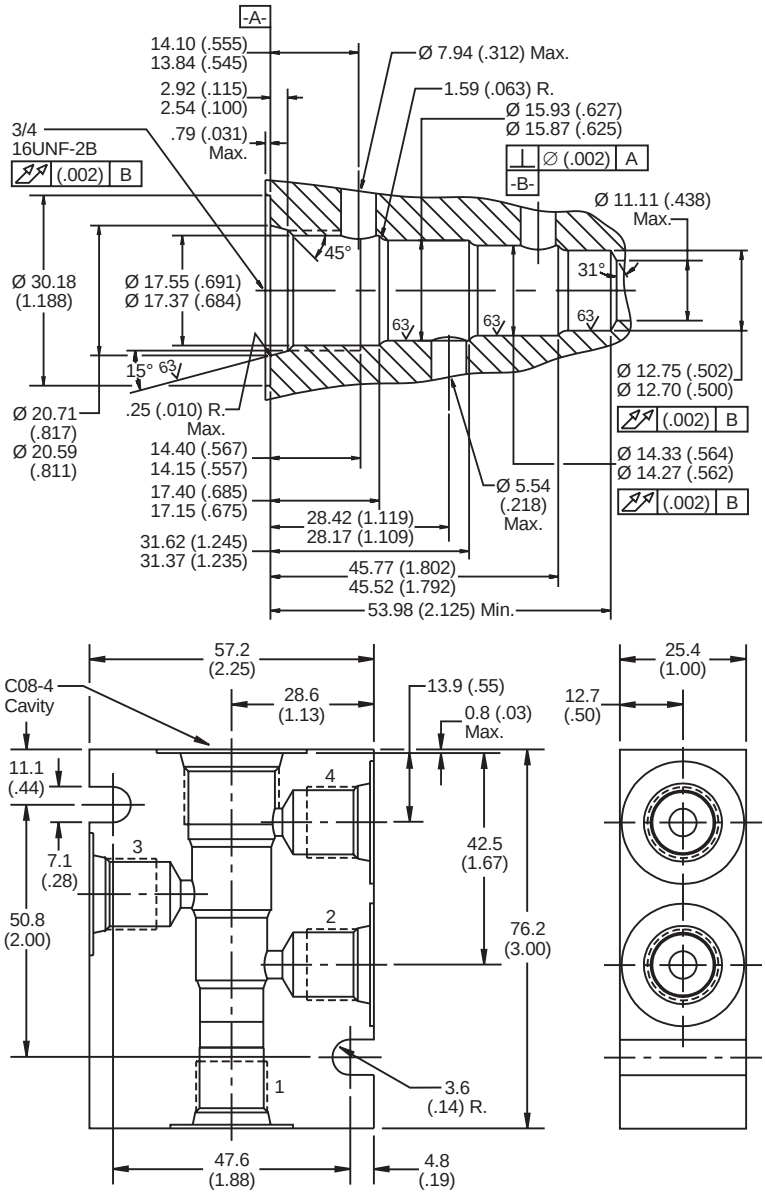
		VALVE				
		Winner's Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner's Circle	X	X	X		
	Parker	X	X	X		
	Waterman	X	X	X		
	FPS				X	
	CEC					

Performance Curve

Pressure Drop vs. Flow



Dimensions Millimeters (Inches)



Ordering Information

B08	—	4	—			
08 Size		4-Way Cavity		Body Material		Port Size

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size
4T	SAE - 4
6T	SAE - 6
6B	3/8″ BSPG

Form Tool: Rougher NFT08-4R
Finisher NFT08-4F

Weight: .45 kg (1.0 lbs.)

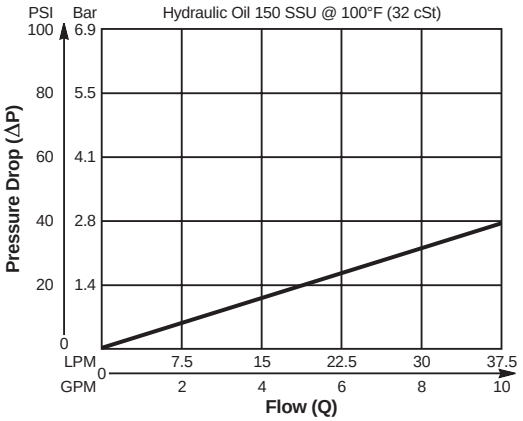
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE				
		Winner's Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner's Circle					
	Parker		X	X		
	Waterman		X	X		
	FPS					
	CEC					

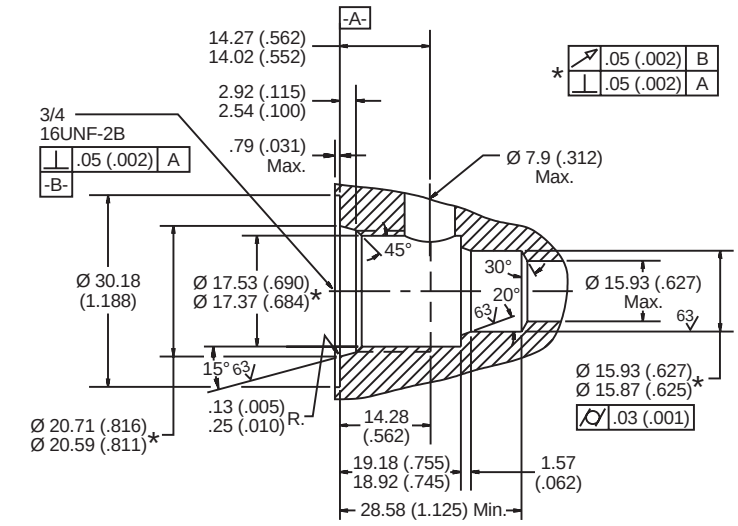
Performance Curve

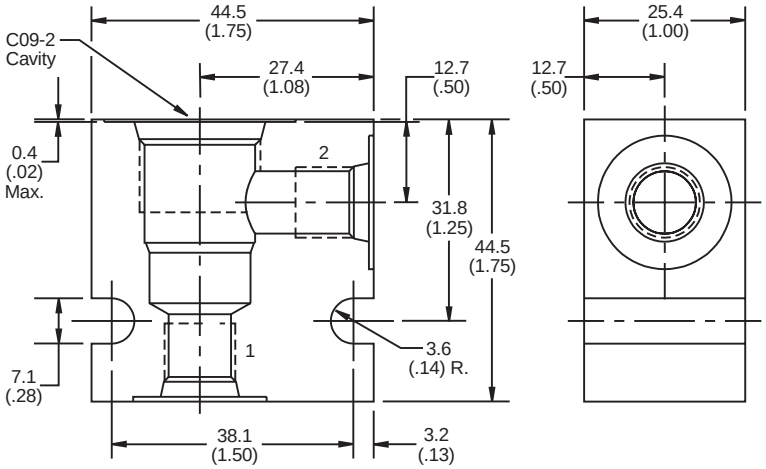
Pressure Drop vs. Flow



Dimensions

Millimeters (Inches)





Ordering Information

B09	—	2	—			
09 Size		2-Way Cavity		Body Material		Port Size

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size
6T	SAE - 6
6B†	3/8″ BSPG

† Steel body only.

Form Tool: Rougher None
Finisher FT09-2
Weight: 11 kg (.25 lbs.)

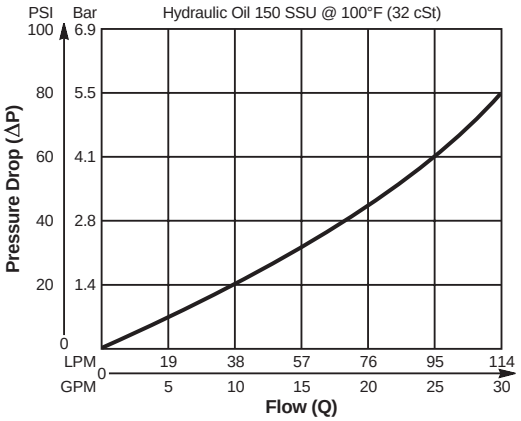
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

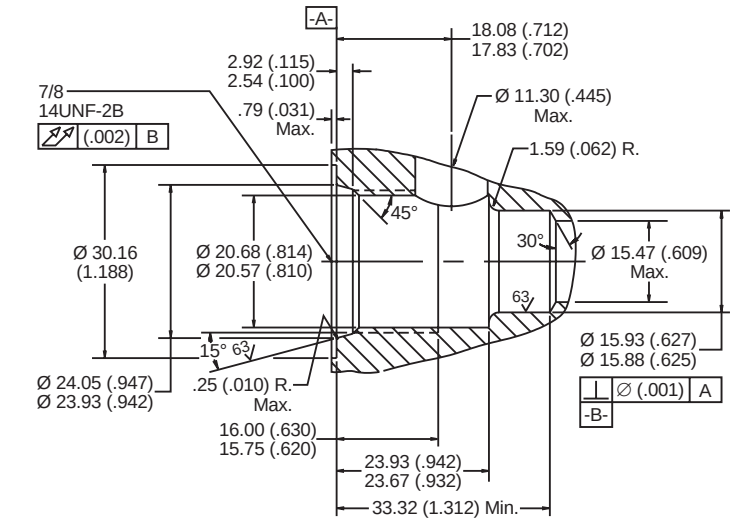
		VALVE				
		Winner's Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner's Circle	X	X	X	X	X
	Parker	X	X	X		
	Waterman	X	X	X		
	FPS	X			X	X
	CEC	X			X	X

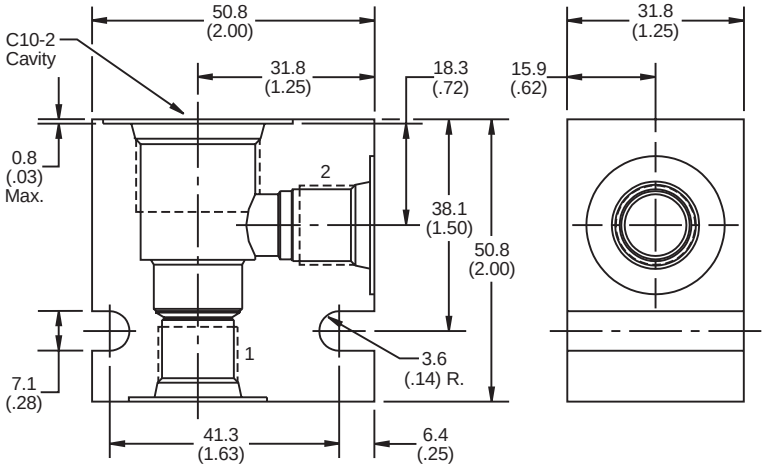
Performance Curve

Pressure Drop vs. Flow



Dimensions Millimeters (Inches)





Ordering Information

B10	—	2	—			
10 Size		2-Way Cavity		Body Material		Port Size

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size
4P	1/4″ NPTF
6P	3/8″ NPTF
8P	1/2″ NPTF
6T	SAE - 6
8T	SAE - 8
6B†	3/8″ BSPG

† Steel body only.

Form Tool: Rougher None
Finisher NFT10-2F

Weight: .45 kg (1.0 lbs.)

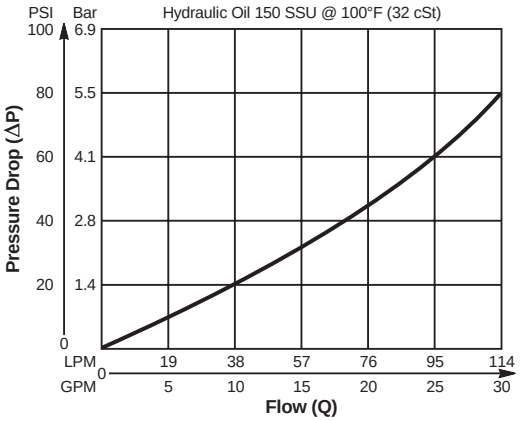
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

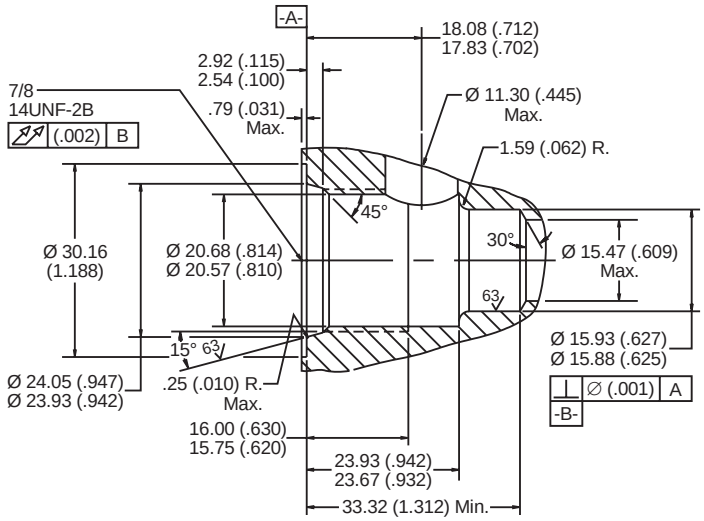
CAVITY	VALVE: Winner's Circle	Parker	Waterman	FPS	CEC
Winner's Circle	X	X	X	X	X
Parker	X	X	X		
Waterman	X	X	X		
FPS	X			X	X
CEC	X			X	X

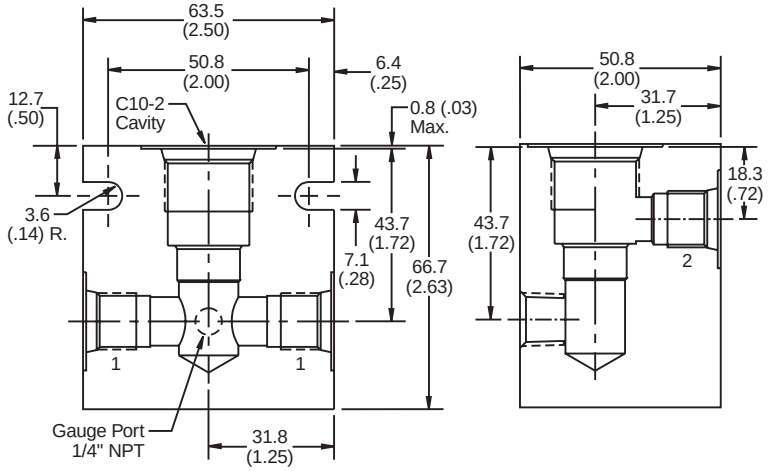
Performance Curve

Pressure Drop vs. Flow



Dimensions Millimeters (Inches)





Ordering Information

B10	—	2T	—		
10 Size		2-Way Cavity		Body Material	Port Size

Code	Body Material
Omit	Steel

Code	Port Size
T6T	SAE - 6
T8T	SAE - 8

Form Tool: Rougher None
Finisher NFT10-2F

Weight: 1.4 kg (3.0 lbs.)

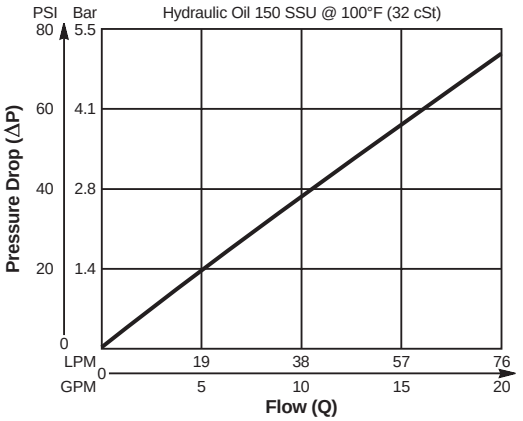
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

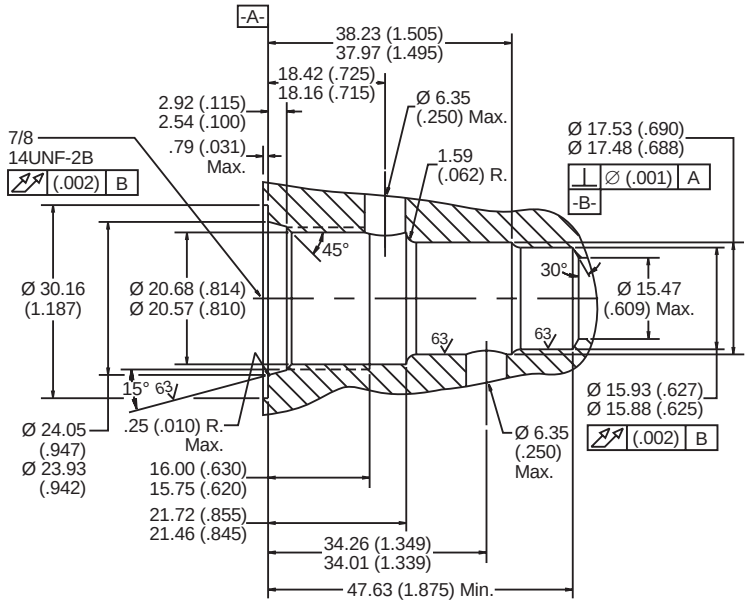
		VALVE				
		Winner's Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner's Circle	X	X	X	X	X
	Parker	X	X	X	X	X
	Waterman	X	X	X	X	X
	FPS	X	X	X	X	X
	CEC	X	X	X	X	X

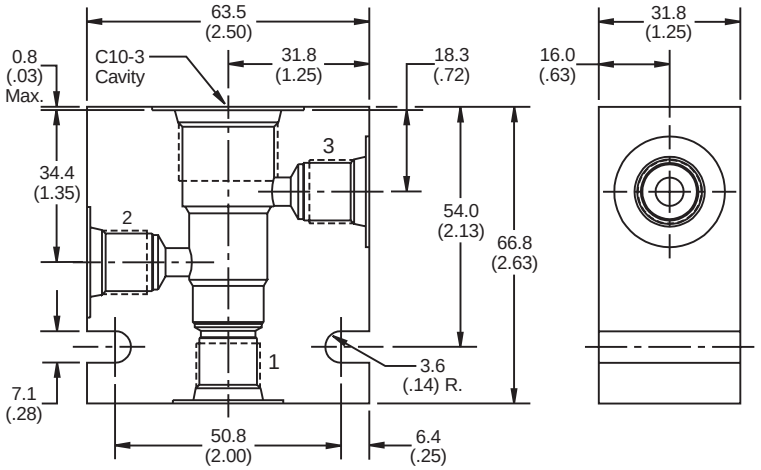
Performance Curve

Pressure Drop vs. Flow



Dimensions Millimeters (Inches)





Ordering Information

B10	—	3	—			
10 Size		3-Way Cavity		Body Material		Port Size

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size
4P	1/4″ NPTF
6P	3/8″ NPTF
8P	1/2″ NPTF
6T	SAE - 6
8T	SAE - 8
6B†	3/8″ BSPG
8B	1/2″ BSPG

† Steel body only.

Form Tool: Rougher NFT10-3R
Finisher NFT10-3F
Weight: .77 kg (1.7 lbs.)

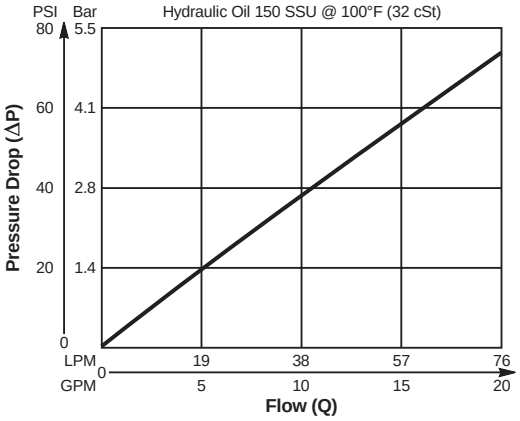
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

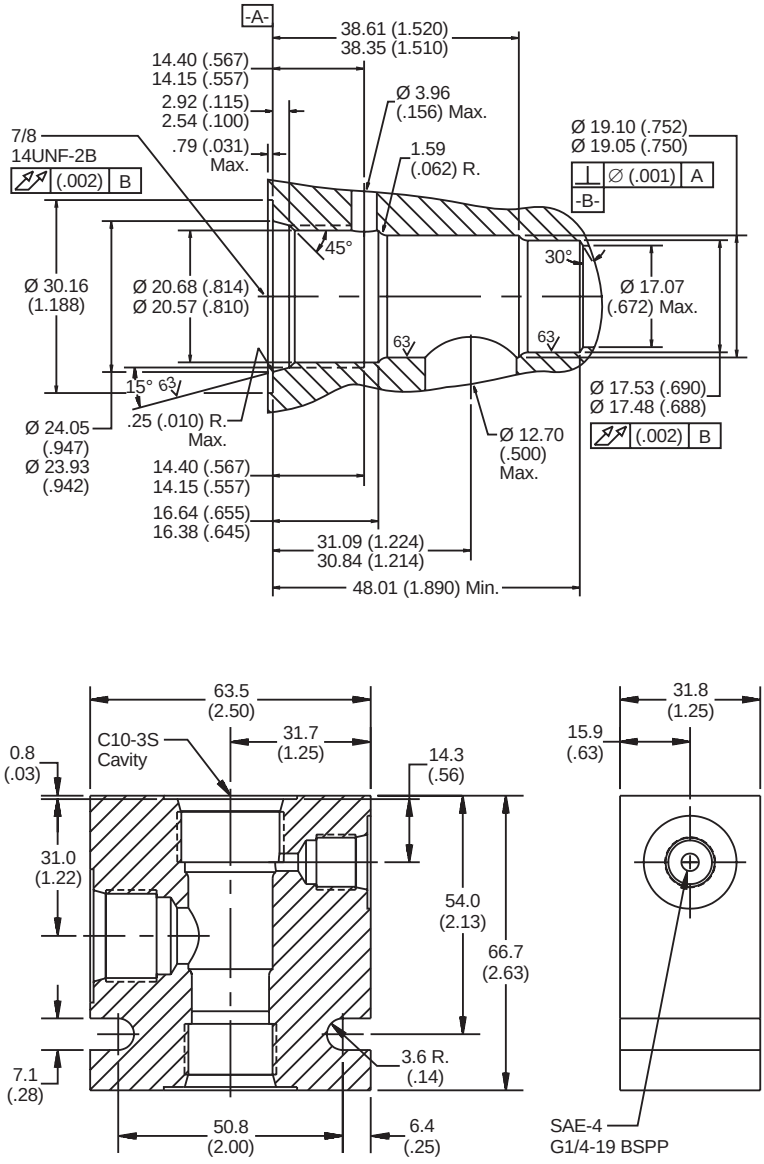
		VALVE				
		Winner's Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner's Circle	X			X	X
	Parker					
	Waterman					
	FPS	X			X	X
	CEC	X			X	X

Performance Curve

Pressure Drop vs. Flow



Dimensions Millimeters (Inches)



Ordering Information

B10	—	3S	—		
10 Size		3-Way Short Cavity		Body Material	Port Size

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size
6T	SAE - 6
8T	SAE - 8
6B	3/8″ BSPG
8B	1/2″ BSPG

Form Tool: Rougher NFT10S-3R
Finisher NFT10S-3F
Weight: .77 kg (1.7 lbs.)

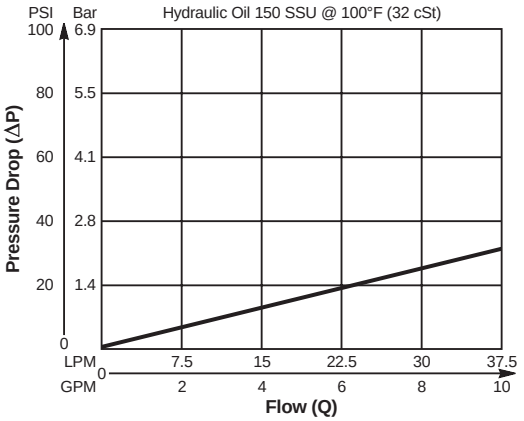
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE				
		Winner's Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner's Circle	X	X	X	X	X
	Parker	X	X	X	X	X
	Waterman	X	X	X	X	X
	FPS	X	X	X	X	X
	CEC	X	X	X	X	X

Performance Curve

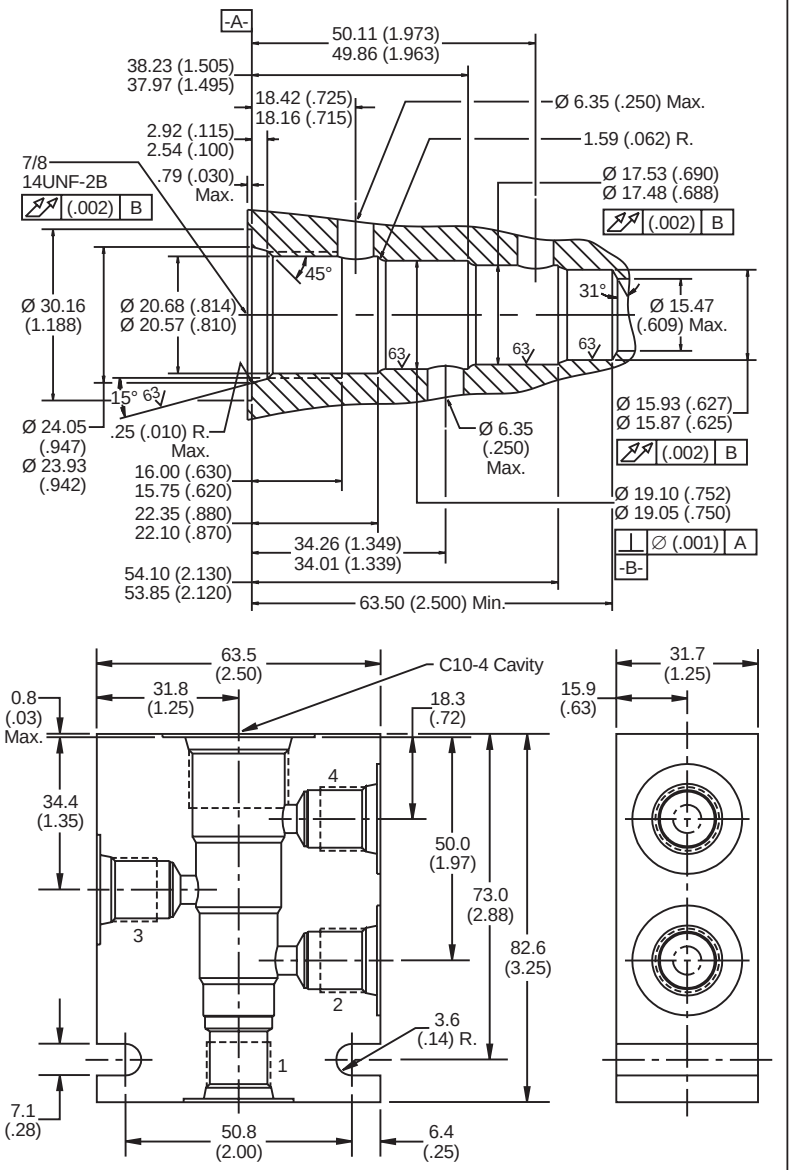
Pressure Drop vs. Flow



NOTE:
When machining for use with DF102P, Ports 1 and 4 must be connected in the manifold/block.

Dimensions

Millimeters (Inches)



Ordering Information

B10	—	4	—			
10 Size		4-Way Cavity		Body Material		Port Size

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size
6P	3/8″ NPTF
6T	SAE - 6
8T	SAE - 8
6B†	3/8″ BSPG

† Steel body only.

Form Tool: Rougher NFT10-4R
Finisher NFT10-4F

Weight: .90 kg (2.0 lbs.)

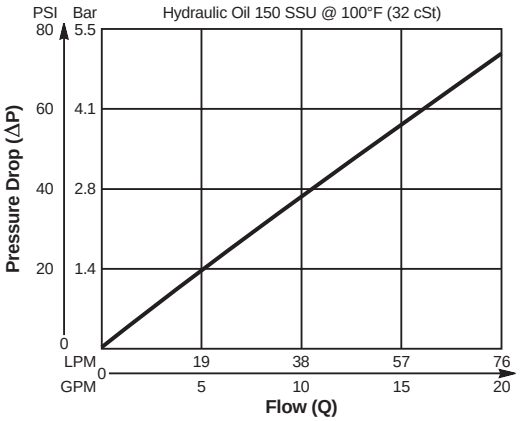
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

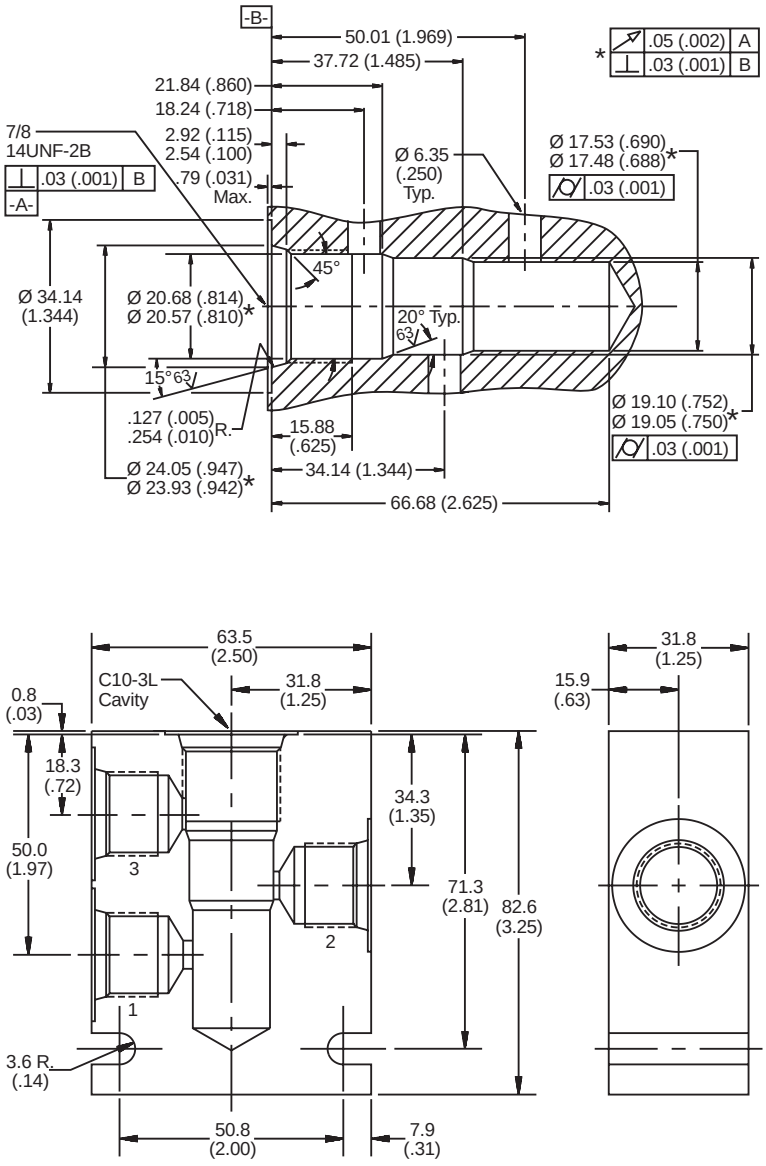
		VALVE				
		Winner's Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner's Circle					
	Parker		X	X	X	
	Waterman		X	X	X	
	FPS		X	X	X	
	CEC					

Performance Curve

Pressure Drop vs. Flow



Dimensions Millimeters (Inches)



Ordering Information

Part Number = 4082075

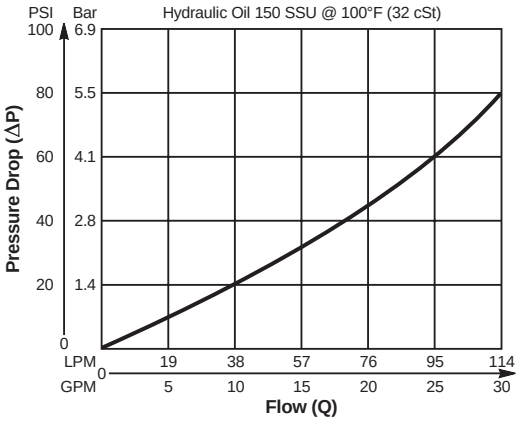
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE				
		Winner's Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner's Circle	X	X	X		
	Parker	X	X	X		
	Waterman	X	X	X		
	FPS					
	CEC					X

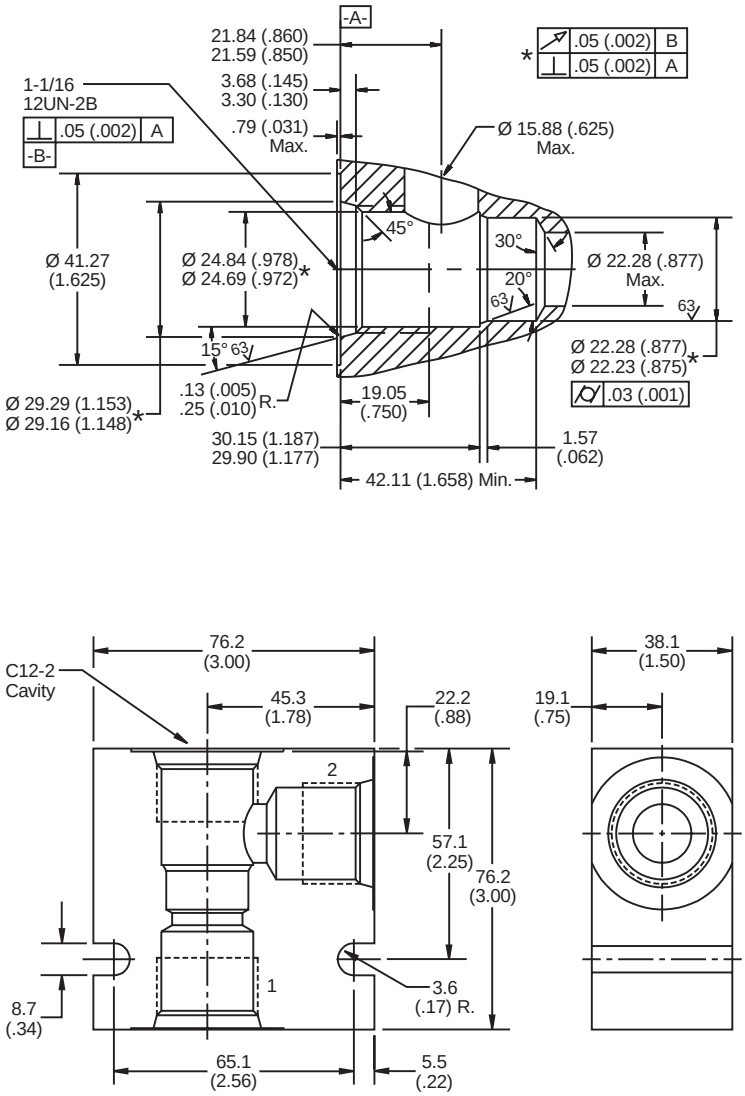
Performance Curve

Pressure Drop vs. Flow



Dimensions

Millimeters (Inches)



Ordering Information

B12	—	2	—			
12 Size		2-Way Cavity		Body Material		Port Size

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size
12P	3/4″ NPTF
8T	SAE - 8
12T	SAE - 12

Form Tool: Rougher None
Finisher NFT12-2F

Weight: .45 kg (1.0 lbs.)

