



Check valves offer optional bias springs and flow capacities up to 380 lpm (100 gpm). Pilot-operated check valves are available for flows up to 95 lpm (25 gpm).

Lock valves with thermal reliefs and sealed pistons are available for flows up to 30 lpm (8 gpm).

Load shuttle check valves offer flows up to 30 lpm (8 gpm).

Low biased (hot oil) shuttle valves are available for flows up to 132 lpm (35 gpm). Models are available with or without spring-centered spool.

Spool-type and poppet-type logic elements offer multiple function with a wide range of application potential, from controlling the rate of shift, to low pressure drop. Models are available for flows up to 280 lpm (74 gpm).

Pilot-operated spool-type directional control valves offer a wide variety of flow path configurations. A simple two-position two-way valve to a three-position four-way valve can be actuated by a remote pilot signal. Models are available for flows up to 265 lpm (70 gpm). PE series valves offer proportional control when the pilot signal pressure is controlled. Operating pressure can be up to 240 bar (3500 psi)

Manual spring-return directional valves feature poppet or spool construction with optional rotational lock position. Models are available for flows up to 57 lpm (15 gpm).

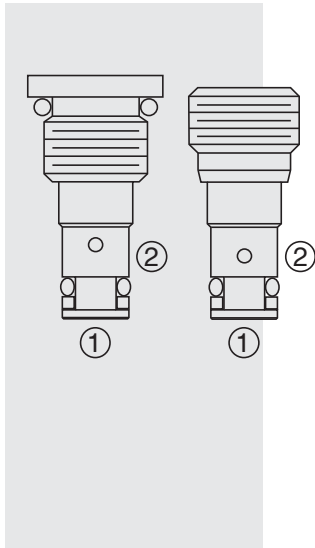
Manual rotary directional valves with multiple spool options feature low manual effort under high pressure loads.

Spring-applied brake release valves are available in two versions.

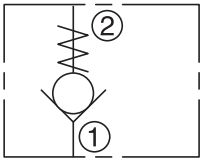
Hall-effect spool position sensors are available on PD series valves.

- Check valves for blocking or load holding.
- Pilot operated valves for remote actuation.
- Logic elements for multi-function applications.
- Manual spring-return or pressure actuated models.
- Pilot-operated valves for control of spool shift rate.
- Proportional directional control valves offer excellent metering characteristics.
- Operating pressures to 240 bar (3500 psi).
- Hardened precision poppets, spools and cages for long life and low leakage.
- Industry common cavities—compact sizes.
- Can be used to create innovative circuitry options.
- Manual rotary valve handles, knob kits available in friction lock or detent.

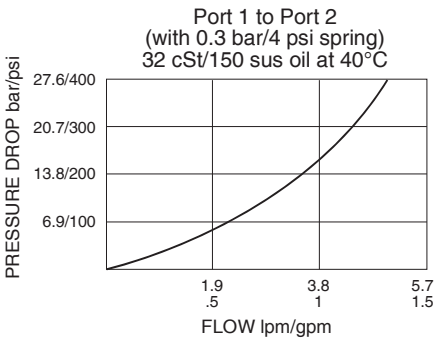
CV04-20 & CV04-B20 Check Valves



ISO SYMBOL



PERFORMANCE (Cartridge Only)



DESCRIPTION

A screw-in, cartridge-style, hydraulic check valve for use as a blocking or load-holding device. Available in conventional surface mount or convenient “down-hole” versions.

OPERATION

The **CV04-20** and **CV04-B20** allow flow passage from 1 to 2, while normally blocking oil flow in the opposite direction.

The cartridge has a fully guided check which is spring-biased closed until sufficient pressure is applied at 1 to open to 2.

FEATURES

- Hardened seat for long life and low leakage.
- Optional bias springs for back-pressure application flexibility.
- Fully guided check assembly.
- Miniature size.
- Fast closing and seating.

RATINGS

Operating Pressure: 241.3 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: 0.10 cc/minute (2 drops/minute) max. at 206.8 bar (3000 psi)

Crack Pressure Defined: Gauge psi evident at 1 at 16.4 cc/minute (1 cu. in./minute) attained

Standard Bias Springs at Crack: 0.34 bar (5 psi)

Temperature: -40° to 120°C (-40° - 248°F)

Filtration: Recommend 25µ nominal or better; See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions

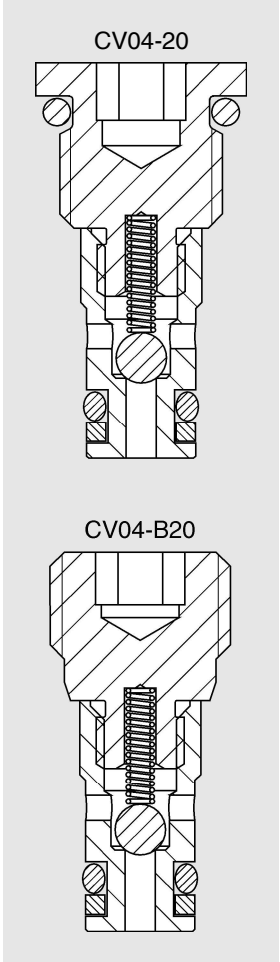
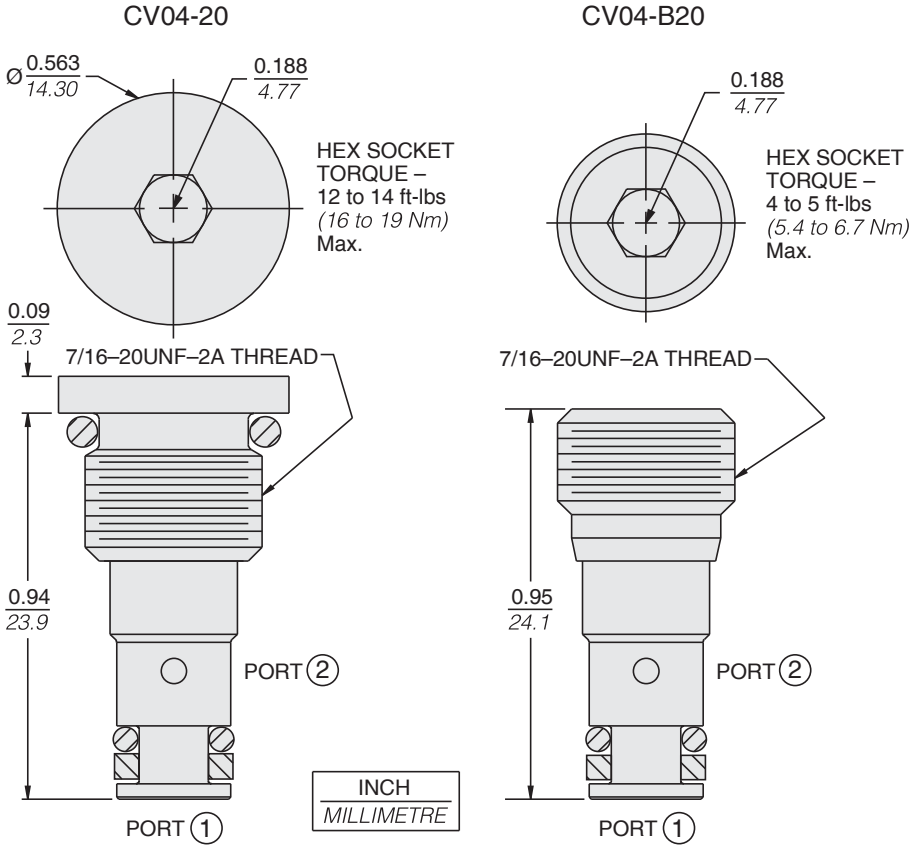
Cavity: VC04-2 or VC04-B2; See page 9.104.1

Cavity Tool: CT04-2xx or CT-B3xx; See page 8.600.1

Seal Kit: For CV04-20: SK04-2X-T; For CV04-B20: SK04-B2X-T

CV04-20 & CV04-B20

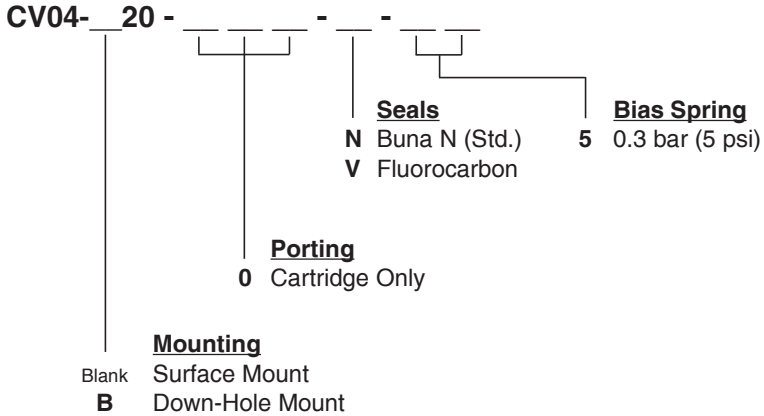
DIMENSIONS



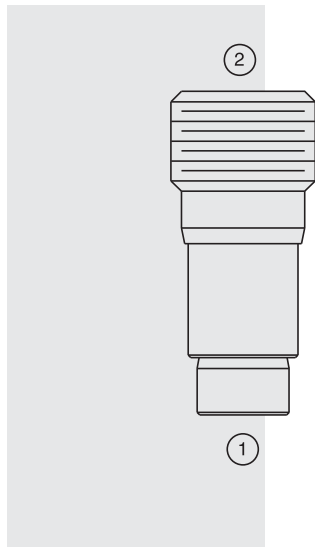
MATERIALS

Cartridge: Weight: 0.05 kg. (0.12 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and back-up standard.

TO ORDER



CV06-B20 Check Valve



DESCRIPTION

A screw-in, cartridge-style, hydraulic check valve for blocking or load-holding.

OPERATION

The **CV06-B20** allows flow from 1 to 2, while normally blocking flow in the opposite direction. The cartridge is spring-biased closed until sufficient pressure is applied at 1 to open to 2.

FEATURES

- Hardened seat for long life and low leakage.
- Fully guided check assembly.
- Small size.
- Fast closing and seating.

RATINGS

Operating Pressure: 345 bar (5000 psi)

Proof Pressure: 690 bar (10,000 psi)

Burst Pressure: greater than 828 bar (12,000 psi)

Flow: up to 7.6 lpm (2 gpm)

Internal Leakage: 0.10 cc/minute (2 drops/minute) max. at 34.5 bar (500 psi) and 345 bar (5000 psi) from port 1, port 2, inlet

Operating Temperature: -54°C to 107°C (-65°F to 225°F)

Filtration: Recommend 25µ nominal or better; See page 9.010.1

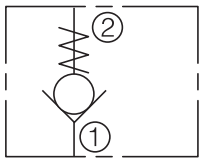
Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions

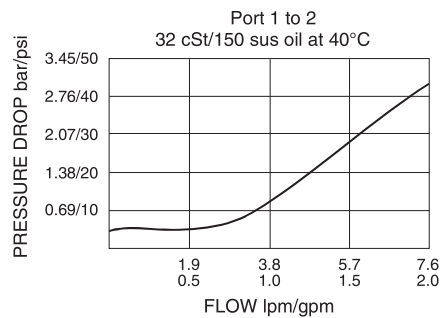
Cavity: VC06-B2; See page 9.106.1

Cavity Tool: CT06-B2xx; See page 8.600.1

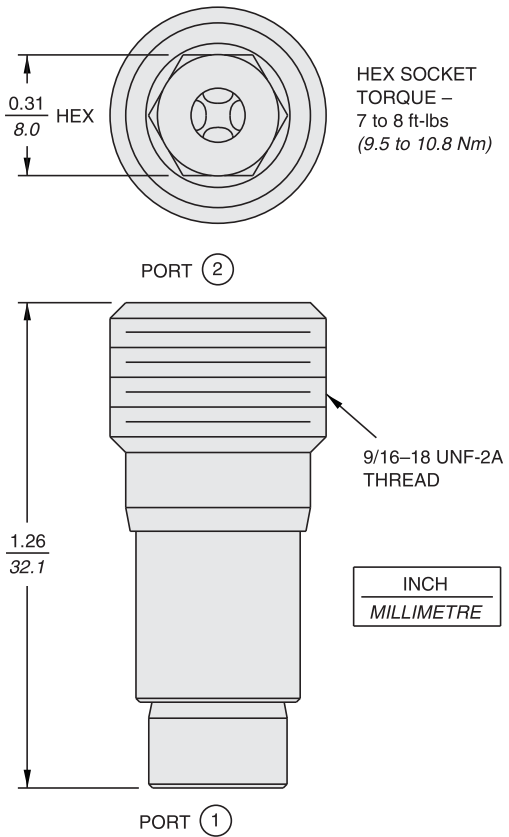
SYMBOL



PERFORMANCE (Cartridge Only)



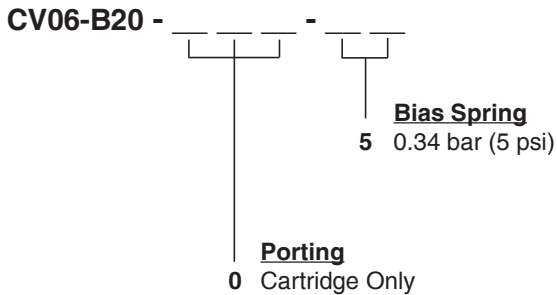
DIMENSIONS



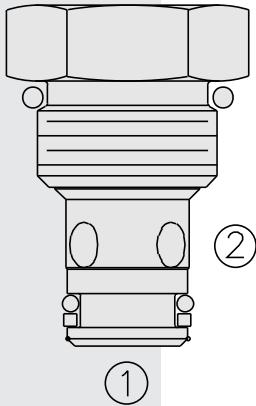
MATERIALS

Cartridge: Weight: 0.023 kg. (0.05 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.

TO ORDER



CV08-20 Check Valve



DESCRIPTION

A screw-in, cartridge-style, hydraulic check valve for use as a blocking or load-holding device.

OPERATION

The CV08-20 allows flow passage from 1 to 2, while normally blocking oil flow in the opposite direction.

The cartridge has a fully guided check which is spring-biased closed until sufficient pressure is applied at 1 to open to 2.

FEATURES

- Hardened seat for long life and low leakage.
- Optional bias springs for back-pressure application flexibility.
- Fully guided check assembly.
- Compact size.
- Fast closing and seating.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: See Performance Chart

Internal Leakage: 0.10 cc/minute (2 drops/minute) max. at 240 bar (3500 psi)

Crack Pressure Defined: Gauge psi evident at 1 at 16.4 cc/minute (1 cu. in./minute) attained

Standard Bias Springs at Crack: 0.3 bar (4 psi); 0.7 bar (10 psi); 1.7 bar (25 psi); 4.1 bar (60 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

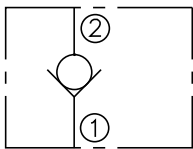
Cavity: VC08-2; See page 9.108.1

Cavity Tool: CT08-2XX; See page 8.600.1

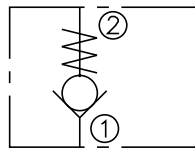
Seal Kit: SK08-2X-T; See page 8.650.1

SYMBOLS

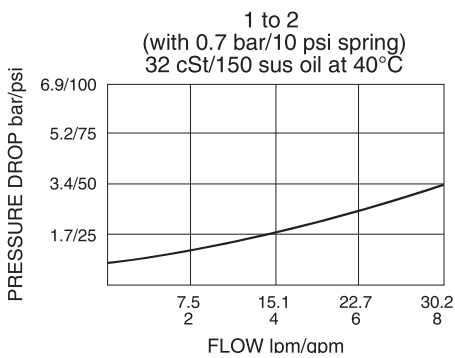
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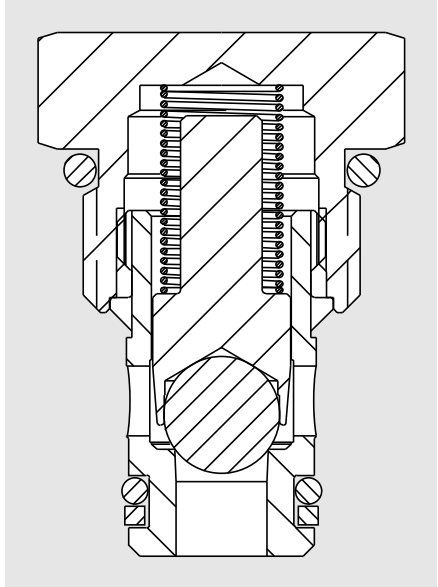
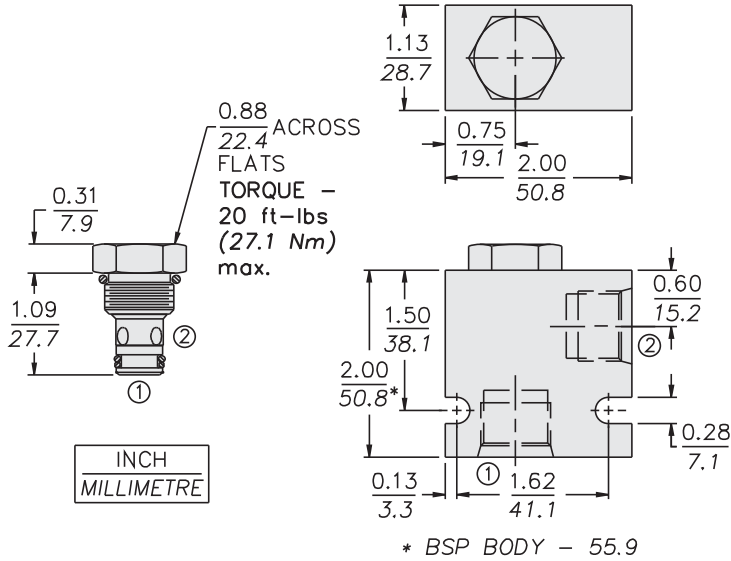
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.08 kg. (0.17 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and back-up standard.

Standard Ported Body: Weight:
0.16 kg. (0.35 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.008.1

TO ORDER

CV08-20 - - -

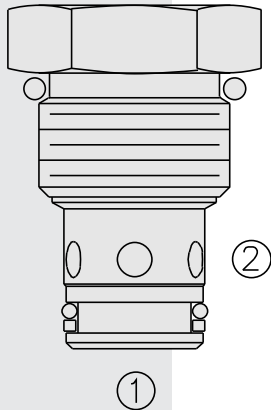
<p>Porting</p> <p>Cartridge Only 0</p> <p>SAE 4 4T</p> <p>SAE 6 6T</p> <p>1/4 in. BSP* 2B</p> <p>3/8 in. BSP* 3B</p> <p>1/2 in. BSP* 4B</p> <p>*BSP Body; U.K. Mfr. Only</p>	<p>Bias Spring</p> <p>4 0.3 bar (4 psi)</p> <p>10 0.7 bar (10 psi)</p> <p>25 1.7 bar (25 psi)</p> <p>60 4.1 bar (60 psi)</p> <p>100 6.9 bar (100 psi)</p> <p>150 10.3 bar (150 psi)</p> <p>200 13.8 bar (200 psi)</p> <p>270 18.3 bar (270 psi)</p>
---	--

Seals

N Buna N (Std.)

V Fluorocarbon

CV10-20 Check Valve



DESCRIPTION

A screw-in, cartridge-style, hydraulic check valve for use as a blocking or load-holding device.

OPERATION

The CV10-20 allows flow passage from 1 to 2, while normally blocking oil flow in the opposite direction.

The cartridge has a fully guided check which is spring-biased closed until sufficient pressure is applied at 1 to open to 2.

FEATURES

- Hardened seat for long life and low leakage.
- Optional bias springs for back-pressure application flexibility.
- Fully guided check assembly.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: 75.8 lpm (20 gpm)

Internal Leakage: 0.10 cc/minute (2 drops/minute) max. at 240 bar (3500 psi)

Crack Pressure Defined: Gauge psi evident at 1 at 16.4 cc/minute (1 cu. in./minute) attained

Standard Bias Springs at Crack: 0.34 bar (5 psi); 1 bar (15 psi); 2.1 bar (30 psi); 4.8 bar (70 psi); 6.9 bar (100 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

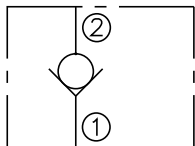
Cavity: VC10-2; See page 9.110.1

Cavity Tool: CT10-2XX; See page 8.600.1

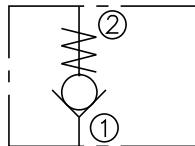
Seal Kit: SK10-2X-T; See page 8.650.1

SYMBOLS

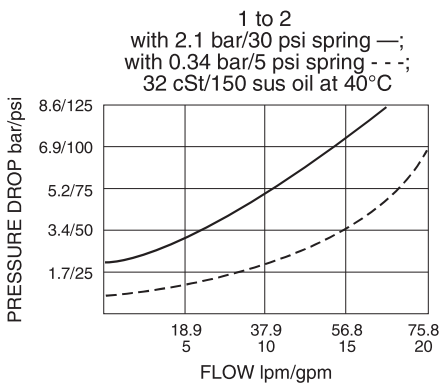
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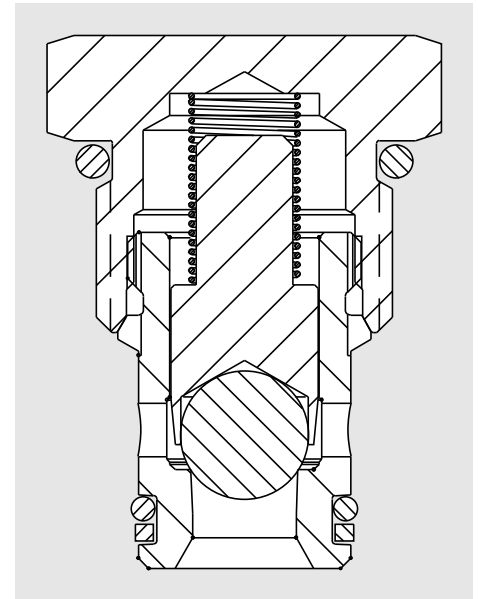
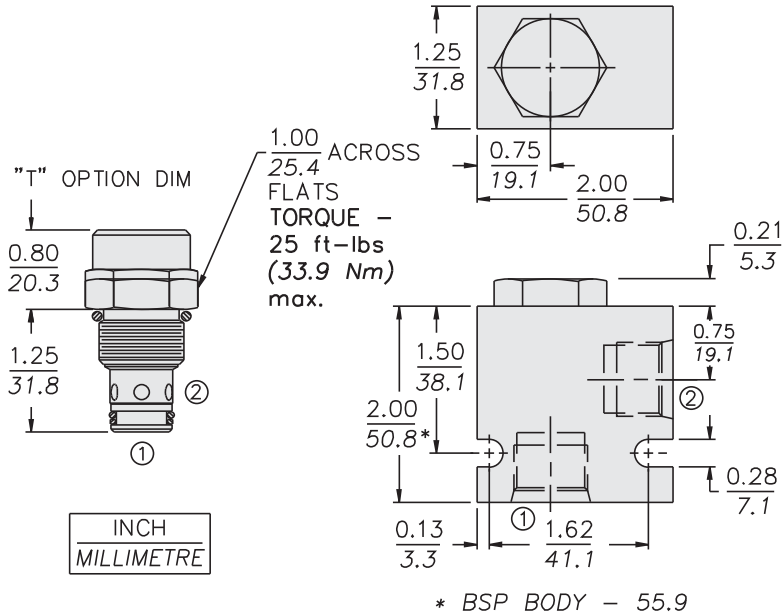
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

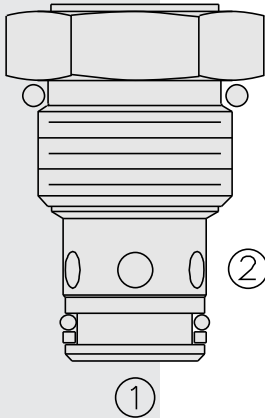
Cartridge: Weight: 0.08 kg. (0.17 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
0.16 kg. (0.35 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.010.1

TO ORDER

CV10-20 -	-	-	-	-	-	-
	"T" Option*	Porting				Bias Spring
	T	Cartridge Only 0				2 0.14 bar (2 psi)
		SAE 6 6T				5 0.34 bar (5 psi)
		SAE 8 8T				15 1 bar (15 psi)
		1/4 in. BSP* 2B				30 2.1 bar (30 psi)
		3/8 in. BSP* 3B				40 2.8 bar (40 psi)
		1/2 in. BSP* 4B				70 4.8 bar (70 psi)
						100 6.9 bar (100 psi)
						200 13.6 bar (200 psi)
						300 20.4 bar (300 psi)*
						*Requires "T" Option
						Seals
						N Buna N (Std.)
						V Fluorocarbon
						P Polyurethane

CV50-20 Check Valve, High Pressure



DESCRIPTION

A screw-in, cartridge-style, hydraulic check valve for use as a blocking or load-holding device for high pressure applications.

OPERATION

The CV50-20 allows flow passage from 1 to 2, while normally blocking oil flow in the opposite direction.

The cartridge has a fully guided check which is spring-biased closed until sufficient pressure is applied at 1 to open to 2.

FEATURES

- Hardened seat for long life and low leakage.
- Optional bias springs for back-pressure application flexibility.
- Fully guided check assembly.
- Industry common cavity.

RATINGS

Operating Pressure: 345 bar (5000 psi)

Flow: See Performance Chart

Internal Leakage: 0.10 cc/minute (2 drops/minute) max. at 345 bar (5000 psi)

Crack Pressure Defined: Gauge psi evident at 1 at 16.4 cc/minute (1 cu. in./minute) attained

Standard Bias Springs at Crack: 0.34 bar (5 psi); 1 bar (15 psi); 2.1 bar (30 psi); 4.8 bar (70 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

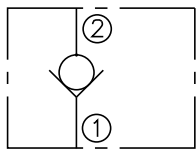
Cavity: VC10-2; See page 9.110.1

Cavity Tool: CT10-2XX; See page 8.600.1

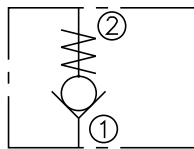
Seal Kit: SK10-2P-T; See page 8.650.1

SYMBOLS

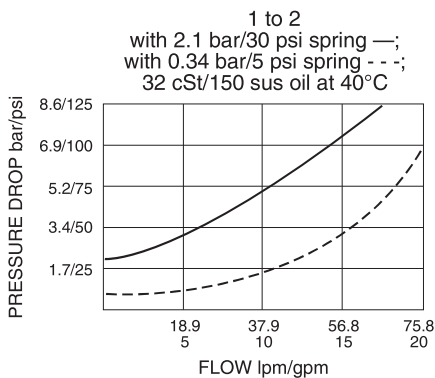
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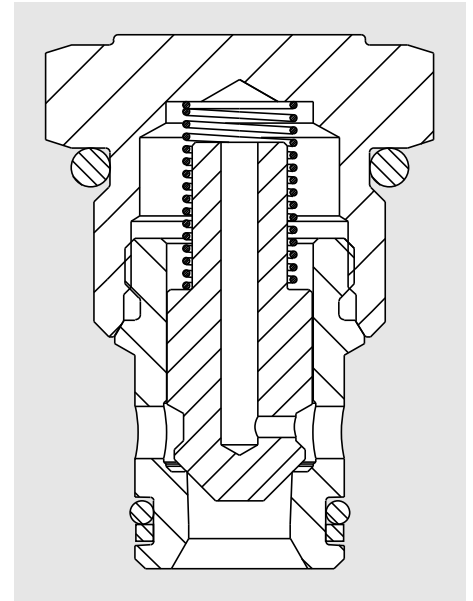
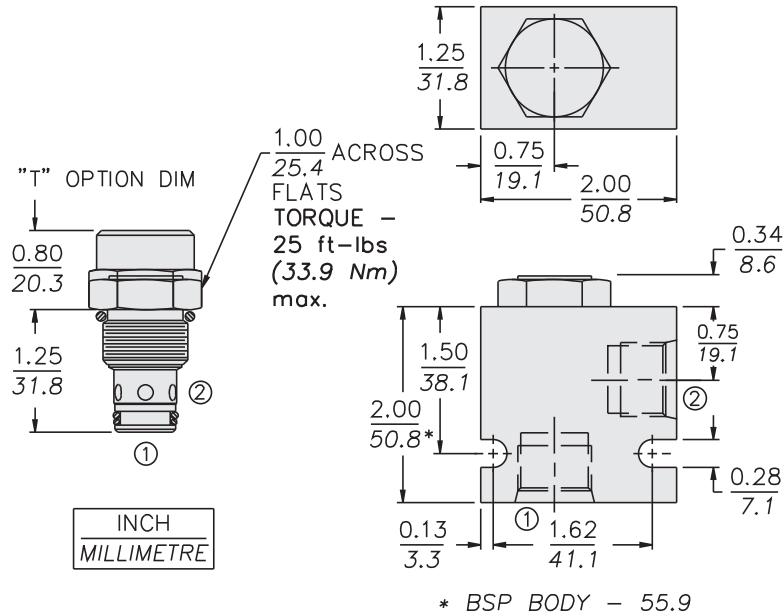
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.08 kg. (0.17 lbs.)
Steel with hardened work surfaces;
Zinc-plated exposed surfaces.
Polyurethane O-rings and
Fluorocarbon back-ups standard.

Ported Body: Weight: 0.43 kg.
(0.95 lbs.) Ductile Iron (code "D")
standard, consult factory for
weight, dimensions may differ;
rated to 345 bar (5000 psi).
See page 8.010.1.

TO ORDER

CV50-20 -

"T" Option*

*Required for
300 psi Spring

T

Porting

Cartridge Only **0**
SAE 6 **6TD**
SAE 8 **8TD**
1/4 in. BSP* **2BD**
3/8 in. BSP* **3BD**

*BSP Body;
U.K. Mfr. Only

Bias Spring

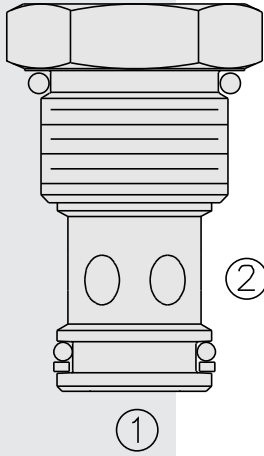
5 0.34 bar (5 psi)
15 1 bar (15 psi)
30 2.1 bar (30 psi)
70 4.8 bar (70 psi)
100 6.9 bar (100 psi)
300 20.4 bar (300 psi)*

*Requires "T" Option

Seals

P Polyurethane (Std.)

CV12-20 Check Valve



DESCRIPTION

A screw-in, cartridge-style, hydraulic check valve for use as a blocking or load-holding device.

OPERATION

The CV12-20 allows flow passage from 1 to 2, while normally blocking oil flow in the opposite direction.

The cartridge has a fully guided check which is spring-biased closed until sufficient pressure is applied at 1 to open to 2.

FEATURES

- Hardened seat for long life and low leakage.
- Optional bias springs for back-pressure application flexibility.
- Fully guided check assembly.
- Cost effective cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 420 bar (6090 psi)

Flow: See Performance Chart

Internal Leakage: 0.25 cc/minute (5 drops/minute) max. at 240 bar (3500 psi)

Crack Pressure Defined: Gauge bar (psi) evident at 1 at 16.4 cc/minute (1 cu. in./minute) attained

Standard Bias Springs at Crack: 0.34 bar (5 psi); 1.7 bar (25 psi); 4.1 bar (60 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

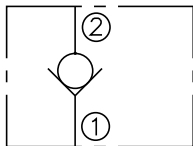
Cavity: VC12-2; See page 9.112.1

Cavity Tool: CT12-2XX; See page 8.600.1

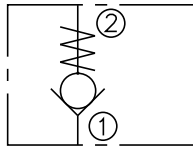
Seal Kit: SK12-2X-T; See page 8.650.1

SYMBOLS

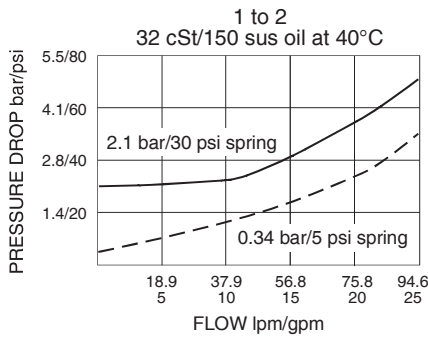
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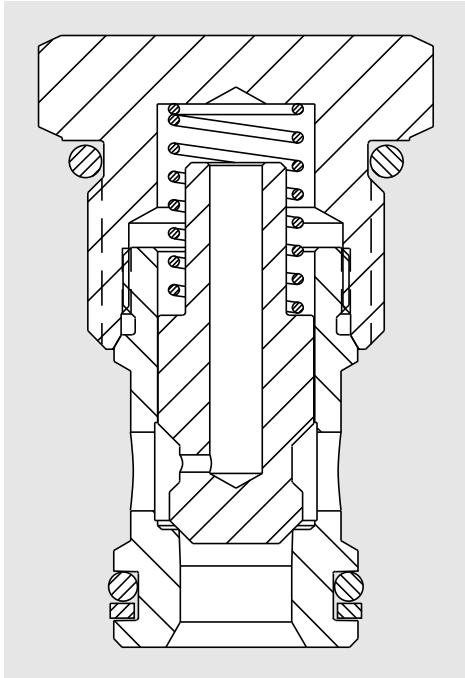
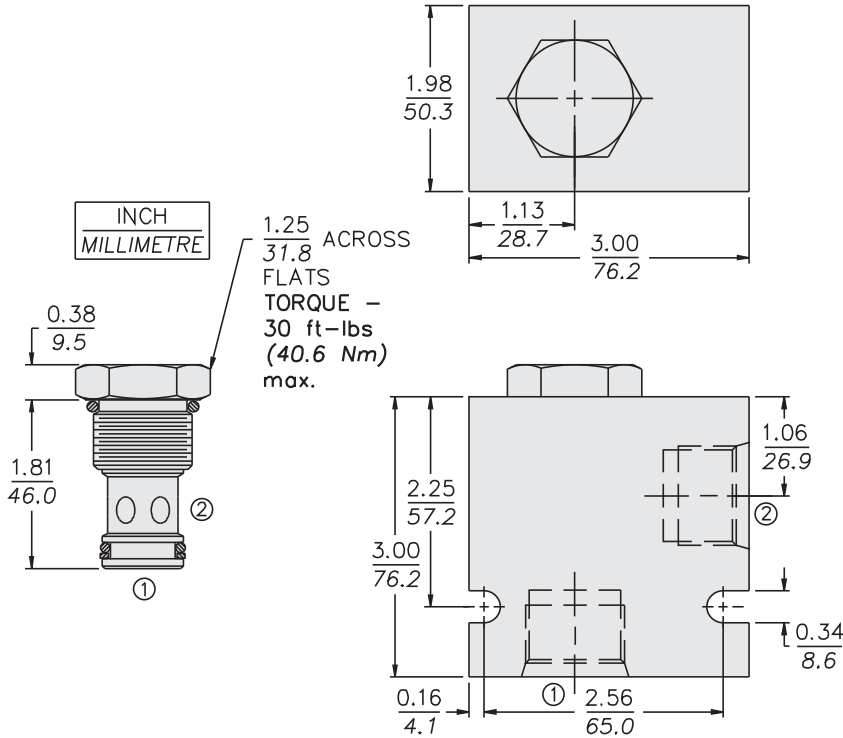
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.18 kg. (0.40 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
0.57 kg. (1.25 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.012.1

TO ORDER

CV12-20 -

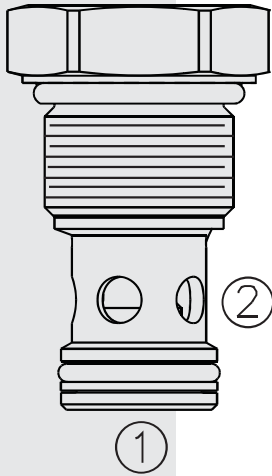
Porting	0	Bias Spring*
Cartridge Only	0	5 0.34 bar (5 psi)
SAE 10	10T	25 1.7 bar (25 psi)
SAE 12	12T	30 2.1 bar (30 psi)
SAE 16	16T	60 4.1 bar (60 psi)

*Additional springs in development;
Consult factory.

Seals

- N** Buna N (Std.)
- V** Fluorocarbon

HCV12-20 HyPerformance™ Check Valve



DESCRIPTION

A screw-in, cartridge-style, hydraulic check valve for use as a blocking or load-holding device for high pressure applications.

OPERATION

The HCV12-20 allows flow passage from 1 to 2, while normally blocking oil flow in the opposite direction.

The cartridge has a fully guided check which is spring-biased closed until sufficient pressure is applied at 1 to open to 2.

FEATURES

- Hardened seat for long life and low leakage.
- Optional bias springs for back-pressure application flexibility.
- Fully guided check assembly.
- Cost effective cavity.
- All HyPerformance products are tested to the rigorous standards of the NFPA specification T2.6.1.
- All HyPerformance valves are tested at a verification level of 90% and an assurance of 99%.

RATINGS

Operating Pressure: 350 bar (5075 psi) 10% cycle life: 420 bar (6090 psi)

Fatigue Rating: Two million cycles at 420 bar (6090 psi)

Cycle Life: One million cycles

Proof Pressure: 420 bar (6090 psi)

Burst Pressure: 1380 bar (20000 psi)

Flow: 95 lpm (25 gpm)

Internal Leakage: 0.25 ml/minute (5 drops/minute) max. at 350 bar (5075 psi)

Operating Temperature: -54° to 107°C (-65° to 225°F) with PPDI Urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

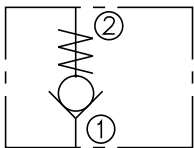
Installation: No restrictions; See page 9.020.1

Cavity: HVC12-2; See page 9.112.1

Cavity Tool: HCT12-2XX; See page 8.600.1

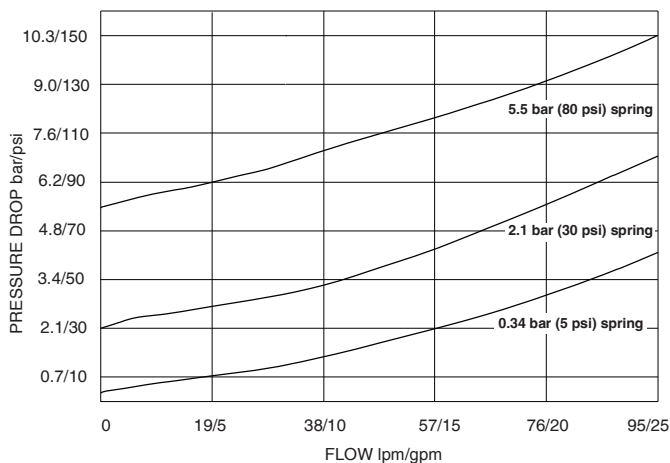
Seal Kit: SK12-2U-0; See page 8.650.1

ISO SYMBOL

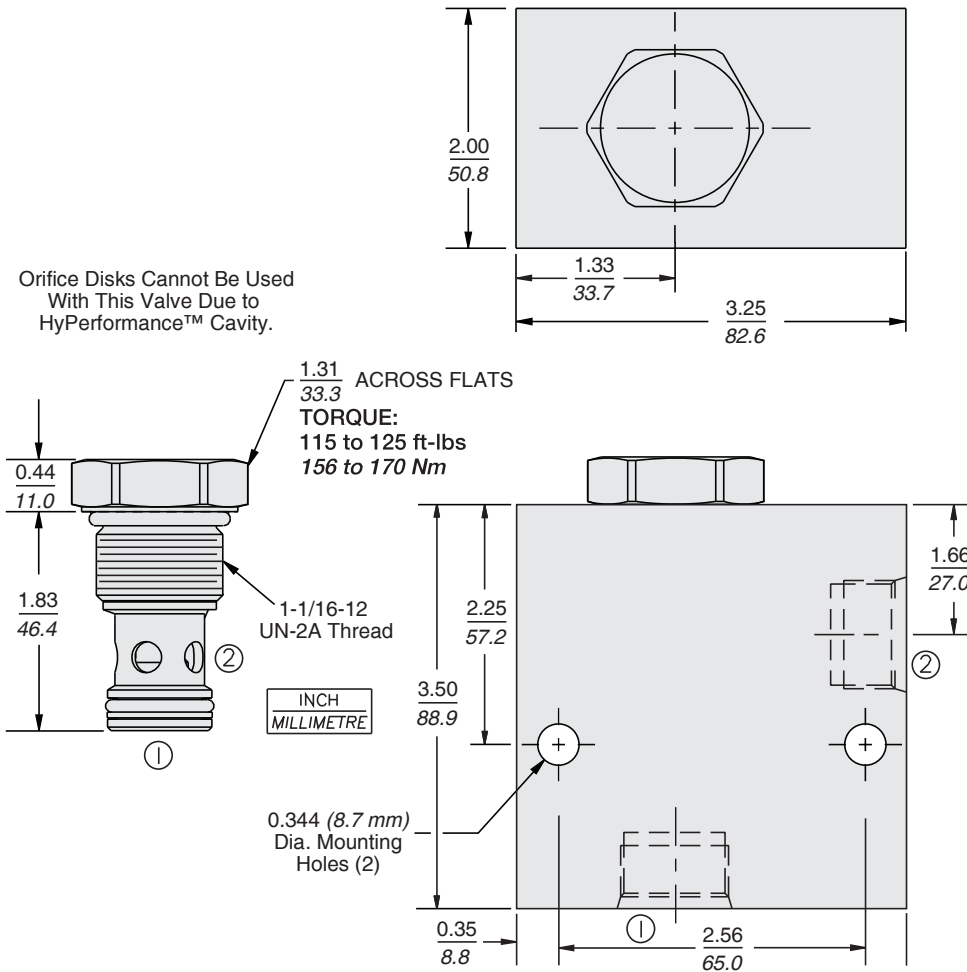


PERFORMANCE (Cartridge Only)

PRESSURE DROP vs. FLOW
32 cSt Oil at 40°C (104°F)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.18 kg. (0.40 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
PPDI urethane seals without back-ups standard.

Standard Ported Body: Weight:
2.74 kg. (6.05 lbs.) HyPerformance™
Ductile iron (code 'D') standard.
Rated to 345 bar (5000 psi).

TO ORDER

HCV12-20 -

Porting
Cartridge Only **0**
1 in. BSP* **8BD**
SAE 16 **16TD**

*BSP Body; U.K. Mfr. Only

Bias Spring*

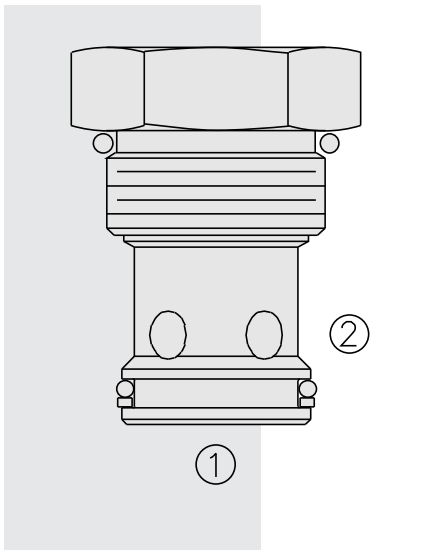
5 0.34 bar (5 psi)
25 1.7 bar (25 psi)
30 2.1 bar (30 psi)
40 2.8 bar (40 psi)
50 3.4 bar (50 psi)
60 4.1 bar (60 psi)
80 5.5 bar (80 psi)

Seals

U PPDI Urethane - Recommended for pressures above 241 bar (3500 psi)

NOTE: Additional seal options available. Consult factory.

CV16-20 Check Valve



DESCRIPTION

A screw-in, cartridge-style, hydraulic check valve for use as a blocking or load-holding device.

OPERATION

The CV16-20 allows flow from 1 to 2, while blocking oil flow in the opposite direction. The cartridge has a fully guided poppet which is spring-biased to closed until sufficient pressure is applied at 1 to open to 2.

FEATURES

- Hardened seat for long life and low leakage.
- Optional bias springs for back-pressure application flexibility.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: See Performance Chart

Internal Leakage: 0.25 cc/minute (5 drops/minute) max. at 240 bar (3500 psi)

Crack Pressure Defined: Gauge pressure evident at 1 at 0.95 lpm (0.25 gpm) attained

Standard Bias Springs at Crack: 0.35 bar (5 psi); 1.7 bar (25 psi); 4.1 bar (60 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

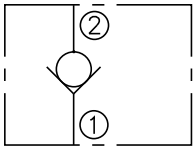
Cavity: VC16-2; See page 9.116.1

Cavity Tool: CT16-2XX; See page 8.600.1

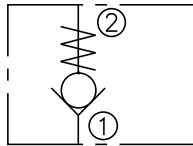
Seal Kit: SK16-2X-T; See page 8.650.1

SYMBOLS

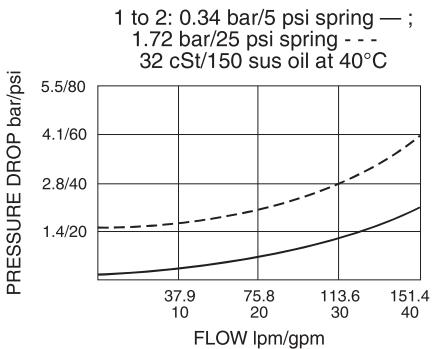
USASI:



ISO:

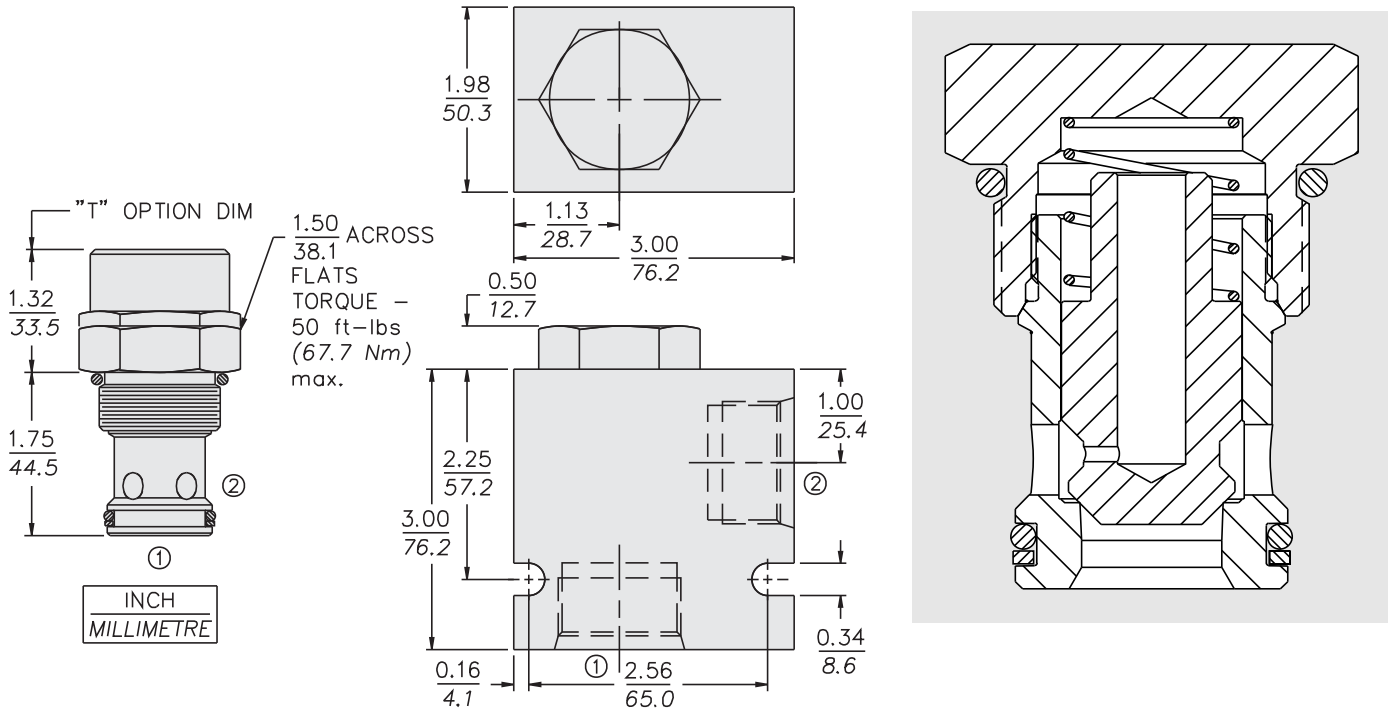


PERFORMANCE (Cartridge Only)



CV16-20

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.29 kg. (0.63 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.57 kg. (1.25 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.016.1

TO ORDER

CV16-20 - - - -

"T" Option* **T**

*Required for 100 or 150 psi spring.

Bias Spring (Crack)

- 5** 0.35 bar (5 psi)
- 25** 1.7 bar (25 psi)
- 60** 4.1 bar (60 psi)
- 100** 6.9 bar (100 psi)*
- 150** 10.3 bar (150 psi)*

*Requires "T" Option

Porting

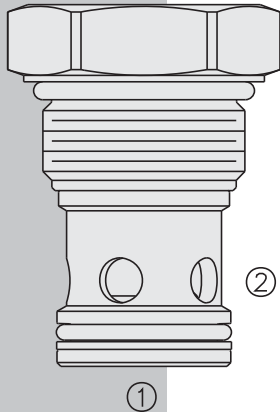
- Cartridge Only **0**
- SAE 12 **12T**
- SAE 16 **16T**
- 3/4 in. BSP* **6B**
- 1 in. BSP* **8B**

Seals

- N** Buna N (Std.)
- V** Fluorocarbon

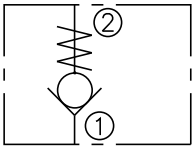
*BSP Body; U.K. Mfr. Only

HCV16-20 HyPerformance™ Check Valve

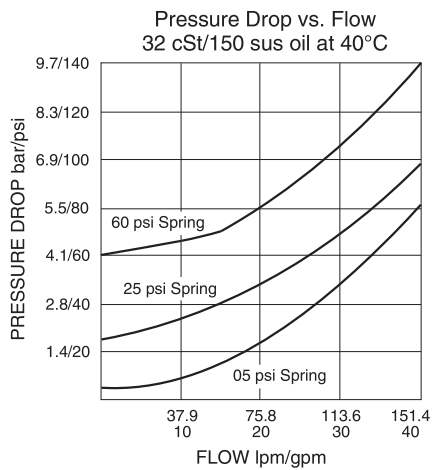


SYMBOLS

USASI/ISO:



PERFORMANCE (Cartridge Only)



DESCRIPTION

A screw-in, cartridge-style, hydraulic check valve for use as a blocking or load-holding device in high pressure applications.

OPERATION

The HCV16-20 allows flow from 1 to 2, while normally blocking flow in the opposite direction.

The cartridge has a fully guided poppet which is spring-biased to closed until sufficient pressure is applied at 1 to open to 2.

FEATURES

- Hardened seat for long life and low leakage.
- Optional bias springs for back-pressure application flexibility.
- All HyPerformance products are tested to the rigorous standards of the NFPA specification T2.6.1.
- All HyPerformance valves are tested at a verification level of 90% and an assurance of 99%.

RATINGS

Operating Pressure: 350 bar (5075 psi); 10% cycle life: 420 bar (6090 psi)

Note: All HyPerformance products are tested for 900K cycles at 350 bar and 100K at 420 bar.

Fatigue Rating: 2 million cycles at 420 bar

Burst Pressure: 1380 bar (20000 psi)

Flow: Up to 151 lpm (40 gpm)

Max. Internal Leakage: 0.25 cc/minute (5 drops/minute) at 350 bar (5075 psi)

Operating Temperature: -54 to 107°C (-65 to 225°F) with Urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

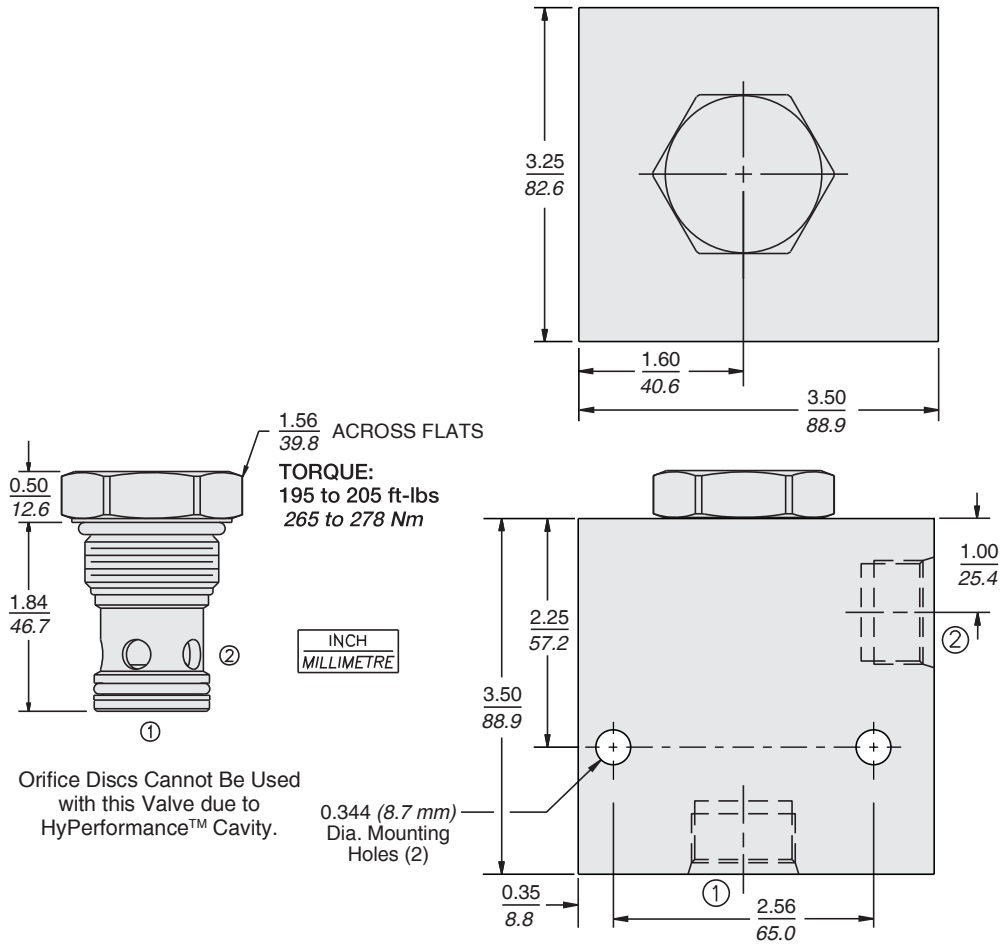
Installation: No restrictions; See page 9.020.1

Cavity: HVC16-2; See page 9.116.1

Cavity Tool: HCT16-2XX; See page 8.600.1

Seal Kit: SK16-2X-X; See page 8.650.1

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.32 kg. (0.70 lbs.)
Steel with hardened work surfaces.
Zinc-nickel plated exposed surfaces.
PPDI Urethane seals and no back-up rings standard.

Ported Body: Weight: 3.97 kg. (8.75 lbs.); HyPerformance™
Ductile iron (code 'D') standard.
Rated to 345 bar (5000 psi).

TO ORDER

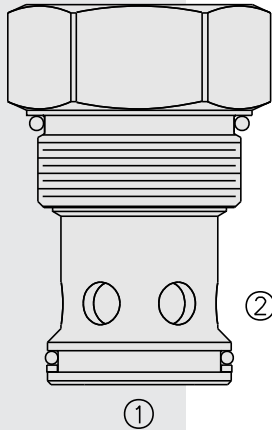
HCV16-20 - - -

<p>Porting Cartridge Only 0 SAE 16 16TD 1 in. BSP* 8BD <small>*BSP Body; U.K. Mfr. Only</small></p>	<p>Bias Spring Value 05 0.35 bar (5 psi) 08 0.6 bar (8 psi) 15 1.0 bar (15 psi) 25 1.7 bar (25 psi) 60 4.1 bar (60 psi)</p>
---	---

Seals
U PPDI Urethane

Note: PPDI Urethane seals are recommended for pressures over 241 bar (3500 psi).

CV42-M20 Check Valve



DESCRIPTION

A screw-in, cartridge-style, hydraulic check valve for use as a blocking or load-holding device.

OPERATION

The **CV42-M20** allows flow from 1 to 2, while blocking oil flow in the opposite direction.

The cartridge has a fully guided poppet which is spring-biased to closed until sufficient pressure is applied at 1 to open to 2.

FEATURES

- Hardened seat for long life and low leakage.
- Optional bias springs for back-pressure application flexibility.
- Conforms to ISO 7789 cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: See Performance Chart

Internal Leakage: 0.25 cc/minute (5 drops/minute) max. at 240 bar (3500 psi)

Crack Pressure Defined: Gauge pressure evident at 1 at 0.95 lpm (0.25 gpm) attained at 2

Standard Bias Springs at Crack: 0.35 bar (5 psi); 1.7 bar (25 psi); 4.1 bar (60 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

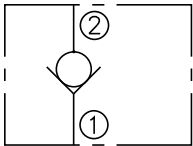
Cavity: VC42-M2 (ISO M42-2.0); See page 9.142.1

Cavity Tool: CT42-M2XX; See page 8.600.1

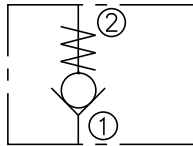
Seal Kit: SK42-M2X-T; See page 8.650.1

SYMBOLS

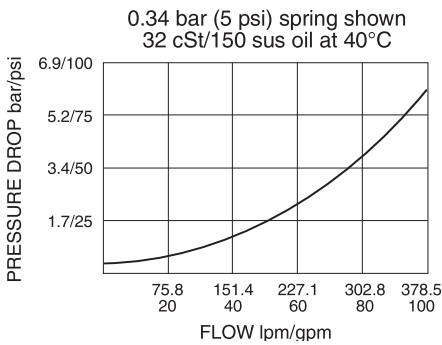
USASI:



ISO:

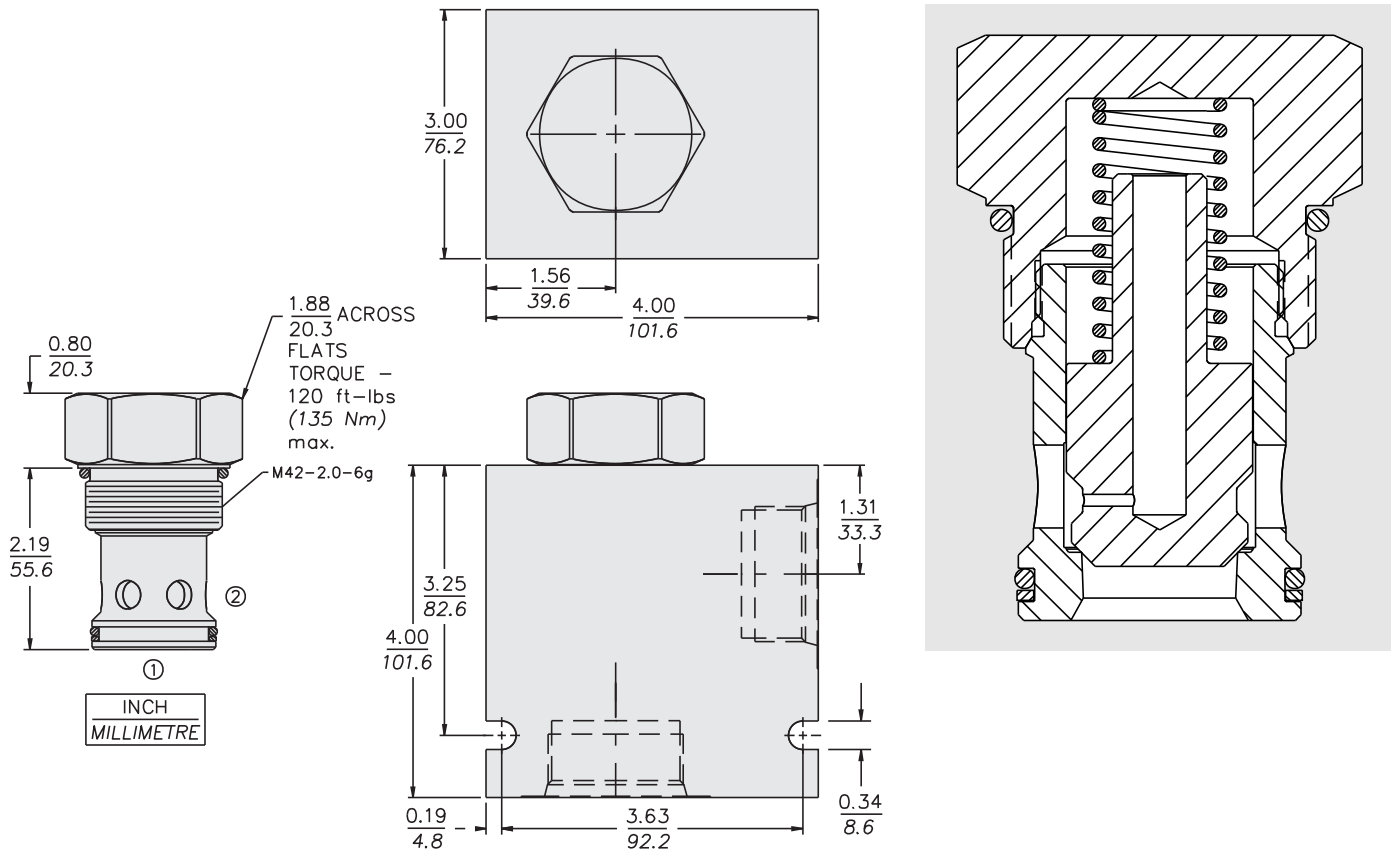


PERFORMANCE (Cartridge Only)



CV42-M20

DIMENSIONS

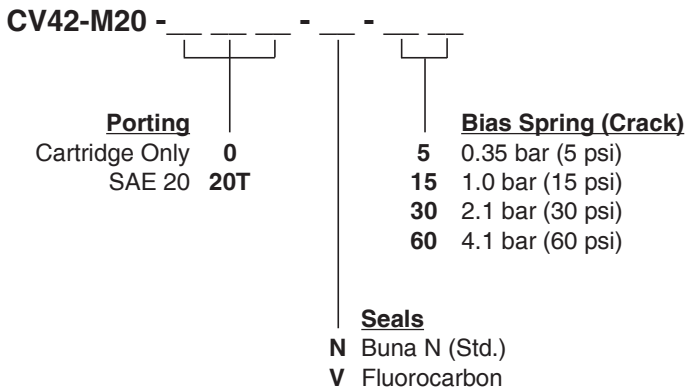


MATERIALS

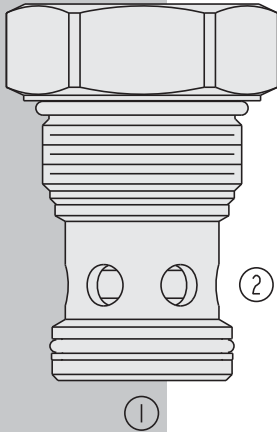
Cartridge: Weight: 0.43 kg. (0.95 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 1.63 kg. (3.60 lbs.)
 Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.042.1

TO ORDER



HCV42-M20 HyPerformance™ Check Valve



DESCRIPTION

A screw-in, cartridge-style, hydraulic check valve for use as a blocking or load-holding device in high pressure applications.

OPERATION

The HCV42-M20 allows flow from 1 to 2, while blocking flow in the opposite direction.

The cartridge has a fully guided poppet which is spring-biased to closed until sufficient pressure is applied at 1 to open to 2.

FEATURES

- Hardened seat for long life and low leakage.
- Optional bias springs for back-pressure application flexibility.
- All HyPerformance products are tested to the rigorous standards of the NFPA specification T2.6.1.
- All HyPerformance valves are tested at a verification level of 90% and an assurance of 99%.

RATINGS

Operating Pressure: 350 bar (5075 psi); 10% cycle life: 420 bar (6090 psi)

Note: All HyPerformance products are tested for 900K cycles at 350 bar and 100K at 420 bar.

Fatigue Rating: 2 million cycles at 420 bar

Burst Pressure: 1380 bar (20000 psi)

Flow: 303 lpm (80 gpm)

Max. Internal Leakage: 0.25 cc/minute (5 drops/minute) at 350 bar (5075 psi)

Operating Temperature: -54 to 107°C (-65 to 225°F) with Urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

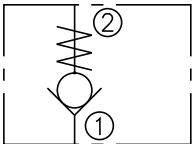
Cavity: HVC42-M2; See page 9.142.1

Cavity Tool: HCT42-M2XX; See page 8.600.1

Seal Kit: SK42-M2X-X; See page 8.650.1

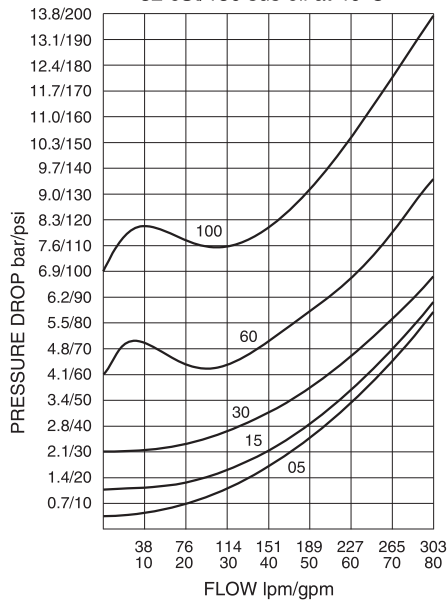
SYMBOLS

USASI/ISO:

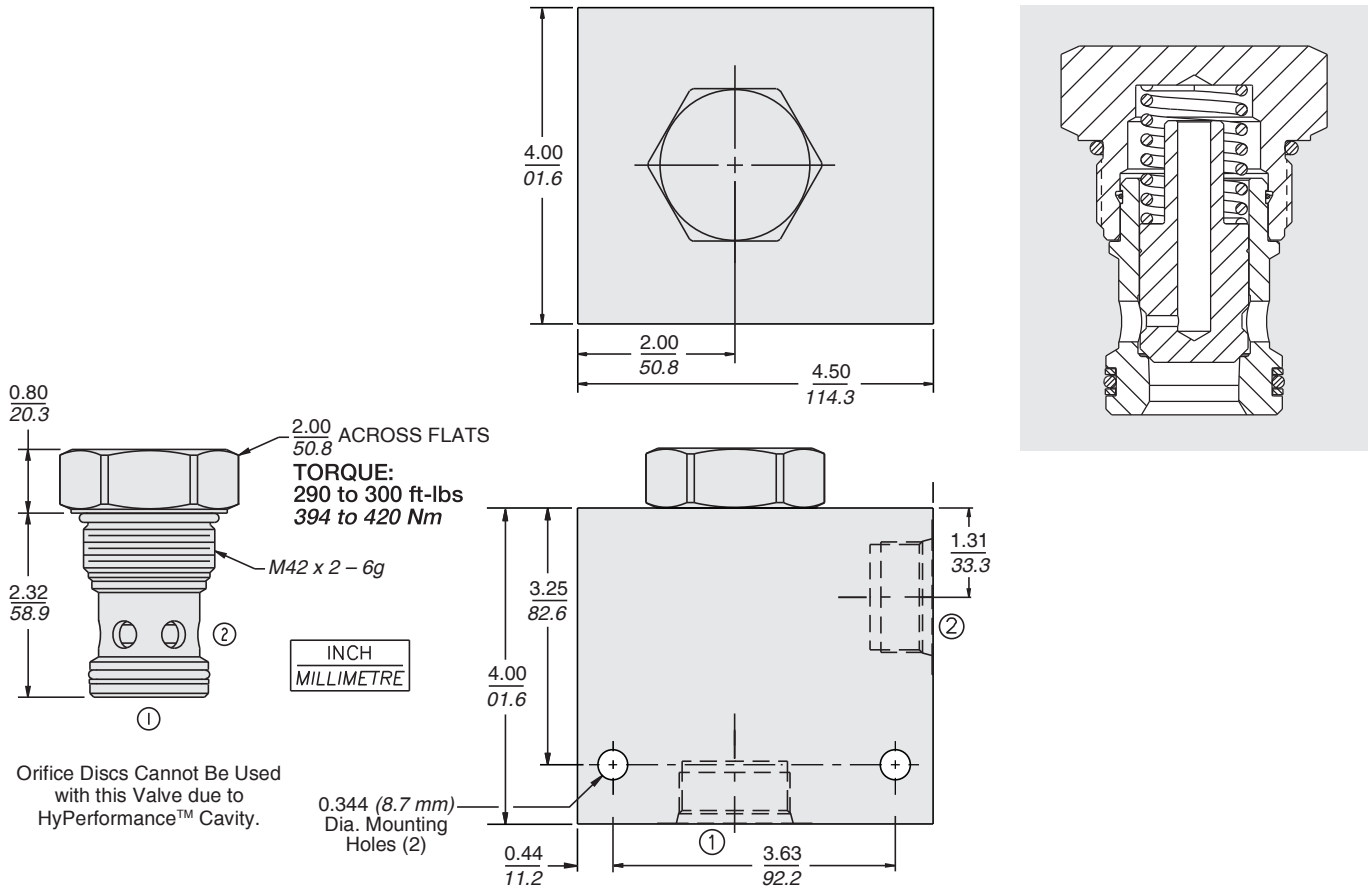


PERFORMANCE (Cartridge Only)

Pressure Drop vs. Flow for each Spring Code Option
32 cSt/150 sus oil at 40°C



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.68 kg. (1.50 lbs.)
Steel with hardened work surfaces.
Zinc-nickel plated exposed surfaces.
PPDI Urethane seals with no backup rings standard.

Ported Body: Weight: 7.21 kg. (15.89 lbs.); HyPerformance™
Ductile iron (code 'D') standard.
Rated to 345 bar (5000 psi).

TO ORDER

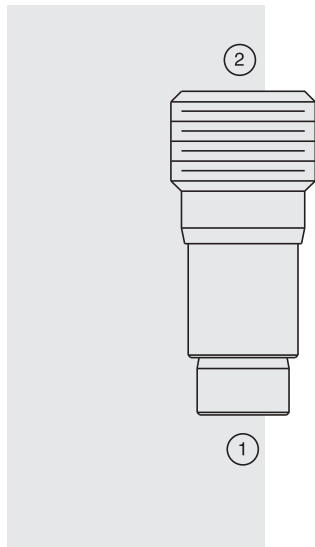
HCV42-M20 - - -

Porting	0	Bias Spring Value	5
Cartridge Only	SAE 20	15	30
	1-1/4 in. BSP*	60	100
	*BSP Body; U.K. Mfr. Only		

Seals

U PPDI Urethane — Recommended for pressures above 241 bar (3500 psi)

CV06-B21 Check Valve



DESCRIPTION

A screw-in, cartridge-style, hydraulic check valve for blocking or load-holding.

OPERATION

The CV06-B21 allows flow from 2 to 1, while normally blocking flow in the opposite direction. The cartridge is spring-biased closed until sufficient pressure is applied at 2 to open to 1.

FEATURES

- Hardened seat for long life and low leakage.
- Fully guided check assembly.
- Small size.
- Fast closing and seating.

RATINGS

Operating Pressure: 345 bar (5000 psi)

Proof Pressure: 690 bar (10,000 psi)

Burst Pressure: greater than 828 bar (12,000 psi)

Flow: up to 7.6 lpm (2 gpm)

Internal Leakage: 0.10 cc/minute (2 drops/minute) max. at 34.5 bar (500 psi) and 345 bar (5000 psi) from port 1, port 2, inlet

Operating Temperature: -54°C to 107°C (-65°F to 225°F)

Filtration: Recommend 25µ nominal or better; See page 9.010.1

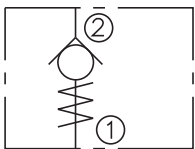
Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions

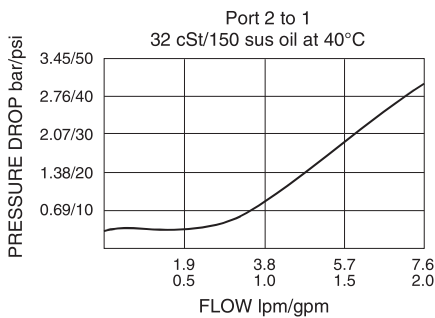
Cavity: VC06-B2; See page 9.106.1

Cavity Tool: CT06-B2xx; See page 8.600.1

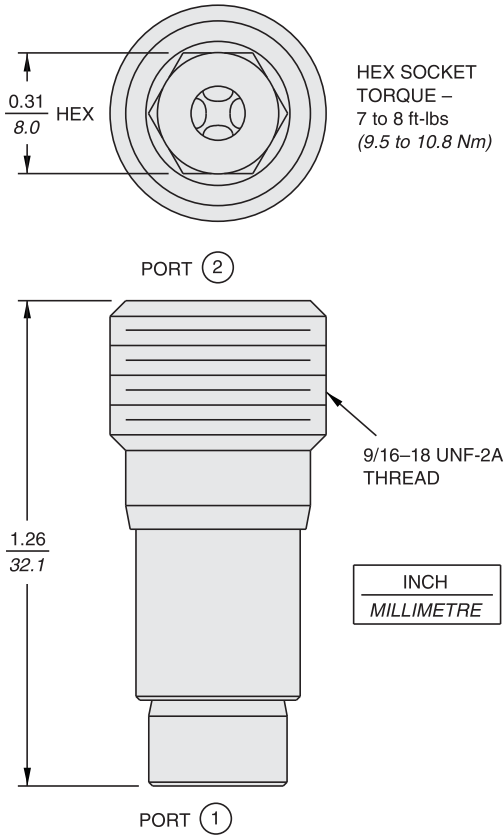
SYMBOL



PERFORMANCE (Cartridge Only)



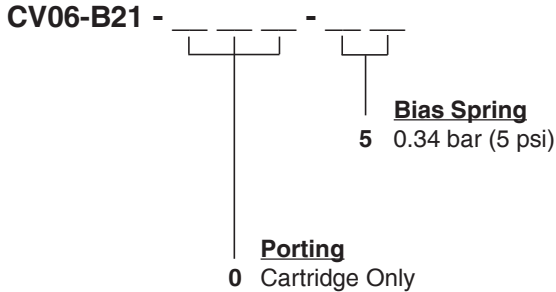
DIMENSIONS



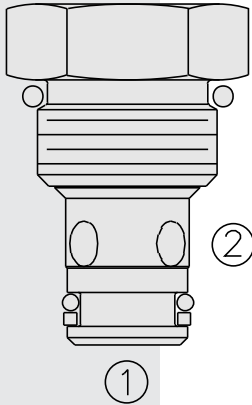
MATERIALS

Cartridge: Weight: 0.023 kg. (0.05 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.

TO ORDER



CV08-21 Check Valve



DESCRIPTION

A screw-in, cartridge-style, hydraulic check valve for use as a blocking or load-holding device.

OPERATION

The CV08-21 allows flow passage from 2 to 1, while normally blocking oil flow in the opposite direction.

The cartridge has a fully guided poppet which is spring-biased closed until sufficient pressure is applied at 2 to open to 1.

FEATURES

- Hardened seat for long life and low leakage.
- Fully guided poppet.
- Compact size.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: 0.25 cc/minute (5 drops/minute) max. at 240 bar (3500 psi)

Crack Pressure Defined: Gauge bar (psi) evident at 2 at 16.4 cc/minute (1 cu. in./minute) attained

Standard Bias Spring at Crack: 2.1 bar (30 psi) nominal. Actual cracking pressure may vary from 1.9 to 2.8 bar (27 to 40 psi); valves which are not actuated for a period of time may initially crack at higher than subsequent cracking pressures.

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

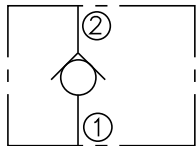
Cavity: VC08-2; See page 9.108.1

Cavity Tool: CT08-2XX; See page 8.600.1

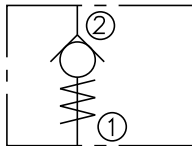
Seal Kit: SK08-2X-B; See page 8.650.1

SYMBOLS

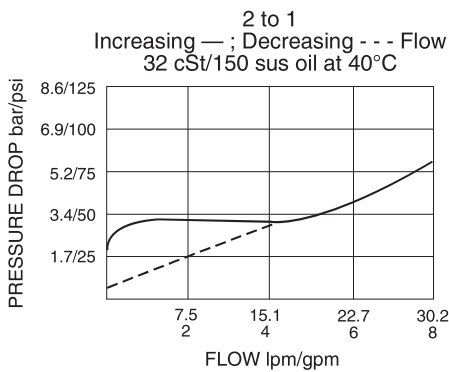
USASI:



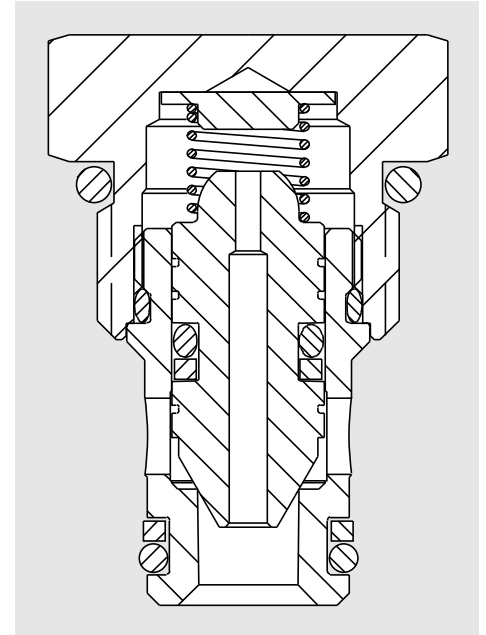
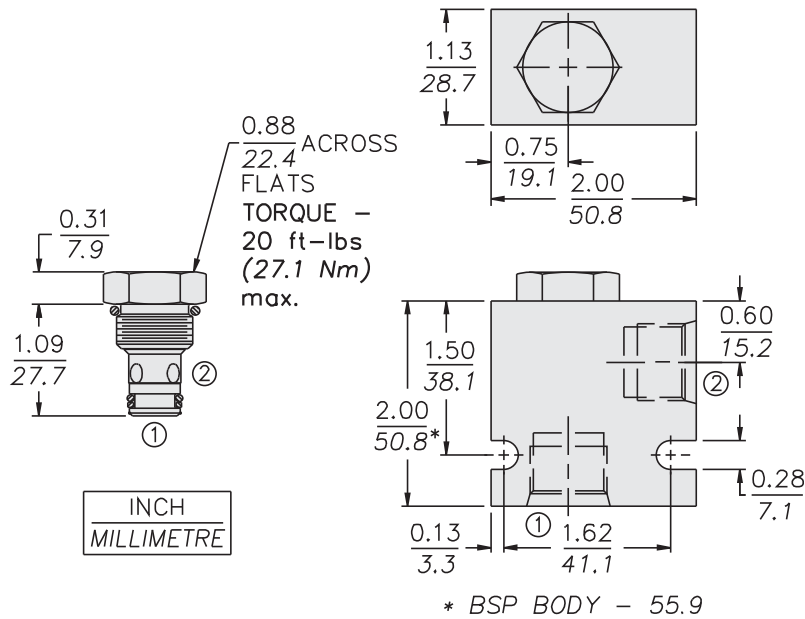
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

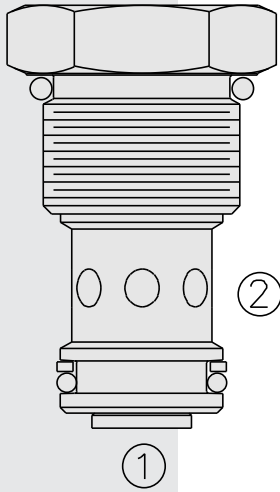
Cartridge: Weight: 0.05 kg. (0.12 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and back-up standard.

Standard Ported Body: Weight:
0.16 kg. (0.35 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.008.1

TO ORDER

CV08-21 -		- 30
	Porting	Standard Bias Spring
Cartridge Only	0	30 2.07 bar (30 psi)
	SAE 4 4T	
	SAE 6 6T	
	1/4 in. BSP* 2B	
	3/8 in. BSP* 3B	
	1/2 in. BSP* 4B	
	Seals	
	N Buna N (Std.)	
	V Fluorocarbon	
	*BSP Body; U.K. Mfr. Only	

CV12-21 Check Valve



DESCRIPTION

A screw-in, cartridge-style, hydraulic check valve for use as a blocking or load-holding device.

OPERATION

The CV12-21 allows flow passage from 2 to 1, while blocking flow from 1 to 2. The cartridge has a fully guided check which is spring-biased closed until sufficient pressure is applied at 2 to open to 1.

FEATURES

- Low check mass for anti-cavitation applications.
- Hardened seat for long life and low leakage.
- Optional bias springs for back-pressure application flexibility.
- Cost-effective cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: 0.25 cc/minute (5 drops/minute) max. at 240 bar (3500 psi)

Crack Pressure Defined: Gauge bar (psi) evident at 2 at 16.4 cc/minute (1 cu. in./minute) attained at 1

Standard Bias Springs at Crack: 0.4 bar (6 psi); 1.8 bar (26 psi); 3.8 bar (56 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: See note in dimension drawing regarding minimum pilot drill diameter

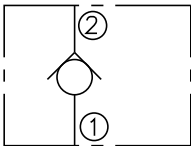
Cavity: VC12-2 (Cavity Variation "A"); See page 9.112.1

Cavity Tool: CT12-2XX; See page 8.600.1

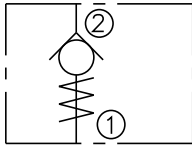
Seal Kit: SK12-2X-B; See page 8.650.1

SYMBOLS

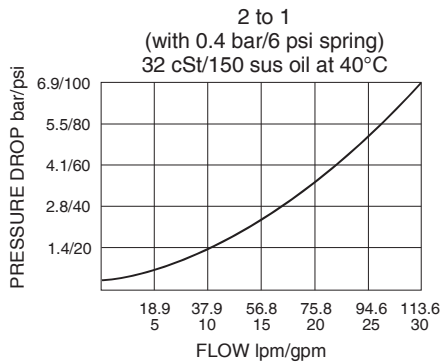
USASI:



ISO:

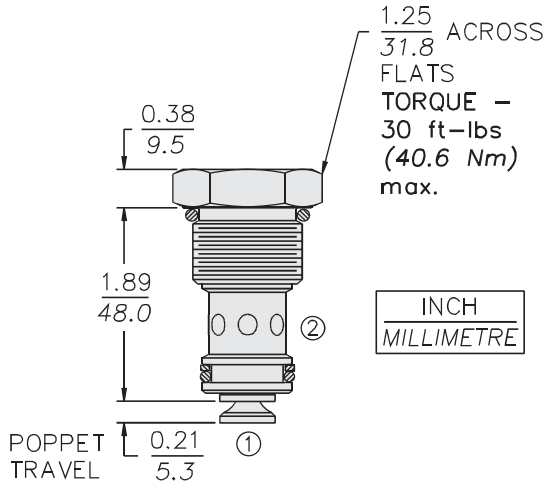


PERFORMANCE (Cartridge Only)

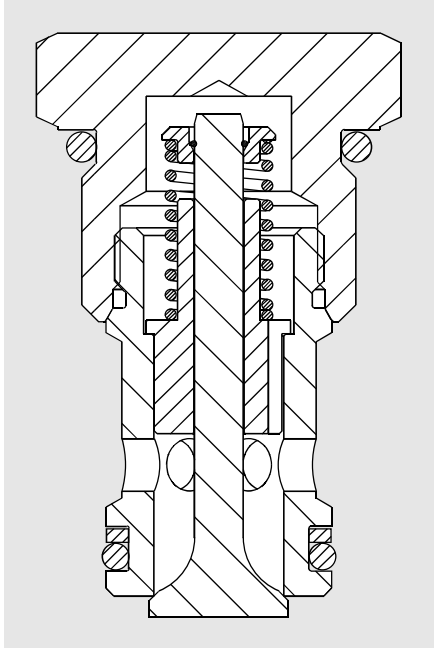


CV12-21

DIMENSIONS



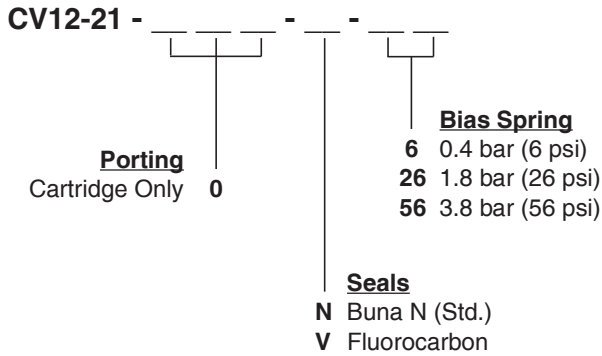
ORIFICE DISCS MAY NOT BE
USED WITH THIS PRODUCT.



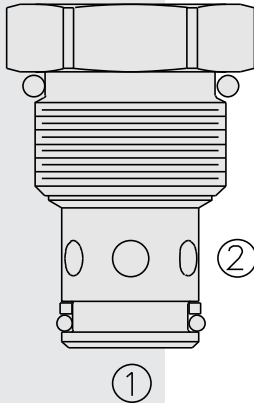
MATERIALS

Cartridge: Weight: 0.18 kg. (0.40 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-up standard.

TO ORDER



CV10-24 Check Valve



DESCRIPTION

A screw-in, cartridge-style, hydraulic check valve for use as a blocking or load-holding device.

OPERATION

The CV10-24 allows flow passage from 2 to 1, while blocking flow from 1 to 2. The cartridge has a fully guided check which is spring-biased closed until sufficient pressure is applied at 2 to open to 1.

FEATURES

- Low check mass for anti-cavitation applications.
- Hardened seat for long life and low leakage.
- Optional bias springs for back-pressure application flexibility.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: 0.25 ml/minute (5 drops/minute) max. at 241 bar (3500 psi)

Crack Pressure Defined: Gauge psi evident at 2 at 16.4 cc/minute (1 cu. in./minute) attained at 1

Standard Bias Springs at Crack: 0.35 bar (5 psi); 1.7 bar (25 psi); 3.8 bar(55 psi)

Temperature: -40° to 120°C (-40°F to 250°F with Buna N seals; -35°C to 204°C (-31°F to 400°F) with Viton seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

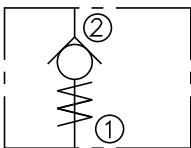
Installation: No restrictions; See page 9.020.1

Cavity: VC10-2; See page 9.110.1

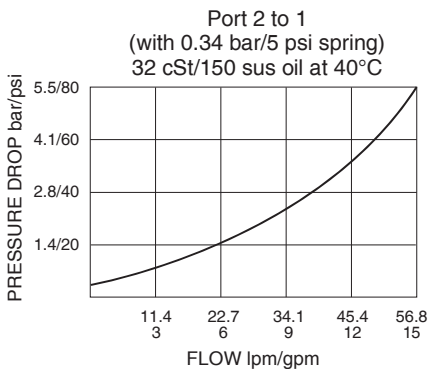
Cavity Tool: CT10-2XX; See page 8.600.1

Seal Kits: SK10-2X-B; See page 8.650.1

ISO SYMBOL

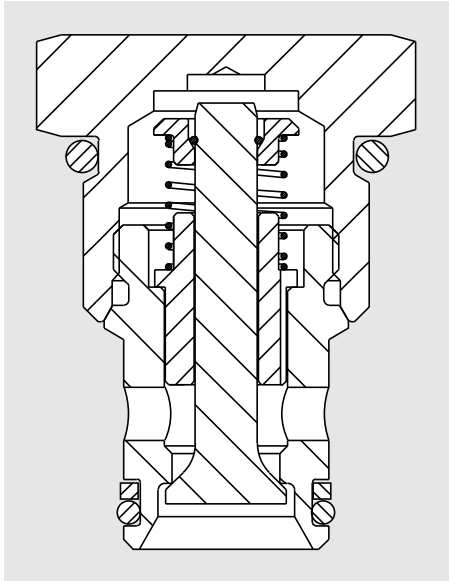
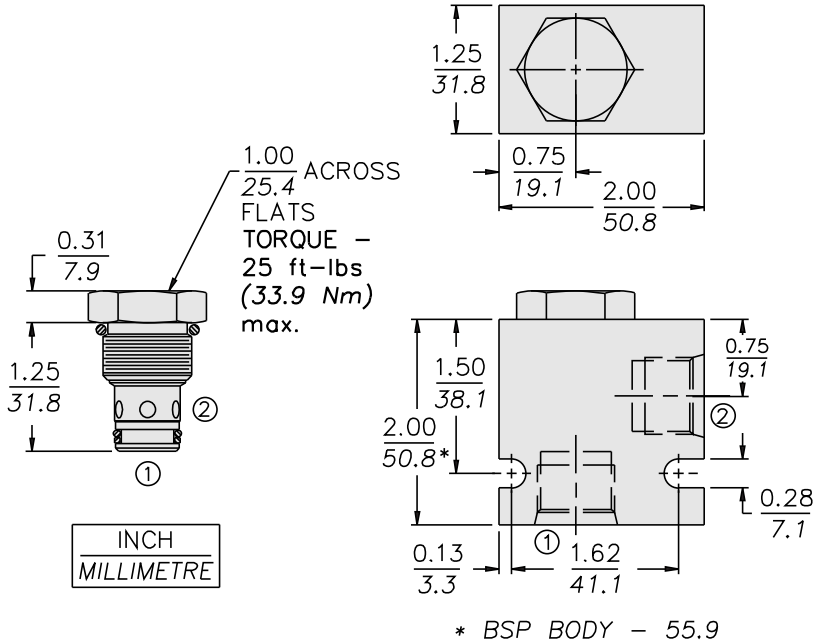


PERFORMANCE (Cartridge Only)



CV10-24

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.9 kg. (0.20 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
0.16 kg. (0.35 lbs.); Anodized high-
strength 6061 T6 aluminum alloy,
rated to 240 bar (3500 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.010.1

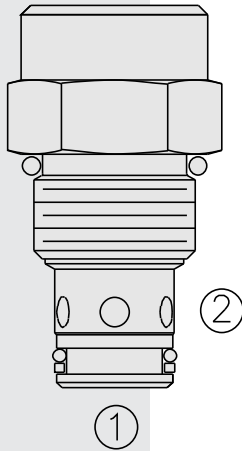
TO ORDER

CV10-24 - - -

Porting		
Cartridge Only	0	
SAE 6	6T	
SAE 8	8T	
1/4 in. BSP*	2B	
3/8 in. BSP*	3B	
1/2 in. BSP*	4B	
		Bias Spring
		05 0.34 bar (5 psi)
		25 1.7 bar (25 psi)
		55 3.8 bar (55 psi)
		Seals
		N Buna N (Std.)
		V Viton

*BSP Body;
U.K. Mfr. Only

CV10-28 Check Valve with Thermal Relief



DESCRIPTION

A screw-in, cartridge-style, hydraulic check valve for use as a blocking or load-holding device. The cartridge incorporates a low flow thermal relief valve intended to prevent cylinder damage resulting from temperature-induced pressure intensification.

OPERATION

The CV10-28 allows flow from 1 to 2, while blocking oil flow in the opposite direction. If the pressure at 2 exceeds the thermal relief valve setting, a small amount of oil will be allowed to pass from 2 to 1, preventing cylinder damage from pressure intensification.

Note: The relief valve feature is not intended for use in dynamic pressure limiting applications. Consult factory.

FEATURES

- Hardened seats for long life and low leakage.
- Industry common cavity.

RATINGS

Formula for Thermal Expansion: $\Delta P = 57.7 \times \Delta T$ (where ΔP is in psi; ΔT is in °F)

Operating Pressure: 241 bar (3500 psi)

Proof Pressure: 390 bar (5700 psi)

Thermal Relief Settings:

05	34.5 – 48.3 bar (500 – 700 psi)
10	69.0 – 93.1 bar (1000 – 1350 psi)
20	137.9 – 172.4 bar (2000 – 2500 psi)
25	172.4 – 217.2 bar (2500 – 3150 psi)
30	206.9 – 262.1 bar (3000 – 3800 psi)
40	275.9 – 344.8 bar (4000 – 5000 psi)
45	310.3 – 386.2 bar (4500 – 5600 psi)

Flow: See Performance Chart

Internal Leakage: 0.25 cc/minute (5 drops/minute) max. at 240 bar (3500 psi)

Standard Check Bias Spring at Crack: 4.5 bar (65 psi)

Check 1 to 2 Crack Pressure Defined: Gauge bar (psi) evident at 1 at 16.4 cc/minute (1 cu. in./minute) attained at 2

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

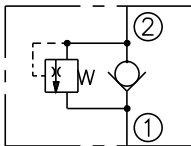
Cavity: VC10-2; See page 9.110.1

Cavity Tool: CT10-2XX; See page 8.600.1

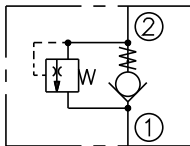
Seal Kit: SK10-2X-T; See page 8.650.1

SYMBOLS

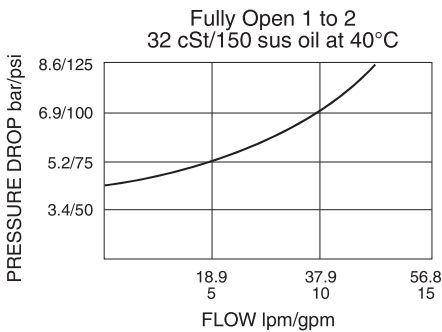
USASI:



ISO:

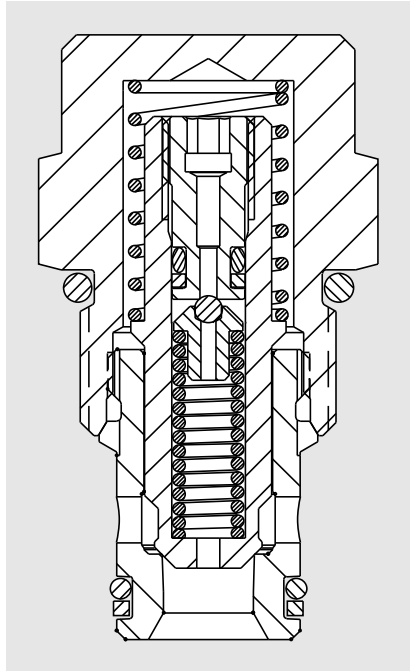
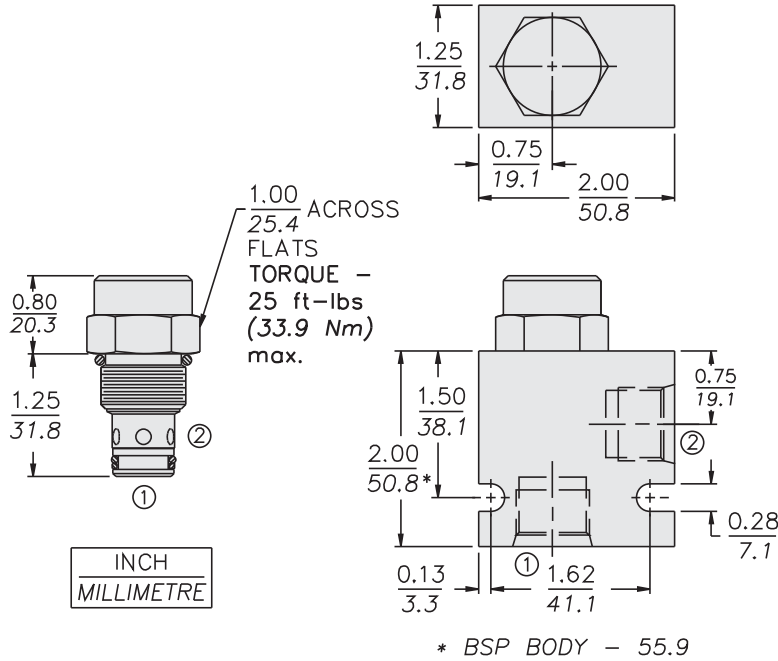


PERFORMANCE (Cartridge Only)



CV10-28

DIMENSIONS



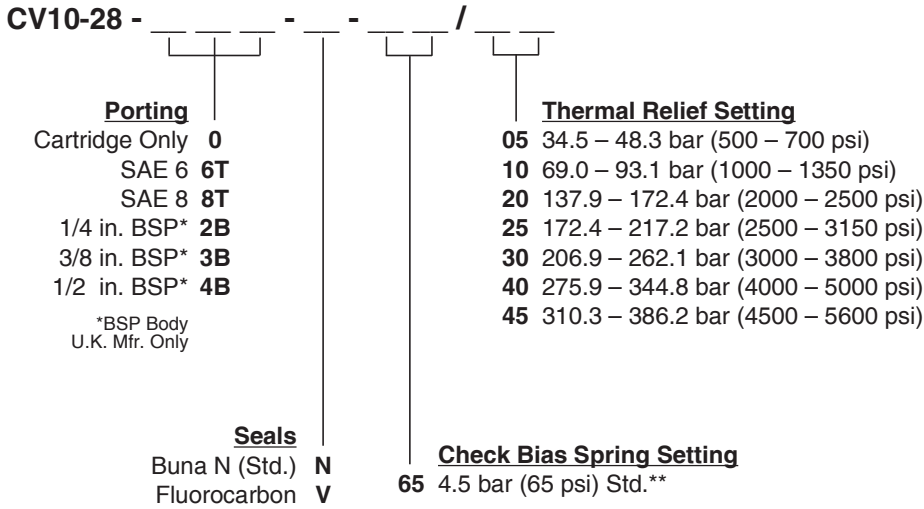
MATERIALS

Cartridge: Weight: 0.08 kg. (0.18 lbs.) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body:

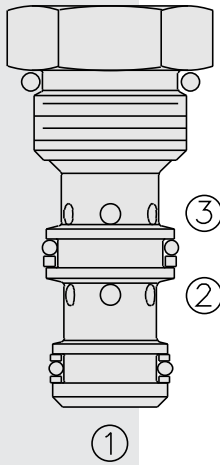
Weight: 0.16 kg. (0.35 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1.

TO ORDER



**Non-standard check bias spring settings and thermal relief settings available for OEM applications. Consult factory.

PC08-30 Check, Pilot-to-Open



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, hydraulic check valve for use in blocking or load-holding circuits.

OPERATION

The **PC08-30** allows flow from 2 to 1, while normally blocking flow from 3 to 2. Flow will be allowed from 3 to 2 when sufficient pressure is applied at 1.

The cartridge has a 3:1 pilot ratio, meaning that at least one-third of the load pressure held at 3 is required at 1 to open the valve.

The check is spring-biased to assure holding in static or no-load conditions. A sealed pilot piston option is available.

FEATURES

- Hardened seat for long life and low leakage.
- Optional sealed piston.
- Optional spring ranges.
- Compact size.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Maximum Internal Leakage at 207 bar (3000 psi):

- 3 to 2: 0.25 ml/minute (5 drops/minute)
- 2 to 1 without sealed piston: 115 ml/minute (7 cu. in./minute)
- 2 to 1 with sealed piston: zero leakage

Pilot Ratio: 3:1

Check Spring Bias: 1.72 bar (25 psi) standard;
With sealed piston option: 6.2 bar (90 psi) minimum

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

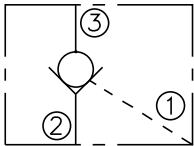
Cavity: VC08-3; See page 9.108.1

Cavity Tool: CT08-3XX; See page 8.600.1

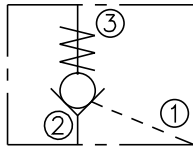
Seal Kit: SK08-3X-TM; See page 8.650.1

SYMBOLS

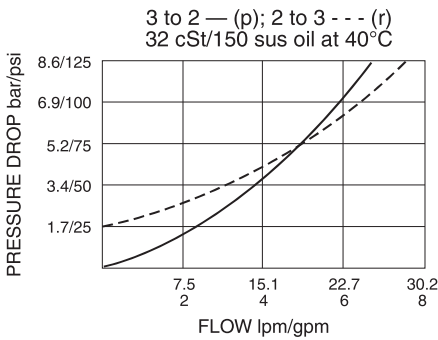
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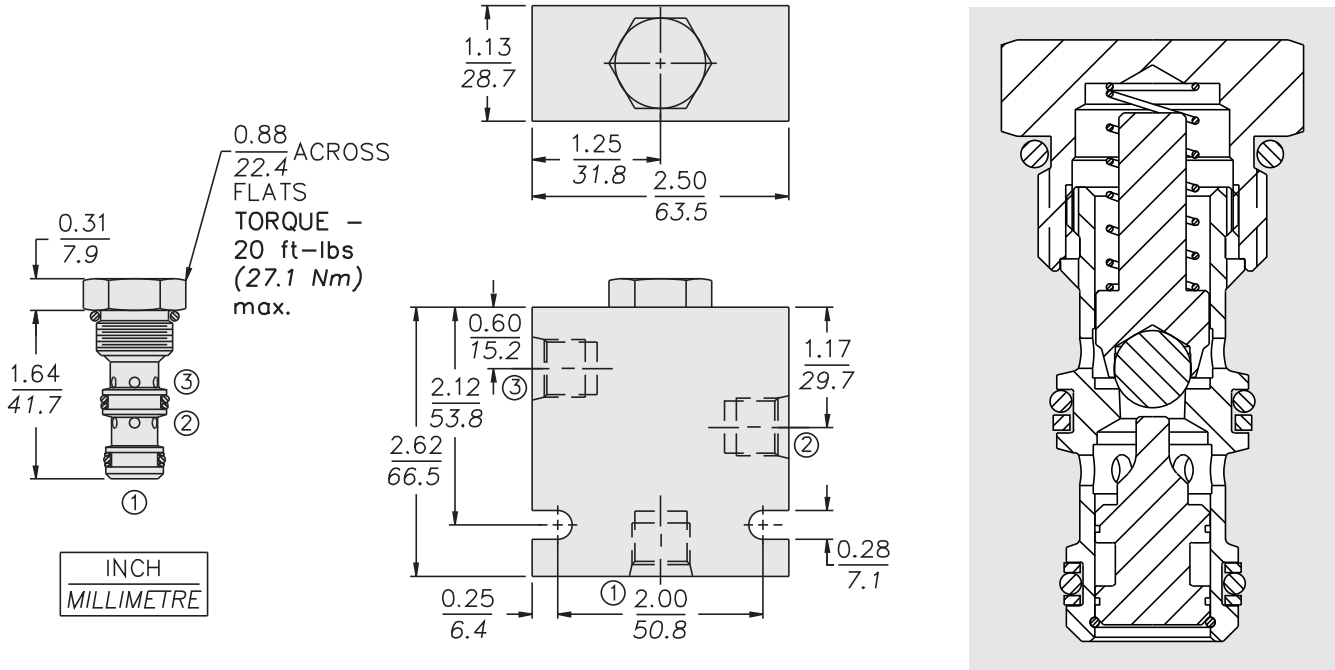
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.08 kg. (0.18 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and back-ups standard.

Standard Ported Body: Weight:
0.27 kg. (0.60 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.008.1

TO ORDER

PC08-30

Options

None (Blank)

Porting

Cartridge Only **0**
SAE 6 **6T**
3/8 in. BSP* **3B**

*BSP Body;
U.K. Mfr. Only

Bias Spring

(Blank) 1.72 bar/25 psi (Std.)*
70 4.8 bar/70 psi
90 6.2 bar/90 psi
120 8.2 bar/120 psi
270 18.3 bar/270 psi

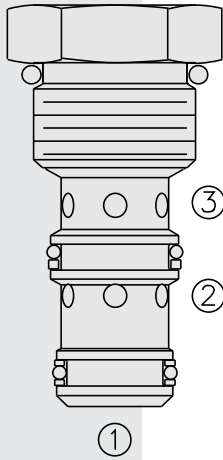
Note: Other bias spring pressures available for OEM applications. Consult factory.

* PC08-30 valves built with standard 25 psi spring are not stamped with spring rating. Other spring ratings are stamped on valve.

Seals

N Buna N (Std.)
NS Buna N with Sealed Piston:
6.2 bar (90 psi) minimum spring
V Fluorocarbon
VS Fluorocarbon with Sealed Piston:
6.2 bar (90 psi) minimum spring

PC10-30 Check, Pilot-to-Open



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, hydraulic check valve for use in blocking or load-holding circuits.

OPERATION

The **PC10-30** allows flow passage from 2 to 3, while normally blocking flow from 3 to 2. Flow will be allowed from 3 to 2 when pressure is applied at 1.

The cartridge has a 4:1 pilot ratio, meaning that at least one-fourth of the load pressure held at 3 is required at 1 to open the valve.

The check is spring-biased to assure holding in static or no-load conditions. A sealed pilot piston option is available.

Note: Special higher bias spring values available. Consult factory.

FEATURES

- Hardened seat for long life and low leakage.
- Optional sealed piston.
- Optional spring ranges.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Maximum Internal Leakage at 207 bar (3000 psi):

- 3 to 2: 0.25 ml/minute (5 drops/minute)
- 2 to 1 without sealed piston: 115 ml/minute (7 cu. in./minute)
- 2 to 1 with sealed piston: zero leakage

Pilot Ratio: 4:1

Check Bias Spring: 2.07 bar (30 psi);
With sealed piston option: 6.2 bar (90 psi) minimum

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

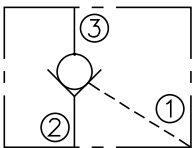
Cavity: VC10-3; See page 9.110.1

Cavity Tool: CT10-3XX; See page 8.600.1

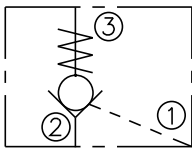
Seal Kit: SK10-3X-TM; See page 8.650.1

SYMBOLS

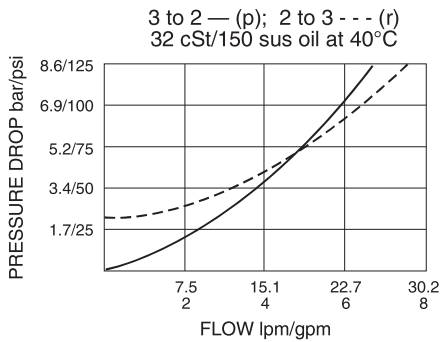
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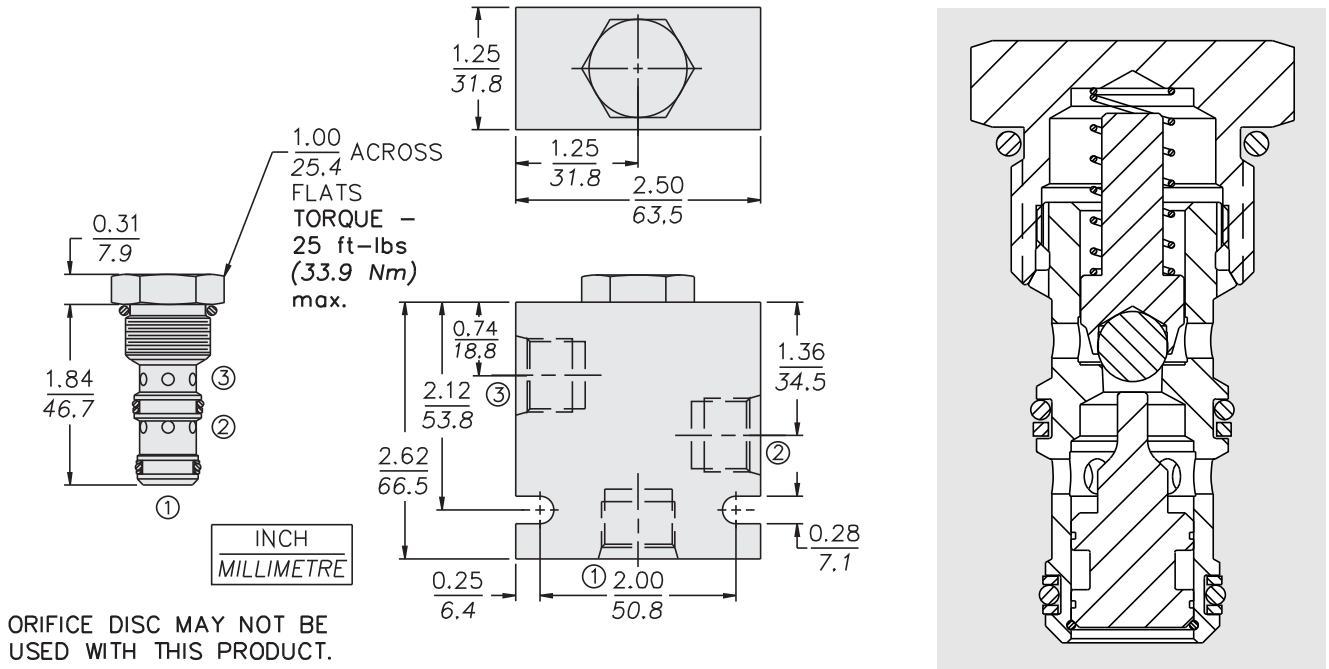
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.09 kg. (0.20 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and back-ups standard.

Standard Ported Body: Weight:
0.36 kg. (0.80 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

PC10-30-

- Porting**
- Cartridge Only **0**
 - SAE 6 **6T**
 - SAE 8 **8T**
 - 1/4 in. BSP* **2B**
 - 3/8 in. BSP* **3B**
- *BSP Body;
U.K. Mfr. Only

Bias Spring

- (Blank) 2.07 bar/30 psi (Std.)*
- 70** 4.8 bar/70 psi
- 90** 6.2 bar/90 psi
- 120** 8.2 bar/120 psi
- 270** 18.3 bar/270 psi

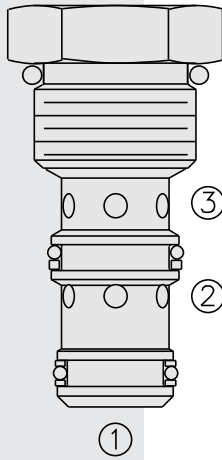
Note: Other bias spring pressures available for OEM applications. Consult factory.

* PC10-30 valves built with standard 30 psi spring are not stamped with spring rating. Other spring ratings are stamped on valve.

Seals

- N** Buna N (Std.)
- NS** Buna N with Sealed Piston:
6.2 bar (90 psi) minimum spring
- V** Fluorocarbon
- VS** Fluorocarbon with Sealed Piston:
6.2 bar (90 psi) minimum spring

PC10-32 Check, Pilot-to-Open, 2:1 Pilot Ratio



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, hydraulic check valve for use in blocking or load-holding circuits.

OPERATION

The **PC10-32** allows flow passage from 2 to 3, while normally blocking flow from 3 to 2. Flow will be allowed from 3 to 2 when pressure is applied at 1.

The cartridge has a 2:1 pilot ratio, meaning that at least one-half of the load pressure held at 3 is required at 1 to open the valve.

The check is spring-biased to assure holding in static or no-load conditions. A sealed pilot piston option is available.

FEATURES

- Hardened seat for long life and low leakage.
- Optional sealed piston.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage:

3 to 2: 0.25 cc/minute (5 drops/minute) max. at 240 bar (3500 psi)

2 to 1 (without sealed piston): 115 cc/minute (7 cu. in./minute) max. at 240 bar (3500 psi)

Pilot Ratio: 2:1

Check Bias Spring: 2.07 bar (30 psi);

With sealed piston option: 6.9 bar (100 psi) minimum

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of

7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

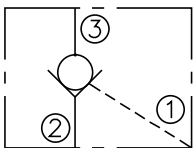
Cavity: VC10-3; See page 9.110.1

Cavity Tool: CT10-3XX; See page 8.600.1

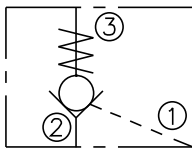
Seal Kit: SK10-3X-TM; See page 8.650.1

SYMBOLS

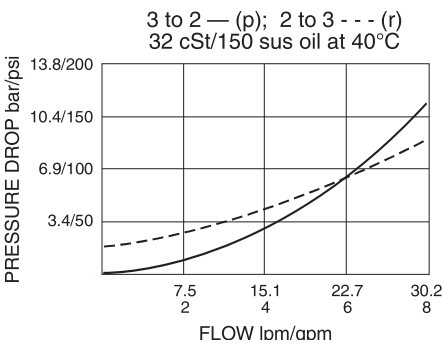
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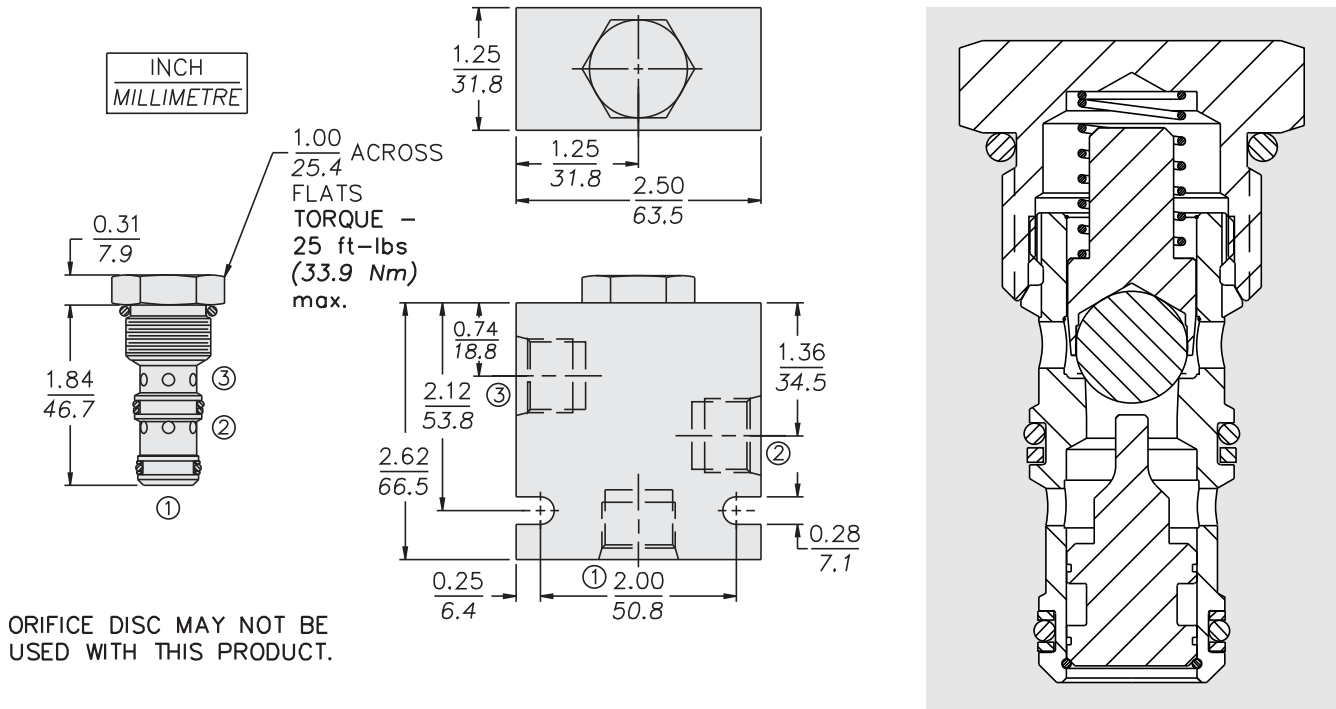
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.09 kg. (0.20 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.36 kg. (0.80 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

PC10-32 -

Porting	
Cartridge Only	0
SAE 6	6T
SAE 8	8T
1/4 in. BSP*	2B
3/8 in. BSP*	3B
*BSP Body; U.K. Mfr. Only	

Bias Spring

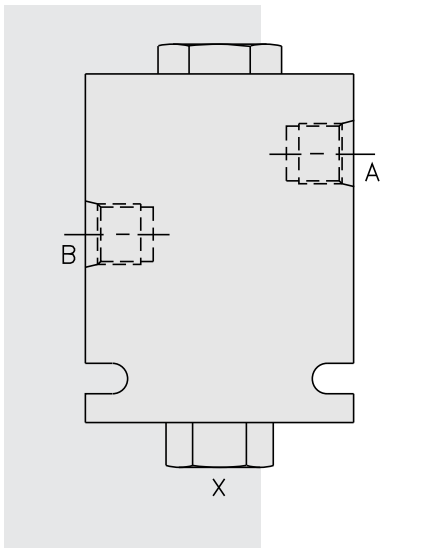
30	2.1 bar/30 psi
100	6.9 bar/100 psi

Note: Non-standard bias spring pressures available for OEM applications. Consult factory.

Seals

N	Buna N (Std.) 2.07 bar (30 psi) spring
NS	Buna N with Sealed Piston 6.9 bar (100 psi) spring minimum
V	Fluorocarbon 2.07 bar (30 psi) spring
VS	Fluorocarbon with Sealed Piston 6.9 bar (100 psi) spring minimum

PCV10 Check, Pilot-to-Open



DESCRIPTION

An in-line-housed, pilot-operated, hydraulic check valve for use in blocking or load-holding circuits.

OPERATION

The **PCV10** allows flow from B to A, while normally blocking flow from A to B. Flow will be allowed from A to B when pressure is applied at X.

The check valve has a 4:1 pilot ratio, meaning that at least one-fourth of the load pressure held at A is required at X to open the valve.

The check is spring-biased at 2 bar (30 psi) to assure holding in static or no-load conditions. A sealed pilot piston option with check spring bias of 6.9 bar (100 psi) is available.

FEATURES

- Hardened seat for long life and low leakage.
- Optional sealed pilot piston.
- Optional spring ranges.
- Check section is serviceable as a cartridge.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage:

A to B: 0.25 cc/minute (5 drops/minute) max. at 240 bar (3500 psi);

B to X (without sealed piston): 245 cc/minute (15 cu. in./minute) max. at 240 bar (3500 psi)

Pilot Ratio: 4:1

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Check Spring Bias: 2 bar (30 psi); with sealed piston option, 6.9 bar (100 psi)

Seal Kit (for CV10-20): SK10-2X-T; See page 8.650.1;

Piston Seal: See Dimension Drawing

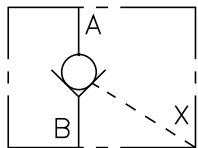
Pilot Piston Service Part Numbers:

O-Ring (1): Buna 6001014; Fluorocarbon 6003014

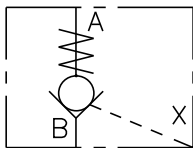
Back-ups (2): Buna 6011014; Fluorocarbon 6011014

SYMBOLS

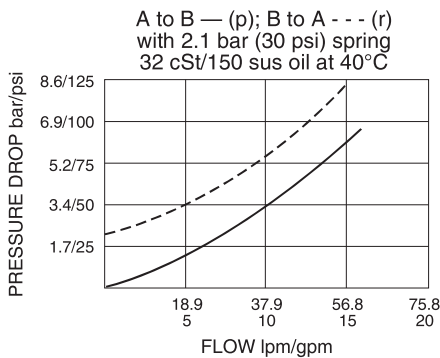
USASI:



ISO:

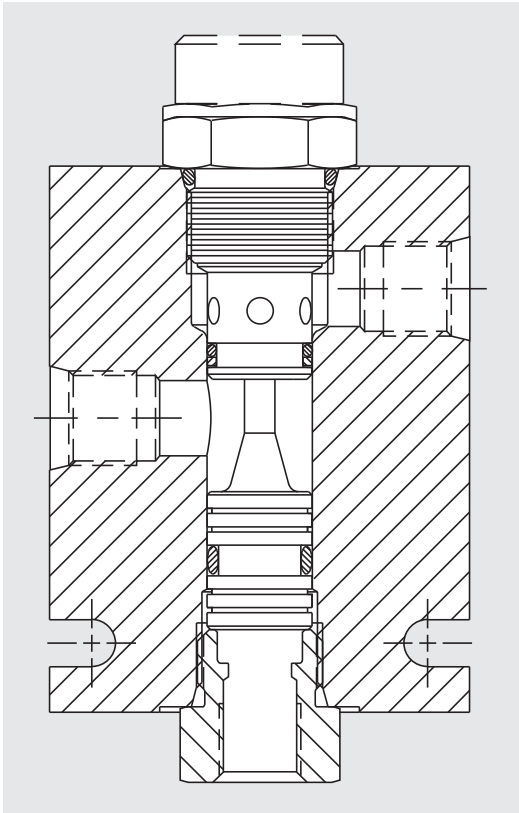
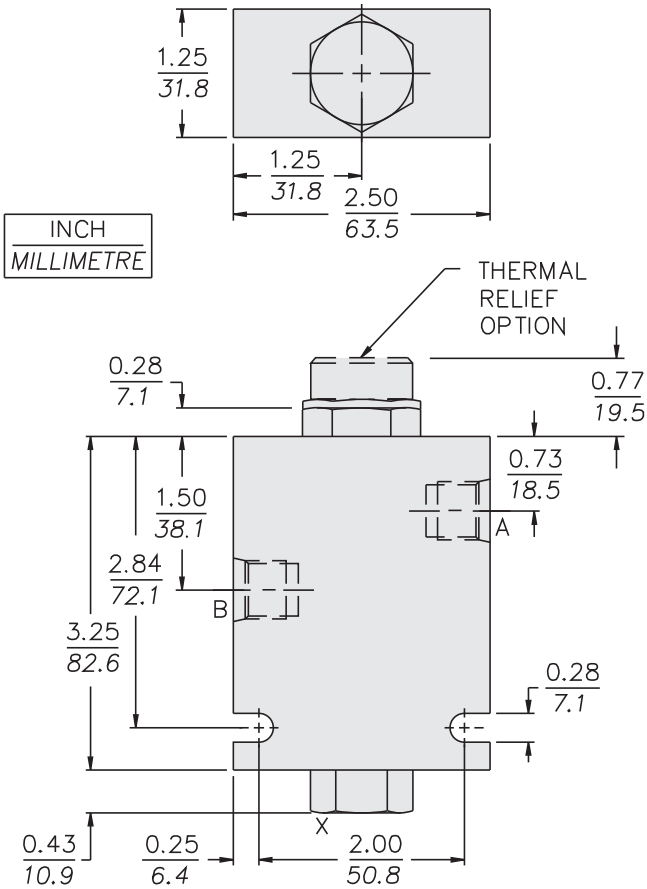


PERFORMANCE (Cartridge Only)



PCV10

DIMENSIONS



MATERIALS

Cartridge (CV10-20): Weight: 0.08 kg. (0.17 lbs.) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and poly-ester elastomer back-ups standard.

Pilot Piston: Hardened steel.

Standard Ported Body: Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ; consult factory.

Product Weight: 0.5 kg. (1.10 lbs.).

TO ORDER

PCV10 -

Porting
SAE 6; SAE 6 Pilot **6T**
SAE 8; SAE 6 Pilot **8T**

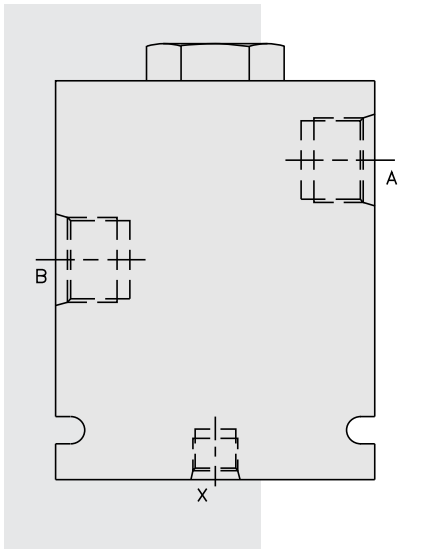
Seals
N Buna N (Std.)
NS Buna N w/Sealed Pilot Piston (100 psi spring minimum required)
V Fluorocarbon
VS Fluorocarbon with Sealed Pilot Piston (100 psi spring minimum required)

Bias Spring
(Blank) 2.1 bar (30 psi) (Std.)*
40 2.8 bar (40 psi)
100 6.9 bar (100 psi)
200 13.8 bar (200 psi)
300 20.7 bar (300 psi)

* PCV10 valves built with standard 30 psi spring are not stamped with spring rating. Other spring ratings are stamped on valve.

Options
(Blank) None
1 Thermal Relief on C1

PCV16 Check, Pilot-to-Open



DESCRIPTION

An in-line-housed, pilot-operated, hydraulic check valve for use in blocking or load-holding circuits.

OPERATION

The **PCV16** allows flow from B to A, while normally blocking flow from A to B. Flow will be allowed from A to B when pressure is applied at X.

The check valve has a 3.8:1 pilot ratio, meaning that at least one-fourth of the load pressure held at A is required at X to open the valve.

The check is spring-biased at 1.7 bar (25 psi) to assure holding in static or no-load conditions. A sealed pilot piston option is available.

FEATURES

- Hardened seat for long life and low leakage.
- Optional sealed pilot piston.
- Optional spring ranges.
- Check section is serviceable as a cartridge.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage:

A to B: 0.25 cc/minute (5 drops/minute) max. at 240 bar (3500 psi);

B to X (without sealed piston): 245 cc/minute (15 cu. in./minute) max. at 240 bar (3500 psi)

Pilot Ratio: 3.8:1

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

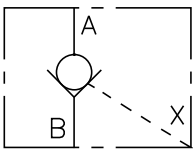
Seal Kit (for CV16-20): SK16-2X-T; See page 8.650.1;

Piston Seals:

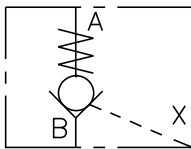
	O-Ring (1)	Back-Ups (2)
Buna	6001119	6010119
Fluorocarbon	6003119	6010119

SYMBOLS

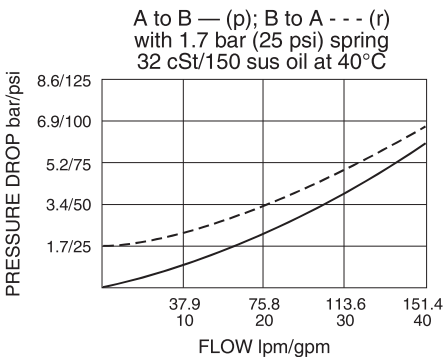
USASI:



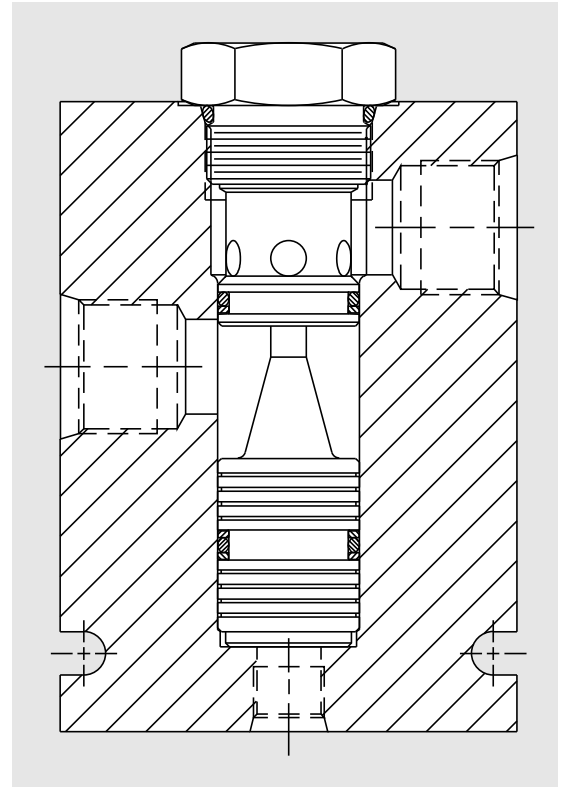
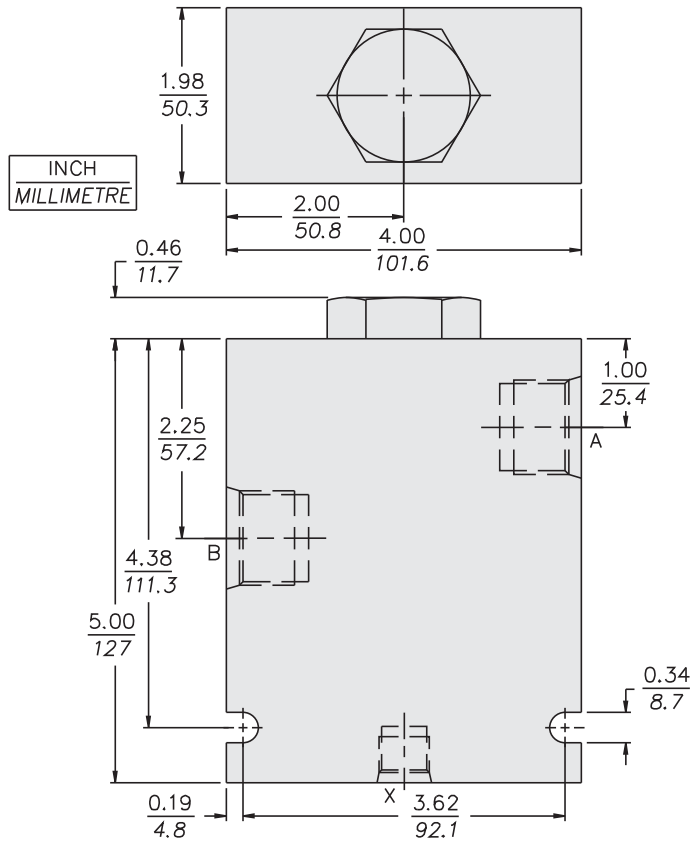
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge (CV16-20): Weight: 0.29 kg. (0.63 lbs.) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-ups standard.

Pilot Piston: Hardened steel.

Standard Ported Body: Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. Consult factory.

TO ORDER

PCV16 -

Porting
SAE 12
w/ SAE 6 Pilot **12T**

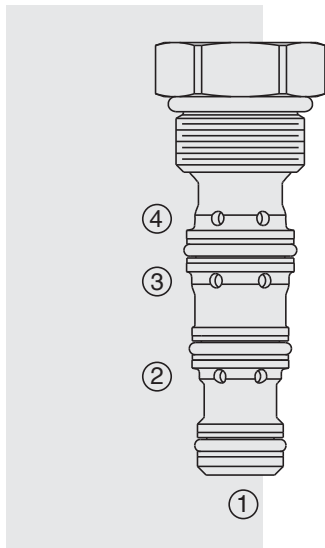
Bias Spring
(Blank) 1.7 bar (25 psi) (Std.)*
60 4.1 bar (60 psi)
100 6.9 bar (100 psi)

* PCV16 valves built with standard 25 psi spring are not stamped with spring rating. Other spring ratings are stamped on valve.

Seals

- N** Buna N (Std.)
- NS** Buna N with Sealed Pilot Piston (60 psi spring minimum required)
- V** Fluorocarbon
- VS** Fluorocarbon with Sealed Pilot Piston (60 psi spring minimum required)

DC08-40 Pilot Operated Check Valve



DESCRIPTION

A dual pilot operated check valve for use in blocking or load-holding circuits.

OPERATION

The **DC08-40** will block flow from 1 to 2, and from 4 to 3. Flow is allowed in the opposite direction when pressure is applied to port 2 and/or port 3.

The valve has a 3:1 pilot ratio, so at least 1/3 of the load pressure at port 1 or 4 is required at the pilot lines (ports 2 or 3) to open the flow passage to allow flow from ports 1 or 4.

The check is spring-biased at 25 psi to assure holding in a static or no load condition. An optional spring biased at 135 psi is available.

Note: Orifice disc cannot be used with this product.

FEATURES

- Hardened seat for long life and low leakage.
- Low pressure drop.

RATINGS

Operating Pressure: Inlet: 240 bar (3500 psi)

Flow: Rated Inlet Flow: 19 lpm (5 gpm); see performance chart

Pilot Ratio: 3:1

Check Spring Bias: 1.7 bar (25 psi); Optional 9.3 bar (135 psi)

Leakage: 5 drops per minute (0.25 ml per minute) at 3000 psi

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

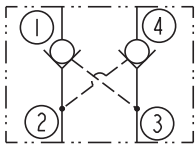
Cavity: VC08-4; See page 9.108.1

Cavity Tool: CT08-4XX-X-X; See page 8.600.1

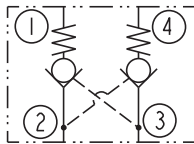
Seal Kit: SK08-4X-MMM; See page 8.650.1

SYMBOLS

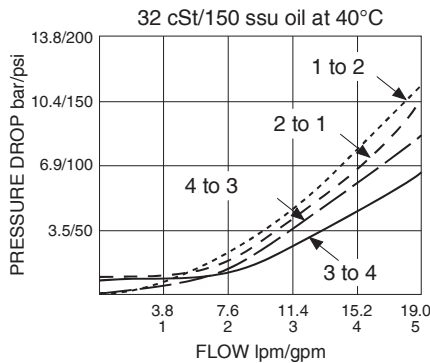
USASI:



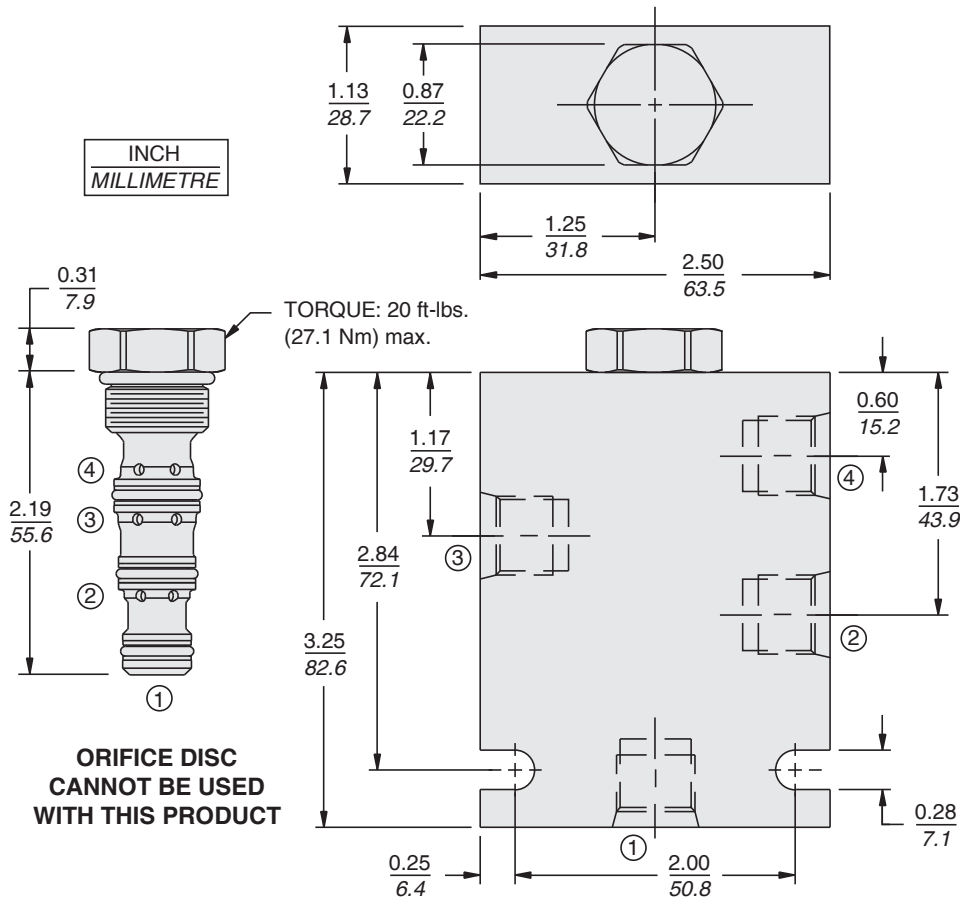
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.13 kg. (0.28 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

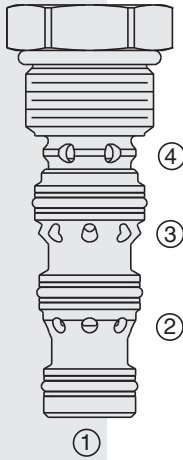
Standard Ported Body: Weight:
0.18 kg. (0.40 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.008.1

TO ORDER

DC08-40 -		Bias Spring	
Porting		25	1.7 bar (25 psi) Standard
Cartridge Only	0	135	9.3 bar (135 psi) Optional
SAE 6	6T		
1/4 in. BSP*	2B		
3/8 in. BSP*	3B		
		Seals	
		N	Buna N (Std.)
		V	Fluorocarbon

*BSP Body;
U.K. Mfr. Only

DC10-40 Pilot Operated Check Valve



DESCRIPTION

A dual pilot operated check valve for use in blocking or load-holding circuits. This valve has an optional thermal relief from port 4 to port 3.

OPERATION

The DC10-40 will block flow from 1 to 2, and from 4 to 3. Flow is allowed in the opposite direction when pressure is applied to port 2 and/or port 3.

The valve has a 3:1 pilot ratio, so at least 1/3 of the load pressure at port 1 or 4 is required at the pilot lines (ports 2 or 3) to open the flow passage to allow flow from ports 1 or 4.

The check is spring-biased at 25 psi to assure holding in a static or no load condition.

Note: Orifice disc cannot be used with this product.

FEATURES

- Hardened seat for long life and low leakage.
- Low pressure drop.
- Optional thermal relief.

RATINGS

Operating Pressure: Inlet: 240 bar (3500 psi)

Flow: Rated Inlet Flow: 30.3 lpm (8 gpm); See performance chart.

Pilot Ratio: 3:1

Check Spring Bias: 1.7 bar (25 psi)

Thermal Relief Crack Pressure Range: 310 to 386 bar (4500 to 5600 psi)

Thermal Relief Valve Leakage: 5 drops per minute (0.25 ml per minute) at up to 85% of crack pressure.

Maximum Check Valve Leakage: 5 drops per minute (0.25 ml per minute) at 240 bar (3500 psi).

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

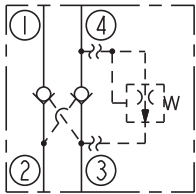
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX-X-X; See page 8.600.1

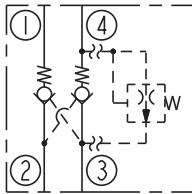
Seal Kit: SK10-4X-MMM; See page 8.650.1

SYMBOLS

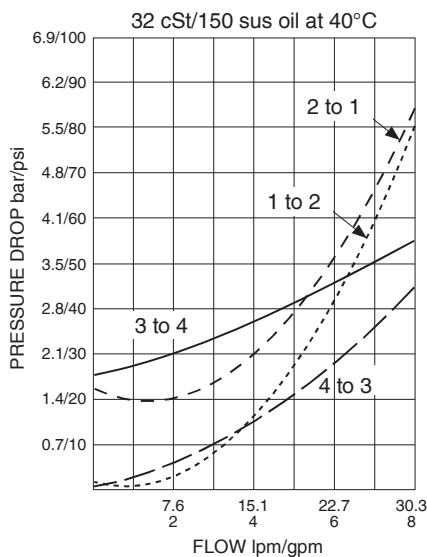
USASI:



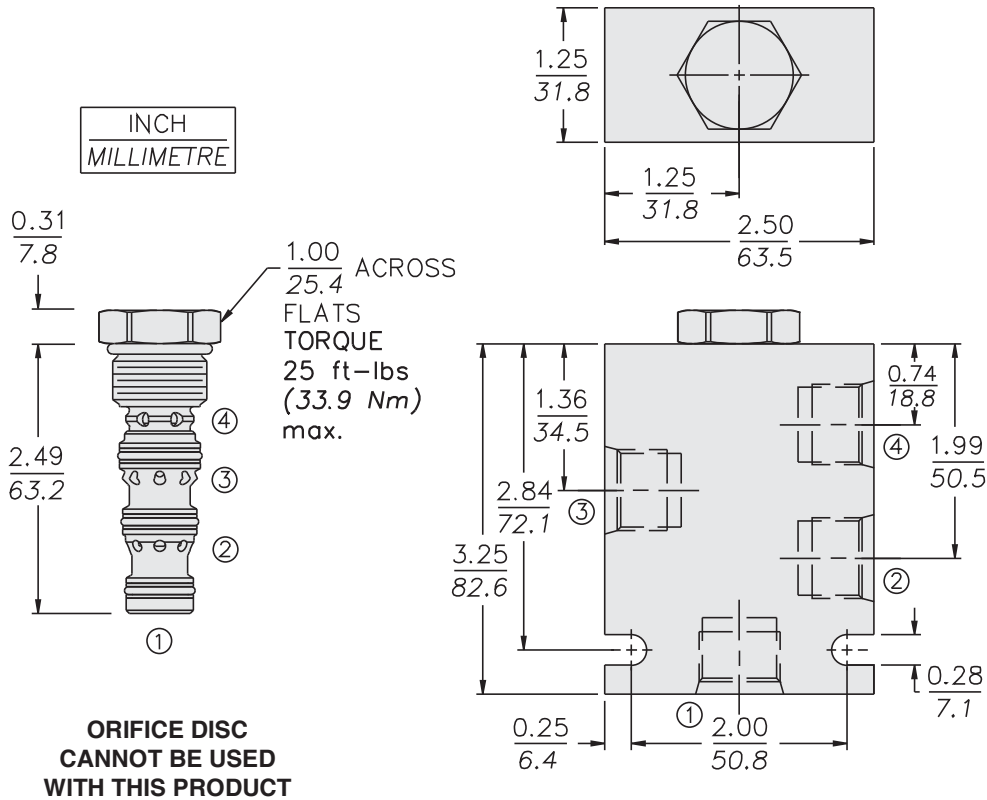
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS

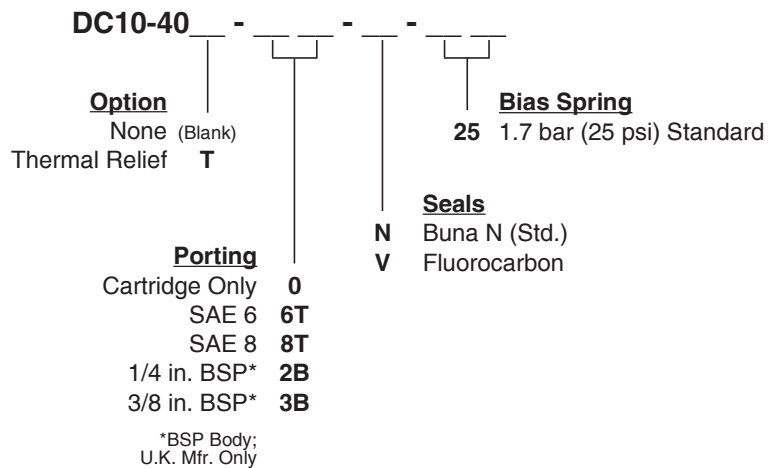


MATERIALS

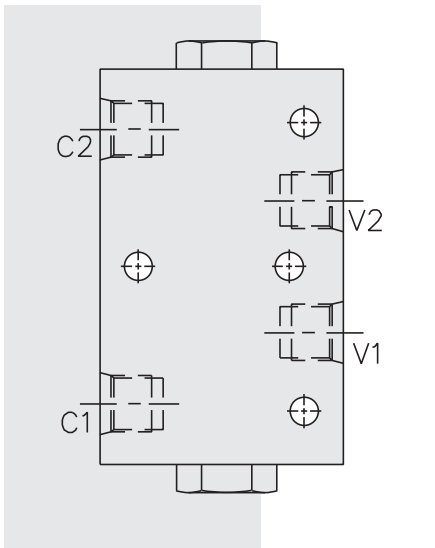
Cartridge: Weight: 0.13 kg. (0.28 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
0.34 kg. (0.75 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.010.1

TO ORDER



DCV08 Lock Valve



DESCRIPTION

An in-line-housed, double-pilot-operated, hydraulic check valve for use in blocking or load holding circuits.

OPERATION

The **DCV08** allows flow from V ports to C ports, while normally blocking flow in the opposite direction. Flow will be allowed from C to V when pressure is applied to the opposite side V port.

The valve has a 4:1 pilot ratio, so approximately one-fourth of the load pressure held at either C port is required at the opposite V port to open the flow passage.

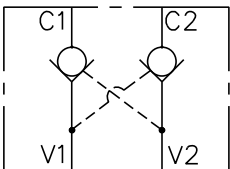
The check is spring-biased at 1.7 bar (25 psi) to assure holding in static or no-load conditions. An optional sealed piston with check spring bias of 6.9 bar (100 psi) is available.

FEATURES

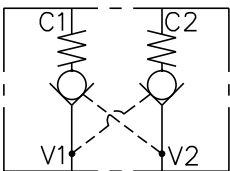
- Hardened seat for long life and low leakage.
- Check section serviceable as a cartridge.
- Optional sealed piston.
- Optional spring ranges.
- Low pressure drop.

SYMBOLS

USASI:



ISO:



RATINGS

Flow: See Performance Chart

Internal Leakage Cx to Vx: 0.25 cc/minute (5 drops/minute) max. at 207 bar (3000 psi)

V1 to V2 (without sealed piston): 328 cc/minute (20 cu. in./minute) max. at 240 bar (3500 psi)

Pilot Ratio: 4:1

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

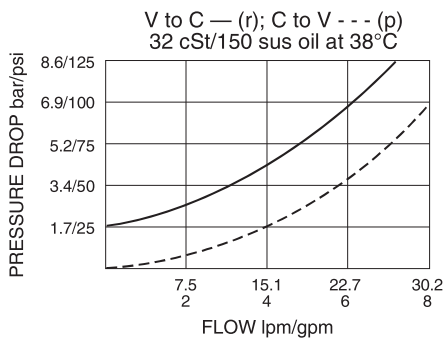
Seal Kit (for CV08-2x): SK08-2x-T (2 required); See page 8.650.1

Pilot Piston Service Part Numbers:

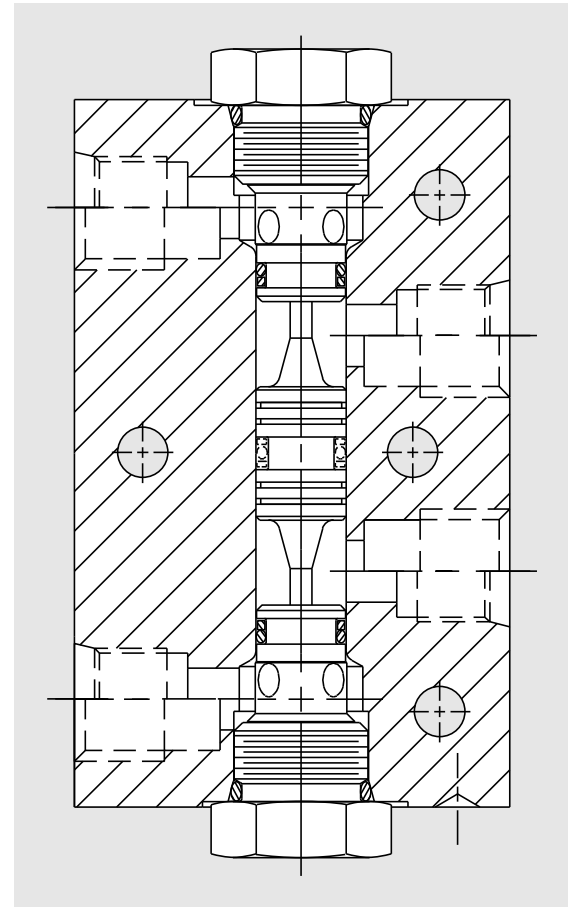
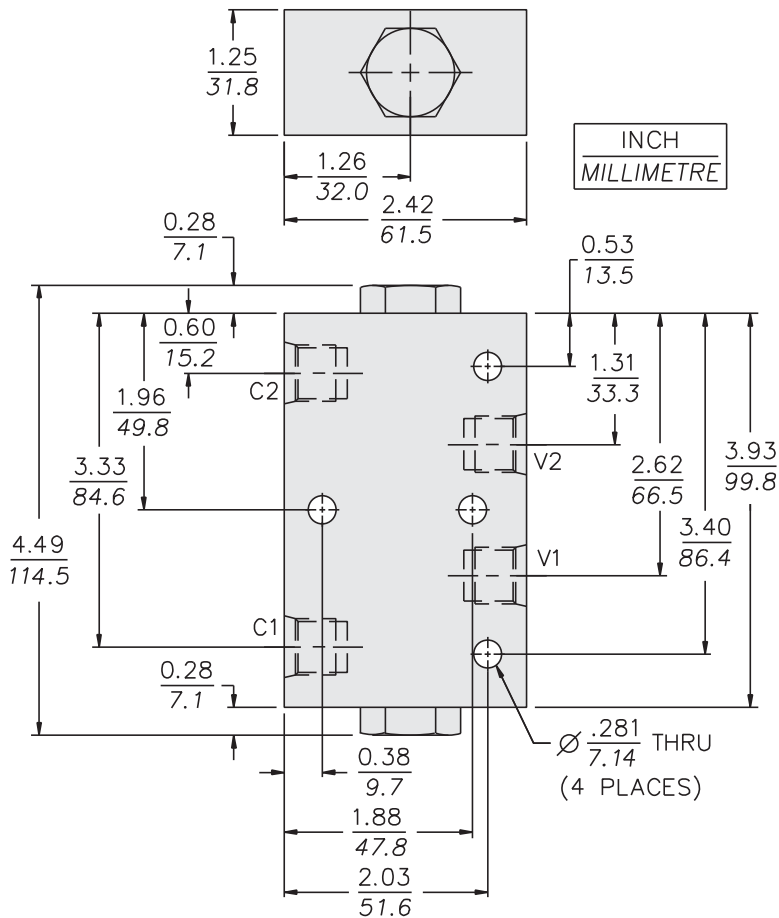
O-Ring (1) – Buna 6001012, Fluorocarbon 6003012

Back-up (2) – Buna 6011012, Fluorocarbon 6011012

PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: (CV08-20): Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and back-up standard.