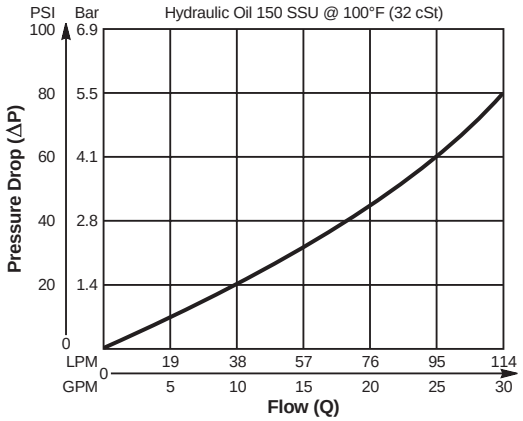
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

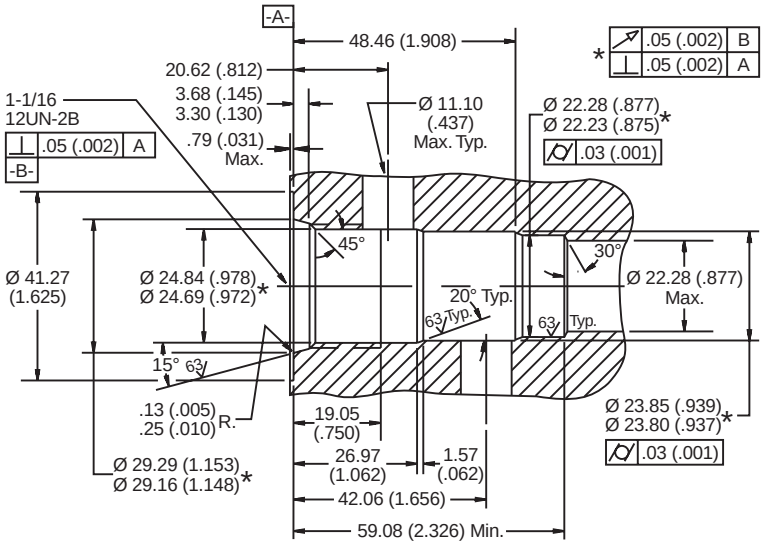
		VALVE				
		Winner's Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner's Circle	X	X	X		
	Parker	X	X	X		
	Waterman	X	X	X		
	FPS					
	CEC					X

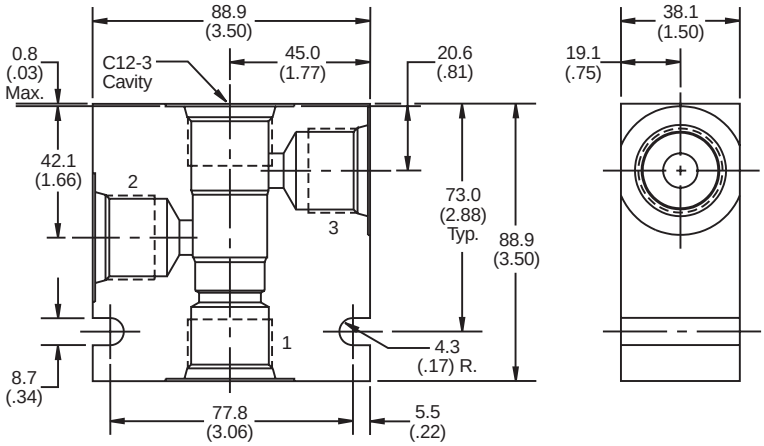
Performance Curve

Pressure Drop vs. Flow



Dimensions Millimeters (Inches)





Ordering Information

B12	—	3	—			
12 Size		3-Way Cavity		Body Material		Port Size

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size
8T	SAE - 8
12T	SAE - 12
8B†	1/2″ BSPG

† Steel body only.

Form Tool: Rougher NFT12-3R
Finisher NFT12-3F
Weight: 2.0 kg (4.5 lbs.)

Valve/Cavity Compatibility

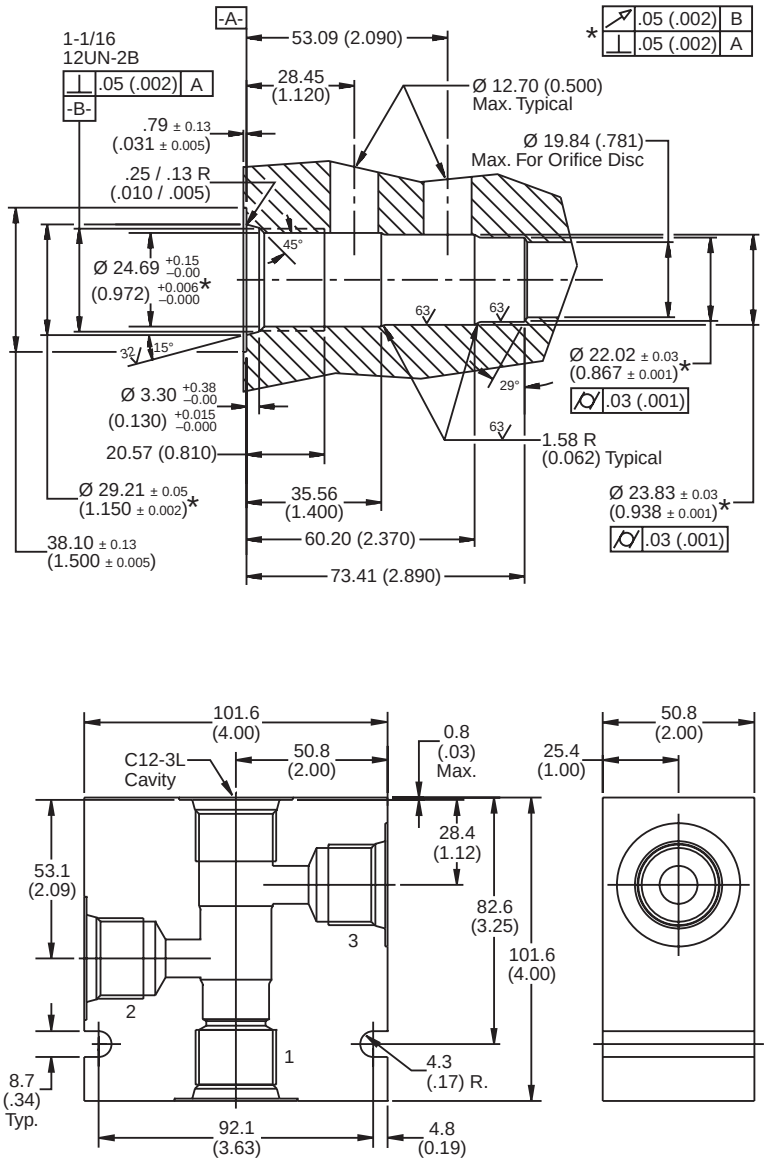
For additional information see Technical Tips on pages BC1-BC6.

Performance Curve

Pressure Drop vs. Flow

Dimensions

Millimeters (Inches)



Ordering Information

B12	—	3L	—		
12 Size		3-Way Long Cavity		Body Material	Port Size

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size
12T	SAE - 12

Form Tool: Rougher NFT12L-3R
Finisher NFT12L-3F

Weight:

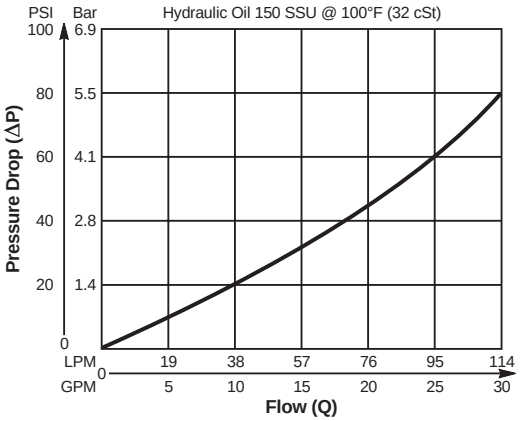
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE				
		Winner's Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner's Circle	X	X	X		
	Parker	X	X	X		
	Waterman	X	X	X		
	FPS					
	CEC					X

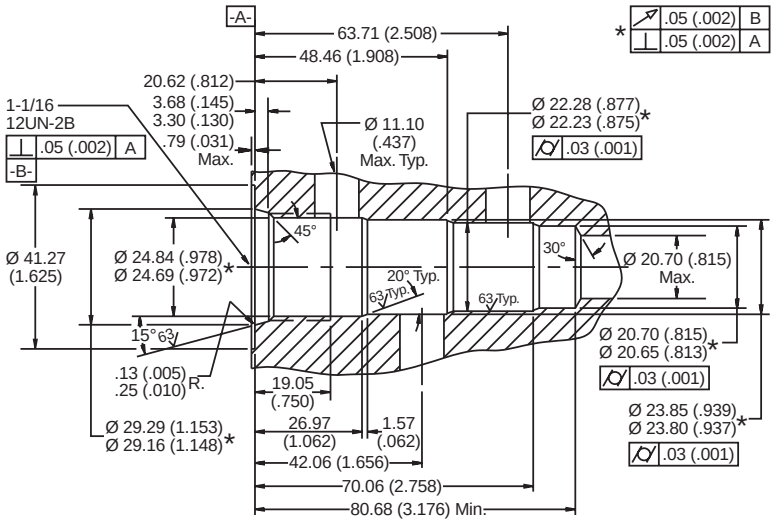
Performance Curve

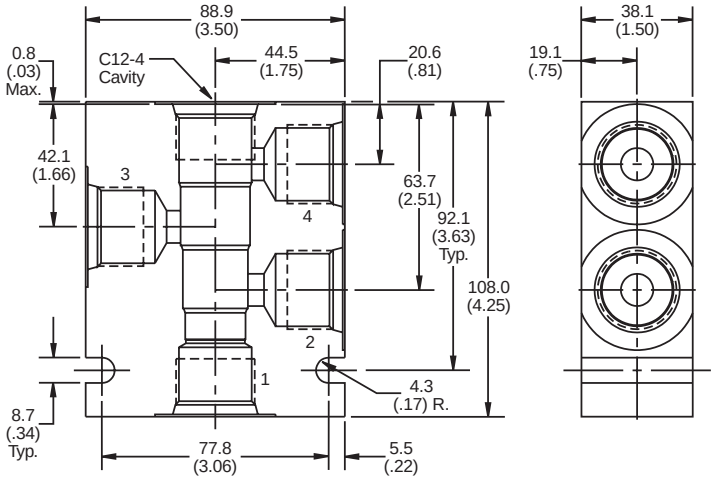
Pressure Drop vs. Flow



Dimensions

Millimeters (Inches)





Ordering Information

B12	—	4	—		
12 Size		4-Way Cavity		Body Material	Port Size

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size
12T	SAE - 12

Form Tool: Rougher NFT12-4R
Finisher NFT12-4F

Weight: 3.3 kg (7.3 lbs.)

Valve/Cavity Compatibility

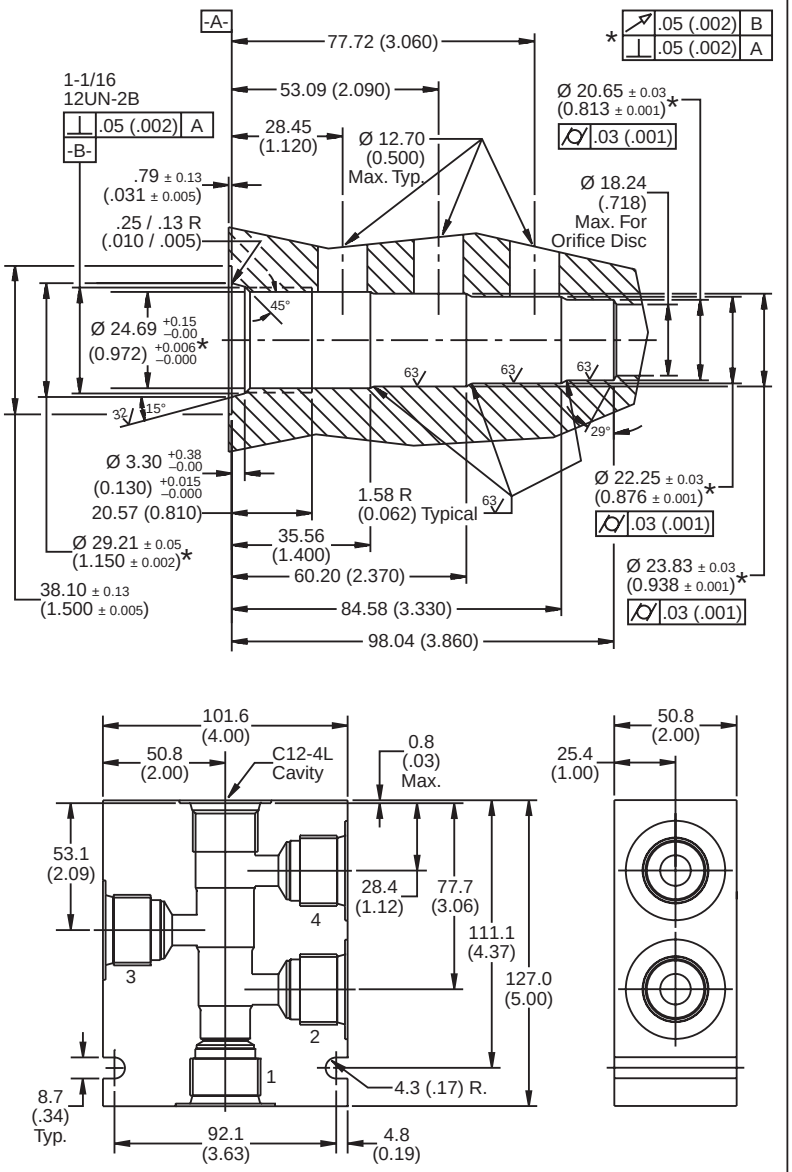
For additional information see Technical Tips on pages BC1-BC6.

Performance Curve

Pressure Drop vs. Flow

Dimensions

Millimeters (Inches)



Ordering Information

B12	—	4L	—		
12 Size		4-Way Long Cavity		Body Material	Port Size

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size
12T	SAE - 12

Form Tool: Rougher NFT12L-4R
Finisher NFT12L-4F

Weight:

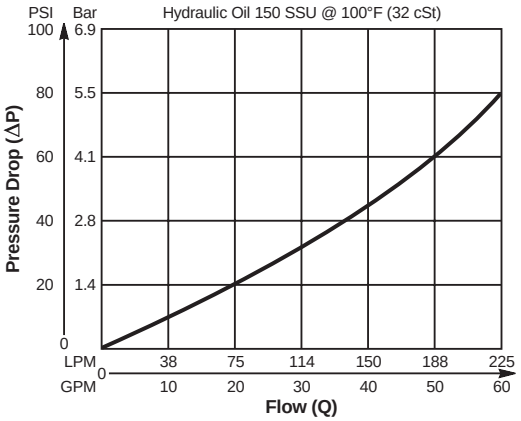
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE				
		Winner's Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner's Circle	X	X	X	X	X
	Parker	X	X	X		
	Waterman	X	X	X		
	FPS	X			X	X
	CEC	X			X	X

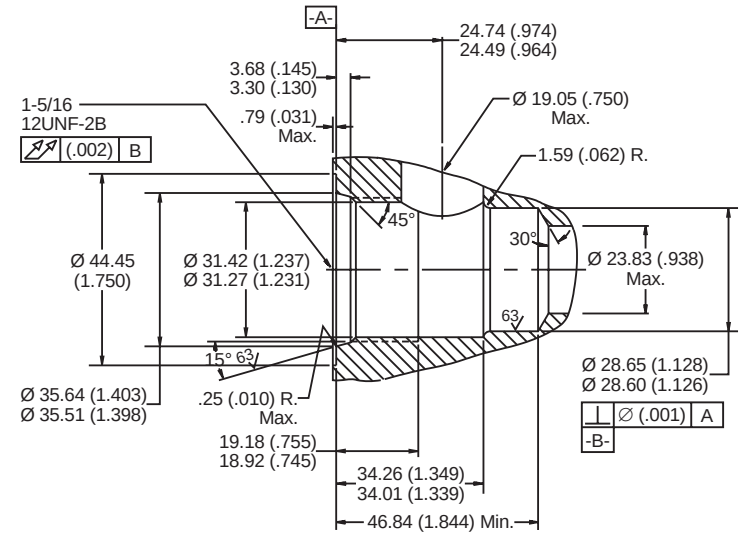
Performance Curve

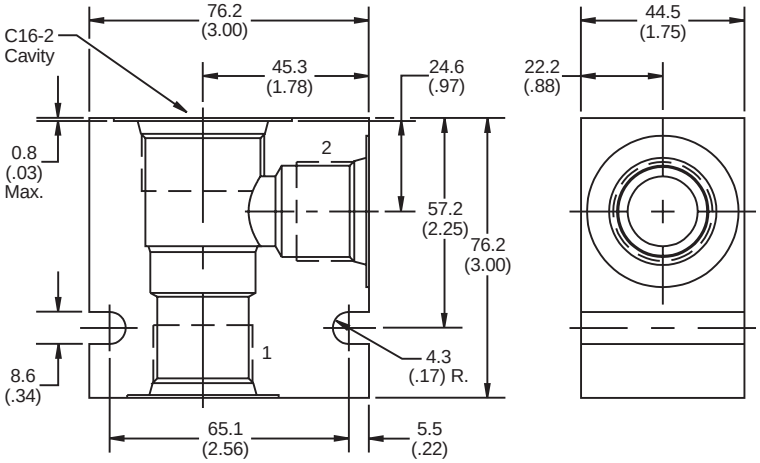
Pressure Drop vs. Flow



Dimensions

Millimeters (Inches)





Ordering Information

B16	—	2	—		
16 Size		2-Way Cavity		Body Material	Port Size

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size
12P	3/4″ NPTF
16P	1″ NPTF
8T	SAE - 8
12T	SAE - 12
16T	SAE - 16
12B†	3/4″ BSPG
16B	1″ BSPG

† Steel body only.

Form Tool: Rougher None
Finisher NFT16-2F

Weight: 1.5 kg (3.4 lbs.)

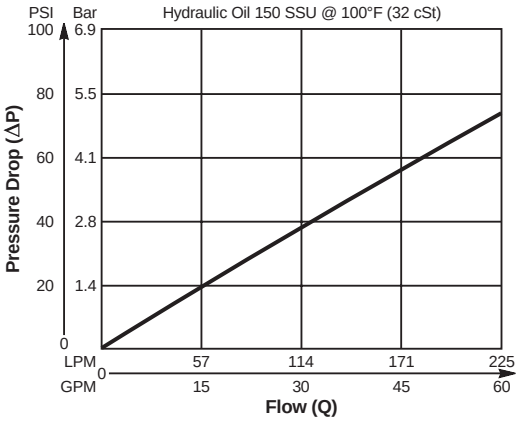
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE				
		Winner's Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner's Circle	X	X	X	X	X
	Parker	X	X	X		
	Waterman	X	X	X		
	FPS	X			X	X
	CEC	X			X	X

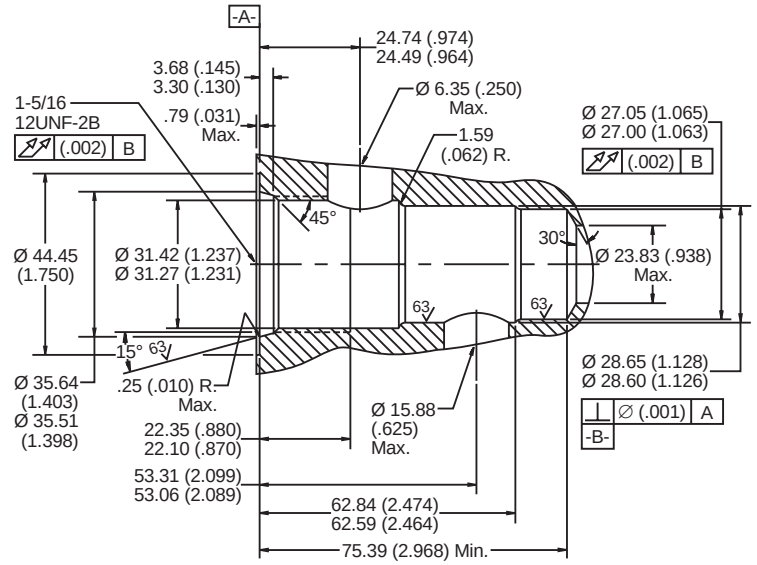
Performance Curve

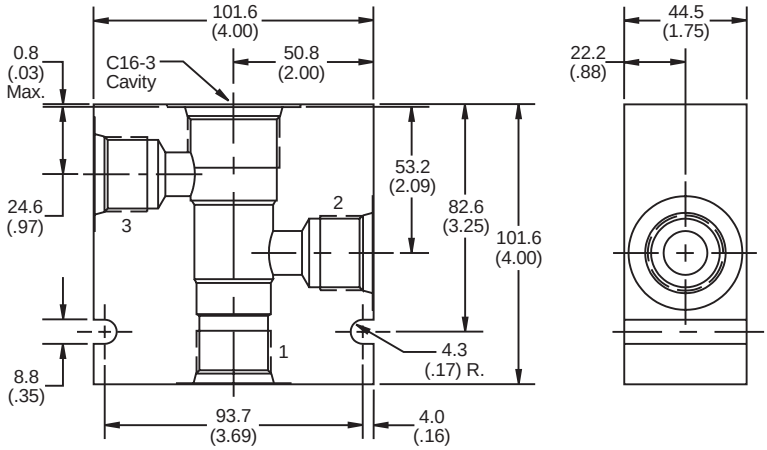
Pressure Drop vs. Flow



Dimensions

Millimeters (Inches)





Ordering Information

B16	—	3	—		
16 Size		3-Way Cavity		Body Material	Port Size

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size
12T	SAE - 12
16T	SAE - 16

Form Tool: Rougher NFT16-3R
Finisher NFT16-3F

Weight: 3.0 kg (6.5 lbs.)

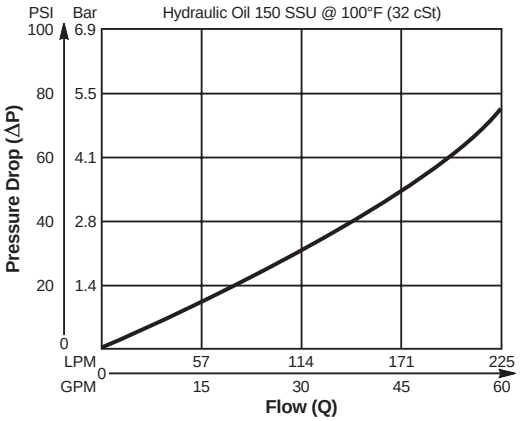
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE				
		Winner's Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner's Circle	X	X	X	X	X
	Parker	X	X	X	X	X
	Waterman	X	X	X	X	X
	FPS	X	X	X	X	X
	CEC	X	X	X	X	X

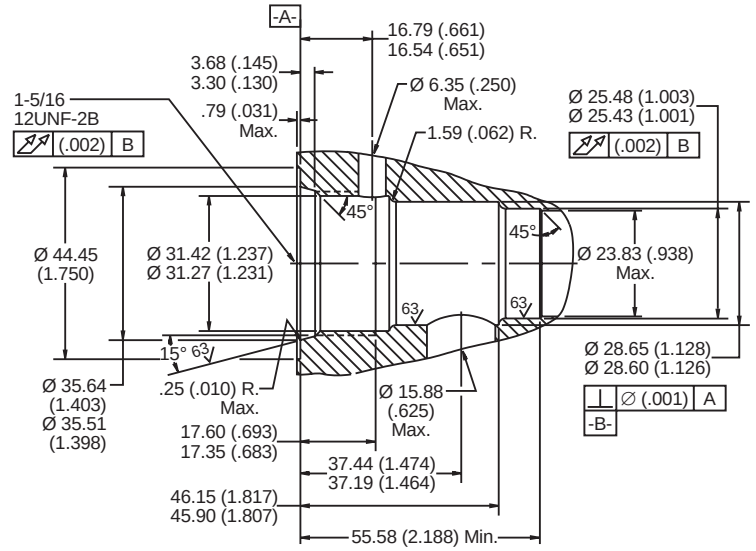
Performance Curve

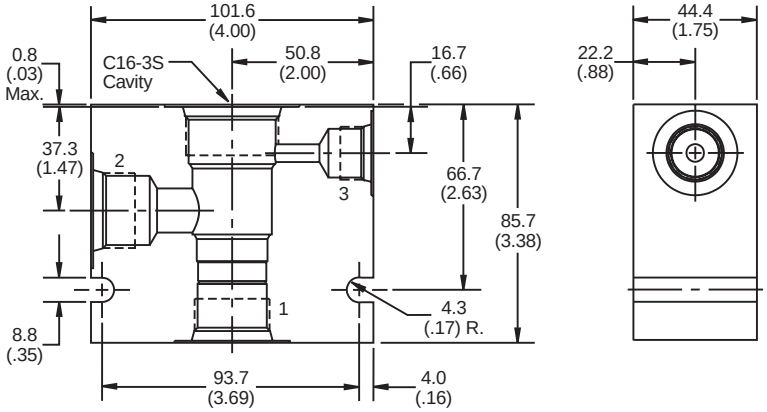
Pressure Drop vs. Flow



Dimensions

Millimeters (Inches)





Ordering Information

B16	—	3S	—		
16 Size		3-Way Short Cavity		Body Material	Port Size

Code	Body Material
Omit	Steel
A	Aluminum

Code	Port Size
16T	SAE - 16
16B	1″ BSPG

Form Tool: Rougher NFT16S-3R
Finisher NFT16S-3F
Weight: 2.4 kg (5.4 lbs.)

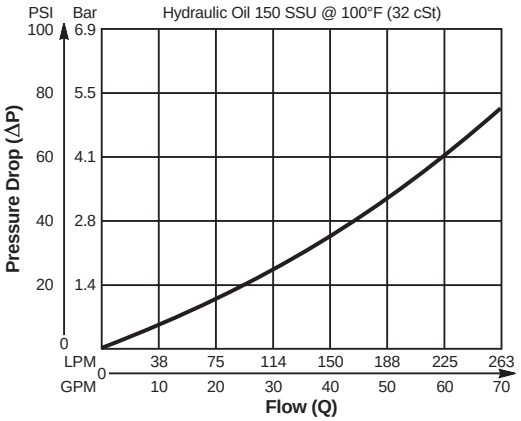
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

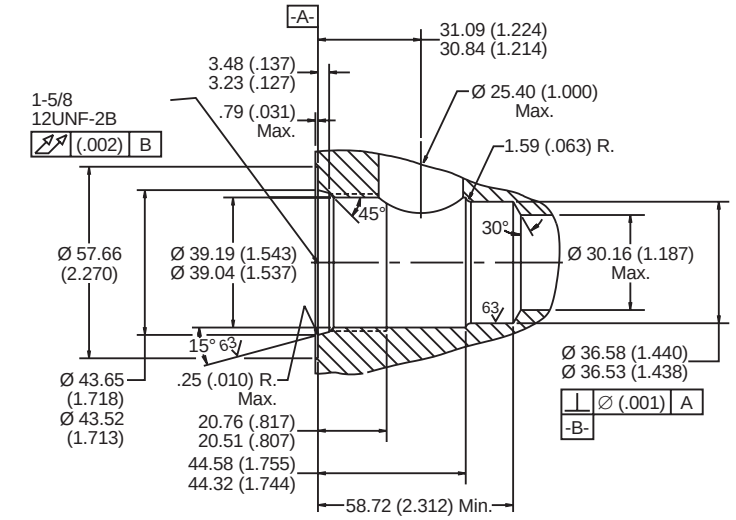
		VALVE				
		Winner's Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner's Circle	X	X	X	X	X
	Parker	X	X	X	X	X
	Waterman	X	X	X	X	X
	FPS	X	X	X	X	X
	CEC	X	X	X	X	X

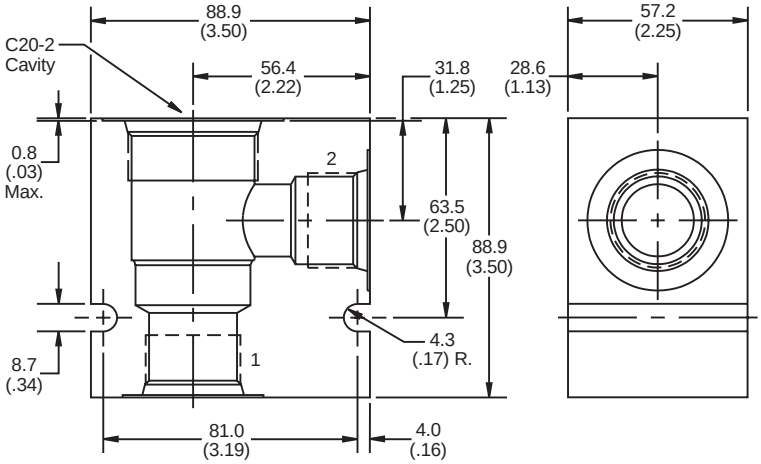
Performance Curve

Pressure Drop vs. Flow



Dimensions Millimeters (Inches)





Ordering Information

B20	—	2	—			
20 Size		2-Way Cavity		Body Material		Port Size

Code	Body Material
Omit	Steel

Code	Port Size
20T	SAE - 20
20B	1-1/4″ BSPG

Form Tool: Rougher None
Finisher NFT20-2F

Weight: 6.3 kg (14 lbs.)

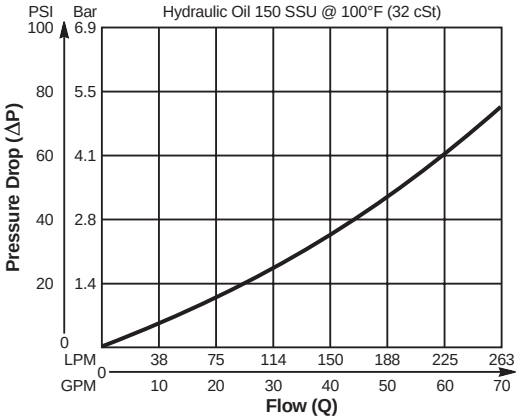
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

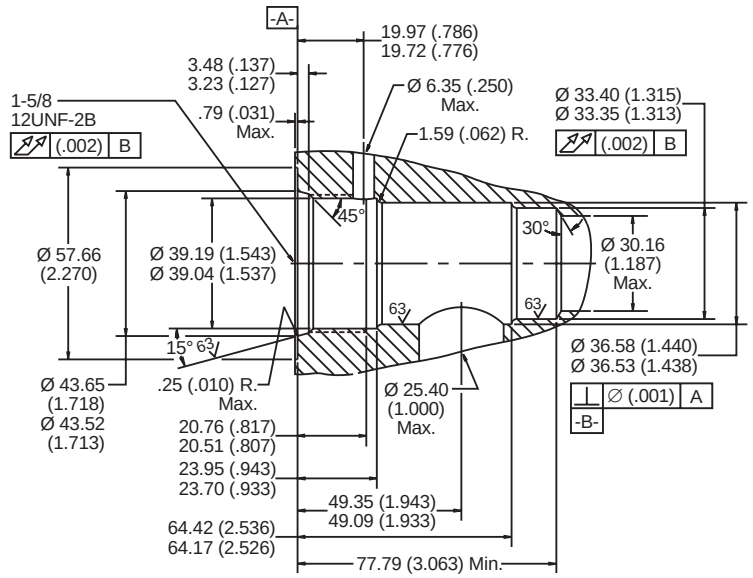
		VALVE				
		Winner's Circle	Parker	Waterman	FPS	CEC
CAVITY	Winner's Circle	X				X
	Parker					
	Waterman					
	FPS					
	CEC	X				X

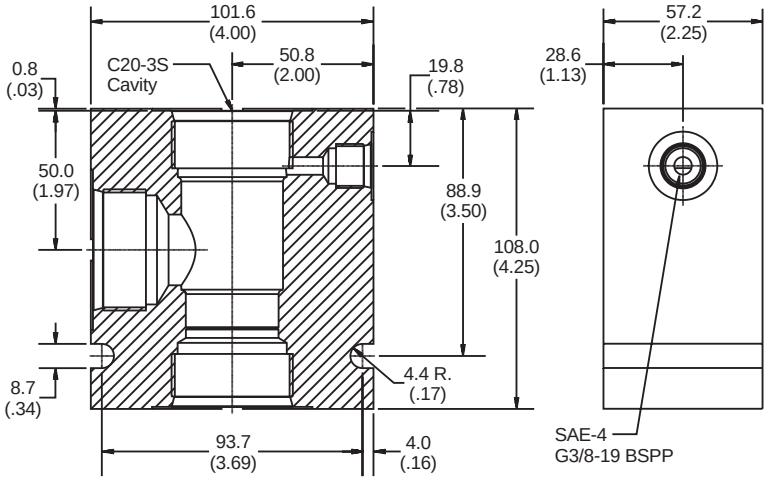
Performance Curve

Pressure Drop vs. Flow



Dimensions Millimeters (Inches)





Ordering Information

B20	—	3S	—		
20 Size		3-Way Short Cavity		Body Material	Port Size

Code	Body Material
Omit	Steel

Code	Port Size
20T	SAE - 20
20B	1-1/4″ BSPG

Form Tool: Rougher NFT20S-3R
Finisher NFT20S-3F

Weight: 10.8 kg (22.2 lbs.)

Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE	
		MHC-010	2-N-4*-10
CAVITY	MHC-010	X	X
	2-N-4*-10	X	X

Ordering Information

MHC	—	010	—		—	53
Counterbalance Cartridge Valve		Nominal Flow Rating		Body Type		Port Size

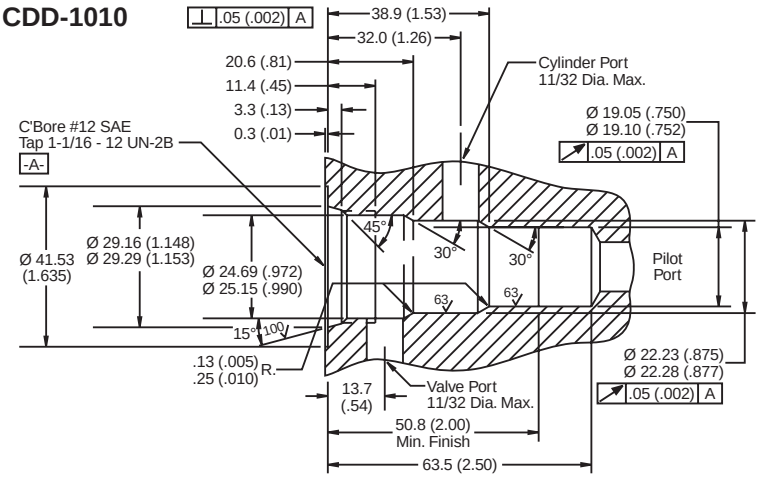
Code	Body Type
A	Single
D	Dual

Code	Port Size
53	SAE-10 through port

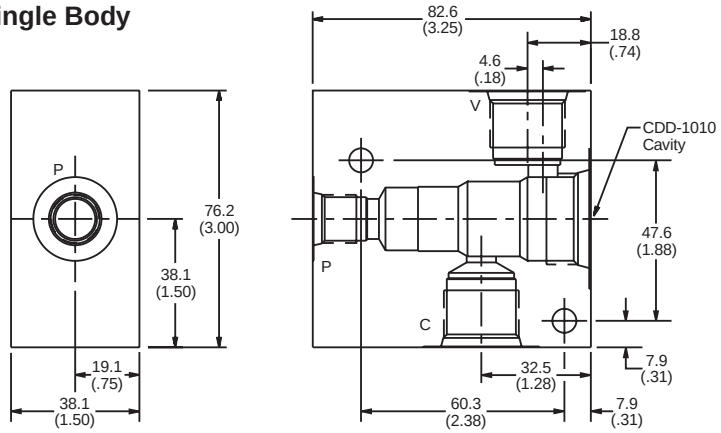
Form Tool: FR-500
Weight: Single 1.1 kg (2.25 lbs.)
Dual 1.9 kg (4.10 lbs.)

Dimensions Millimeters (Inches)

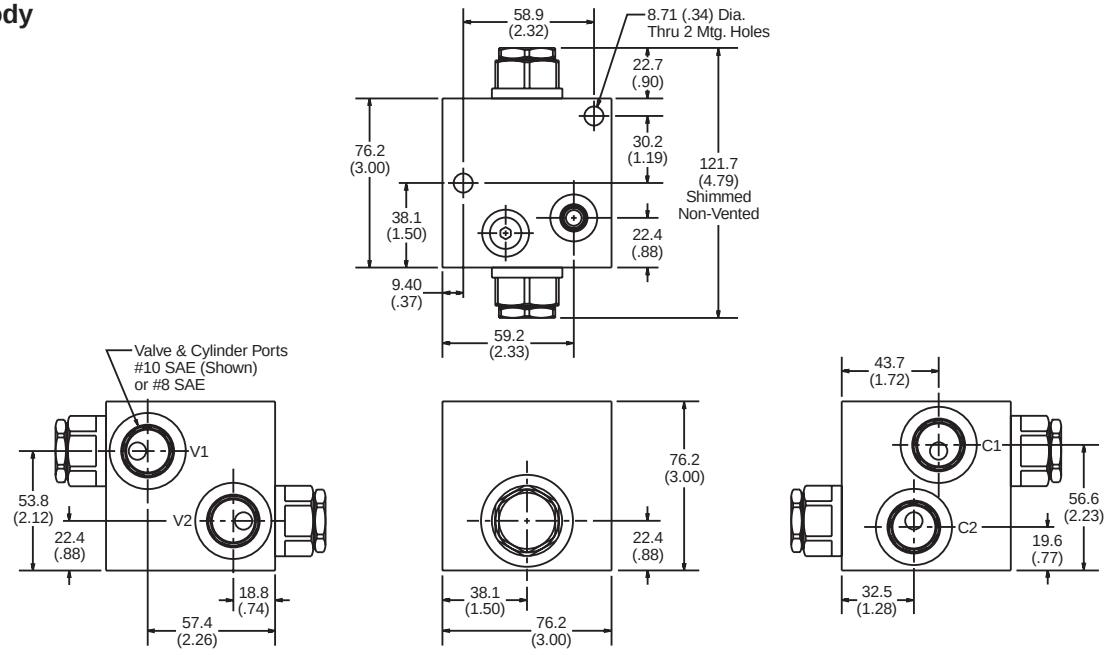
CDD-1010



Single Body



Dual Body



Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE	
		MHC-022	2-N-4*-25
CAVITY	MHC-022	X	X
	2-N-4*-25	X	X

Ordering Information

MHC	—	022	—		—	53
Counterbalance Cartridge Valve		Nominal Flow Rating		Body Type		Port Size

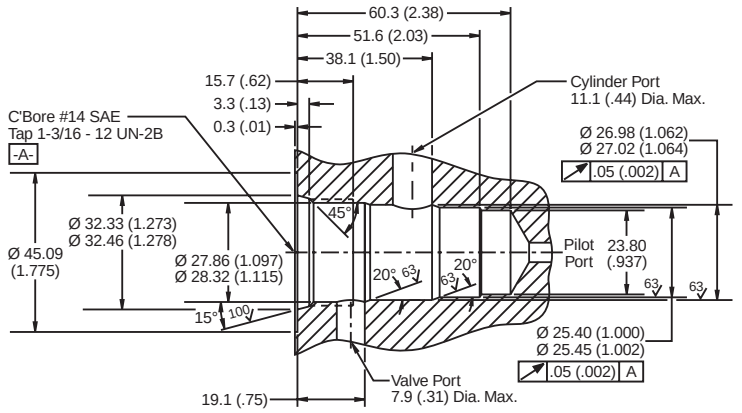
Code	Body Type
A	Single
D	Dual

Code	Port Size
53	SAE-10 through port

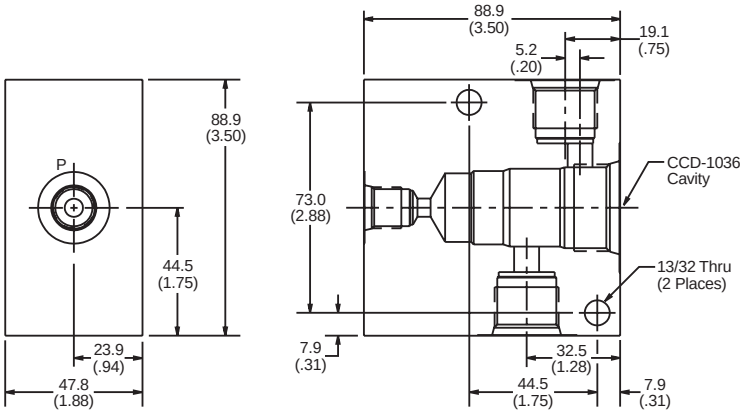
Form Tool: FR-501
Weight: Single 1.7 kg (3.75 lbs.)
Dual 2.7 kg (5.90 lbs.)

Dimensions Millimeters (Inches)

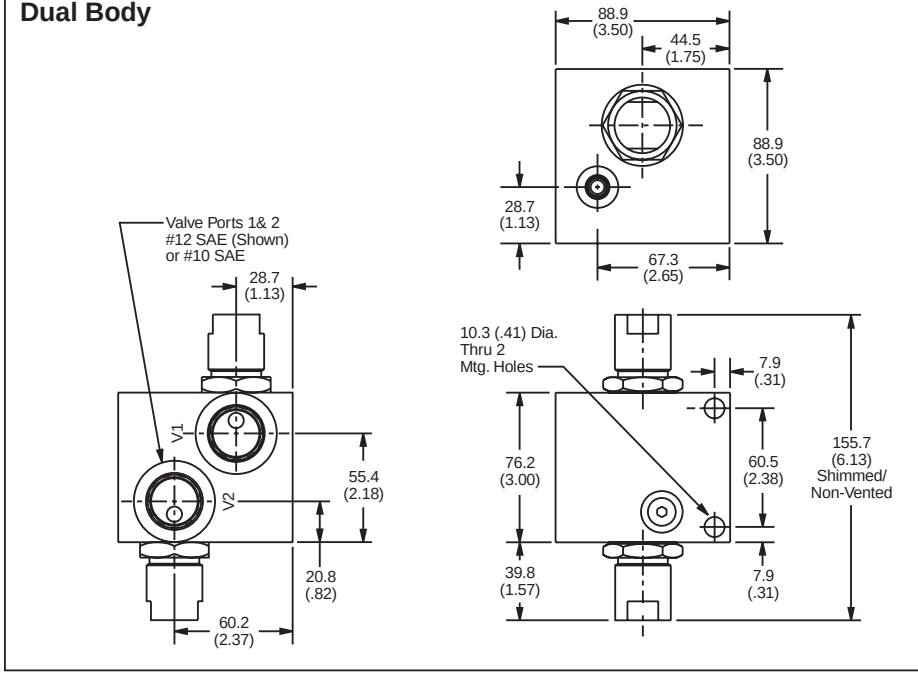
CDD-1036



Single Body



Dual Body



Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE	
		MHC-025	2-N-4*-50
CAVITY	MHC-025	X	X
	2-N-4*-50	X	X

Ordering Information

MHC	—	025	—		—	54
Counterbalance Cartridge Valve		Nominal Flow Rating		Body Type		Port Size

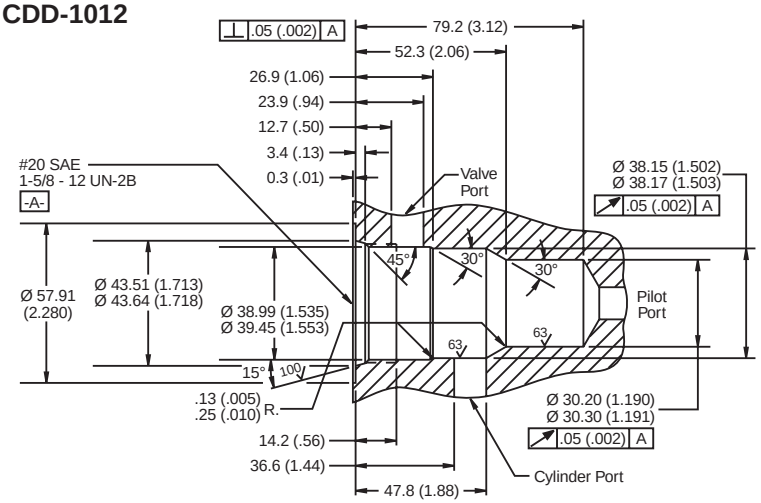
Code	Body Type
A	Single
D	Dual

Code	Port Size
54	SAE-12 through port

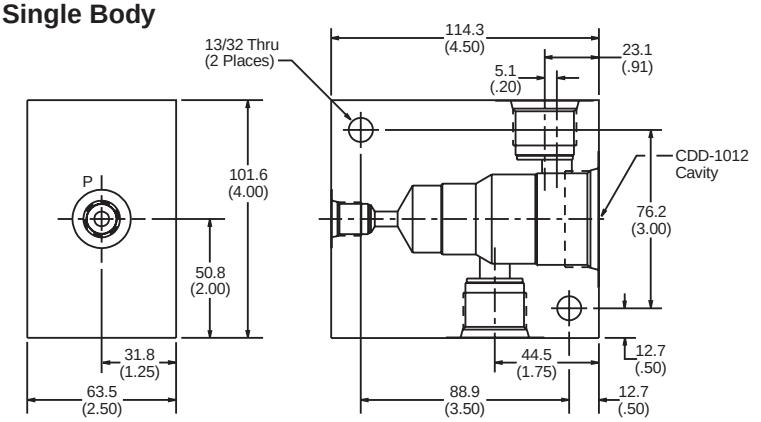
Form Tool: Drill FD-291
Reamer FR-105
Weight: Single 3.3 kg (7.25 lbs.)
Dual 5.4 kg (11.90 lbs.)

Dimensions Millimeters (Inches)

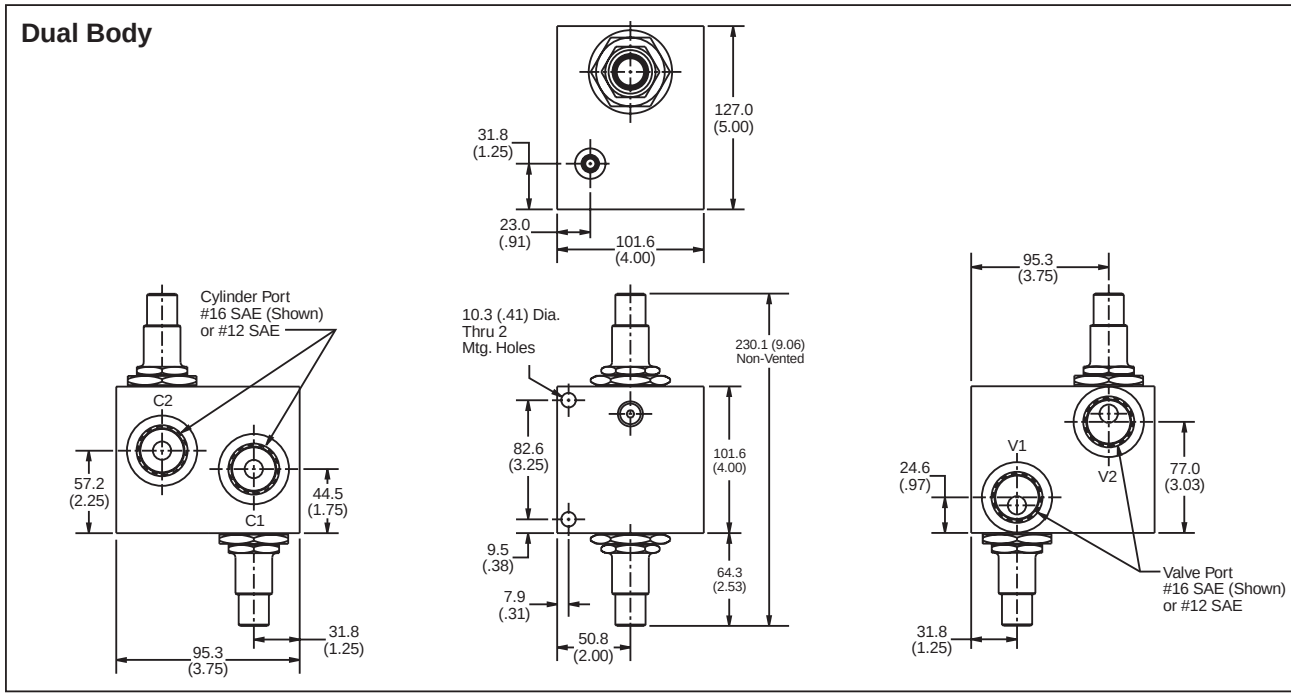
CDD-1012



Single Body



Dual Body



Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE	
		MHC-050	2-N-4*-100
CAVITY	MHC-050	X	X
	2-N-4*-100	X	X

Ordering Information

MHC	—	050	—		—	
Counterbalance Cartridge Valve		Nominal Flow Rating		Body Type		Port Size

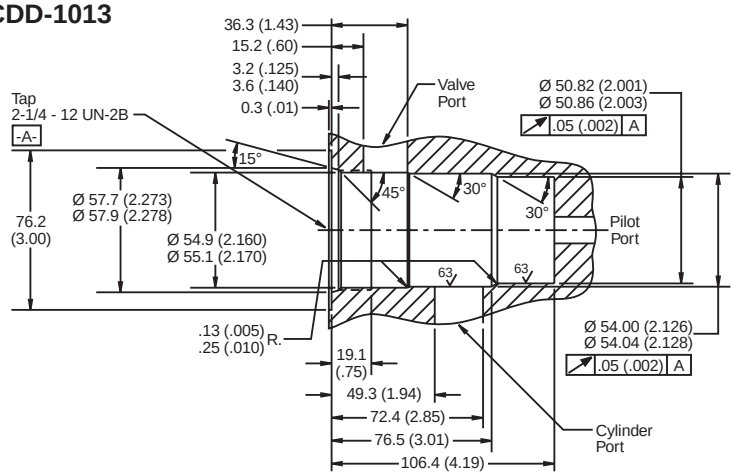
Code	Body Type
A	Single
D	Dual

Code	Port Size
54	SAE-12 through port
56	SAE-16 through port

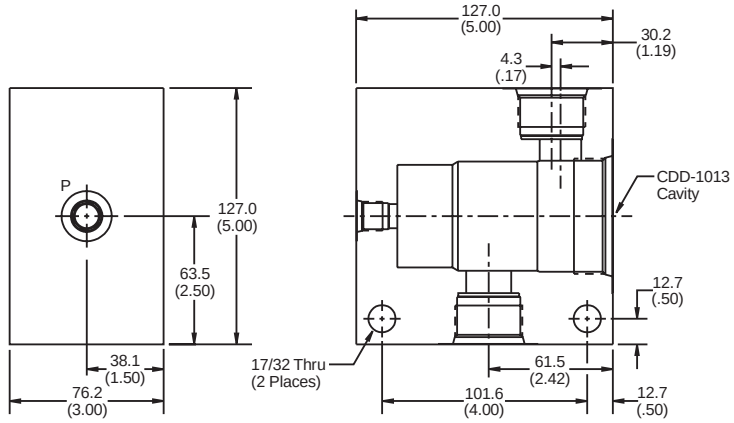
Form Tool: Drill FD-813
Reamer FR-231
Weight: Single 5.5 kg (12.00 lbs.)
Dual 10.8 kg (23.85 lbs.)

Dimensions Millimeters (Inches)

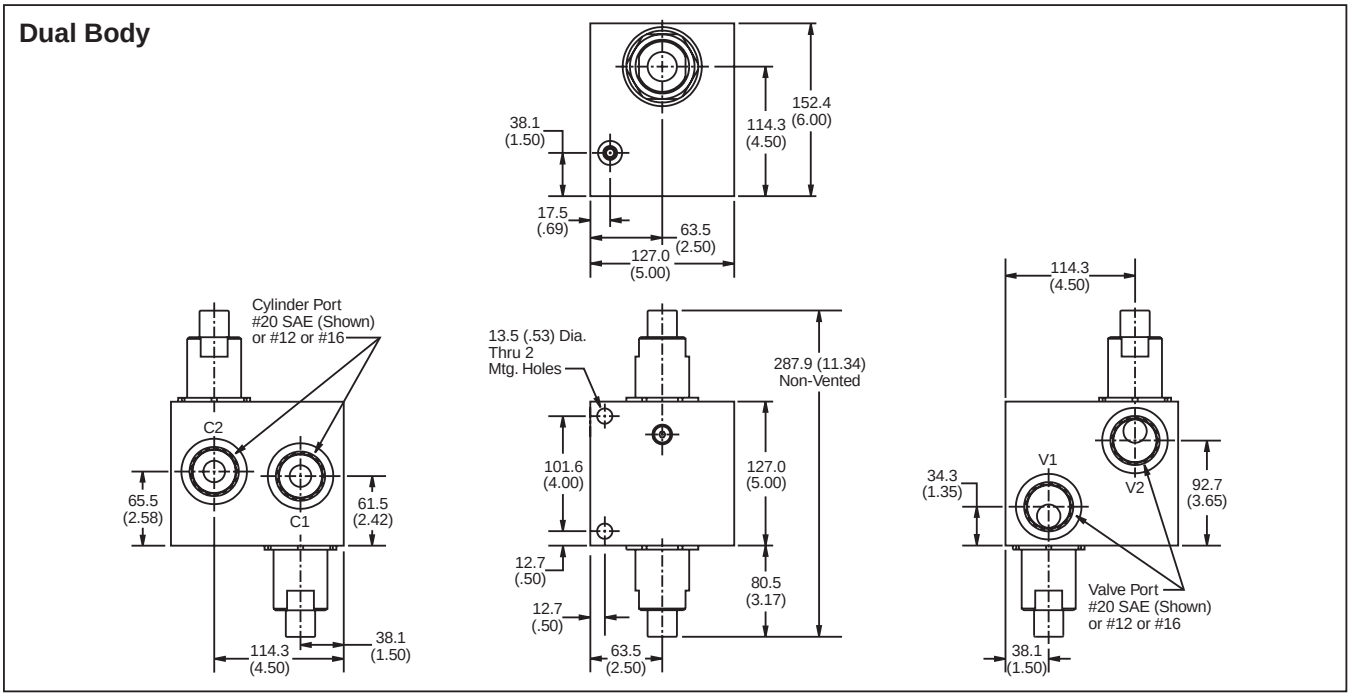
CDD-1013



Single Body



Dual Body



Dimensions Millimeters (Inches)

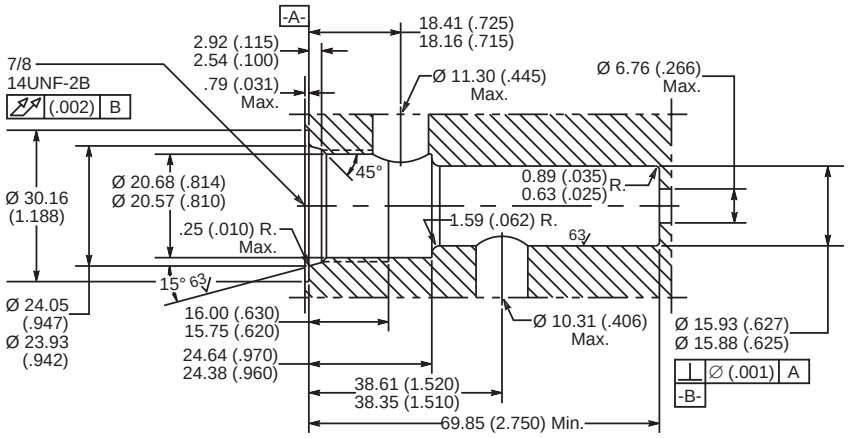
10 Size Cavity for Single Check and Pilot Piston

For Check Valve Use

CVH103P**

For Pilot Piston Use

717909	No Seal
717909N	Buna-N
707909V	Fluorocarbon



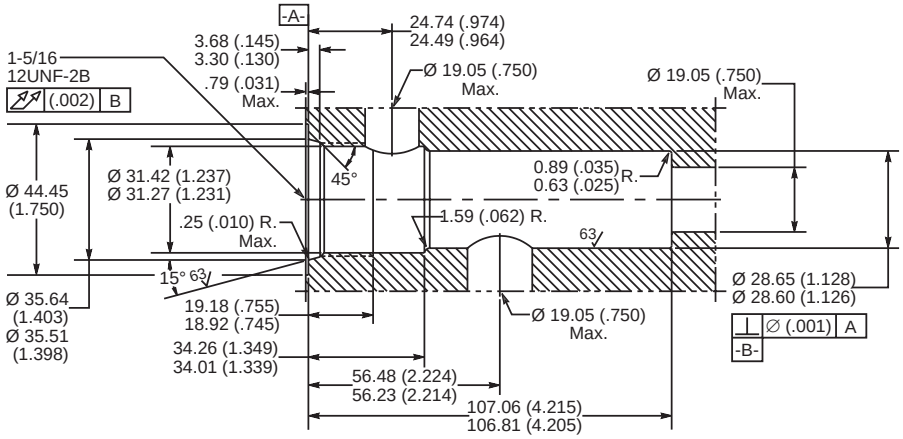
16 Size Cavity for Single Check and Pilot Piston

For Check Valve Use

CVH161P**

For Pilot Piston Use

717910	No Seal
717910N	Buna-N
717910V	Fluorocarbon



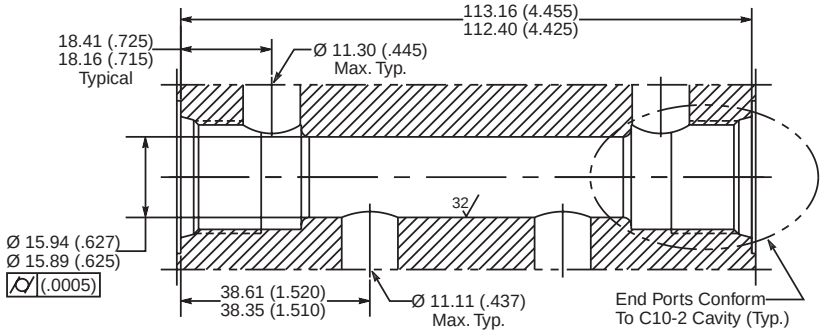
10 Size Cavity for Dual Check and Pilot Piston

For Check Valves Use 2

CVH103P**

For Pilot Piston Use

717917	No Seal
717917N	Buna-N
707917V	Fluorocarbon



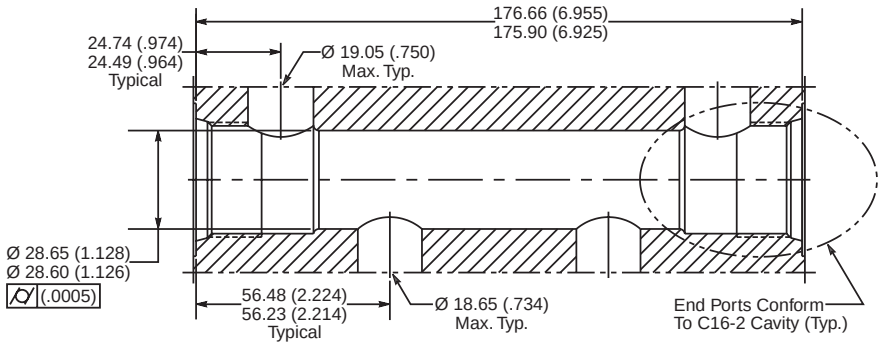
16 Size Cavity for Dual Check and Pilot Piston

For Check Valves Use 2

CVH161P**

For Pilot Piston Use

717918	No Seal
717918N	Buna-N
707918V	Fluorocarbon



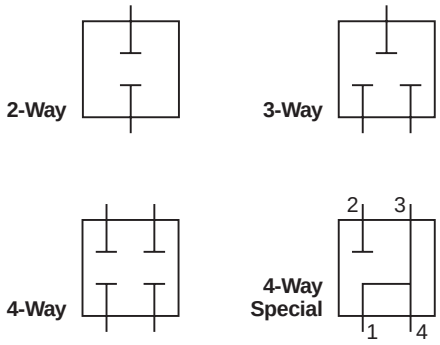
General Description

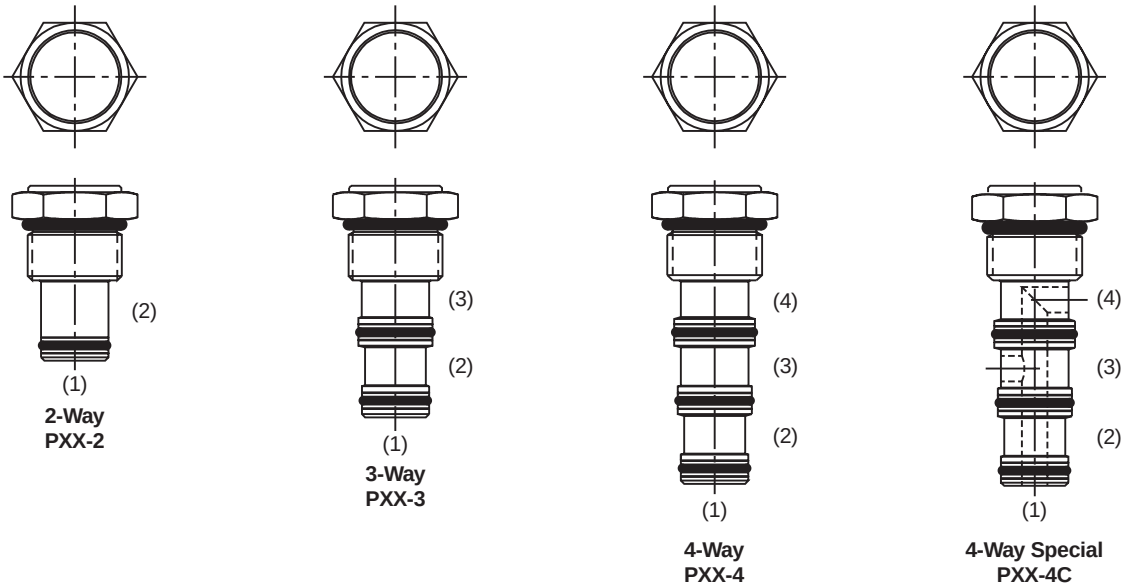
Parker cavity plugs can be used in any Integrated Hydraulic Circuit where one valve serves several machines and/or options. Two machines may have identical circuits except for one having a pressure reducing function, and the other not having this function. The machine that does not require this function can have the pressure reducing function replaced by a cavity plug; thereby utilizing a common body for both machines.

Specifications

Maximum Working Pressure - 240 Bar (3500 PSI)
Material - Steel

Symbols





Ordering Information

P	☐	—	☐	☐	☐
Plug	Cavity Plug Thread Size		Cavity Type	Type	Seals

Code	Cavity Plug Thread Size
08*	3/4 - 16
10	7/8 - 14
12	1-1/16 - 12
16	1-5/16 - 12

**** 08 Nose Diameter = 1/2"***
Consult Factory for Shaded Areas.

Code	Cavity Type
2	Two Way
3	Three Way
4	Four Way

	Type								
	Two Way		Three Way			Four Way			
Code	**1**	**2**	**1**	**2**	**3**	**1**	**2**	**3**	**4**
Omit	C	C	C	C	C	C	C	C	C
A			O	O	C	O	O	O	C
B			O	C	O	O	O	C	O
C			C	O	O	O	C	O	O
D						*O	*O	*C	*C

C = Blocked O = Open
**** Only Available In Sizes 08 and 10.***
Consult Factory for Shaded Areas.