Pilot Piston: Hardened steel.

Standard Ported Body: Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi).
Ductile iron bodies available; dimensions may differ.
See page 8.008.1

Product Weight: 0.58 kg. (1.28 lbs.)

TO ORDER

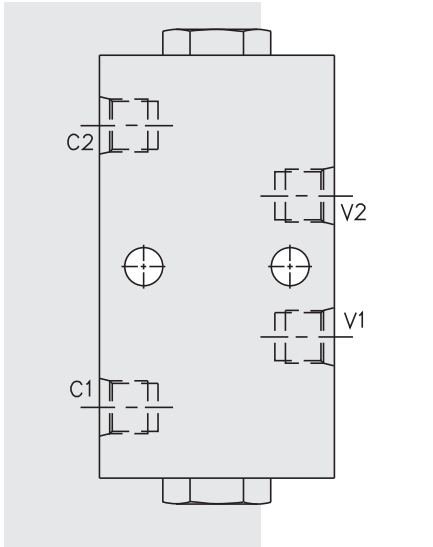
DCV08-			
Porting			Bias Spring
SAE 6	6T		(Blank) 1.7 bar (25 psi) (Std.)*
SAE 8	8T		60 4.1 bar (60 psi)
1/4 in. BSP*	2B		80 5.5 bar (80 psi)
3/8 in. BSP*	3B		100 6.9 bar (100 psi)
			150 10.3 bar (150 psi)
			200 13.8 bar (200 psi)
			270 18.3 bar (270 psi)
		Seals	
		Buna N (Std.)	N
		Fluorocarbon	V
		Buna N w/Sealed Piston	NS
		Fluorocarbon w/Sealed Piston	VS

*BSP Body; U.K. Mfr. Only

Note: Both check valves must have same spring value.

* DCV08 valves built with standard 25 psi spring are not stamped with spring rating. Other spring ratings are stamped on valve.

DCV10 Lock Valve



DESCRIPTION

An in-line-housed, double-pilot-operated, hydraulic check valve with optional thermal reliefs for use in blocking or load holding circuits.

OPERATION

The DCV10 allows flow from V ports to C ports, while normally blocking flow in the opposite direction. Flow will be allowed from C to V when pressure is applied to the opposite side V port.

The valve has a 4:1 pilot ratio, so at least one-fourth of the load pressure held at either C port is required at the opposite V port to open the flow passage.

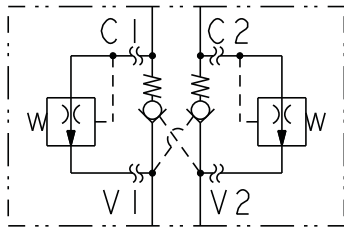
The check is spring-biased at 2 bar (30 psi) to assure holding in static or no-load conditions. An optional sealed piston with check spring bias of 6.9 bar (100 psi) is available. Optional thermal reliefs are preset to 348 bar (5050 psi) as standard.

NOTE: Thermal reliefs cannot be used with sealed pistons.

FEATURES

- Hardened seat for long life and low leakage.
- Check section serviceable as a cartridge.
- Optional cartridge thermal relief(s).
- Optional sealed piston.
- Optional spring ranges.
- Low pressure drop.

ISO SYMBOL



RATINGS

Flow: up to 76 lpm (20 gpm)

Optional Thermal Relief Factory Setting: 348 ±38 bar (5050 ±550 psi)

Thermal Relief Reset: 207 bar (3000 psi)

Internal Leakage:

Cx to Vx: 0.25 cc/minute (5 drops/minute) maximum at 207 bar (3000 psi);

V1 to V2: (without sealed piston): 328 cc/minute (20 cu. in./minute) maximum at 240 bar (3500 psi)

Pilot Ratio: 4:1

Check Spring Bias: 2 bar (30 psi); with sealed piston option, 6.9 bar (100 psi)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

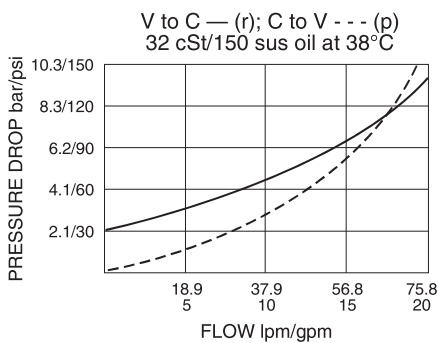
Seal Kit (for CV10-2x): SK10-2x-T (2 required); See page 8.650.1

Pilot Piston Service Part Numbers:

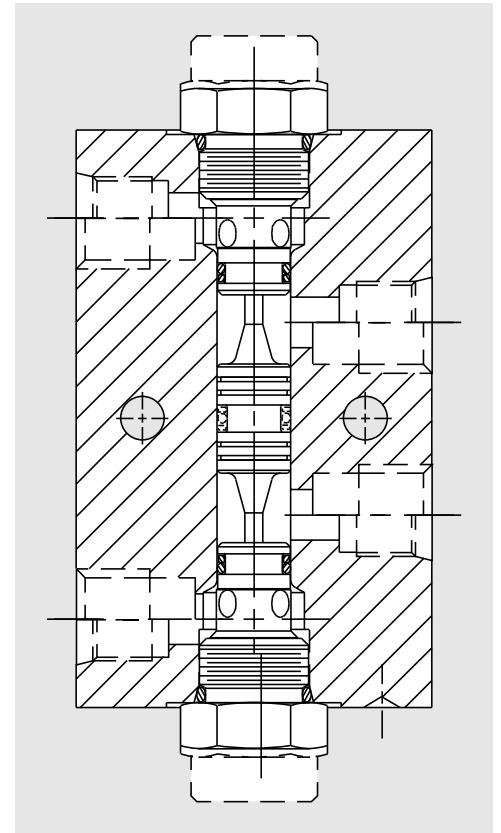
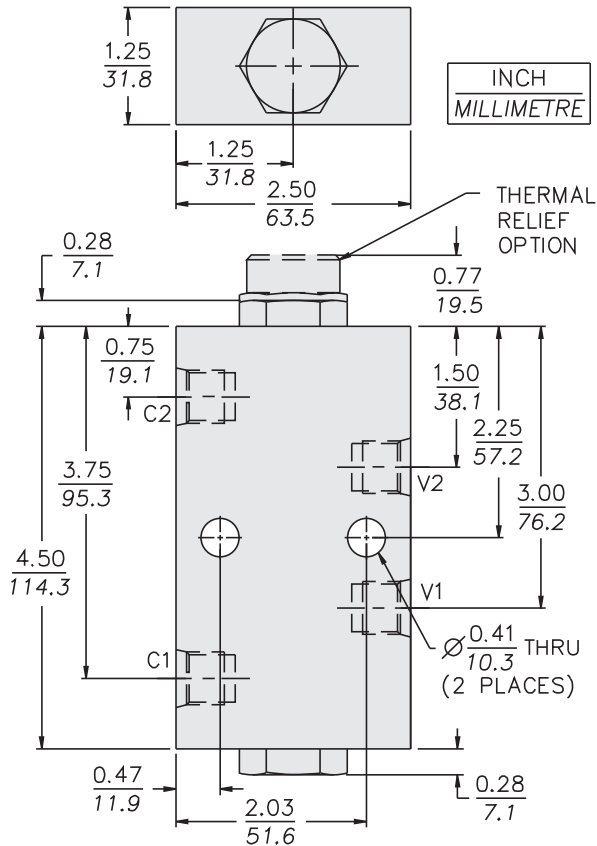
O-Ring (1) – Buna 6001014, Fluorocarbon 6003014

Back-up (2) – Buna 6011014, Fluorocarbon 6011014

PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: (CV10-20): Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Pilot Piston: Hardened steel.

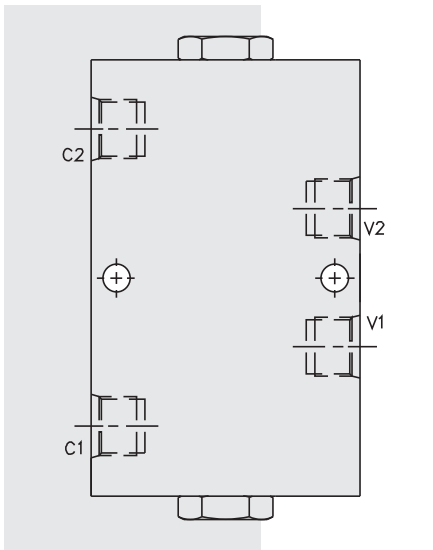
Standard Ported Body: Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi).
Ductile iron bodies available; dimensions may differ.
See page 8.010.1

Product Weight: 0.68 kg. (1.5 lbs.)

TO ORDER

DCV10-					
Porting					
SAE 6	6T				
SAE 8	8T				
		Seals		Bias Spring	
		Buna N (Std.)	N	(Blank) 2.1 bar (30 psi) (Standard)*	
		(6.1 bar/30 psi spring minimum required)		(Blank) Thermal Relief (65 psi only)	
		Fluorocarbon	V	(Blank) 6.9 bar (100 psi)	
		(6.1 bar/30 psi spring minimum required)		(Std. NS and VS seals)	
		Buna N w/Sealed Piston	NS	40 2.8 bar (40 psi)	
		(6.9 bar/100 psi spring minimum required)		70 4.8 bar (70 psi)	
		Fluorocarbon w/Sealed Piston	VS	100 6.9 bar (100 psi)	
		(6.9 bar/100 psi spring minimum required)		200 13.6 bar (200 psi)	
				300 20.4 bar (300 psi)	
					Note: Both check valves must have same spring value.
					* DCV10 valves built with standard 30 psi spring are not stamped with spring rating. Other spring ratings are stamped on valve.
		Options			
		None (Blank)			
		Thermal Relief on C1	1		
		Thermal Relief on C2	2		
		Thermal Relief on C1 and C2	3		

DCV12 Lock Valve



DESCRIPTION

An in-line-housed, double-pilot-operated, hydraulic check valve for use in blocking or load holding circuits.

OPERATION

The DCV12 allows flow from V ports to C ports, while normally blocking flow in the opposite direction. Flow will be allowed from C to V when pressure is applied to the opposite side V port.

The valve has a 4:1 pilot ratio, so at least one-fourth of the load pressure held at either C port is required at the opposite V port to open the flow passage.

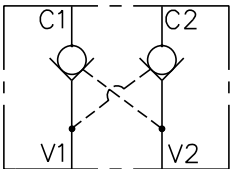
The check is spring-biased at 1.7 bar (25 psi) to assure holding in static or no-load conditions. An optional sealed piston with check spring bias of 4.1 bar (60 psi) is available.

FEATURES

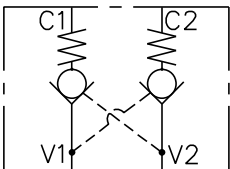
- Hardened seat for long life and low leakage.
- Check section serviceable as a cartridge.
- Optional cartridge thermal relief(s).
- Optional sealed piston.
- Optional spring ranges.
- Low pressure drop.

SYMBOLS

USASI:



ISO:



RATINGS

Maximum Operating Pressure: 241 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage Cx to Vx: 0.25 cc/minute (5 drops/minute) max. at 207 bar (3000 psi);

Vx to Vx (without sealed piston): 328 cc/minute (20 cu. in./minute) max. at 240 bar (3500 psi)

Pilot Ratio: 4:1

Check Spring Bias: 1.7 bar (25 psi); with sealed piston option, 4.1 bar (60 psi)

Optional Thermal Relief Factory Setting: 348 ± 38 bar (5050 ± 550 psi)

Thermal Relief Reseat: 207 bar (3000 psi) minimum.

Operating Temperature: -40°C to 120°C (-40°F to 248°F) with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

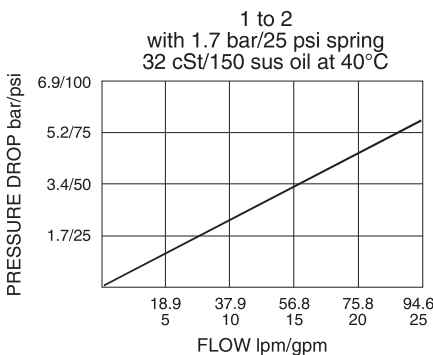
Seal Kit (for CV12-2x): SK12-2x-T (2 required); See page 8.650.1

Pilot Piston Service Part Numbers:

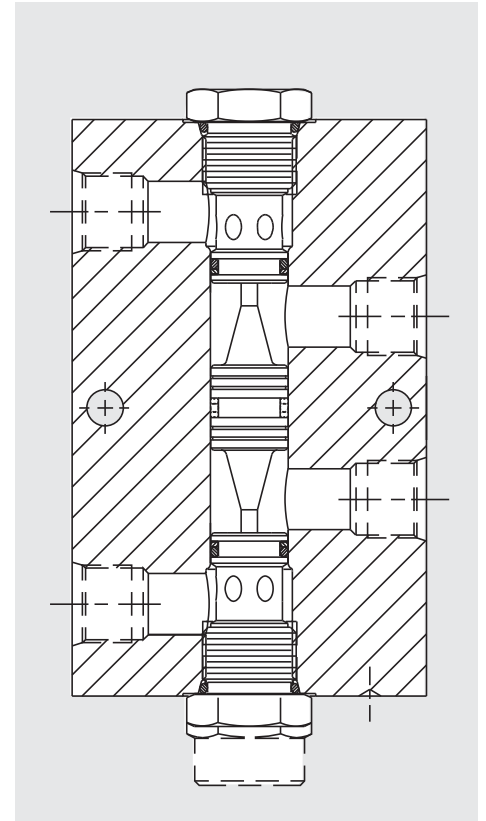
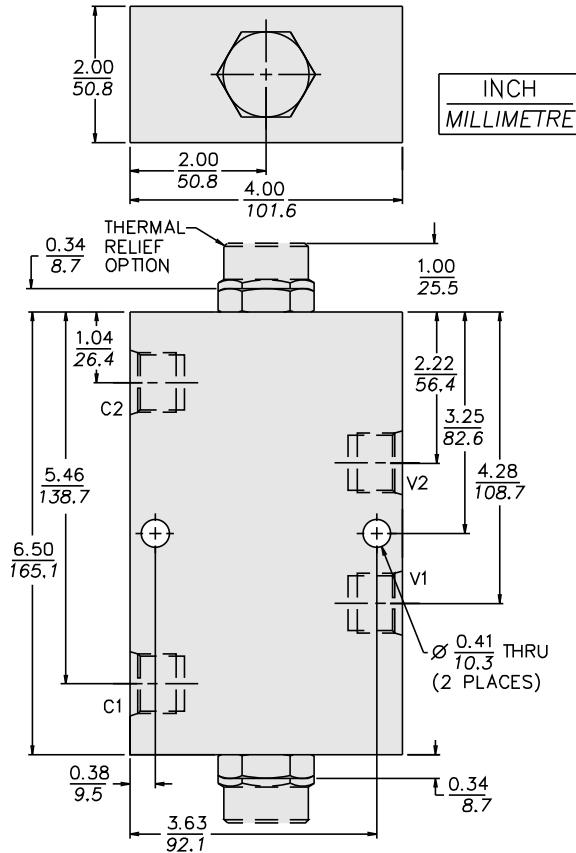
O-Ring (1) – Buna 6001115, Fluorocarbon 6003115

Back-up (2) – Fluorocarbon 6011115 (all)

PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: (CV12-20): Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-ups standard.

Pilot Piston: Hardened steel.

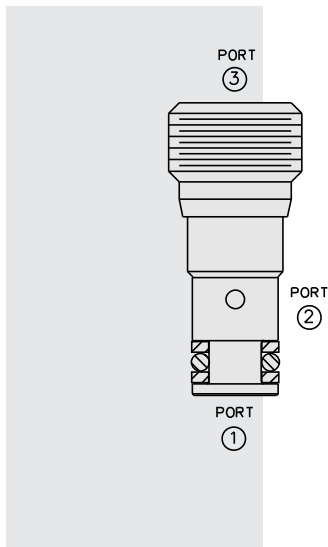
Standard Ported Body: Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1.

Product Weight: 2.4 kg. (5.3 lbs.)

TO ORDER

DCV12-					
Porting					
SAE 10	10T				
SAE 12	12T				
SAE 16	16T				
		Seals			
		Buna N (Std.)	N		
		Fluorocarbon	V		
		Buna N w/Sealed Piston (4.1 bar/60 psi spring minimum)	NS		
		Fluorocarbon w/Sealed Piston (4.1 bar/60 psi spring minimum)	VS		
		Options			
		None (Blank)			
		Thermal Relief on C1	1		
		Thermal Relief on C2	2		
		Thermal Relief on C1 and C2	3		
		Bias Spring			
		(Blank) 1.7 bar (25 psi) (Std.)* N and V			
		(Blank) Thermal Relief Option			
		(Blank) 4.1 bar (60 psi) NS and VS			
		30 2.1 bar (30 psi) N and V			
		40 2.8 bar (40 psi) N and V			
		50 3.4 bar (50 psi) N and V			
		60 4.1 bar (60 psi) N and V			
		80 5.5 bar (80 psi) N, V, NS and VS			
		Note: Both check valves must have same spring value.			
		* DCV12 valves built with standard 25 psi spring are not stamped with spring rating. Other spring ratings are stamped on valve.			
		Thermal Relief Spring Value: 4.9 bar (65 psi) N, V, NS and VS			
		Check Valve Spring Value: 1.7 bar (25 psi) N and V			
		Check Valve Spring Value: 4.1 bar (60 psi) NS and VS			

LS04-B30 Load Shuttle, Ball-Type, "Down-Hole" Mount



DESCRIPTION

A load-shuttling, screw-in, cartridge-style hydraulic check valve, for use in blocking circuits where a priority of flow/direction is given to a higher pressure circuit over a lower one.

OPERATION

The **LS04-B30** will allow flow from the higher pressure of 1 or 3 port to the 2 port. The valve is commonly used to direct oil from the pressure side of a bidirectional hydraulic motor to a pressure-released hydraulic brake. It can also be used as a load-sense signaling valve.

FEATURES

- Rapid response to load direction changes.
- Miniature size.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: 0.25 cc/minute (5 drops/minute) max. at 207 bar(3000 psi)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

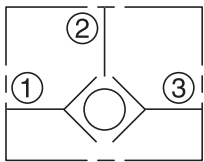
Cavity: VC04-B3; See page 9.104.1

Cavity Tool: CT04-B3XX; See page 8.600.1

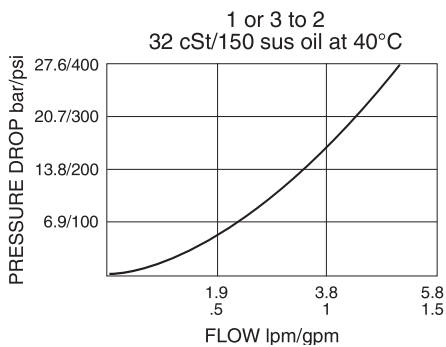
Seal Kit: SK04-B3X-M; See page 8.650.1

SYMBOLS

USASI/ISO:

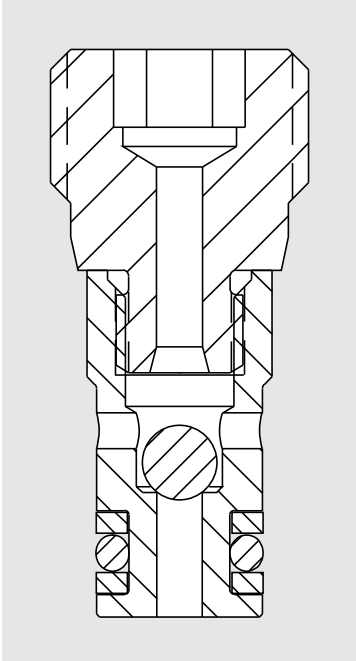
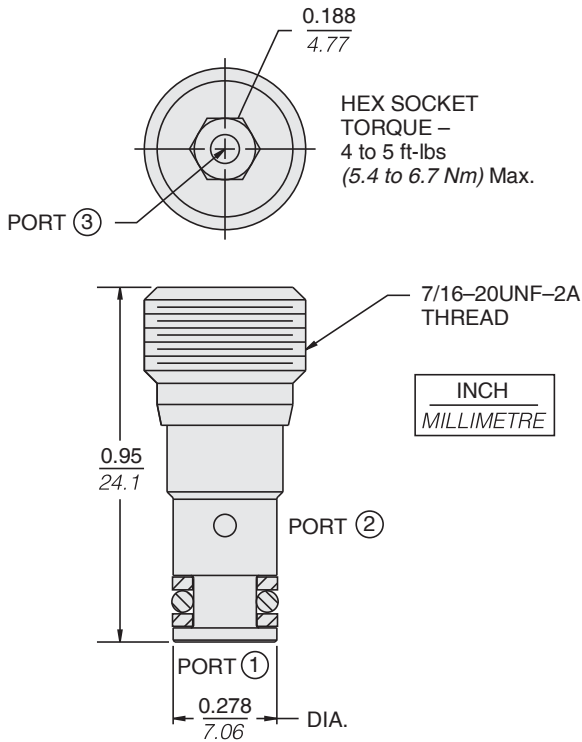


PERFORMANCE (Cartridge Only)



LS04-B30

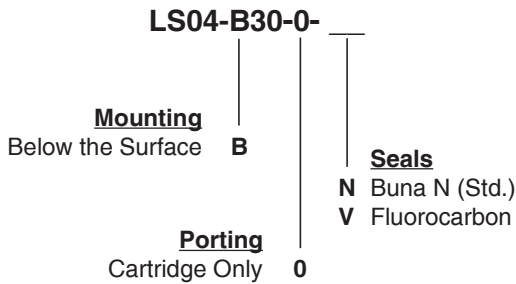
DIMENSIONS



MATERIALS

Cartridge: Weight: 0.08 kg. (0.17 lbs.)
Steel with Zinc-plated exposed surfaces; Buna N O-rings and back-ups standard.

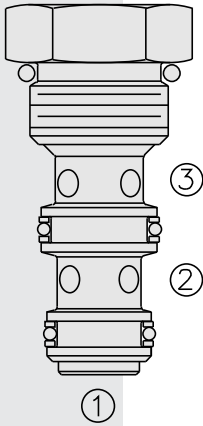
TO ORDER



HLS06-B30

For more information on ***HLS06-B30***,
please visit our website at
www.hydraforce.com

LS08-30 Load Shuttle, Ball-Type



DESCRIPTION

A load-shuttling, screw-in, cartridge-style hydraulic check valve, for use in blocking circuits where a priority of flow/direction is given to a higher pressure circuit over a lower one.

OPERATION

The **LS08-30** will allow flow from the higher pressure of 1 or 3 port to the 2 port. The valve is commonly used to direct oil from the pressure side of a bidirectional hydraulic motor to a pressure-released hydraulic brake.

FEATURES

- Rapid response to load direction changes.
- Compact size.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 390 bar (5700 psi)

Flow: See Performance Chart

Internal Leakage: 0.25 cc/minute (5 drops/minute) max. at 207 bar(3000 psi)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

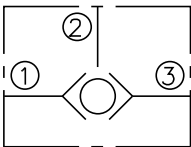
Cavity: VC08-3; See page 9.108.1

Cavity Tool: CT08-3XX; See page 8.600.1

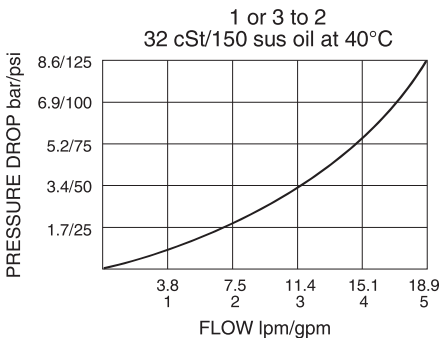
Seal Kit: SK08-3X-MM; See page 8.650.1

SYMBOLS

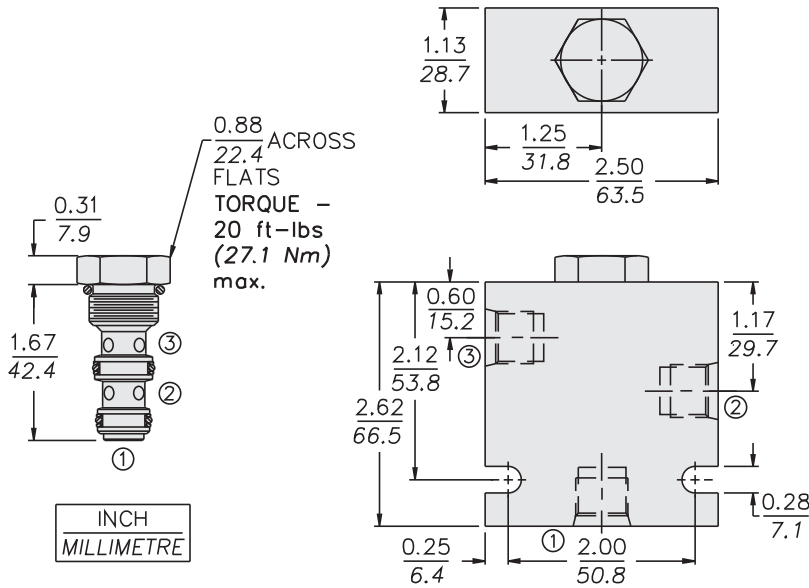
USASI/ISO:



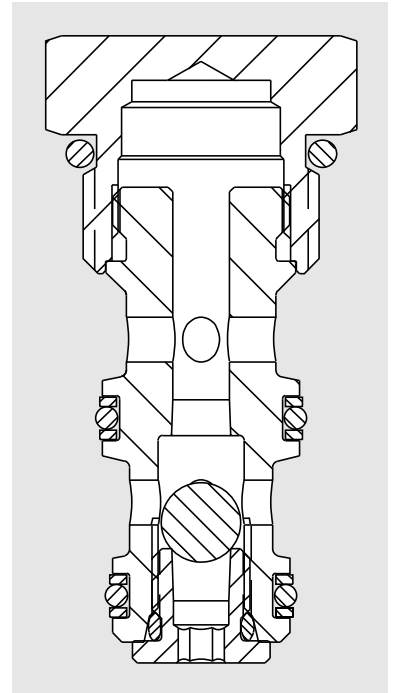
PERFORMANCE (Cartridge Only)



DIMENSIONS



ORIFICE DISC MAY NOT BE USED WITH THIS PRODUCT.



MATERIALS

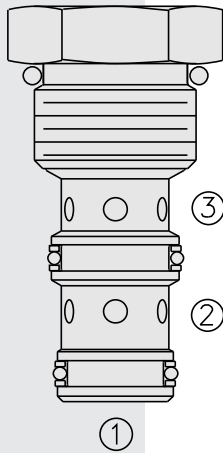
Cartridge: Weight: 0.08 kg. (0.17 lbs.)
Steel with Zinc-plated exposed surfaces; Buna N O-rings and back-ups standard.

Standard Ported Body: Weight: 0.27 kg. (0.60 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.008.1

TO ORDER

LS08-30-	Porting		Seals
	Cartridge Only	0	N Buna N (Std.)
	SAE 4	4T	V Fluorocarbon
	SAE 6	6T	
	1/4 in. BSP*	2B	
	3/8 in. BSP*	3B	
	*BSP Body U.K. Mfr. Only		

LS10-30 Load Shuttle, Ball-Type



DESCRIPTION

A load-shuttling, screw-in, cartridge-style hydraulic check valve, for use in blocking circuits where a priority of flow/direction is given to a higher pressure circuit over a lower one.

OPERATION

The LS10-30 will allow flow from the higher pressure 1 or 3 port to the 2 port. The valve is commonly used to direct oil from the pressure side of a bidirectional hydraulic motor to a pressure-released hydraulic brake.

FEATURES

- Rapid response to load direction changes.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 390 bar (5700 psi)

Flow: See Performance Chart

Internal Leakage: 0.25 cc/minute (5 drops/minute) max. at 207 bar(3000 psi)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

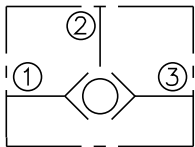
Cavity: VC10-3; See page 9.110.1

Cavity Tool: CT10-3XX; See page 8.600.1

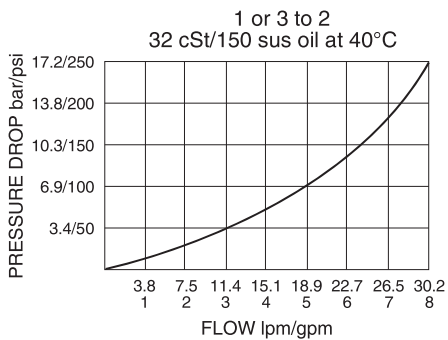
Seal Kit: SK10-3X-MM; See page 8.650.1

SYMBOLS

USASI/ISO:

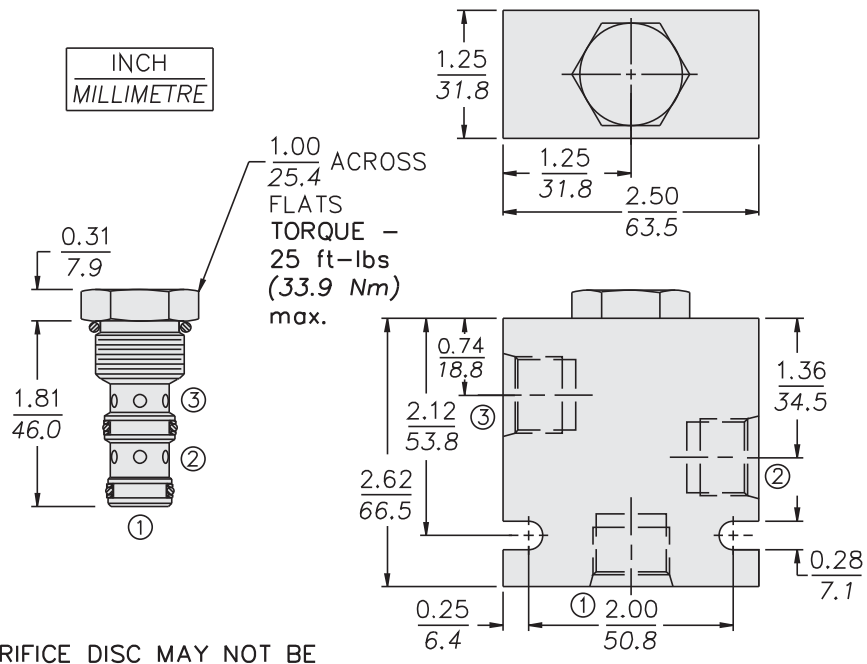


PERFORMANCE (Cartridge Only)

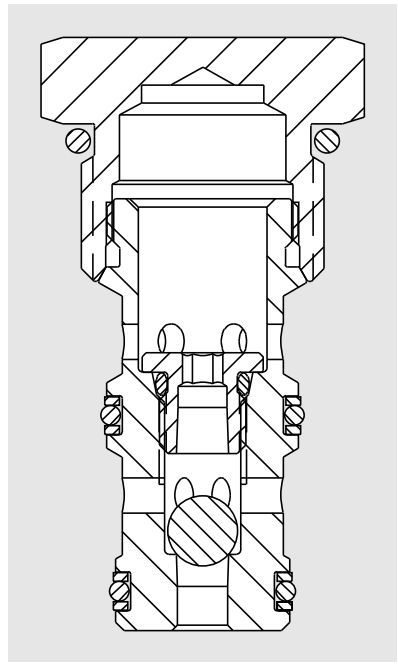


LS10-30

DIMENSIONS



ORIFICE DISC MAY NOT BE USED WITH THIS PRODUCT.



MATERIALS

Cartridge: Weight: 0.08 kg. (0.18 lbs.)
Steel with Zinc-plated exposed surfaces; Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.36 kg. (0.80 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

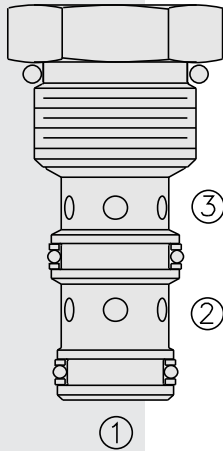
TO ORDER

LS10-30- -

Porting		Seals
Cartridge Only	0	N Buna N (Std.)
SAE 6	6T	V Fluorocarbon
SAE 8	8T	
1/4 in. BSP*	2B	
3/8 in. BSP*	3B	

*BSP Body;
U.K. Mfr. Only

LS50-30 Load Shuttle, Ball-Type



DESCRIPTION

A load-shuttling, screw-in, cartridge-style hydraulic check valve, for use in blocking circuits where a priority of flow/direction is given to a higher pressure circuit over a lower one.

OPERATION

The **LS50-30** will allow flow from the higher pressure 1 or 3 port to the 2 port. The valve is commonly used to direct oil from the pressure side of a bidirectional hydraulic motor to a pressure-released hydraulic brake.

FEATURES

- Rapid response to load direction changes.
- Industry common cavity.

RATINGS

Operating Pressure: 345 bar (5000 psi)

Proof Pressure: 390 bar (5700 psi)

Flow: See Performance Chart

Internal Leakage: 0.25 cc/minute (5 drops/minute) max. at 345 bar(5000 psi)

Temperature: -40 to 120°C with standard Polyurethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

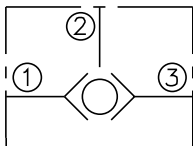
Cavity: VC10-3; See page 9.110.1

Cavity Tool: CT10-3XX; See page 8.600.1

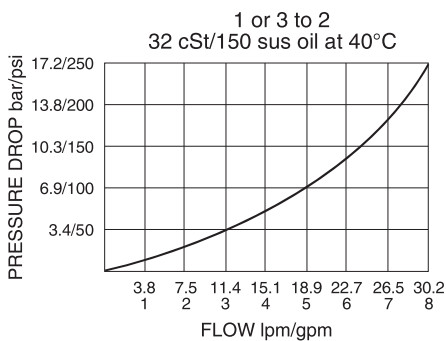
Seal Kit: SK10-3P-MM; See page 8.650.1

SYMBOLS

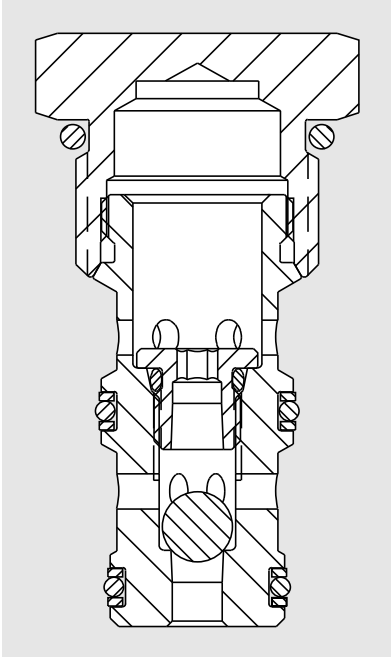
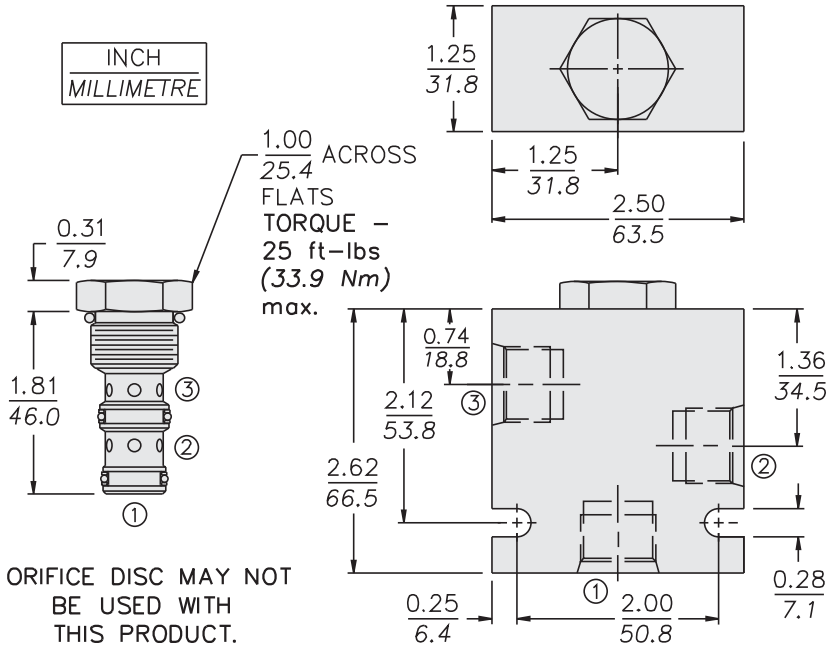
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS

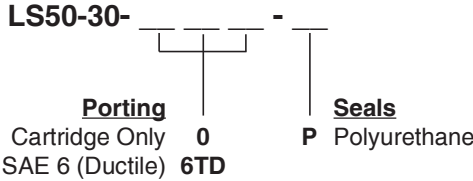


MATERIALS

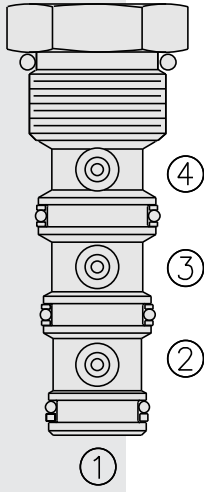
Cartridge: Weight: 0.08 kg. (0.18 lbs.)
Steel with zinc-plated exposed surfaces; Polyurethane O-rings and Fluorocarbon elastomer back-ups standard.

Ported Body: Weight: 0.64 kg. (1.41 lbs.) Ductile Iron (code "D") standard, consult factory for weight. Rated to 345 bar (5000 psi); See page 8.010.1.

TO ORDER



LS10-40 Load Shuttle Network



DESCRIPTION

A cartridge-style check valve network for use in hydraulic load-sense circuits.

OPERATION

The LS10-40 will compare pressures from three circuits to provide a pressure signal from the highest pressure circuit, while blocking the other circuits.

The valve will allow flow from the highest pressure port (4, 3 or 2) to port 1.

FEATURES

- Industry common cavity.
- Hardened seat for long life and low leakage.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 1.89 lpm (0.5 gpm); See performance chart

Internal Leakage: 0.15 ml/minute (2 drops/minute) at 240 bar (3500 psi)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

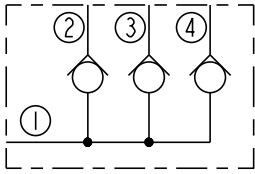
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX-X-X; See page 8.600.1

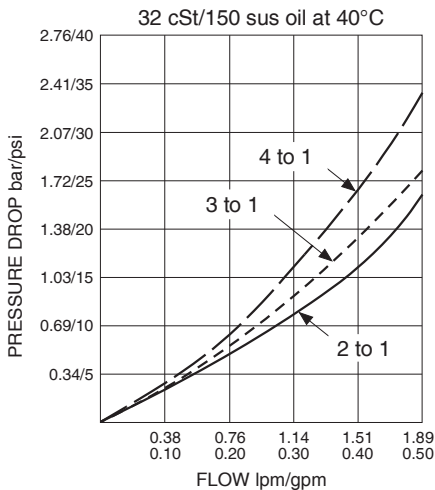
Seal Kit: SK10-4X-MMM; See page 8.650.1

SYMBOLS

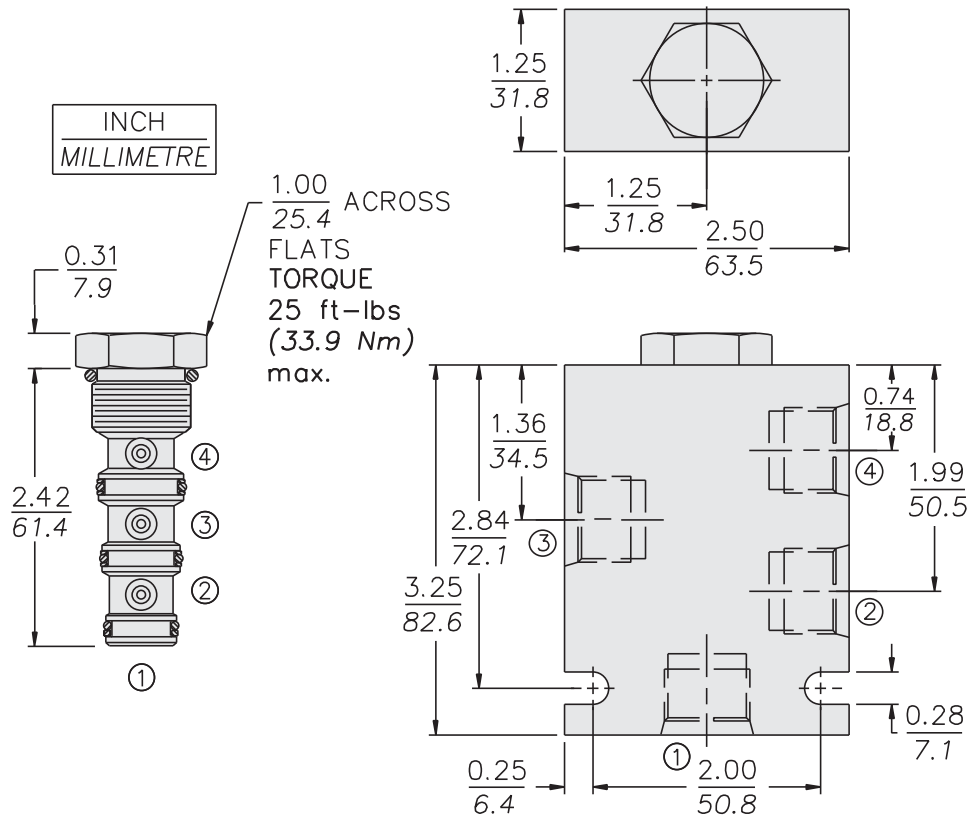
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

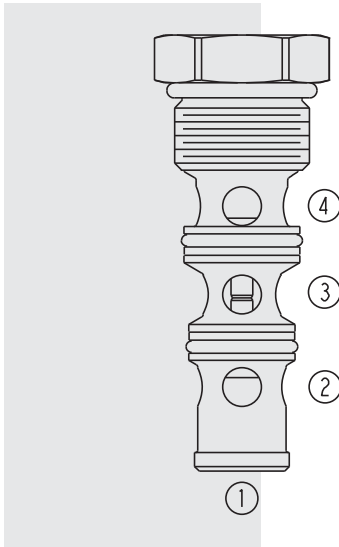
Cartridge: Weight: 0.12 kg. (0.26 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
0.34 kg. (0.75 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.010.1

TO ORDER

LS10-40 - -		
Porting		
Cartridge Only	0	
SAE 6	6T	
SAE 8	8T	
1/4 in. BSP*	2B	
3/8 in. BSP*	3B	
*BSP Body; U.K. Mfr. Only		Seals
		N Buna N (Std.)
		V Fluorocarbon
		P Polyurethane

LS10-41 Inverted Shuttle Valve



DESCRIPTION

A screw-in, cartridge-style inverted shuttle valve, which can be used to help protect against brake or steering failure in the event of loss of pressure in either one of two accumulators.

OPERATION

If one accumulator fails, the **LS10-41** will shift over to protect the good one. All ports are connected in neutral. When pressure at one of the two load ports exceeds the other, the poppets shuttle to allow bi-directional flow between other two ports. Typical applications include braking and steering circuits.

Note: Port 1 should be blocked.

FEATURES

- Hardened work surfaces.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 15.1 lpm (4 gpm); See Performance Chart

Internal Leakage: 0.15 ml per minute (3 drops per minute)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

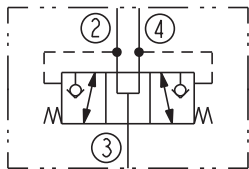
Installation: No restrictions; See page 9.020.1

Cavity: VC10-4; See page 9.110.1

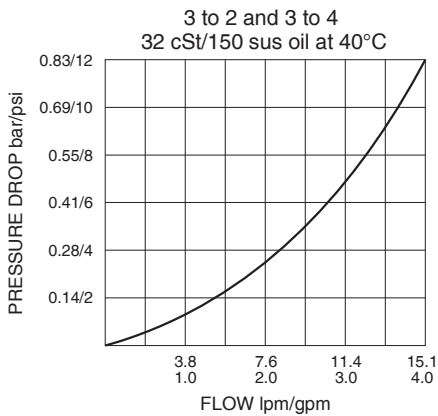
Cavity Tool: CT10-4XX; See page 8.600.1

Seal Kit: SK10-4X-TBX; See page 8.650.1

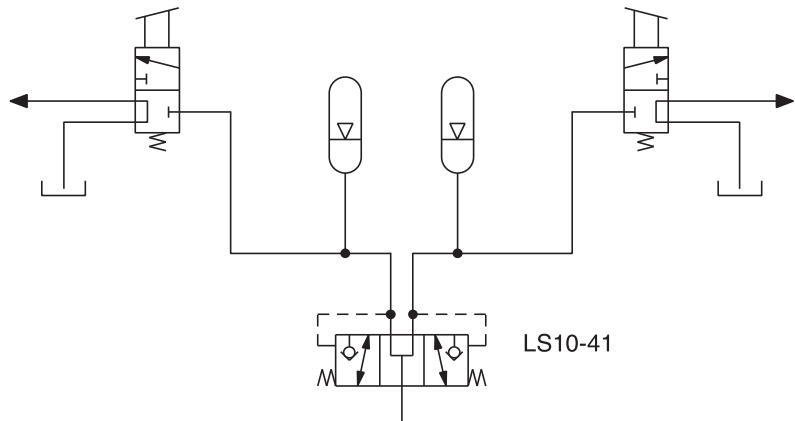
SYMBOL



PERFORMANCE (Cartridge Only)

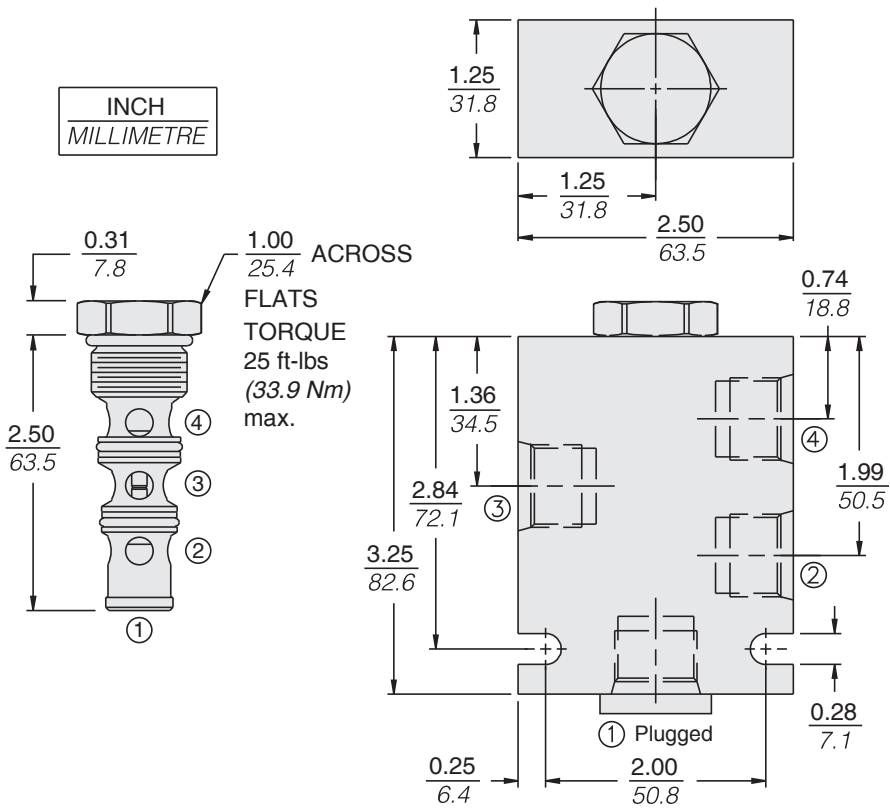


TYPICAL APPLICATION



LS10-41

DIMENSIONS



MATERIALS

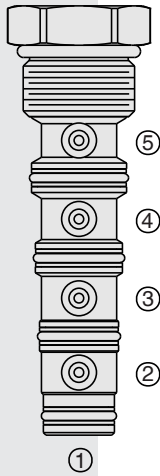
Cartridge: Weight: 0.1 kg. (0.22 lbs.)
Steel with zinc-plated exposed surfaces; Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron steel bodies available; dimensions may differ. See page 8.010.1.

TO ORDER

LS10-41-	-	
	Porting	Seals
Cartridge Only	0	N Buna N (Std.)
SAE 6	6T	V Fluorocarbon
SAE 8	8T	
1/4 in. BSP*	2B	
3/8 in. BSP*	3B	
	*BSP Body; U.K. Mfr. Only	

LS10-50 Load Shuttle Network



DESCRIPTION

A cartridge-style check valve network for use in hydraulic load-sense circuits.

OPERATION

The LS10-50 will compare pressures from four circuits to provide a pressure signal from the highest pressure circuit, while blocking the other circuits.

The valve will allow flow from the highest pressure port (5, 4, 3 or 2) to port 1.

FEATURES

- Hardened seat for long life and low leakage.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 1.89 lpm (0.5 gpm); See performance chart

Internal Leakage: 0.15 ml/minute (2 drops/minute) at 240 bar (3500 psi)

Temperature: -40 to 120°C with Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

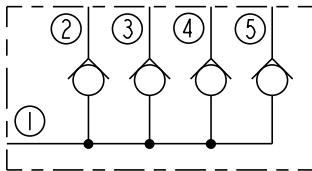
Cavity: VC10-5; See page 9.110.1

Cavity Tool: CT10-5XX-X-X; See page 8.600.1

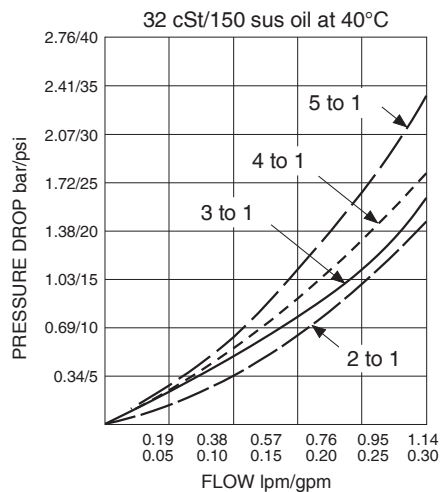
Seal Kit: SK10-5X-MMMM; See page 8.650.1

SYMBOLS

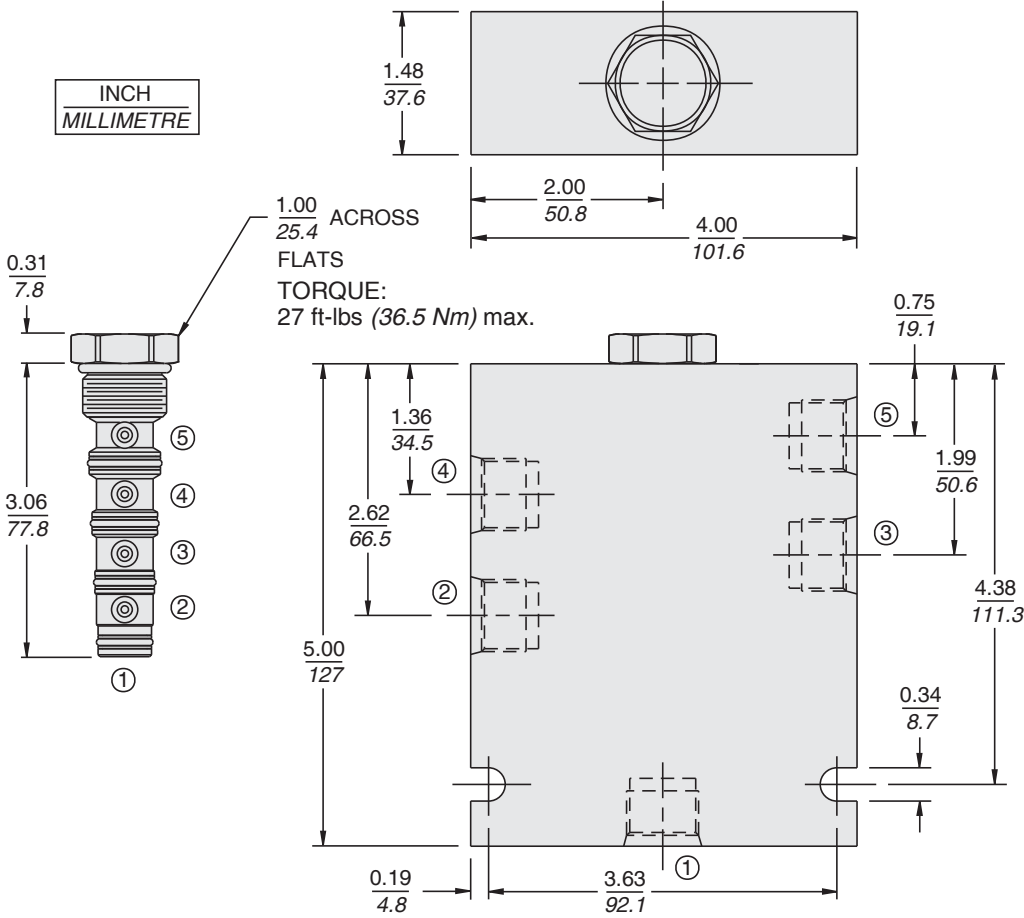
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

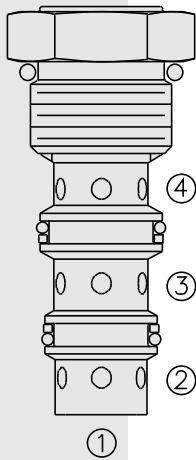
Cartridge: Weight: 0.14 kg. (0.30 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.41 kg. (0.85 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

LS10-50 - -		
	Porting	
Cartridge Only	0	
SAE 6	6T	
SAE 8	8T	
	Seals	
	N	Buna N (Std.)
	V	Fluorocarbon

HS10-42 Low Side (Hot Oil) Shuttle, Springless



DESCRIPTION

A spool-type, closed in transition, 2-position, 3-way hot oil shuttle valve, which may be used on hydrostatic transmissions to direct charge pump oil to a heat exchanger or to tank.

OPERATION

With internal piloting at port 1, 2 or 4, oil will flow from the port opposite of the port piloted to port 3, thus removing oil from the low-pressure side for cooling or filtration purposes. The valve is **springless**, relying solely on the internal pilot pressure signal to shift to either side. The **HS10-42** is closed in transition.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

RATINGS

Operating Pressure:

- HS10-42: 207 bar (3000 psi)
- HS50-42: 345 bar (5000 psi)

Flow Rate: See Performance Chart

Internal Leakage: 115 cc/minute (7 cu. in./minute) max.

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC10-4; See page 9.110.1

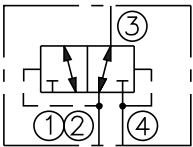
Cavity Tool: CT10-4XX; See page 8.600.1

Seal Kit:

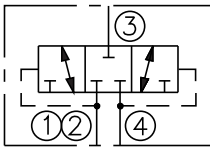
- HS10-42: SK10-4N-TTT/BBB; See page 8.650.1
- HS50-42: SK10-4P-TTT/BBB; See page 8.650.1

SYMBOLS

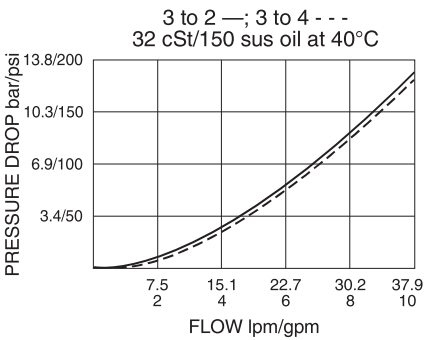
USASI/ISO:



TRANSITION:

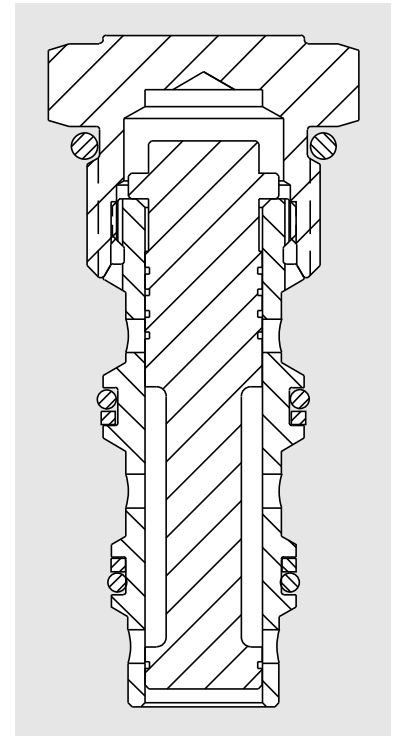
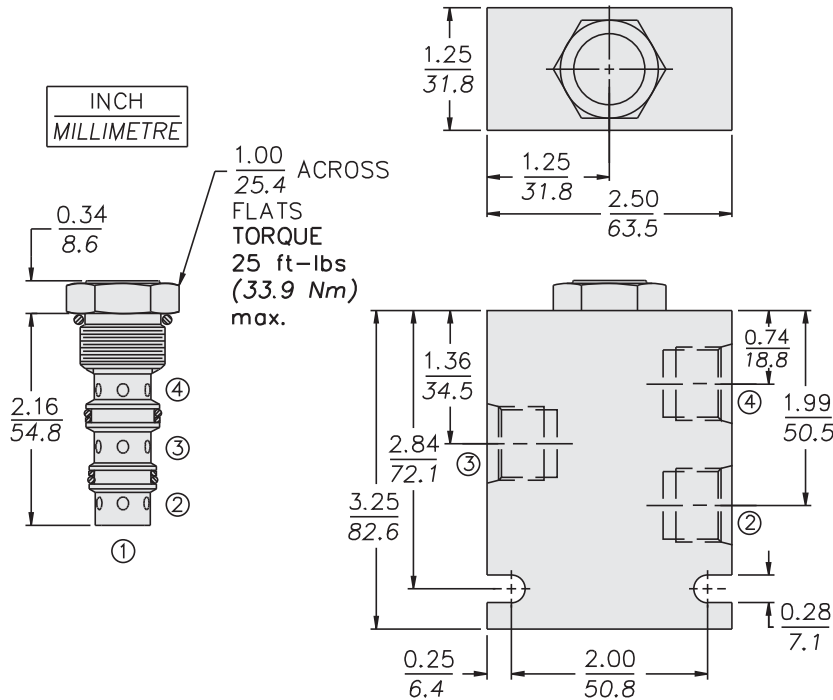


PERFORMANCE (Cartridge Only)



HS10-42

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.15 kg. (0.32 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.
Polyurethane seals optional
for high pressure.

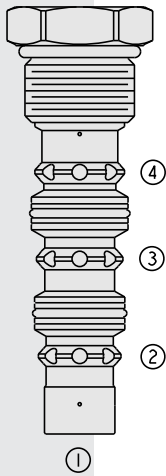
Standard Ported Body: Weight:
0.34 kg. (0.75 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron body required for operation over
241 bar (3500 psi); dimensions may
differ. See page 8.010.1

TO ORDER

HS		0 - 42 -	-	-
Pressure				Seals
207 bar (3000 psi)	1			N Buna N (Std. for 3000 psi)
345 bar (5000 psi)	5			P Polyurethane (Std. for 5000 psi)
		Porting		
		Cartridge Only	0	
		SAE 6	6T	
		SAE 6 (Ductile)	6TD	
		SAE 8	8T	
		1/4 in. BSP*	2B	
		3/8 in. BSP*	3B	
		*BSP Body; U.K. Mfr. Only		

Note: Steel or Ductile body
required for operation over
241 bar (3500 psi).

HS52-42 Low Side (Hot Oil) Shuttle, Springless



DESCRIPTION

A spool-type, closed in transition, 2-position, 3-way hot oil shuttle valve, which may be used on hydrostatic transmissions to direct charge pump oil to a heat exchanger or to tank.

OPERATION

With internal piloting at port 1, 2 or 4, oil will flow from the port opposite of the port piloted to port 3, thus removing oil from the low-pressure side for cooling or filtration purposes. The valve is **springless**, relying solely on the internal pilot pressure signal to shift to either side. The **HS52-42** is closed in transition.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

RATINGS

Operating Pressure: 345 bar (5000 psi) when used in steel body

Flow Rate: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) max.

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

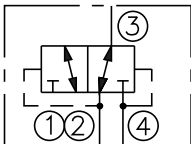
Cavity: VC12-4; See page 9.112.1

Cavity Tool: CT12-4XX; See page 8.600.1

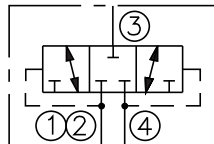
Seal Kit: SK12-2x-TB

SYMBOLS

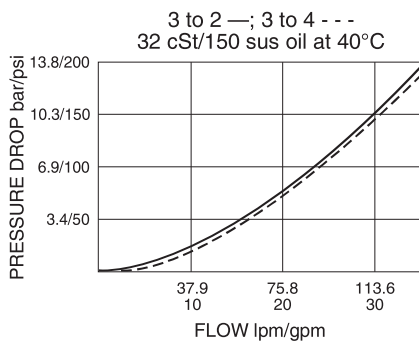
USASI/ISO:



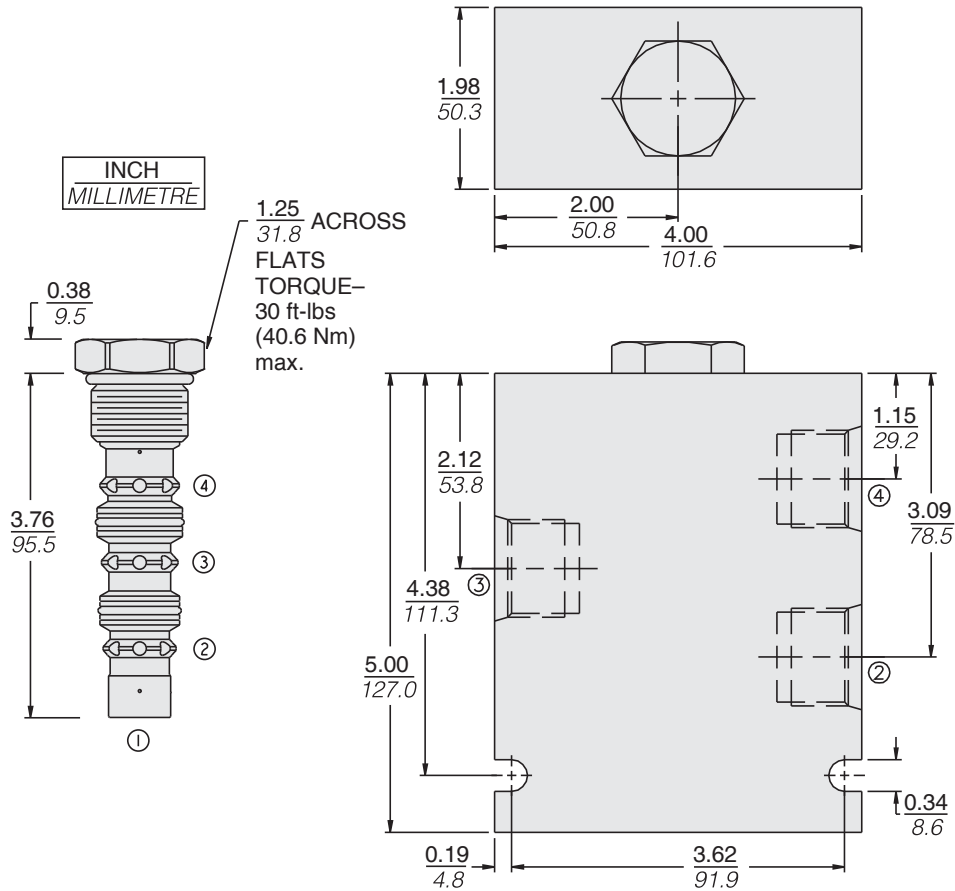
TRANSITION:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.15 kg. (0.32 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Polyurethane seals and polyester
elastomer back-ups required for
operation over 207 bar (3000 psi).

Ported Body: Weight: 3.57 kg.
(7.87 lbs.); Ductile Iron (code "D")
standard, rated to 345 bar (5000 psi).
Some body dimensions may differ.
See page 8.012.1.

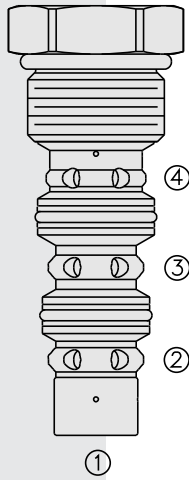
TO ORDER

HS52 - 42 -

Porting
Cartridge Only 0
SAE 12 (Ductile) 12TD

Seals
N Buna N (Std.)
V Fluorocarbon
P Polyurethane — required for
operation over 207 bar (3000 psi)

HS50-43 Low Side (Hot Oil) Shuttle,



DESCRIPTION

A spring-centered, spool-type, closed-in-neutral, 2-position, 3-way hot oil shuttle valve, which may be used on hydrostatic transmissions to direct charge pump oil to a heat exchanger or to tank.

OPERATION

With internal piloting at port 1, 2 or 4, the **HS50-43** will direct oil from the port opposite of the piloted port to port 3, thus removing oil from the low-pressure side for cooling or filtration purposes. The valve has a spring-centered spool, and is closed in neutral position.

FEATURES

- Hardened spool and cage for long life.
- Industry common cavity.

RATINGS

Operating Pressure: 345 bar (5000 psi) when used in steel body

Flow Rate: See Performance Chart

Bias Spring Value: 4.1 bar (60 psi)

Internal Leakage: 541 ml/minute (33 cu. in./minute) max. at 345 bar (5000 psi)

Temperature: -40 to 120°C with standard polyurethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

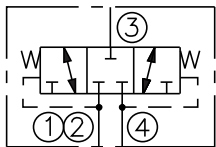
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

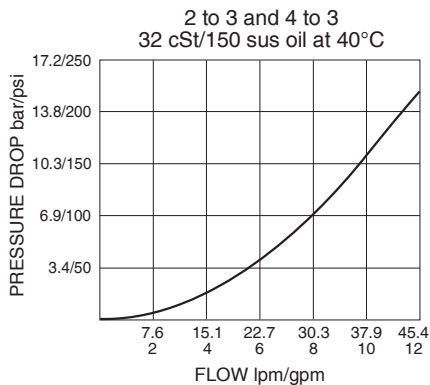
Seal Kit: SK10-4X-MMM, See page 8.650.1

SYMBOLS

USASI/ISO:



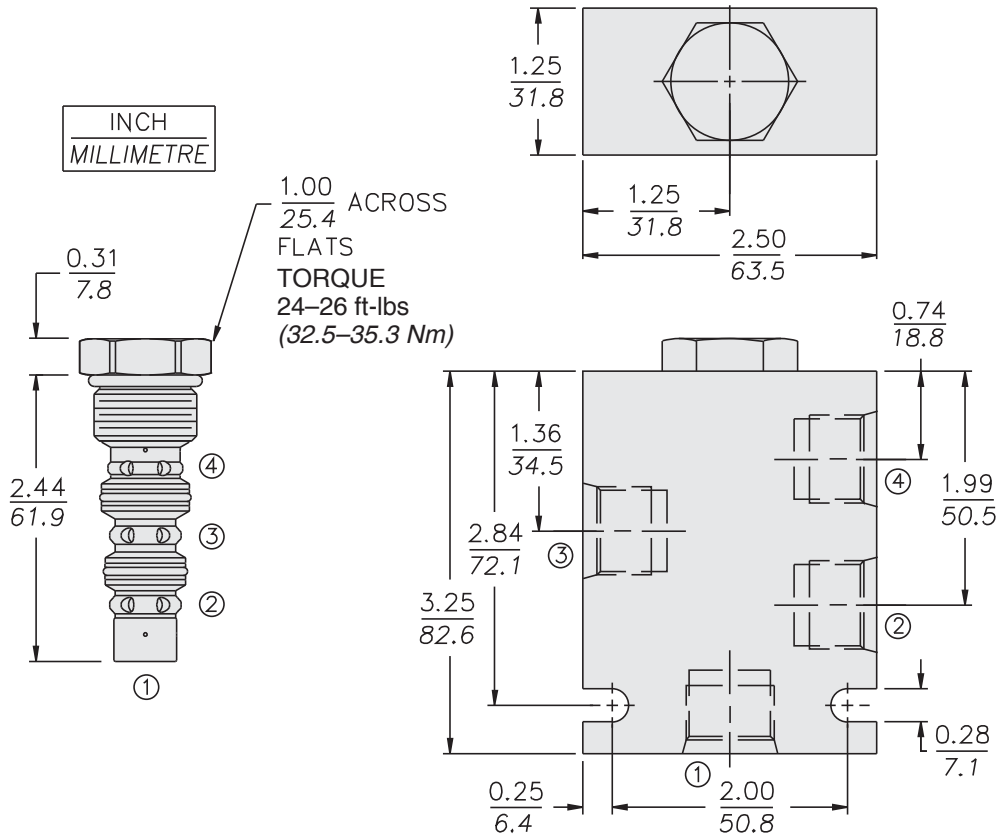
PERFORMANCE (Cartridge Only)



Spring Centered

HS50-43

DIMENSIONS



MATERIALS

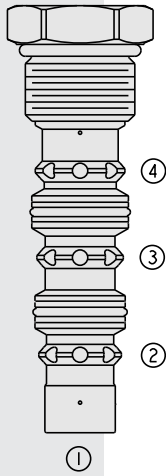
Cartridge: Weight: 0.12 kg. (0.27 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Polyurethane seals and polyester elastomer back-ups standard.

Ported Body: Weight: 0.68 kg. (1.51 lbs.); Ductile Iron (code "D") standard, consult factory for weight, dimensions may differ. Rated to 345 bar (5000 psi). See page 8.010.1.

TO ORDER

HS50-43 -		- P
		Seals
		P Polyurethane
Porting		
Cartridge Only	0	
SAE 6 (Ductile)	6TD	
SAE 6 (Steel)	6TS	

HS52-43 Low Side (Hot Oil) Shuttle,



DESCRIPTION

A spring centered, spool-type, closed in neutral, 2-position, 3-way hot oil shuttle valve, which may be used on hydrostatic transmissions to direct charge pump oil to a heat exchanger or to tank.