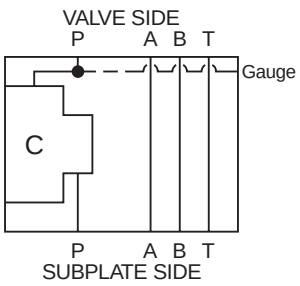
Code	Seals
Omit	Nitrile
V	Fluorocarbon

General Description

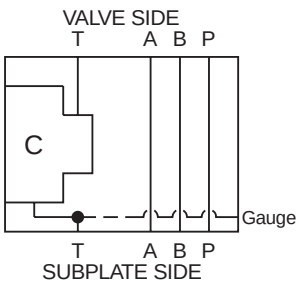
P Port Interrupt, 2-Way, D03 Cartpak Body.
For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



INVERTED



Ordering Information

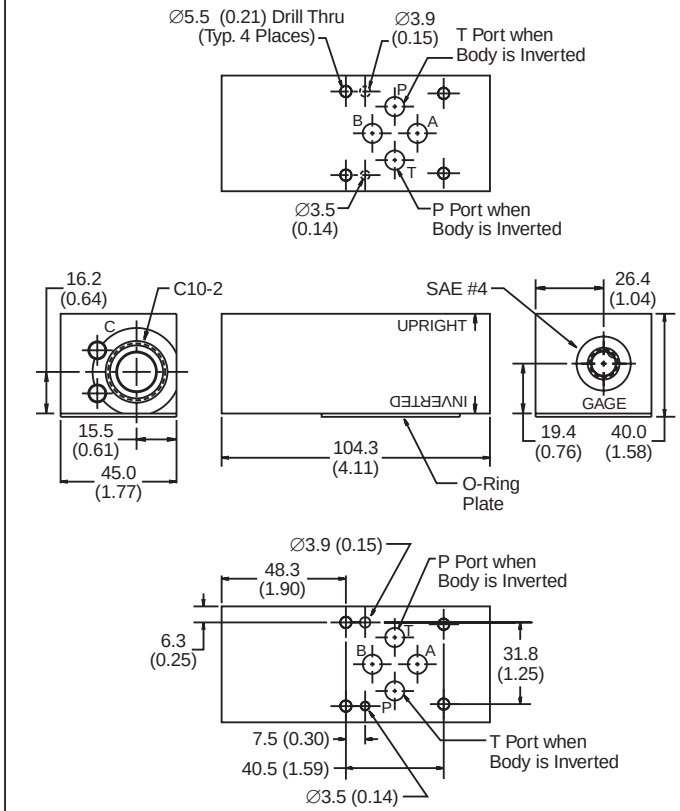
BD03	—	PN	—			
D03 Cartpak Body		P Port Interrupt 2-Way		Plug Seals		Body Material

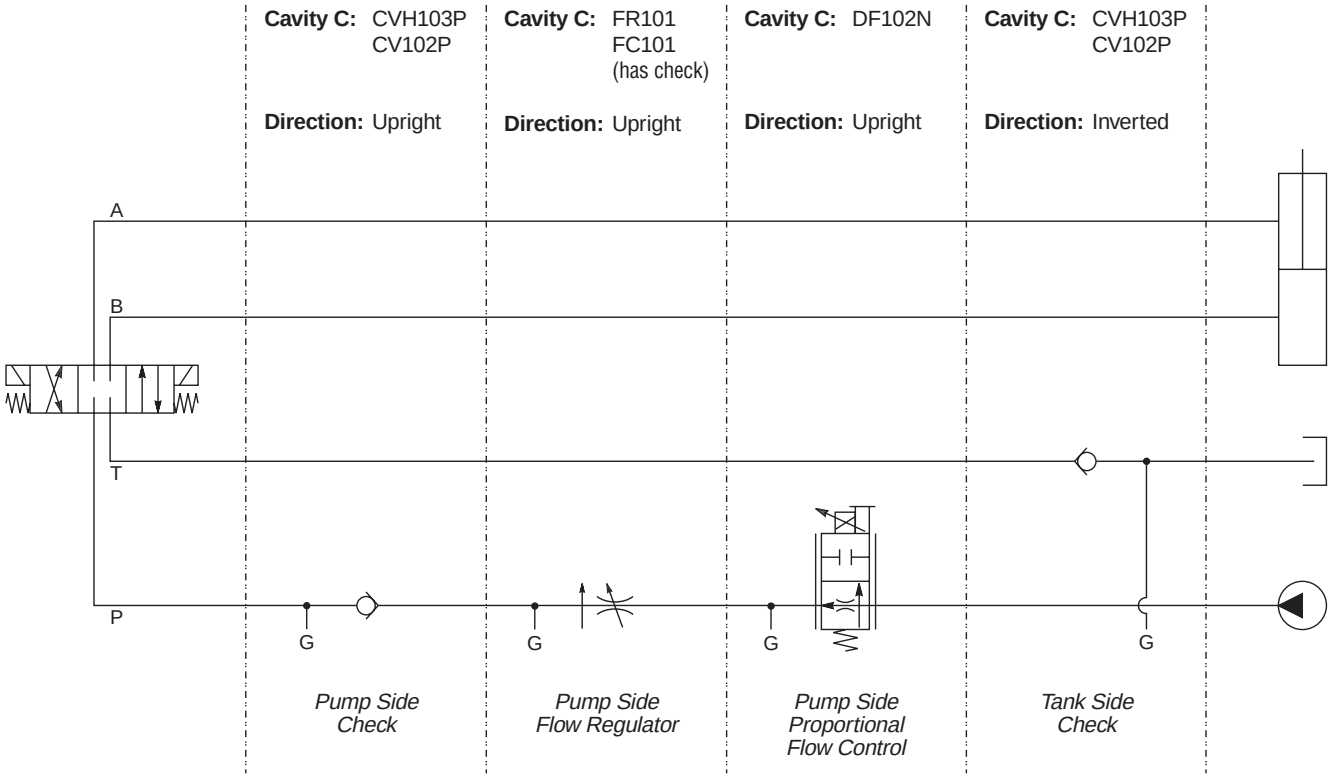
Code	Plug Seals
Omit	Nitrile
V	Fluorocarbon

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
- Gage Port Plug Installed
- O-Ring Plate, O-Rings and Drive Pin Kit

Dimensions Millimeters (Inches)



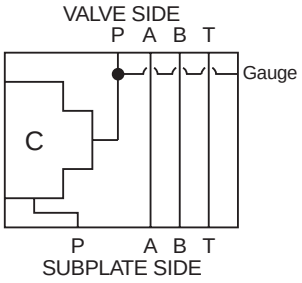


General Description

P Port Interrupt, 2-Way, D03 Cartpak Body.
For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



Ordering Information

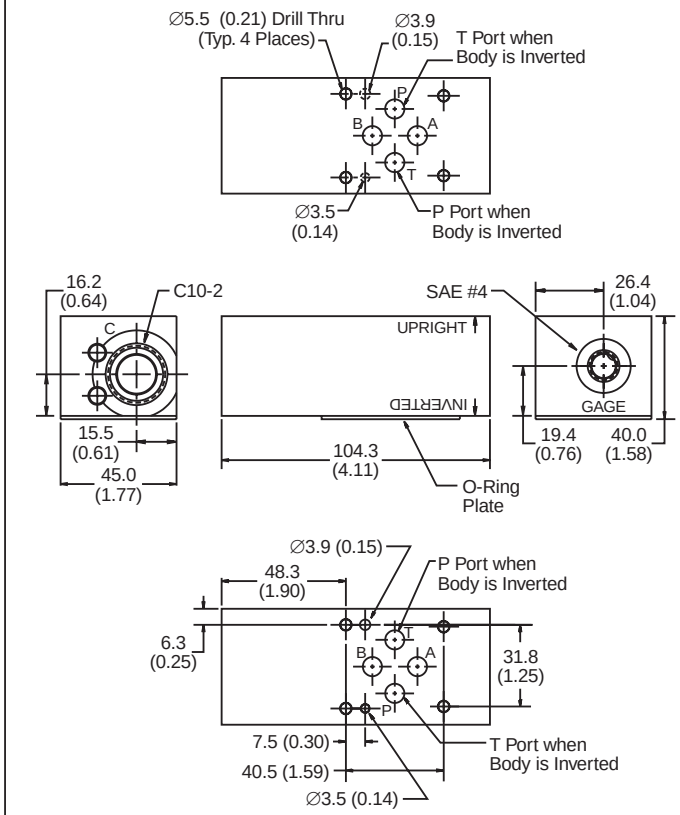
BD03	—	PN2	—		
D03 Cartpak Body		P Port Interrupt 2-Way		Plug Seals	Body Material

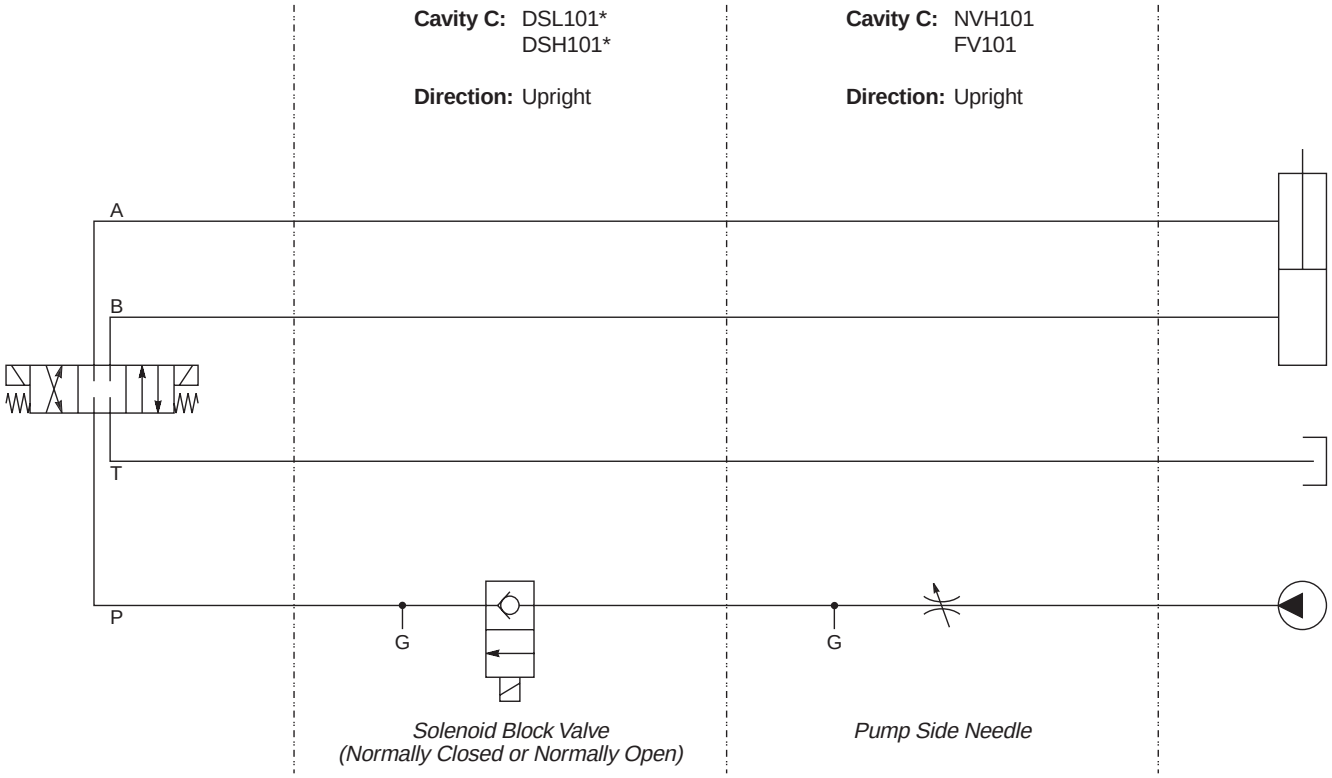
Code	Plug Seals
Omit	Nitrile
V	Fluorocarbon

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
- Gage Port Plug Installed
- O-Ring Plate, O-Rings and Drive Pin Kit

Dimensions Millimeters (Inches)



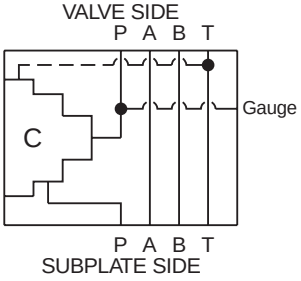


General Description

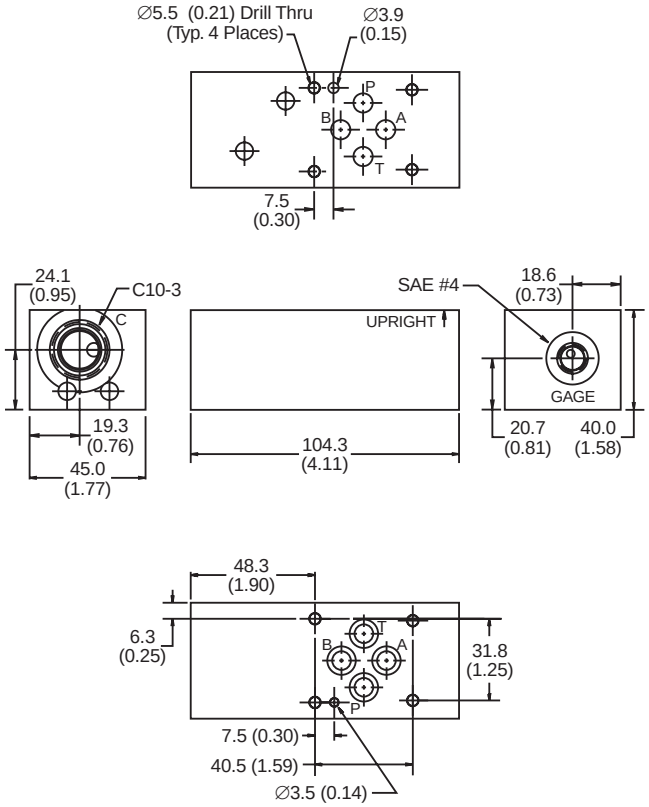
P Port Interrupt, Reducing Function, D03 Cartpak Body. For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



Dimensions Millimeters (Inches)



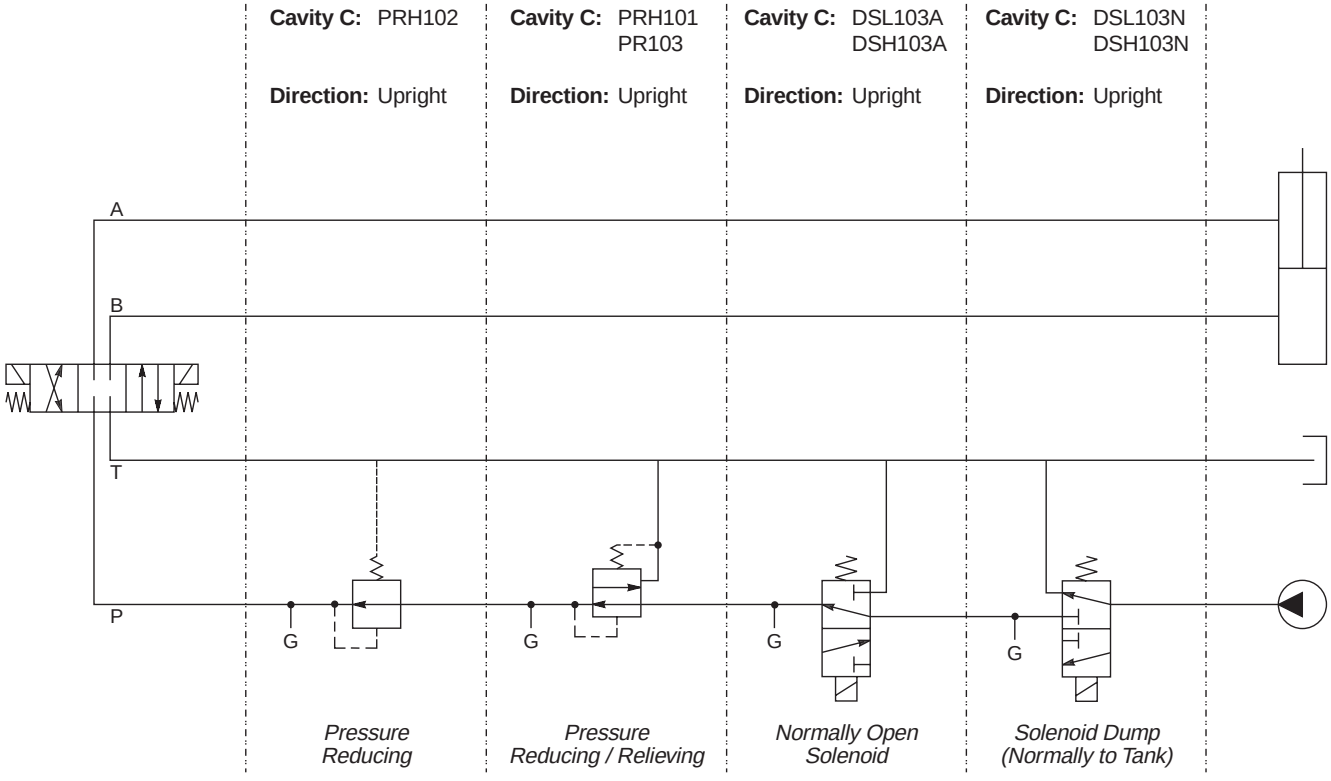
Ordering Information

BD03	—	PNR	—			
D03 Cartpak Body		P Port Interrupt Reducing		Plug Seals		Body Material

Code	Plug Seals
Omit	Nitrile
V	Fluorocarbon

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
- Gage Port Plug Installed
- O-Rings and Drive Pin

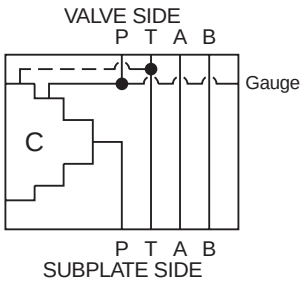


General Description

P Port Interrupt, Sequence Function, D03 Cartpak Body. For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



Ordering Information

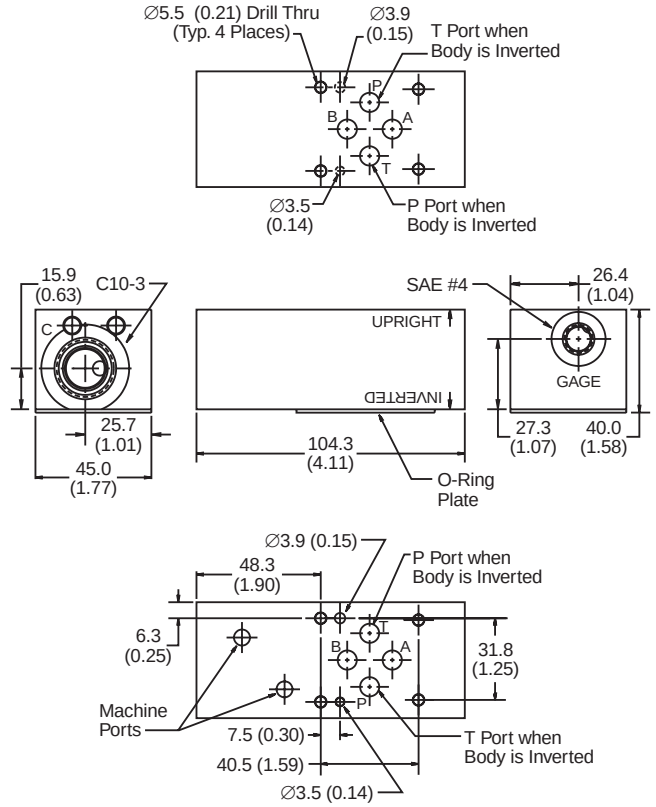
BD03	—	PNS	—			
D03 Cartpak Body		P Port Interrupt Sequence		Plug Seals		Body Material

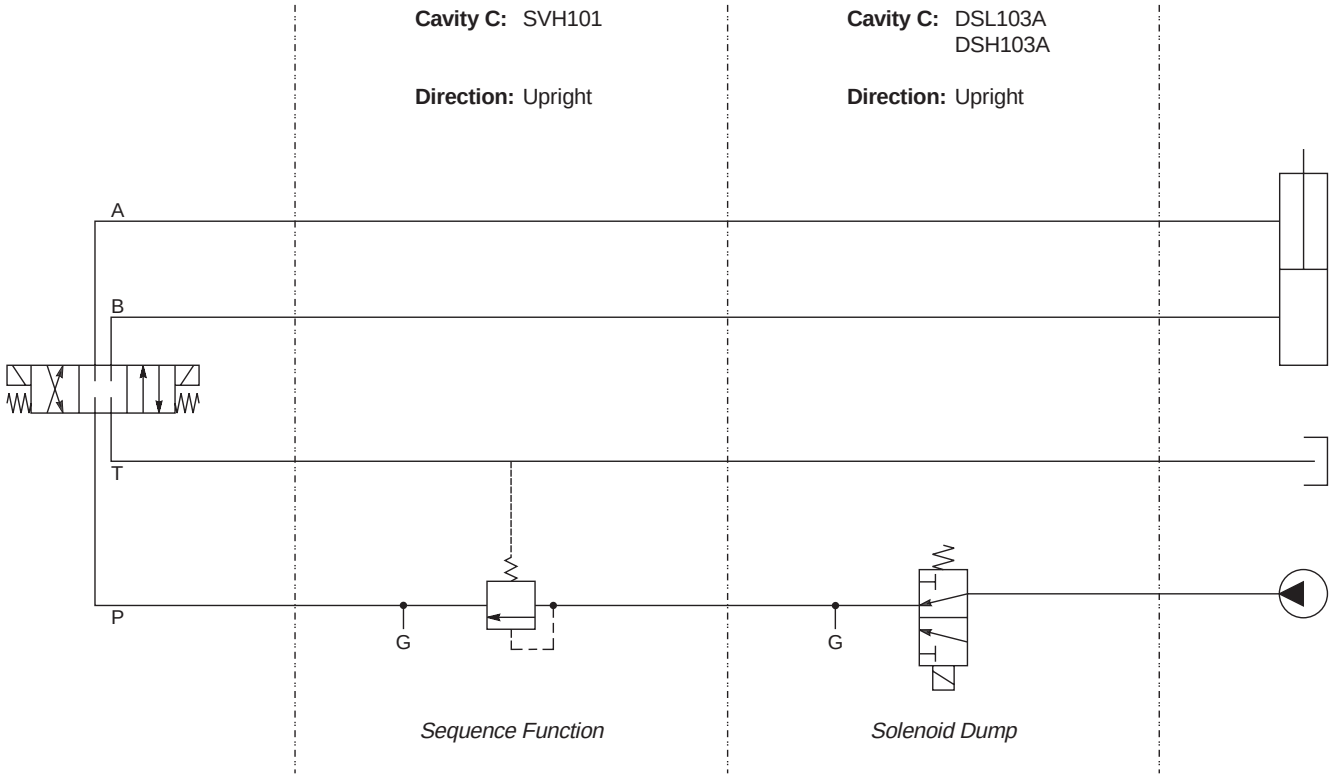
Code	Plug Seals
Omit	Nitrile
V	Fluorocarbon

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
- Gage Port Plug Installed
- O-Ring Plate, O-Rings and Drive Pin Kit

Dimensions Millimeters (Inches)

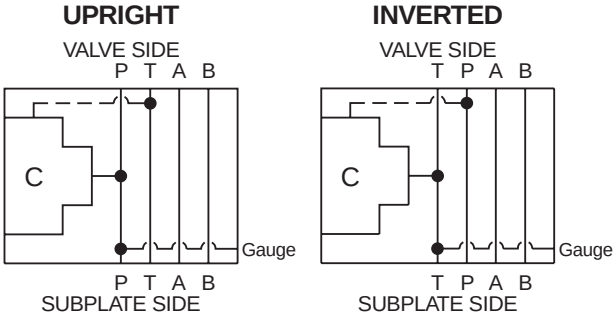




General Description

P to T D03 Cartpak Body.
For additional information see Technical Tips on pages BC1-BC6.

Body Schematic



Ordering Information

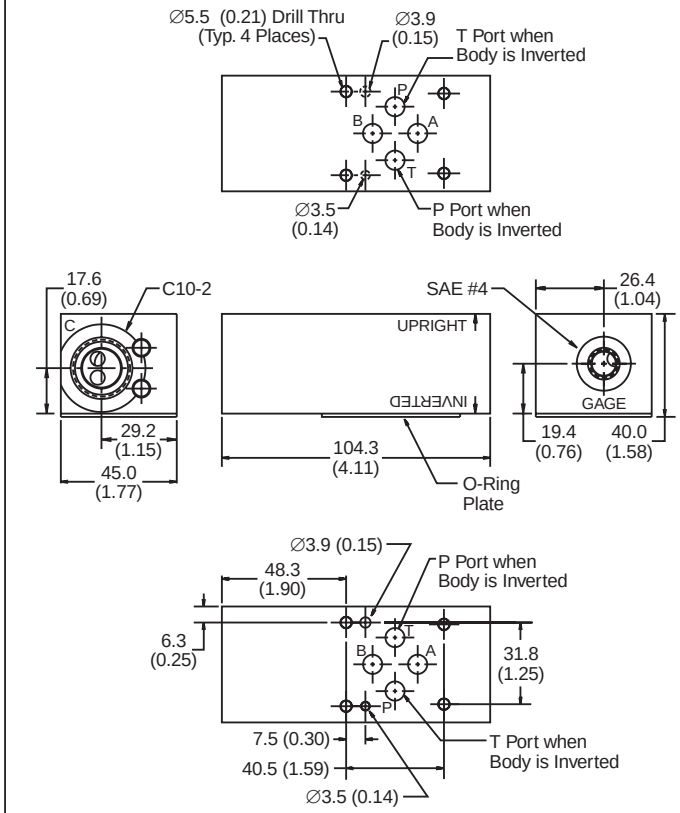
BD03	—	PT	—		
D03 Cartpak Body		P to T		Plug Seals	Body Material

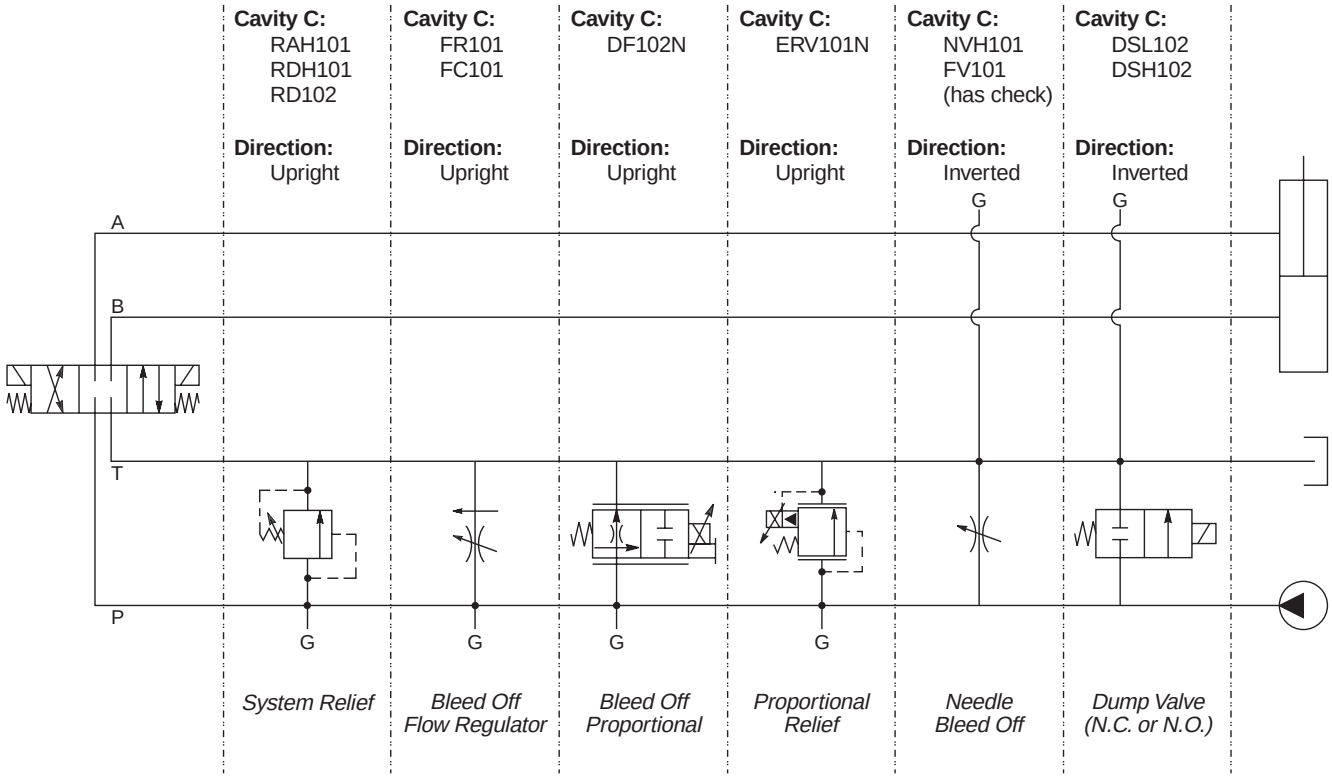
Code	Plug Seals
Omit	Nitrile
V	Fluorocarbon

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
- Gage Port Plug Installed
- O-Ring Plate, O-Rings and Drive Pin Kit

Dimensions Millimeters (Inches)



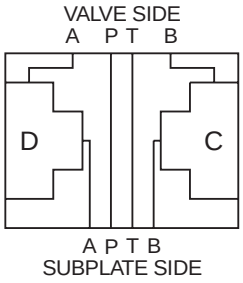


General Description

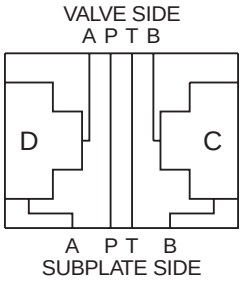
A and B Port Interrupt D03 Cartpak Body.
For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

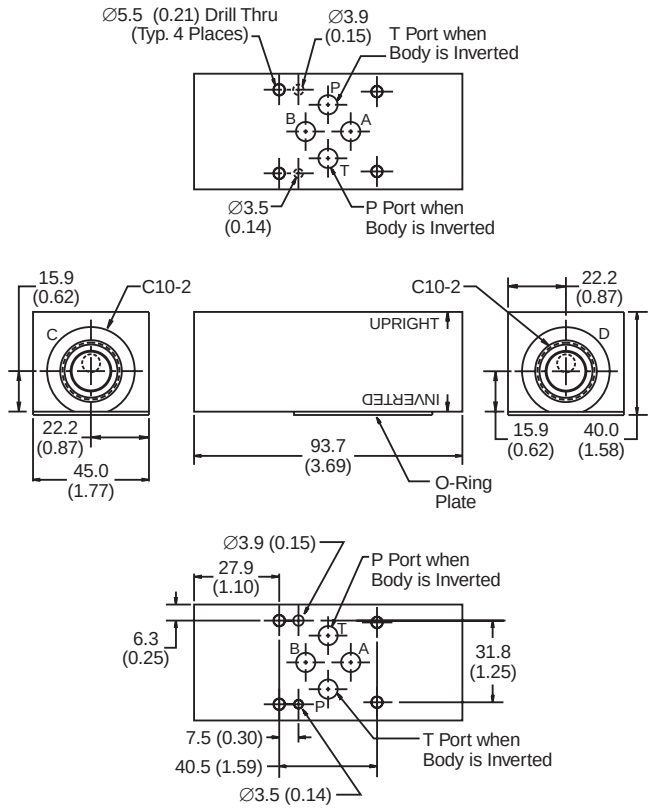
UPRIGHT



INVERTED



Dimensions Millimeters (Inches)