OPERATION

With internal piloting at port 1, 2 or 4, the **HS52-43** will direct oil from the port opposite of the piloted port to port 3, thus removing oil from the low-pressure side for cooling or filtration purposes. The valve has a spring-centered spool, and is closed in neutral position.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

RATINGS

Operating Pressure: 345 bar (5000 psi) when used in steel body

Flow Rate: See Performance Chart

Bias Spring Value: 4.1 bar (60 psi)

Internal Leakage: 164 cc/minute (10 cu. in./minute) max. when shifted, and 984 cc/minute (60 cu. in./minute) max. in neutral position at 207 bar (3000 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

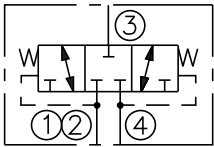
Cavity: VC12-4; See page 9.112.1

Cavity Tool: CT12-4XX; See page 8.600.1

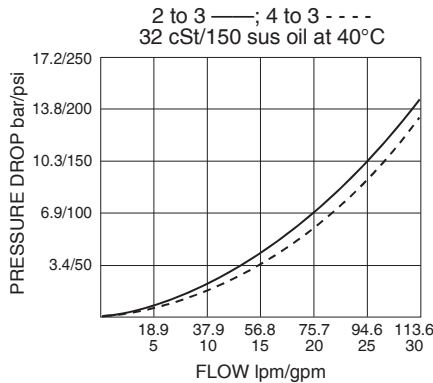
Seal Kit: SK52-4x-TB, See page 8.650.1

SYMBOLS

USASI/ISO:



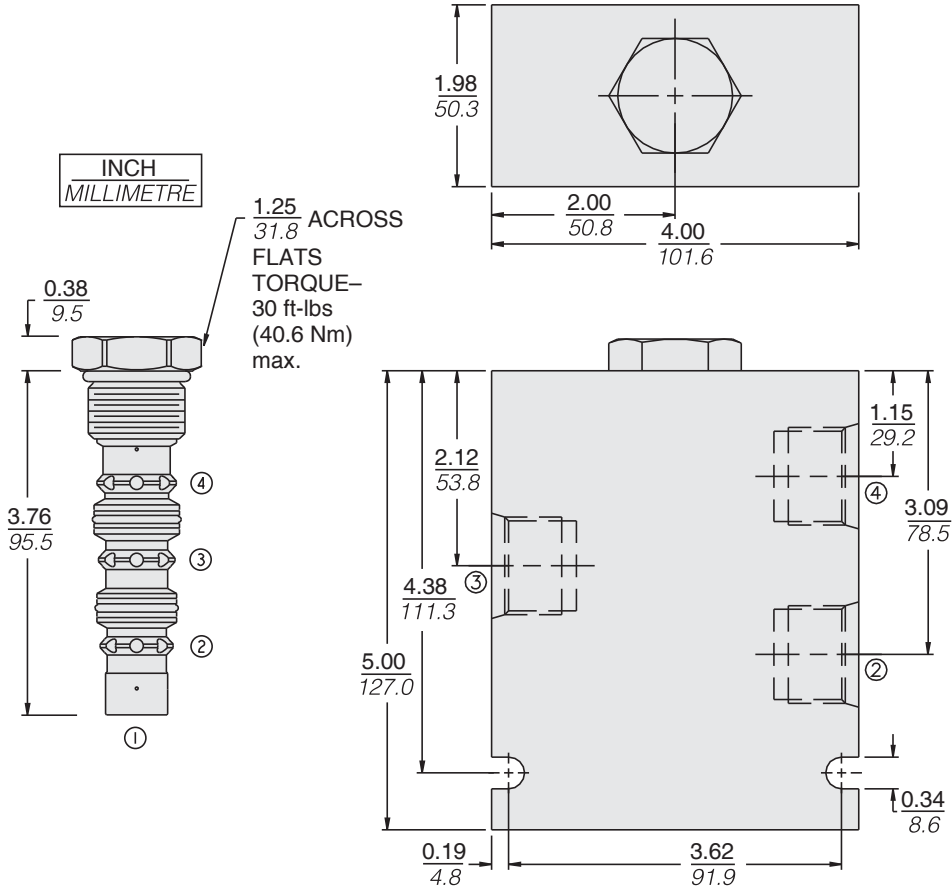
PERFORMANCE (Cartridge Only)



Spring Centered

HS52-43

DIMENSIONS



MATERIALS

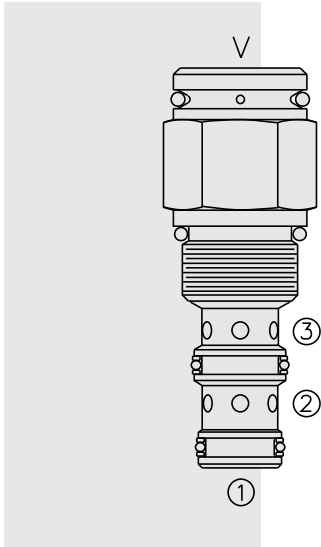
Cartridge: Weight: 0.15 kg. (0.32 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Polyurethane seals and polyester elastomer back-ups required for operation over 207 bar (3000 psi).

Ported Body: Weight: 3.57 kg. (7.87 lbs.); Ductile Iron (code "D") standard, rated to 345 bar (5000 psi).
 Some body dimensions may differ;
 See page 8.012.1

TO ORDER

HS52 - 43 -		-	-
		Porting	Seals
		Cartridge Only	N Buna N (Std.)
		SAE 12 (Ductile)	V Fluorocarbon
		SAE 12 (Steel)	P Polyurethane — required for operation over 207 bar (3000 psi)
	0	12TD	
	12TS		

PD10-30 Piloted 2-Way Spool, Normally Open,



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, normally open hydraulic directional valve for two-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD10-30** allows flow from 3 to 2 bidirectionally. V is a spring chamber vent-to-atmosphere, which is internally O-ring sealed from the cartridge flow paths.

On remote pilot signal at 1, the valve shifts to block 3 to 2 bidirectionally.

FEATURES

- Hardened spool and cage for long life.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 390 bar (5700 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required: To Full Spool Shift:

for 4.1 bar (60 psi) spring: 4.7 bar (68.2 psi)

for 7.6 bar (110 psi) spring: 8.6 bar (125 psi)

Oil Volume Required to Full Shift: 0.65 cc (0.04 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC10-3; See page 9.110.1

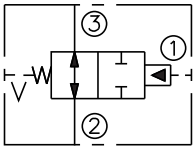
Cavity Tool: CT10-3XX; See page 8.600.1

Seal Kit: SK10-3X-MM; See page 8.650.1

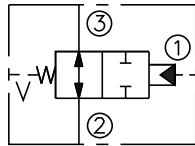
Cap Vent Seal: 6003117

SYMBOLS

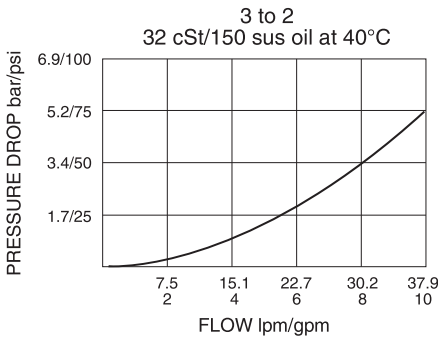
USASI:



ISO:



PERFORMANCE (Cartridge Only)

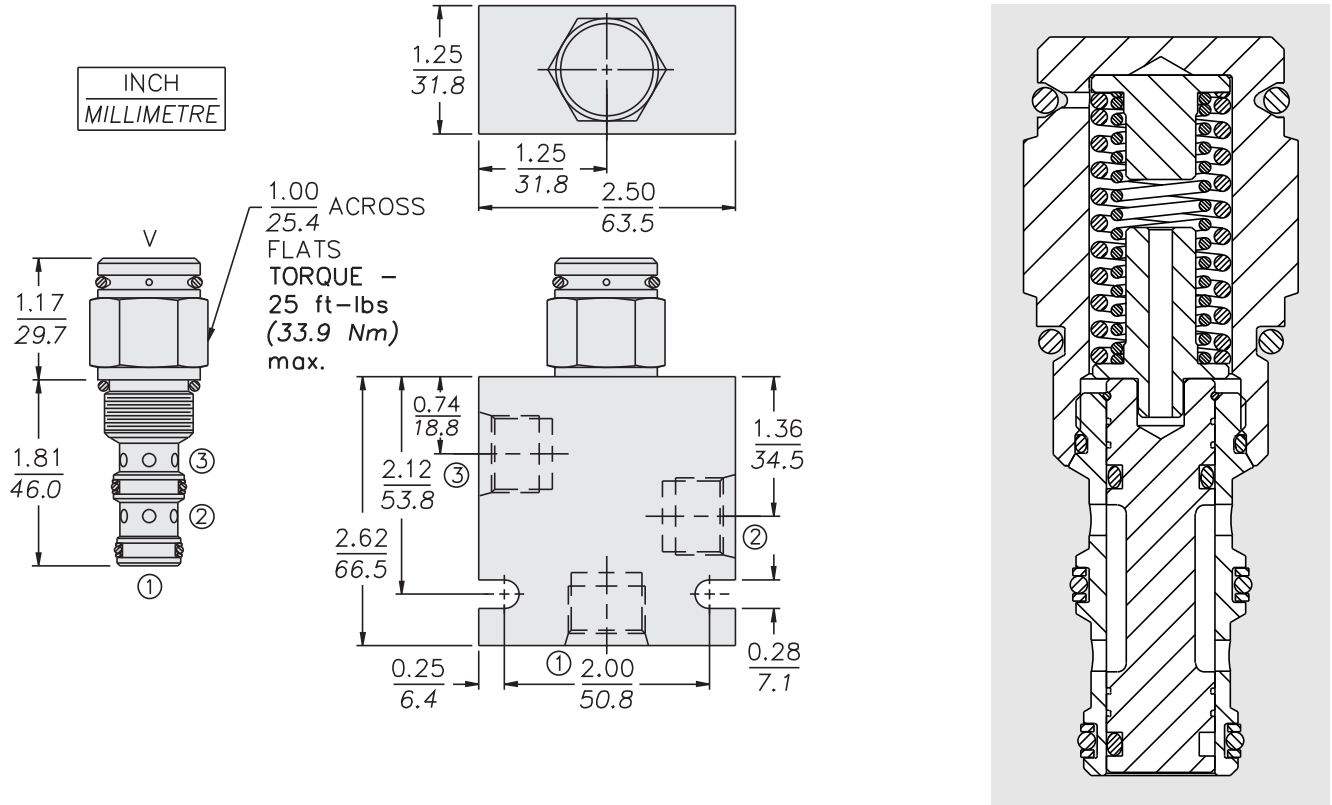


Note: This valve is designed with a dynamic oil-to-atmosphere seal in the vent section. Ambient conditions will cause this vent seal to degrade which will reduce the valve's cycle life. If this could cause a problem, we suggest that a non-vented model be selected, or special seal be used. Consult factory for assistance.

External Vent

PD10-30

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.15 kg. (0.34 lbs.)
Steel with hardened work surfaces;
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
0.36 kg. (0.80 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.010.1

TO ORDER

PD10-30 -

Porting

Cartridge Only	0
SAE 6	6T
SAE 8	8T
1/4 in. BSP*	2B
3/8 in. BSP*	3B

*BSP Body
U.K. Mfr. Only

Bias Spring†

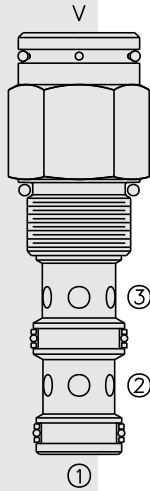
40	2.8 bar (40 psi)
60	4.1 bar (60 psi)
110	7.6 bar (110 psi)
170	11.7 bar (170 psi)

†Note: 110 psi bias spring is the
minimum required for use with
sealed spool.

Seals

Buna N (Std.)	N
Buna N with Sealed Spool	NS
Fluorocarbon	V
Fluorocarbon with Sealed Spool	VS

PD12-30 Piloted 2-Way Spool, Normally Open,



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, normally open, hydraulic directional valve for two-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the PD12-30 allows flow from 3 to 2 bidirectionally.

V is a spring chamber vent-to-atmosphere, which is internally O-ring sealed from the cartridge flow paths.

On remote pilot signal at 1, the valve shifts to block 2 to 3 bidirectionally.

Because of the vented spring chamber, the cartridge may be fully pressurized at any port without affecting required pilot pressure.

FEATURES

- Hardened and cage for long life.
- Cost-effective cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required for 7.6 bar (110 psi) Spring:

to Cross-Over: 7.6 bar (110 psi)

to Full Shift: 9.1 bar (132 psi)

Oil Volume Required to Full Shift: 1.32 cc (0.08 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC12-3; See page 9.112.1

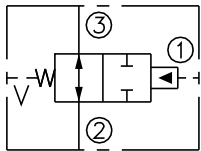
Cavity Tool: CT12-3XX; See page 8.600.1

Seal Kit: SK12-3X-MM; See page 8.650.1

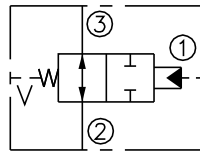
Cap Vent Seal: 6003121

SYMBOLS

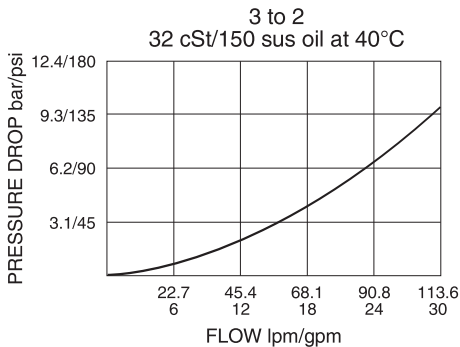
USASI:



ISO:



PERFORMANCE (Cartridge Only)

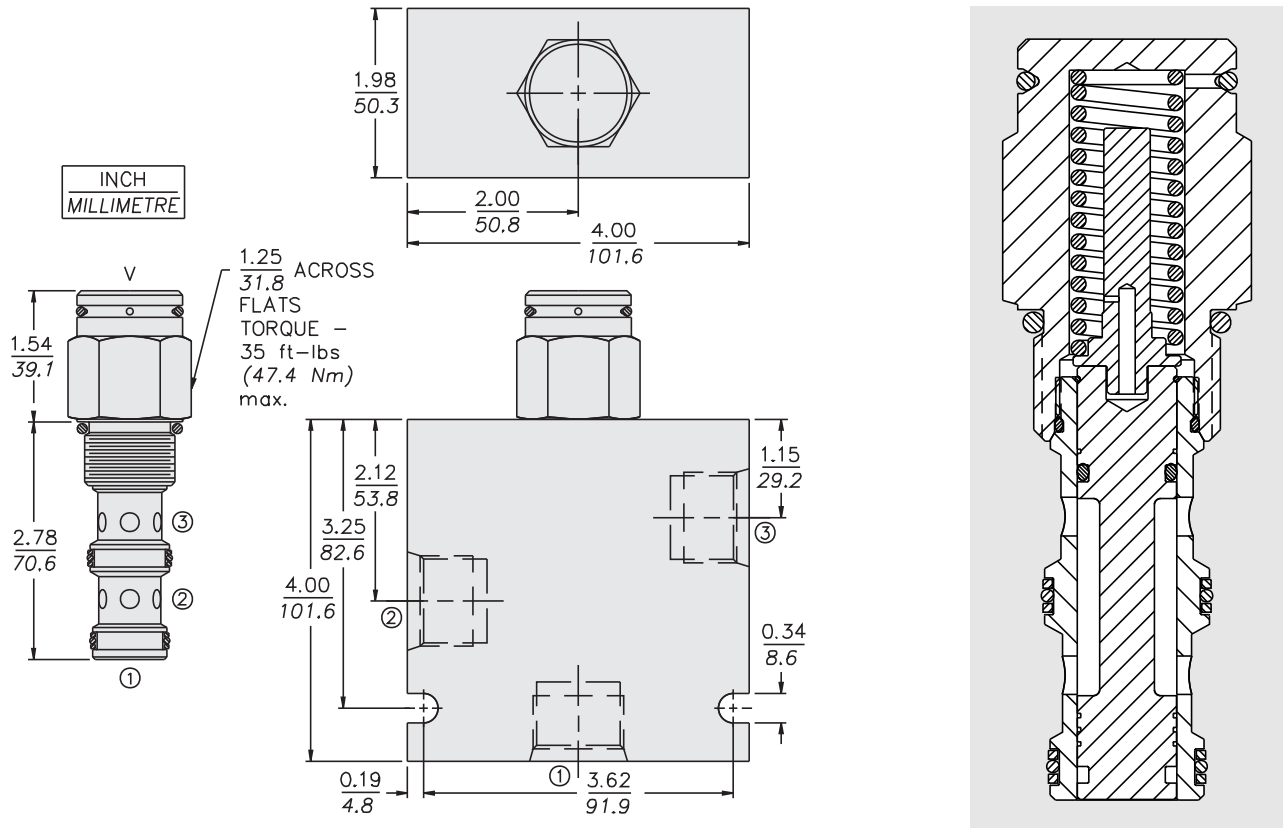


Note: This valve is designed with a dynamic oil-to-atmosphere seal in the vent section. Ambient conditions will cause this vent seal to degrade which will reduce the valve's cycle life. If this could cause a problem, we suggest that a non-vented model be selected, or special seal be used. Consult factory for assistance.

External Vent

PD12-30

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.23 kg. (0.50 lbs.)
Steel with hardened work surfaces;
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
1.13 kg. (2.50 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.012.1

TO ORDER

PD12-30 -

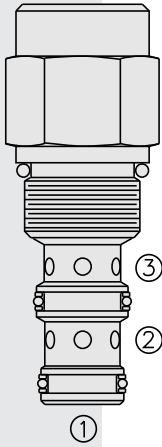
Porting
Cartridge Only **0**
SAE 8 **8T**
SAE 10 **10T**
SAE 12 **12T**
1/2 in. BSP* **4B**
3/4 in. BSP* **6B**

*BSP Body
U.K. Mfr. Only

Bias Spring
110 7.6 bar (110 psi)
170 11.7 bar (170 psi)

Seals
N Buna N (Std.)
NS Buna N with Sealed Spool
V Fluorocarbon
VS Fluorocarbon with Sealed Spool

PD10-32 Piloted 2-Way Spool, Normally Closed,



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, normally closed, hydraulic directional valve for two-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD10-32** blocks flow from 3 to 2 bidirectionally. The spring bias chamber is internally vented to 3.

On remote pilot signal at 1, the valve shifts to open 2 to 3 unidirectionally.

FEATURES

- Hardened spool and cage for long life.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 390 bar (5700 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required: To Full Spool Shift:

for 4.1 bar (60 psi) spring: 4.7 bar (68.2 psi)

for 7.6 bar (110 psi) spring: 8.6 bar (125 psi)

Oil Volume Required to Full Shift: 0.65 cc (0.04 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

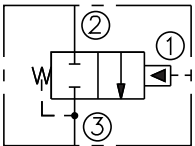
Cavity: VC10-3; See page 9.110.1

Cavity Tool: CT10-3XX; See page 8.600.1

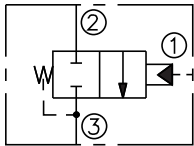
Seal Kit: SK10-3X-MM; See page 8.650.1

SYMBOLS

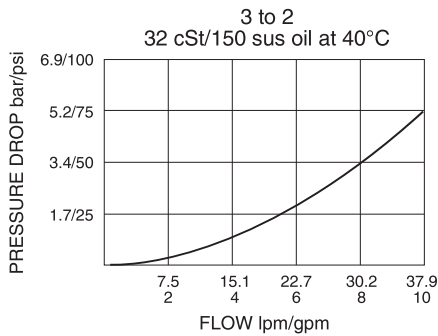
USASI:



ISO:



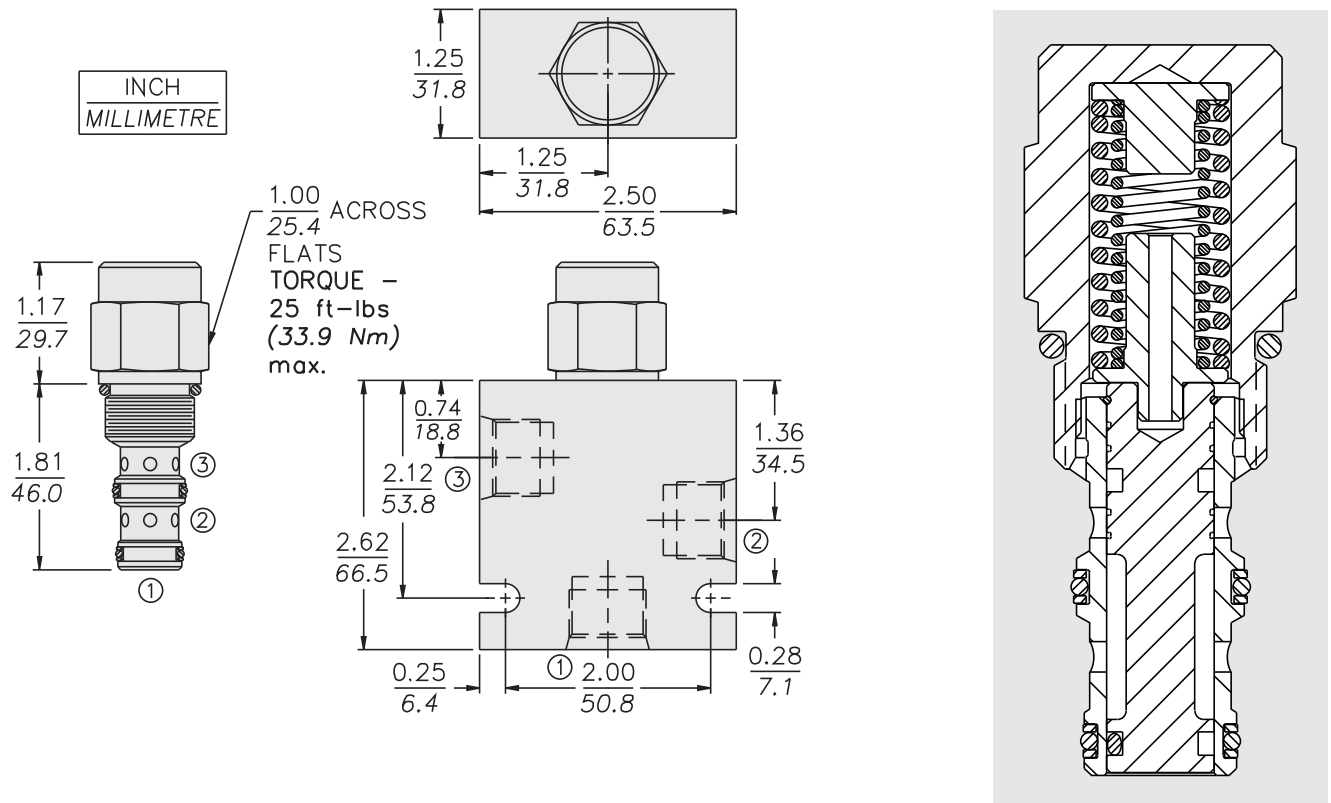
PERFORMANCE (Cartridge Only)



Internal Vent

PD10-32

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.15 kg. (0.34 lbs.)
Steel with hardened work surfaces;
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
0.36 kg. (0.80 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.010.1.

TO ORDER

PD10-32 -

Porting

Cartridge Only	0
SAE 6	6T
SAE 8	8T
1/4 in. BSP*	2B
3/8 in. BSP*	3B

*BSP Body
U.K. Mfr. Only

Bias Spring†

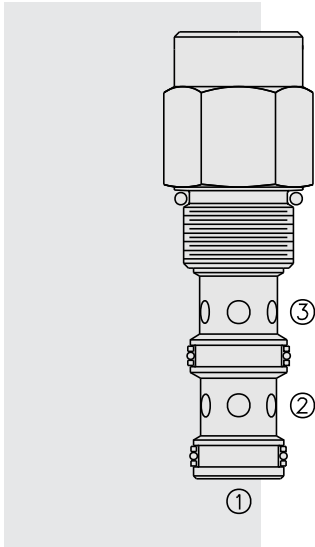
40	2.8 bar (40 psi)
60	4.1 bar (60 psi)
110	7.6 bar (110 psi)
170	11.7 bar (170 psi)

†Note: 110 psi bias spring is the
minimum required for use with
sealed spool.

Seals

N	Buna N (Std.)
NS	Buna N with Sealed Spool
V	Fluorocarbon
VS	Fluorocarbon with Sealed Spool

PD12-32 Piloted 2-Way Spool, Normally Closed,



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, normally closed, hydraulic directional valve for two-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD12-32** blocks flow from 3 to 2 bidirectionally. The spring bias chamber is internally vented to 3.

On remote pilot signal at 1, the valve shifts to open 2 to 3 unidirectionally.

FEATURES

- Hardened spool and cage for long life.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required: To Full Spool Shift for 7.6 bar (110 psi) spring:
8.6 bar (125 psi)

Oil Volume Required to Full Shift: 1.32 cc (0.08 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

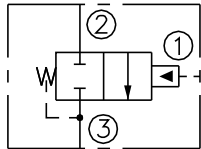
Cavity: VC12-3; See page 9.112.1

Cavity Tool: CT12-3XX; See page 8.600.1

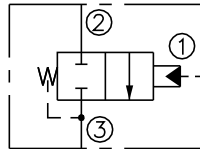
Seal Kit: SK12-3X-MM; See page 8.650.1

SYMBOLS

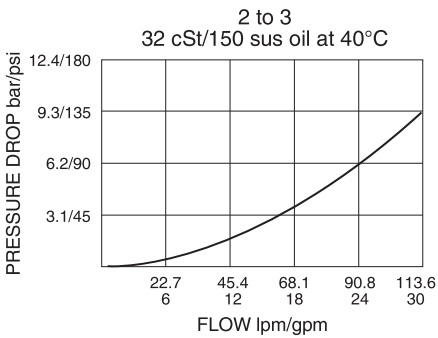
USASI:



ISO:



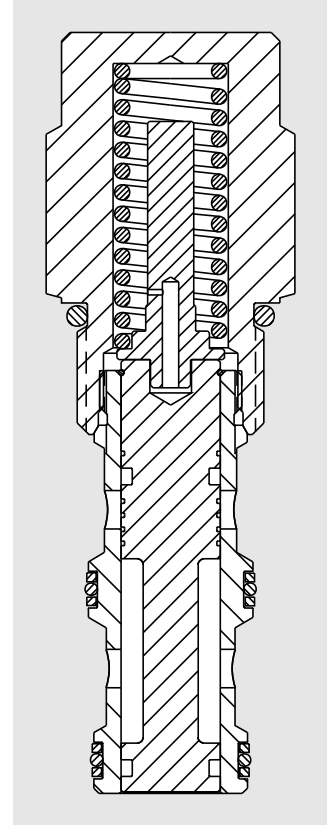
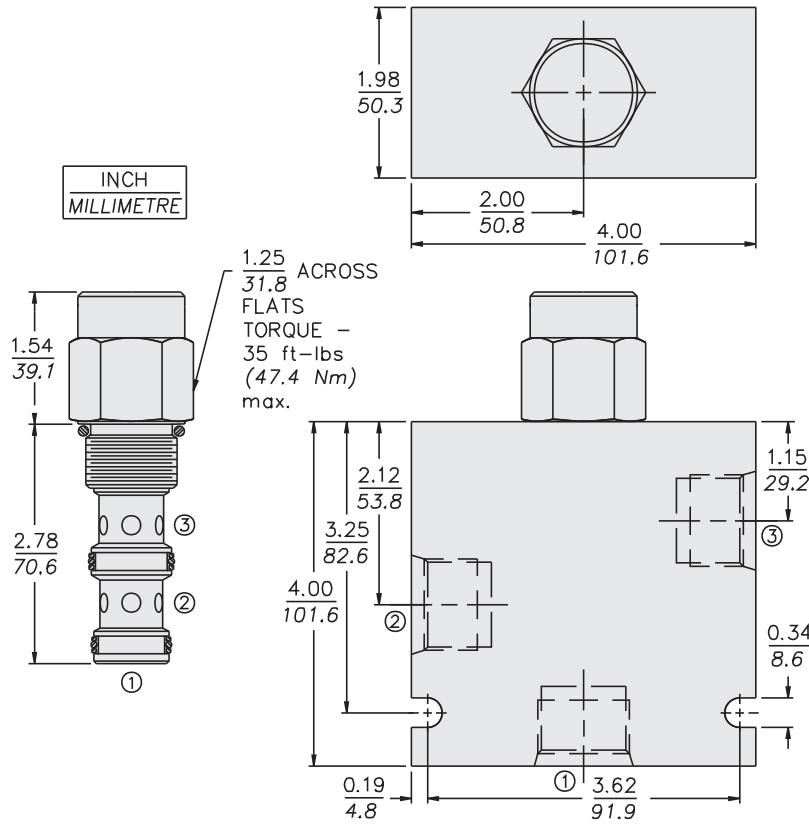
PERFORMANCE (Cartridge Only)



Internal Vent

PD12-32

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.23 kg. (0.50 lbs.)
Steel with hardened work surfaces;
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
1.13 kg. (2.50 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.012.1.

TO ORDER

PD12-32 -

Porting
Cartridge Only **0**
SAE 8 **8T**
SAE 10 **10T**
SAE 12 **12T**
1/2 in. BSP* **4B**
3/4 in. BSP* **6B**

*BSP Body
U.K. Mfr. Only

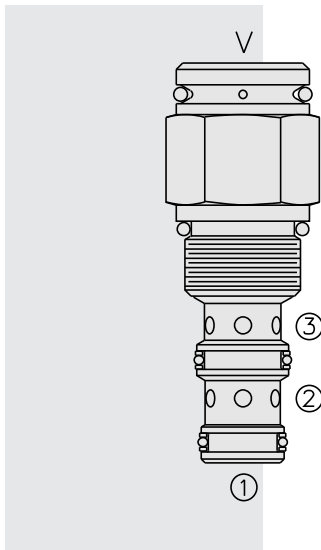
Bias Spring

110 7.6 bar (110 psi)
170 11.7 bar (170 psi)

Seals

N Buna N (Std.)
NS Buna N with Sealed Spool
V Fluorocarbon
VS Fluorocarbon with Sealed Spool

PD10-34 Piloted 2-Way Spool, Normally Closed,



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, normally closed, hydraulic directional valve for two-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD10-34** blocks flow from 3 to 2 bidirectionally.

V is a spring chamber vent-to-atmosphere, which is internally O-ring sealed from the cartridge flow paths.

On remote pilot signal at 1, the valve shifts to open 2 to 3 bidirectionally.

Because of the vented spring chamber, the cartridge may be fully pressurized at any port without affecting required pilot pressure.

FEATURES

- Hardened spool and cage for long life.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 390 bar (5700 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required: To Full Spool Shift:
 for 4.1 bar (60 psi) spring: 4.7 bar (68.2 psi)
 for 7.6 bar (110 psi) spring: 8.6 bar (125 psi)

Oil Volume Required to Full Shift: 0.65 cc (0.04 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC10-3; See page 9.110.1

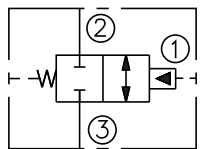
Cavity Tool: CT10-3XX; See page 8.600.1

Seal Kit: SK10-3X-MM; See page 8.650.1

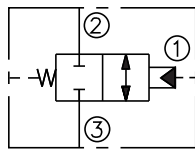
Cap Vent Seal: 6003117

SYMBOLS

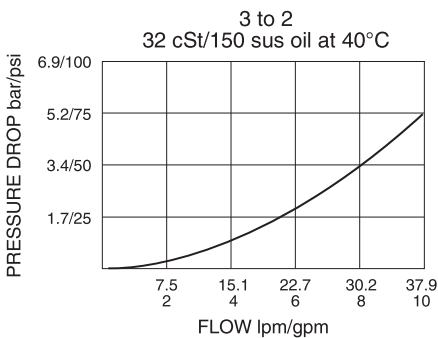
USASI:



ISO:



PERFORMANCE (Cartridge Only)

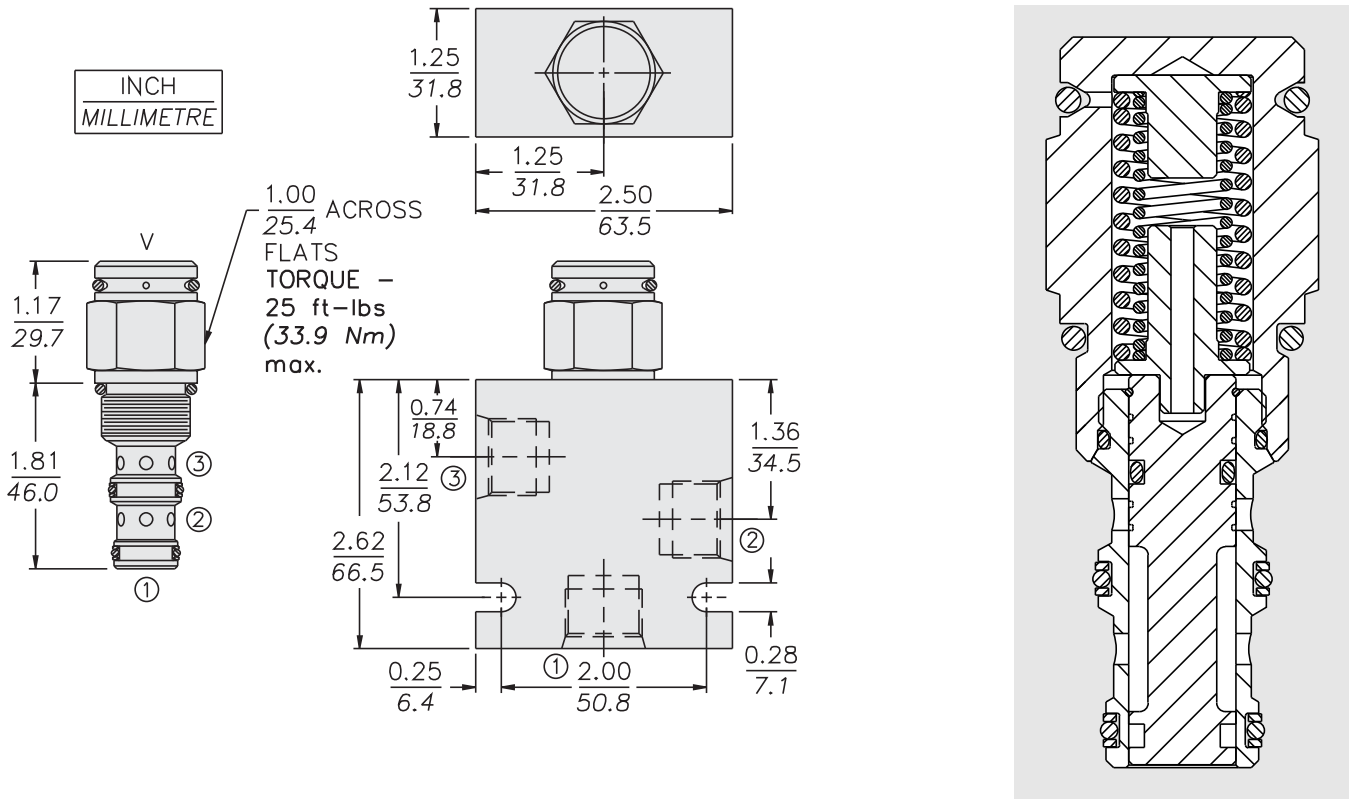


Note: This valve is designed with a dynamic oil-to-atmosphere seal in the vent section. Ambient conditions will cause this vent seal to degrade which will reduce the valve's cycle life. If this could cause a problem, we suggest that a non-vented model be selected, or special seal be used. Consult factory for assistance.

External Vent

PD10-34

DIMENSIONS



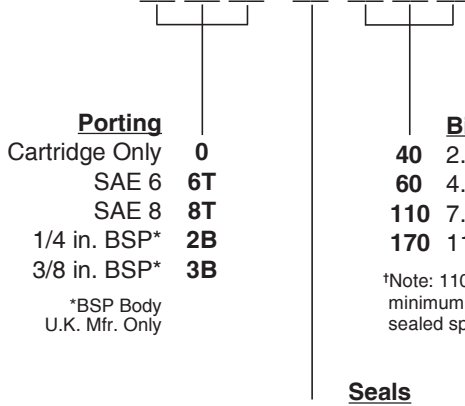
MATERIALS

Cartridge: Weight: 0.15 kg. (0.34 lbs.)
 Steel with hardened work surfaces;
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester
 elastomer back-ups standard.

Standard Ported Body: Weight:
 0.36 kg. (0.80 lbs.) Anodized high-
 strength 6061 T6 aluminum alloy,
 rated to 207 bar (3000 psi).
 Ductile iron and steel bodies
 available; dimensions may differ.
 See page 8.010.1.

TO ORDER

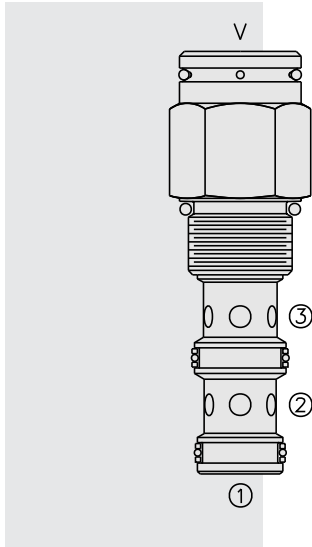
PD10-34 -



Seals

- N** Buna N (Std.)
- NS** Buna N with Sealed Spool
- V** Fluorocarbon
- VS** Fluorocarbon with Sealed Spool

PD12-34 Piloted 2-Way Spool, Normally Closed,



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, normally closed, hydraulic directional valve for two-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD12-34** blocks flow from 3 to 2 bidirectionally.

V is a spring chamber vent-to-atmosphere, which is internally O-ring sealed from the cartridge flow paths.

On remote pilot signal at 1, the valve shifts to open 2 to 3 bidirectionally.

Because of the vented spring chamber, the cartridge may be fully pressurized at any port without affecting required pilot pressure.

FEATURES

- Hardened and cage for long life.
- Cost-effective cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 420 bar (6090 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required for 7.6 bar (110 psi) Spring:

to Cross-Over: 7.6 bar (110 psi)

to Full Shift: 9.1 bar (132 psi)

Oil Volume Required to Full Shift: 1.32 cc (0.08 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC12-3; See page 9.112.1

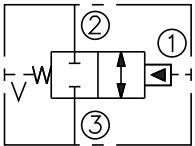
Cavity Tool: CT12-3XX; See page 8.600.1

Seal Kit: SK12-3X-MM; See page 8.650.1

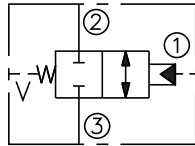
Cap Vent Seal: 6003121

SYMBOLS

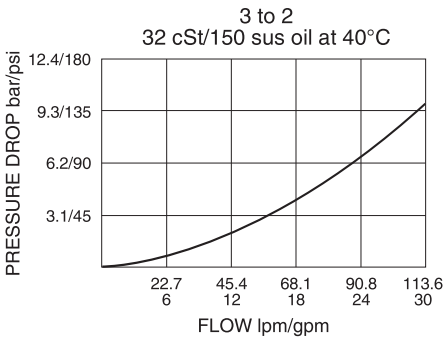
USASI:



ISO:



PERFORMANCE (Cartridge Only)

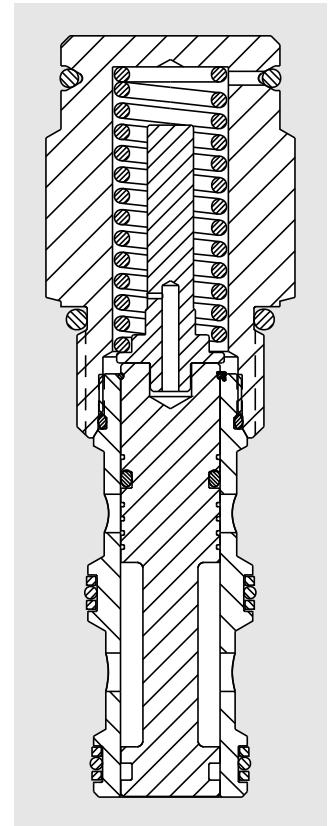
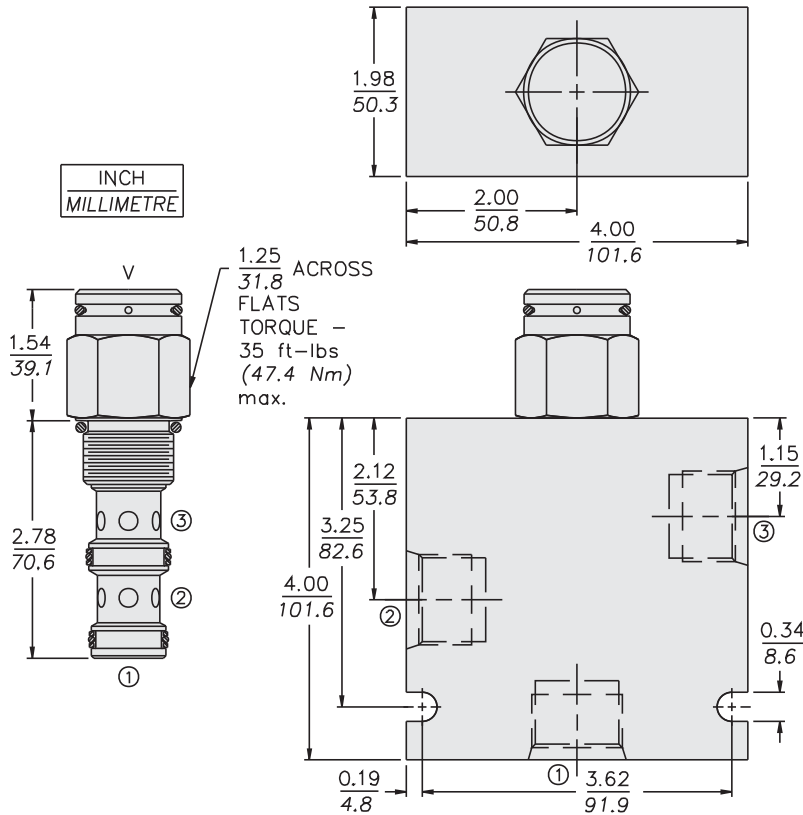


Note: This valve is designed with a dynamic oil-to-atmosphere seal in the vent section. Ambient conditions will cause this vent seal to degrade which will reduce the valve's cycle life. If this could cause a problem, we suggest that a non-vented model be selected, or special seal be used. Consult factory for assistance.

External Vent

PD12-34

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.23 kg. (0.50 lbs.)
Steel with hardened work surfaces;
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
1.13 kg. (2.50 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi); Ductile
iron bodies available; dimensions
may differ. See page 8.012.1.

TO ORDER

PD12-34 -

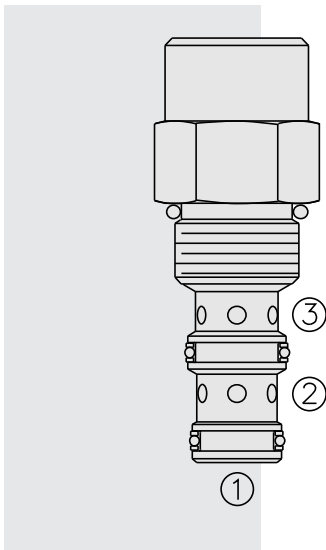
Porting
Cartridge Only **0**
SAE 8 **8T**
SAE 10 **10T**
SAE 12 **12T**
1/2 in. BSP* **4B**
3/4 in. BSP* **6B**

*BSP Body
U.K. Mfr. Only

Bias Spring
110 7.6 bar (110 psi)
170 11.7 bar (170 psi)

Seals
N Buna N (Std.)
NS Buna N with Sealed Spool
V Fluorocarbon
VS Fluorocarbon with Sealed Spool

PD10-35 Piloted 2-Way Spool, Normally Open,



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, normally open hydraulic directional valve for two-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD10-35** allows flow from 2 to 3. The spring bias chamber is internally vented to 3.

On remote pilot signal at 1, the valve shifts to block 3 to 2 bidirectionally.

Note: Back pressure at 3 will increase the pilot pressure required at 1 to shift, at a ratio of 1:1. Consult factory.

Consult factory for applications where bi-directional flow is required when the valve is in the normal or spring-offset position.

FEATURES

- Hardened spool and cage for long life.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 390 bar (5700 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required: To Full Spool Shift
 for 4.1 bar (60 psi) spring: 4.7 bar (68.2 psi)
 for 7.6 bar (110 psi) spring: 8.6 bar (125 psi)

Oil Volume Required to Full Shift: 0.65 cc (0.04 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

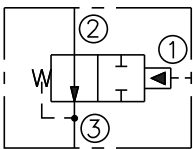
Cavity: VC10-3; See page 9.110.1

Cavity Tool: CT10-3XX; See page 8.600.1

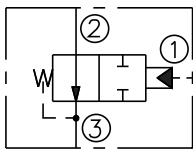
Seal Kit: SK10-3X-MM; See page 8.650.1

SYMBOLS

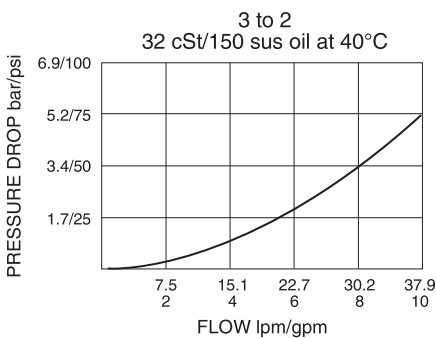
USASI:



ISO:



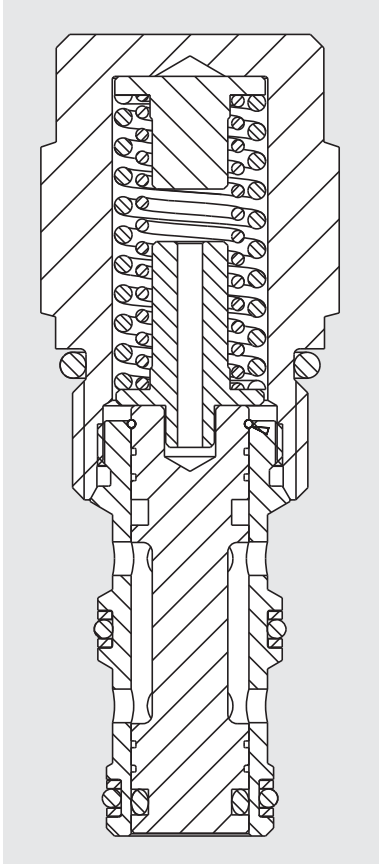
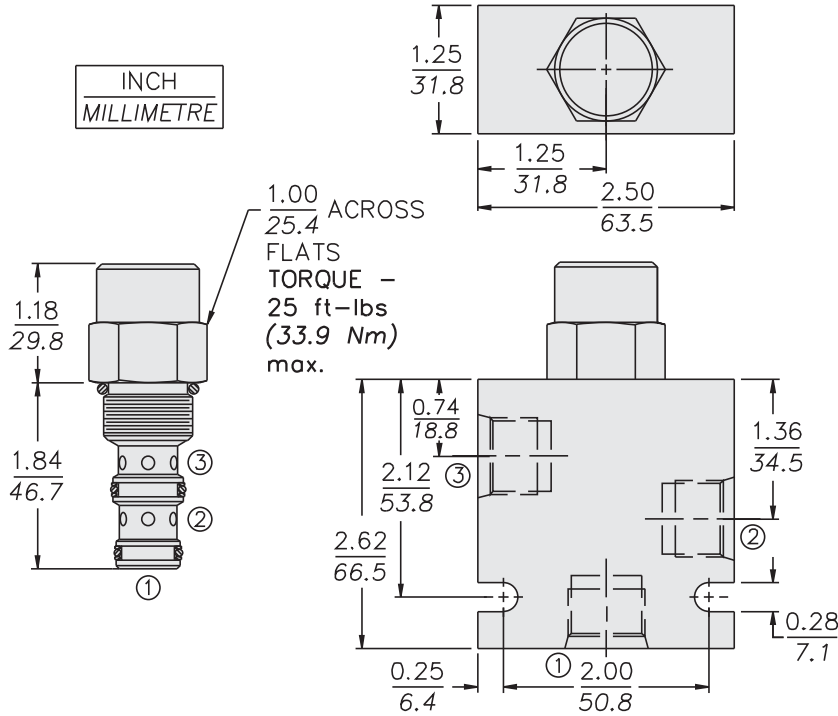
PERFORMANCE (Cartridge Only)



Internal Vent

PD10-35

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.15 kg. (0.34 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
0.36 kg. (0.80 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.010.1

TO ORDER

PD10-35 -

Porting
Cartridge Only **0**
SAE 6 **6T**
SAE 8 **8T**
1/4 in. BSP* **2B**
3/8 in. BSP* **3B**

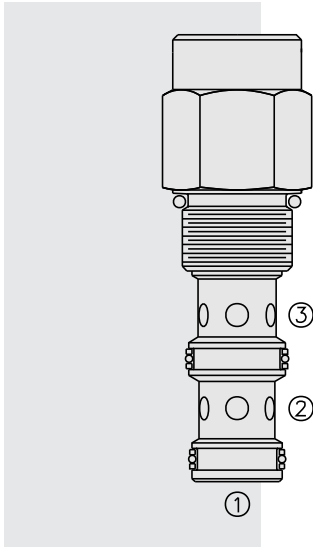
*BSP Body
U.K. Mfr. Only

Bias Spring†
40 2.8 bar (40 psi)
60 4.1 bar (60 psi)
110 7.6 bar (110 psi)
170 11.7 bar (170 psi)

†Note: 110 psi bias spring is the
minimum required for use with
sealed spool.

Seals
N Buna N (Std.)
NS Buna N with Sealed Spool
V Fluorocarbon
VS Fluorocarbon with Sealed Spool

PD12-35 Piloted 2-Way Spool, Normally Open,



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, normally open hydraulic directional valve for two-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD12-35** allows flow from 2 to 3. The spring bias chamber is internally vented to 3.

On remote pilot signal at 1, the valve shifts to block 3 to 2 bidirectionally.

Note: Back pressure at 3 will increase the pilot pressure required at 1 to shift, at a ratio of 1:1. Consult factory.

Consult factory for applications where bi-directional flow is required when the valve is in the normal or spring-offset position.

FEATURES

- Hardened spool and cage for long life.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 420 bar (6090 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required: To Full Spool Shift for 7.6 bar (110 psi) spring:
8.6 bar (125 psi)

Oil Volume Required to Full Shift: 1.32 cc (0.08 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

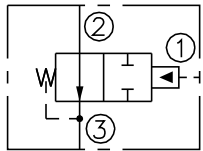
Cavity: VC12-3; See page 9.112.1

Cavity Tool: CT12-3XX; See page 8.600.1

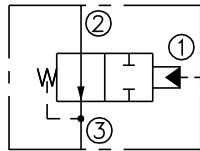
Seal Kit: SK12-3X-MM; See page 8.650.1

SYMBOLS

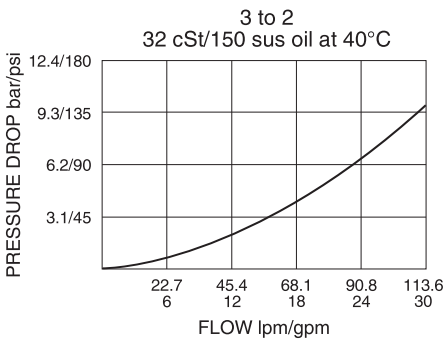
USASI:



ISO:



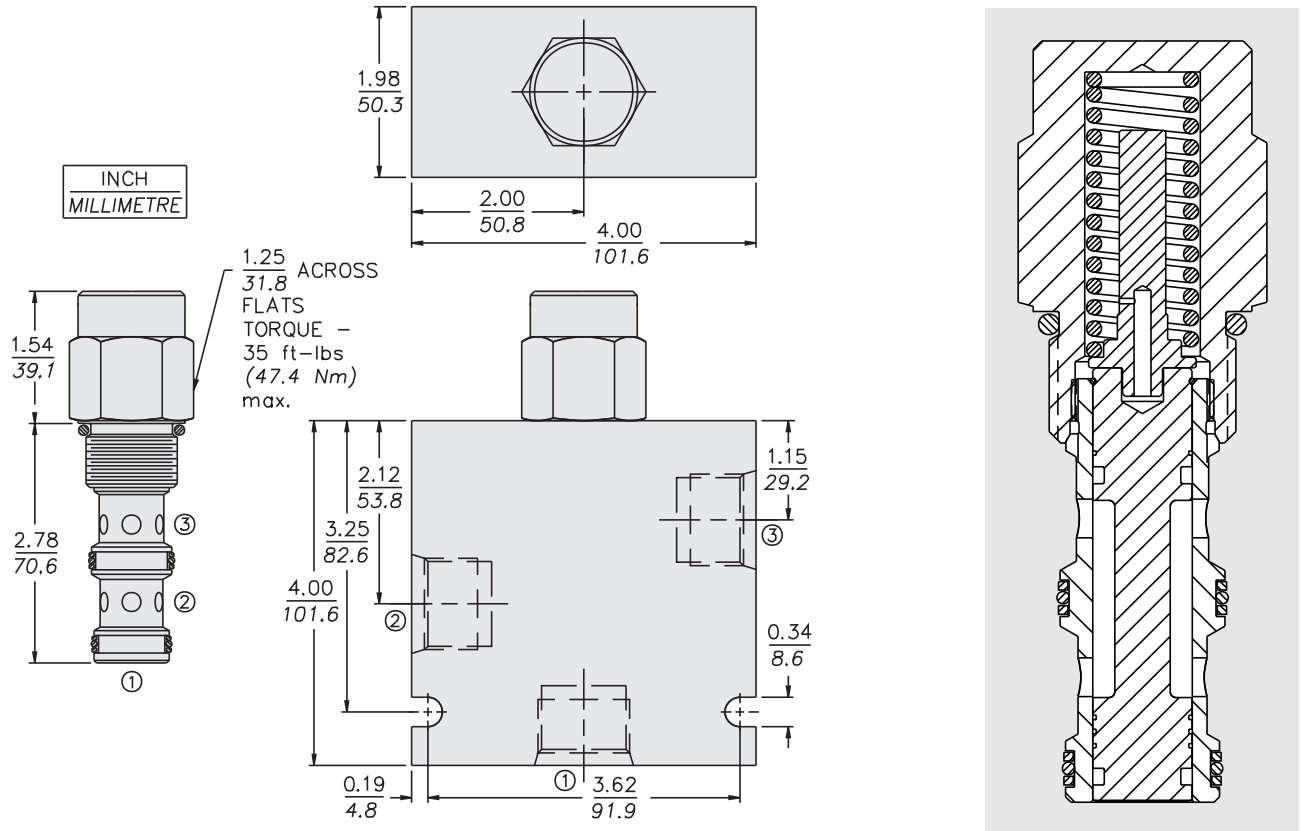
PERFORMANCE (Cartridge Only)



Internal Vent

PD12-35

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.23 kg. (0.50 lbs.)
 Steel with hardened work surfaces;
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester
 elastomer back-ups standard.

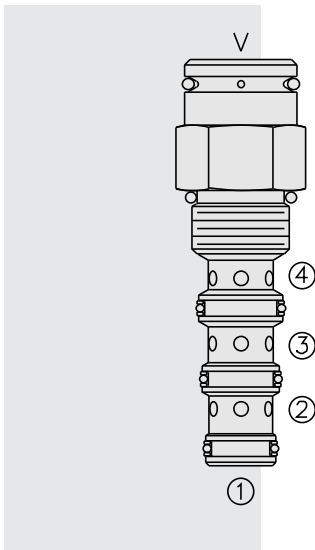
Standard Ported Body: Weight:
 1.13 kg. (2.50 lbs.) Anodized high-
 strength 6061 T6 aluminum alloy,
 rated to 207 bar (3000 psi). Ductile
 iron bodies available; dimensions
 may differ. See page 8.012.1

TO ORDER

PD12-35 -		Bias Spring	
Porting		110	7.6 bar (110 psi)
Cartridge Only	0	170	11.7 bar (170 psi)
SAE 8	8T		
SAE 10	10T		
SAE 12	12T		
1/2 in. BSP*	4B		
3/4 in. BSP*	6B		
		Seals	
		N	Buna N (Std.)
		NS	Buna N with Sealed Spool
		V	Fluorocarbon
		VS	Fluorocarbon with Sealed Spool

*BSP Body
 U.K. Mfr. Only

PD10-40 Piloted 3-Way Spool, External Vent



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for three-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD10-40** allows flow from 3 to 2 bidirectionally, while flow is blocked at 4. V is a spring chamber vent-to-atmosphere, which is internally O-ring sealed from the cartridge flow paths.

On remote pilot signal at 1, the valve shifts to open from 3 to 4, while blocking flow at 2.

Because of the vented spring chamber, the cartridge may be fully pressurized at any port without affecting required pilot pressure.

FEATURES

- Hardened spool and cage for long life.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required:

To Spool Crossover: 7.6 bar (110 psi)

To Full Spool Shift: 8.6 bar (125 psi)

Oil Volume Required to Full Shift: 0.65 cc (0.04 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC10-4; See page 9.110.1

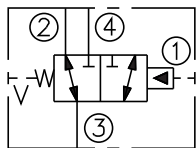
Cavity Tool: CT10-4XX; See page 8.600.1

Seal Kit: SK10-4X-MMM; See page 8.650.1

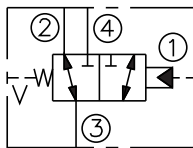
Cap Vent Seal: 6003117

SYMBOLS

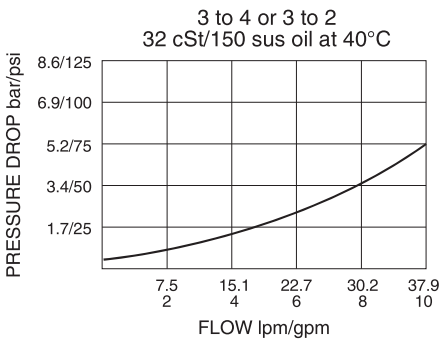
USASI:



ISO:

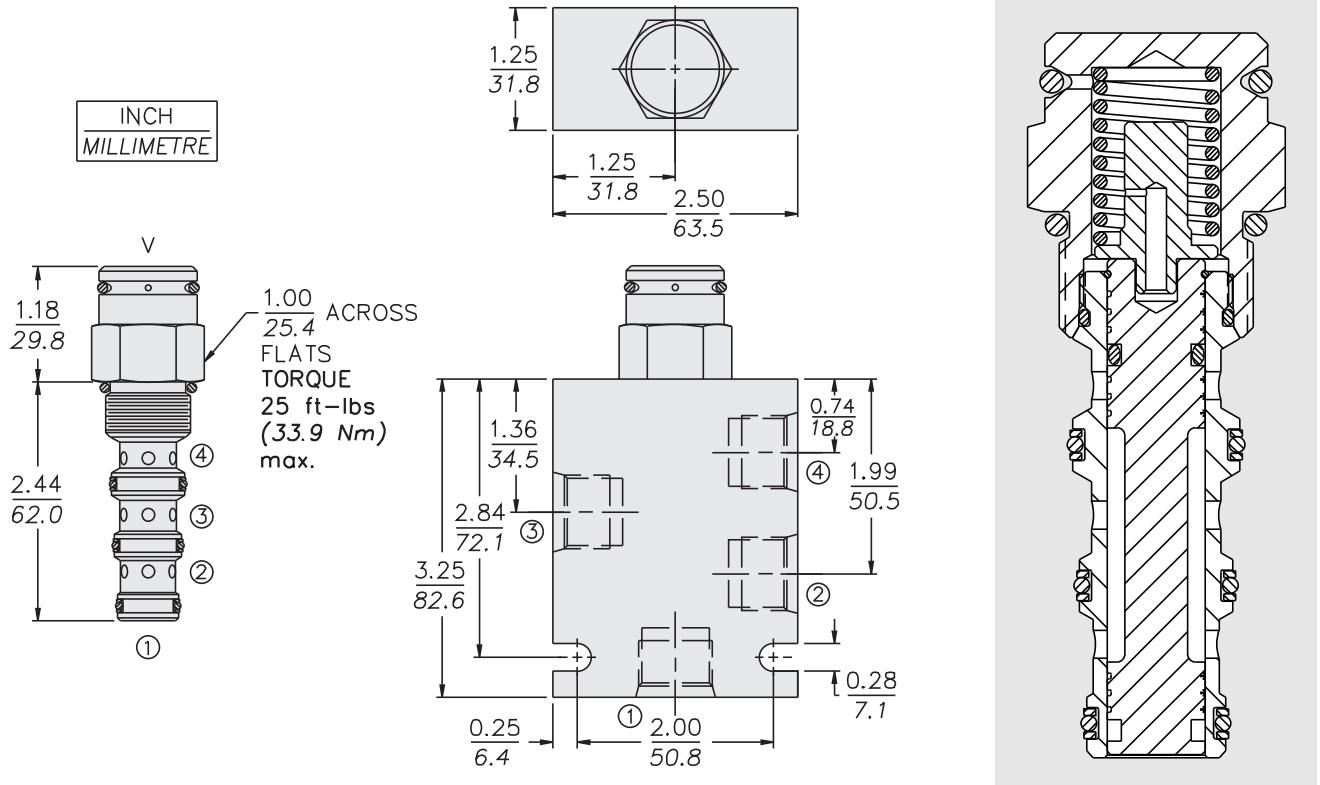


PERFORMANCE (Cartridge Only)



Note: This valve is designed with a dynamic oil-to-atmosphere seal in the vent section. Ambient conditions will cause this vent seal to degrade which will reduce the valve's cycle life. If this could cause a problem, we suggest that a non-vented model be selected. Consult factory for assistance.

DIMENSIONS



MATERIALS

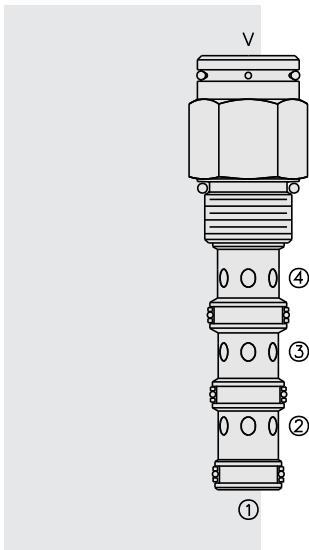
Cartridge: Weight: 0.16 kg. (0.35 lbs.)
Steel with hardened work surfaces;
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
0.34 kg. (0.75 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.010.1

TO ORDER

PD10-40 - - - - -		
Options		Bias Spring†
None (Blank)		40 2.8 bar (40 psi)
Open Transition N		60 4.1 bar (60 psi)
Tall Cap T		110 7.6 bar (110 psi)
		130 9.1 bar (130 psi)
		170 11.7 bar (170 psi)
		M5.0 5.0 bar (73 psi)
		#M14.0 14 bar (203 psi)
		#M15.0 15 bar (217 psi)
		† T option required. Cap Height: 2.21" (56.1 mm)
		†Note: 110 psi bias spring is the minimum required for use with sealed spool.
Porting		Seals
Cartridge Only 0		N Buna N (Std.)
SAE 6 6T		NS Buna N with Sealed Spool (110 psi spring minimum required)
SAE 8 8T		V Fluorocarbon
1/4 in. BSP* 2B		VS Fluorocarbon with Sealed Spool (110 psi spring minimum required)
3/8 in. BSP* 3B		
*BSP Body U.K. Mfr. Only		

PD12-40 Piloted 3-Way Spool, External Vent



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for three-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD12-40** allows flow from 3 to 2 bidirectionally, while flow is blocked at 4. V is a spring chamber vent-to-atmosphere, which is internally O-ring sealed from the cartridge flow paths.

On remote pilot signal at 1, the valve shifts to open from 3 to 4, while blocking flow at 2.

Because of the vented spring chamber, the cartridge may be fully pressurized at any port without affecting required pilot pressure.

FEATURES

- Hardened spool and cage for long life.
- Cost effective cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 420 bar (6090 psi)

Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required with 7.6 bar (110 psi) Spring:

To Spool Crossover: 7.6 bar (110 psi)

To Full Spool Shift: 9.1 bar (132 psi)

Oil Volume Required to Full Shift: 1.32 cc (0.08 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC12-4; See page 9.112.2

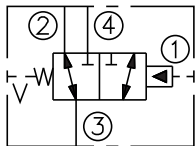
Cavity Tool: CT12-4XX; See page 8.600.1

Seal Kit: SK12-4X-MMM; See page 8.650.1

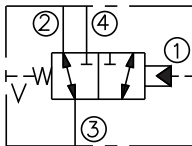
Cap Vent Seal: Part Number 6003121

SYMBOLS

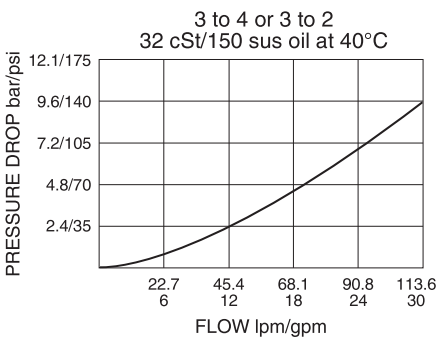
USASI:



ISO:

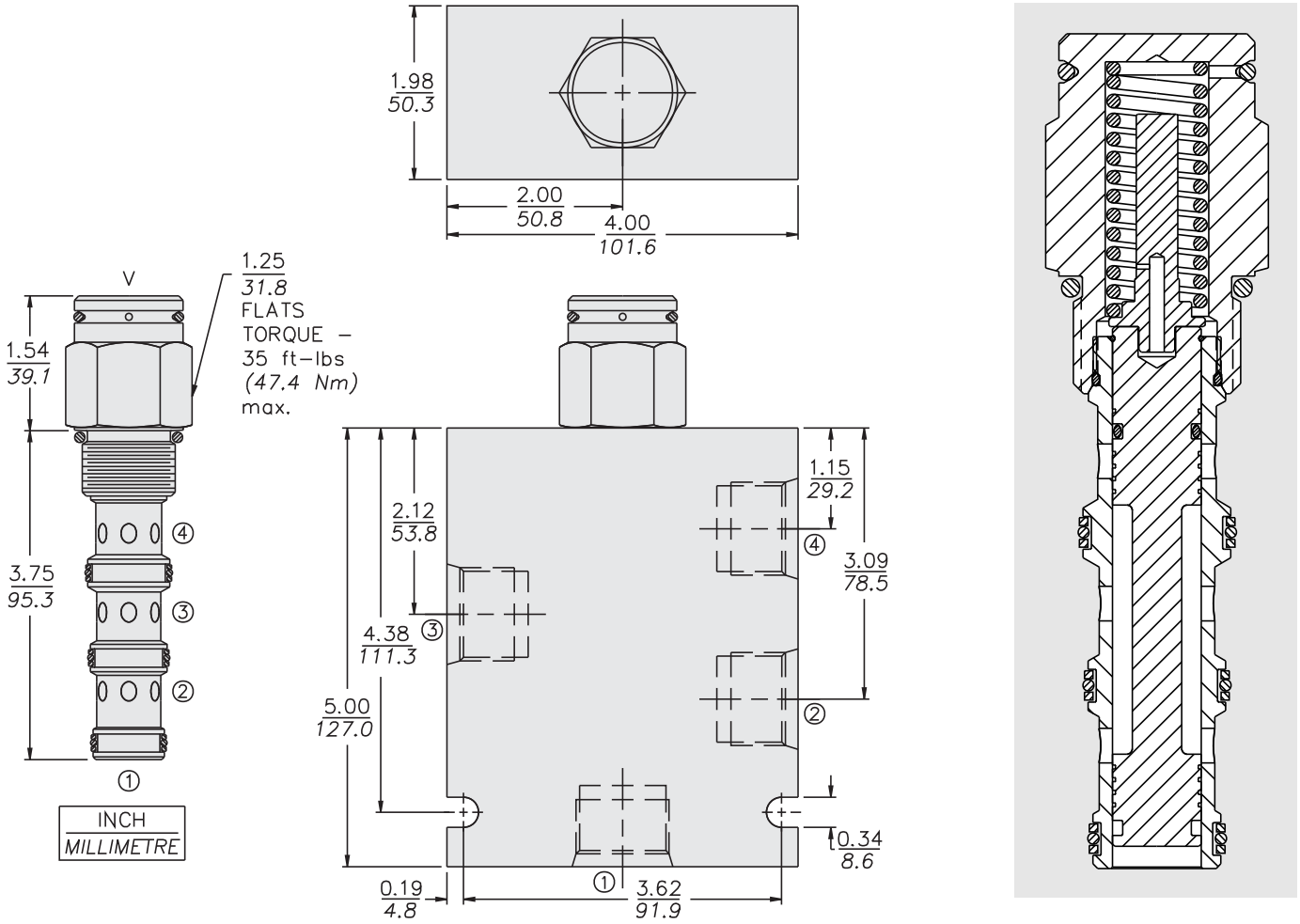


PERFORMANCE (Cartridge Only)



Note: This valve is designed with a dynamic oil-to-atmosphere seal in the vent section. Ambient conditions will cause this vent seal to degrade which will reduce the valve's cycle life. If this could cause a problem, we suggest that a non-vented model be selected. Consult factory for assistance.

DIMENSIONS

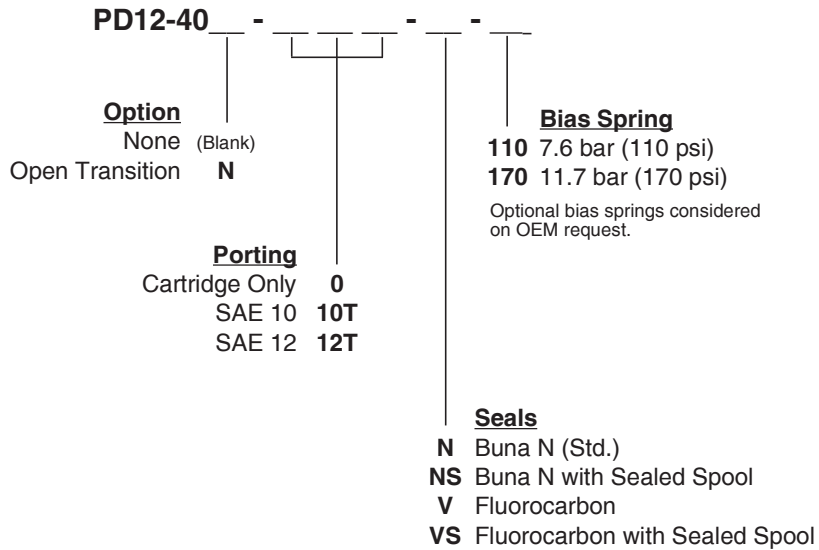


MATERIALS

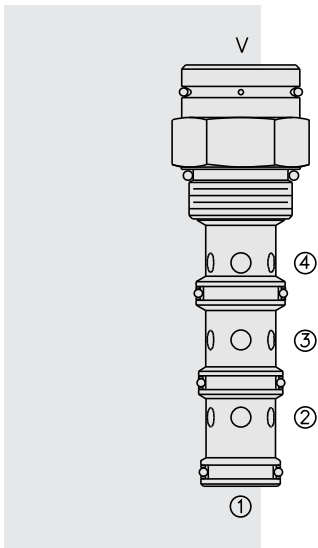
Cartridge: Weight: 0.28 kg. (0.61 lbs.)
 Steel with hardened work surfaces;
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester
 elastomer back-ups standard.

Standard Ported Body: Weight:
 1.50 kg. (3.30 lbs.) Anodized high-
 strength 6061 T6 aluminum alloy,
 rated to 207 bar (3000 psi). Ductile
 iron bodies available; dimensions
 may differ. See page 8.012.1

TO ORDER



PD16-40 Piloted 3-Way Spool, External Vent



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for three-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD16-40** allows flow passage from 3 to 2 bidirectionally, while flow is blocked at 4. V is a spring chamber vent-to-atmosphere, which is internally O-ring sealed from the cartridge flow paths.

On remote pilot signal at 1, the valve shifts to open from 3 to 4, while blocking flow at 2.

The vented spring chamber allows PD16-40 to be fully pressurized at any port without affecting required pilot pressure.

FEATURES

- Hardened spool and cage for long life.
- Optional sealed pilot.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required:

To Spool Crossover: 7.6 bar (110 psi)

To Full Spool Shift: 9.0 bar (130 psi)

Oil Volume Required to Full Shift: 2.5 cc (0.15 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC16-4; See page 9.116.1

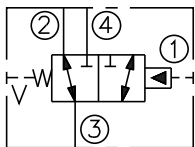
Cavity Tool: CT16-4XX; See page 8.600.1

Seal Kit: SK16-4X-MMM; See page 8.650.1

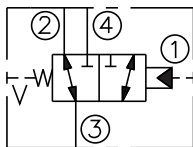
Cap Vent Seal: 6003125

SYMBOLS

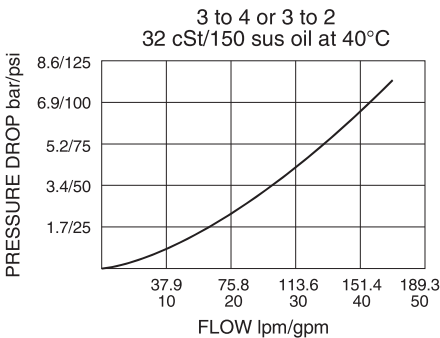
USASI:



ISO:



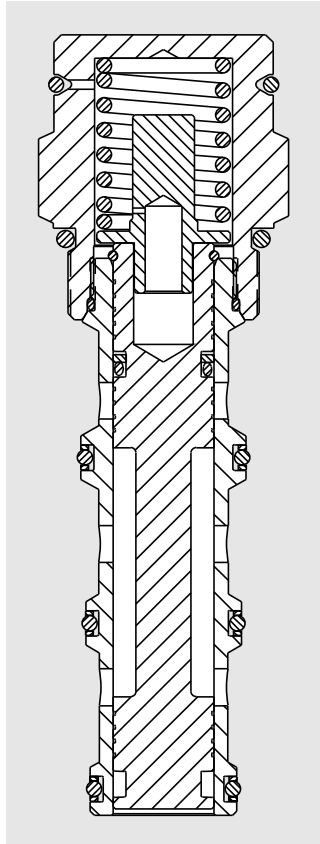
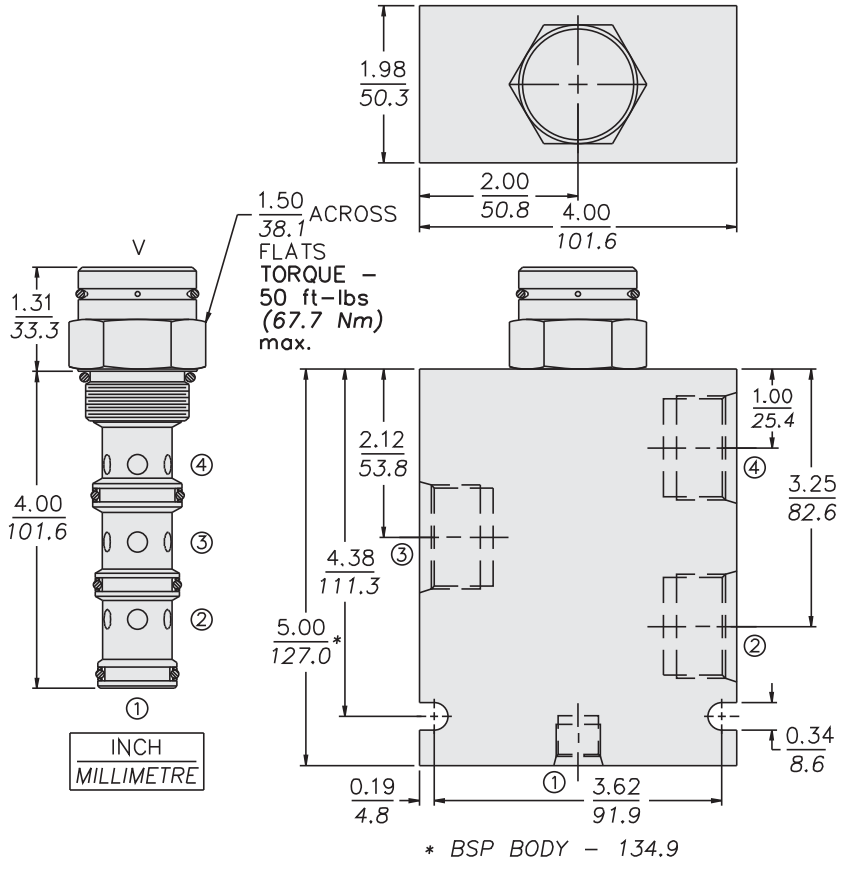
PERFORMANCE (Cartridge Only)



Note: This valve is designed with a dynamic oil-to-atmosphere seal in the vent section. Ambient conditions will cause this vent seal to degrade which will reduce the valve's cycle life. If this could cause a problem, we suggest that a non-vented model be selected. Consult factory for assistance.