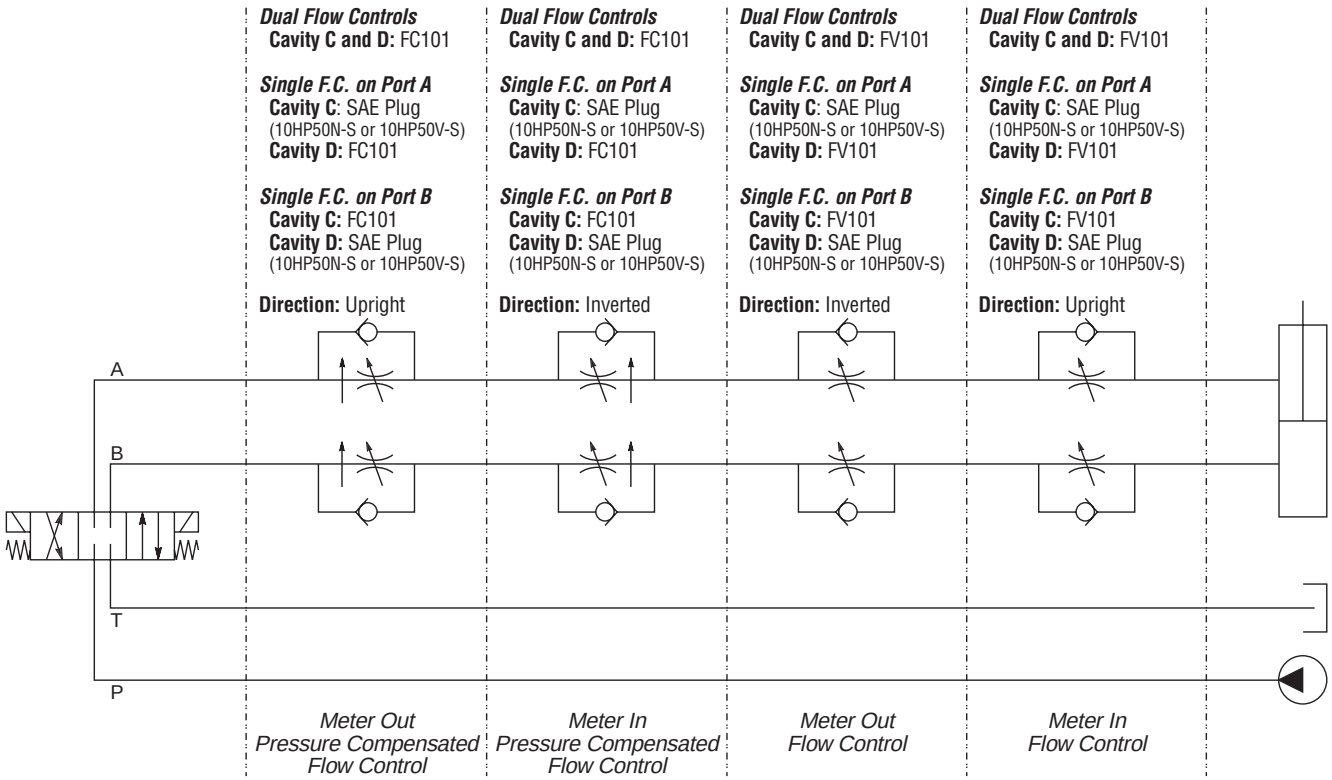
Ordering Information

BD03	—	ABN	—			
D03 Cartpak Body		A & B Port Interrupt		Plug Seals		Body Material

Code	Plug Seals
Omit	Nitrile
V	Fluorocarbon

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
- O-Ring Plate, O-Rings and Drive Pin Kit

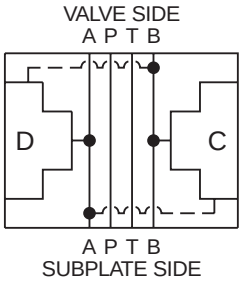


General Description

A and B Crossover D03 Cartpak Body.
For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



Ordering Information

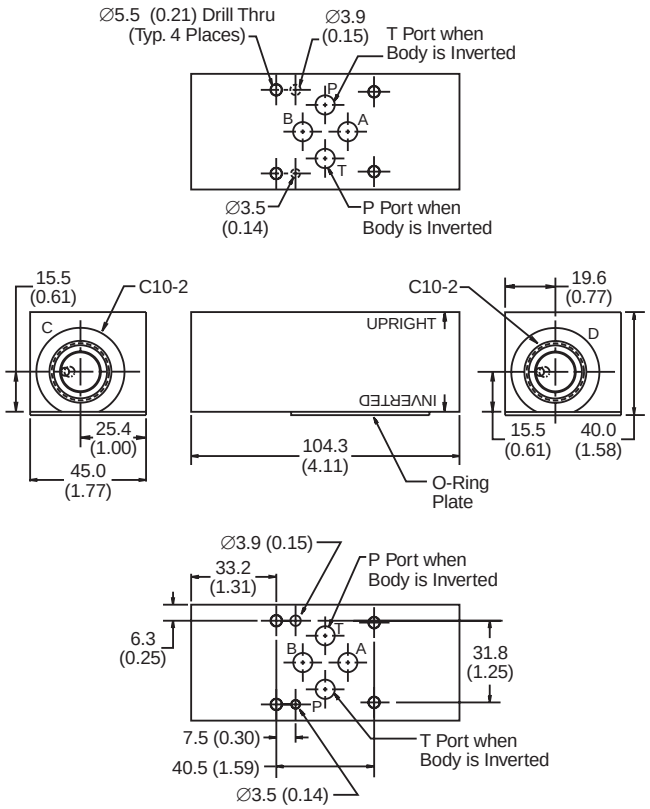
BD03	—	ABX	—			
D03 Cartpak Body		A & B Crossover		Plug Seals		Body Material

Code	Plug Seals
Omit	Nitrile
V	Fluorocarbon

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
- O-Ring Plate, O-Rings and Drive Pin Kit

Dimensions Millimeters (Inches)



Option 1
Cavity C: RAH101, RD102
Cavity D: RAH101, RD102

Option 2
Cavity C: RDH103
Cavity D: RDH103

Direction: Upright

Dual Crossover Relief

Option 1
Cavity C: P10-2
Cavity D: RDH103

Option 2
Cavity C: RAH101, RD102
Cavity D: P10-2

Direction: Upright

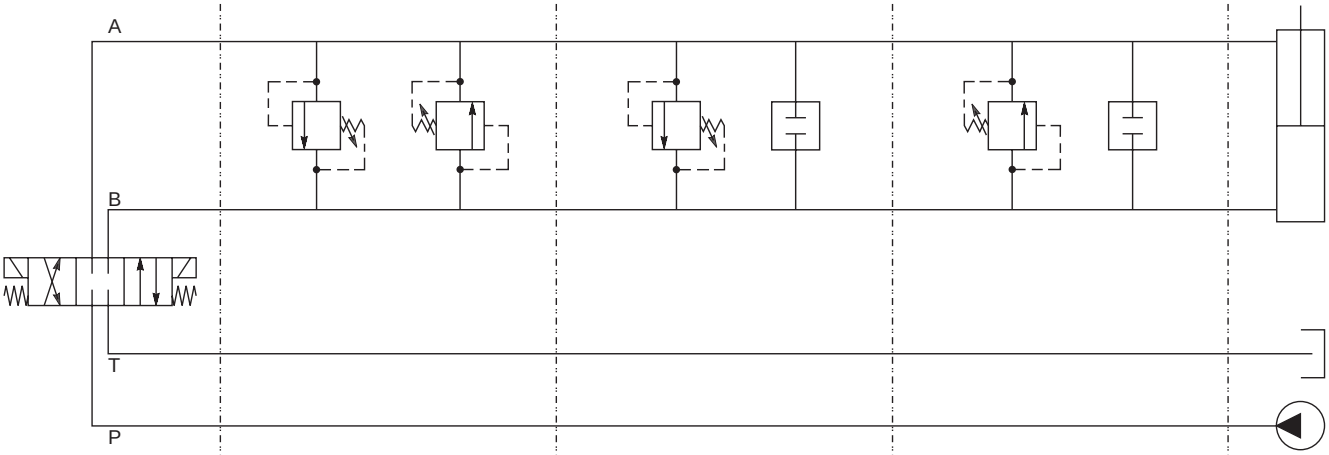
Relief In A Port

Option 1
Cavity C: RDH103
Cavity D: P10-2

Option 2
Cavity C: P10-2
Cavity D: RAH101, RD102

Direction: Upright

Relief In B Port

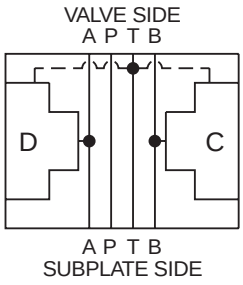


General Description

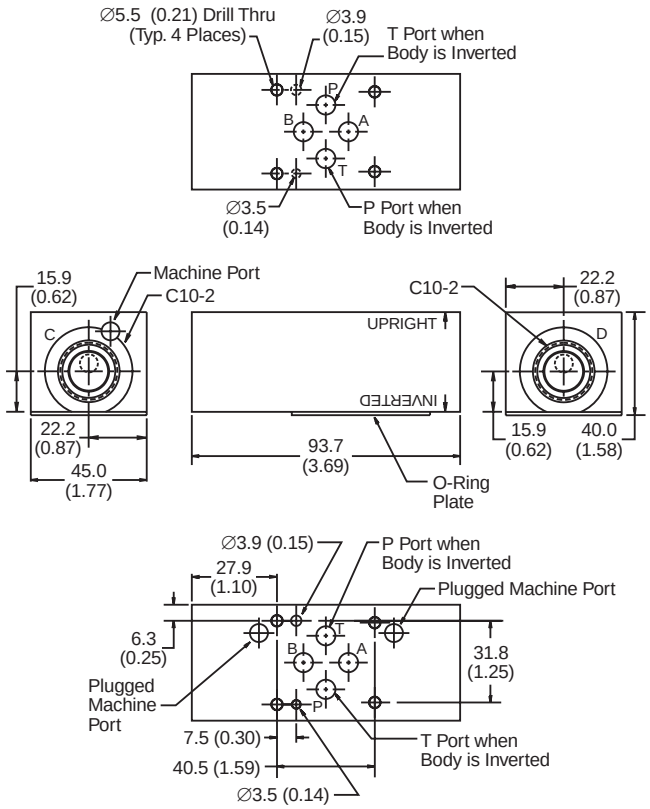
A and B Ports to Tank D03 Cartpak Body.
For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



Dimensions Millimeters (Inches)



Ordering Information

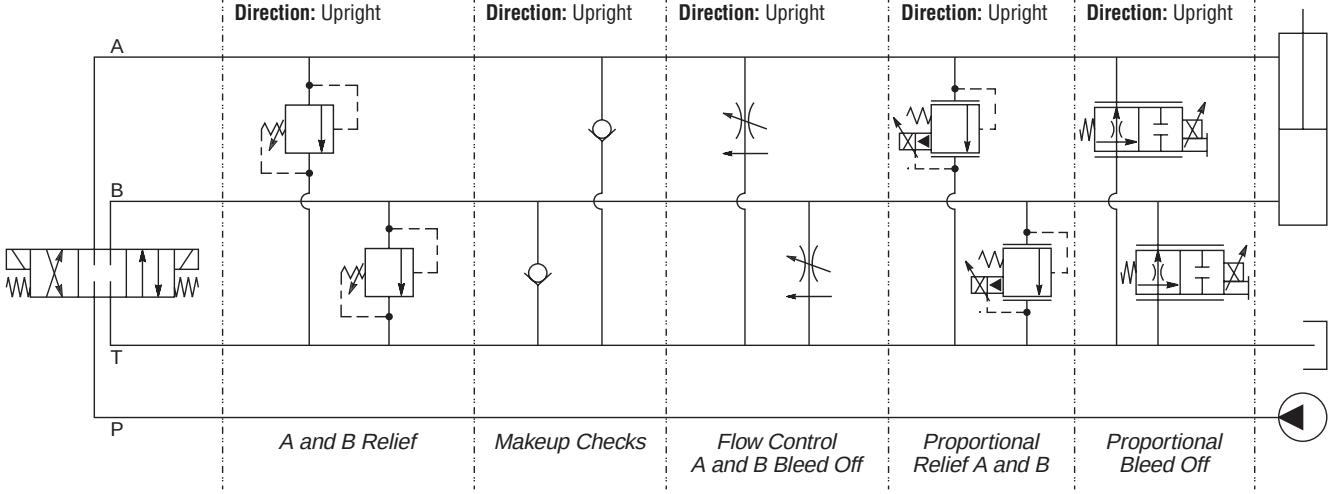
BD03	—	ABT	—			
D03 Cartpak Body		**A & B Ports to Tank**		**Plug Seals**		**Body Material**

Code	Plug Seals
Omit	Nitrile
V	Fluorocarbon

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
- O-Ring Plate, O-Rings and Drive Pin Kit

Dual Relief	*Dual Makeup Checks*	*Dual Bleed Off*	*Dual Relief*	*Dual Bleed Off*
Cavity C and D: RAH101, RD102	**Cavity C and D:** CVH104P	**Cavity C and D:** FR101, FC101	**Cavity C and D:** ERV101N	**Cavity C and D:** DF102N
Relief on Port A **Cavity C:** P10-2 **Cavity D:** RAH101, RD102	***Check on Port A*** **Cavity C:** P10-2 **Cavity D:** CVH104P	***Bleed Off on Port A*** **Cavity C:** P10-2 **Cavity D:** FR101, FC101	***Relief on Port A*** **Cavity C:** P10-2 **Cavity D:** ERV101N	***Bleed Off on Port A*** **Cavity C:** P10-2 **Cavity D:** DF102N
Relief on Port B **Cavity C:** RAH101, RD102 **Cavity D:** P10-2	***Check on Port B*** **Cavity C:** CVH104P **Cavity D:** P10-2	***Bleed Off on Port B*** **Cavity C:** FR101, FC101 **Cavity D:** P10-2	***Relief on Port B*** **Cavity C:** ERV101N **Cavity D:** P10-2	***Bleed Off on Port B*** **Cavity C:** DF102N **Cavity D:** P10-2
Direction: Upright	**Direction:** Upright	**Direction:** Upright	**Direction:** Upright	**Direction:** Upright



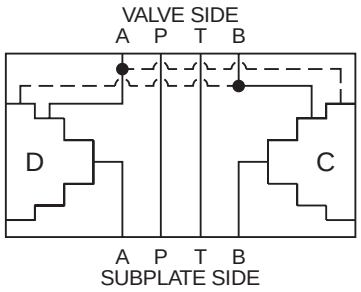
A and B Relief | *Makeup Checks* | *Flow Control A and B Bleed Off* | *Proportional Relief A and B* | *Proportional Bleed Off*

General Description

Dual (Ports A and B) Drain to Crossover Port D03 Cartpak Body. For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



Ordering Information

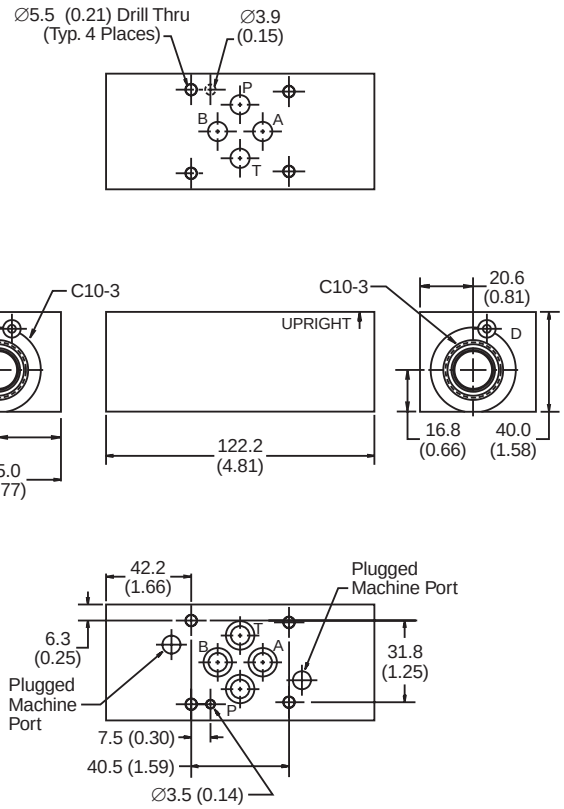
BD03	—	DDX	—			
D03 Cartpak Body		**Dual (Ports A & B) Drain to Crossover**		**Plug Seals**		**Body Material**

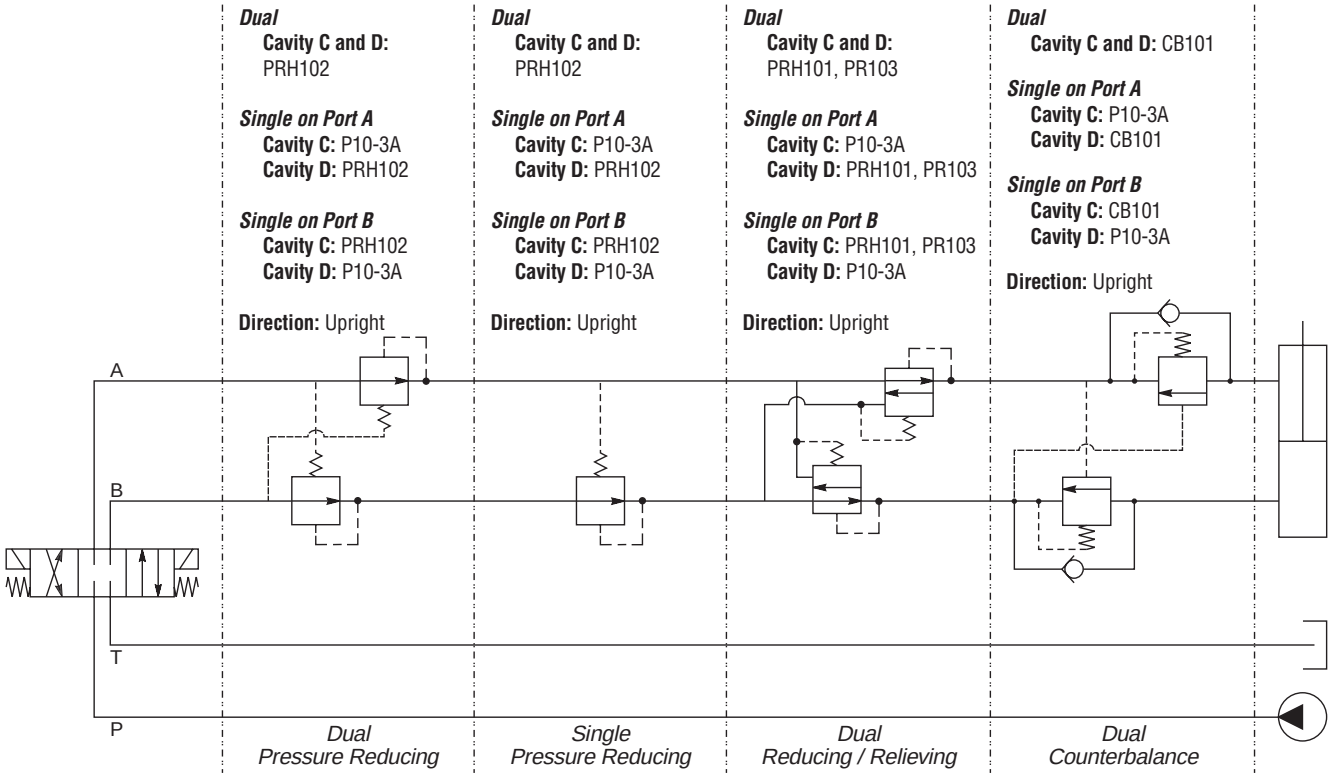
Code	Plug Seals
Omit	Nitrile
V	Fluorocarbon

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
- O-Rings and Drive Pin

Dimensions Millimeters (Inches)





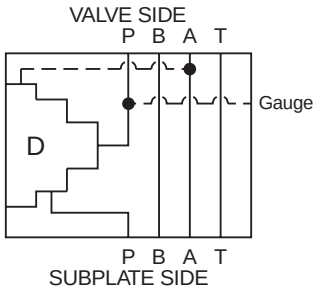
Dual Pressure Reducing	*Single* Pressure Reducing	*Dual* Reducing / Relieving	*Dual* Counterbalance
Dual **Cavity C and D:** PRH102	***Dual*** **Cavity C and D:** PRH102	***Dual*** **Cavity C and D:** PRH101, PR103	***Dual*** **Cavity C and D:** CB101
Single on Port A **Cavity C:** P10-3A **Cavity D:** PRH102	***Single on Port A*** **Cavity C:** P10-3A **Cavity D:** PRH102	***Single on Port A*** **Cavity C:** P10-3A **Cavity D:** PRH101, PR103	***Single on Port A*** **Cavity C:** P10-3A **Cavity D:** CB101
Single on Port B **Cavity C:** PRH102 **Cavity D:** P10-3A	***Single on Port B*** **Cavity C:** PRH102 **Cavity D:** P10-3A	***Single on Port B*** **Cavity C:** PRH101, PR103 **Cavity D:** P10-3A	***Single on Port B*** **Cavity C:** CB101 **Cavity D:** P10-3A
Direction: Upright	**Direction:** Upright	**Direction:** Upright	**Direction:** Upright

General Description

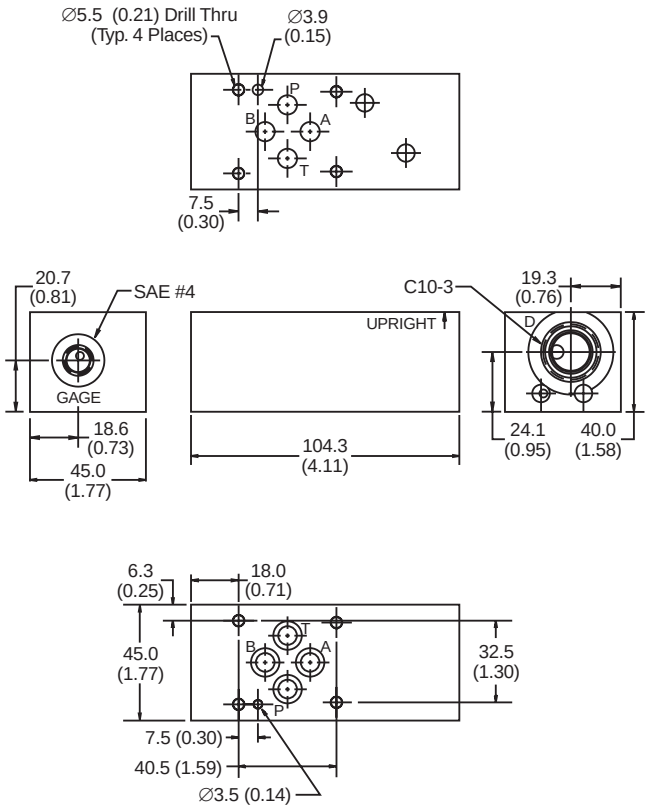
B Port Drain to A D03 Cartpak Body.
For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



Dimensions Millimeters (Inches)



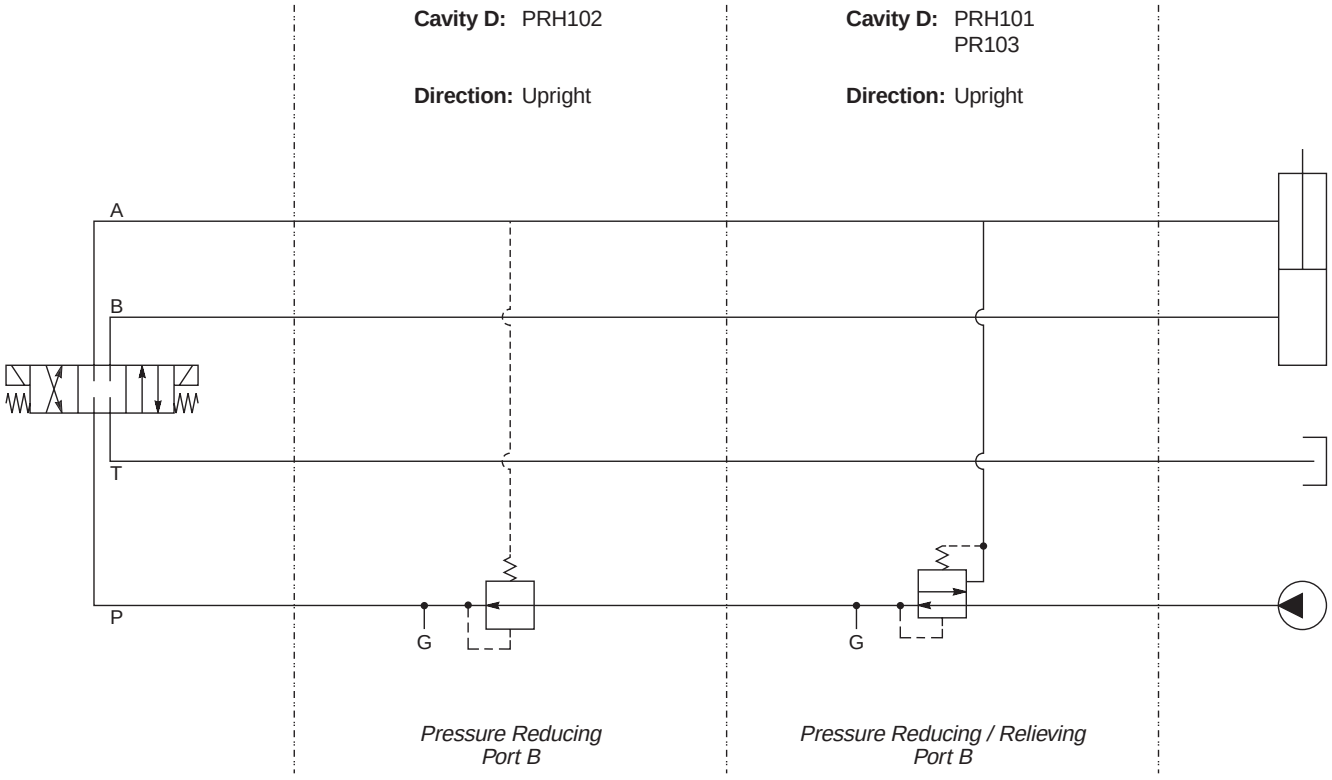
Ordering Information

BD03	—	BDA	—			
D03 Cartpak Body		B Port Drain to A		Plug Seals		Body Material

Code	Plug Seals
Omit	Nitrile
V	Fluorocarbon

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
- Gage Port Plug Installed
- O-Rings and Drive Pin

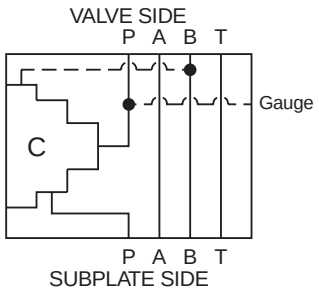


General Description

A Port Drain to B D03 Cartpak Body.
For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



Ordering Information

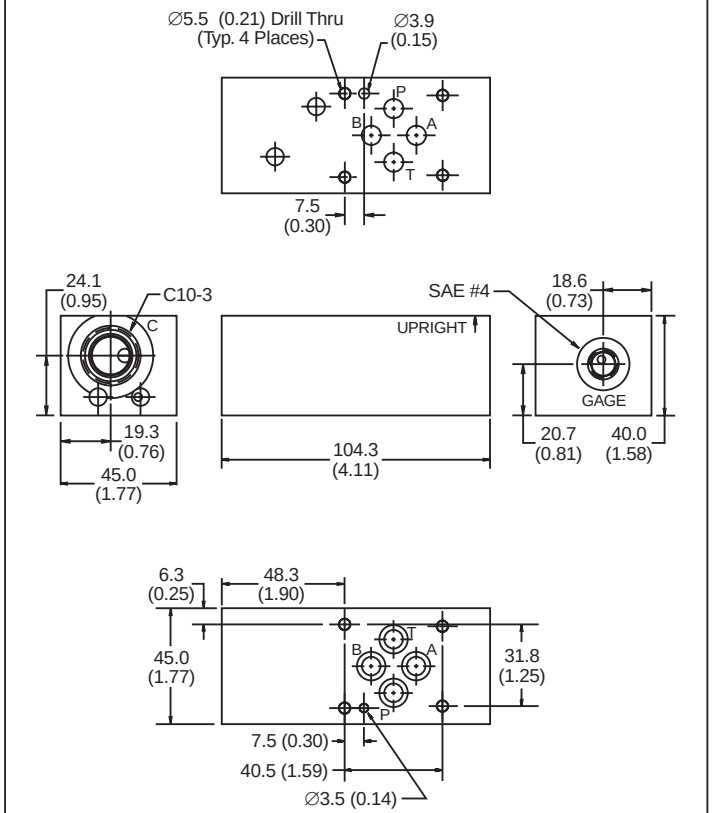
BD03	—	ADB	—		
D03 Cartpak Body		A Port Drain to B		Plug Seals	Body Material

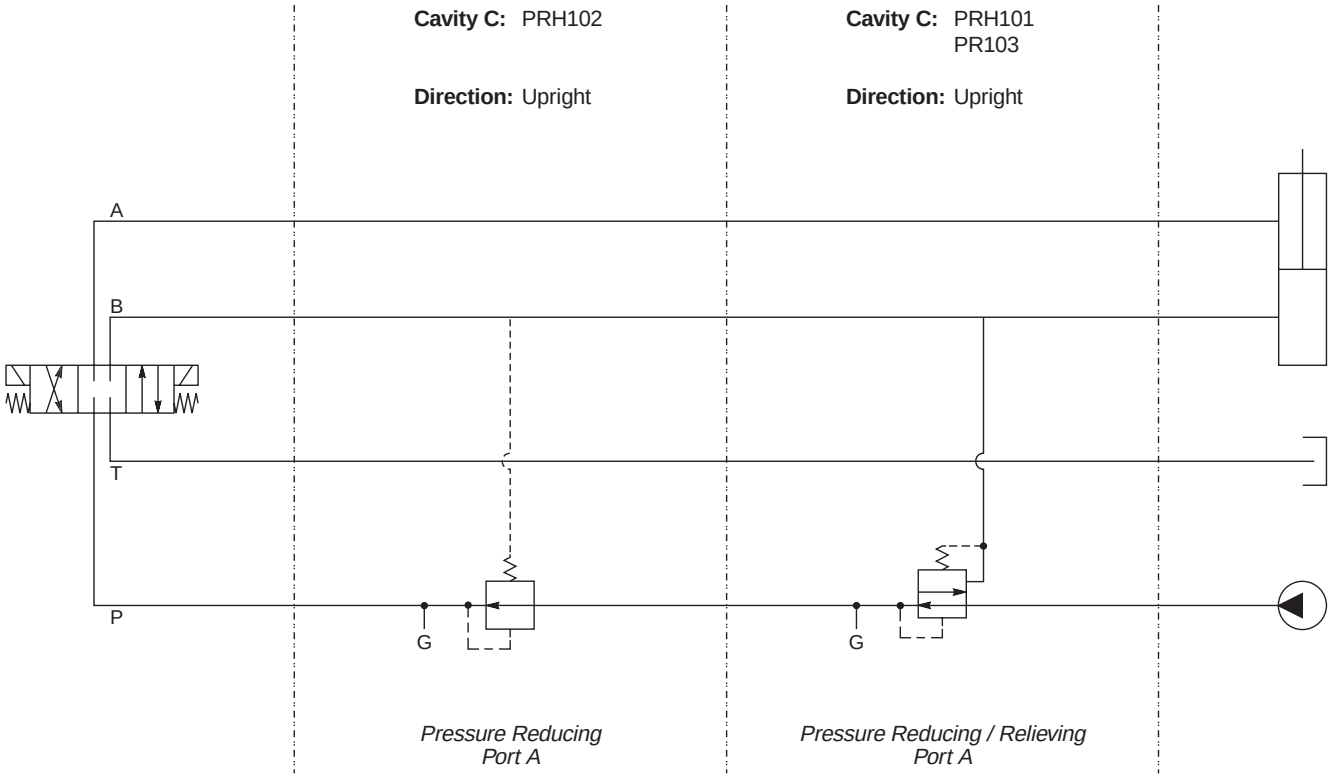
Code	Plug Seals
Omit	Nitrile
V	Fluorocarbon

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
- Gage Port Plug Installed
- O-Rings and Drive Pin

Dimensions Millimeters (Inches)