PD16-40

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.52 kg. (1.15 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 1.5 kg. (3.3 lbs.); Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.016.1

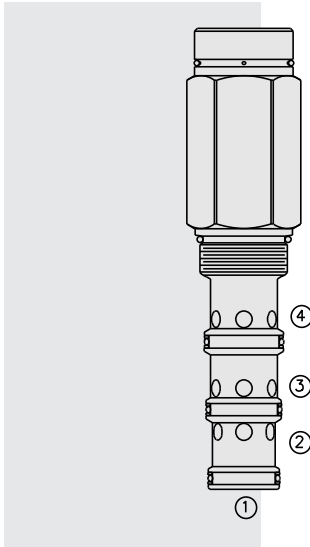
TO ORDER

PD16-40 - - -

<p>Option None (Blank) Open Transition N</p>	<p>Porting Cartridge Only 0 SAE 12, SAE 6 Pilot 12T SAE 16, SAE 6 Pilot 16T</p>	<p>Bias Spring† 60 4.1 bar (60 psi) 80 5.5 bar (80 psi) 110 7.6 bar (110 psi) 170 11.7 bar (170 psi) †Optional bias springs considered on OEM request. *Note: 110 psi bias spring is the minimum required for use with sealed spool.</p>
--	--	---

Seals
N Buna N (Std.)
NS Buna N with Sealed Spool (110 psi spring minimum required)
V Fluorocarbon
VS Fluorocarbon with Sealed Spool (110 psi spring minimum required)

PD42-M40 Piloted 3-Way Spool, External Vent



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for three-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD42-M40** allows flow passage from 3 to 2 bidirectionally, while flow is blocked at 4. V is a spring chamber vent-to-atmosphere, which is internally O-ring sealed from the cartridge flow paths.

On remote pilot signal at 1, the valve shifts to open from 3 to 4, while blocking flow at 2.

The vented spring chamber allows PD42-M40 to be fully pressurized at any port without affecting required pilot pressure.

FEATURES

- Hardened spool and cage for long life.
- Optional sealed pilot.
- Industry-standard ISO cavity.

RATINGS

Operating Pressure: 344 bar (5000 psi) with polyurethane seals

Flow: See Performance Chart

Internal Leakage: 246 cc/minute (15 cu. in./minute) max. at 344 bar (5000 psi)

Pilot Pressure Required:

To Spool Crossover: 11.6 bar (172 psi)

To Full Spool Shift: 17 bar (245 psi)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC42-M4; See page 9.142.1

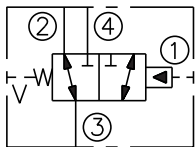
Cavity Tool: CT42-M4XX; See page 8.600.1

Seal Kit: SK42-4X-MMM; See page 8.650.1

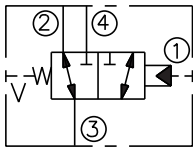
Cap Vent Seal: 6003125

SYMBOLS

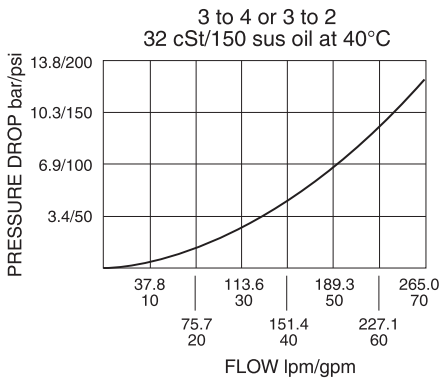
USASI:



ISO:



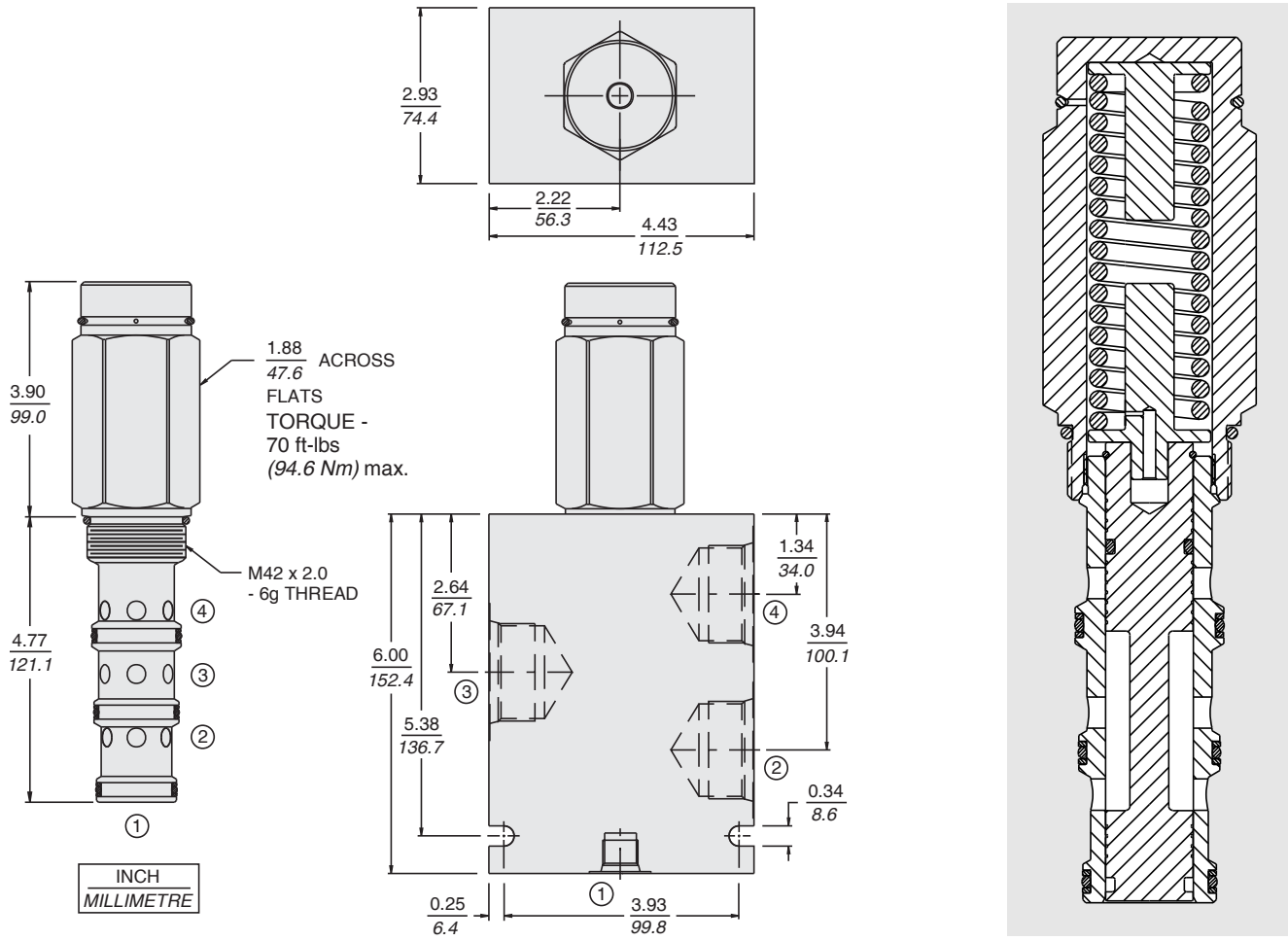
PERFORMANCE (Cartridge Only)



Note: This valve is designed with a dynamic oil-to-atmosphere seal in the vent section. Ambient conditions will cause this vent seal to degrade which will reduce the valve's cycle life. If this could cause a problem, we suggest that a non-vented model be selected. Consult factory for assistance.

PD42-M40

DIMENSIONS

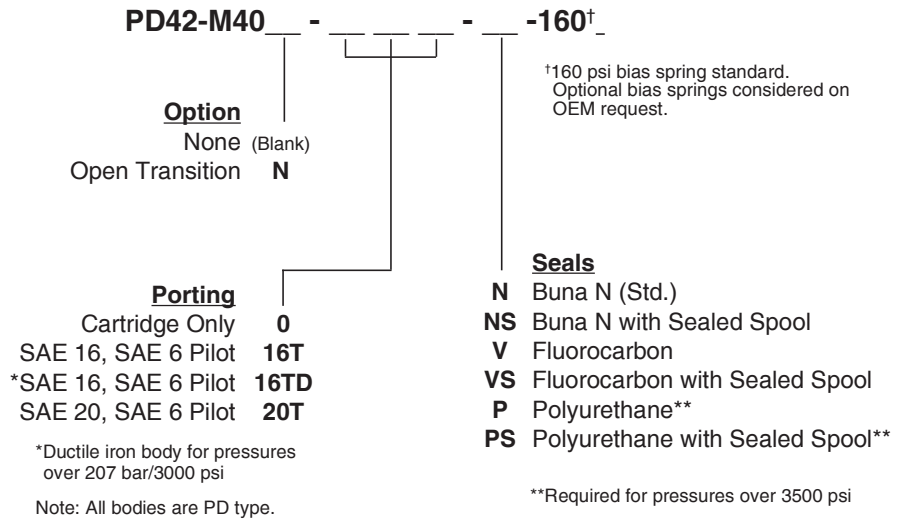


MATERIALS

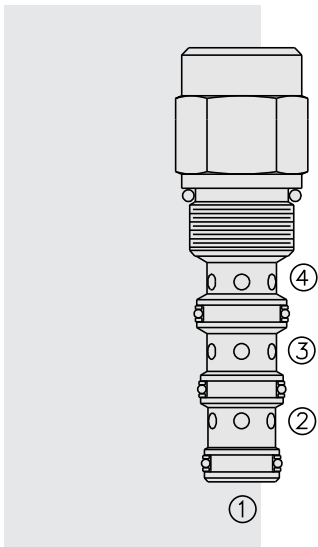
Cartridge: Weight: 0.52 kg. (1.15 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 2.8 kg. (6.2 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.042.1

TO ORDER



PD10-41 Piloted 3-Way Spool, Internal Vent



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for three-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD10-41** allows flow from 3 to 4. 2 is blocked.

On remote pilot signal at 1, the valve shifts to open from 3 to 2, while blocking flow to 4.

Since 4 is common to the spring chamber, pressure on 4 will directly (1:1) affect the pilot pressure required, and must always be added to the bias spring value.

Note: Consult factory for applications where bi-directional flow is required when the valve is in the normal or spring-offset position.

FEATURES

- Hardened spool and cage for long life.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required:

- To Spool Crossover – 4.1 bar (60 psi) Spring: 4.7 bar (68.2 psi)
7.6 bar (110 psi) Spring: 7.6 bar (110 psi)
- To Full Spool Shift – 4.1 bar (60 psi) Spring: 5.2 bar (75 psi)
7.6 bar (110 psi) Spring: 8.6 bar (125 psi)

Oil Volume Required to Full Shift: 0.65 cc (0.04 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

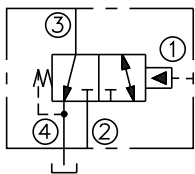
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

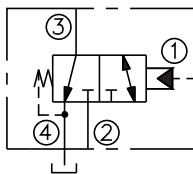
Seal Kit: SK10-4X-MMM; See page 8.650.1

SYMBOLS

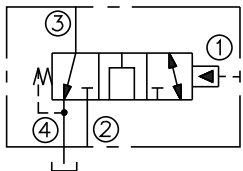
USASI:



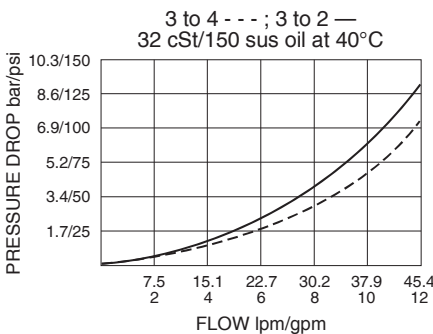
ISO:



OPEN TRANSITION:

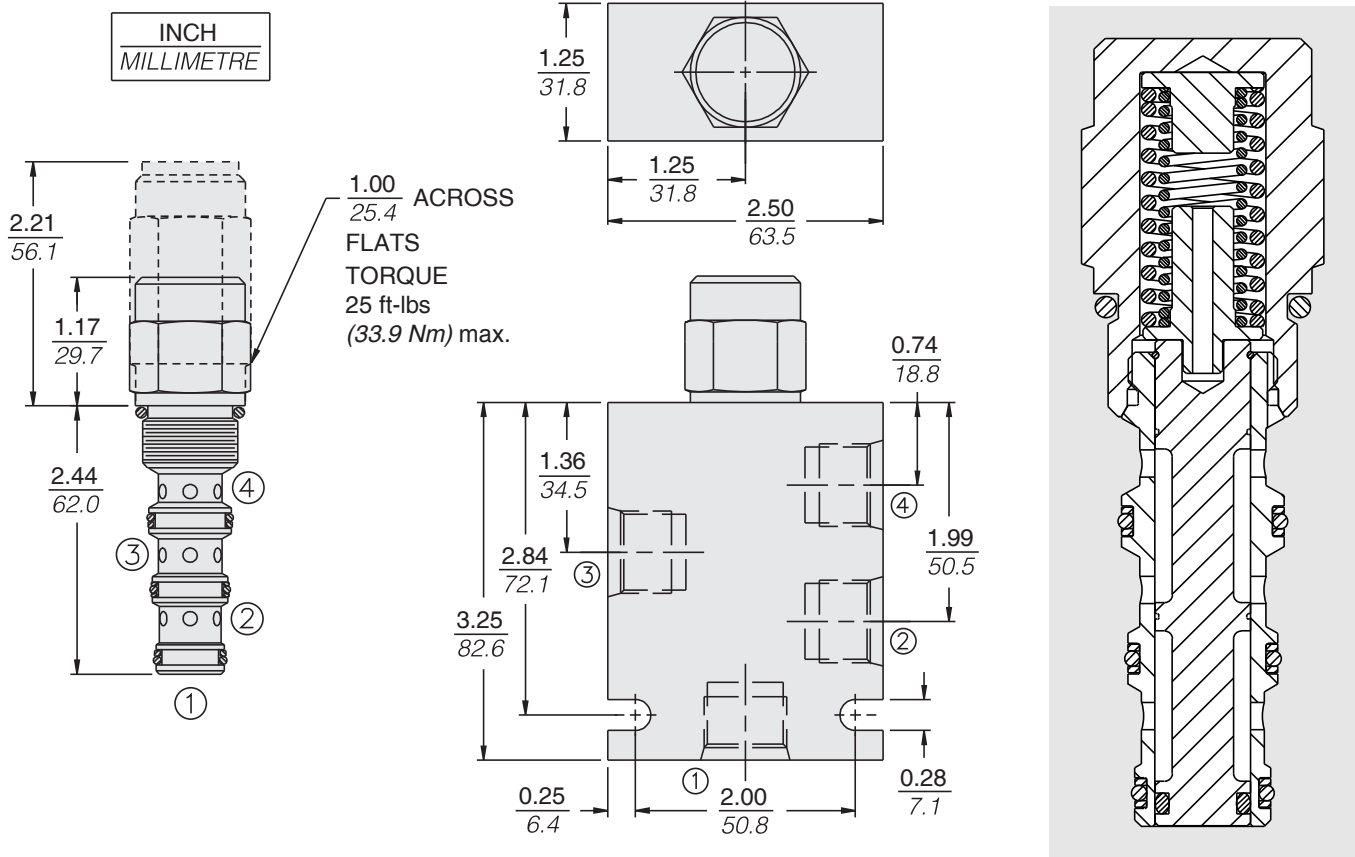


PERFORMANCE (Cartridge Only)



PD10-41

DIMENSIONS



MATERIALS

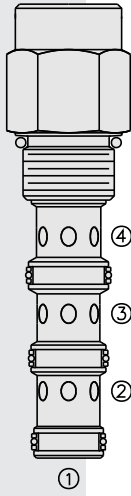
Cartridge: Weight: 0.16 kg. (0.35 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi); Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

PD10-41		-	-	-	-
Option	None	blank			
	Open Transition	N			
	Tall Cap	T			
Porting	Cartridge Only	0			
	SAE 6	6T			
	SAE 8	8T			
	1/4 in. BSP*	2B			
	3/8 in. BSP*	3B			
	*BSP Body U.K. Mfr. Only				
	Bias Spring†				
	60	4.1 bar (60 psi)			
	110	7.6 bar (110 psi)			
	170	11.7 bar (170 psi)			
	*200	14 bar (203 psi)			
	*Note: "T" option required for 203 psi bias spring				
	*Note: 110 psi bias spring is the minimum required for use with sealed spool.				
	Seals				
	N	Buna N (Std.)			
	NS	Buna N with Sealed Spool			
	V	Fluorocarbon			
	VS	Fluorocarbon with Sealed Spool			

PD12-41 Piloted 3-Way Spool, Internal Vent



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for three-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD12-41** allows flow from 3 to 4. 2 is blocked.

On remote pilot signal at 1, the valve shifts to open from 3 to 2, while blocking flow to 4.

Since 4 is common to the spring chamber, pressure on 4 will directly (1:1) affect the pilot pressure required, and must always be added to the bias spring value.

Note: Consult factory for applications where bi-directional flow is required when the valve is in the normal or spring-offset position.

FEATURES

- Hardened spool and cage for long life.
- Cost effective cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 420 bar (6090 psi)

Flow: See Performance Chart

Internal Leakage: 246 cc/minute (15 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required Using 7.6 bar (110 psi) Spring:

To Spool Crossover: 7.6 bar (110 psi)

To Full Spool Shift: 9.1 bar (132 psi)

Oil Volume Required to Full Shift: 1.32 cc (0.08 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

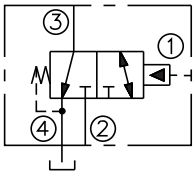
Cavity: VC12-4; See page 9.112.1

Cavity Tool: CT12-4XX; See page 8.600.1

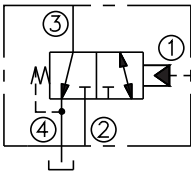
Seal Kit: SK12-4X-MMM; See page 8.650.1

SYMBOLS

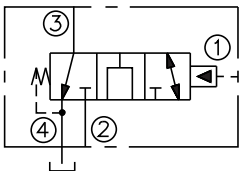
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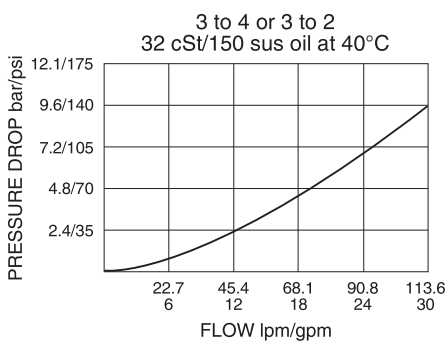
ISO:



OPEN TRANSITION:

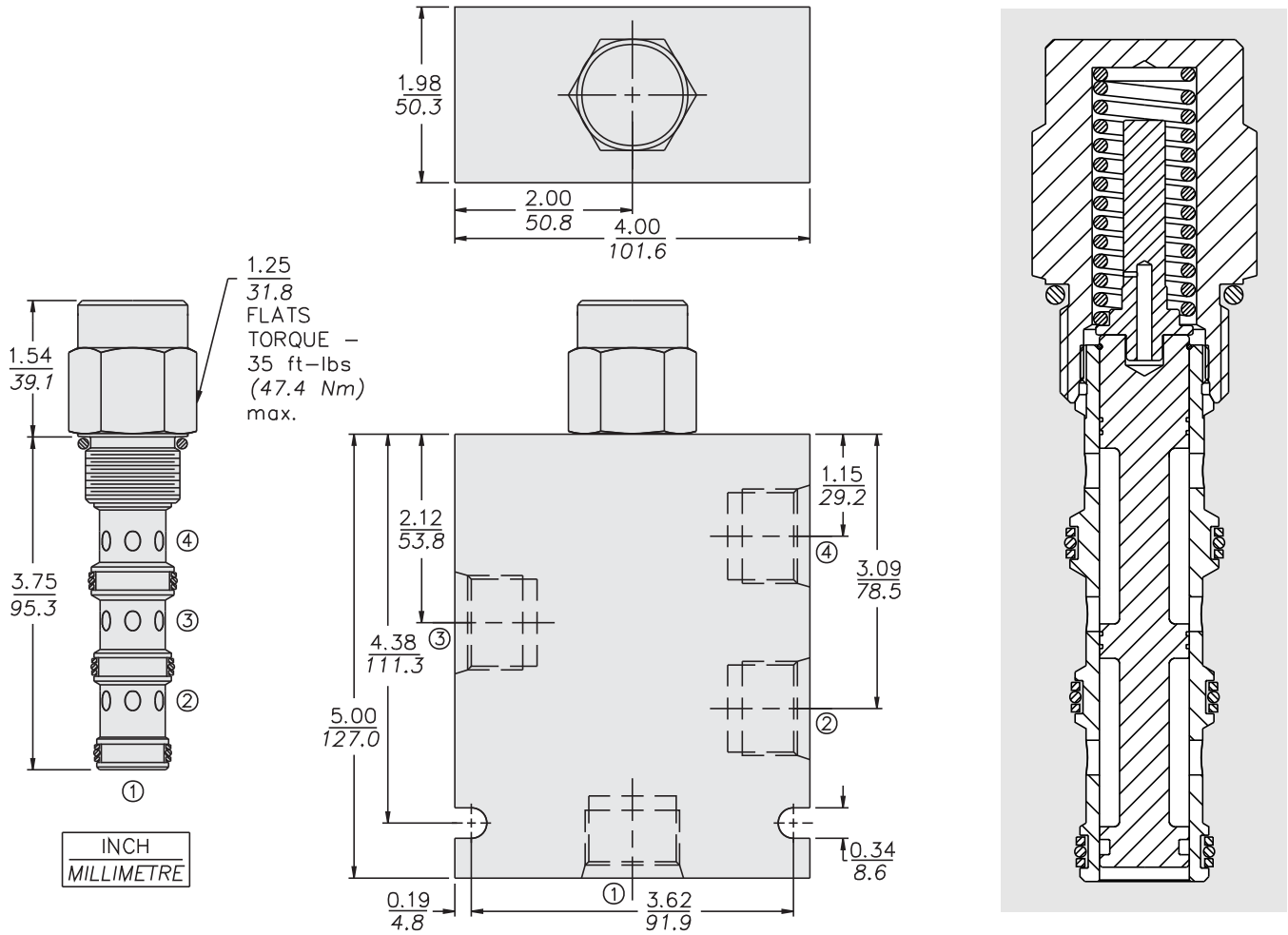


PERFORMANCE (Cartridge Only)



PD12-41

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.28 kg. (0.61 lbs.)
Steel with hardened work surfaces;
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

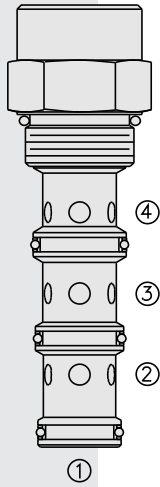
Standard Ported Body: Weight:
1.5 kg. (3.3 lbs.); Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.012.1

TO ORDER

PD12-41 - - -

<p>Option</p> <p>None (Blank)</p> <p>Open Transition N</p>	<p>Porting</p> <p>Cartridge Only 0</p> <p>SAE 10 10T</p> <p>SAE 12 12T</p>	<p>Bias Spring†</p> <p>60 4.1 bar (60 psi)</p> <p>110 7.6 bar (110 psi)</p> <p>170 11.7 bar (170 psi)</p> <p>Optional bias springs considered on OEM request.</p> <p>†Note: 110 psi bias spring is the minimum required for use with sealed spool.</p> <p>Seals</p> <p>N Buna N (Std.)</p> <p>NS Buna N with Sealed Spool</p> <p>V Fluorocarbon</p> <p>VS Fluorocarbon with Sealed Spool</p>
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PD16-41 Piloted 3-Way Spool, Internal Vent



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for three-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD16-41** allows flow from 3 to 4 while 2 is blocked.

On remote pilot signal at 1, the valve shifts to open from the 3 to 2 flow path, while blocking flow to 4.

Note that 4 is common to the spring chamber. Pressure on 4 will directly (1:1) affect required pilot pressure and must always be added to the bias spring value.

Note: Consult factory for applications where bi-directional flow is required when the valve is in the normal or spring-offset position.

FEATURES

- Hardened spool and cage for long life.
- Optional sealed pilot.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 420 bar (6090 psi)

Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required:

To Spool Crossover: 7.6 bar (110 psi)

To Full Spool Shift: 9.0 bar (130 psi)

Oil Volume Required to Full Shift: 2.5 cc (0.15 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

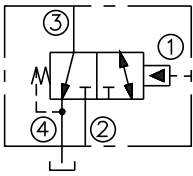
Cavity: VC16-4; See page 9.116.1

Cavity Tool: CT16-4XX; See page 8.600.1

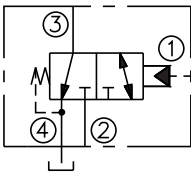
Seal Kit: SK16-4X-MMM; See page 8.650.1

SYMBOLS

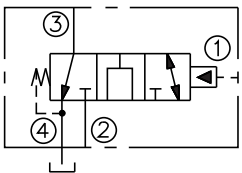
USASI:



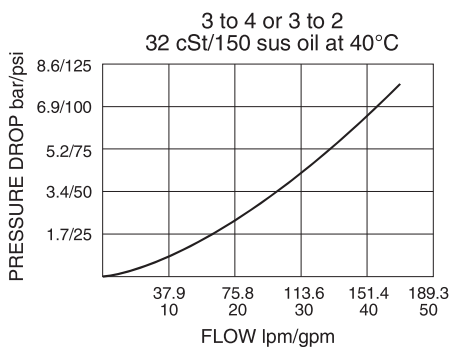
ISO:



OPEN TRANSITION:

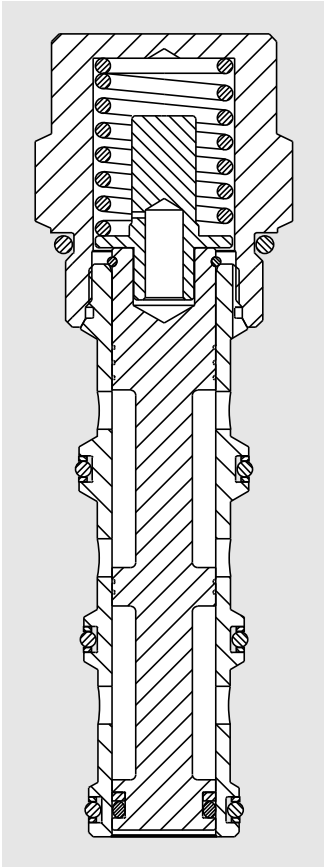
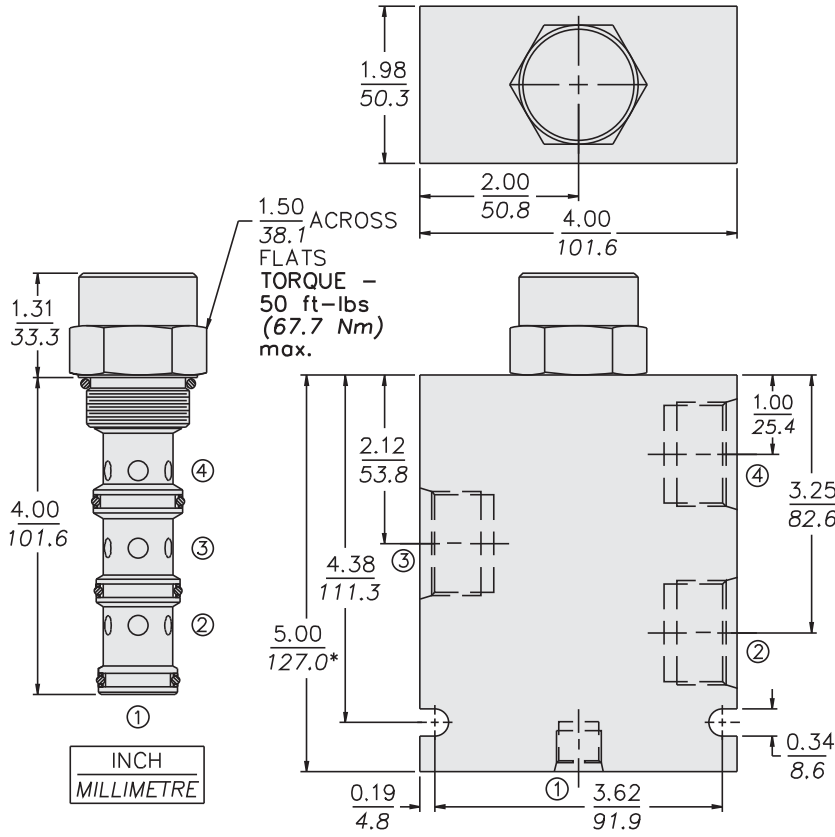


PERFORMANCE (Cartridge Only)



PD16-41

DIMENSIONS



MATERIALS

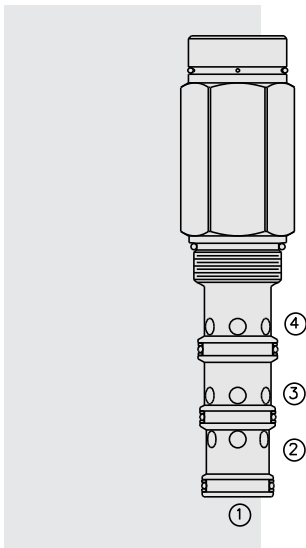
Cartridge: Weight: 0.52 kg. (1.15 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 1.5 kg. (3.3 lbs.); Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.016.1

TO ORDER

PD16-41 - - -		
Option		Bias Springs†
None (Blank)		60 4.1 bar (60 psi)
Open Transition N		110 7.6 bar (110 psi)
		170 11.7 bar (170 psi)
		Optional bias springs considered on OEM request.
		†Note: 110 psi bias spring is the minimum required for use with sealed spool.
Porting		Seals
Cartridge Only 0		N Buna N (Std.)
SAE 12, SAE 6 Pilot 12T		NS Buna N with Sealed Spool
SAE 16, SAE 6 Pilot 16T		V Fluorocarbon
		VS Fluorocarbon with Sealed Spool

PD42-M41 Piloted 3-Way Spool, Internal Vent



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for three-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD42-M41** allows flow from 3 to 4 while 2 is blocked.

On remote pilot signal at 1, the valve shifts to open from the 3 to 2 flow path, while blocking flow to 4.

Note that 4 is common to the spring chamber. Pressure on 4 will directly (1:1) affect required pilot pressure and must always be added to the bias spring value.

Note: Consult factory for applications where bi-directional flow is required when the valve is in the normal or spring-offset position.

FEATURES

- Hardened spool and cage for long life.
- Optional sealed pilot.
- Industry-standard ISO cavity.

RATINGS

Maximum Operating Pressure: With Polyurethane Seals: Ports 1, 2, & 3: 345 bar (5000 psi); Port 4: 210 bar (3000 psi)

Flow: See Performance Chart

Internal Leakage at Maximum Operating Pressure:

Ports 2, 3, & 4: 246 cc/minute (15 cu. in./minute);

Port 1: 524 cc/minute (32 cu. in./minute)

With the sealed pilot there is no leakage at 1 at maximum operating pressure.

Pilot Pressure Required:

To Begin Spool Movement: 11 bar (160 psi)

To Bring Spool to Cross-Over Point: 16.2 bar (235 psi)

To Fully Shift the Spool: 18.3 bar (265 psi)

Oil Volume Required to Full Shift: 2.5 cc (0.15 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

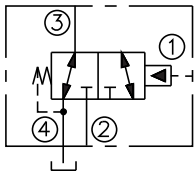
Cavity: VC42-M4; See page 9.142.1

Cavity Tool: CT42-M4XX; See page 8.600.1

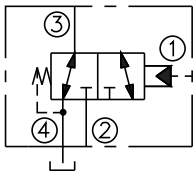
Seal Kit: SK42-4X-MMM; See page 8.650.1

SYMBOLS

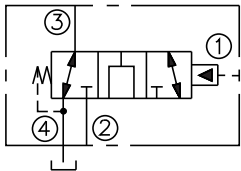
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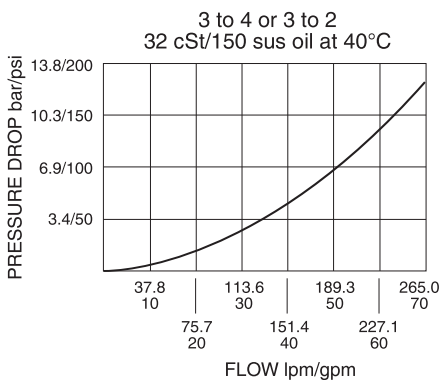
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OPEN TRANSITION:

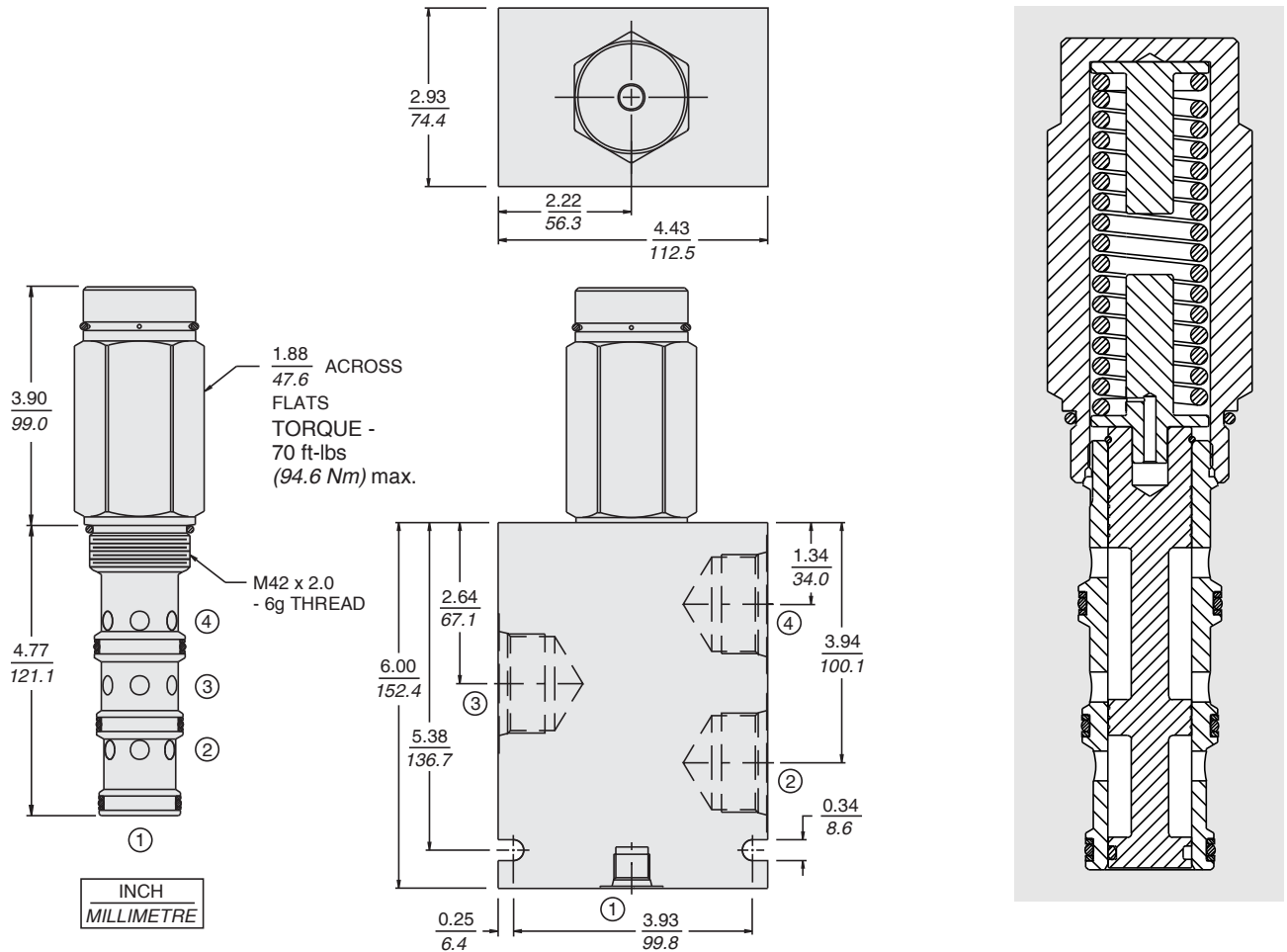


PERFORMANCE (Cartridge Only)



PD42-M41

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.52 kg. (1.15 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
2.8 kg. (6.2 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.042.1

TO ORDER

PD42-M41 - - -160[†]

Option
None (Blank)
Open Transition **N**

Porting
Cartridge Only **0**
SAE 16, SAE 6 Pilot **16T**
*SAE 16, SAE 6 Pilot **16TD**
SAE 20, SAE 6 Pilot **20T**

*Ductile iron body for pressures
over 207 bar/3000 psi

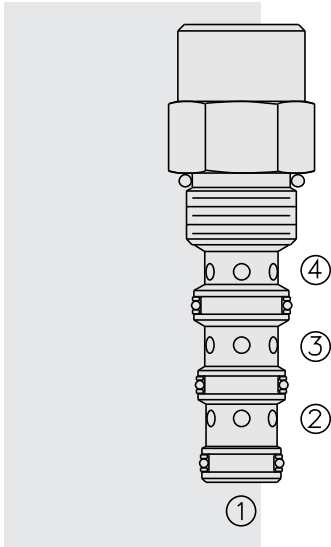
Note: All bodies are PD type.

[†]160 psi bias spring standard.
Optional bias springs considered
on OEM request.

Seals
N Buna N (Std.)
NS Buna N with Sealed Spool
V Fluorocarbon
VS Fluorocarbon with Sealed Spool
P Polyurethane**
PS Polyurethane with Sealed Spool**

**Required for pressures over 3500 psi

PD10-42 Piloted 3-Way Spool, Internal Vent



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for three-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD10-42** allows flow from 3 to 2 bidirectionally while 4 is blocked.

On remote pilot signal at 1, the valve shifts to open from 3 to 4, while blocking flow at 2.

Since 4 is common to the spring chamber, pressure on 4 will directly (1:1) affect the pilot pressure required, and must always be added to the bias spring value.

Note: Consult factory for applications where bi-directional flow is required when the valve is in the piloted position.

FEATURES

- Hardened spool and cage for long life.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required:

To Spool Crossover: 4.1 bar (60 psi) Spring: 4.7 bar (68.2 psi)
7.6 bar (110 psi) Spring: 7.6 bar (110 psi)

To Full Spool Shift: 4.1 bar (60 psi) Spring: 5.2 bar (75 psi)
7.6 bar (110 psi) Spring: 8.6 bar (125 psi)

Oil Volume Required to Full Shift: 0.65 cc (0.04 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

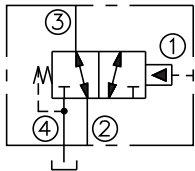
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

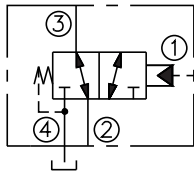
Seal Kit: SK10-4X-MMM; See page 8.650.1

SYMBOLS

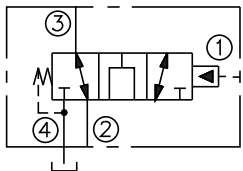
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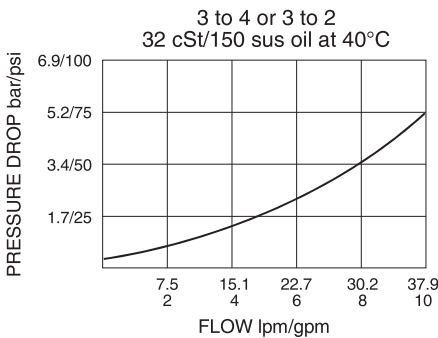
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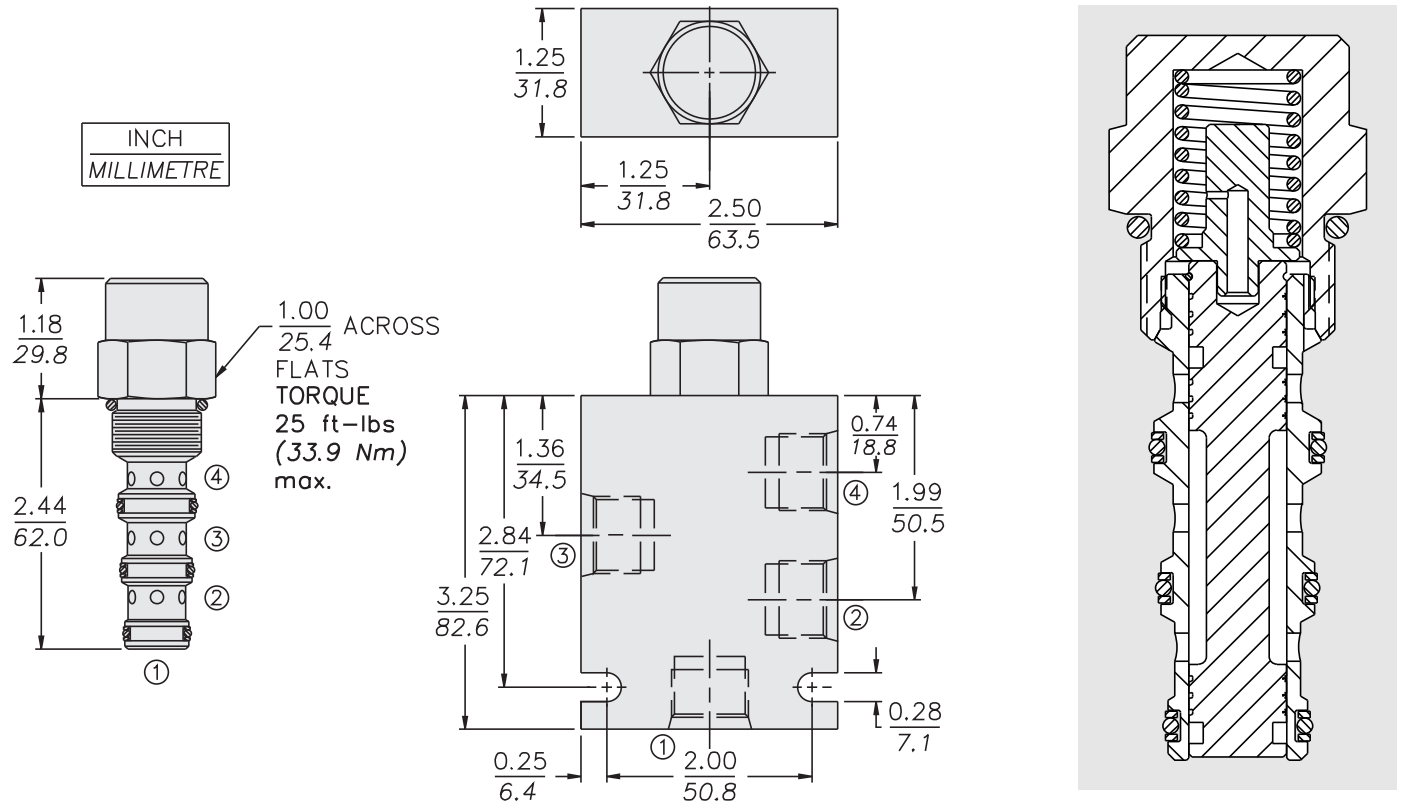
OPEN TRANSITION:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

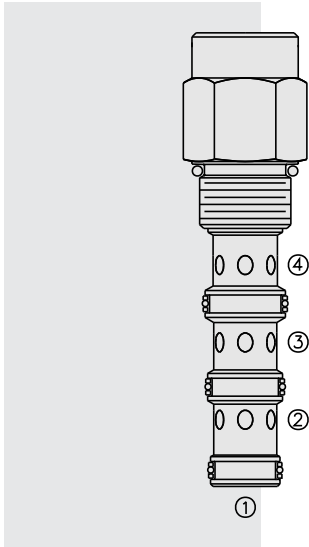
Cartridge: Weight: 0.16 kg. (0.35 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.); Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

PD10-42 - - -		
Option		Bias Spring[†]
None (Blank)		60 4.1 bar (60 psi)
Open Transition N		110 7.6 bar (110 psi)
		170 11.7 bar (170 psi)
		<small>[†]Note: 110 psi bias spring is the minimum required for use with sealed spool.</small>
Porting		Seals
Cartridge Only 0		N Buna N (Std.)
SAE 6 6T		NS Buna N with Sealed Spool
SAE 8 8T		V Fluorocarbon
1/4 in. BSP* 2B		VS Fluorocarbon with Sealed Spool
3/8 in. BSP* 3B		
<small>*BSP Body U.K. Mfr. Only</small>		

PD12-42 Piloted 3-Way Spool, Internal Vent



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for three-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD12-42** allows flow from 3 to 2 bidirectionally while 4 is blocked.

On remote pilot signal at 1, the valve shifts to open from 3 to 4, while blocking flow at 2.

Since 4 is common to the spring chamber, pressure on 4 will directly (1:1) affect the pilot pressure required, and must always be added to the bias spring value.

Note: Consult factory for applications where bi-directional flow is required when the valve is in the piloted position.

FEATURES

- Hardened spool and cage for long life.
- Cost effective cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 420 bar (6090 psi)

Flow: See Performance Chart

Internal Leakage: 115 cc/minute (7 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required Using 7.6 bar (110 psi) Spring:

To Spool Crossover: 7.6 bar (110 psi)

To Full Spool Shift: 9.1 bar (132 psi)

Oil Volume Required to Full Shift: 1.32 cc (0.08 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

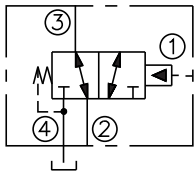
Cavity: VC12-4; See page 9.112.2

Cavity Tool: CT12-4XX; See page 8.600.1

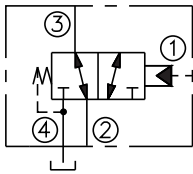
Seal Kit: SK12-4X-MMM; See page 8.650.1

SYMBOLS

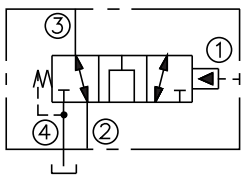
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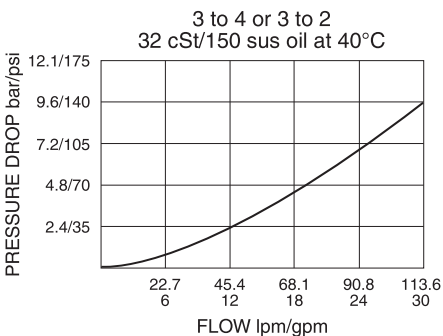
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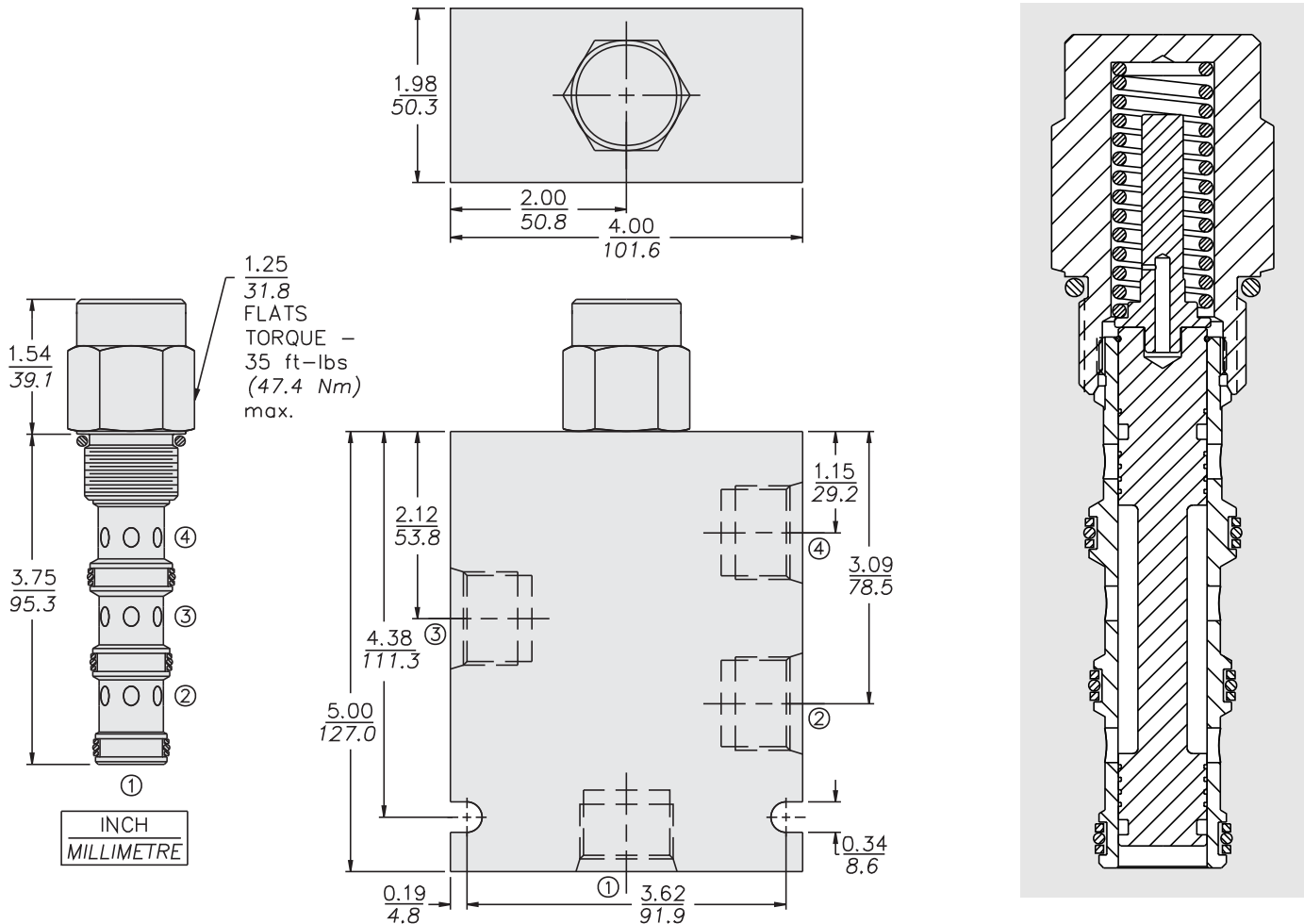
OPEN TRANSITION:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.28 kg. (0.61 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 1.5 kg. (3.3 lbs.); Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1

TO ORDER

PD12-42

Option
 None (Blank)
 Open Transition **N**

Porting
 Cartridge Only **0**
 SAE 10 **10T**
 SAE 12 **12T**

Bias Spring

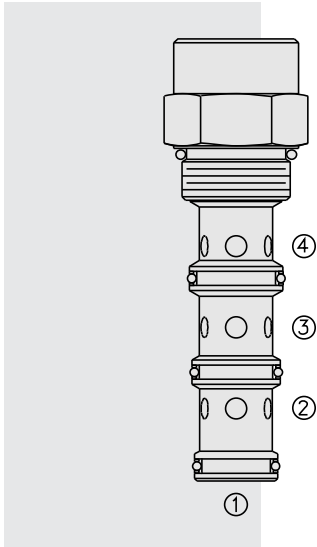
60 4.1 bar (60 psi)
110 7.6 bar (110 psi)
170 11.7 bar (170 psi)

Optional bias springs considered on OEM request.

Seals

N Buna N (Std.)
NS Buna N with Sealed Spool
V Fluorocarbon
VS Fluorocarbon with Sealed Spool

PD16-42 Piloted 3-Way Spool, Internal Vent



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for three-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD16-42** allows flow passage between 3 and 2 while 4 is blocked.

On remote pilot signal at 1, the valve shifts to open from 3 to 4, while blocking flow to 2.

Note that 4 is common to the spring chamber. Pressure on 4 will directly (1:1) affect required pilot pressure and must always be added to the bias spring value.

Note: Consult factory for applications where bi-directional flow is required when the valve is in the piloted position.

FEATURES

- Hardened spool and cage for long life.
- Optional sealed pilot.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 420 bar (6090 psi)

Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required:

To Spool Crossover: 7.6 bar (110 psi)

To Full Spool Shift: 9.0 bar (130 psi)

Oil Volume Required to Full Shift: 2.5 cc (0.15 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

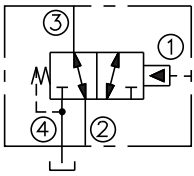
Cavity: VC16-4; See page 9.116.1

Cavity Tool: CT16-4XX; See page 8.600.1

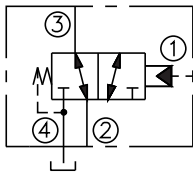
Seal Kit: SK16-4X-MMM; See page 8.650.1

SYMBOLS

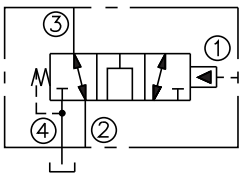
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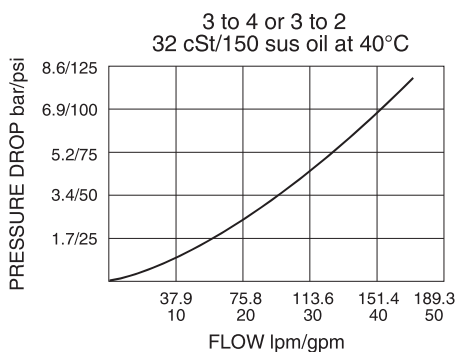
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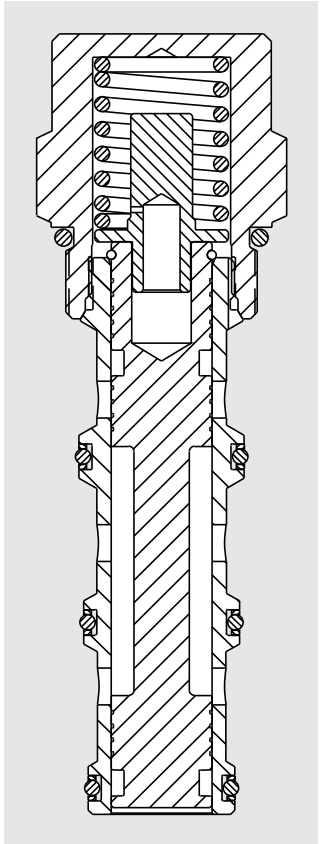
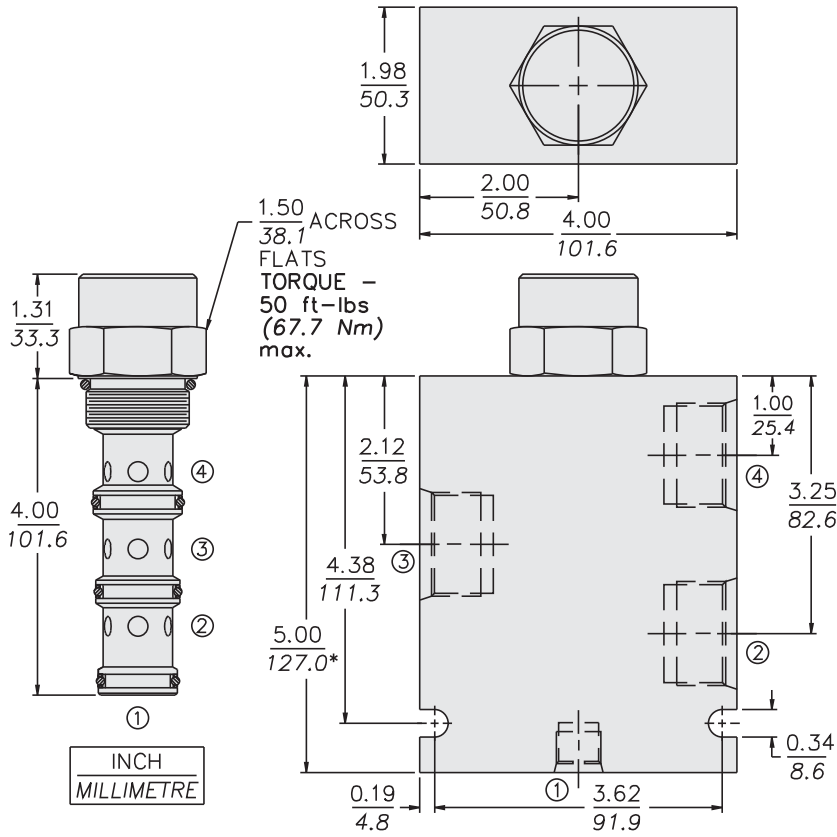
OPEN TRANSITION:



PERFORMANCE (Cartridge Only)



DIMENSIONS



* BSP BODY - 134.9

MATERIALS

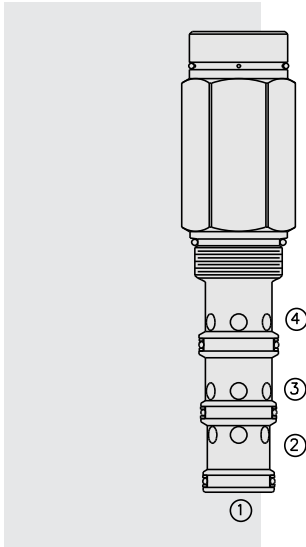
Cartridge: Weight: 0.52 kg. (1.15 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 1.5 kg. (3.3 lbs.); Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.016.1.

TO ORDER

PD16-42		-	-	-
Option	None (Blank)			
Open Transition	N			
Porting				
Cartridge Only	0			
SAE 12, SAE 6 Pilot	12T			
SAE 16, SAE 6 Pilot	16T			
				Bias Spring[†]
				60 4.1 bar (60 psi)
				110 7.6 bar (110 psi)
				170 11.7 bar (170 psi)
				Optional bias springs considered on OEM request.
				[†] Note: 110 psi bias spring is the minimum required for use with sealed spool.
				Seals
				N Buna N (Std.)
				NS Buna N with Sealed Spool
				V Fluorocarbon
				VS Fluorocarbon with Sealed Spool

PD42-M42 Piloted 3-Way Spool, Internal Vent



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for three-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the PD42-M42 allows flow passage between 3 and 2 while 4 is blocked.

On remote pilot signal at 1, the valve shifts to open from 3 to 4, while blocking flow to 2.

Note that 4 is common to the spring chamber. Pressure on 4 will directly (1:1) affect required pilot pressure and must always be added to the bias spring value.

Note: Consult factory for applications where bi-directional flow is required when the valve is in the piloted position.

FEATURES

- Hardened spool and cage for long life.
- Optional sealed pilot.
- Industry-standard ISO cavity.

RATINGS

Maximum Operating Pressure: With Polyurethane Seals: Ports 1, 2, & 3: 345 bar (5000 psi); Port 4: 210 bar (3000 psi)

Flow: See Performance Chart

Internal Leakage at Maximum Operating Pressure: All Ports : 246 cc/minute (15 cu. in./minute); The sealed pilot version exhibits no leakage at maximum operating pressure.

Pilot Pressure Required:

- To Begin Spool Movement: 11.9 bar (172 psi)
- To Bring Spool to Cross-Over Point: 14.5 bar (210 psi)
- To Fully Shift the Spool: 17 bar (245 psi)

Oil Volume Required to Full Shift: 2.5 cc (0.15 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

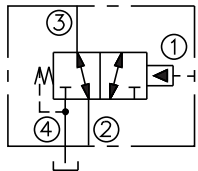
Cavity: VC42-M4; See page 9.142.1

Cavity Tool: CT42-M4XX; See page 8.600.1

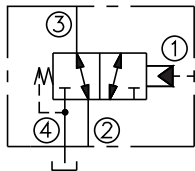
Seal Kit: SK42-4X-MMM; See page 8.650.1

SYMBOLS

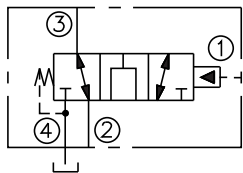
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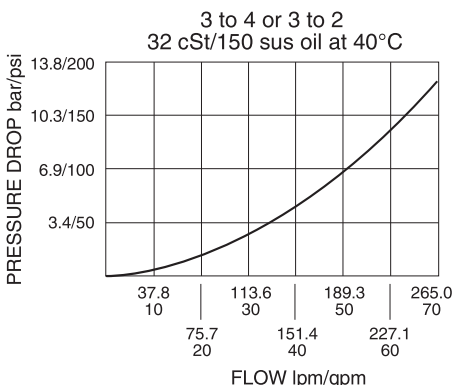
ISO:



OPEN TRANSITION:

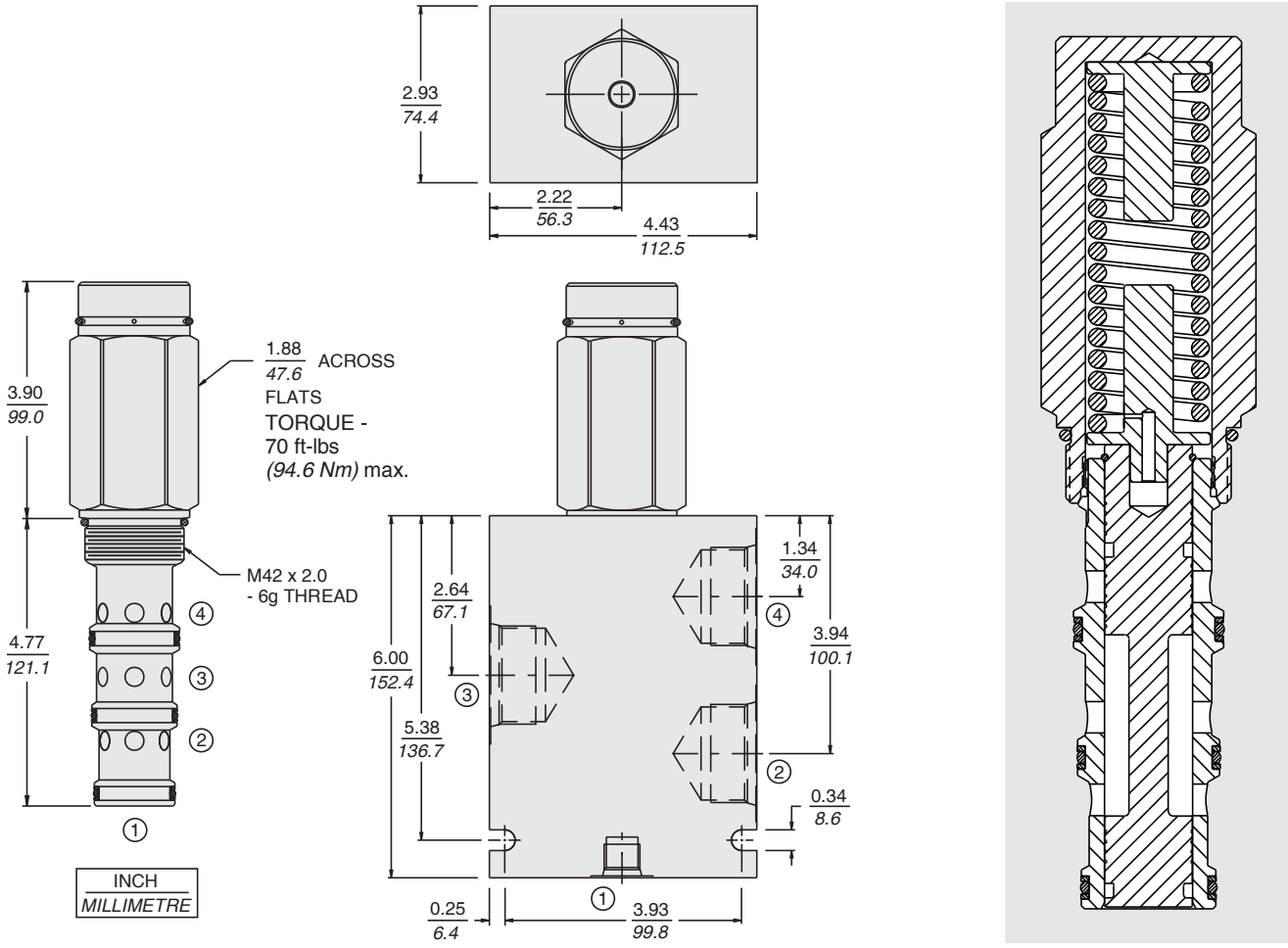


PERFORMANCE (Cartridge Only)



PD42-M42

DIMENSIONS

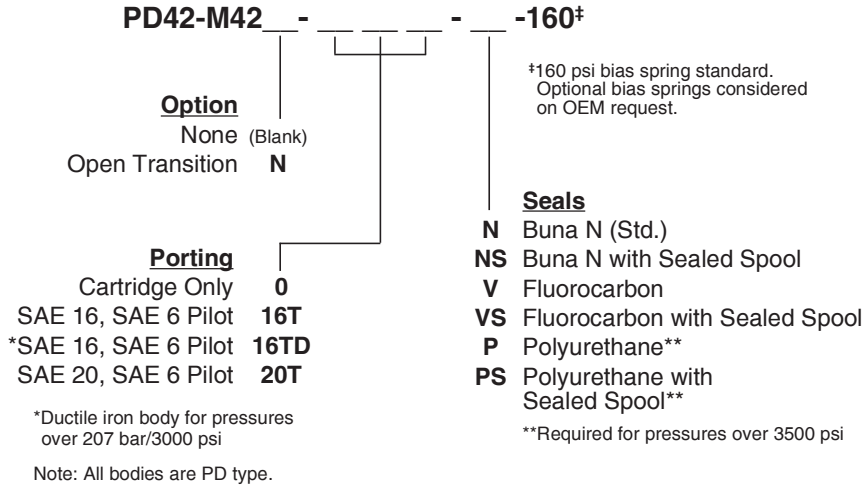


MATERIALS

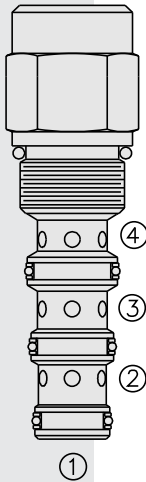
Cartridge: Weight: 0.52 kg. (1.15 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 2.8 kg. (6.2 lbs.)
 Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.042.1

TO ORDER



PD10-44 Piloted 2-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for three-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD10-44** blocks flow from 3 to 2 bidirectionally. The spring chamber is directed to port 4, which is internally O-ring sealed from the cartridge flow paths.

On remote pilot signal at 1, the valve shifts to open from 2 to 3, bidirectionally. Any pressure on port 4 is added to the spring value.

FEATURES

- Hardened spool and cage for long life.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required:

To Spool Crossover: 7.6 bar (110 psi) with a 110 psi bias spring

To Full Spool Shift: 8.6 bar (125 psi) with a 110 psi bias spring

Oil Volume Required to Full Shift: 0.65 cc (0.04 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

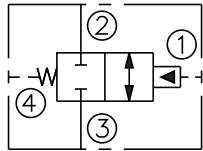
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

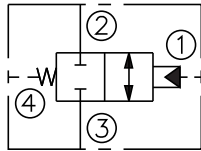
Seal Kit: SK10-4X-MMM; See page 8.650.1

SYMBOLS

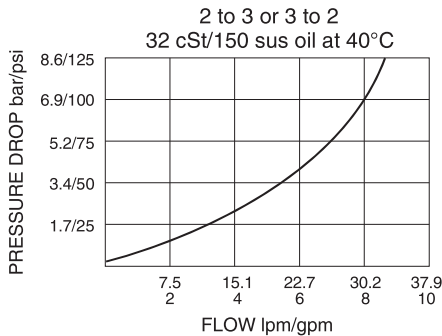
USASI



ISO:

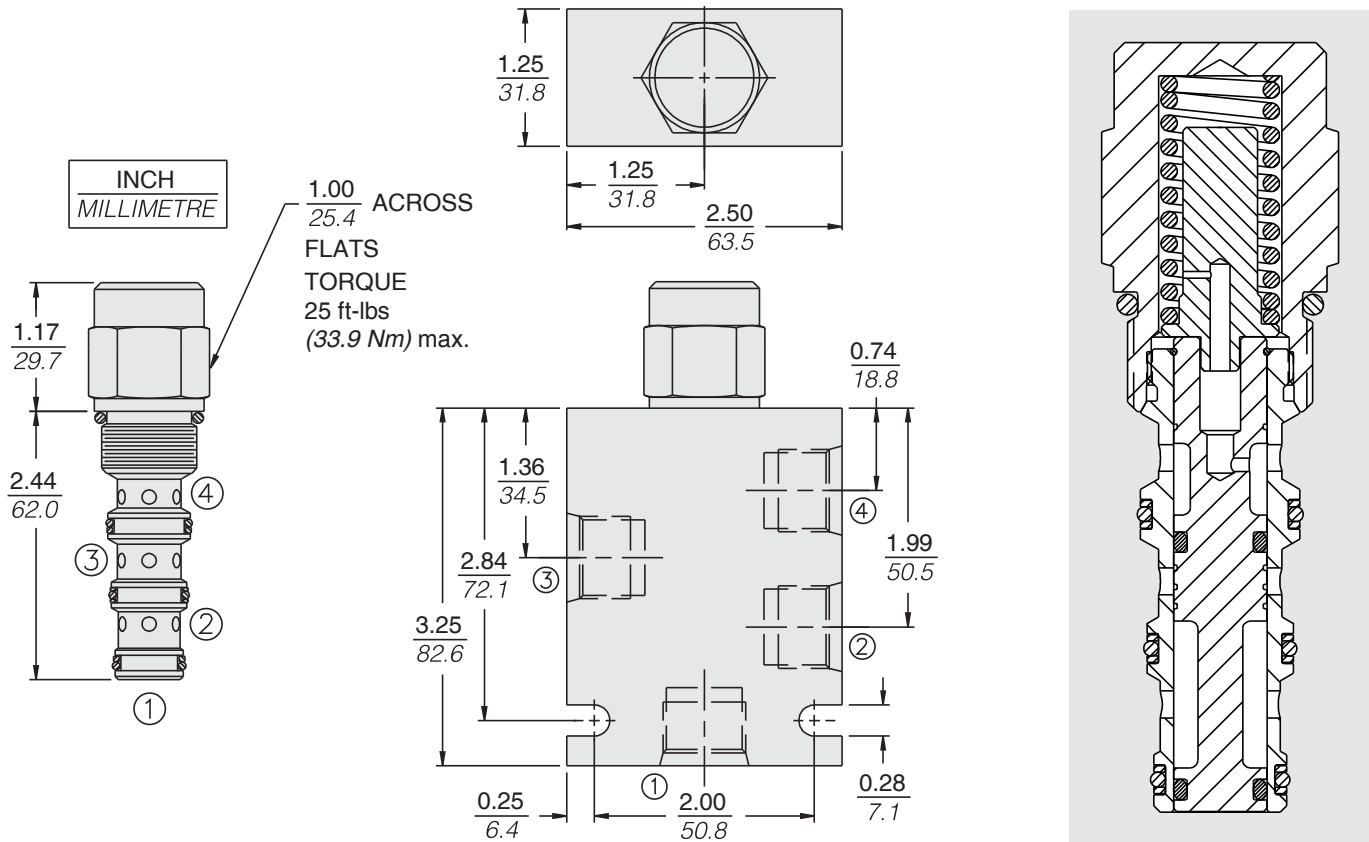


PERFORMANCE (Cartridge Only)



PD10-44

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.16 kg. (0.35 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.); Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

PD10-44 - - -

Porting
Cartridge Only **0**
SAE 6 **6T**
SAE 8 **8T**
1/4 in. BSP* **2B**
3/8 in. BSP* **3B**

*BSP Body
U.K. Mfr. Only

Bias Spring†
60 4.1 bar (60 psi)
110 7.6 bar (110 psi)
170 11.7 bar (170 psi)

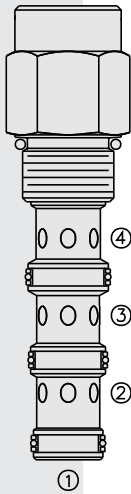
Optional bias springs considered on OEM request

†Note: 110 psi bias spring is the minimum required for use with sealed spool.

Seals

NS Buna N with Sealed Spool
VS Fluorocarbon with Sealed Spool

PD12-44 Piloted 2-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for two-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD12-44** blocks flow from 3 to 2 bidirectionally.

The spring chamber is directed to port 4, which is internally O-ring sealed from the cartridge flow paths.

On remote pilot signal at 1, the valve shifts to open from 2 to 3, bidirectionally.

Any pressure on port 4 is added to the spring value.

FEATURES

- Hardened spool and cage for long life.
- Cost effective cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: 115 cc/minute (7 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required Using 7.6 bar (110 psi) Spring:

To Spool Crossover: 7.6 bar (110 psi)

To Full Spool Shift: 9.1 bar (132 psi)

Oil Volume Required to Full Shift: 1.32 cc (0.08 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

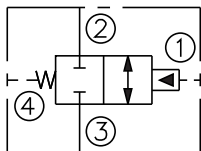
Cavity: VC12-4; See page 9.112.2

Cavity Tool: CT12-4XX; See page 8.600.1

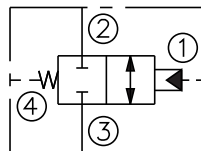
Seal Kit: SK12-4X-MMM; See page 8.650.1

SYMBOLS

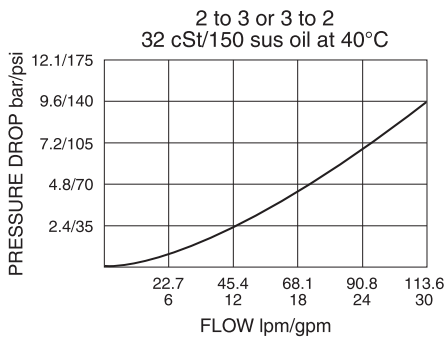
USASI:



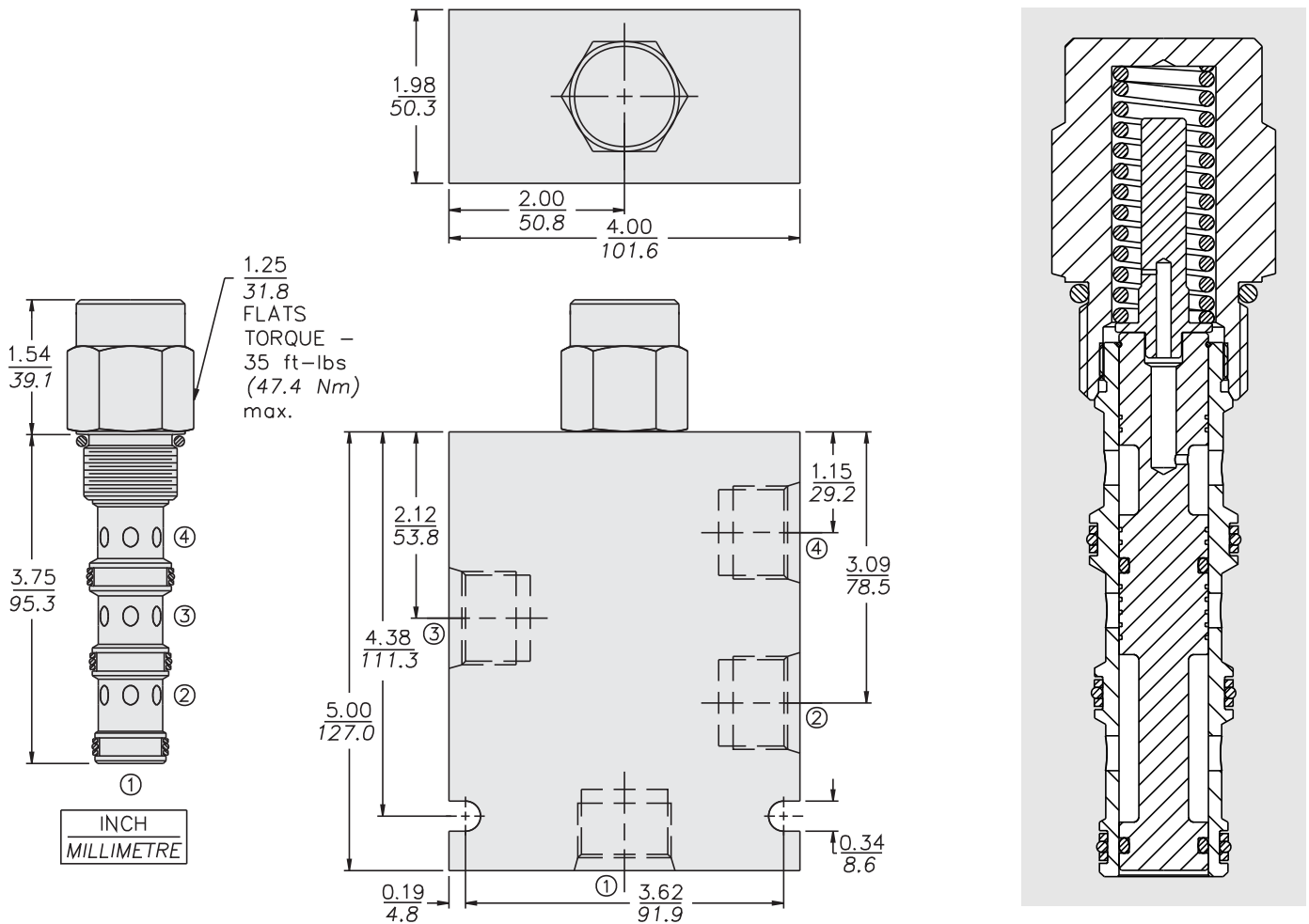
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.28 kg. (0.61 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
1.5 kg. (3.3 lbs.); Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi).
Ductile iron steel bodies available;
dimensions may differ.
See page 8.012.1

TO ORDER

PD12-44 -

Porting
Cartridge Only 0
SAE 10 10T
SAE 12 12T

Bias Spring

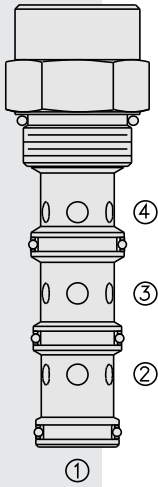
110 7.6 bar (110 psi)
170 11.7 bar (170 psi)

Optional bias springs considered
on OEM request.

Seals

N Buna N (Std.)
NS Buna N with Sealed Spool
V Fluorocarbon
VS Fluorocarbon with Sealed Spool

PD16-44 Piloted 2-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for three-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD16-44** blocks flow from 3 to 2 bidirectionally. The spring chamber is directed to port 4, which is internally O-ring sealed from the cartridge flow paths.

On remote pilot signal at 1, the valve shifts to open from 2 to 3, bidirectionally. Any pressure on port 4 is added to the spring value.

FEATURES

- Hardened spool and cage for long life.
- Optional sealed pilot.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required:

- To Spool Crossover: 7.6 bar (110 psi) with 110 psi bias spring
- To Full Spool Shift: 9.0 bar (130 psi) with 110 psi bias spring

Oil Volume Required to Full Shift: 2.5 cc (0.15 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC16-4; See page 9.116.1

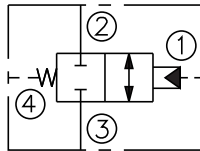
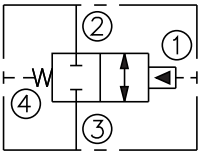
Cavity Tool: CT16-4XX; See page 8.600.1

Seal Kit: SK16-4X-MMM; See page 8.650.1

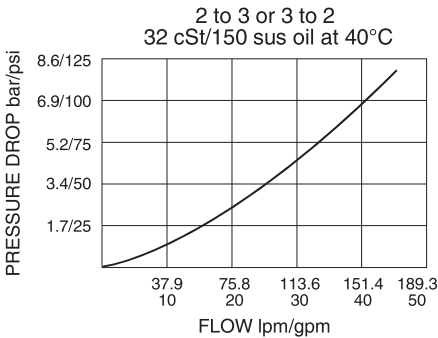
SYMBOLS

USASI:

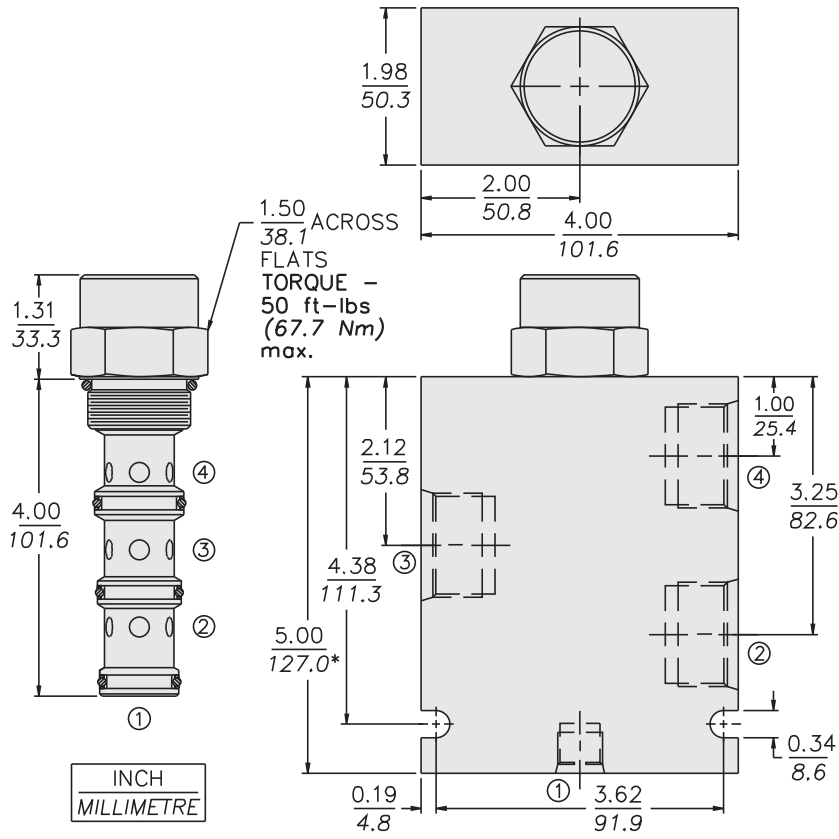
ISO:



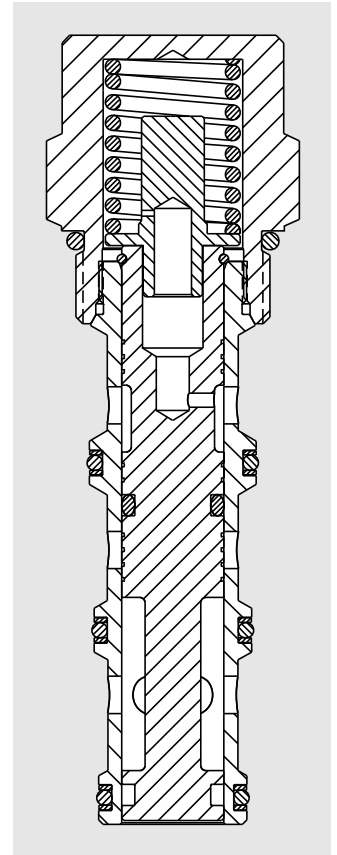
PERFORMANCE (Cartridge Only)



DIMENSIONS



* BSP BODY - 134.9



MATERIALS

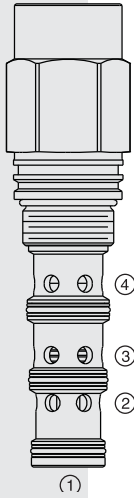
Cartridge: Weight: 0.52 kg. (1.15 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 1.5 kg. (3.3 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.016.1

TO ORDER

PD16-44 -		-	-
Porting			
Cartridge Only	0		
SAE 12, SAE 6 Pilot	12T		
SAE 16, SAE 6 Pilot	16T		
		Bias Spring	
		110	7.6 bar (110 psi)
		170	11.7 bar (170 psi)
			Optional bias springs considered on OEM request.
		Seals	
		N	Buna N (Std.)
		NS	Buna N with Sealed Spool
		V	Fluorocarbon
		VS	Fluorocarbon with Sealed Spool

HPD42-M44 HyPerformance™ Piloted 2-Way Spool



DESCRIPTION

A high performance, screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for two-way circuits requiring remote pilot actuation and vented spring chamber.

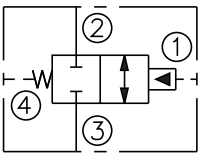
OPERATION

In neutral (unpiloted), the **HPD42-M44** blocks flow from 2 to 3 and 3 to 2 on remote pilot signal at port 1. The valve's spool shifts to allow flow from port 2 to 3 and port 3 to 2. The spring chamber is vented to port 4. Pressure at port 4 will directly (1:1) affect the pilot pressure required and must be added to the bias spring value.

FEATURES

- Multiple function/application potential.
- Smooth shift transition.
- Low pressure drop.
- Hardened spool and cage for long life.
- Optional sealed pilot.
- Industry-standard ISO cavity.
- All HyPerformance products are tested to the rigorous standards of NFPA specification T2.6.1.
- All HyPerformance products are tested at a verification level of 90% and an assurance of 99%.

ISO SYMBOL



RATINGS

Operating Pressure: 350 bar (5075 psi); 10% cycle life: 420 bar (6090 psi)

Flow: 265 lpm (70 gpm)

Internal Leakage: 310 ml/min (19 cu. in./minute) at 350 bar (5075 psi)

Pilot Pressure Required:

To Spool Crossover: 10.3 bar (150 psi) with 150 psi bias spring

To Full Spool Shift: 17.9 bar (260 psi) with 150 psi bias spring

Oil Volume Required to Full Shift: 6.22 cc (0.38 cu. in.)

Temperature: -54°C to 107°C (-65°F to 225°F) with standard PPDI Urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

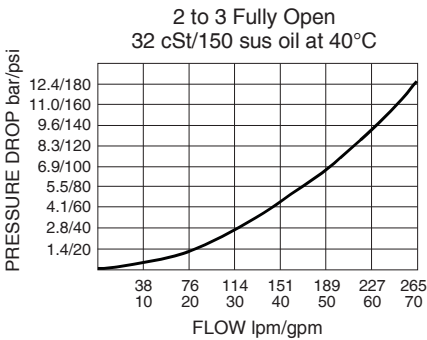
Installation: No restrictions; See page 9.020.1

Cavity: HVC42-M4

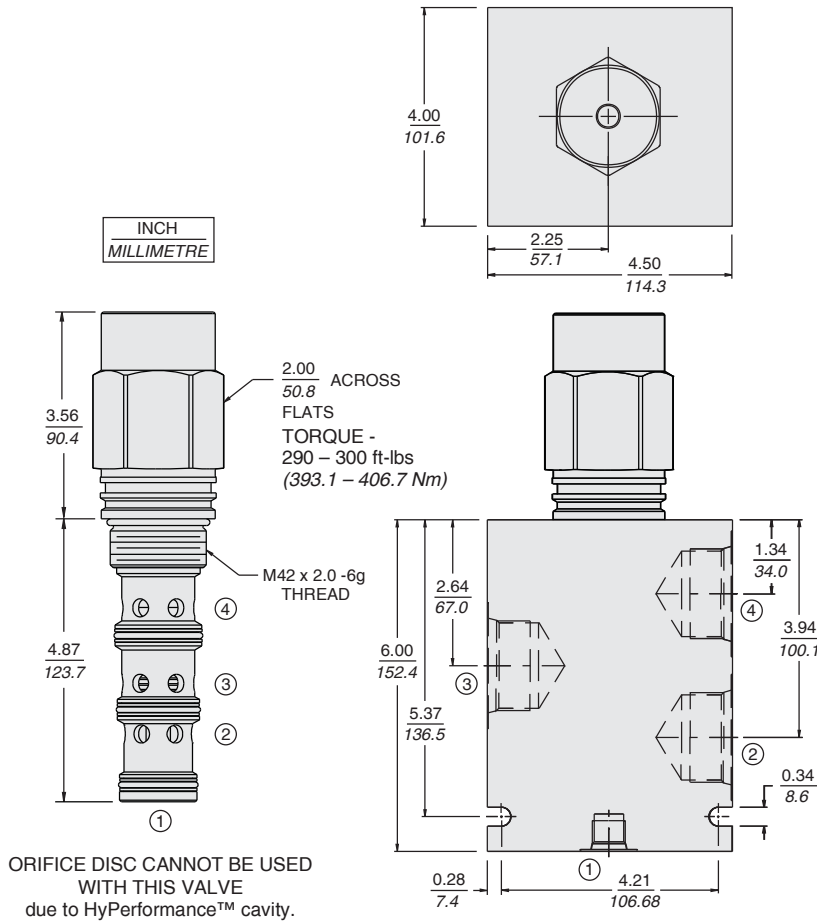
Cavity Tool: HCT42-M4XX (See page 8.600.1).

Seal Kit: SK42-M4U-000 (Urethane) See page 8.650.1

PERFORMANCE (Cartridge Only)



DIMENSIONS

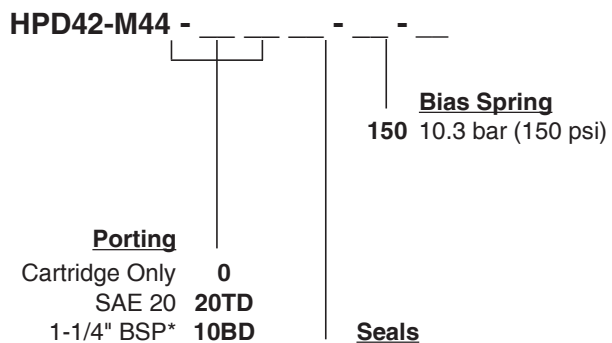


MATERIALS

Cartridge: Weight: 1.9 kg. (4.2 lbs.)
Steel with hardened work surfaces.
Zinc-nickel plated exposed surfaces.
PPDI urethane O-rings and polyester elastomer back-ups standard.

Ported Body: Weight: 10.68 kg (23.56 lbs.) HyPerformance™ Ductile iron (code 'D') standard. PD type.
Rated to 345 bar (5000 psi).

TO ORDER

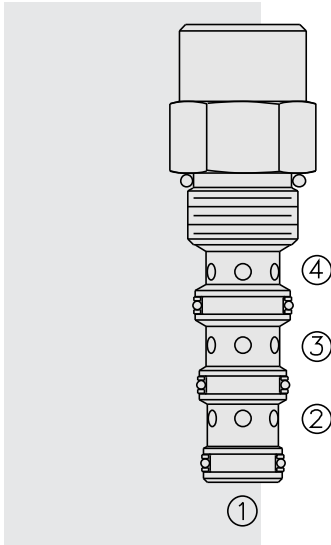


*BSP body; U.K. mfr. Only

NOTE: All bodies are PD type.

***U** PPDI Urethane (Standard)
***US** PPDI Urethane with Sealed Spool
* Urethane seals recommended for operating pressures above 241 bar (3500 psi)

PD10-45 Piloted 2-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for two-way circuits requiring remote pilot actuation and vented spring chamber.

OPERATION

In neutral (unpiloted), the **PD10-45** allows flow from 3 to 2 bidirectionally. The spring chamber is directed to port 4.

On remote pilot signal at 1, the valve shifts to block from 3 to 2, bidirectionally.

Since 4 is common to the spring chamber, pressure on 4 will directly (1:1) affect the pilot pressure required, and must always be added to the bias spring value.

FEATURES

- Hardened spool and cage for long life.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: at 207 bar (3000 psi) and 38° C (100° F):

From 3 to 2 and 4: 82 cc/minute (5 cu. in./minute) max.

From 1 to 2: 164 cc/minute (10 cu. in./minute) max.

Pilot Pressure Required:

To Spool Crossover: 4.1 bar (60 psi) Spring: 4.7 bar (68.2 psi)
7.6 bar (110 psi) Spring: 7.6 bar (110 psi)

To Full Spool Shift: 4.1 bar (60 psi) Spring: 5.2 bar (75 psi)
7.6 bar (110 psi) Spring: 8.6 bar (125 psi)

Oil Volume Required to Full Shift: 0.65 cc (0.04 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

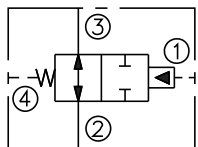
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

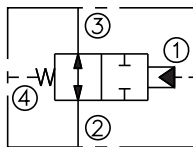
Seal Kit: SK10-4X-MMM; See page 8.650.1

SYMBOLS

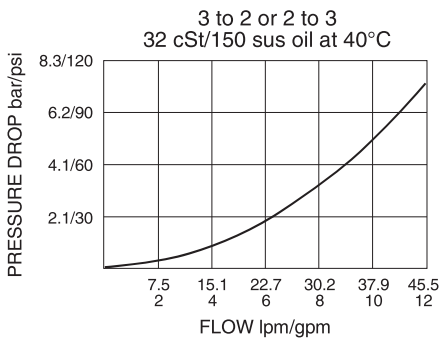
USASI:



ISO:

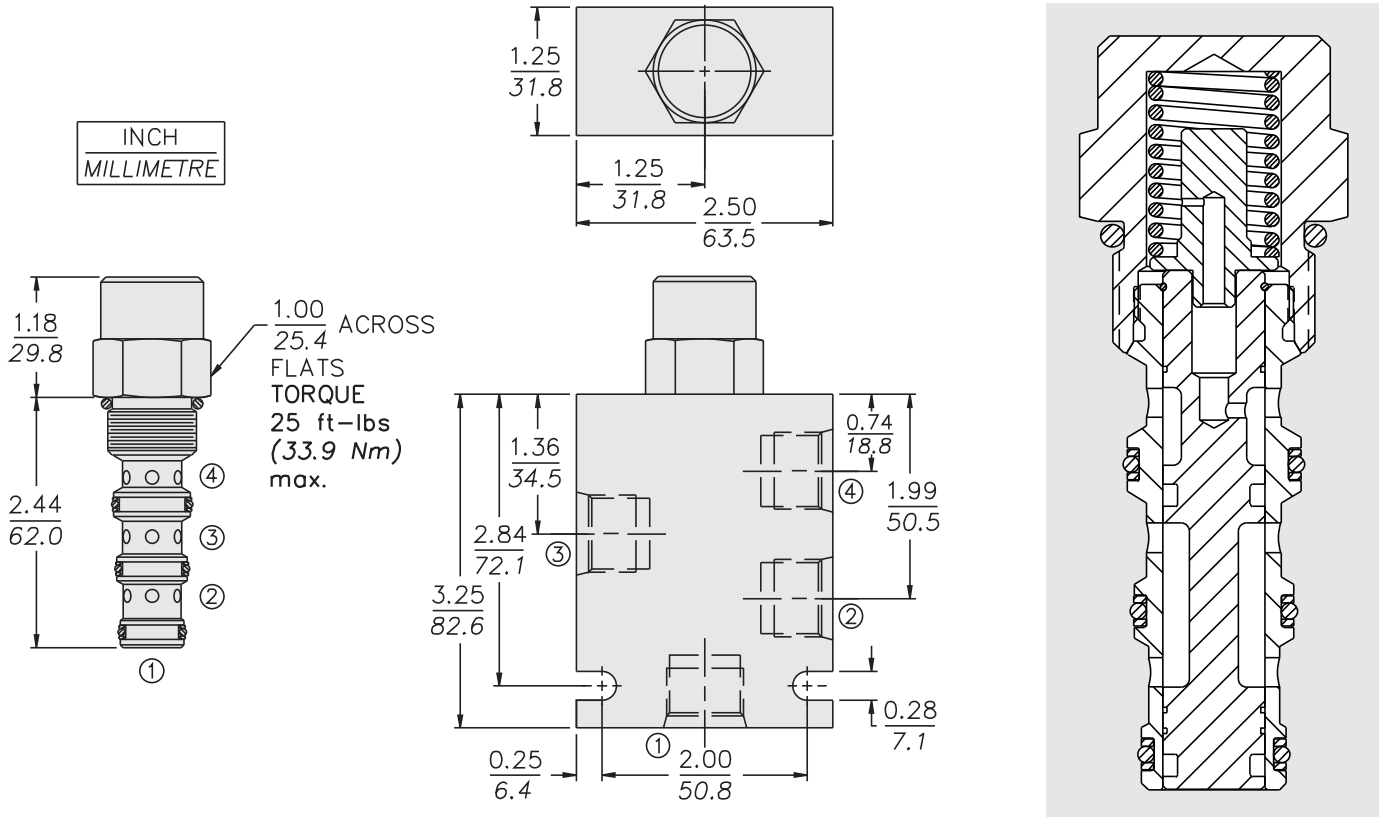


PERFORMANCE (Cartridge Only)



PD10-45

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.16 kg. (0.35 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1.

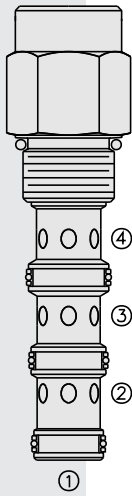
TO ORDER

PD10-45 -

Porting		Bias Spring†	
Cartridge Only	0	60	4.1 bar (60 psi)
SAE 6	6T	110	7.6 bar (110 psi)
SAE 8	8T	170	11.7 bar (170 psi)
1/4 in. BSP*	2B		
3/8 in. BSP*	3B		
*BSP Body U.K. Mfr. Only			
Seals			
Buna N (Std.)	N		
Buna N with Sealed Spool	NS		
Fluorocarbon	V		
Fluorocarbon with Sealed Spool	VS		

†Note: 110 psi bias spring is the minimum required for use with sealed spool.

PD12-45 Piloted 2-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for two-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD12-45** allows flow from 3 to 5 bidirectionally. The spring chamber is directed to port 4.

On remote pilot signal at 1, the valve shifts to block from 3 to 2, bidirectionally. Since 4 is common to the spring chamber, pressure on 4 will directly (1:1) affect the pilot pressure required, and must always be added to the bias spring value.

FEATURES

- Hardened spool and cage for long life.
- Cost effective cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: 115 cc/minute (7 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required Using 7.6 bar (110 psi) Spring:

To Spool Crossover: 7.6 bar (110 psi)

To Full Spool Shift: 9.1 bar (132 psi)

Oil Volume Required to Full Shift: 1.32 cc (0.08 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

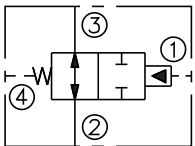
Cavity: VC12-4; See page 9.112.2

Cavity Tool: CT12-4XX; See page 8.600.1

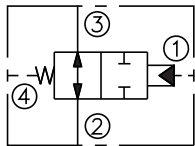
Seal Kit: SK12-4X-MMM; See page 8.650.1

SYMBOLS

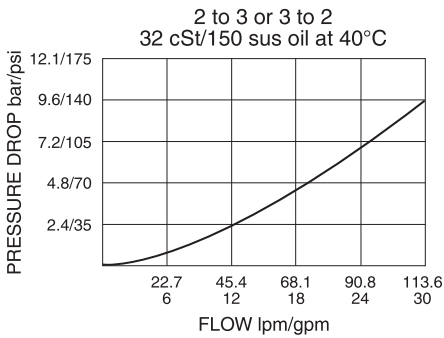
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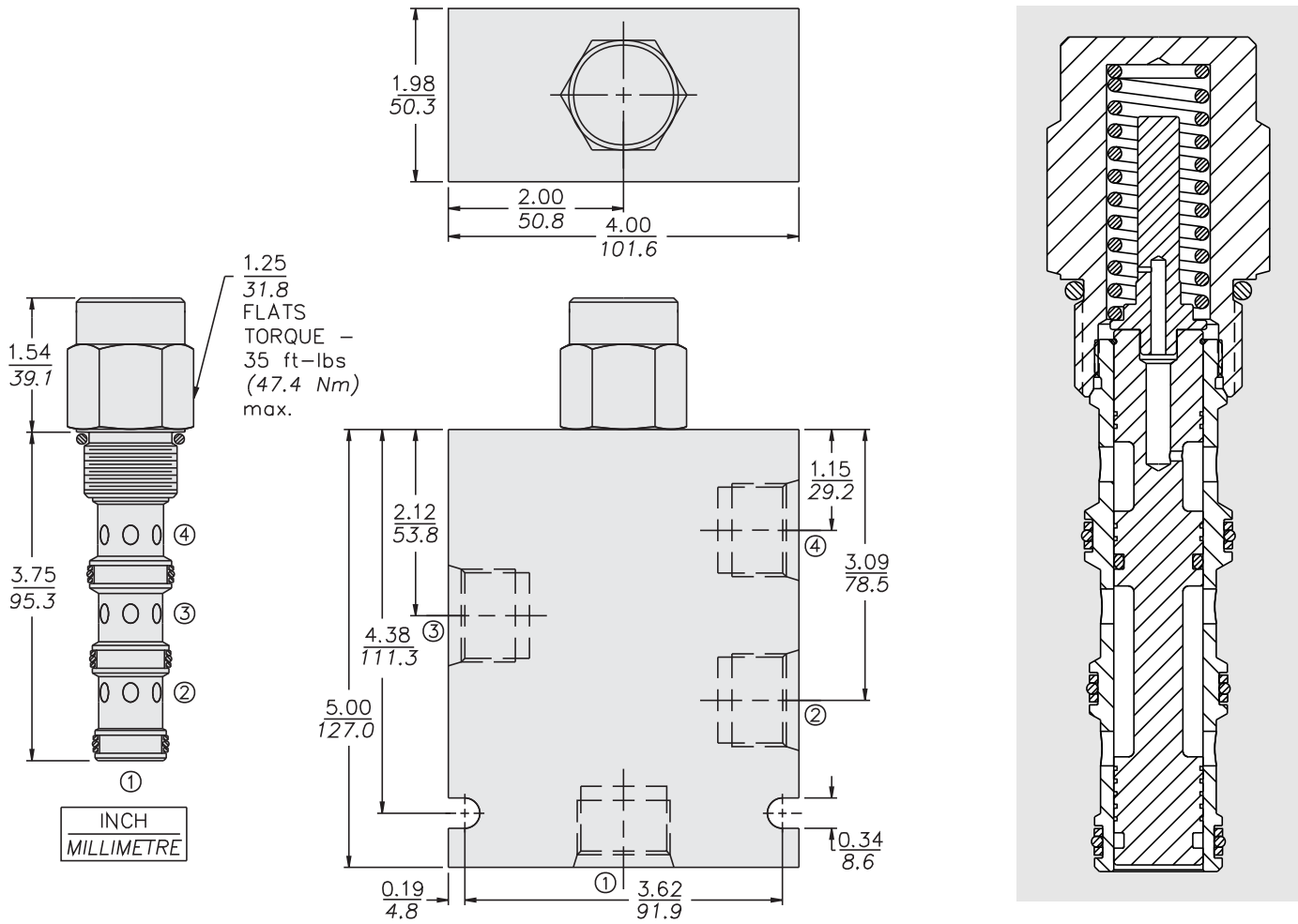
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



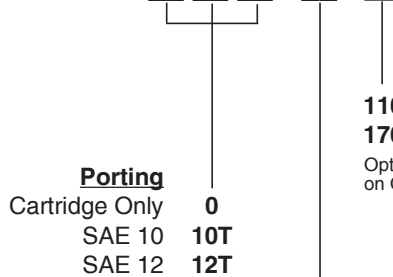
MATERIALS

Cartridge: Weight: 0.28 kg. (0.61 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
1.5 kg. (3.3 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.012.1

TO ORDER

PD12-45 -



Bias Spring

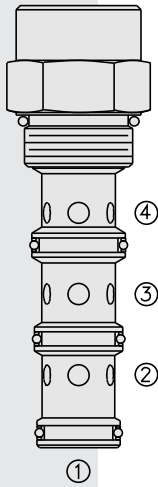
- 110 7.6 bar (110 psi)
- 170 11.7 bar (170 psi)

Optional bias springs considered
on OEM request.

Seals

- N Buna N (Std.)
- NS Buna N with Sealed Spool
- V Fluorocarbon
- VS Fluorocarbon with Sealed Spool

PD16-45 Piloted 2-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for two-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD16-45** allows flow from 3 to 2 bidirectionally. The spring chamber is directed to port 4.

On remote pilot signal at 1, the valve shifts to block from 3 to 2, bidirectionally.

Since 4 is common to the spring chamber, pressure on 4 will directly (1:1) affect the pilot pressure required, and must always be added to the bias spring value.

FEATURES

- Hardened spool and cage for long life.
- Optional sealed pilot.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required:

To Spool Crossover: 7.6 bar (110 psi)

To Full Spool Shift: 9.0 bar (130 psi)

Oil Volume Required to Full Shift: 2.5 cc (0.15 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

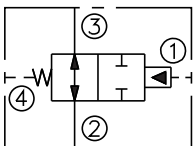
Cavity: VC16-4; See page 9.116.1

Cavity Tool: CT16-4XX; See page 8.600.1

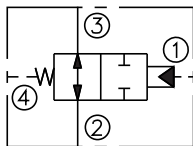
Seal Kit: SK16-4X-MMM; See page 8.650.1

SYMBOLS

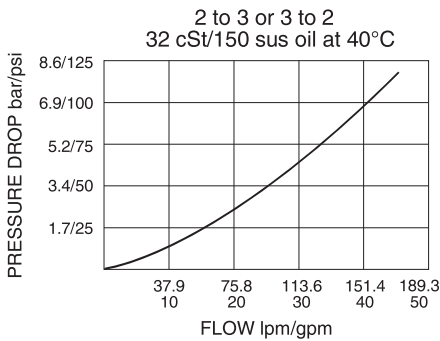
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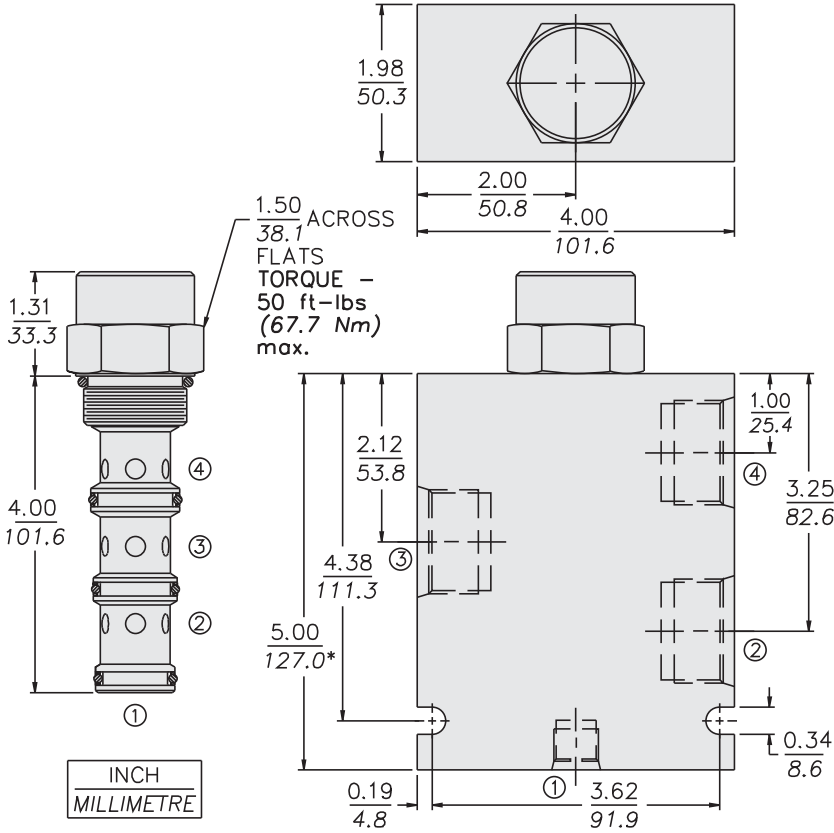
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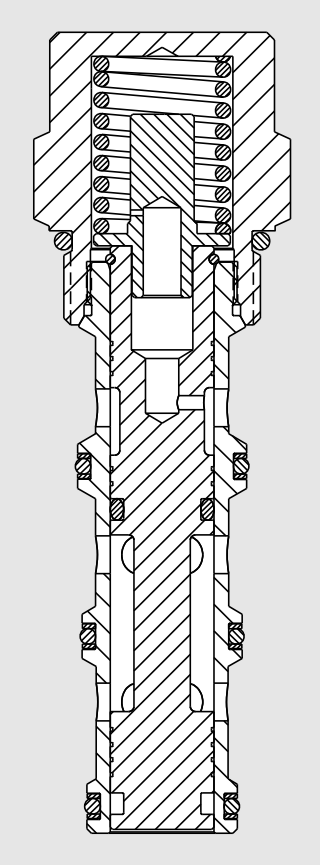
PERFORMANCE (Cartridge Only)



DIMENSIONS



* BSP BODY - 134.9



MATERIALS

Cartridge: Weight: 0.52 kg. (1.15 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 1.5 kg. (3.3 lbs.)
Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.016.1.

TO ORDER

PD16-45 - - -

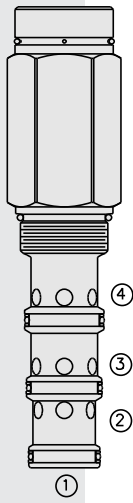
Porting
Cartridge Only **0**
SAE 12, SAE 6 Pilot **12T**
SAE 16, SAE 6 Pilot **16T**

Bias Spring†
60 4.1 bar (60 psi)
110 7.6 bar (110 psi)
170 11.7 bar (170 psi)
Optional bias springs considered on OEM request.

†Note: 110 psi bias spring is the minimum required for use with sealed spool.

Seals
N Buna N (Std.)
NS Buna N with Sealed Spool
V Fluorocarbon
VS Fluorocarbon with Sealed Spool

PD42-M45 Piloted 2-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for three-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD42-M45** allows flow from 3 to 2 bidirectionally. The spring chamber is directed to port 4.

On remote pilot signal at 1, the valve shifts to block 3 to 4 bidirectionally.

Note that 4 is common to the spring chamber. Pressure on 4 will directly (1:1) affect required pilot pressure and must always be added to the bias spring value.

FEATURES

- Hardened spool and cage for long life.
- Optional sealed pilot.
- Industry-standard ISO cavity.

RATINGS

Maximum Operating Pressure: With Polyurethane Seals: Ports 1, 2 & 3: 344 bar (5000 psi); Port 4: 210 bar (3000 psi)

Flow: See Performance Chart

Internal Leakage: 246 ml/minute (15 cu. in./minute) max. at 344 bar (5000 psi)

Pilot Pressure Required:

To Spool Crossover: 13 bar (188 psi)

To Full Spool Shift: 17.2 to 27.6 bar (250 to 400 psi)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

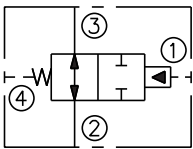
Cavity: VC42-M4; See page 9.142.1

Cavity Tool: CT42-M4XX; See page 8.600.1

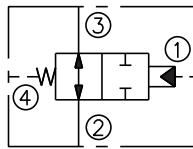
Seal Kit: SK42-4X-MMM; See page 8.650.1

SYMBOLS

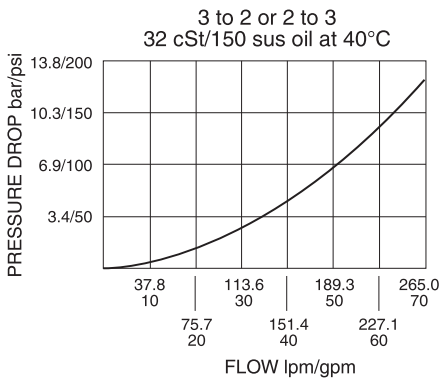
USASI:



ISO:

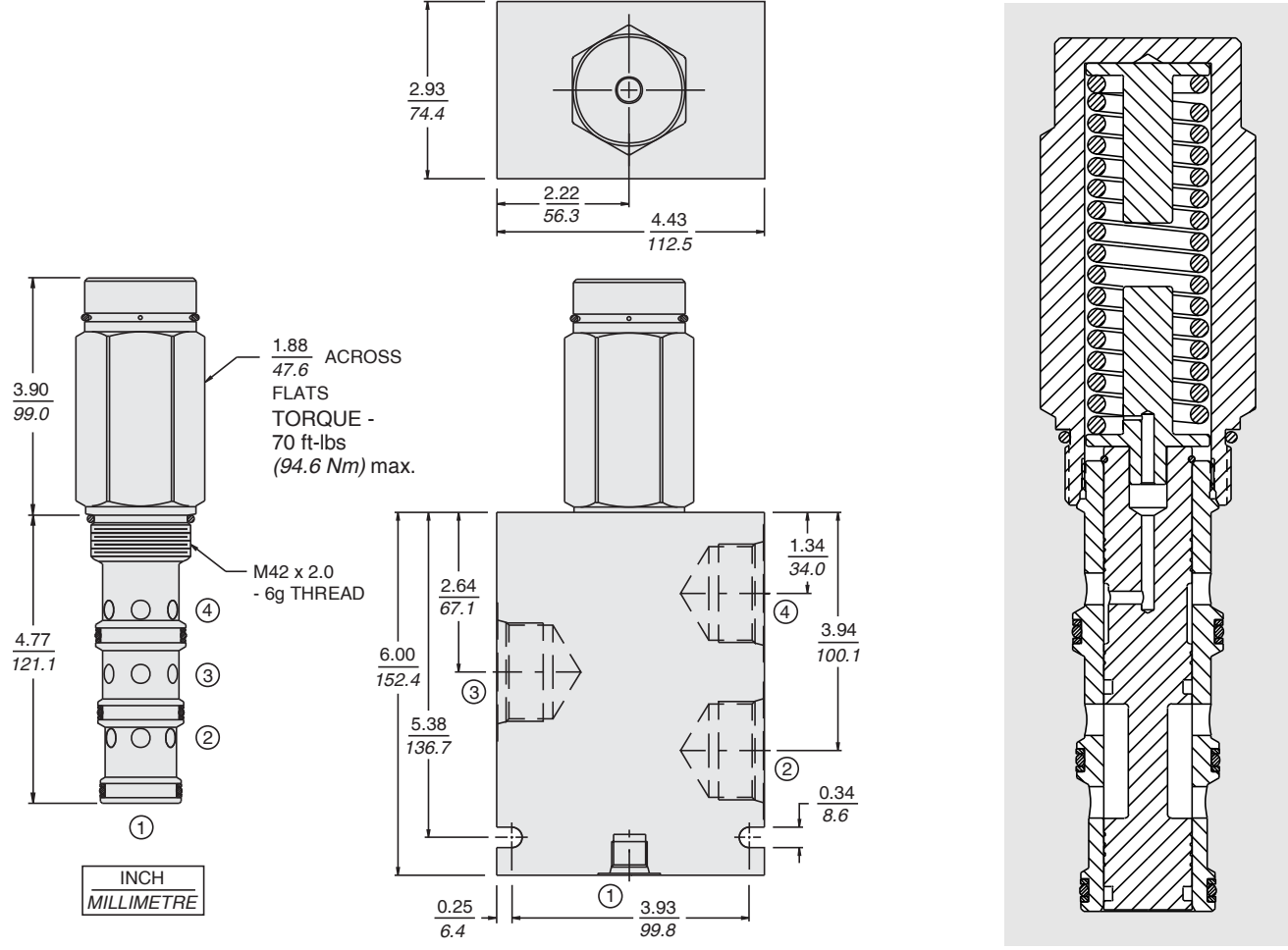


PERFORMANCE (Cartridge Only)



PD42-M45

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.52 kg. (1.15 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight: 2.8
kg. (6.2 lbs.) Anodized high-strength
6061 T6 aluminum alloy, rated to
207 bar (3000 psi). Ductile iron
bodies available; dimensions may dif-
fer. See page 8.042.1.

TO ORDER

PD42-M45 - - -160[†]

Option
None (Blank)

Porting
Cartridge Only **0**
SAE 16, SAE 6 Pilot **16T**
*SAE 16, SAE 6 Pilot **16TD**
SAE 20, SAE 6 Pilot **20T**

[†]160 psi bias spring standard.
Optional bias springs considered
on OEM request.

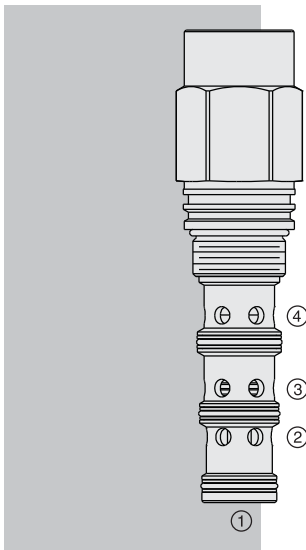
Seals
N Buna N (Std.)
NS Buna N with Sealed Spool
V Fluorocarbon
VS Fluorocarbon with Sealed Spool
P Polyurethane**
PS Polyurethane with
Sealed Spool**

*Ductile iron body for pressures
over 207 bar/3000 psi

**Required for pressures over 3500 psi

Note: All bodies are PD type.

HPD42-M45 HyPerformance™ Piloted 2-Way Spool



DESCRIPTION

A high performance, screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for two-way circuits requiring remote pilot actuation and vented spring chamber.

OPERATION

In neutral (unpiloted), the **HPD42-M45** allows flow from 3 to 2 bidirectionally. The spring chamber is directed to port 4.

On remote pilot signal at 1, the valve shifts to block 3 to 2 bidirectionally.

Note that 4 is common to the spring chamber. Pressure on 4 will directly (1:1) affect required pilot pressure and must always be added to the bias spring value.

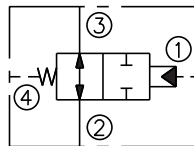
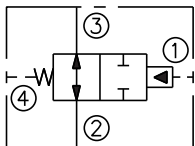
FEATURES

- Multiple function/application potential.
- Smooth shift transition.
- Low pressure drop.
- Hardened spool and cage for long life.
- Optional sealed pilot.
- Industry-standard ISO cavity.
- All HyPerformance products are tested to the rigorous standards of NFPA specification T2.6.1.
- All HyPerformance products are tested at a verification level of 90% and an assurance of 99%.

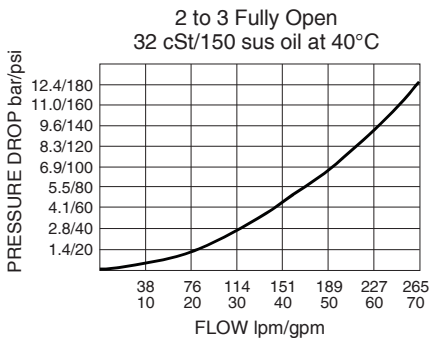
SYMBOLS

USASI:

ISO:



PERFORMANCE (Cartridge Only)



RATINGS

Operating Pressure: 350 bar (5075 psi); 10% cycle life: 420 bar (6090 psi)

Note: All HyPerformance products are tested for 900K cycles at 350 bar and 100K at 420 bar

Fatigue Rating: 2 million cycles at 420 bar

Burst Pressure: 1380 bar (20000 psi)

Flow: 265 lpm (70 gpm)

Internal Leakage: 560 ml/min (30 cu. in./minute) max at 350 bar (5075 psi)

Pilot Pressure Required:

To Spool Crossover: 5.51 bar (80 psi) with 180 psi bias spring

To Full Spool Shift: 12.4 bar (180 psi) with 180 psi bias spring

Oil Volume Required to Full Shift: 5.07 cu. cm. (0.31 cu. in.)

Temperature: -54°C to 107°C (-65°F to 225°F) with standard PPDI Urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of

7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

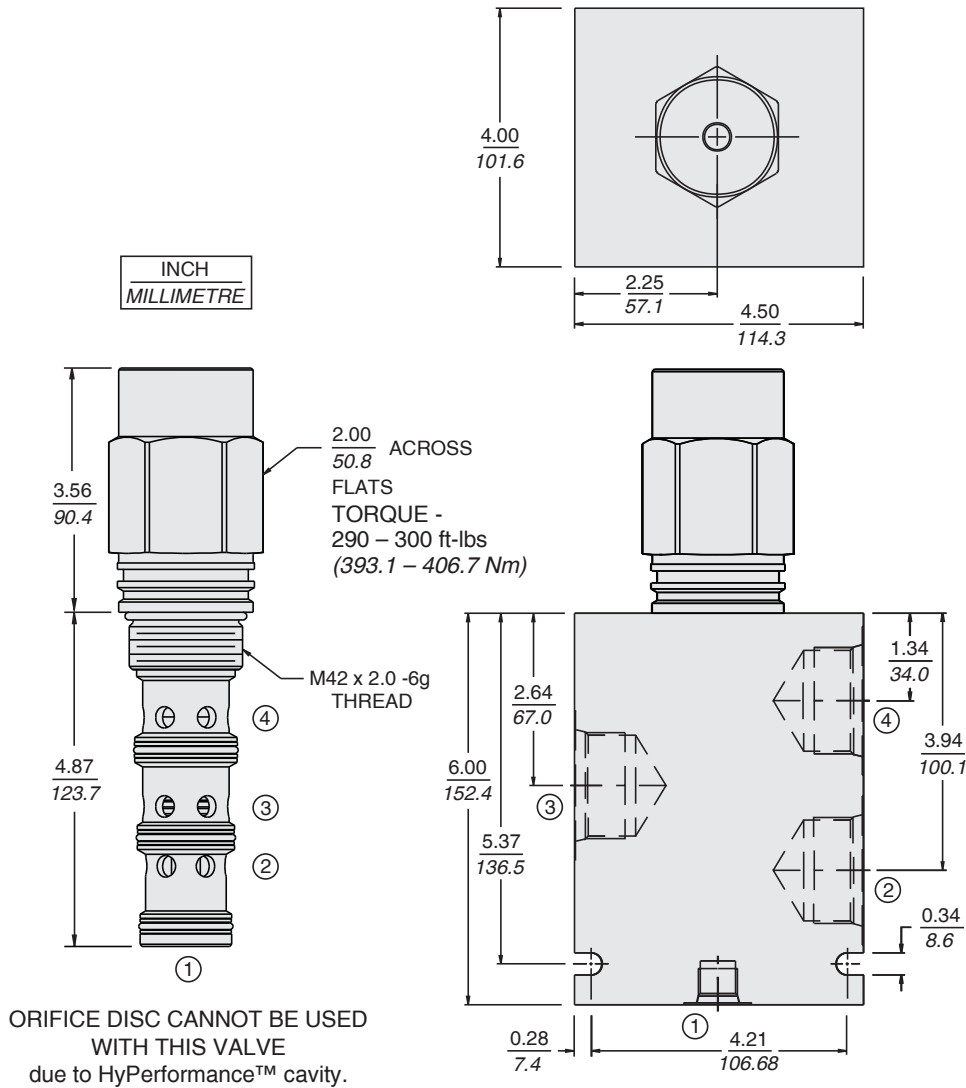
Installation: No restrictions; See page 9.020.1

Cavity: HVC42-M4 See page 9.142.1

Cavity Tool: HCT42-M4XX; See page 8.600.1

Seal Kit: SK42-4X-MMM; See page 8.650.1

DIMENSIONS



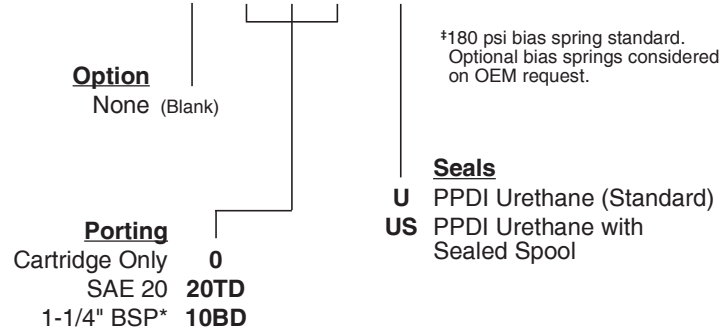
MATERIALS

Cartridge: Weight: 1.9 kg. (4.2 lbs.)
Steel with hardened work surfaces.
Zinc-nickel plated exposed surfaces. PPDI urethane O-rings and polyester elastomer back-ups standard.

Ported Body: Weight: 10.68 kg (23.56 lbs.) HyPerformance™
Ductile iron (code 'D') standard. PD type. Rated to 345 bar (5000 psi).

TO ORDER

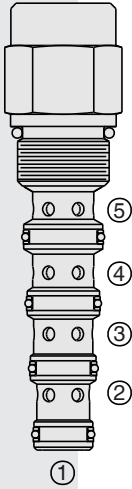
HPD42-M45 - - -180⁺



*BSP body; U.K. mfr. Only

NOTE: All bodies are PD type.

PD10-50 Piloted 3-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve which is open in transition, for three-way circuits requiring remote pilot operation.

OPERATION

In neutral (unpiloted), the **PD10-50** allows flow from 3 to 2 bidirectionally, while flow is blocked from 3 to 4. The spring chamber is vented to tank at port 5, and is internally O-ring sealed from the cartridge flow paths.

On remote pilot signal at 1, the valve shifts to block flow from 3 to 2, while opening flow between 3 and 4 bidirectionally. Any pressure at port 5 is added to the spring value.

FEATURES

- Hardened spool and cage for long life.
- Cost-effective cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max. at 207 bar (3000 psi)

Pilot Pressure Required using 10.3 bar (150 psi) Spring:

To Spool Crossover: 10.3 bar (150 psi)

To Full Spool Shift: 12.2 bar (177 psi)

Oil Volume Required to Full Shift: 0.44 cc (0.027 cu. in.)

Temperature: -40 to 100°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC10-5; See page 9.110.1

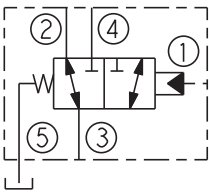
Cavity Tool: CT10-5XX; See page 8.600.1

Seal Kit: SK10-5X-MMMM; See page 8.650.1

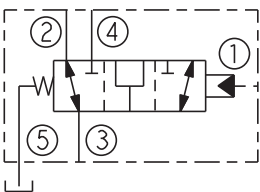
Cap Vent Seal: Part No. 6003117

SYMBOLS

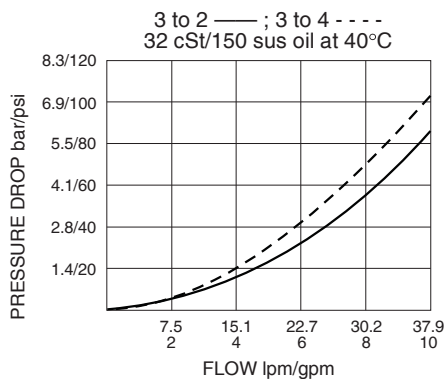
ISO:



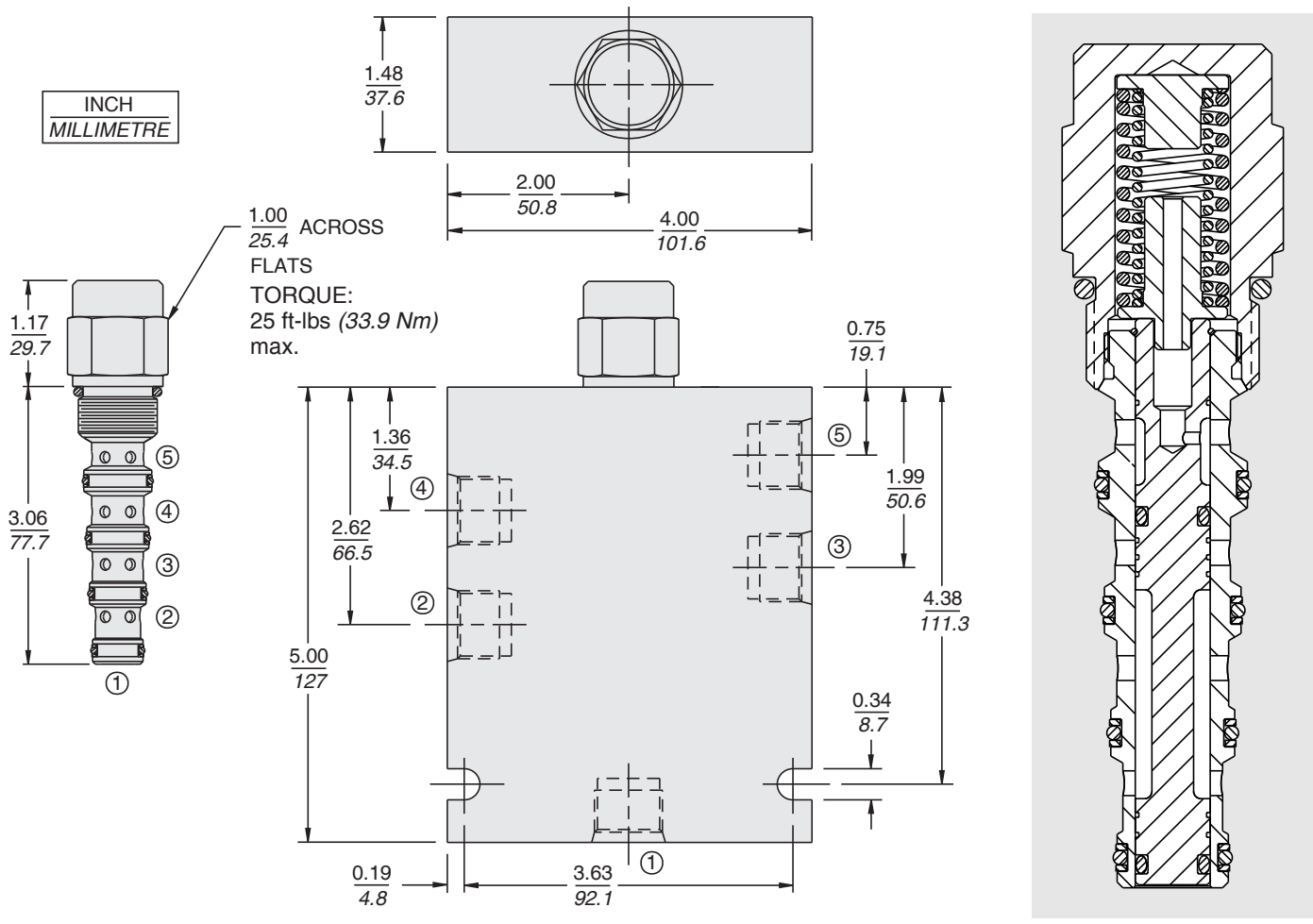
Open Transition:



PERFORMANCE (Cartridge Only)



DIMENSIONS

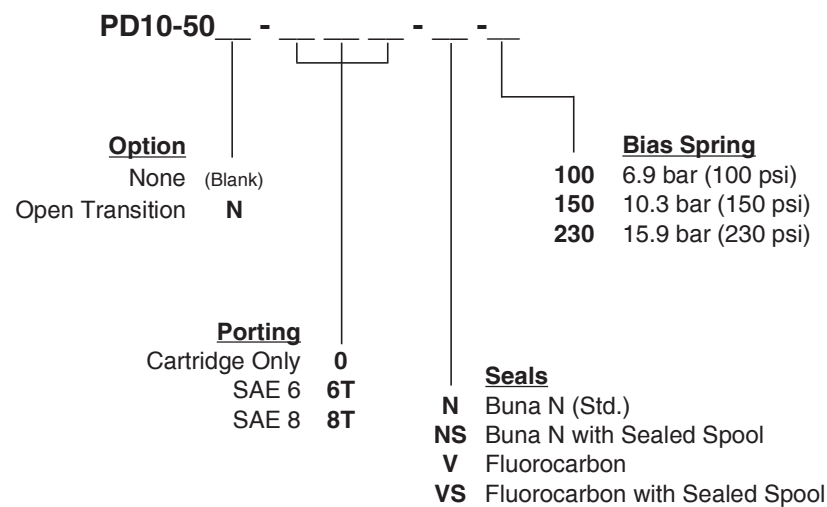


MATERIALS

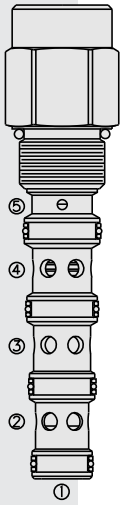
Cartridge: Weight: 0.20 kg. (0.44 lbs.)
Steel with hardened work surfaces;
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
0.41 kg. (0.85 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.010.1

TO ORDER



PD12-S50 Piloted 3-Way Spool with Vented Spring



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for three-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD12-S50** allows flow from 3 to 2 bidirectionally, while flow is blocked at 4.

On remote pilot signal at 1, the valve shifts to open 3 to 4 while blocking 2.

The spring chamber is vented to the tank through port 5, which is optionally O-ring sealed from the cartridge flow paths. The vented spring chamber allows the valve to be fully pressurized at ports 1, 2 and 3 without affecting required pilot pressure. Pressure at \square will affect required pilot pressure.

FEATURES

- Hardened spool and cage for long life.
- Optional sealed pilot and spring chamber.

RATINGS

Maximum Operating Pressure: 241 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) on all flow ports at maximum operating pressure. The sealed pilot version exhibits no leakage at ports 1 and 5 at maximum pressure.

Oil Volume Required to Full Shift: 1.07 cc (0.065 cu. in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

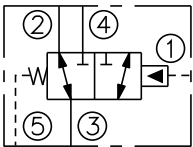
Cavity: VC12-S5; See page 9.112.1

Cavity Tool: CT12-S5; See page 8.600.1

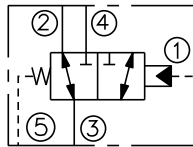
Seal Kit: SK12-S5X-MMMM; See page 8.650.1

SYMBOLS

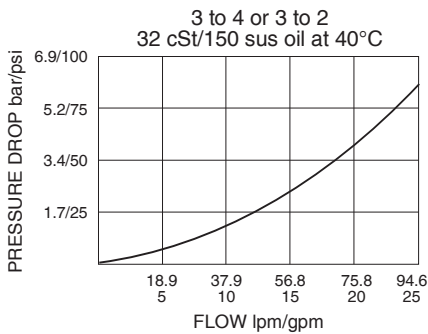
USASI:



ISO:



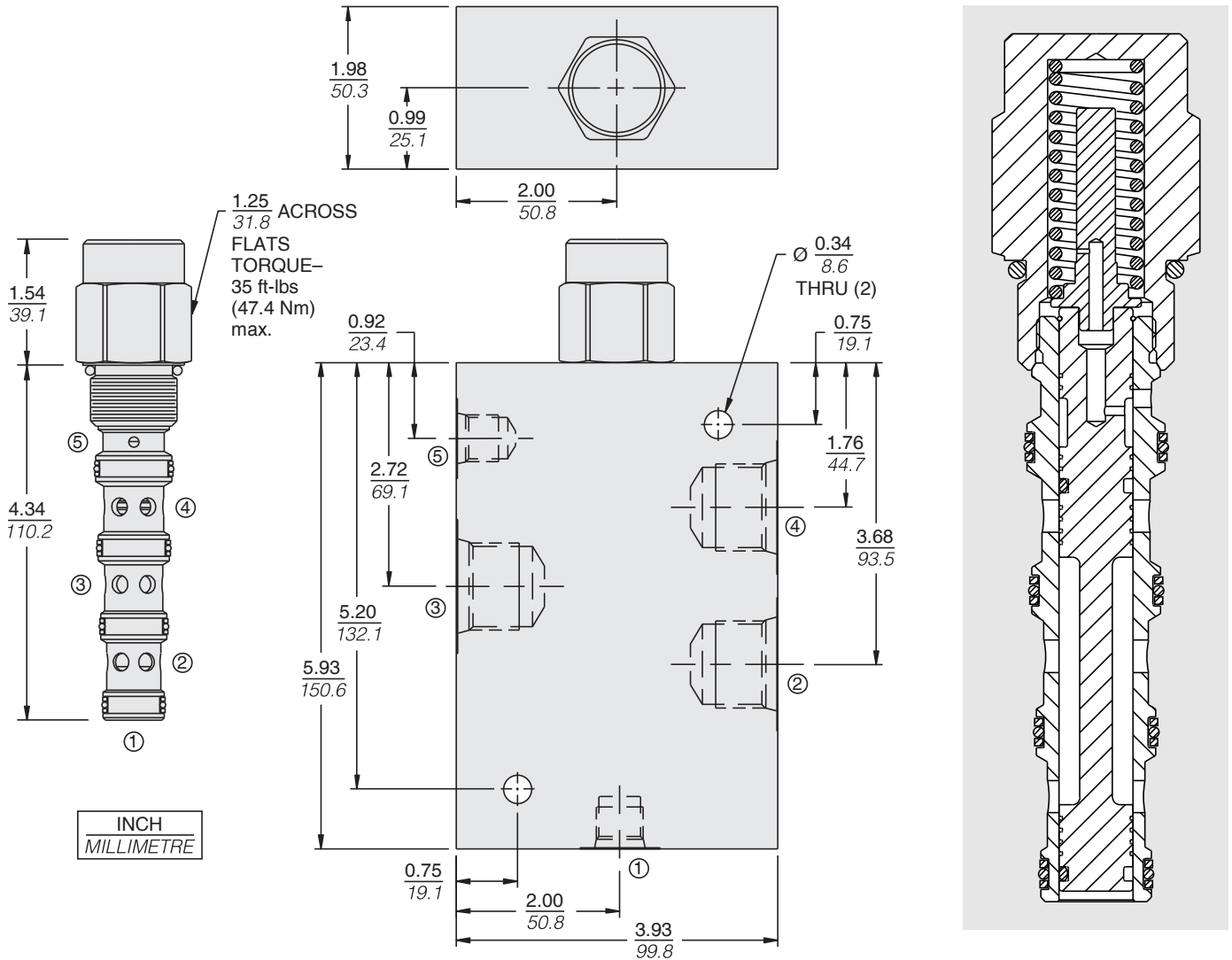
PERFORMANCE (Cartridge Only)



Chamber

PD12-S50

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.375 kg. (0.83 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 1.5 kg. (3.3 lbs.)
 Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1

TO ORDER

PD12-S50- - -110*

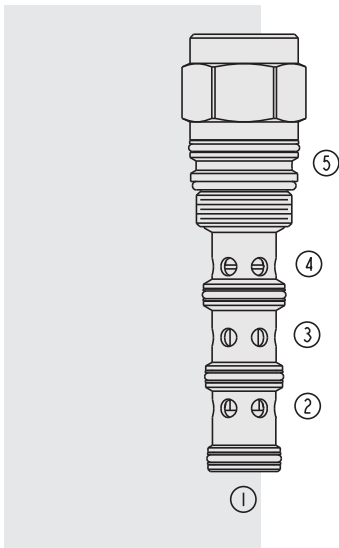
Porting
 Cartridge Only 0
 SAE 10, SAE 6 Pilot 10T
 SAE 12, SAE 6 Pilot 12T

Note: All bodies are PD type.

*110 psi bias spring standard.
 Optional bias springs considered on OEM request.

Seals
 N Buna N (Std.)
 NS Buna N with Sealed Pilot
 V Fluorocarbon
 VS Fluorocarbon with Sealed Pilot

PD16-S50 Piloted 3-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve.

OPERATION

When in neutral the PD16-S50 allows flow between ports 3 and 2 while blocking at 4. On remote pilot signal at 1, the valve's spool shifts to allow flow between 3 and 4, while blocking at 5. The spring chamber is vented to the tank through port 5. The vented spring chamber allows the valve to be fully pressurized at ports 1, 2, 3, and 4 without affecting required pilot pressure. Pressure at port 5 will affect required pilot pressure.

FEATURES

- Hardened spool and cage for long life.
- 50, 70, 100 and 150 psi bias springs available.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 0–170 lpm (0–45 gpm); See Performance Chart

Internal Leakage at 207 bar (3000 psi): 245 ml/minute (15 cu. in./minute);
Zero leakage from port 1 to port 2 with sealed spool.

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

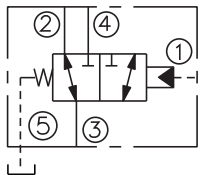
Installation: No restrictions; See page 9.020.1 A 6-way body can be used for this valve by plugging body port 2 and using body ports 3, 4, 5 and 6 as ports 2, 3, 4 and 5 for the valve.

Cavity: VC16-S5; See page 9.116.1

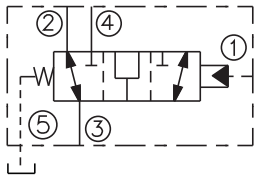
Cavity Tool: CT16-S5XX; See page 8.600.1

Seal Kit: SK16-S5X-BMMM; See page 8.650.1

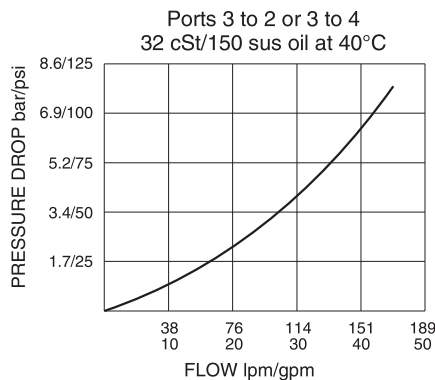
SYMBOLS



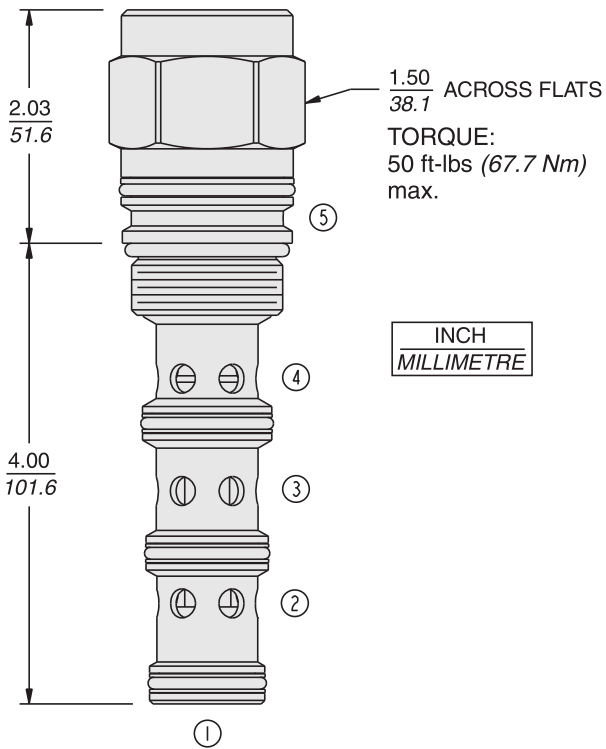
Open Transition Option:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.68 kg. (1.50 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Ported Body: Consult factory. A 6-way body can be used for this valve by plugging body port 2 and using body ports 3, 4, 5 and 6 as ports 2, 3, 4 and 5 for the valve.

TO ORDER

PD16-S50 - - -

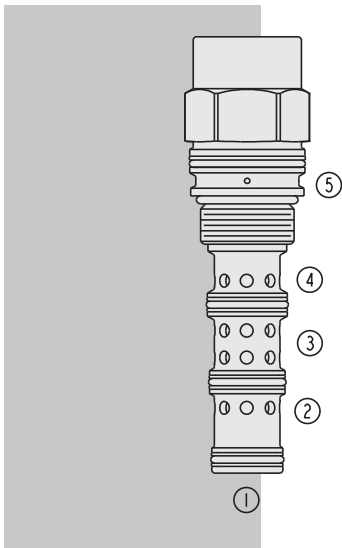
Option
None (Blank) **N**
Open Transition

Porting
Cartridge Only **0**

Bias Spring[†]
50 3.4 bar (50 psi)
70 4.8 bar (70 psi)
100 6.9 bar (100 psi)
150 10.3 bar (150 psi)
[†]Note: 100 psi bias spring is the minimum required for use with sealed spool.

Seals
N Buna N (Std.)
V Fluorocarbon
P Polyurethane
NS Buna N w/Sealed Spool
VS Fluorocarbon w/Sealed Spool
PS Polyurethane w/Sealed Spool

HPD16-S50 HyPerformance™ Piloted 3-Way Spool



DESCRIPTION

A high pressure, screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve.

OPERATION

When in neutral, the **HPD16-S50** allows flow between ports 3 and 2 bidirectionally while port 4 is blocked. On remote pilot signal at 1, the valve's spool shifts to block port 2 while opening flow between ports 3 and 4 bidirectionally. The spring chamber is vented to the tank through port 5. The vented spring chamber allows the valve to be fully pressurized at ports 1, 2, 3, and 4 without affecting required pilot pressure at port 5. Pressure at port 5 will increase the required pilot pressure at a 1:1 ratio.

FEATURES

- Hardened spool and cage for long life.
- All HyPerformance™ products are tested to the rigorous standards of the NFPA specification T2.6.1.
- All HyPerformance™ valves are tested at a verification level of 90% and an assurance of 99%.

RATINGS

Operating Pressure: 350 bar (5075 psi); 10% cycle life: 420 bar (6090 psi)

Note: All HyPerformance™ products are tested for 900K cycles at 350 bar and 100K at 420 bar.

Proof Pressure: 690 bar (10000 psi)

Burst Pressure: 1380 bar (20000 psi)

Flow Rating: Up to 151 lpm (40 gpm) with PPDI urethane seals. Up to 114 lpm (30 gpm) with sealed spool between ports 1 and 2 and restricted flow between ports 2 and 3 up to 57 lpm (15 gpm) maximum.

Maximum Internal Leakage: 350 bar (5075 psi) at 32 cSt.

HPD16-S50:

Ports 3-4: 246 ml/min. (15 cu.in./min.)

Ports 3-2: 410 ml/min. (25 cu.in./min.) Pilot Pressure 350 bar (5075 psi)

HPD16-S50N:

Ports 3-4: 328 ml/min. (20 cu.in./min.)

Ports 3-2: 492 ml/min. (30 cu.in./min.) Pilot Pressure 350 bar (5075 psi)

Operating Temperature: -54° to 107°C (-65° to 225°F) with PPDI urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

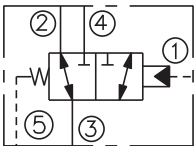
Cavity: HVC16-S5; See page 9.116.1

Cavity Tool: HCT16-S5XX; See page 8.600.1.

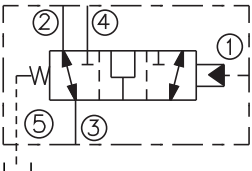
Seal Kit: HSK16-S5U-0000 (Urethane); See page 8.650.1.