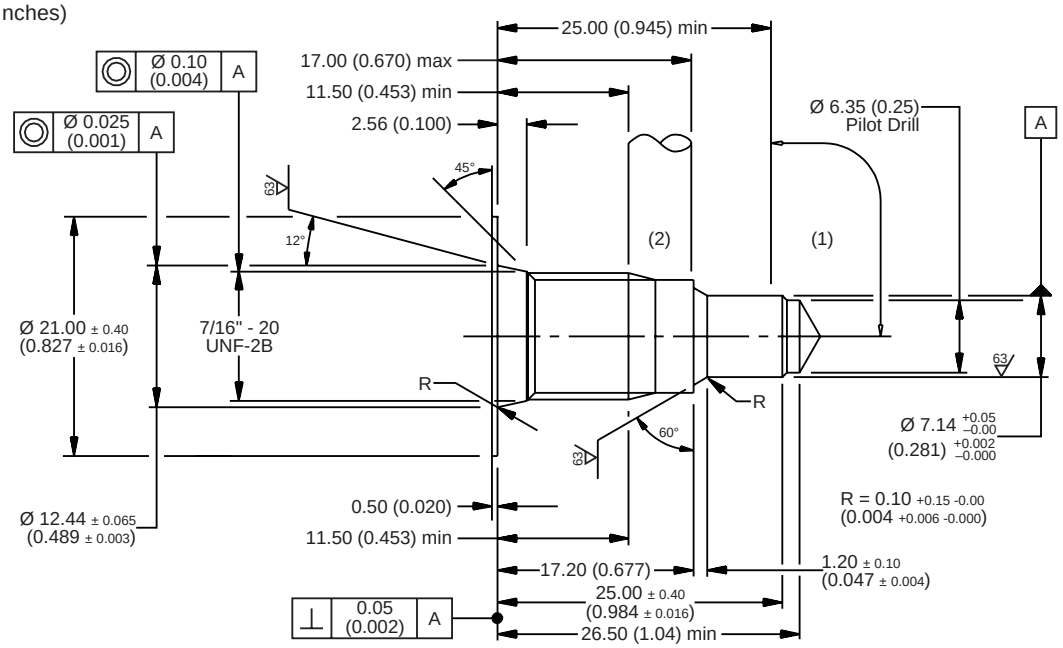


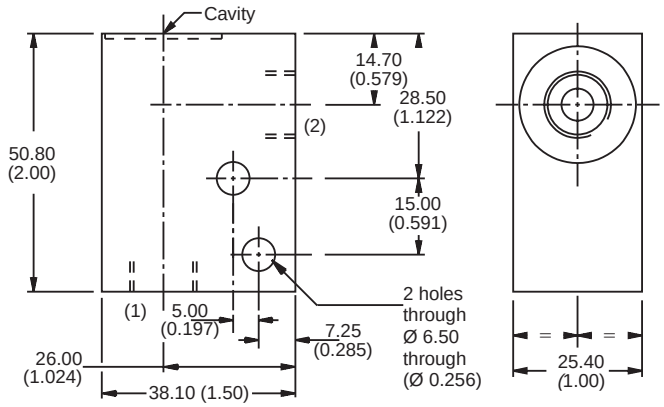


For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)





Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
795	1/4 SAE
796	1/4 BSP

Code	Body Material
A	Aluminum
S	Steel

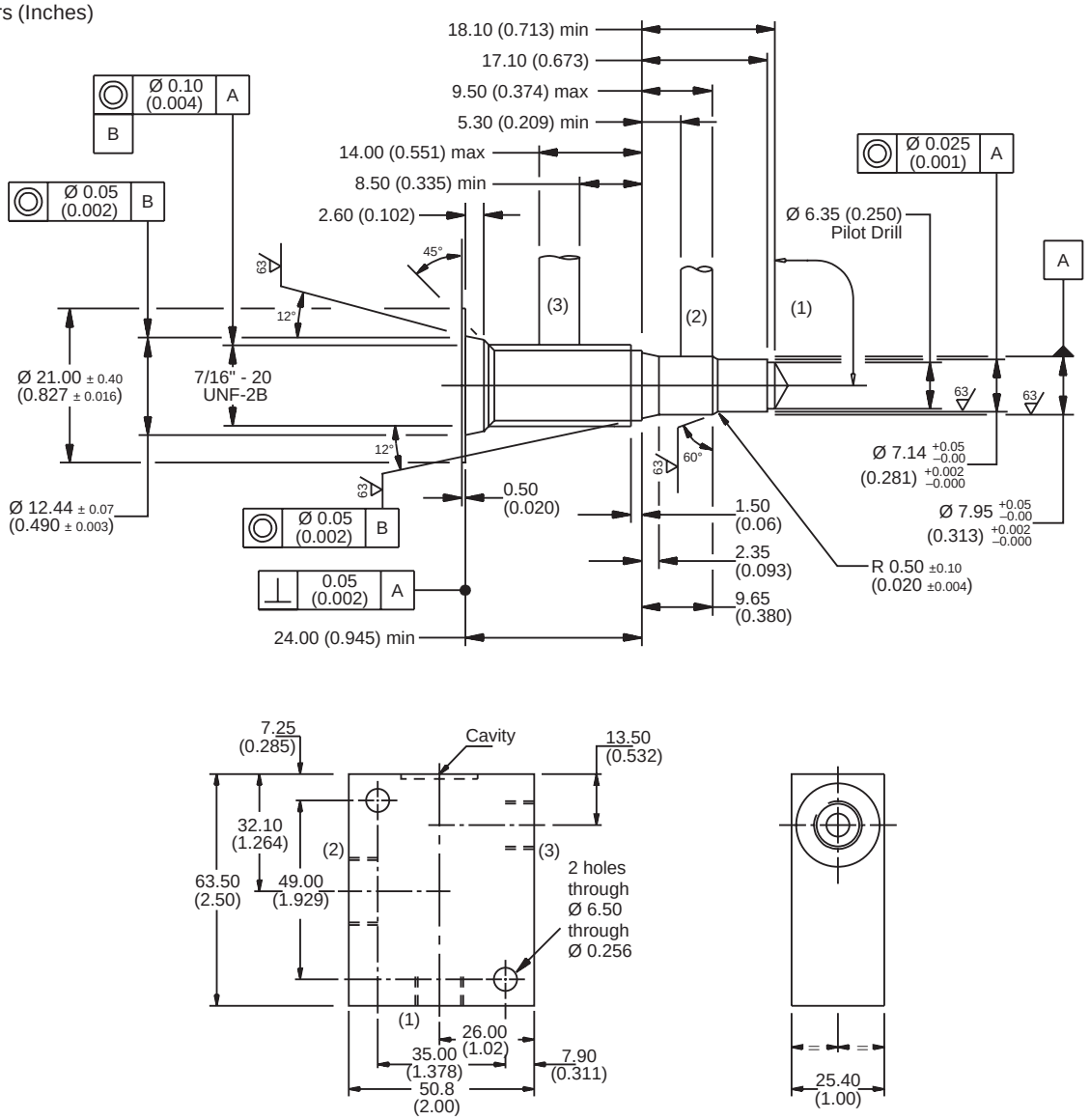
Cavity Tooling For CAV0W-2	
Pilot Drill Ø	6.35 (0.25)
Step Drill	8DS31369
Reamer (Alum)	8RM31082A
Reamer (Steel	8RM31082S
Counterbore	—
Tap	8TP31221

CV Check Valves
SH Shuttle Valves
LM Load/Motor Controls
FC Flow Controls
PC Pressure Controls
LE Logic Elements
DC Directional Controls
MV Manual Valves
SV Solenoid Valves
PV Proportional Valves
CE Coils & Electronics
BC Bodies & Cavities
TD Technical Data

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
815	1/4 SAE
816	1/4 BSP

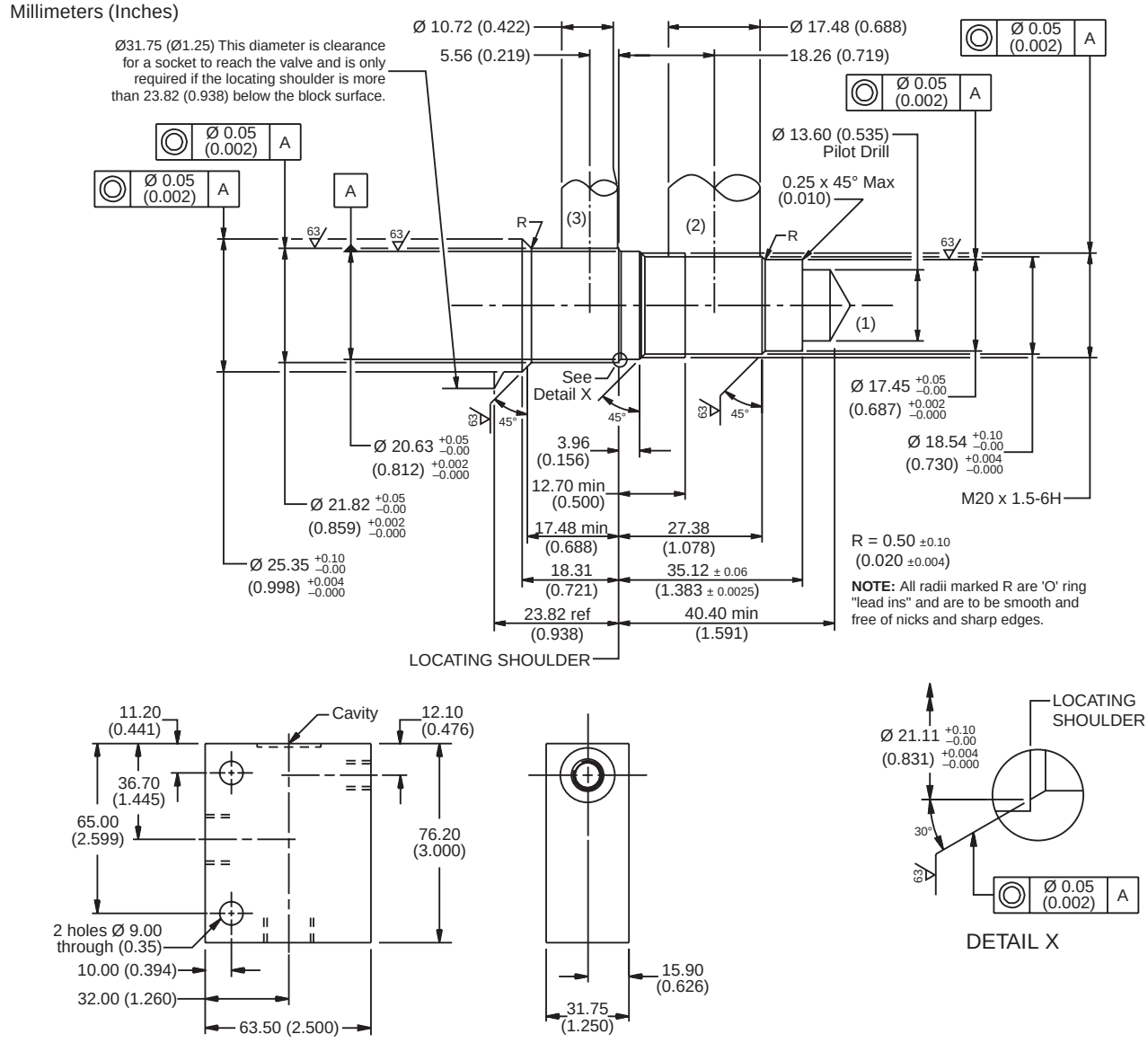
Code	Body Material
A	Aluminum
S	Steel

Cavity Tooling For CAVSW-3	
Pilot Drill Ø	6.35 (0.25)
Step Drill	8DS31378
Reamer (Alum)	8RM31086A
Reamer (Steel	8RM31086S
Counterbore	—
Tap	8TP31221

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
825	1/2 SAE (Main) 1/4 SAE (Aux.)
826	1/2 BSP (Main) 1/4 BSP (Aux.)

Code	Body Material
A	Aluminum
S	Steel

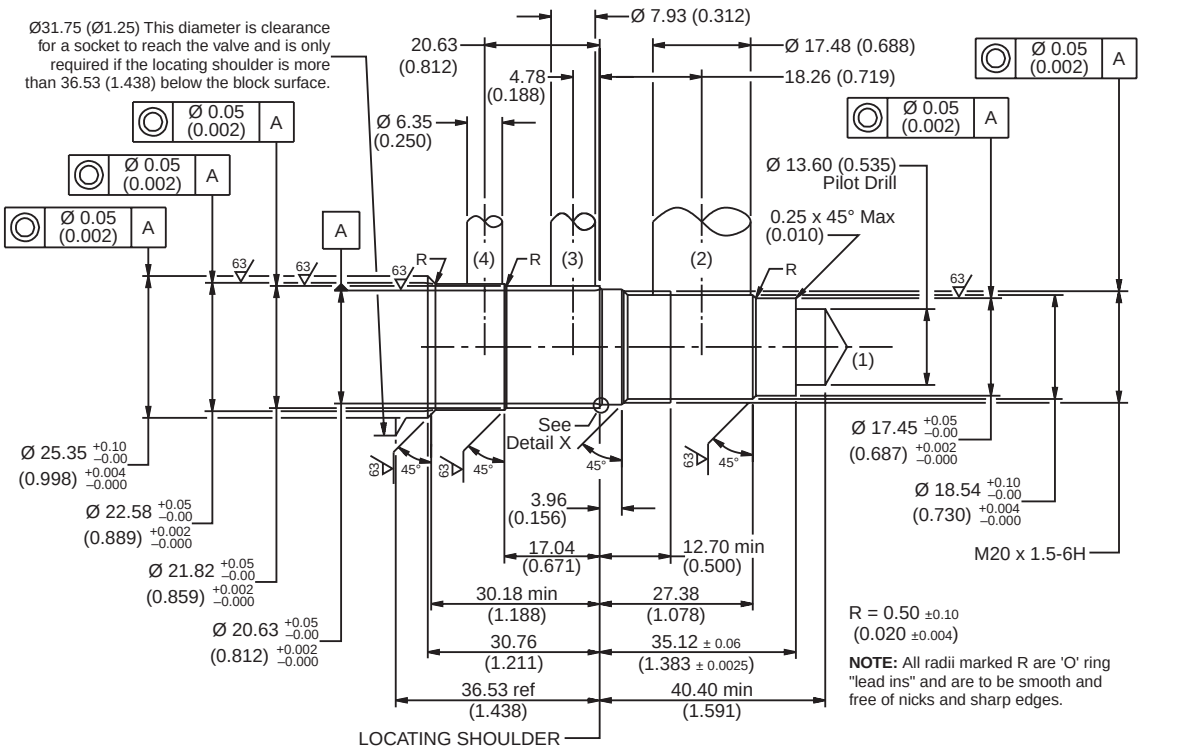
Cavity Tooling For CAVT11A	
Pilot Drill Ø	13.60 (0.535)
Step Drill	8DS31387
Reamer (Alum)	8RM31095A
Reamer (Steel	8RM31095S
Counterbore	—
Tap	8TP31209

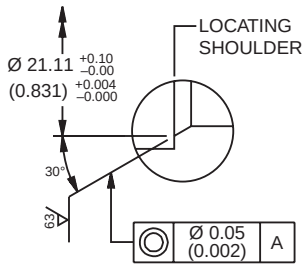
CV Check Valves
SH Shuttle Valves
LM Load/Motor Controls
FC Flow Controls
PC Pressure Controls
LE Logic Elements
DC Directional Controls
MV Manual Valves
SV Solenoid Valves
PV Proportional Valves
CE Coils & Electronics
BC Bodies & Cavities
TD Technical Data

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)





DETAIL X

Ordering Information

LB10		
Line Body	Port Size	Body Material

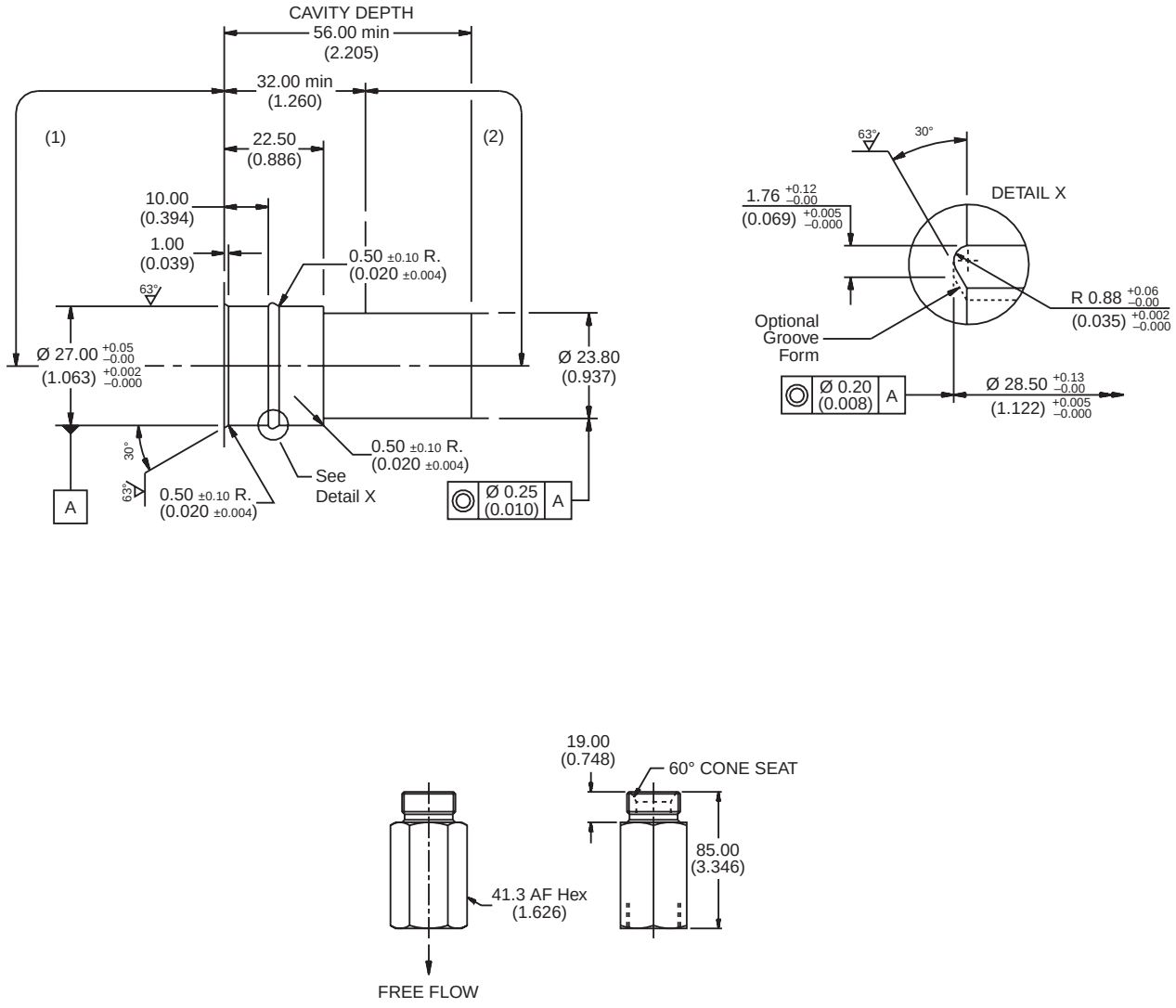
Code	Port Size
830	1/2 SAE (Main) 3/8 + 1/4 SAE (Aux.)
831	1/2 BSP (Main) 3/8 + 1/4 BSP (Aux.)

Code	Body Material
A	Aluminum
S	Steel

Cavity Tooling For CAVT11A	
Pilot Drill Ø	13.60 (0.535)
Step Drill	8DS31388
Reamer (Alum)	8RM31096A
Reamer (Steel	8RM31096S
Counterbore	—
Tap	8TP31209

For additional information see Technical Tips on pages BC1-BC6.

Dimensions
Millimeters (Inches)



Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
210	1 BSP
212	1 SAE

Code	Body Material
A	Aluminum
S	Steel

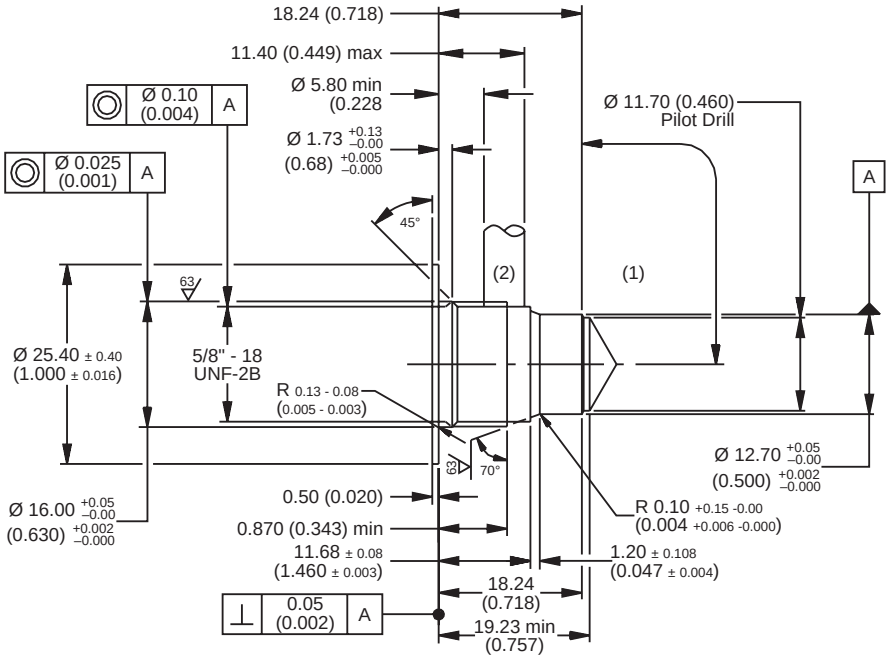
Cavity Tooling For 2C	
Pilot Drill Ø	—
Step Drill	—
Reamer (Alum)	—
Reamer (Steel	—
Counterbore	—
Tap	—

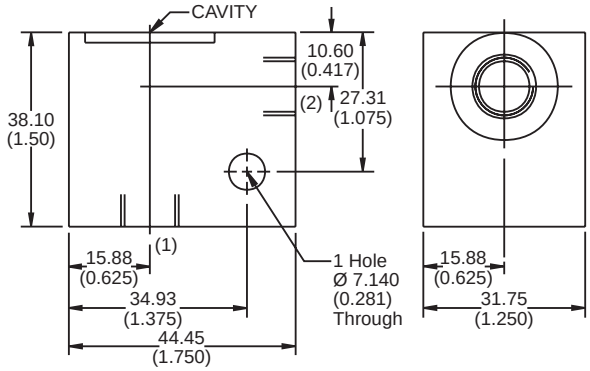
CV Check Valves
SH Shuttle Valves
LM Load/Motor Controls
FC Flow Controls
PC Pressure Controls
LE Logic Elements
DC Directional Controls
MV Manual Valves
SV Solenoid Valves
PV Proportional Valves
CE Coils & Electronics
BC Bodies & Cavities
TD Technical Data

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)





Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
324	1/4 SAE
325	1/4 BSP

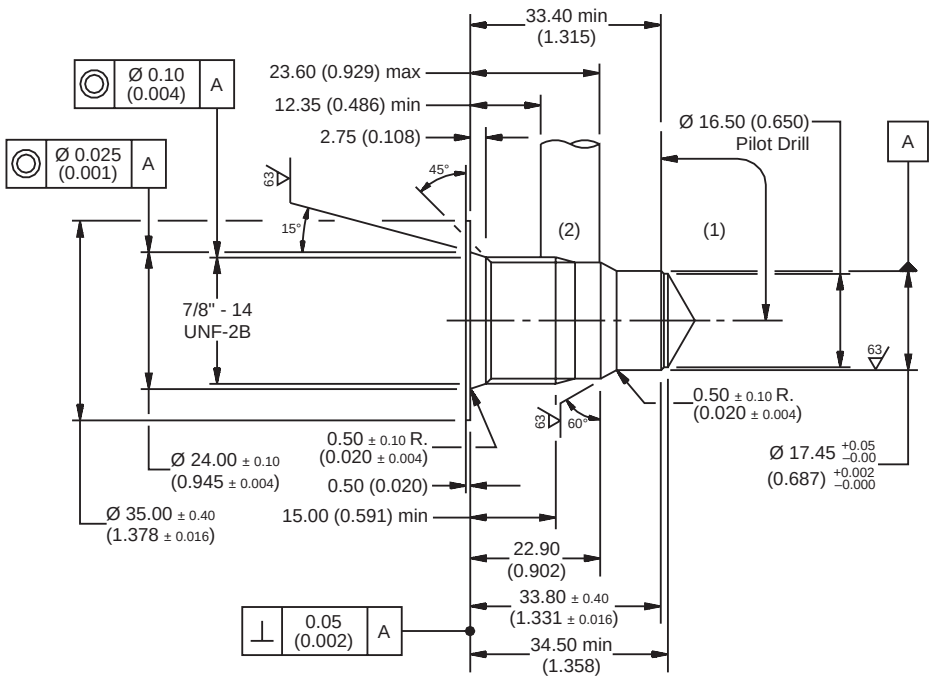
Code	Body Material
A	Aluminum
S	Steel

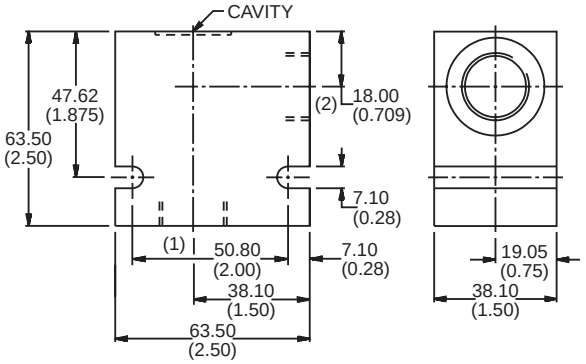
Cavity Tooling For 2G	
Pilot Drill Ø	11.70 (0.46)
Step Drill	8DS31384
Reamer (Alum)	8RM31092A
Reamer (Steel	8RM31092S
Counterbore	—
Tap	8TP31223

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)





Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
543	1/2 SAE
545	1/2 BSP

Code	Body Material
A	Aluminum
S	Steel

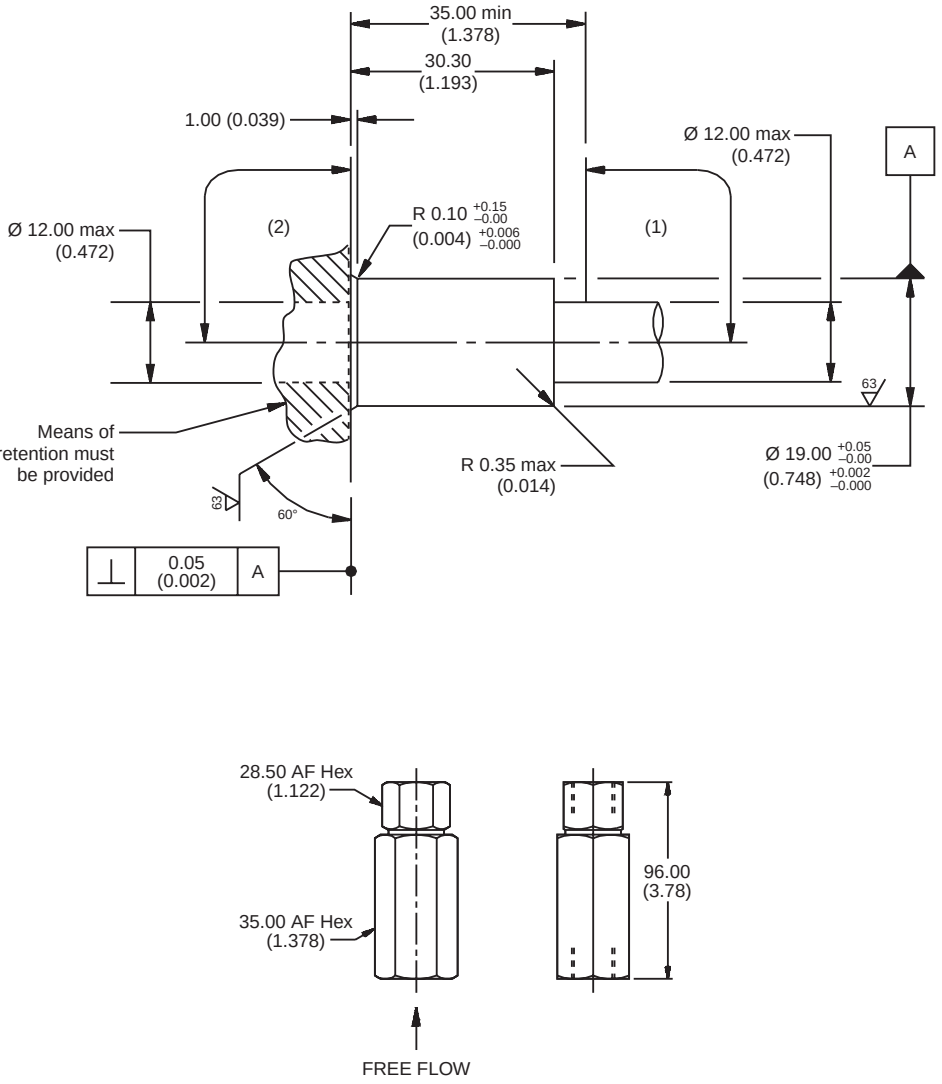
Cavity Tooling For 2R
Pilot Drill Ø
Step Drill
Reamer (Alum)
Reamer (Steel
Counterbore
Tap

CV Check Valves
SH Shuttle Valves
LM Load/Motor Controls
FC Flow Controls
PC Pressure Controls
LE Logic Elements
DC Directional Controls
MV Manual Valves
SV Solenoid Valves
PV Proportional Valves
CE Coils & Electronics
BC Bodies & Cavities
TD Technical Data

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10		
Line Body	Port Size	Body Material

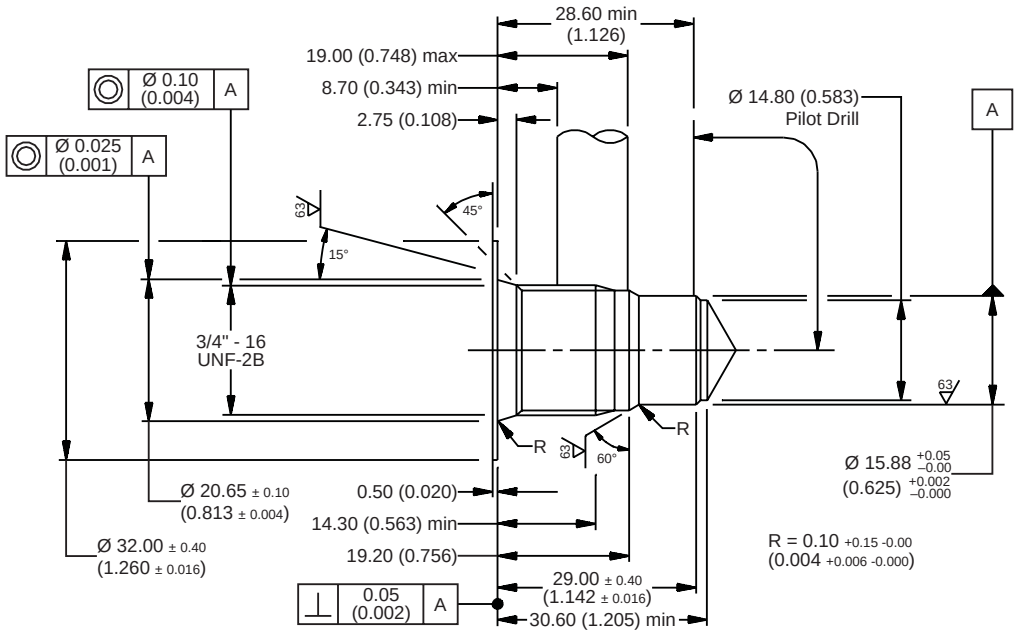
Code	Port Size
205	1 BSP
220	1 SAE

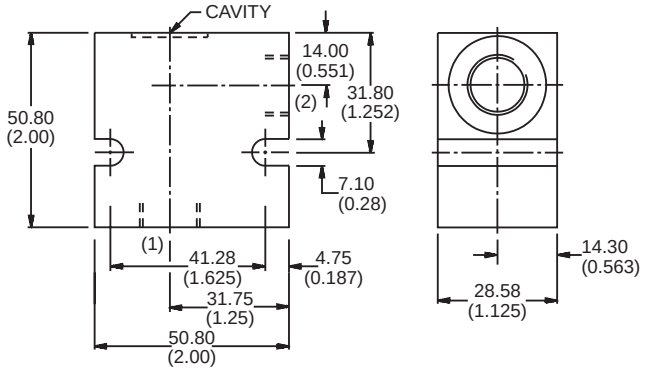
Code	Body Material
S	Steel

Cavity Tooling For 2U	
Pilot Drill Ø	—
Step Drill	—
Reamer (Alum)	—
Reamer (Steel	—
Counterbore	—
Tap	—

For additional information see Technical Tips on pages BC1-BC6.