SYMBOLS

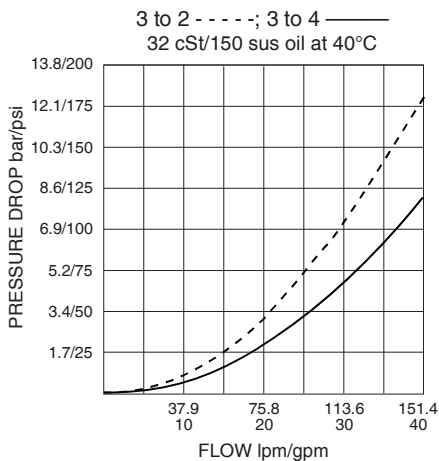
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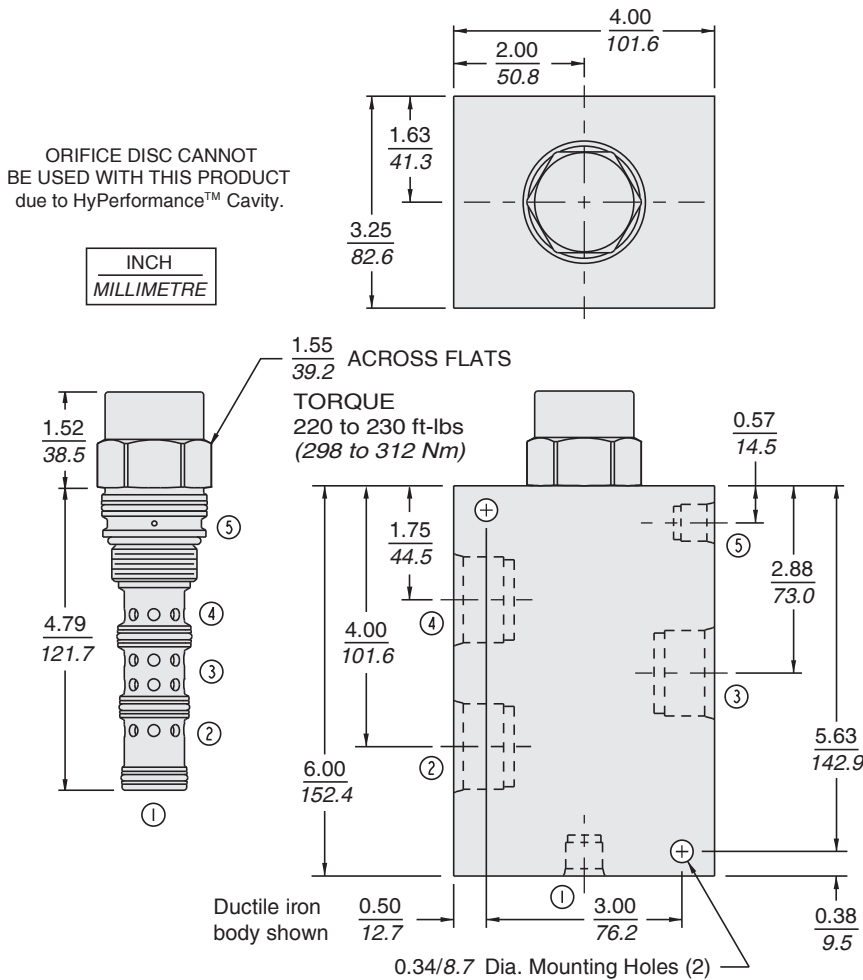
OPEN TRANSITION OPTION:



PERFORMANCE (Cartridge Only)



DIMENSIONS

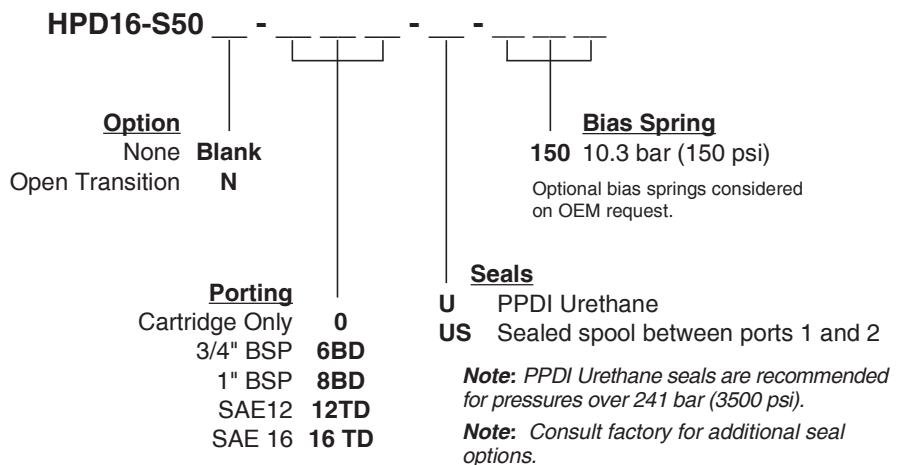


MATERIALS

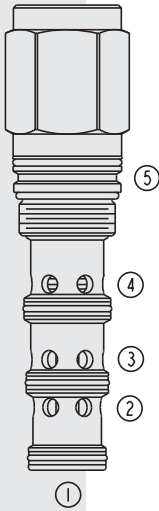
Cartridge: Weight: 0.8 kg. (1.75 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
PPDI Urethane seals and no back-up rings standard.

Ported Body: Weight: 8.09 kg (17.79 lbs) HyPerformance™
Ductile iron (code 'D') standard.
Rated to 345 bar (5000 psi).
See page 8.016.1.

TO ORDER



PD42-S50 Piloted 3-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for three-way circuits requiring remote pilot actuation.

OPERATION

In neutral (unpiloted), the **PD42-S50** allows flow from 3 to 2 bidirectionally, while flow is blocked at 4.

On remote pilot signal at 1, the valve shifts to open 3 to 4 while blocking 2.

The spring chamber is vented to the tank through port 5, which is common to the spring chamber. Pressure on port 5 will directly (1:1) affect the pilot pressure required and must be added to the bias spring value.

FEATURES

- Hardened spool and cage for long life.
- Optional open transition (ports 2, 3 and 4).

RATINGS

Maximum Operating Pressure: 345 bar (5000 psi)

Flow: See Performance Chart

Internal Leakage: 245 ml/minute (15 cu. in./minute) at 345 bar (5000 psi).

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

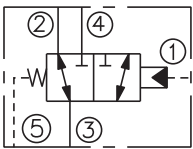
Installation: No restrictions; See page 9.020.1

Cavity: VC42-S5; See page 9.142.1

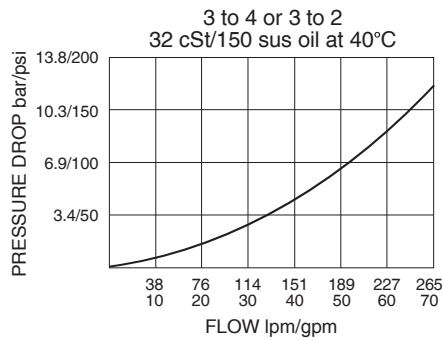
Cavity Tool: CT42-S5; See page 8.600.1

Seal Kit: SK42-S5X-BMMM; See page 8.650.1

SYMBOL



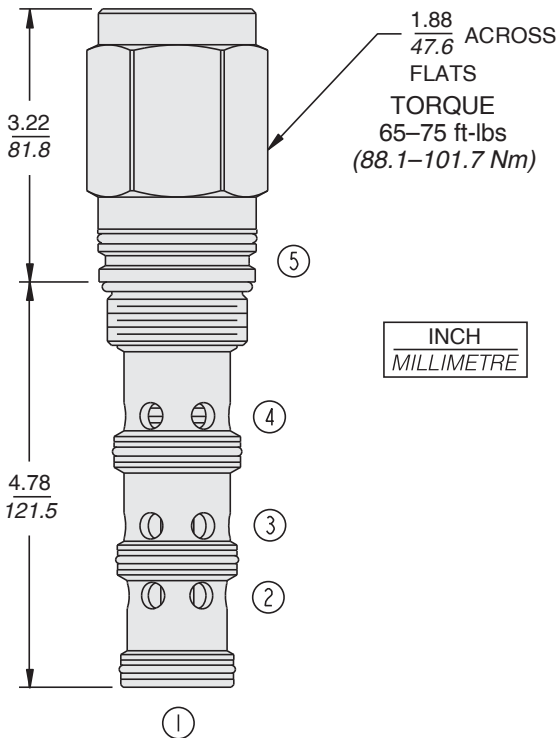
PERFORMANCE (Cartridge Only)



with Vented Spring Chamber

PD42-S50

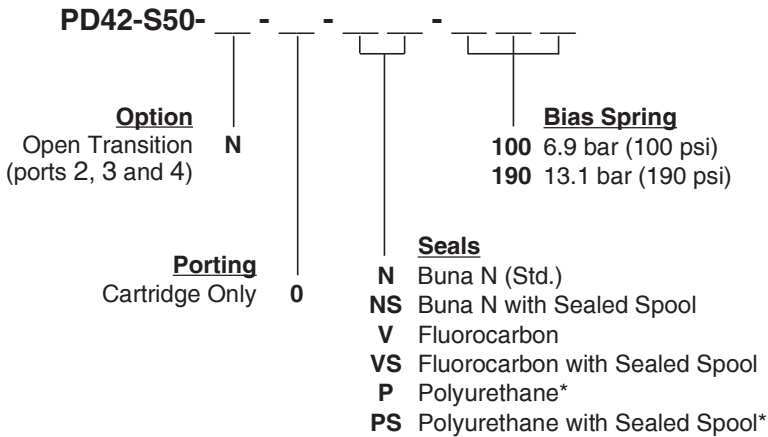
DIMENSIONS



MATERIALS

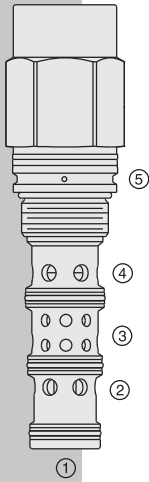
Cartridge: Weight: 1.60 kg. (3.5 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

TO ORDER



* Required for pressure over 241 bar (3500 psi)

HPD42-S50 HyPerformance™ Piloted 3-Way Spool



DESCRIPTION

A high pressure, screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve.

OPERATION

When in neutral, the **HPD42-S50** allows flow between ports 3 and 2 bidirectionally while port 4 is blocked. On remote pilot signal at 1, the valve's spool shifts to block port 2 while opening flow between ports 3 and 4 bidirectionally. The spring chamber is vented to the tank through port 5. The vented spring chamber allows the valve to be fully pressurized at ports 1, 2, 3, and 4 without affecting required pilot pressure at port 5. Pressure at port 5 will increase the required pilot pressure at a 1:1 ratio.

FEATURES

- Hardened spool and cage for long life.
- All HyPerformance™ products are tested to the rigorous standards of the NFPA specification T2.6.1.
- All HyPerformance™ valves are tested at a verification level of 90% and an assurance of 99%.

RATINGS

Operating Pressure: 350 bar (5075 psi); 10% cycle life: 420 bar (6090 psi)

Note: All HyPerformance products are tested for 900K cycles at 350 bar and 100K at 420 bar.

Fatigue Rating: Two million cycles at 420 bar (6090 psi)

Proof Pressure: 690 bar (10000 psi)

Burst Pressure: 1380 bar (20000 psi)

Flow Rating: 265 lpm (70 gpm) with seal options N, V and U.
246 lpm (65 gpm) with seal options NS, VS and US.

Maximum Internal Leakage: 350 bar (5075 psi) at 32 cSt.

HPD42-S50:

Ports 3-4: 328 ml/min. (20 cu.in./min.)

Ports 3-2: 492 ml/min. (30 cu.in./min.) Pilot Pressure 350 bar (5075 psi)

HPD42-S50N:

Ports 3-4: 410 ml/min. (25 cu.in./min.)

Ports 3-2: 655 ml/min. (40 cu.in./min.) Pilot Pressure 350 bar (5075 psi)

Operating Temperature: -54° to 107°C (-65° to 225°F) with PPDI urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

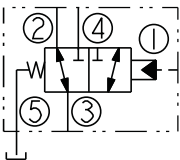
Cavity: HVC42-S5; See page 9.142.1

Cavity Tool: HCT42-S5XX; See page 8.600.1.

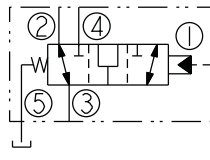
Seal Kit: HSK42-S5U-0000 (Urethane); See page 8.650.1.

SYMBOLS

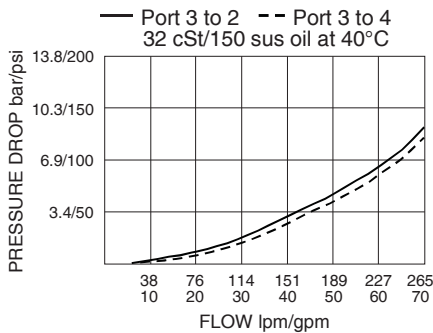
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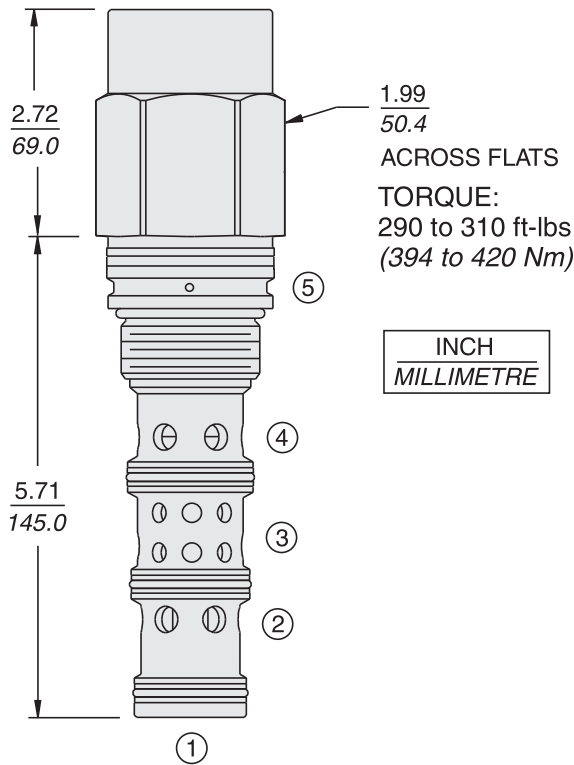
TRANSITION:



PERFORMANCE (Cartridge Only)



DIMENSIONS

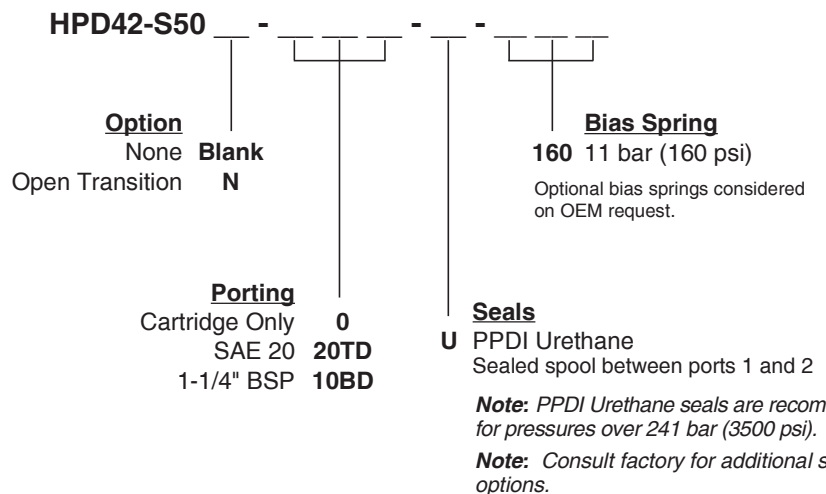


ORIFICE DISC SHOULD NOT BE USED WITH THIS PRODUCT.

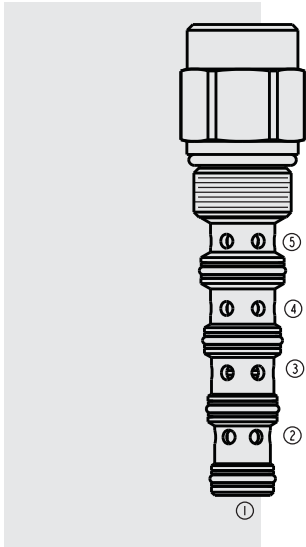
MATERIALS

Cartridge: Weight: 1.9 kg. (4.2 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
PPDI Urethane seals and no back-up rings standard.

TO ORDER



PD10-51 Piloted 3-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve.

OPERATION

When in neutral the PD10-51 allows flow between ports 2, 3 and 4. On remote pilot signal at 1, the valve's spool shifts to block all ports. The spring chamber is vented to the tank through port 5. The vented spring chamber allows the valve to be fully pressurized at ports 1, 2, 3, and 4 without affecting required pilot pressure. Pressure at port 5 will affect required pilot pressure.

FEATURES

- Hardened spool and cage for long life.
- 150 and 250 psi bias springs available.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 0–45 lpm (0–12 gpm); See Performance Chart

Internal Leakage at 241 bar (3500 psi): 164 ml/minute (10 cu. in./minute). Zero leakage from port 1 to 2 with sealed spool.

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

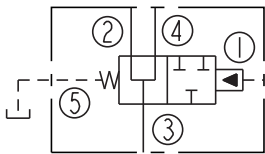
Installation: No restrictions; See page 9.020.1

Cavity: VC10-5; See page 9.110.1

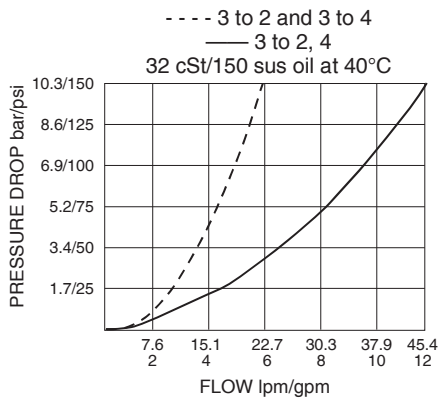
Cavity Tool: CT10-5XX; See page 8.600.1

Seal Kit: SK10-5X-BMMM; See page 8.650.1

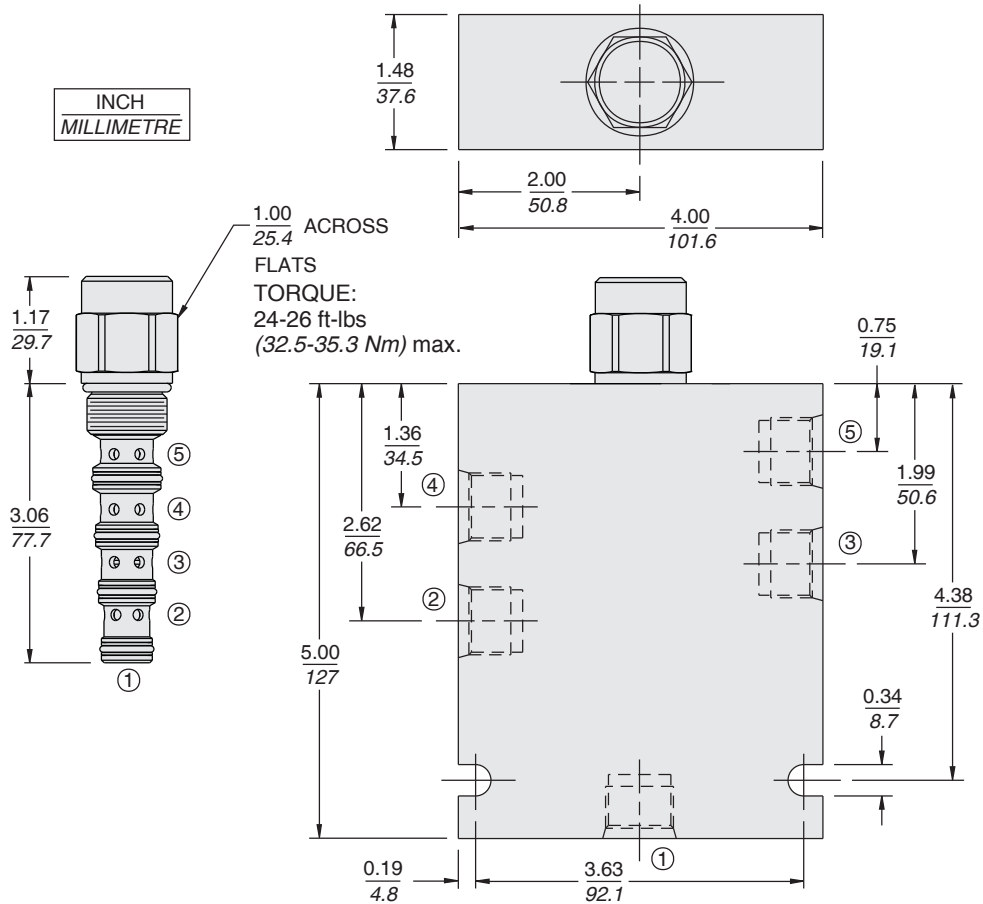
ISO SYMBOL



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.23 kg. (0.5 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Ported Body: Weight: .41 kg. (0.85 lbs.); Anodized high strength 6061T6 aluminum alloy, rated to 207 bar (3000 psi). See page 8.010.1

TO ORDER

PD10-51 - - -

Porting
Cartridge Only 0
SAE 6 6T
SAE 8 8T

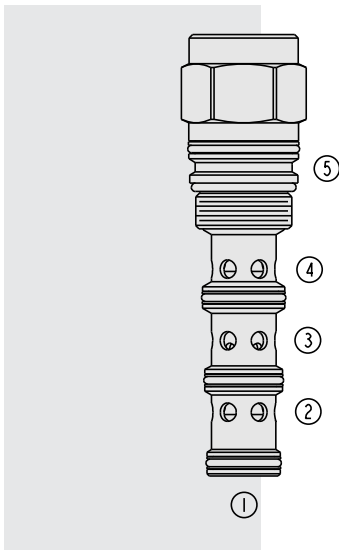
Bias Spring†
150 10.3 bar (150 psi)
230 15.9 bar (230 psi)

†Note: 15.9 bar (230 psi) bias spring is required for use with sealed spool.

Seals

- N Buna N (Standard)
- V Fluorocarbon (Viton)
- P Polyurethane
- NS Buna N w/Sealed Spool 1 to 2 only
- VS Fluorocarbon (Viton) w/Sealed Spool 1 to 2 only
- PS Polyurethane w/Sealed Spool 1 to 2 only

PD16-S51 Piloted 3-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve.

OPERATION

When in neutral the PD16-S51 allows flow between ports 2, 3 and 4. On remote pilot signal at 1, the valve's spool shifts to block all ports. The spring chamber is vented to the tank through port 5. The vented spring chamber allows the valve to be fully pressurized at ports 1, 2, 3, and 4 without affecting required pilot pressure. Pressure at port 5 will affect required pilot pressure.

FEATURES

- Hardened spool and cage for long life.
- 70, 90 and 140 psi bias springs available.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 0–151 lpm (0–40 gpm); See Performance Chart

Internal Leakage at 207 bar (3000 psi): 410 ml/minute (25 cu. in./minute) between ports 3 and 2. 820 ml/minute (50 cu. in./minute) between ports 3 and 4.

Pilot Pressure Required: 4.1 bar (60 psi) minimum

Oil Volume Required to Full Shift: 1.83 cc (0.11 cu. in.)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1 A 6-way body can be used for this valve by plugging body port 2 and using body ports 3, 4, 5 and 6 as ports 2, 3, 4 and 5 for the valve.

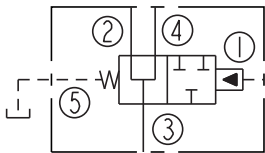
Cavity: VC16-S5; See page 9.116.1

Cavity Tool: CT16-S5XX; See page 8.600.1

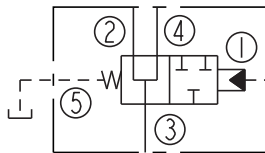
Seal Kit: SK16-S5X-BMMM; See page 8.650.1

SYMBOLS

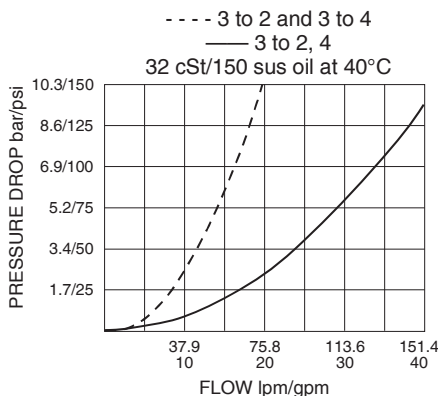
USASI:



ISO:

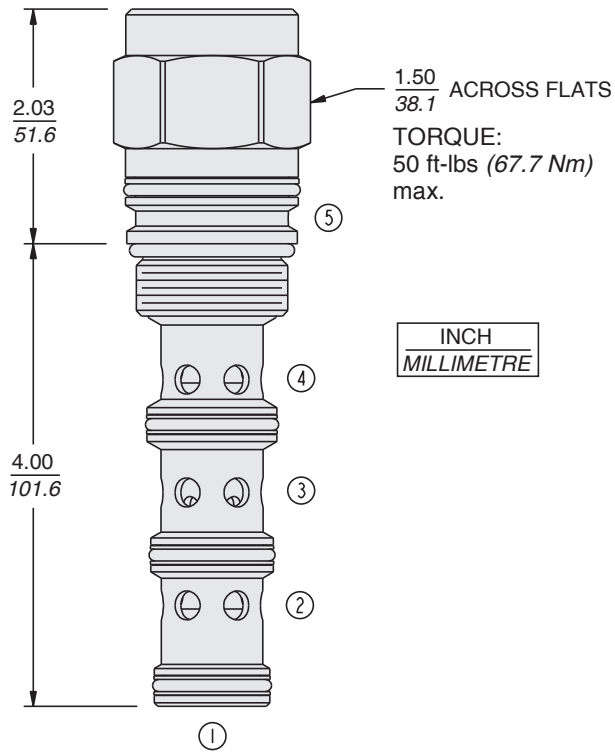


PERFORMANCE (Cartridge Only)



PD16-S51

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.25 kg. (0.55 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Ported Body: Consult factory. A 6-way body can be used for this valve by plugging body port 2 and using body ports 3, 4, 5 and 6 as ports 2, 3, 4 and 5 for the valve.

TO ORDER

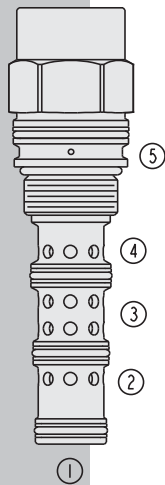
PD16-S51 - - -

Porting
Cartridge Only 0

Bias Spring[†]
70 4.8 bar (70 psi)
90 6.2 bar (90 psi)
140 9.7 bar (140 psi)
Optional bias springs considered on OEM request.
[†]Note: 90 psi bias spring is the minimum required for use with sealed spool.

Seals
N Buna N (Std.)
V Fluorocarbon
NS Buna N w/Sealed Spool 1 to 2 only
VS Fluorocarbon w/Sealed Spool 1 to 2 only

HPD16-S51 HyPerformance™ Piloted 3-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for use in high pressure applications.

OPERATION

When in neutral the **HPD16-S51** allows flow between ports 2, 3 and 4. On remote pilot signal at 1, the valve's spool shifts to block all ports. The spring chamber is vented to the tank through port 5. The vented spring chamber allows the valve to be fully pressurized at ports 1, 2, 3, and 4 without affecting required pilot pressure. Pressure at port 5 will increase the required pilot pressure at a 1:1 ratio.

FEATURES

- Hardened spool and cage for long life.
- All HyPerformance™ products are tested to the rigorous standards of the NFPA specification T2.6.1.
- All HyPerformance™ valves are tested at a verification level of 90% and an assurance of 99%.

RATINGS

Operating Pressure: 350 bar (5075 psi); 10% cycle life: 420 bar (6090 psi)

Note: All HyPerformance™ products are tested for 900K cycles at 350 bar and 100K at 420 bar.

Proof Pressure: 690 bar (10000 psi)

Burst Pressure: 1380 bar (20000 psi)

Flow: Up to 151 lpm (40 gpm) with PPDI urethane seals and no flow restriction; up to 151 lpm (40 gpm) with seals spool between ports 1 and 2 and restricted flow between ports 2 and 3 and 3 and 4 up to 95 lpm (25 gpm) maximum.

Internal Leakage: 350 bar (5075 psi) at 32 cSt. Ports 3 to 4: 492 ml/min (30 cu.in./min); Ports 3 to 2: 655 ml/min (40 cu.in./min); Pilot Pressure: 350 bar (5075 psi).

Operating Temperature: -54 to 107°C (-65 to 225°F) with PPDI urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

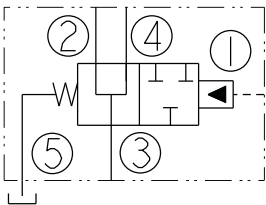
Installation: No restrictions; See page 9.020.1

Cavity: HVC16-S5; See page 9.116.1

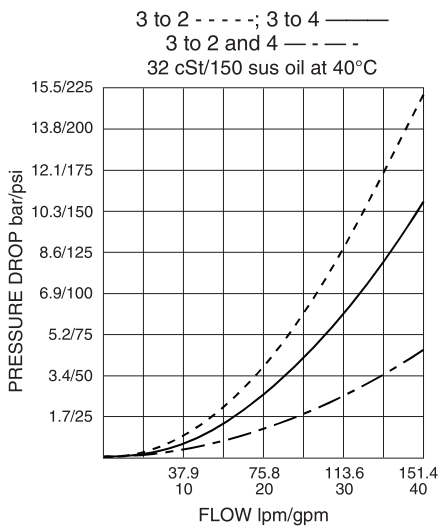
Cavity Tool: HCT16-5XX; See page 8.600.1.

Seal Kit: HSK16-S5U-0000 (Urethane); See page 8.650.1

ISO SYMBOL



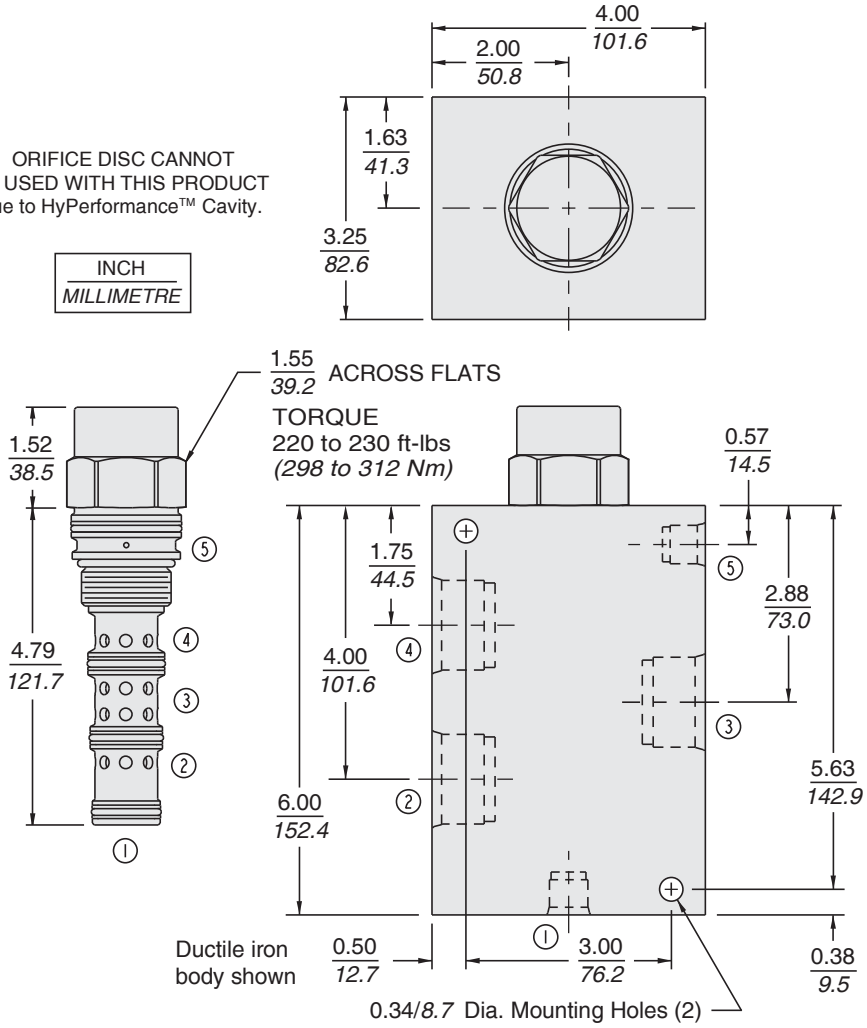
PERFORMANCE (Cartridge Only)



DIMENSIONS

ORIFICE DISC CANNOT BE USED WITH THIS PRODUCT due to HyPerformance™ Cavity.

INCH
MILLIMETRE



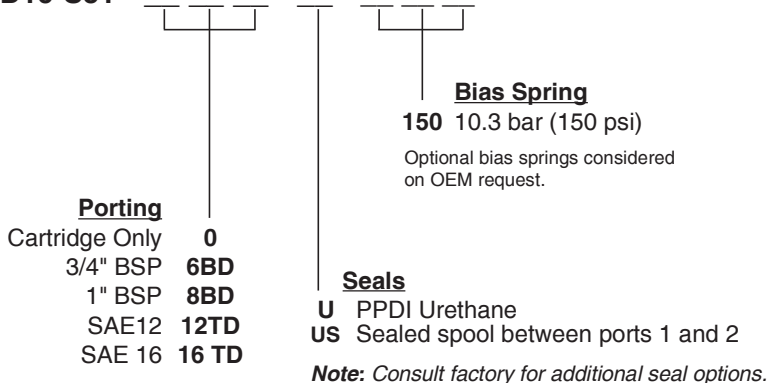
MATERIALS

Cartridge: Weight: 0.80 kg. (1.75 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
PPDI Urethane seals without back-up rings standard.

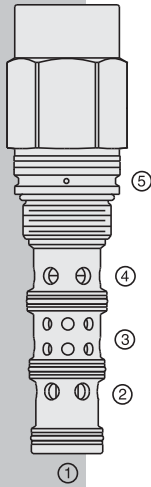
Ported Body: Weight: 8.09 kg (17.79 lbs) HyPerformance™
Ductile iron (code 'D') standard.
Rated to 345 bar (5000 psi).
See page 8.016.1.

TO ORDER

HPD16-S51 -



HPD42-S51 HyPerformance™ Piloted 3-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for use in high pressure applications.

OPERATION

When in neutral the **HPD42-S51** allows flow between ports 2, 3 and 4. On remote pilot signal at 1, the valve's spool shifts to block all ports. The spring chamber is vented to the tank through port 5. The vented spring chamber allows the valve to be fully pressurized at ports 1, 2, 3, and 4 without affecting required pilot pressure. Pressure at port 5 will increase the required pilot pressure at a 1:1 ratio.

FEATURES

- Hardened spool and cage for long life.
- All HyPerformance™ products are tested to the rigorous standards of the NFPA specification T2.6.1.
- All HyPerformance™ valves are tested at a verification level of 90% and an assurance of 99%.

RATINGS

Operating Pressure: 350 bar (5075 psi); 10% cycle life: 420 bar (6090 psi)

Note: All HyPerformance products are tested for 900K cycles at 350 bar and 100K at 420 bar.

Proof Pressure: 690 bar (10000 psi)

Burst Pressure: 1380 bar (20000 psi)

Flow: With PPDl urethane seals up to 265 lpm (70 gpm) with no flow restrictions.

With seal option US (PPDI urethane with sealed spool between ports 1 and 2) up to 246 lpm (65 gpm) with flow restrictions from ports 2-3 and 3-4 up to 114 lpm (30 gpm).

Internal Leakage: Ports 3-4: 328 ml/minute (20 cu. in./minute) at 350 bar (5075 psi)

Ports 3-2: 492 ml/minute (30 cu. in./minute) at 350 bar (5075 psi)

Cycle Life: One million cycles.

Operating Temperature: -54 to 107°C (-65 to 225°F) with PPDl urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

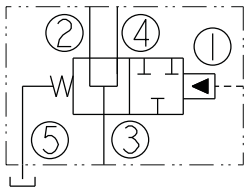
Installation: No restrictions; See page 9.020.1

Cavity: HVC42-S5; See page 9.142.1.

Cavity Tool: HCT42-5XX; See page 8.600.1.

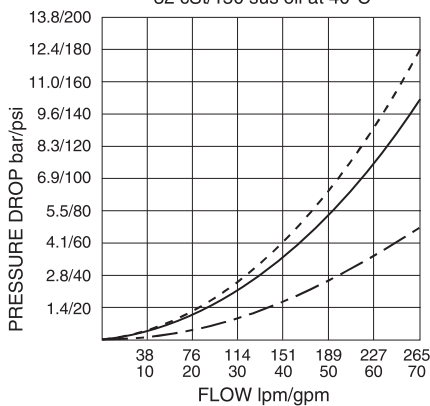
Seal Kit: HSK42-S5U-0000 (Urethane); See page 8.650.1

ISO SYMBOL

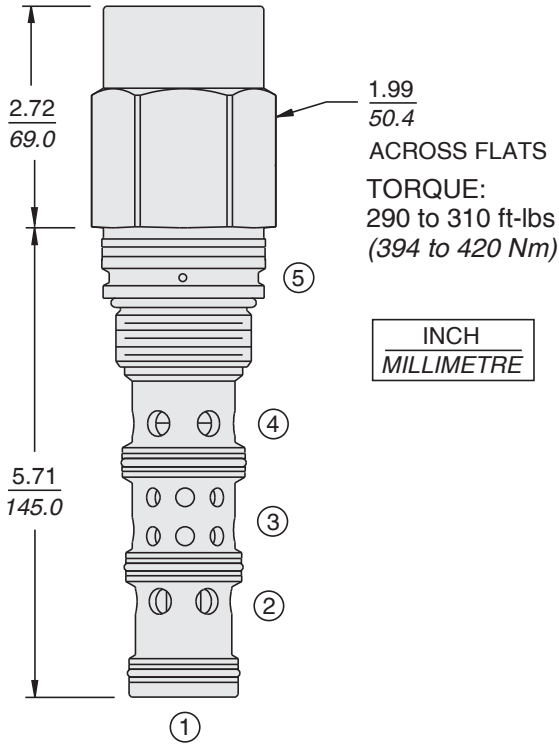


PERFORMANCE (Cartridge Only)

Pressure Drop vs. Flow
Neutral; Cartridge Only
3 to 2 - - - -; 3 to 4 - - - -
3 to 2 and 4 - - - -
32 cSt/150 sus oil at 40°C



DIMENSIONS



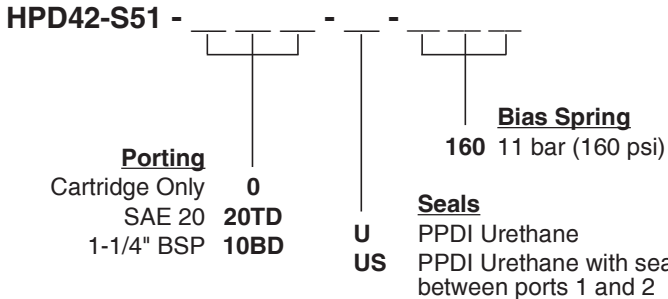
ORIFICE DISC CANNOT BE USED WITH THIS PRODUCT due to HyPerformance™ Cavity.

MATERIALS

Cartridge: Weight: 1.9 kg. (4.2 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
PPDI Urethane seals and no back-up rings standard.

Ported Body: Weight: 14.0 kg (30.90 lbs)
HyPerformance™ ductile iron (code 'D') standard. Rated to 345 bar (5000 psi).
See page 8.042.1.

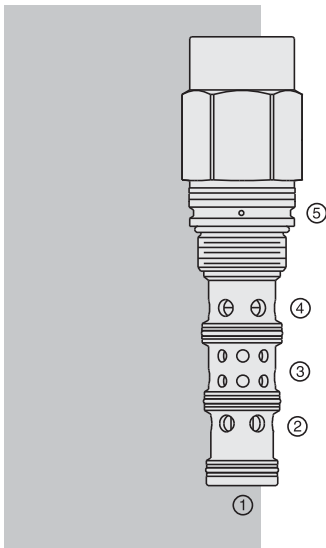
TO ORDER



Note: PPDI Urethane seals are recommended for pressures over 241 bar (3500 psi).

Note: Consult factory for additional seal options.

HPD42-S52 HyPerformance™ Piloted 3-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve for use in high pressure applications.

OPERATION

When in neutral the **HPD42-S52** blocks flow between all ports. On remote pilot signal at 1, the valve's spool shifts to allow flow between ports 2, 3 and 4. The spring chamber is vented to the tank through port 5. The vented spring chamber allows the valve to be fully pressurized at ports 1, 2, 3, and 4 without affecting required pilot pressure. Pressure at port 5 will increase the required pilot pressure at a 1:1 ratio.

FEATURES

- Hardened spool and cage for long life.
- All HyPerformance™ products are tested to the rigorous standards of the NFPA specification T2.6.1.
- All HyPerformance™ valves are tested at a verification level of 90% and an assurance of 99%.

RATINGS

Operating Pressure: 350 bar (5075 psi); 10% cycle life: 420 bar (6090 psi)

Note: All HyPerformance™ products are tested for 900K cycles at 350 bar and 100K at 420 bar.

Proof Pressure: 690 bar (10000 psi)

Burst Pressure: 1380 bar (20000 psi)

Flow Rating: Maximum total input flow 265 lpm (70 gpm)

Internal Leakage: 328 ml/minute (20 cu. in./minute) at 350 bar (5075 psi)

Operating Temperature: -54 to 107°C (-65 to 225°F) with PPDI urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

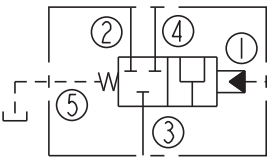
Installation: No restrictions; See page 9.020.1

Cavity: HVC42-S5. See page 9.142.1

Cavity Tool: HCT42-5XX. See page 8.600.1

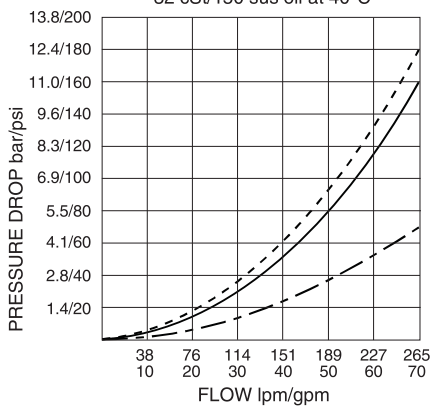
Seal Kit: HSK42-S5U-0000 (Urethane). See page 8.650.1

ISO SYMBOL

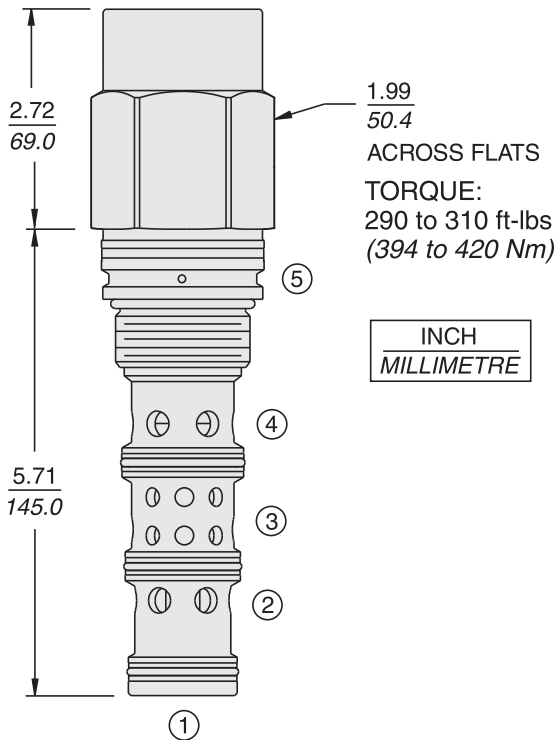


PERFORMANCE (Cartridge Only)

Pressure Drop vs. Flow
Neutral; Cartridge Only
3 to 2 - - - - ; 3 to 4 ———
3 to 2 and 4 - - - -
32 cSt/150 sus oil at 40°C



DIMENSIONS



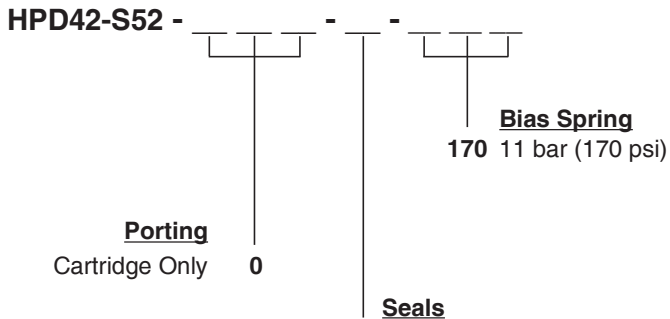
ORIFICE DISC SHOULD NOT BE USED WITH THIS PRODUCT.

MATERIALS

Cartridge: Weight: 1.9 kg. (4.2 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
PPDI Urethane seals and no back-up rings standard.

Ported Body: Weight: 14.0 kg (30.90 lbs) HyPerformance™ ductile iron (code 'D') standard. Rated to 345 bar (5000 psi). See page 8.042.1.

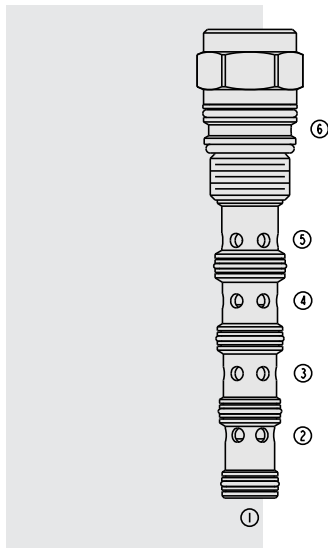
TO ORDER



Note: Urethane seals recommended for operating pressures above 241 bar (3500 psi).

Note: Consult factory for additional seal options.

PD12-S60N Piloted, 2-Position, 4-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, 2-position, 4-way, spool-type, hydraulic directional valve.

OPERATION

In the neutral position, the PD12-S60N allows flow between ports 2 and 3 and between ports 4 and 5. On remote pilot signal at 1, the valve shifts to allow flow between ports 3 and 4, and between ports 2 and 5.

The spring chamber is vented to the tank through port 6. The vented spring chamber allows the valve to be fully pressurized at ports 1, 2, 3, 4, and 5 without affecting required pilot pressure. Pressure at 6 will affect required pilot pressure.

FEATURES

- Hardened spool and cage for long life.
- Up to 344 bar (5000 psi) operation.
- 110 and 170 psi bias springs available.

RATINGS

Maximum Operating Pressure: With Polyurethane Seals: 344 bar (5000 psi)

Flow: 0 to 56 lpm (0 to 15 gpm); See Performance Chart

Internal Leakage: Maximum leakage at 240 bar (3500 psi):
197 ml/minute (12 cu. in./minute).

Temperature: -40 to 120°C (-40 to 248°F)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

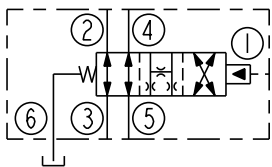
Installation: No restrictions; See page 9.020.1

Cavity: VC12-S6; See page 9.112.1

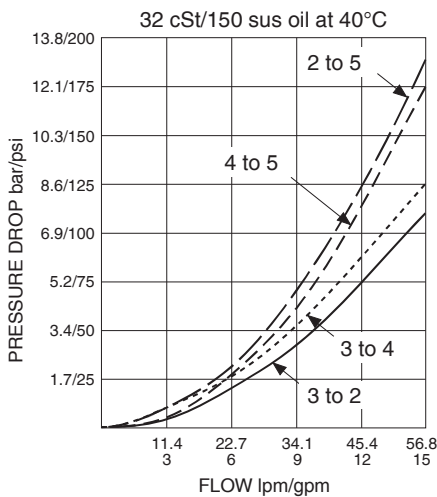
Cavity Tool: CT12-S6XX; See page 8.600.1

Seal Kit: SK12-S6X-BMMMM; See page 8.650.1

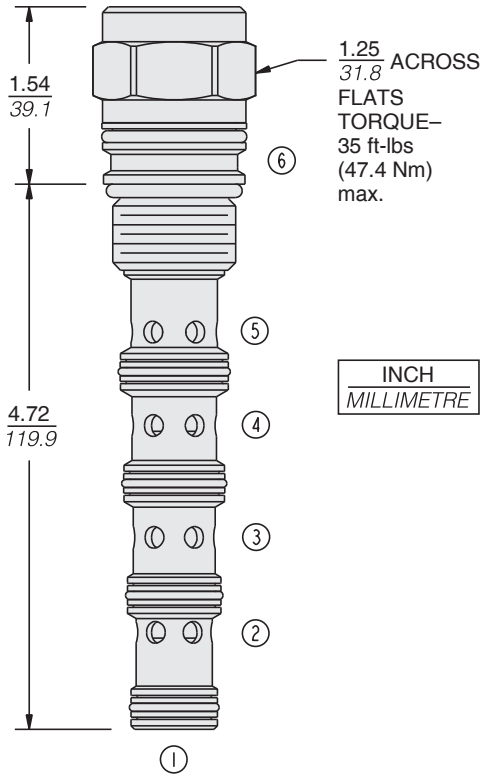
ISO SYMBOLS



PERFORMANCE (Cartridge Only)



DIMENSIONS

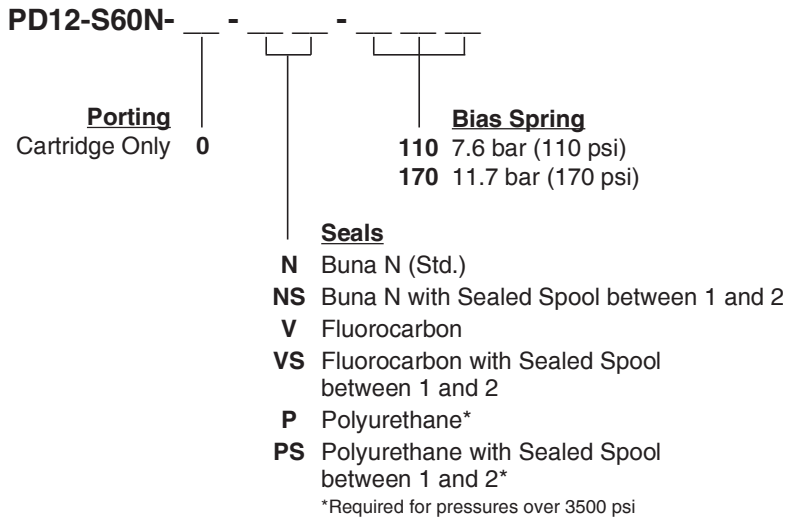


MATERIALS

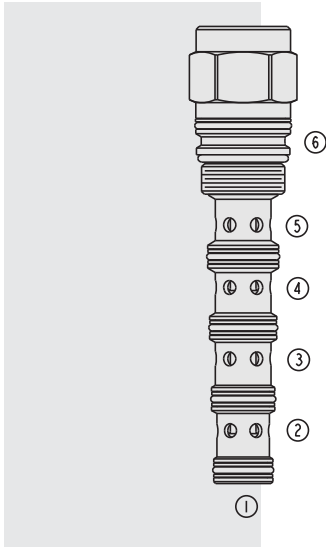
Cartridge: Weight: 0.21 kg. (0.46 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Ported Body: Test housing available;
see page 8.012.1.

TO ORDER



PD16-S60N Piloted 4-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve.

OPERATION

In the neutral position, the PD16-S60N allows flow between ports 2 and 3, and between 4 and 5. On remote pilot signal at 1, the valve shifts to allow flow between 3 and 4 and between 2 to 5. The spring chamber is vented to the tank through port 6. The vented spring chamber allows the valve to be fully pressurized at ports 1, 2, 3 and 4 without affecting required pilot pressure. Pressure at port 6 will affect required pilot pressure.

FEATURES

- Hardened spool and cage for long life.
- 60, 80, 110 and 170 psi bias springs available.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 0–95 lpm (0–25 gpm); See Performance Chart

Maximum Internal Leakage: at 207 bar (3000 psi): 164 ml/minute (10 cu. in./minute)

Pilot Pressure Required: 4.1 bar (60 psi) minimum

Oil Volume Required to Full Shift: 1.5 cc (0.09 cu. in.)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

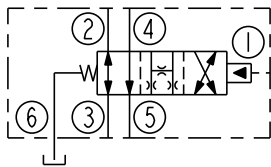
Cavity: VC16-S6; See page 9.116.1

Cavity Tool: CT16-S6XX; See page 8.600.1

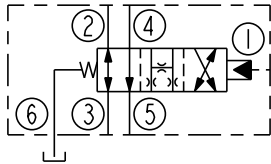
Seal Kit: SK16-S6X-BMMMM; See page 8.650.1

SYMBOLS

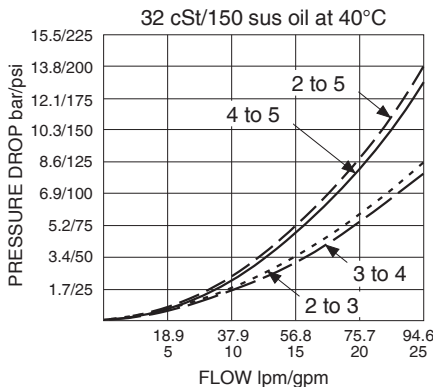
USASI:



ISO:

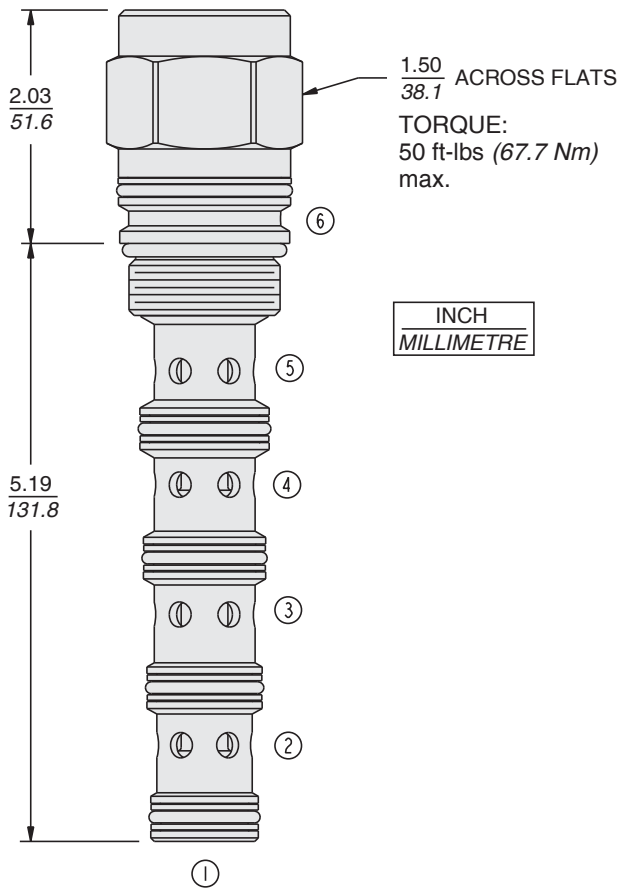


PERFORMANCE (Cartridge Only)



PD16-S60N

DIMENSIONS



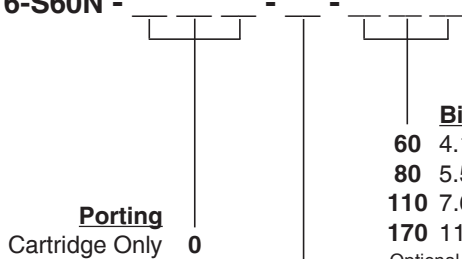
MATERIALS

Cartridge: Weight: 0.25 kg. (0.55 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

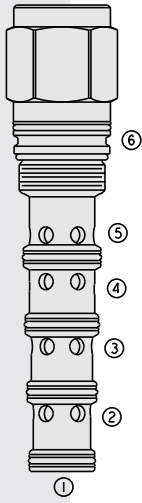
Ported Body: Consult factory.

TO ORDER

PD16-S60N -



PD42-S60N Piloted, 2-Position, 4-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, 2-position, 4-way, spool-type, hydraulic directional valve.

OPERATION

In the neutral position, the PD42-S60N allows flow between ports 2 and 3 and between 4 to 5. On remote pilot signal at 1, the valve shifts to allow flow between ports 3 and 4, and between 2 and 5.

The spring chamber is vented to the tank through port 6. The vented spring chamber allows the valve to be fully pressurized at ports 2, 3 and 4 without affecting required pilot pressure. Pressure at 6 will affect required pilot pressure.

FEATURES

- Hardened spool and cage for long life.

RATINGS

Maximum Operating Pressure: ports 2, 3 and 4: 324 bar (4700 psi);
Port 1: 28 bar (400 psi)

Flow: 0 to 189 lpm (0 to 50 gpm); See Performance Chart

Internal Leakage: Maximum leakage at 207 bar (3000 psi):
1.31 liters/minute (80 cu. in./minute).

Temperature: -40 to 120°C (-40 to 248°F)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of
7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

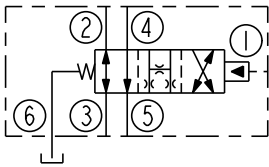
Cavity: VC42-S6; See page 9.142.1

Cavity Tool: CT42-S6XX; See page 8.600.1

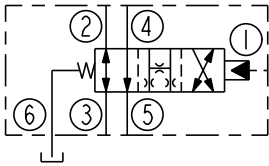
Seal Kit: SK42-S6X-BMMMM; See page 8.650.1

SYMBOLS

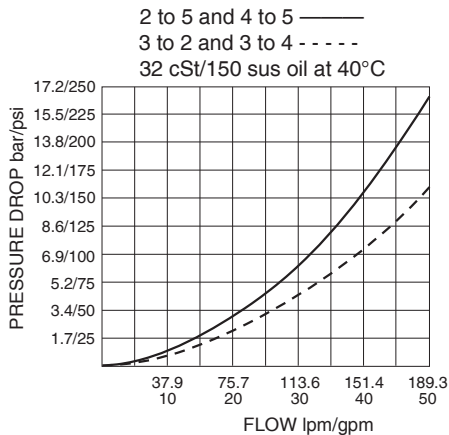
USASI:



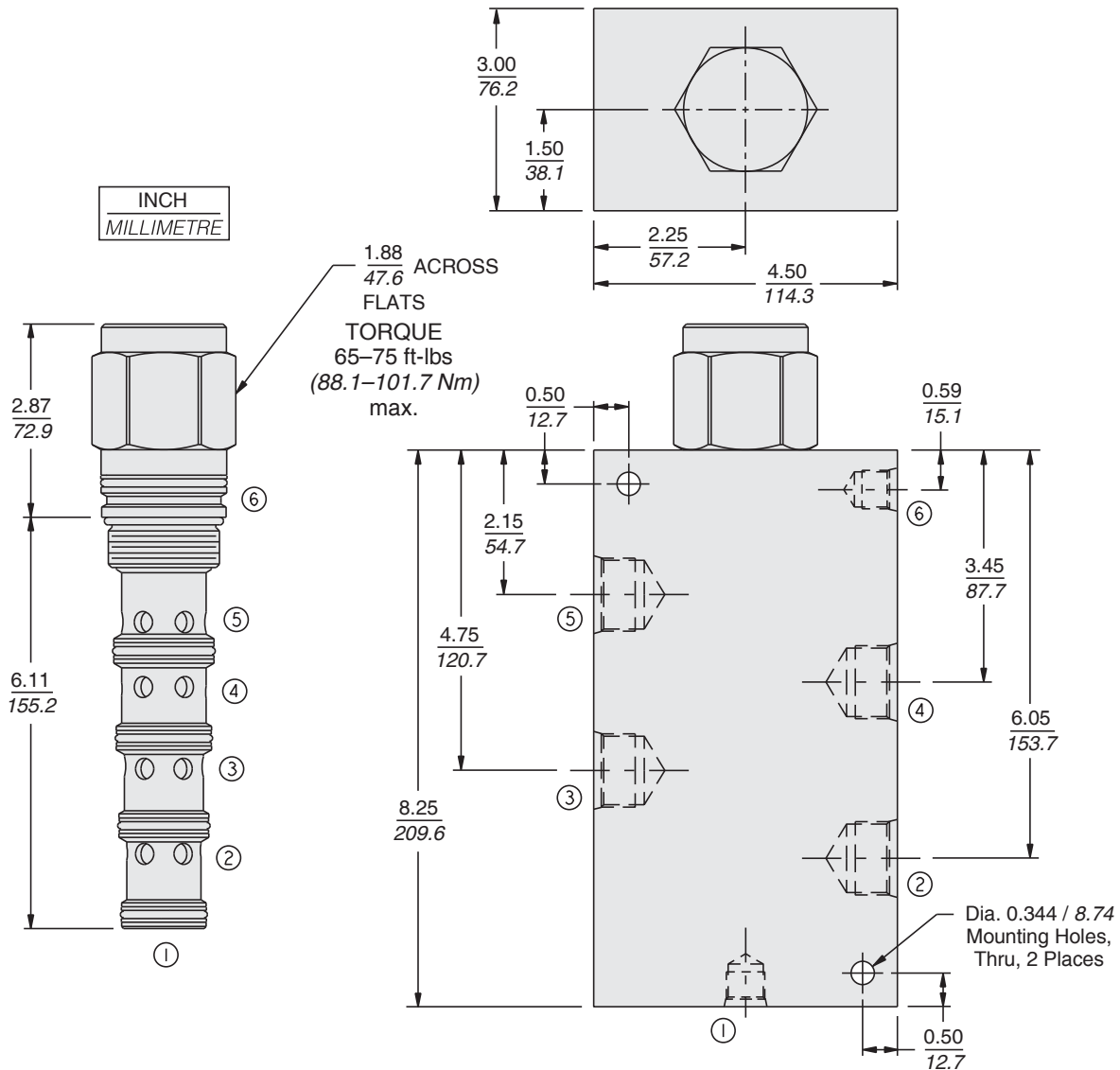
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.76 kg. (1.68 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Ported Body: Ductile Iron,
Rated to 345 bar (5000 psi).
See page 8.042.1.

TO ORDER

PD42-S60N - - -170*

Porting
Cartridge Only **0**
SAE 12 **12TD**
SAE 16 **16TD**
SAE 20 **20TD**
*3/4 in. BSP **6BD**
*1 in. BSP **8BD**
*1-1/4 in. BSP **10BD**
*BSP Body; U.K. Mfr. Only

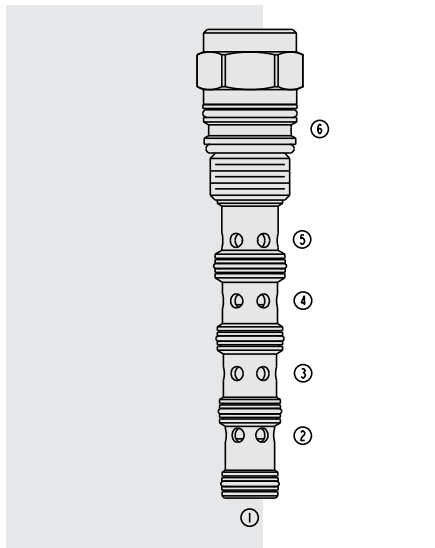
*170 psi (11.7 bar) bias spring
standard. Optional bias springs
considered on OEM request.

Seals

N Buna N (Std.)
NS Buna N with Sealed Spool between □ and □
P Polyurethane
PS Polyurethane with Sealed Spool between □ and □
V Fluorocarbon
VS Fluorocarbon with Sealed Spool between □ and □

Note: Polyurethane seals are required for operation over 240 bar/3500 psi

PD12-S61N Piloted, 2-Position, 4-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, 2-position, 4-way, spool-type, hydraulic directional valve.

OPERATION

In the neutral position, the **PD12-S61N** allows flow between ports 2 and 3 and between ports 4 and 5. On remote pilot signal at 1, the valve shifts to allow flow between ports 3 and 4, while blocking ports 2 and 3.

The spring chamber is vented to the tank through port 6. The vented spring chamber allows the valve to be fully pressurized at ports 1, 2, 3, 4 and 5 without affecting required pilot pressure. Pressure at 6 will affect required pilot pressure.

FEATURES

- Hardened spool and cage for long life.
- 110 and 170 psi bias springs available.

RATINGS

Maximum Operating Pressure: 240 bar (3500 psi)

Flow: 0 to 56 lpm (0 to 15 gpm); See Performance Chart

Internal Leakage: Maximum leakage at 240 bar (3500 psi):
197 ml/minute (12 cu. in./minute).

Temperature: -40 to 120°C (-40 to 248°F)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

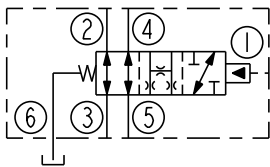
Installation: No restrictions; See page 9.020.1

Cavity: VC12-S6; See page 9.112.1

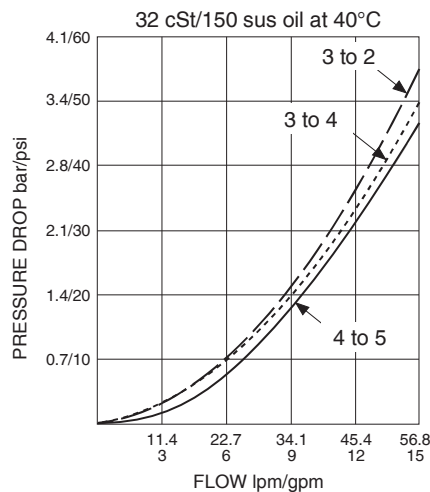
Cavity Tool: CT12-S6XX; See page 8.600.1

Seal Kit: SK12-S6X-BMMMM; See page 8.650.1

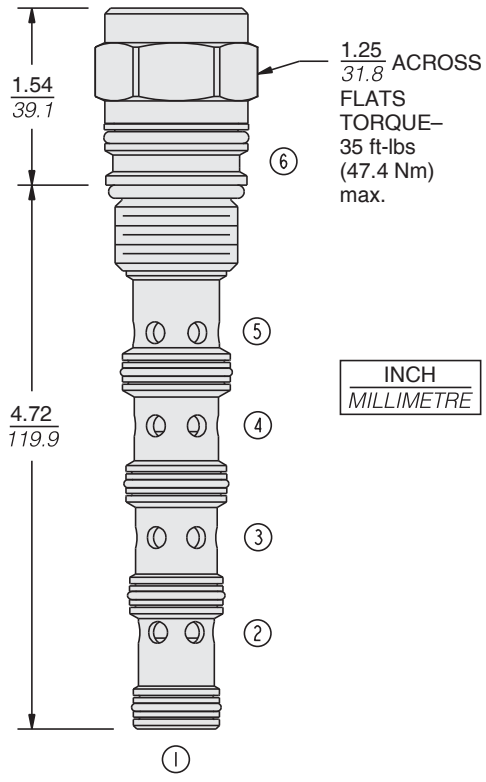
ISO SYMBOL



PERFORMANCE (Cartridge Only)



DIMENSIONS

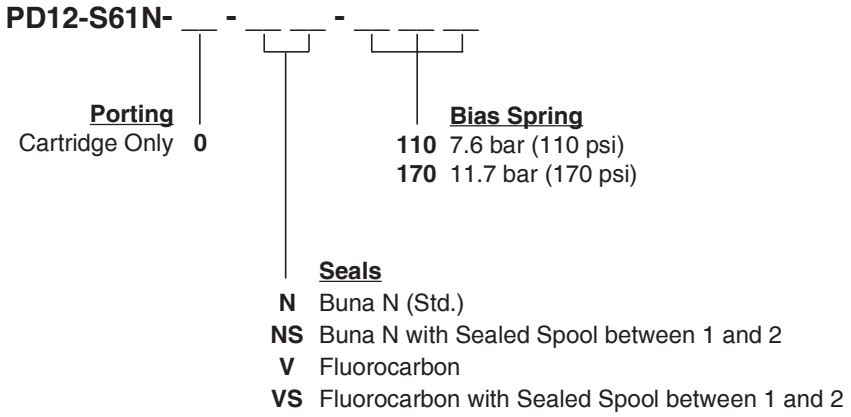


MATERIALS

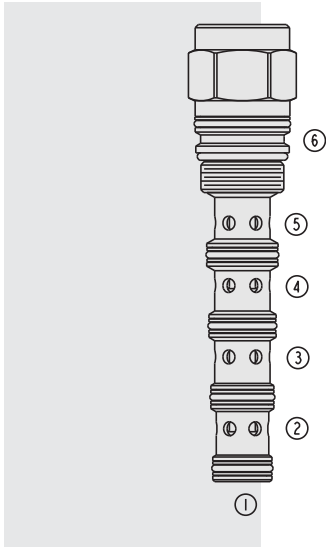
Cartridge: Weight: 0.21 kg. (0.46 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Ported Body: Test housing available; see page 8.012.1.

TO ORDER



PD16-S61N Piloted 4-Way Spool



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve.

OPERATION

When in neutral the **PD16-S61N** allows flow between ports 2 and 3, and between ports 4 and 5. On remote pilot signal at 1, the valve's spool shifts to allow flow between 3 and 4 while blocking 2 and 5. The spring chamber is vented to the tank through port 6. The vented spring chamber allows the valve to be fully pressurized at ports 1, 2, 3, 4 and 5 without affecting required pilot pressure. Pressure at port 6 will affect required pilot pressure.

FEATURES

- Hardened spool and cage for long life.
- 60, 110 and 170 psi bias springs available.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 0–151 lpm (0–40 gpm); See Performance Chart

Maximum Internal Leakage: at 207 bar (3000 psi): 164 ml/minute (10 cu. in./minute)

Pilot Pressure Required: 4.1 bar (60 psi) minimum

Oil Volume Required to Full Shift: 1.5 cc (0.09 cu. in.)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

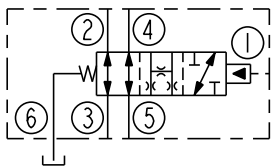
Cavity: VC16-S6; See page 9.116.1

Cavity Tool: CT16-S6XX; See page 8.600.1

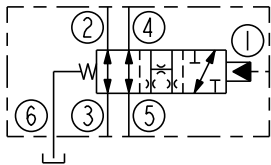
Seal Kit: SK16-S6X-BMMMM; See page 8.650.1

SYMBOLS

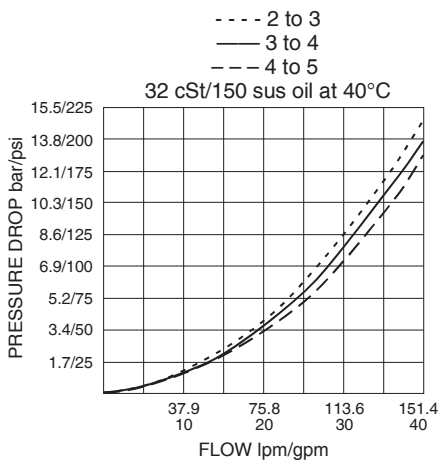
USASI:



ISO:

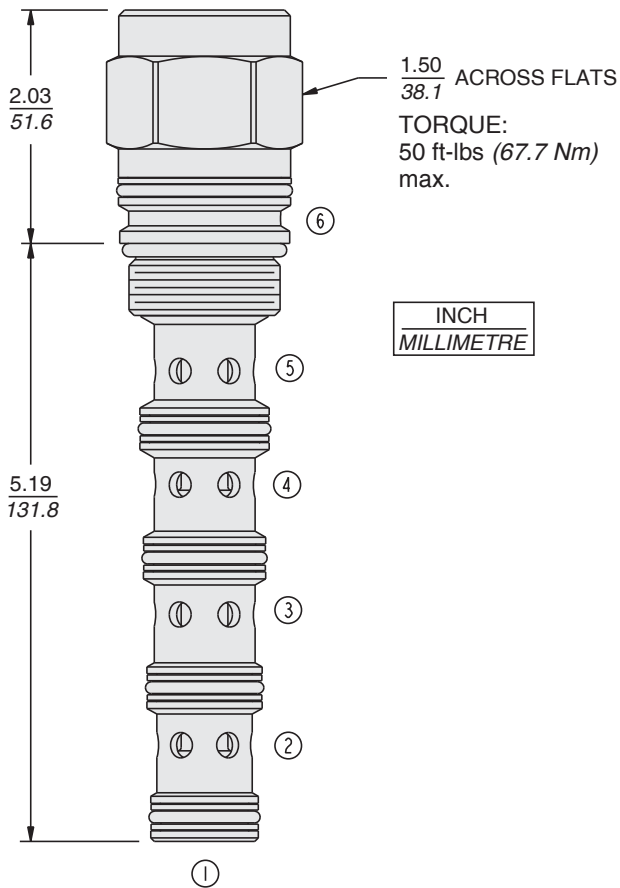


PERFORMANCE (Cartridge Only)



PD16-S61N

DIMENSIONS



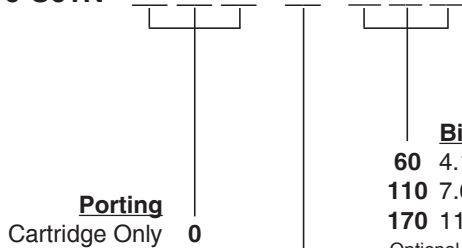
MATERIALS

Cartridge: Weight: 0.25 kg. (0.55 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Ported Body: Consult factory.

TO ORDER

PD16-S61N -

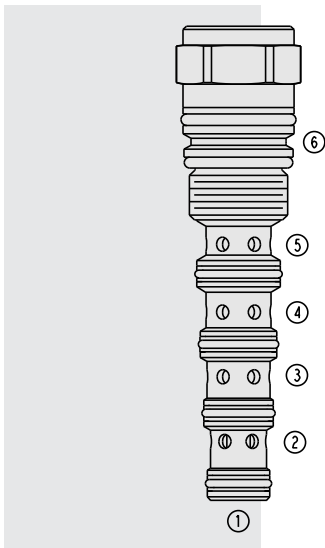


Bias Spring[†]
60 4.1 bar (60 psi)
110 7.6 bar (110 psi)
170 11.7 bar (170 psi)
 Optional bias springs considered on OEM request.