Dimensions
Millimeters (Inches)





Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
513	3/8 SAE
515	1/4 BSP

Code	Body Material
A	Aluminum
S	Steel

Cavity Tooling For 2X	
Pilot Drill Ø	14.80 (0.583)
Step Drill	8DS31344
Reamer (Alum)	8RM31057A
Reamer (Steel	8RM31057S
Counterbore	—
Tap	8TP31202

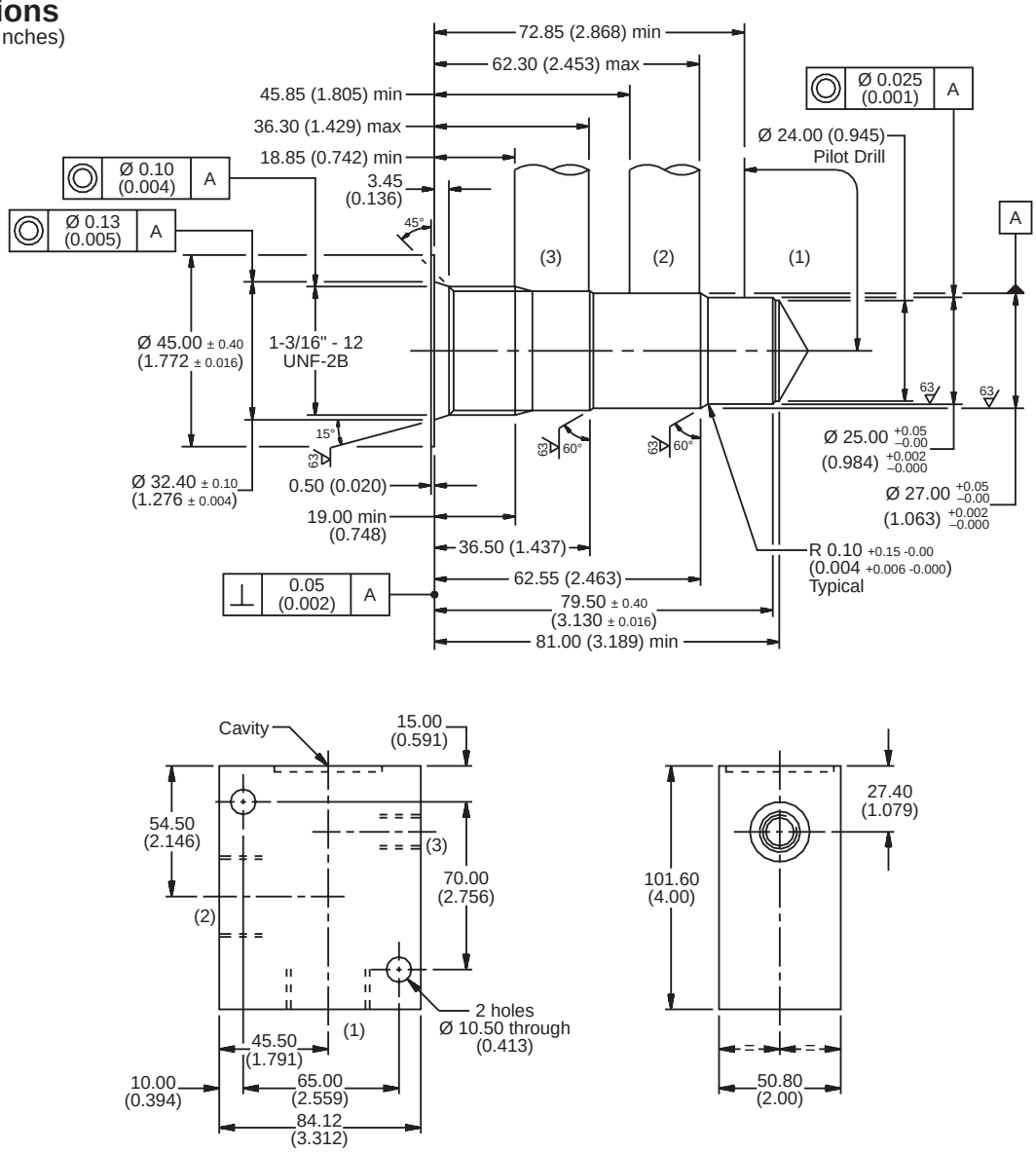
NOTE:
Use parker C09-2 cavity and body.

CV Check Valves
SH Shuttle Valves
LM Load/Motor Controls
FC Flow Controls
PC Pressure Controls
LE Logic Elements
DC Directional Controls
MV Manual Valves
SV Solenoid Valves
PV Proportional Valves
CE Coils & Electronics
BC Bodies & Cavities
TD Technical Data

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
007	3/4 BSP
066	1 SAE

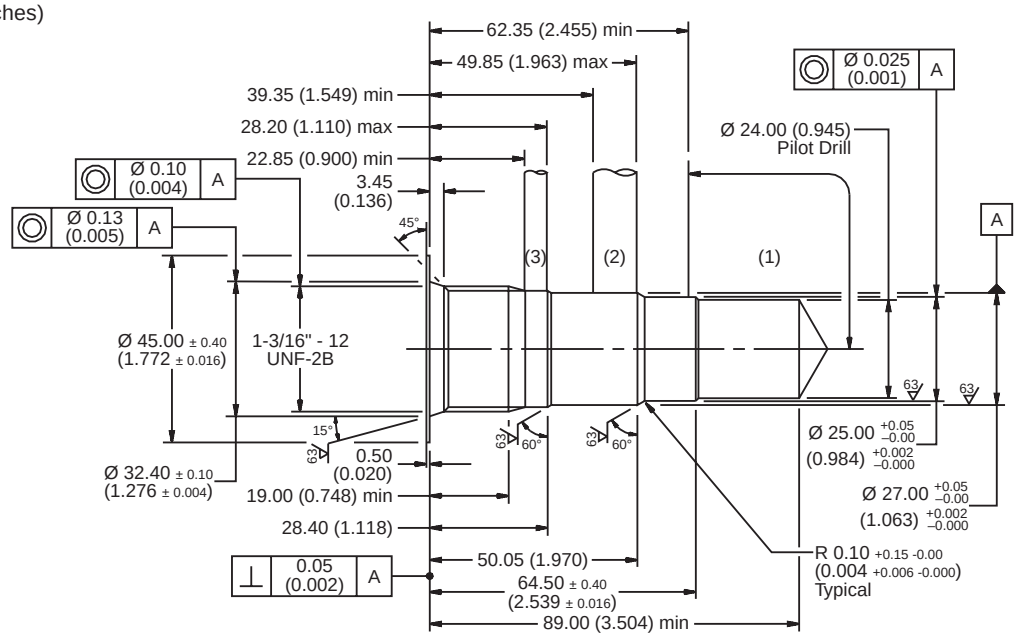
Code	Body Material
A	Aluminum
S	Steel

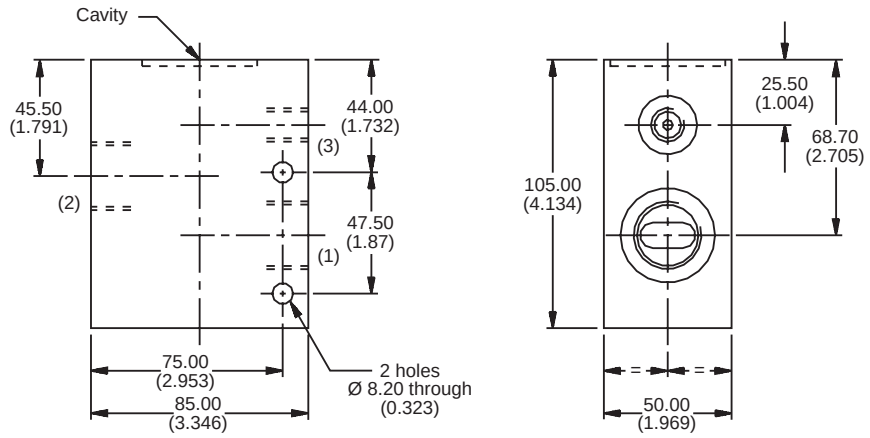
Cavity Tooling For 3A	
Pilot Drill Ø	24.00 (0.94)
Step Drill	8DS31303
Reamer (Alum)	8RM31003A
Reamer (Steel	8RM31003S
Counterbore	8CB31100
Tap	8TP31200

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)





Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
039	3/4 BSP (Main) 1/4 BSP (Aux.)
069	1 SAE (Main) 1/4 SAE (Aux.)
034	3/4 BSP Dual Cavity
234	3/4 SAE Dual Cavity

Code	Body Material
A	Aluminum
S	Steel

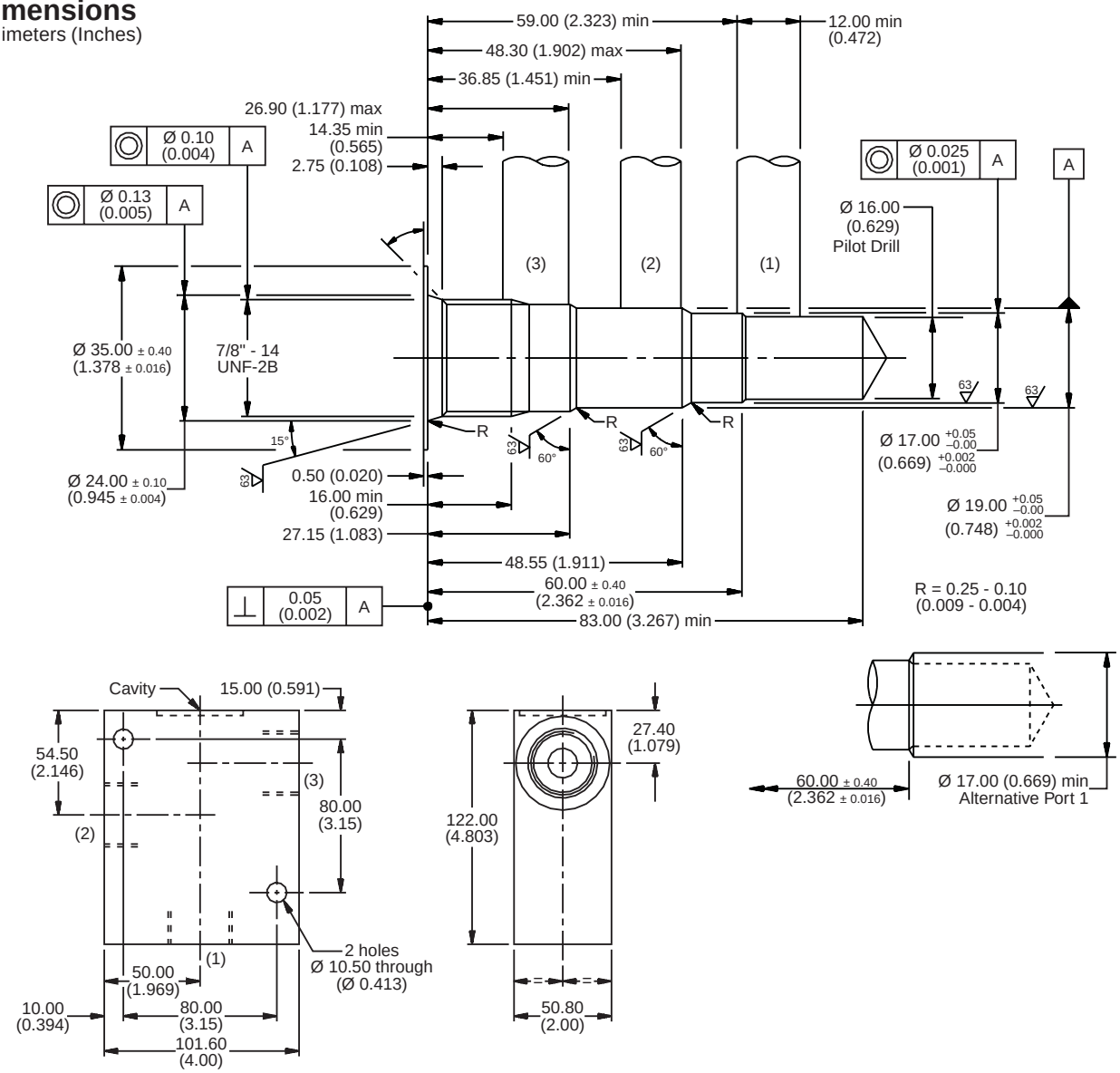
Cavity Tooling For 3C	
Pilot Drill Ø	24.00 (0.94)
Step Drill	8DS31305
Reamer (Alum)	8RM31005A
Reamer (Steel	8RM31005S
Counterbore	8CB31100
Tap	8TP31200

CV Check Valves
SH Shuttle Valves
LM Load/Motor Controls
FC Flow Controls
PC Pressure Controls
LE Logic Elements
DC Directional Controls
MV Manual Valves
SV Solenoid Valves
PV Proportional Valves
CE Coils & Electronics
BC Bodies & Cavities
TD Technical Data

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10		
Line Body	Port Size	Body Material

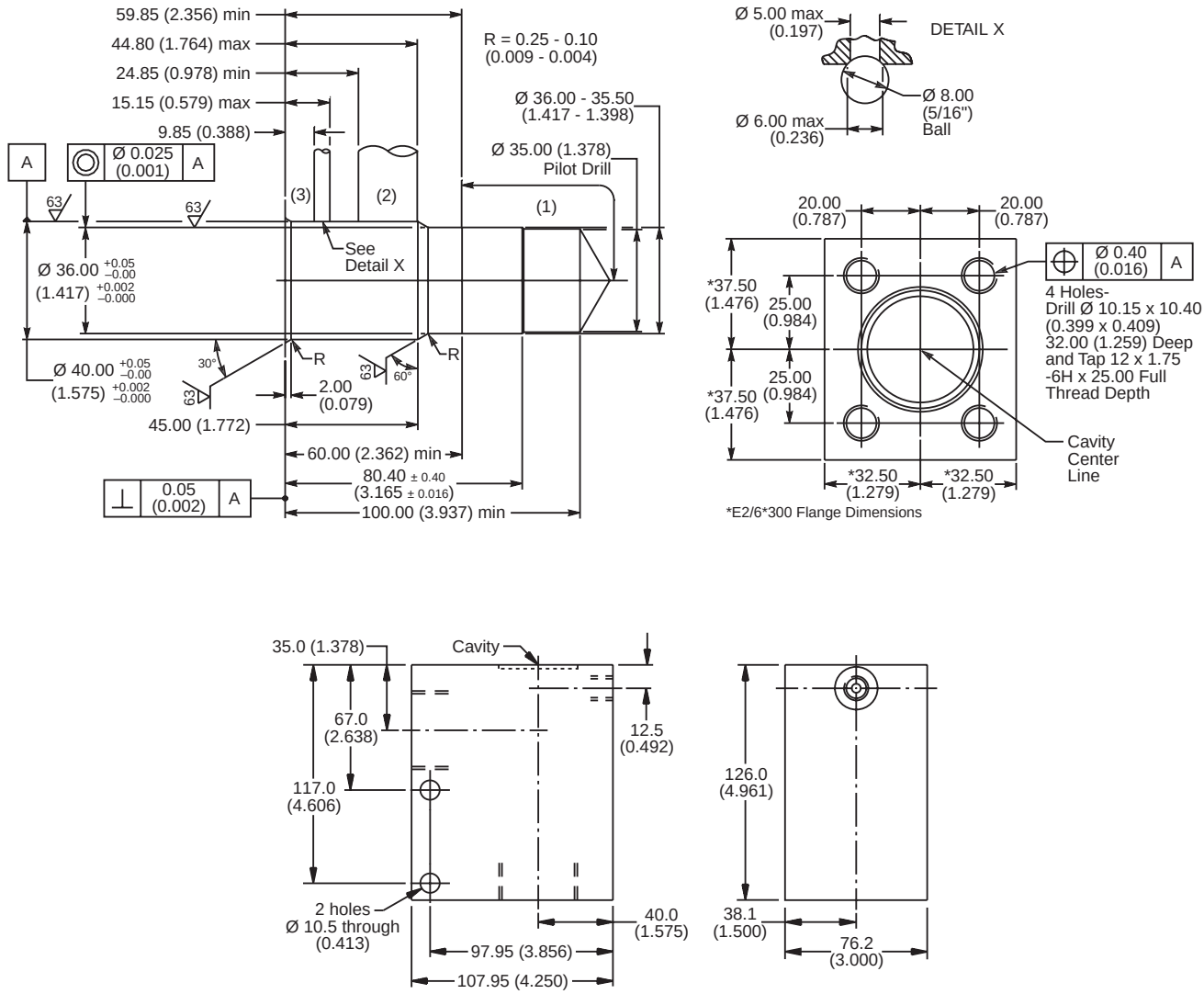
Code	Port Size
092	3/4 BSP
093	1 SAE

Code	Body Material
A	Aluminum
S	Steel

Cavity Tooling For 3J
Pilot Drill Ø
Step Drill
Reamer (Alum)
Reamer (Steel
Counterbore
Tap

For additional information see Technical Tips on pages BC1-BC6.

Dimensions
Millimeters (Inches)



Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
089	1-1/4 BSP (Main) 1/4 BSP (Aux)

Code	Body Material
A	Aluminum
S	Steel

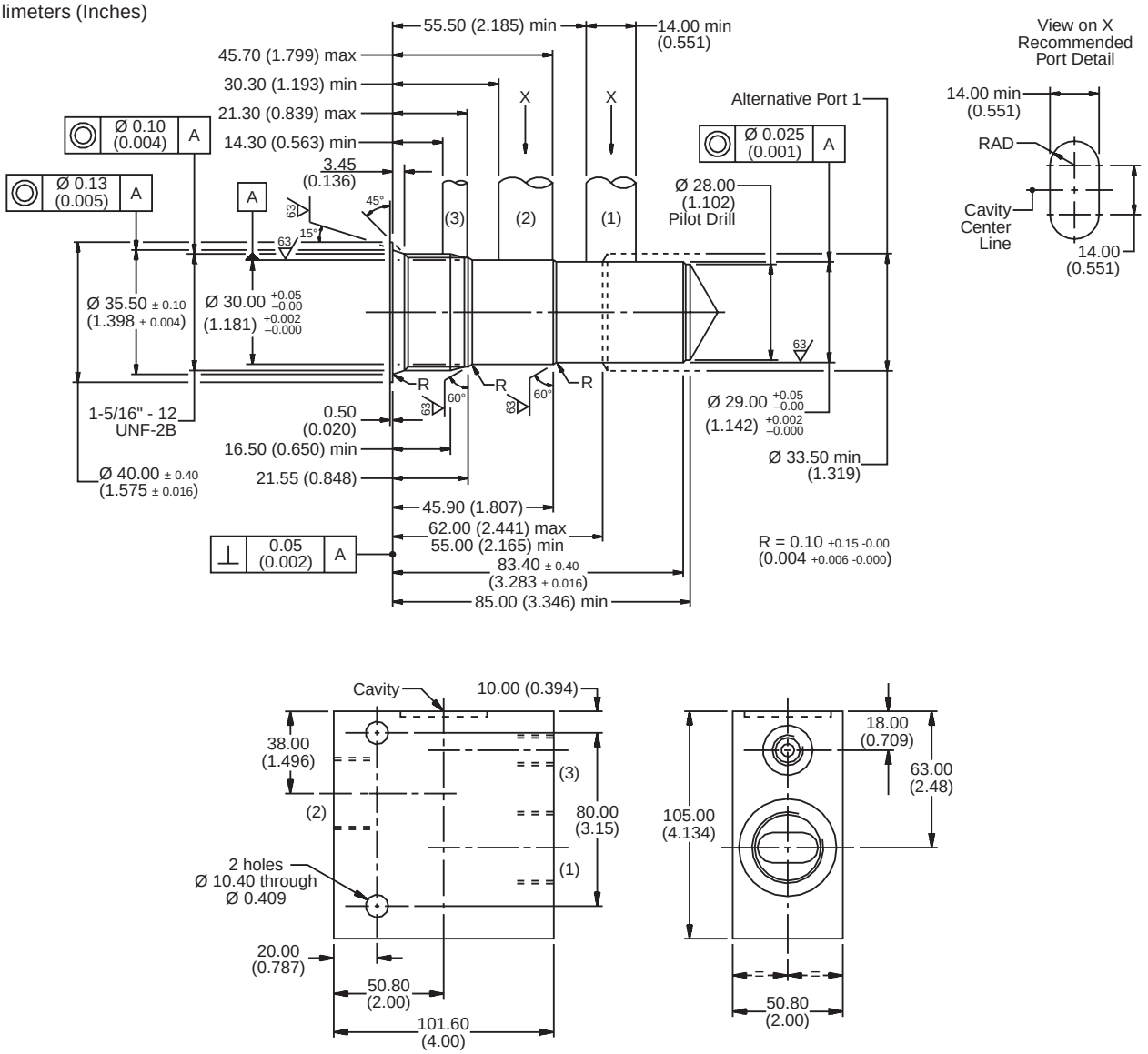
Cavity Tooling For 3K	
Pilot Drill Ø	35.00 (1.38)
Step Drill	8DS31310
Reamer (Alum)	8RM31010A
Reamer (Steel	8RM31010A
Counterbore	—
Tap	8TP31215

CV Check Valves
SH Shuttle Valves
LM Load/Motor Controls
FC Flow Controls
PC Pressure Controls
LE Logic Elements
DC Directional Controls
MV Manual Valves
SV Solenoid Valves
PV Proportional Valves
CE Coils & Electronics
BC Bodies & Cavities
TD Technical Data

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
076	1 BSP (Main) 1/4 BSP (Aux.)
078	1 SAE (Main) 1/4 SAE (Aux.)
104	1 BSP Dual Cavity
105	1 SAE Dual Cavity

Code	Body Material
A	Aluminum
S	Steel

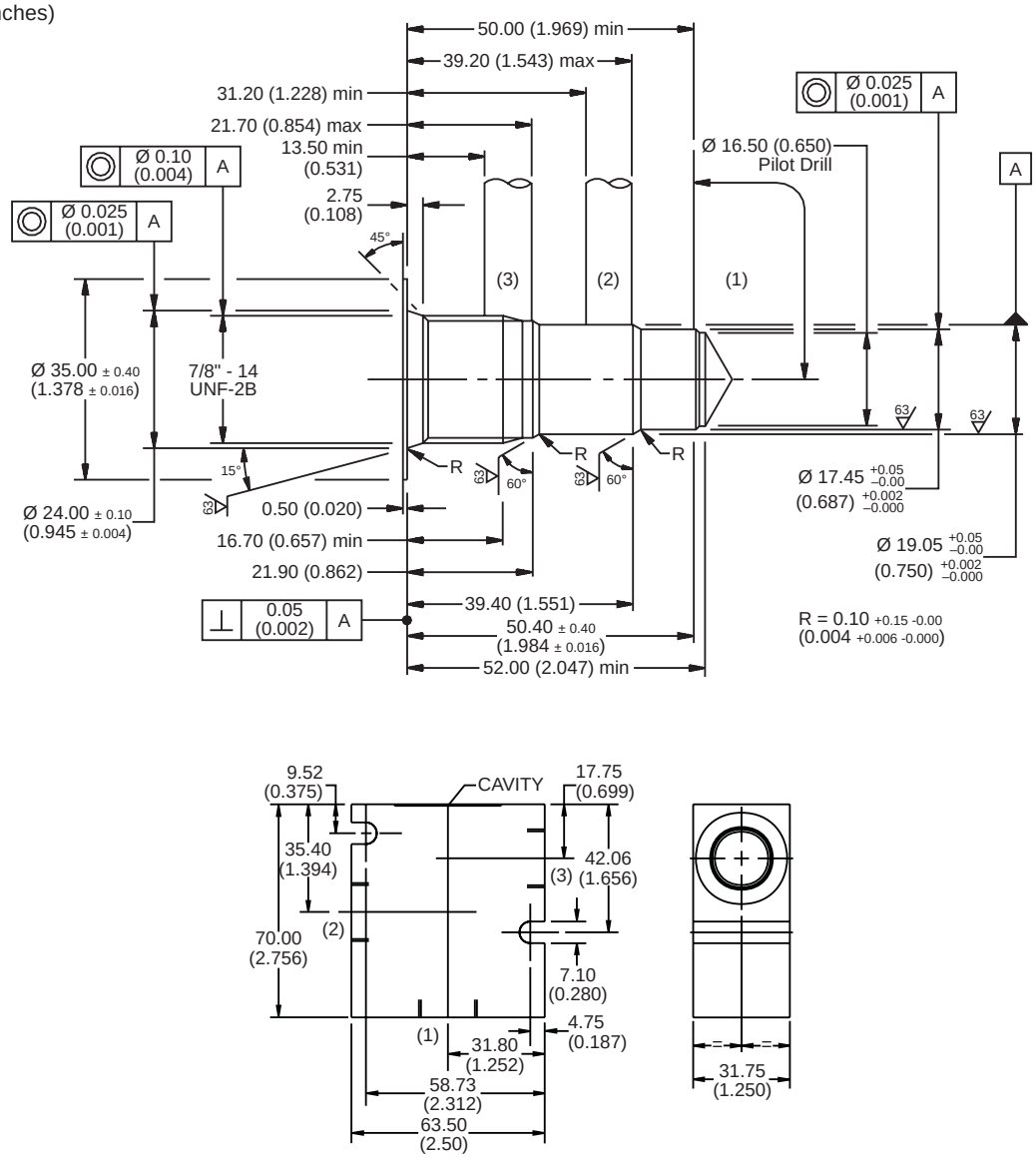
Cavity Tooling For 3M	
Pilot Drill Ø	28.00 (1.10)
Step Drill	8DS31311
Reamer (Alum)	8RM31011A
Reamer (Steel	8RM31011S
Counterbore	8CB31103
Tap	8TP31203

Parker Hannifin Corporation
Hydraulic Cartridge Systems

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
553	1/2 SAE
554	3/8 BSP

Code	Body Material
A	Aluminum
S	Steel

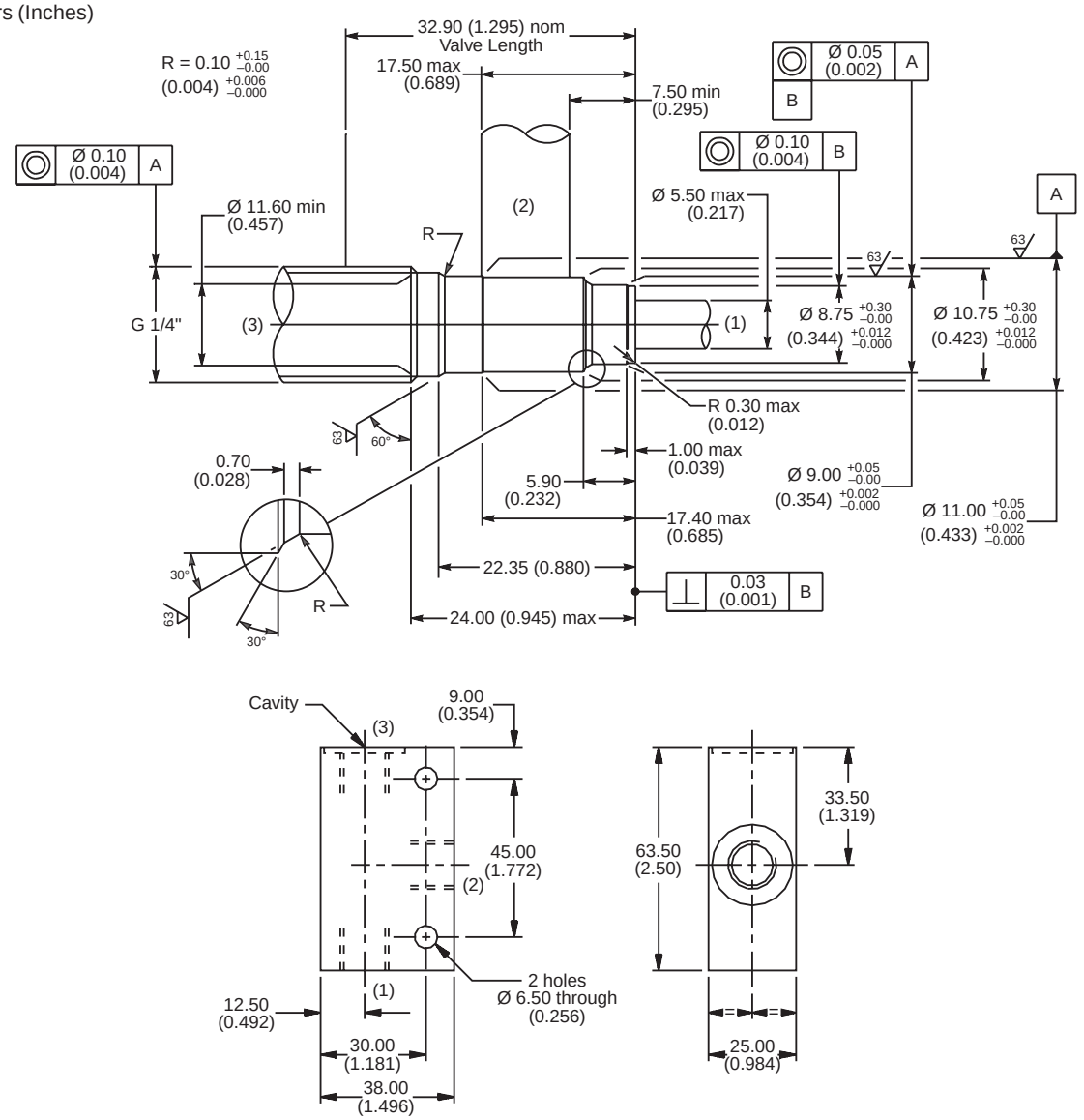
Cavity Tooling For 3X	
Pilot Drill Ø	16.50 (0.650)
Step Drill	8DS31343
Reamer (Alum)	8RM31062A
Reamer (Steel	8RM31062S
Counterbore	—
Tap	8TP31201

CV Check Valves
SH Shuttle Valves
LM Load/Motor Controls
FC Flow Controls
PC Pressure Controls
LE Logic Elements
DC Directional Controls
MV Manual Valves
SV Solenoid Valves
PV Proportional Valves
CE Coils & Electronics
BC Bodies & Cavities
TD Technical Data

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
313	1/4 BSP
320	1/4 SAE

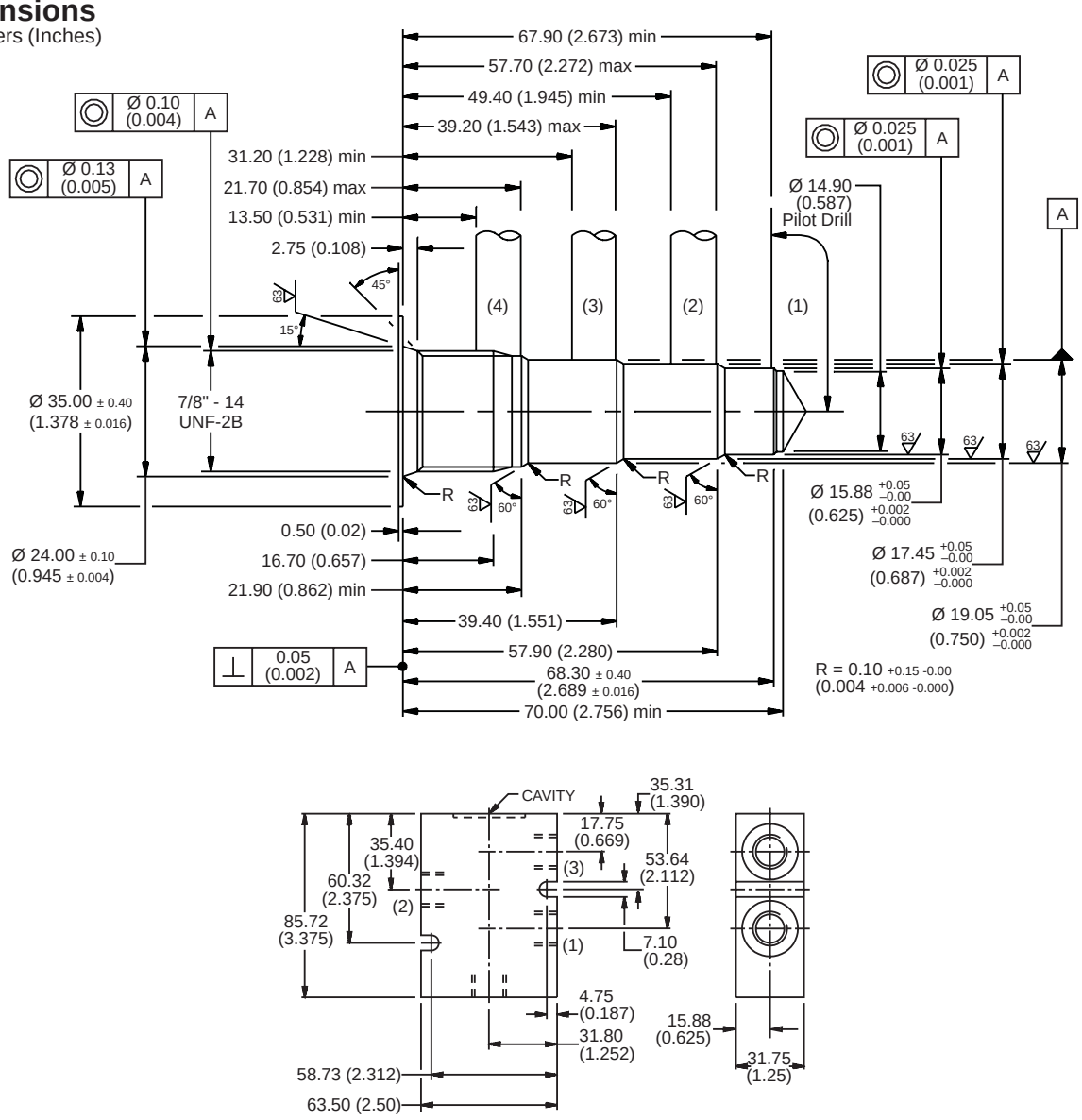
Code	Body Material
A	Aluminum
S	Steel

Cavity Tooling For 3Z	
Pilot Drill Ø	8.50 (0.335)
Step Drill	8DS31355
Reamer (Alum)	8RM31055A
Reamer (Steel	8RM31055S
Counterbore	—
Tap	8TP31219

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
562	1/2 SAE
563	3/8 BSP

Code	Body Material
A	Aluminum
S	Steel

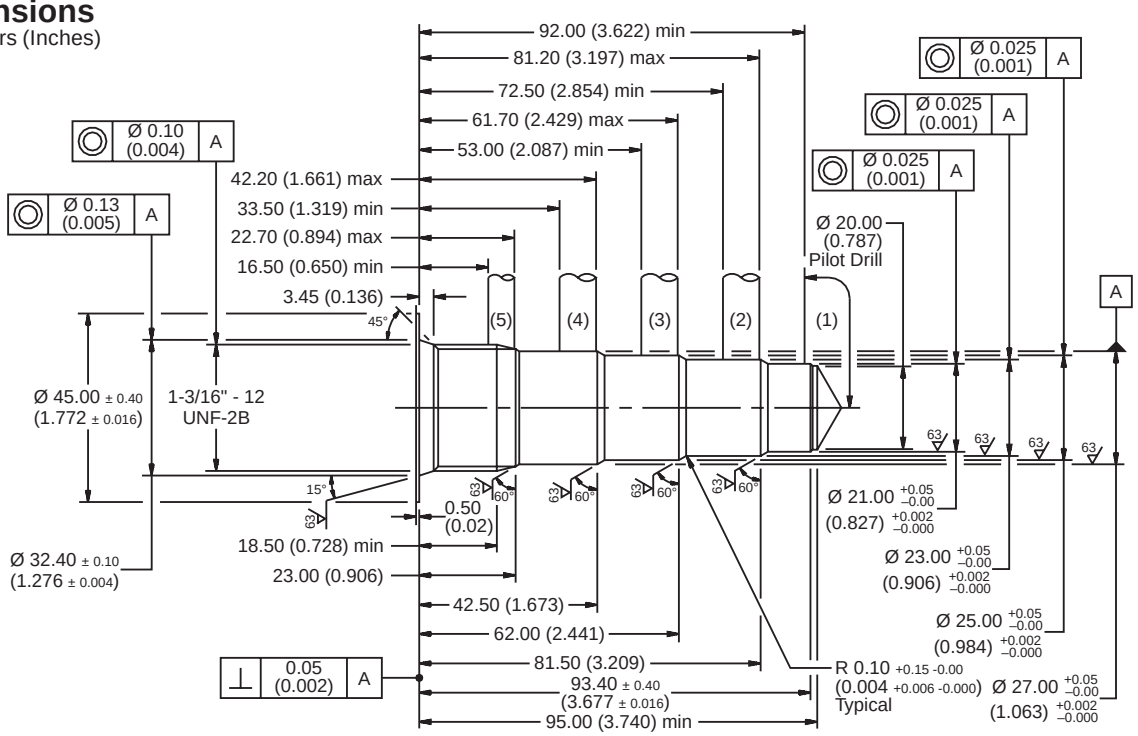
Cavity Tooling For 4C	
Pilot Drill Ø	14.90 (0.587)
Step Drill	8DS31346
Reamer (Alum)	8RM31063A
Reamer (Steel	8RM31063S
Counterbore	—
Tap	8TP31201

CV Check Valves
SH Shuttle Valves
LM Load/Motor Controls
FC Flow Controls
PC Pressure Controls
LE Logic Elements
DC Directional Controls
MV Manual Valves
SV Solenoid Valves
PV Proportional Valves
CE Coils & Electronics
BC Bodies & Cavities
TD Technical Data

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
314	3/4 BSP (Main) 1/4 BSP (Aux.)
321	3/4 SAE (Main) 1/4 SAE (Aux.)

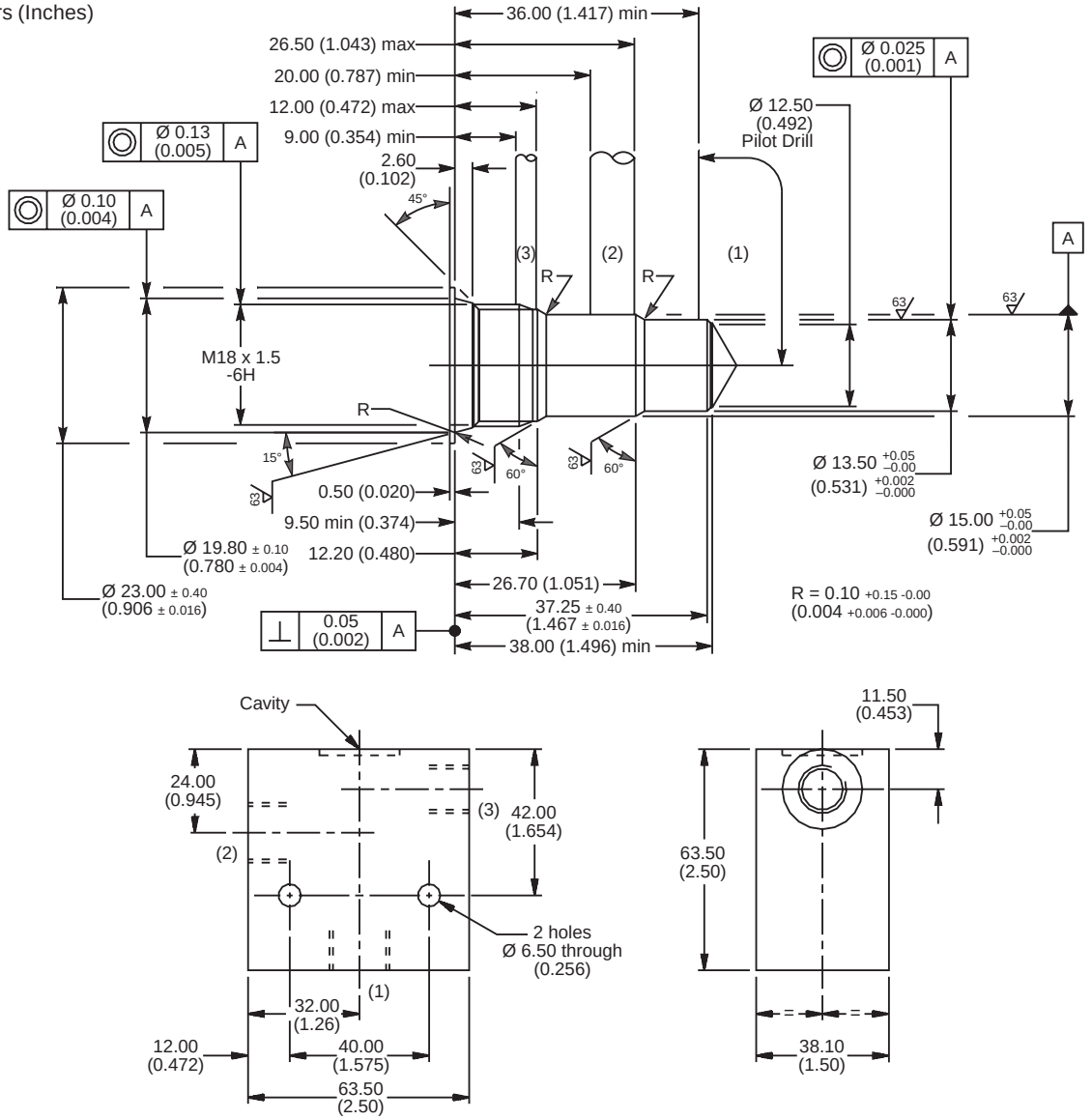
Code	Body Material
A	Aluminum
S	Steel

Cavity Tooling For 5A	
Pilot Drill Ø	20.00 (0.78)
Step Drill	8DS31353
Reamer (Alum)	8RM31053A
Reamer (Steel	8RM31053S
Counterbore	8CB31100
Tap	8TP31200

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
310	3/8 BSP (Main) 1/4 BSP (Aux.)
318	3/8 SAE (Main) 1/4 SAE (Aux.)
312	3/8 BSP Dual Cavity

Code	Body Material
A	Aluminum
S	Steel

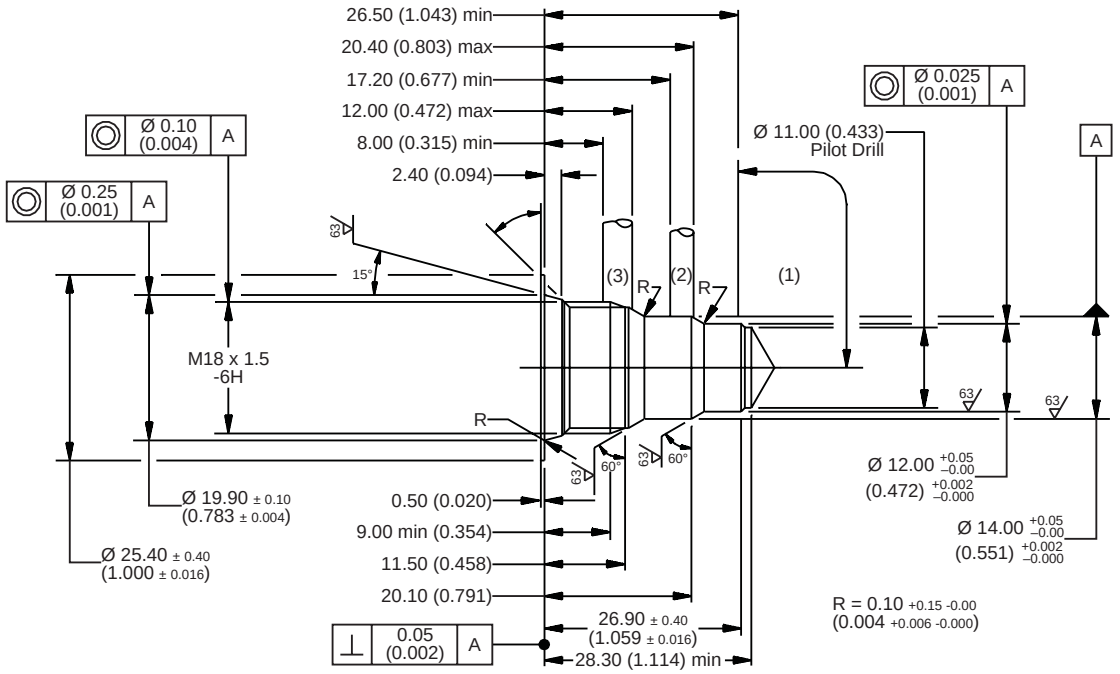
Cavity Tooling For 53-1	
Pilot Drill Ø	12.50 (0.49)
Step Drill	8DS31349
Reamer (Alum)	8RM31049A
Reamer (Steel	8RM31049S
Counterbore	8CB31107
Tap	8TP31207

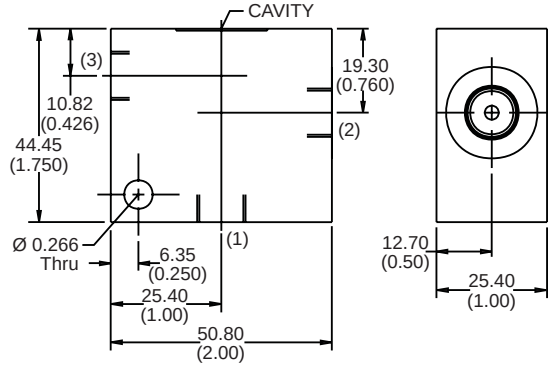
CV Check Valves
SH Shuttle Valves
LM Load/Motor Controls
FC Flow Controls
PC Pressure Controls
LE Logic Elements
DC Directional Controls
MV Manual Valves
SV Solenoid Valves
PV Proportional Valves
CE Coils & Electronics
BC Bodies & Cavities
TD Technical Data

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)





Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
591	1/4 SAE

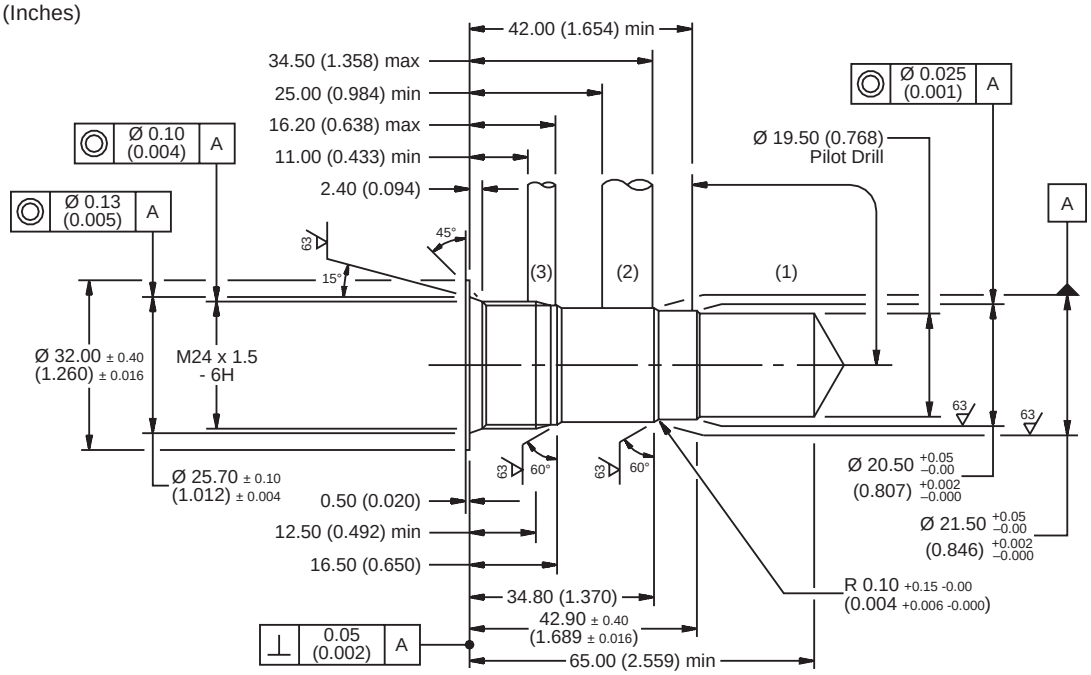
Code	Body Material
A	Aluminum
S	Steel

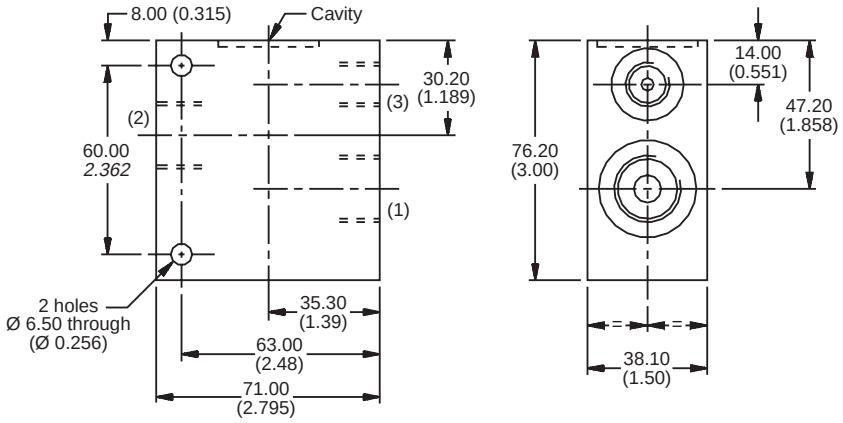
Cavity Tooling For 54-1	
Pilot Drill Ø	11.00 (0.433)
Step Drill	8DS31379
Reamer (Alum)	8RM31087A
Reamer (Steel	8RM31087S
Counterbore	—
Tap	8TP31207

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)





Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
251	1/2 BSP (Main) 1/4 BSP (Aux.)
253	1/2 SAE (Main) 1/4 SAE (Aux.)

Code	Body Material
A	Aluminum
S	Steel

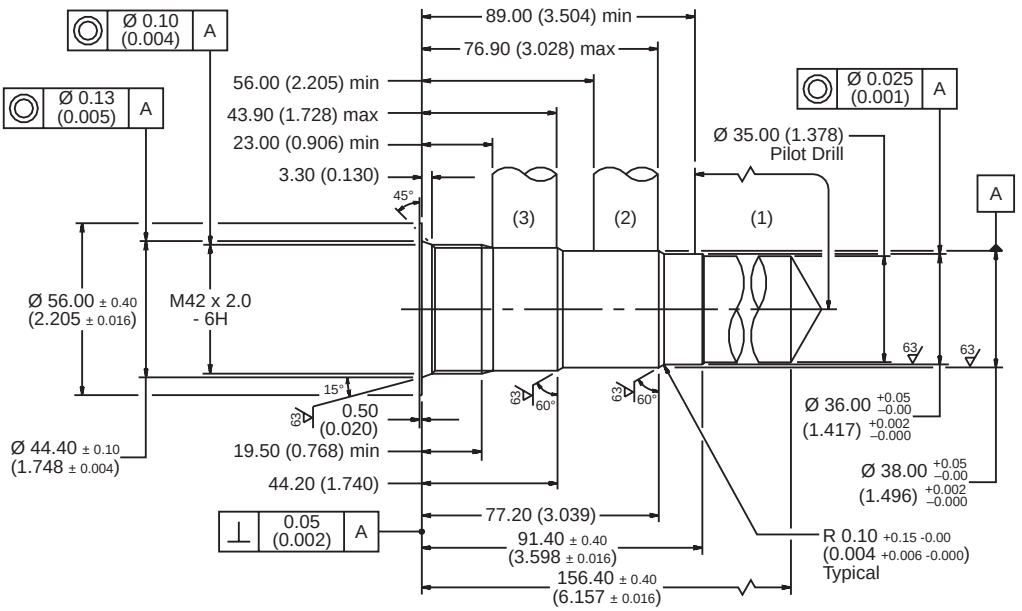
Cavity Tooling For 68-1	
Pilot Drill Ø	19.50 (0.77)
Step Drill	8DS31341
Reamer (Alum)	8RM31041A
Reamer (Steel	8RM31041S
Counterbore	8CB31116
Tap	8TP31216

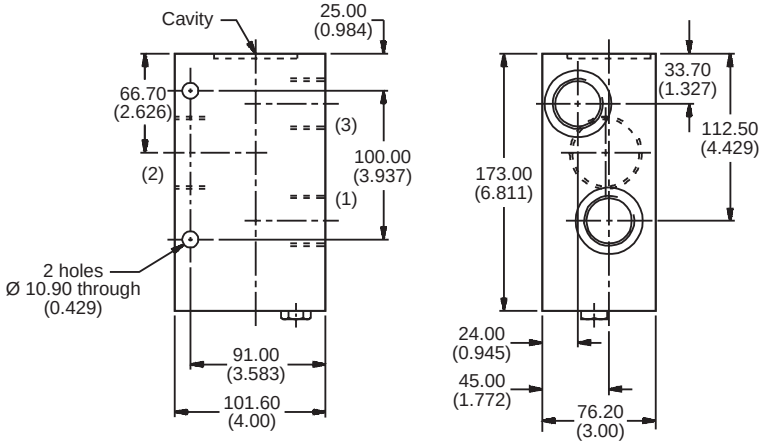
CV Check Valves
SH Shuttle Valves
LM Load/Motor Controls
FC Flow Controls
PC Pressure Controls
LE Logic Elements
DC Directional Controls
MV Manual Valves
SV Solenoid Valves
PV Proportional Valves
CE Coils & Electronics
BC Bodies & Cavities
TD Technical Data

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)





Ordering Information

LB10		
Line Body	**Port Size**	**Body Material**

Code	Port Size
156	2 x 1 BSP (Main) 1 x 1-1/2 BSP (Aux.)
157	2 x 1 SAE (Main) 1 x 1-1/2 SAE (Aux.)

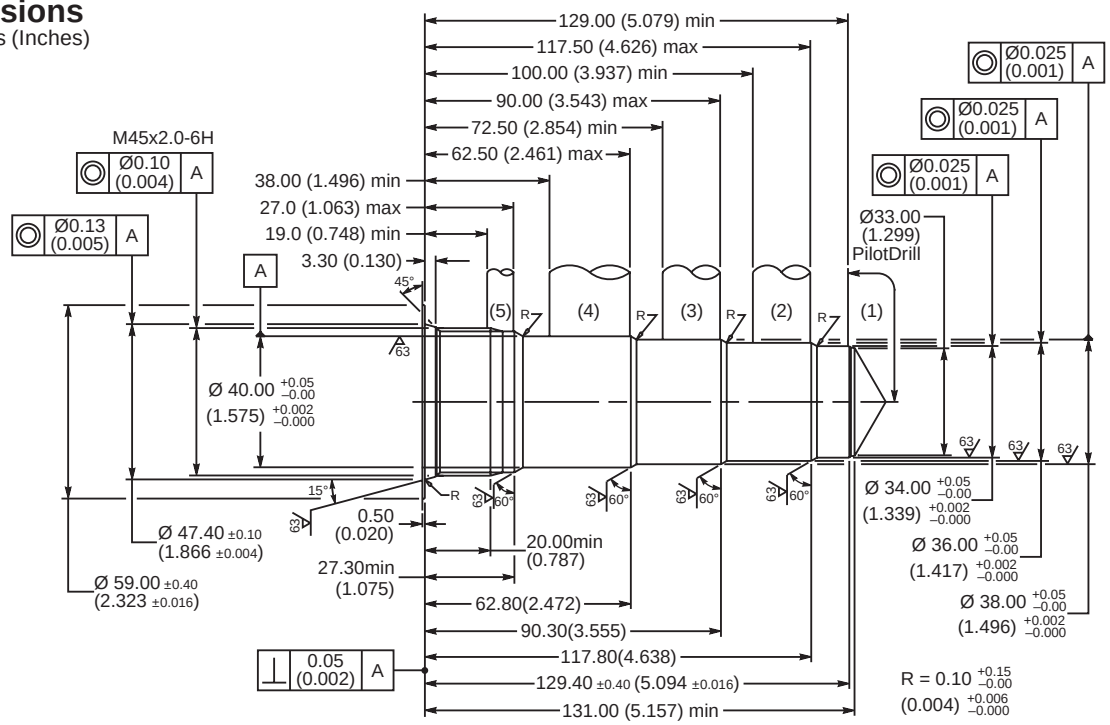
Code	Body Material
A	Aluminum
S	Steel

Cavity Tooling For 91-1	
Pilot Drill Ø	35.00 (1.378)
Step Drill	8DS31332
Reamer (Alum)	8RM31032A
Reamer (Steel	8RM31032S
Counterbore	8CB31118
Tap	8TP31213

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10		
Line Body	Port Size	Body Material

Code	Port Size
316	1-1/4 BSP (Main) 3/8 BSP (Aux)
317	1-1/4 SAE (Main) 3/8 SAE (Aux)

Code	Body Material
A	Aluminum
S	Steel

Cavity Tooling (100-1 Cavity)	
Pilot Drill Ø	33.00 (1.30)
Step Drill	8DS31350
Reamer (Alum)	8RM31050A
Reamer (Steel	8RM31050S
Counterbore	8CB31119
Tap	8TP31218

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PAGE

DESCRIPTION	PAGE NO.
Basic Hydraulic Formulas	TD1
Ratings and Testing	TD1
Temperature Ratings	TD1
Viscosity	TD1
Pressure Ratings	TD1
Thermal Shock	TD1
Service and Components	TD1
Limitations in Use	TD1
Seal Material Selection	TD2
Hydraulic Fluids	TD3
Hydraulic Filtration	TD3
Application of Product	TD3
Offer of Sale	TD4

INTRODUCTION

In this section you will find a variety of technical information pertinent to general hydraulics as well as cartridge valve technology.

HYDRAULIC FORMULAS

Below are a few of the common hydraulic formulas to assist you in calculating the requirements for your system:

Voltage = *Current × Resistance*

Flow = *Volume ÷ Unit of Time*

Pressure = *Force ÷ Area*

Horsepower = *Flow × Pressure ÷ (1714 × Efficiency)*

$$\textbf{Hydraulic power (kW)} = \frac{\Delta p\ (Bar) \times flow\ rate\ (LPM)}{600}$$

where Δp = pressure drop

$$\textbf{Hydraulic power (HP)} = \frac{\Delta p\ (PSI) \times flow\ rate\ (GPM)}{1714}$$

RATINGS & TESTING

All Parker cartridge valve products have been performance tested with the results shown on the individual valve catalog pages. The performance data shown represents typical operation characteristics of the product. In addition, our valves are endurance tested. Validation is conducted by testing or similarity in designs.
Note: Not every cartridge option is endurance tested. In other words, one three way spool is endurance tested, and the others are assumed by similarity.

TEMPERATURE RATINGS

Product operating limits are broadly in the range -30°C to 150°C (-20°F to 300°F) but satisfactory operation within the specification may not be accomplished. Leakage and response will be affected when used at temperature extremes and it is the user's responsibility to determine acceptability at these levels.

Seals used in these products generally have the following temperature limitations:

Nitrile (Buna N)	-30°C to 100°C (-20°F to 210°F)
Fluorocarbon	-20°C to 150°C (-4°F to 300°F)
Hytrel	-54°C to 135°C (-65°F to 275°F)
GTPFE	-30°C to 150°C (-20°F to 300°F)

VISCOSITY

Catalog data is from tests conducted on mineral oil at a viscosity of 30 cSt (140 SSU) using an ISO VG:46 test fluid.

Product should ideally be used at viscosities in the range of 15 to 50 cSt (80 to 230 SSU).

Product will perform with reduced efficiency in the ranges, 5 to 15 cSt (42 to 80 SSU) and 50 to 500 cSt (230 to 2300 SSU). These extreme conditions must be evaluated by the user to establish suitability of the product's performance.

PRESSURE RATINGS

Unless otherwise stated, all Parker cartridges have a continuous duty pressure ratings as shown in the catalog. All pressure ratings are based on the cartridge valve only. Exposure to elevated pressures may affect the performance and fatigue life of the product. The material chosen for the body or carrier may affect the pressure rating we recommend. Parker does not recommend the use of cartridge valves in aluminum bodies at pressures above 207 bar (3000 psi).

THERMAL SHOCK

It is unreasonable to expect product to withstand rapid temperature changes - this could affect both performance and life and care should be taken to protect the product from such situations.

SERVICE & COMPONENTS

One of the advantages of integrated hydraulic circuits is their serviceability. Should a valve need to be replaced for any reason, a user only needs to unscrew the valve from the manifold and screw the replacement into the cavity. As such, there are few replacement parts available for the Parker cartridge products. As with any hydraulic system, the operator should bleed off any trapped pressure and consult machine service manuals prior to service. Parker does not offer any service parts for internal components, but external components such as coils, knobs, and seals are available.

LIMITATIONS IN USE

Parker cartridge valves are designed for a wide variety of industrial and mobile applications. Despite their flexibility, Parker Hannifin does not recommend or support the use of our cartridge valves in any on highway or aerospace applications. We also do not recommend our products for use in the transport of explosive products or in hazardous environments.

SEAL MATERIAL SELECTION

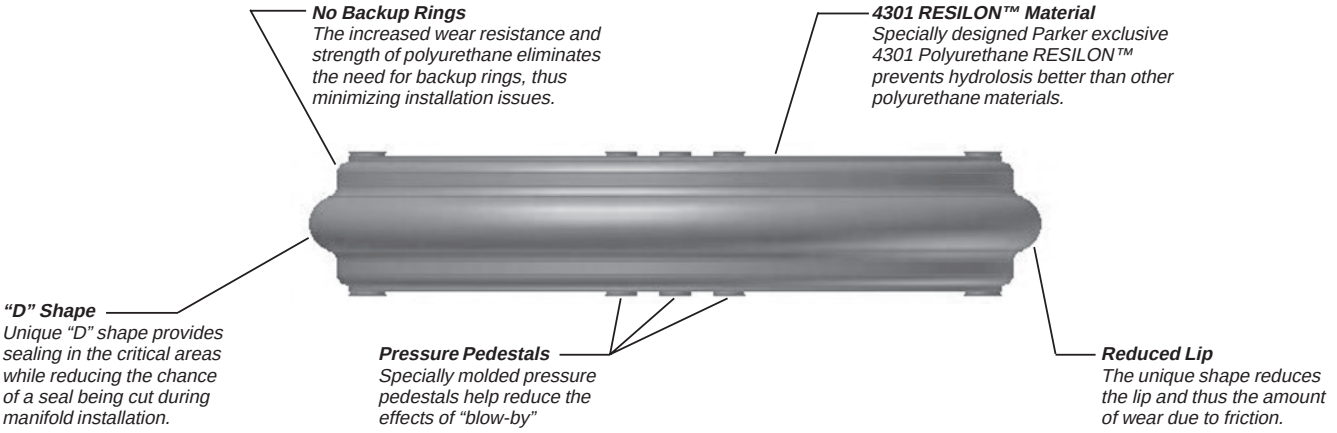
You should match the seal compatibility to the temperature and fluid being used in your application. Parker offers three seal materials to meet your application requirements. Parker's standard material is a 4301 Polyurethane RESILON™ material "D"-Ring. We also offer Fluorocarbon and Nitrile seals. A brief synopsis of each seal material is given below to help you choose the best seal for your application.

"D"-Ring (4301 Polyurethane RESILON™ Material)

The "D"-Ring is the standard seal material on the Winner's Circle threaded cartridge valves. The "D"-Ring is molded of a special 4301 Polyurethane RESILON™. Polyurethane materials exhibit better wear resistance and tensile strength than standard Nitrile or Fluorocarbon material. In addition, it has an excellent resistance to compression set. This increased strength eliminates the need for back-rings and simplifies installation.

The 4301 compound is a Parker exclusive material designed to prevent hydrolysis at high temperatures. Thus, the "D"-Ring outperforms standard polyurethane o-rings, especially when using high water content fluids at elevated temperatures. The "D"-Ring is compatible with most water-glycol, water/oil emulsions, and high grade petroleum based hydraulic fluids at temperatures between -45°C to +93°C (-50°F to +200°F)

The unique shape of the Parker "D"-Ring also provides a variety of design advantages. The seal is molded into a "D" shape where the seal is higher in the middle and lower on the ends. This prevents the seal edge from folding over on a corner inside the manifold during installation. In addition, this design has a minimal lip, thus, friction is reduced. Another unique feature of the "D"-Ring is its symmetrical design, resulting in no performance degradation from the reverse direction, or worry of backward installation. The "D"-Ring is also equipped with "pressure pedestals" to reduce the effects of "blow-by" common in reverse cycling. The pressure pedestals increase the sealing capability of the "D"-Ring, by reducing the radial pressure forces that compress the sealing face of the o-ring. The drawing below depicts the shape and highlights the features.



Nitrile

Nitrile o-rings are also compatible with most water-glycol, water/oil emulsions, and high grade petroleum based hydraulic fluids. Parker only recommends Nitrile o-rings for temperatures between -40°C to +93°C (-40°F to +200°F). Nitrile o-rings do require a full back-up ring, or two half back-ups.

Fluorocarbon

Fluorocarbon o-rings are compatible with most phosphate ester fluids and phosphate ester blends. Parker only recommends Fluorocarbon seals for temperatures between -32°C to +121°C (-25°F to +250°F). Fluorocarbon o-rings do require a full back-up ring, or two half back-ups.

HYDRAULIC FLUIDS

Parker recommends using top-quality mineral based or synthetic hydraulic fluids with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt) at 38°C (100°F). The absolute viscosity range 80 to 1000 SSU (16 to 220 cSt.). Fluids should have high anti-wear characteristics and be treated to protect against oxidation.

HYDRAULIC FILTRATION

Hydraulic systems that include Parker valves should be carefully protected against fluid contamination. The proper cleanliness level for Parker cartridge valves should be maintained at an ISO cleanliness level of 18/16/13.

75% of all system failures are a direct result of contamination. Contamination interferes with four functions of hydraulic fluids.

1. To act as an energy transmission medium.

2. To lubricate internal moving parts of components.

3. To act a heat transfer medium.

4. To seal clearances between moving components.

A properly selected filter will provide adequate protection and reduce operating cost. This is achieved by increasing the expected life of the valves and reducing the cost of maintenance and repairs. Operation will be smoother and more precise.

There is no direct correlation between using a specific ISO cleanliness classification. Numerous other variables should be considered such as particulate ingression, actual flow through filters, and filter location.

A number of interrelated system factors combine to determine proper media and filter combinations. To accurately determine which combination is ideal for your system, all these factors need to be accounted for. With the development of filtration sizing software such as Parker inPHorm, this information can be used to compute the optimal selection. In many instances the information available may be limited. In these cases, “rules of thumb” based on empirical data and proven examples are applied to get an initial starting point.

APPLICATION OF PRODUCT

CAUTION - It is important to note that the Parker Hydraulic Cartridge Systems Division makes a variety of valves, many of which fit into the same cavity. However, their functionality may differ considerably from one valve type to another. **Accordingly *fit* interchangeability does not necessarily mean *form* or *function* interchangeability.** Users should ensure that the appropriate valve is installed in the cavity by cross checking the part number stamped on the valve with that published in approved service literature or in the installation drawing.

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