[†]Note: 110 psi bias spring is the minimum required for use with sealed spool.

Seals
N Buna N (Std.)
V Fluorocarbon
NS Buna N w/Sealed Spool □ to □ only
VS Fluorocarbon w/Sealed Spool □ to □ only

PD10-S62 Piloted Directional Valve



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic cartridge valve.

OPERATION

In the neutral position, the PD10-S62 allows flow between ports 2 and 3 and between ports 4 and 5 bidirectionally. When the remote pilot signal at 1 exceeds the force of the bias spring, the spool shifts to block flow at all ports.

The spring chamber is vented to the tank through port 6. The vented spring chamber allows the valve to be fully pressurized at ports 1, 2, 3, 4 and 5 without affecting required pilot pressure. Pressure at 6 will affect required pilot pressure.

FEATURES

- Hardened spool and cage for long life.
- Optional sealed spool between ports 1 and 2.

RATINGS

Maximum Operating Pressure: 250 bar (3625 psi) with standard Buna N seals.

Maximum Total Input Flow: 53 lpm (14 gpm) in any combination of flows between ports 2 and 3, and ports 4 and 5 (e.g., 2 & 12 gpm, 7 & 7 gpm, or 10 & 4 gpm).

Internal Leakage: Maximum leakage at 250 bar (3625 psi):
131 ml/minute (8 cu. in./minute).

Temperature: -40 to 120°C (-40 to 248°F)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

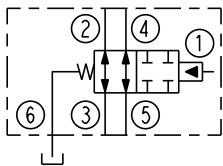
Cavity: VC10-S6; See page 9.110.1

Cavity Tool: CT10-S6X; See page 8.600.1

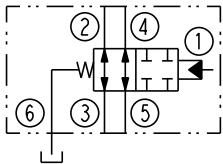
Seal Kit: SK10-S6X-BMMMM; See page 8.650.1

SYMBOLS

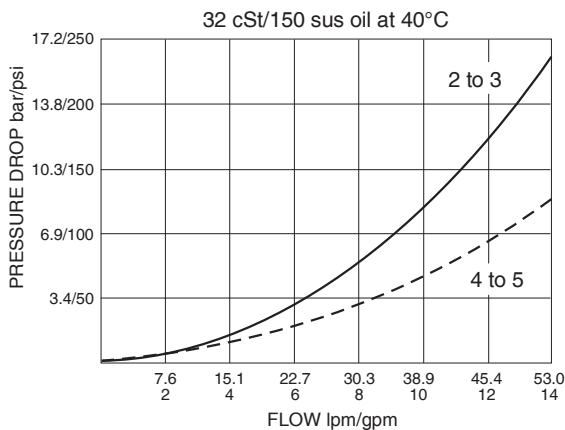
USASI:



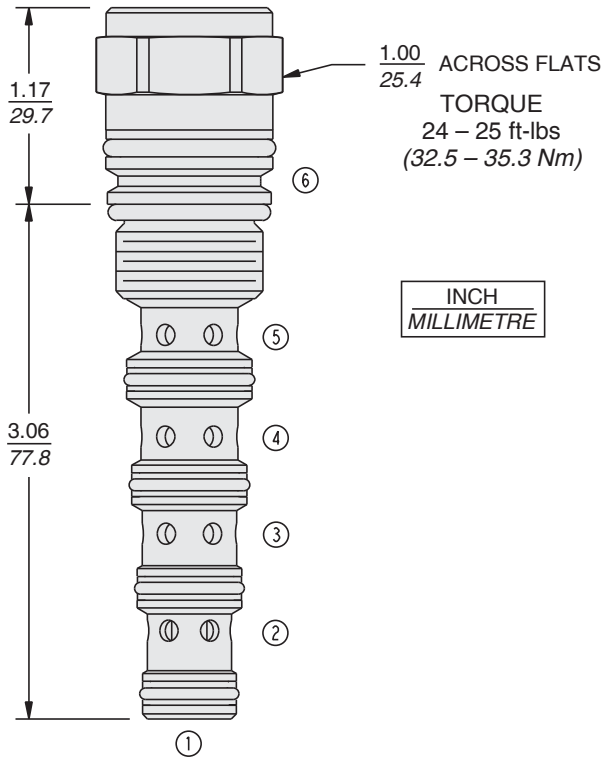
ISO:



PERFORMANCE (Cartridge Only)



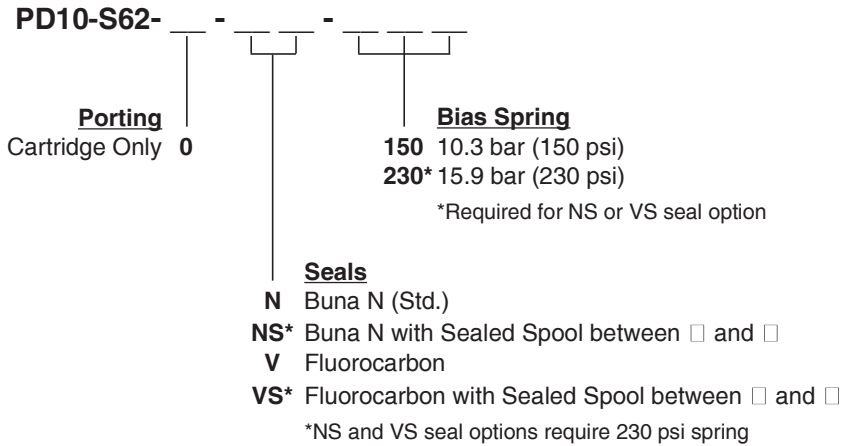
DIMENSIONS



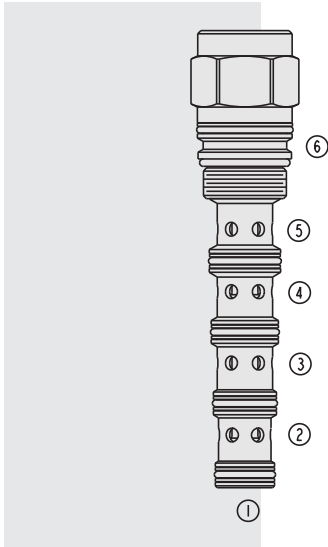
MATERIALS

Cartridge: Weight: 0.20 kg. (0.45 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

TO ORDER



PD16-S63 Piloted Directional Valve



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic cartridge valve.

OPERATION

In the neutral position, the **PD16-S63** blocks flow at all ports. On remote pilot signal at 1, the valve shifts to allow flow between ports 2 and 3, and between 4 and 5.

The spring chamber is vented to the tank through port 6. The vented spring chamber allows the valve to be fully pressurized at ports 1, 2, 3, 4 and 5 without affecting required pilot pressure. Pressure at 6 will affect required pilot pressure.

FEATURES

- Hardened spool and cage for long life.
- Optional sealed spool between ports 1 and 2.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 0–151 lpm (0–40 gpm); See Performance Chart

Maximum Internal Leakage: at 207 bar (3000 psi): 164 ml/minute (10 cu. in./minute)

Oil Volume Required to Full Shift: 1.5 cc (0.09 cu. in.)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

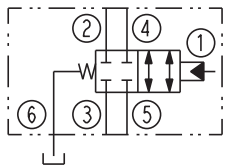
Installation: No restrictions; See page 9.020.1

Cavity: VC16-S6; See page 9.116.1

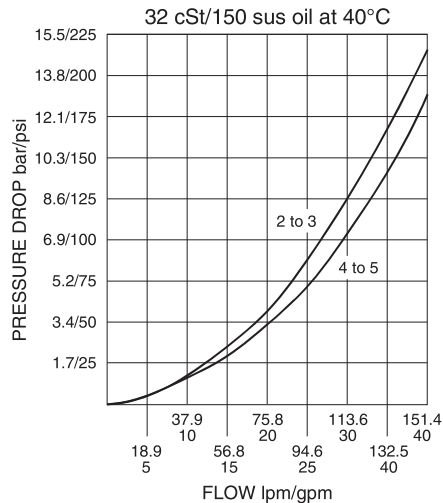
Cavity Tool: CT16-S6XX; See page 8.600.1

Seal Kit: SK16-S6X-BMMMM; See page 8.650.1

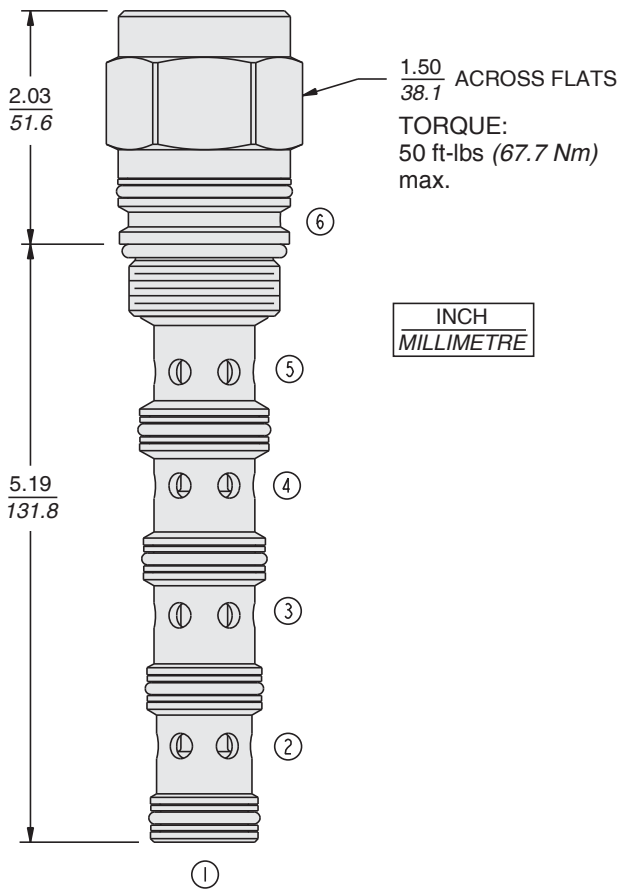
SYMBOL



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.75 kg. (1.66 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

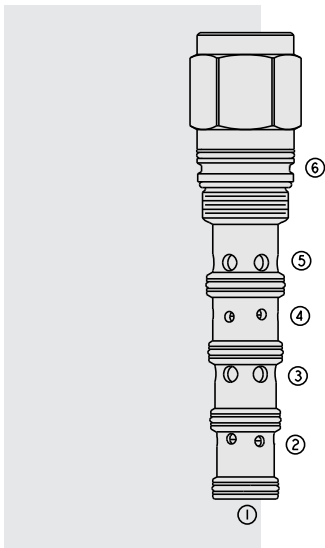
Ported Body: Consult factory.

TO ORDER

PD16-S63-		-	-	-
	Porting			Bias Spring
	Cartridge Only	0		60 4.1 bar (60 psi)
				80 5.5 bar (80 psi)
				110 7.6 bar (110 psi)
				170 11.7 bar (170 psi)
				Seals
				N Buna N (Std.)
				NS Buna N with Sealed Spool between □ and □
				V Fluorocarbon
				VS Fluorocarbon with Sealed Spool between □ and □
				P Polyurethane
				PS Polyurethane with Sealed Spool between □ and □

Note: NS, VS and PS seal options require 80 psi minimum bias spring.

PD42-S67B Piloted, 4-Way Spool-Type Valve



DESCRIPTION

A screw-in, cartridge-style, pilot-operated spool-type hydraulic directional valve.

OPERATION

When the **PD42-S67B** is in neutral position, flow is allowed between ports 2, 3 and 5. When the remote pilot signal at 1 exceeds the force of the bias spring, the spool shifts to allow flow between 3 and 4, and between 2 and 5. On remote pilot signal at 6, the spool shifts to allow flow between 3 and 2, and between 4 and 5.

FEATURES

- Hardened spool and cage for long life.

RATINGS

Operating Pressure: 324 bar (4700 psi) at ports 2, 3 and 4;
28 bar (400 psi) at ports 1 and 6 with standard Buna N seals.

Flow: 0–189 lpm (0–50 gpm); See Performance Chart

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

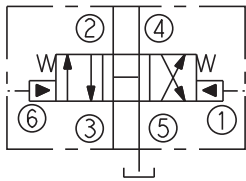
Cavity: VC42-S6; See page 9.142.1

Cavity Tool: CT42-S6X; See page 8.600.1

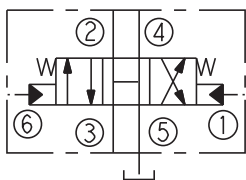
Seal Kit: SK42-S6X-BMMMM; See page 8.650.1

SYMBOLS

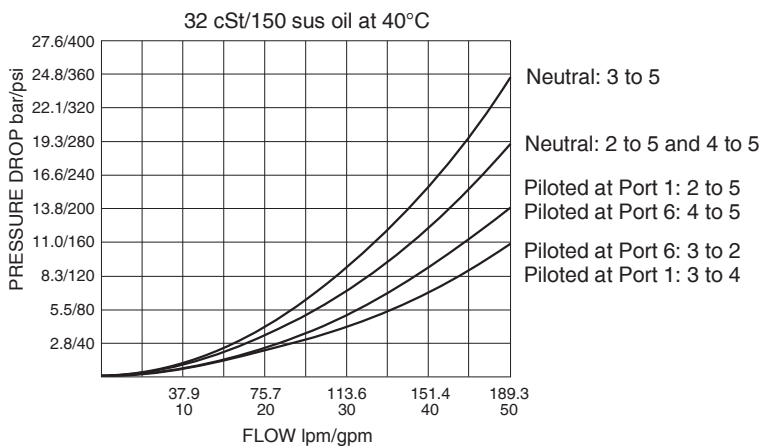
USASI:



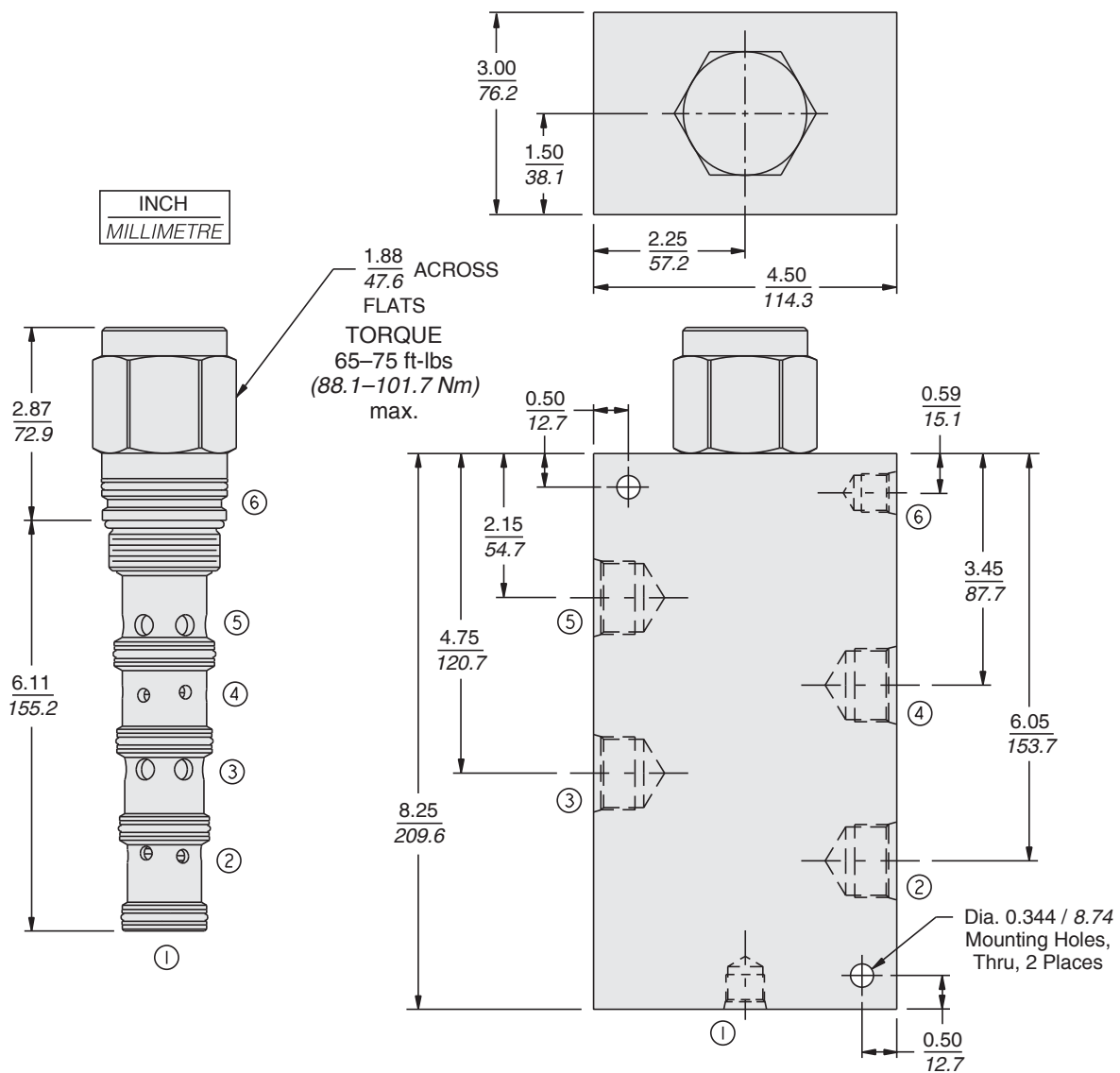
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.76 kg. (1.68 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Ported Body: Ductile Iron,
Rated to 345 bar (5000 psi).
See page 8.042.1

TO ORDER

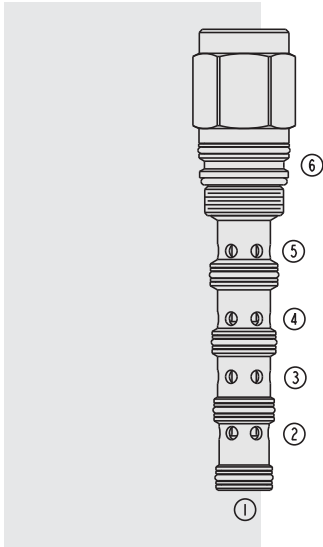
PD42-S67B - - -170[‡]

Porting
Cartridge Only 0
SAE 12 12TD
SAE 16 16TD
SAE 20 20TD
*3/4 in. BSP 6BD
*1 in. BSP 8BD
*1-1/4 in. BSP 10BD
*BSP Body; U.K. Mfr. Only

[‡]170 psi (11.7 bar) bias spring
standard. Optional bias springs
considered on OEM request.

Seals
N Buna N (Std.)
P Polyurethane (Required for pressures
over 240 bar/3500 psi)
V Fluorocarbon

PD16-S67C Piloted 4-Way Spool-Type Valve



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve.

OPERATION

When the **PD16-S67C** is in neutral position, all ports are blocked. On remote pilot signal at 1, the valve shifts to allow flow between 3 and 4, and between 2 and 5. On remote pilot signal at 6, the valve shifts to allow flow between 3 and 2, and between 4 and 5.

FEATURES

- Hardened spool and cage for long life.
- 110 and 170 psi bias springs available.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 0–94.6 lpm (0–25 gpm); See Performance Chart

Maximum Internal Leakage: at 207 bar (3000 psi): 164 ml/minute (10 cu. in./minute)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

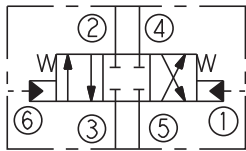
Installation: No restrictions; See page 9.020.1

Cavity: VC16-S6; See page 9.116.1

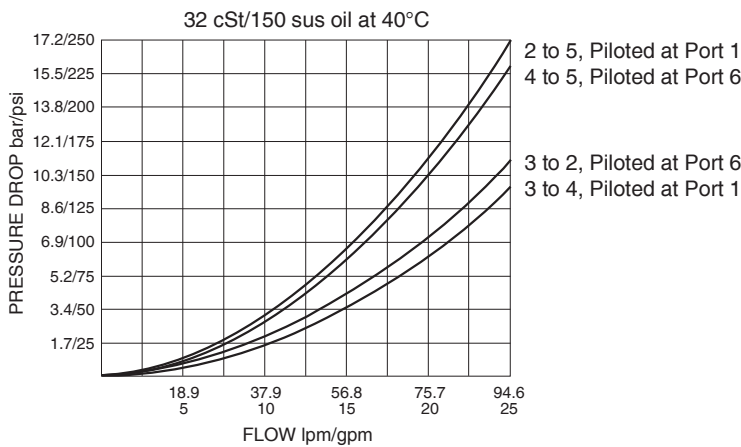
Cavity Tool: CT16-S6XX; See page 8.600.1

Seal Kit: SK16-S6X-BMMMM; See page 8.650.1

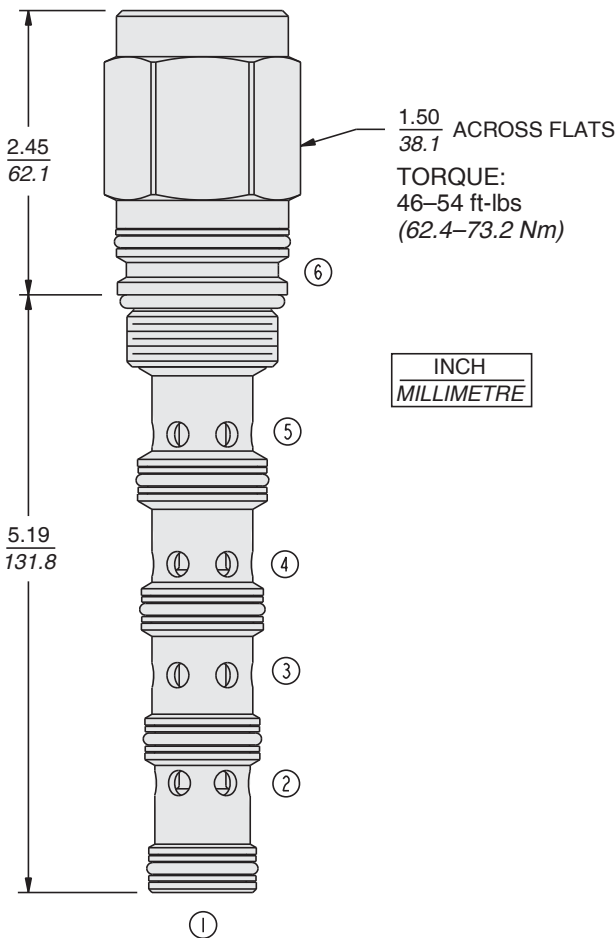
SYMBOL



PERFORMANCE (Cartridge Only)



DIMENSIONS



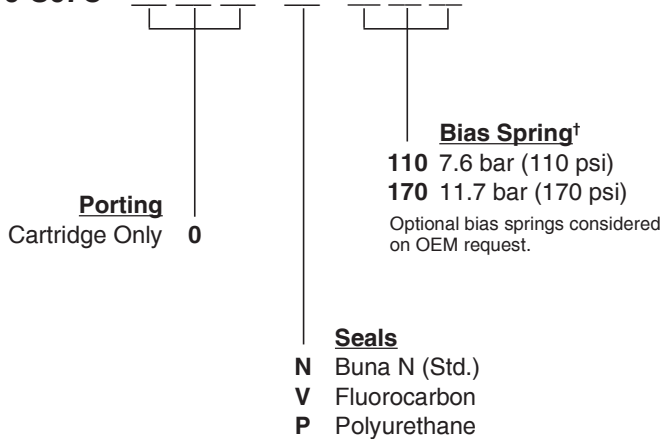
MATERIALS

Cartridge: Weight: 0.85 kg. (1.88 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Ported Body: Consult factory.

TO ORDER

PD16-S67C -

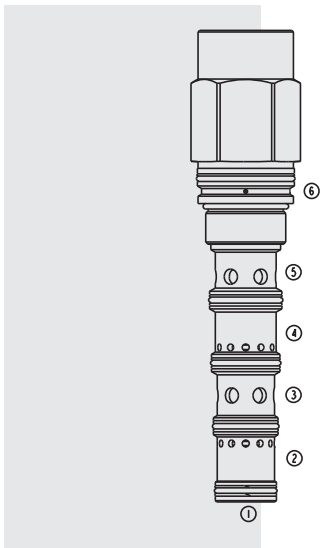


HPD16-S67C

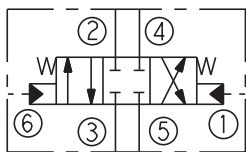
COMING SOON

COMING SOON

HPD42-S67C HyPerformance™ Piloted 4-Way Spool



SYMBOL



DESCRIPTION

A high-pressure, cartridge-style, pilot-operated, screw-in hydraulic directional valve.

OPERATION

When the **HPD42-S67C** is in neutral position, all ports are blocked. When remote pilot signal at 1, exceeds force of bias spring, the spool shifts to allow flow from 3 to 4 and from 2 to 5. When remote pilot signal at 6 exceeds force of bias spring, the spool shifts to allow flow from 3 to 2 and from 4 to 5.

FEATURES

- Hardened spool and cage for long life.
- Flows up to 379 lpm/100 gpm.
- 1000 hour salt spray tested.
- Vibration tested (3-axis) to 20G RMS.
- All HyPerformance products are tested to the rigorous standards of NFPA specification T2.6.1.
- All HyPerformance products are tested at a verification level of 90% and an assurance of 99%.

RATINGS

Operating Pressure: 350 bar (5075 psi); 10% cycle life: 420 bar (6090 psi)

Note: All HyPerformance products are tested for 900K cycles at 350 bar and 100K at 420 bar

Fatigue Rating: 2 million cycles at 420 bar/6090 psi

Burst Pressure: 1380 bar (20000 psi)

Flow: 189 lpm (50 gpm); See Performance Chart

Maximum Internal Leakage: at 350 bar (5075 psi): 820 ml/minute (50 cu. in./minute)

Temperature: -54 to 107°C (-65 to 225°F) with PPDI Urethane seals

Ambient Temperature: -40 to 90°C (-40 to 194°F)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

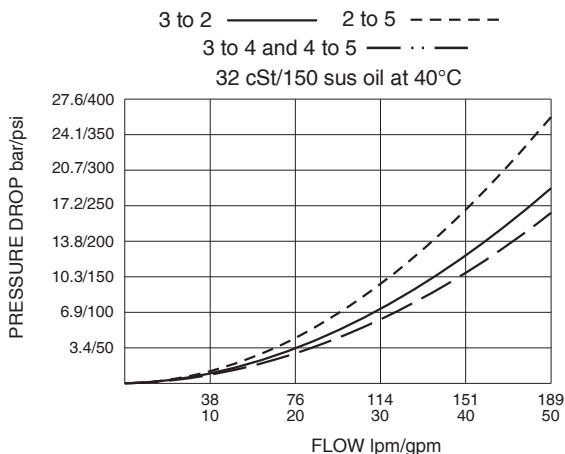
Note: Adaptor lock kit HF P/N 4207540 (sold separately) may be required when pilot pressure exceeds 35 bar (500 psi).

Cavity: HVC42-S6; See page 9.142.1

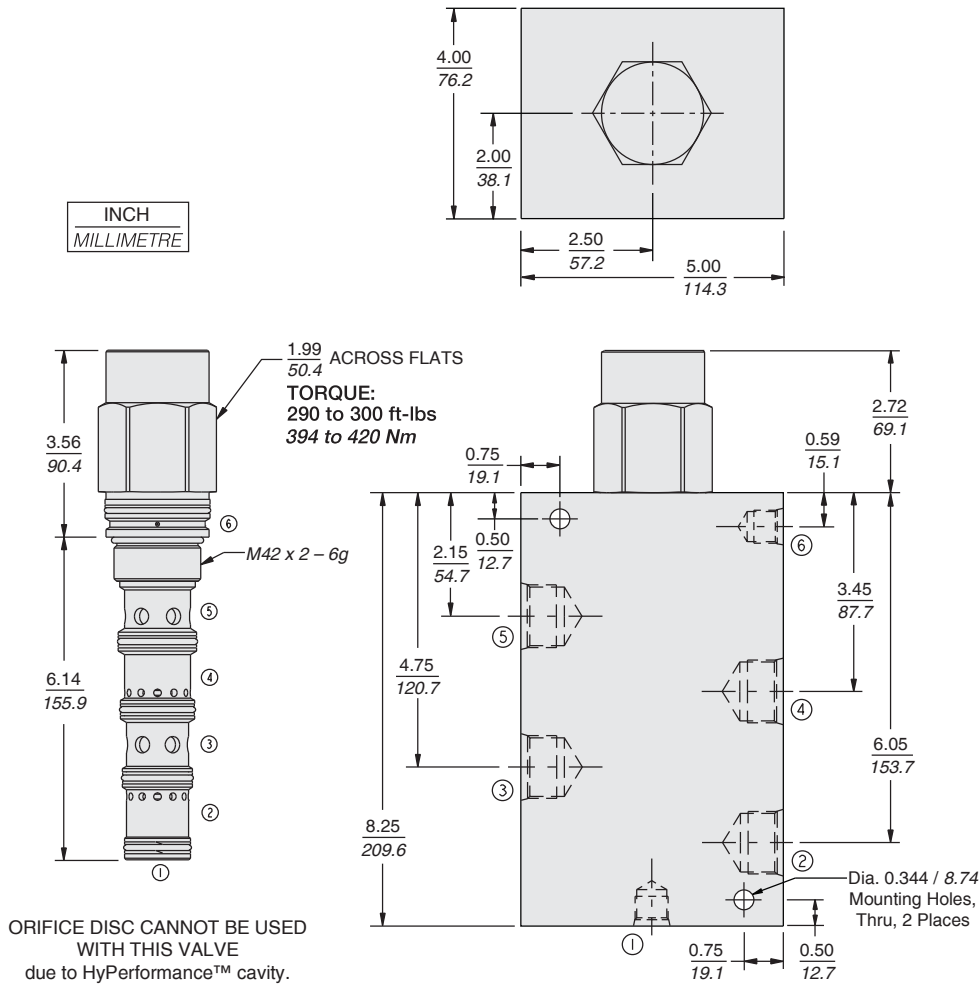
Cavity Tool: HCT42-S6XX; See page 8.600.1

Seal Kit: HSK42-S6U-00000 (PPDI Urethane); See page 8.650.1

PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 2.0 kg. (4.5 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Ported Body: Weight: 16.61 kg. (36.62 lbs.)
HyPerformance™ Ductile iron (code 'D') standard. PD type.
Rated to 345 bar (5000 psi).
See page 8.042.1

TO ORDER

HPD42-S67C -

Porting	0	-	-	-	-	-
Cartridge Only	SAE 20	20TD				
	1-1/4" BSP*	10BD				
*BSP body; U.K. mfr. Only						

Bias Spring
170 11.7 bar (170 psi)

Optional bias springs considered on OEM request.

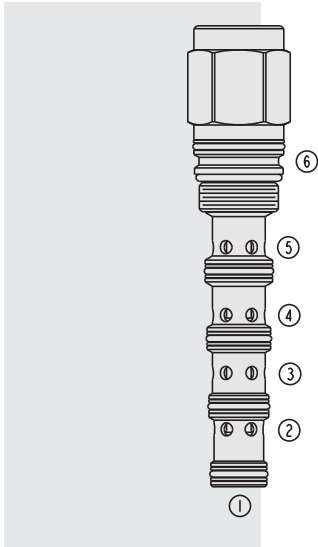
Seals

*U PPDI Urethane
US PPDI Urethane w/Sealed Spool

Consult factory for other available seal options.

*PPDI urethane seals recommended for operating pressures above 241 bar (3500 psi)

PD16-S67D Piloted 4-Way Spool-Type Valve



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve.

OPERATION

When the **PD16-S67D** is in neutral position, flow is allowed between ports 2, 4 and 5. When the remote pilot signal at 1 exceeds the force of the bias spring, the spool shifts to allow flow between 3 and 4, and between 2 and 5. On remote pilot signal at 1, the spool shifts to allow flow between 3 and 2, and between 4 and 5.

FEATURES

- Hardened spool and cage for long life.
- 110 and 170 psi bias springs available.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 0–94.6 lpm (0–25 gpm); See Performance Chart

Maximum Internal Leakage: at 207 bar (3000 psi): 164 ml/minute (10 cu. in./minute)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

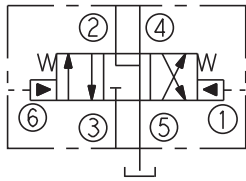
Cavity: VC16-S6; See page 9.116.1

Cavity Tool: CT16-S6XX; See page 8.600.1

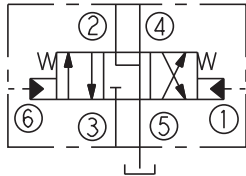
Seal Kit: SK16-S6X-BMMMM; See page 8.650.1

SYMBOLS

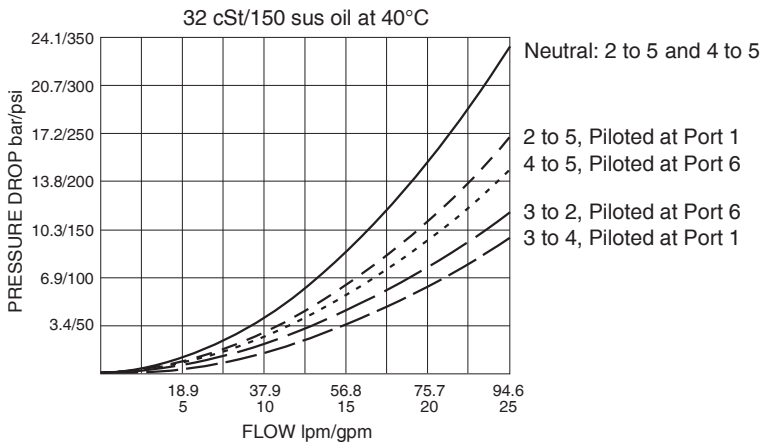
USASI:



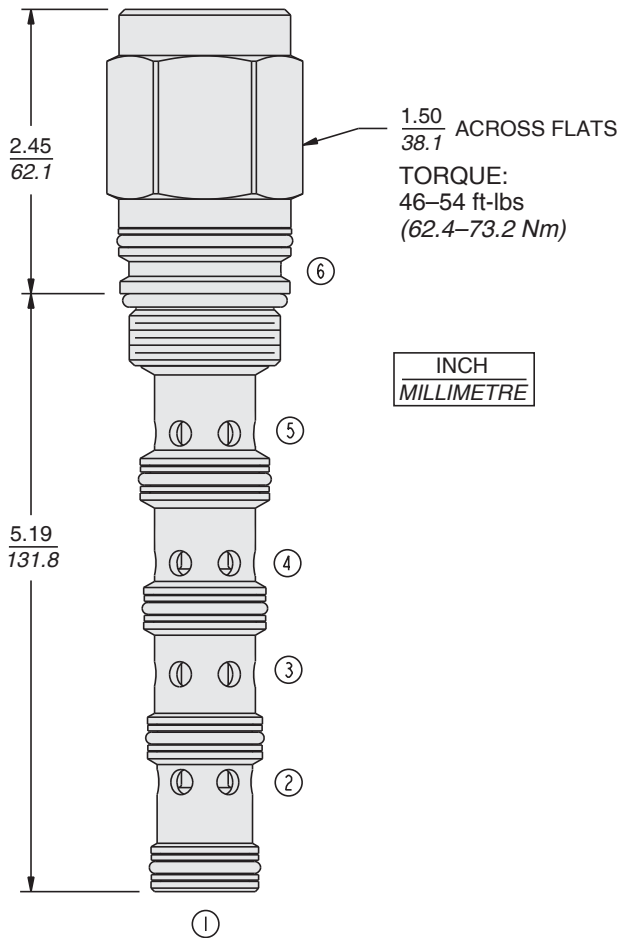
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



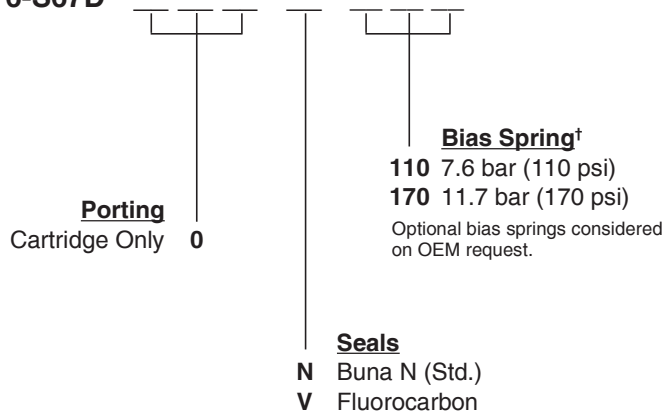
MATERIALS

Cartridge: Weight: 0.85 kg. (1.88 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Ported Body: Consult factory.

TO ORDER

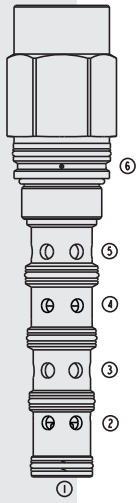
PD16-S67D -



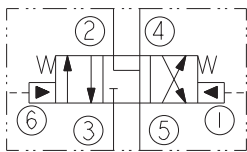
HPD16-S67D

For more information on ***HPD16-S67D***,
please visit our website at
www.hydraforce.com

HPD42-S67D HyPerformance™ Piloted 4-Way Spool



ISO SYMBOL



DESCRIPTION

A high-pressure, screw-in, cartridge-style, pilot-operated, spool-type, hydraulic directional valve.

OPERATION

When the **HPD42-S67D** is in neutral position, port 3 is blocked and flow is allowed between ports 2, 4 and 5. When remote pilot signal at 1 exceeds force of bias spring, the spool shifts to allow flow from 3 to 4 and from 2 to 5. When remote pilot signal at 6 exceeds force of bias spring, the spool shifts to allow flow from 3 to 2 and from 4 to 5.

FEATURES

- Hardened spool and cage for long life.
- Flows up to 379 lpm/100 gpm.
- 1000 hour salt spray tested.
- Vibration tested (3-axis) to 20G RMS.
- HyPerformance™ product tested to rigorous standards of NFPA specification T2.6.1.
- HyPerformance™ valve tested at 90% verification level and 99% assurance.

RATINGS

Operating Pressure: 350 bar (5075 psi); 10% cycle life: 420 bar (6090 psi)

Note: All HyPerformance products are tested for 900K cycles at 350 bar and 100K at 420 bar

Fatigue Rating: 2 million cycles at 420 bar/6090 psi.

Burst Pressure: 1380 bar (20000 psi)

Flow: 189 lpm (50 gpm); See Performance Chart

Maximum Internal Leakage: at 350 bar (5075 psi): 820 ml/minute (50 cu. in./minute)

Operating Temperature: -54° to 107°C (-65° to 255° F) with PPD1 Urethane seals.

Ambient Temperature: -40° to 90°C (-40° to 194° F)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

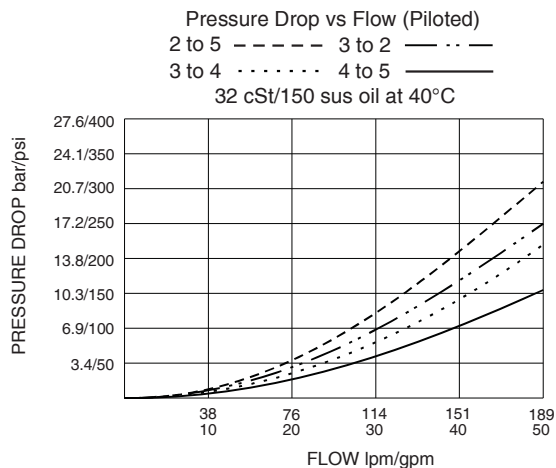
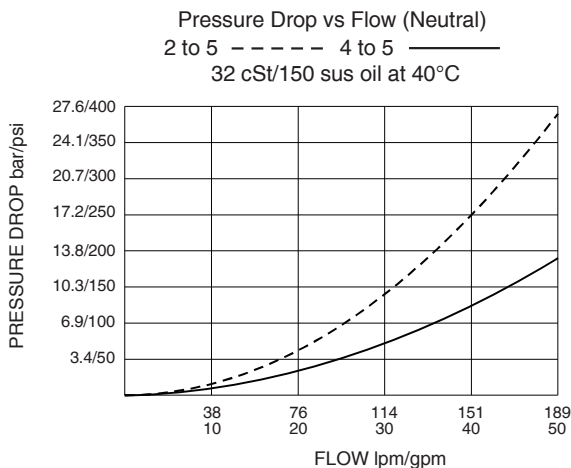
Note: Adaptor lock kit HF P/N 4207540 (sold separately) may be required when pilot pressure exceeds 35 bar (500 psi).

Cavity: HVC42-S6; See page 9.142.1

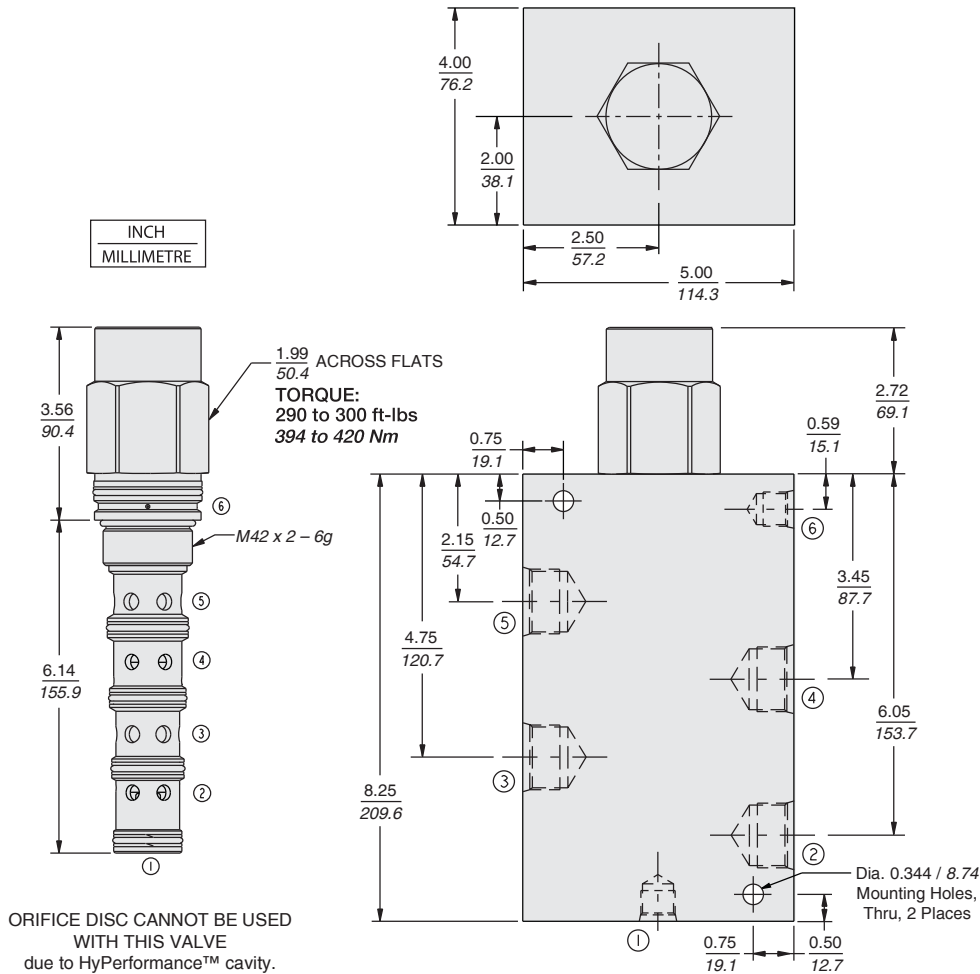
Cavity Tool: HCT42-S6XX; See page 8.600.1

Seal Kits: HSK42-S6U-T0000 (PPDI Urethane). See page 8.650.1

PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 2.0 kg. (4.5 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces. Urethane seals without backup rings standard.

Ported Body: Weight 16.61 kg (36.62 lbs).
HyPerformance™ ductile iron (code 'D') standard. Rated to 354 bar (5000 psi).
See page 8.042.1

TO ORDER

HPD42-S67D -

Porting
Cartridge Only **0**
1-1/4 in. BSP **10 BD**
SAE 20 **20 TD**

*BSP Body; U.K. Mfr. Only

Bias Spring
170 11.7 bar (170 psi)

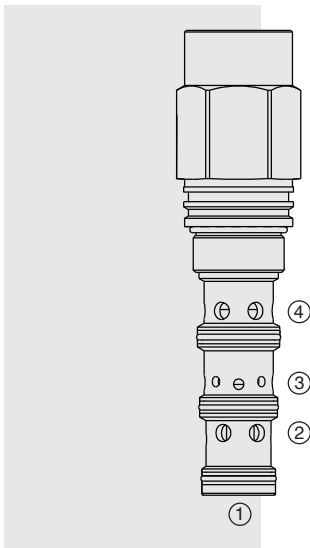
Optional bias springs considered on OEM request.

Seals
N Buna N (Std.)
V Fluorocarbon
***U** PPDI Urethane
NS Buna N w/Sealed Spool
VS Fluorocarbon w/Sealed Spool
US PPDI Urethane w/Sealed Spool

Consult factory for other available seal options.

*PPDI urethane seals recommended for operating pressures above 241 bar (3500 psi)

HPE42-M44 HyPerformance™ Piloted 2-Way Spool



DESCRIPTION

A high pressure, screw-in, cartridge-style, pilot-operated, proportional spool-type, hydraulic directional valve.

OPERATION

In neutral (unpiloted), the **HPE42-M44** blocks flow from 2 to 3 bidirectionally. On remote pilot signal at 1, the spool shifts proportionally to the applied pilot pressure to allow flow from port 2 to 3 bidirectionally. The spring chamber is vented to port 4. Pressure at 4 will directly (1:1) affect the pilot pressure required and must be added to the bias spring valve.

FEATURES

- Hardened spool and cage for long life.
- Optional sealed pilot.
- Cost-effective cavity.
- All HyPerformance™ products are tested to the rigorous standards of the NFPA specification T2.6.1.
- All HyPerformance™ valves are tested at a verification level of 90% and an assurance of 99%.

RATINGS

Operating Pressure: 350 bar (5075 psi); 10% duty cycle 420 bar (6090 psi)

Note: All HyPerformance™ products are tested for 900K cycles at 350 bar and 100K cycles at 420 bar.

Proof Pressure: 690 bar (10,000 psi)

Burst Pressure: 1380 bar (20,000 psi)

Flow Rating: 170 lpm (45 gpm)

Internal Leakage: 230 ml/minute (14 cu. in./minute) max. at 350 bar (5075 psi)

Pilot Pressure Required To Full Spool Shift: 27 bar (400 psi) minimum

Operating Fluid Temperature: -54 to 107°C (-65 to 225°F) with PPDI urethane seals; Storage Temperature: -40 to 70°C (-40 to 160°F)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

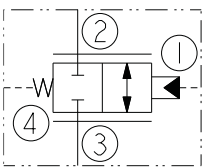
Installation: No restrictions; See page 9.020.1

Cavity: HVC42-M4; See page 9.142.1

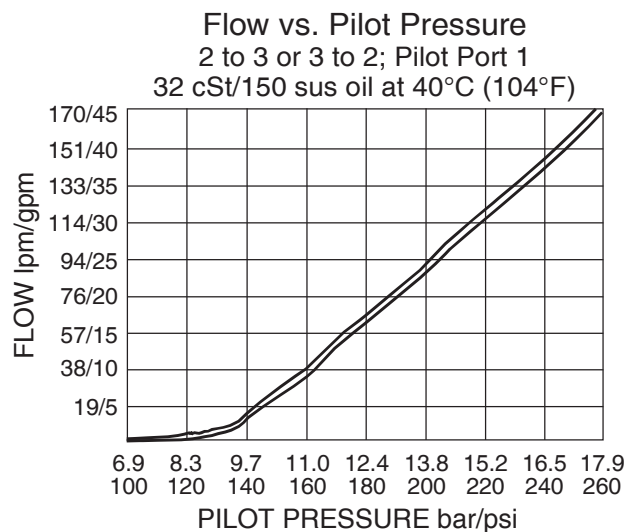
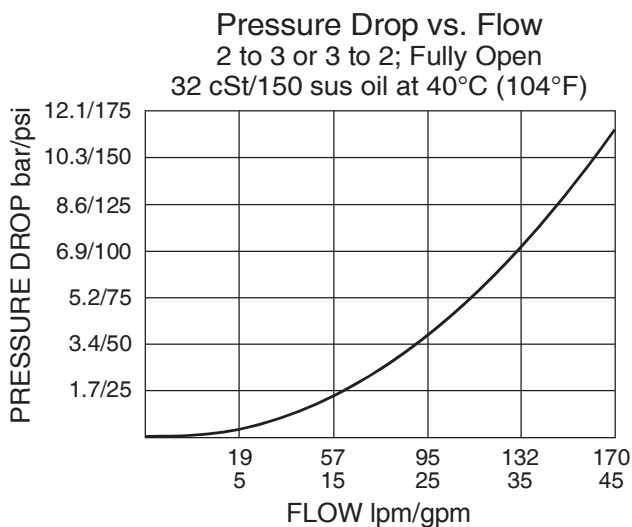
Cavity Tool: HCT42-M4xx; See page 8.600.1

Seal Kit: SK42-M4U-000; See page 8.650.1

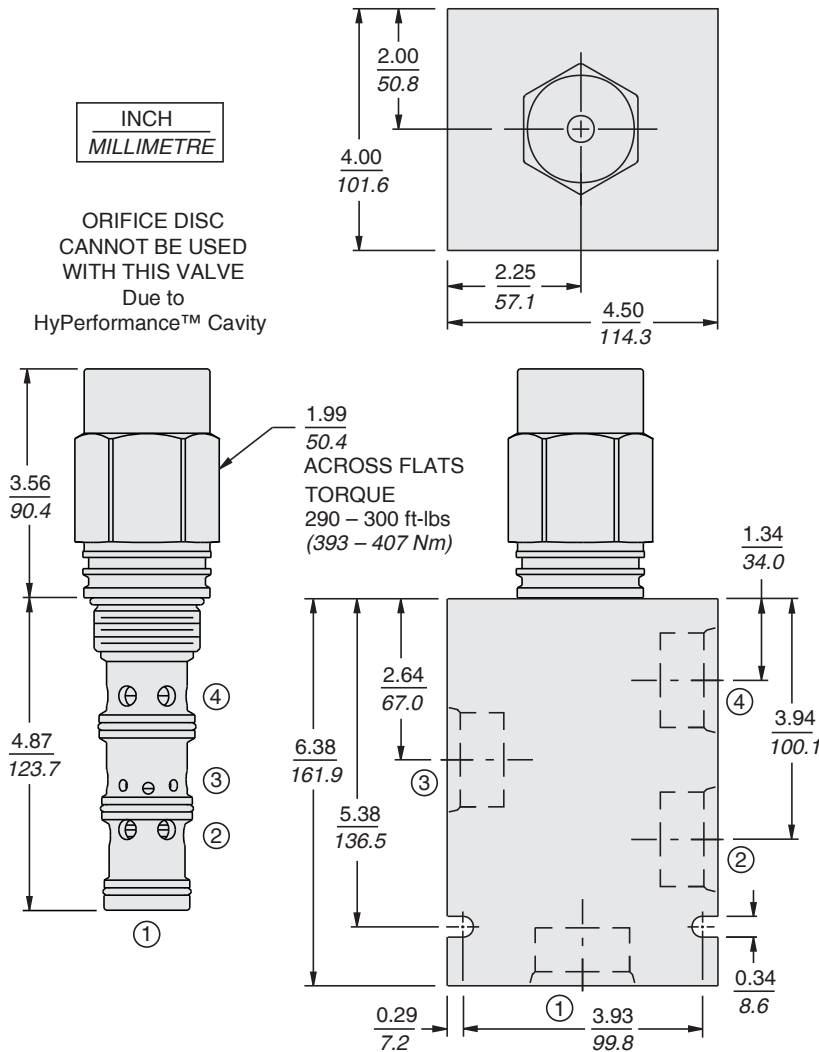
ISO SYMBOL



PERFORMANCE (Cartridge Only)



DIMENSIONS

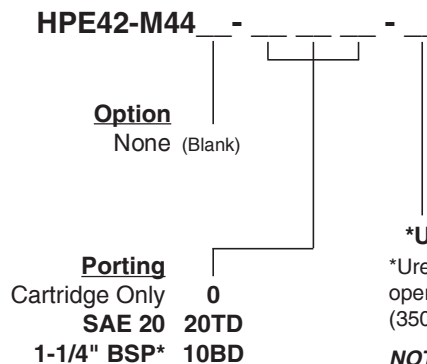


MATERIALS

Cartridge: Weight: 2.0 kg. (4.5 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 PPDI urethane O-rings without backup rings standard.

Standard Ported Body: Weight: 10.68 kg (23.56 lbs) HyPerformance™ ductile iron (code 'D') standard.
 Rated to 354 bar (5000 psi).
 See page 8.042.1

TO ORDER



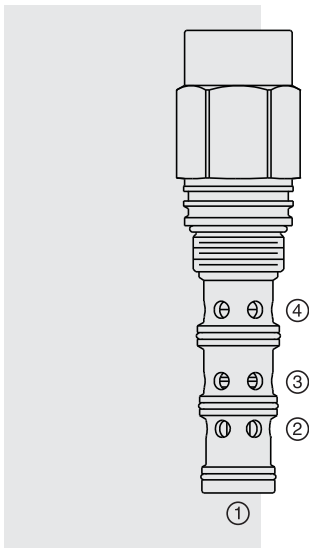
* BSP body; U.K. mfr. Only

*Ductile iron body for pressures over 207 bar/3000 psi

*Urethane seals recommended for operating pressures above 241 bar (3500 psi).

NOTE: Consult factory for additional seal options.

HPE42-M45 HyPerformance™ Piloted 2-Way Spool



DESCRIPTION

A high pressure, screw-in, cartridge-style, pilot-operated, proportional spool-type, hydraulic directional valve.

OPERATION

In neutral (unpiloted), the **HPE42-M45** allows flow from 2 to 3 bidirectionally. On remote pilot signal at 1, the spool shifts proportionally to the applied pilot pressure to gradually close the flow path until the spool is fully shifted, blocking flow. The spring chamber is vented to port 4. Pressure at 4 will directly (1:1) affect the pilot pressure required and must be added to the bias spring valve.

FEATURES

- Hardened spool and cage for long life.
- Optional sealed pilot.
- Cost-effective cavity.
- All HyPerformance™ products are tested to the rigorous standards of the NFPA specification T2.6.1.
- All HyPerformance™ valves are tested at a verification level of 90% and an assurance of 99%.

RATINGS

Operating Pressure: 350 bar (5075 psi); 10% duty cycle 420 bar (6090 psi)

Note: All HyPerformance™ products are tested for 900K cycles at 350 bar and 100K cycles at 420 bar.

Proof Pressure: 690 bar (10,000 psi)

Burst Pressure: 1380 bar (20,000 psi)

Flow Rating: 170 lpm (45 gpm)

Internal Leakage: 490 ml/minute (30 cu. in./minute) max. at 350 bar (5075 psi)

Pilot Pressure Required To Full Spool Shift: 27 bar (400 psi) minimum

Operating Fluid Temperature: -54 to 107°C (-65 to 225°F) with PPDI urethane seals; Storage Temperature: -40 to 70°C (-40 to 160°F)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

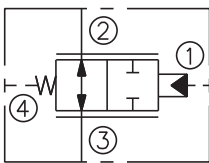
Installation: No restrictions; See page 9.020.1

Cavity: HVC42-M4; See page 9.142.1

Cavity Tool: HCT42-M4xx; See page 8.600.1

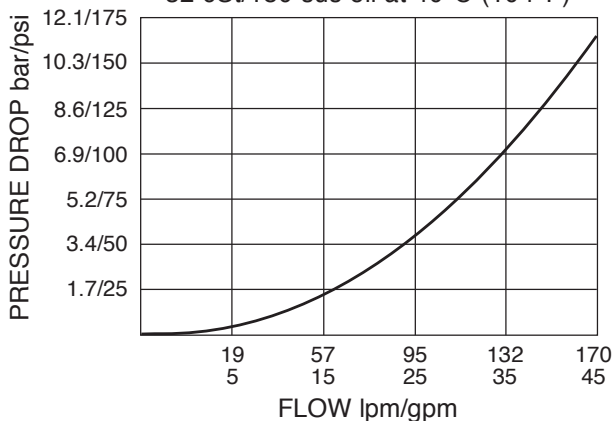
Seal Kit: SK42-M4U-000; See page 8.650.1

ISO SYMBOL

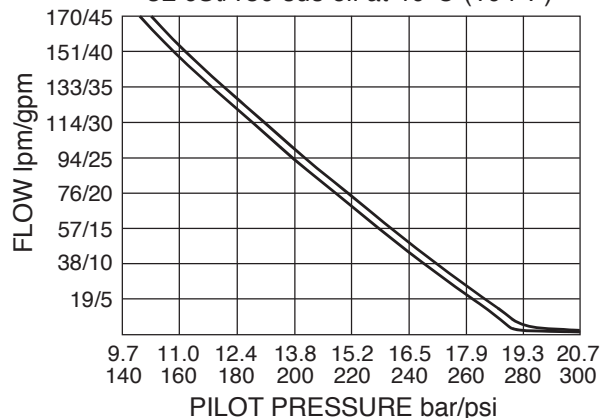


PERFORMANCE (Cartridge Only)

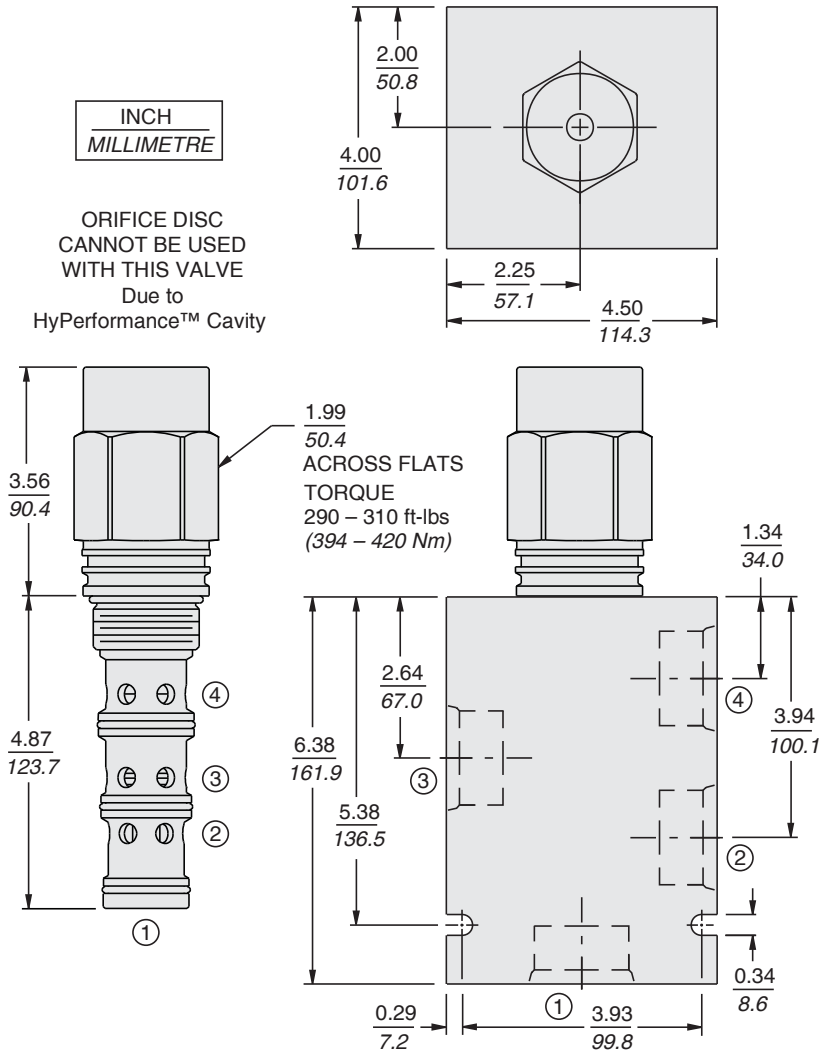
Pressure Drop vs. Flow
2 to 3 or 3 to 2; Fully Open
32 cSt/150 sus oil at 40°C (104°F)



Flow vs. Pilot Pressure
2 to 3 or 3 to 2; Pilot Port 1
32 cSt/150 sus oil at 40°C (104°F)



DIMENSIONS

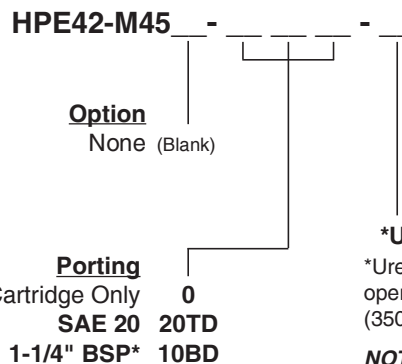


MATERIALS

Cartridge: Weight: 2.0 kg. (4.5 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 PPDI urethane O-rings without backup rings standard.

Standard Ported Body: Weight: 10.68 kg (23.56 lbs) HyPerformance™ ductile iron (code 'D') standard.
 Rated to 354 bar (5000 psi).
 See page 8.042.1

TO ORDER



* BSP body; U.K. mfr. Only

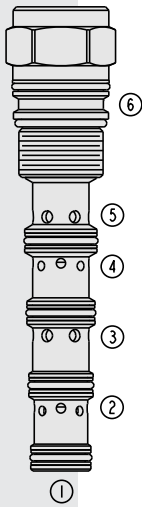
*Ductile iron body for pressures over 207 bar/3000 psi

*Urethane seals recommended for operating pressures above 241 bar (3500 psi).

NOTE: Consult factory for additional seal options.

PE12-S67C Proportional, Pilot Operated

U.S. Patent
6,554,014



DESCRIPTION

A screw-in, cartridge-style, proportional, spring-centered, pilot-operated spool-type hydraulic directional valve.

OPERATION

When the **PE12-S67C** is in neutral position all ports are blocked. When the remote pilot signal at 1 exceeds the force of the bias spring, the spool shifts proportionally to the applied pilot pressure to allow flow from 3 to 4 through a load such as a hydraulic cylinder or motor, and from 2 to 5 and to tank. On remote pilot signal at 6, the valve's spool shifts proportionally to the applied pressure in the opposite direction, reversing the flow direction. **The valve's spool is symmetrical, providing meter-in and meter-out control.**

FEATURES

- Hardened spool and cage for long life.
- Excellent metering characteristics.
- Good linearity.

RATINGS

Maximum Operating Pressure: Ports 3 and 5: 345 bar (5000 psi)
Ports 2 and 4: 240 bar (3500 psi)
Ports 1 and 6: 27.6 bar (400 psi)

Flow: See Performance Chart

Internal Leakage: 50 ml/minute (3 cu. in./minute) at 207 bar (3000 psi)

Temperature: -40 to 120°C with standard Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

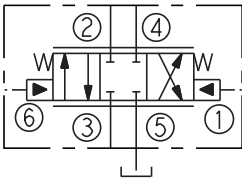
Cavity: VC12-S6; See page 9.112.1

Cavity Tool: CT12-S6; See page 8.600.1

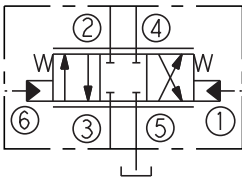
Seal Kit: SK12-6X-BMMMM; See page 8.650.1

SYMBOLS

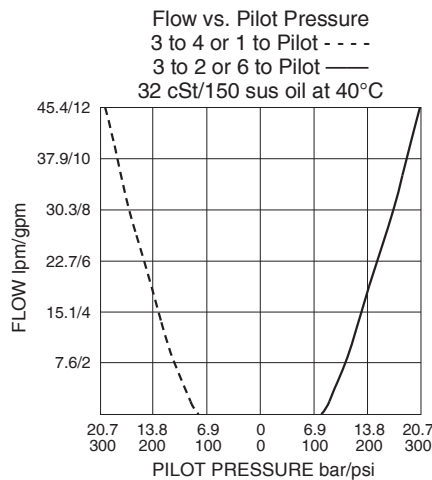
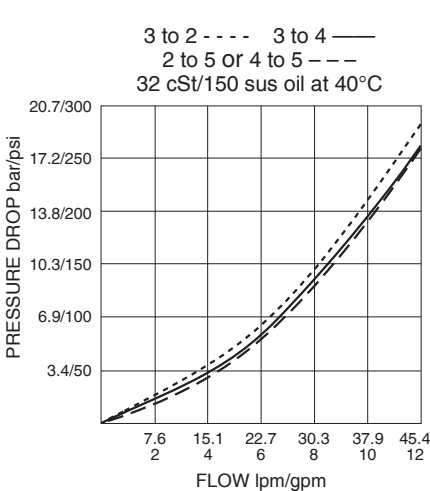
USASI:



ISO:

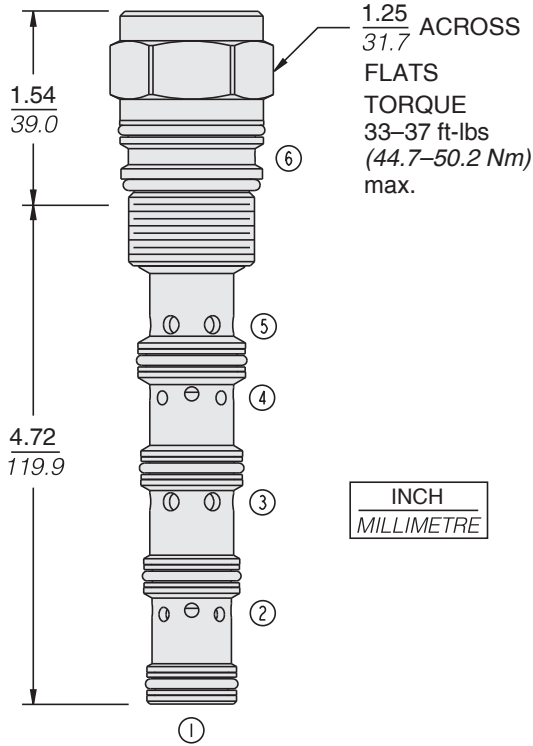


PERFORMANCE (Cartridge Only)



DIMENSIONS

U.S. Patent 6,554,014



MATERIALS

Cartridge: Weight: 0.45 kg. (0.98 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Ported Body: Test housing available.
See page 8.012.1.

TO ORDER

PE12-S67C - -
 Porting
 Cartridge Only 0

Seals
N Buna N (Std.)
P Polyurethane (for pressures over 240 bar/3500 psi)
V Fluorocarbon

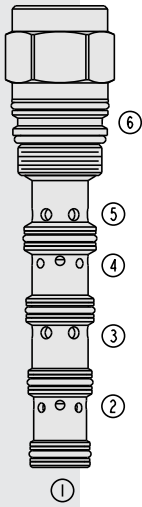
PE12-6X Combo, Proportional, Pilot Operated

COMING SOON

COMING SOON

PE16-S67C Proportional, Pilot Operated

U.S. Patent
6,554,014



DESCRIPTION

A screw-in, cartridge-style, proportional, spring-centered, pilot-operated spool-type hydraulic directional valve.

OPERATION

When the **PE16-S67C** is in neutral position all ports are blocked. When the remote pilot signal at 1 exceeds the force of the bias spring, the spool shifts proportionally to the applied pilot pressure to allow flow from 3 to 4 through a load such as a hydraulic cylinder or motor, and from 2 to 5 and to tank. When the pilot signal at 6 exceeds the force of the bias spring the spool shifts proportionally to the applied force to allow flow from 3 to 2 and from 4 to 5. When the pilot signal is less than the force of the bias spring, the spool will return to the center position. **The valve's spool is symmetrical, providing meter-in and meter-out control.**

FEATURES

- Hardened spool and cage for long life.
- Cost-effective cavity.
- Excellent metering characteristics.
- Good linearity.

RATINGS

Maximum Operating Pressure: Port 3: 345 bar (5000 psi)
Ports 2 and 4: 240 bar (3500 psi)
Ports 1 and 6: 27.6 bar (400 psi)

Flow: See Performance Chart

Internal Leakage: 295 cc/minute (18 cu. in./minute) at 207 bar (3000 psi)

Temperature: -40 to 120°C with standard Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

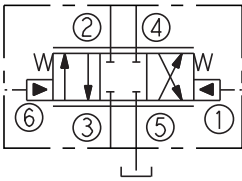
Cavity: VC16-S6; See page 9.116.1

Cavity Tool: CT16-S6; See page 8.600.1

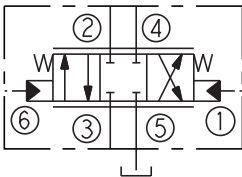
Seal Kit: SK16-S6P-BMMMM; See page 8.650.1

SYMBOLS

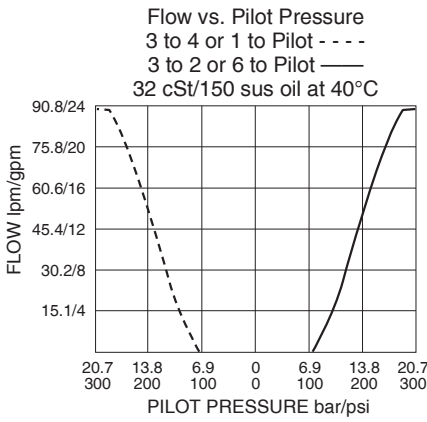
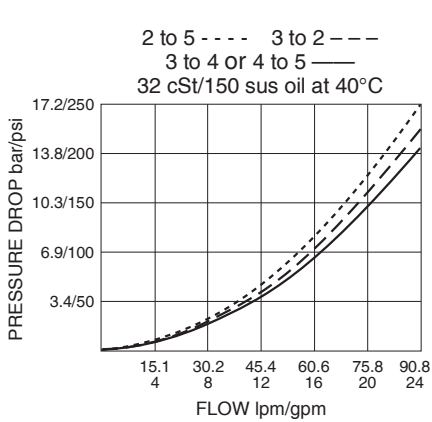
USASI:



ISO:

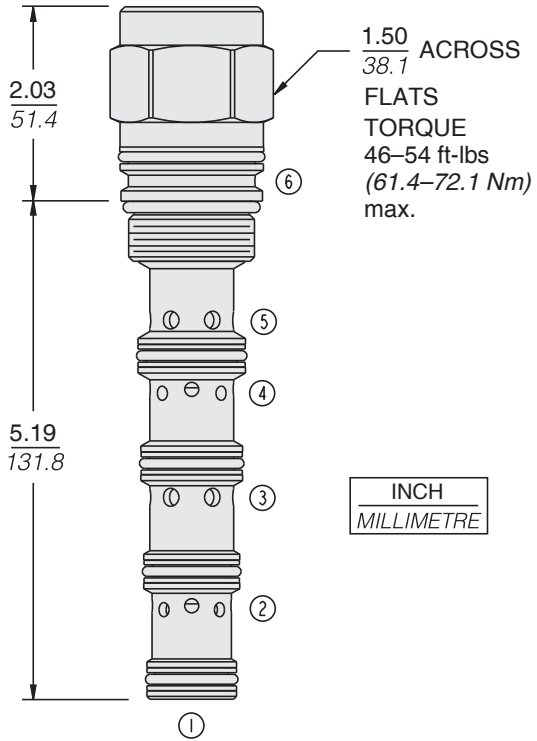


PERFORMANCE (Cartridge Only)



DIMENSIONS

U.S. Patent 6,554,014



MATERIALS

Cartridge: Weight: 0.76 kg. (1.68 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Test Body: Consult Factory

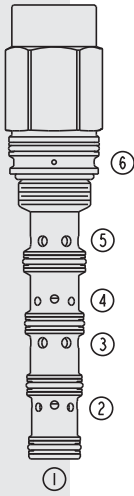
TO ORDER

PE16-S67C - -
 Porting
 Cartridge Only 0

- Seals**
- N** Buna N (Std.)
 - P** Polyurethane (for pressures over 240 bar/3500 psi)
 - V** Fluorocarbon

HPE16-S67C HyPerformance™ Proportional,

U.S. Patent
6,554,014



DESCRIPTION

A high pressure, screw-in, cartridge-style, proportional, spring-centered, pilot-operated spool-type hydraulic directional valve.

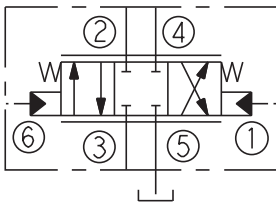
OPERATION

When the HPE16-S67C is in neutral position all ports are blocked. When the remote pilot signal at 1 exceeds the force of the bias spring, the spool shifts proportionally to the applied pilot pressure to allow flow from 3 to 4 through a load such as a hydraulic cylinder or motor, and from 2 to 5 and to tank. Port 5 is to be used as tank port only with maximum pressure of 69 bar (1000 psi). On remote pilot signal at 6 the spool shifts proportionally to the applied force in the opposite direction, this reversing the flow direction. **The valve's spool is symmetrical, providing meter-in and meter-out control.**

FEATURES

- Hardened spool and cage for long life.
- Cost-effective cavity.
- Excellent metering characteristics.
- Good linearity.
- All HyPerformance™ products are tested to the rigorous standards of the NFPA specification T2.6.1.
- All HyPerformance™ valves are tested at a verification level of 90% and an assurance of 99%.

SYMBOLS



RATINGS

Maximum Operating Pressure: Ports 2, 3, 4: 350 bar (5075 psi) 10% cycle life:
420 bar (6090 psi); Ports 1 and 6 (pilot): 35 bar (500 psi);
Port 5 (tank): 69 bar (1000 psi)

Proof Pressure: 690 bar (10000 psi); **Burst Pressure:** 1380 bar (20000 psi)

Flow: 95 lpm (25 gpm)

Internal Leakage: 330 ml/minute (20 cu. in./minute) at 350 bar (5075 psi)

Temperature: -54° to 107°C (-65° to 225° F) with PPDI Urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

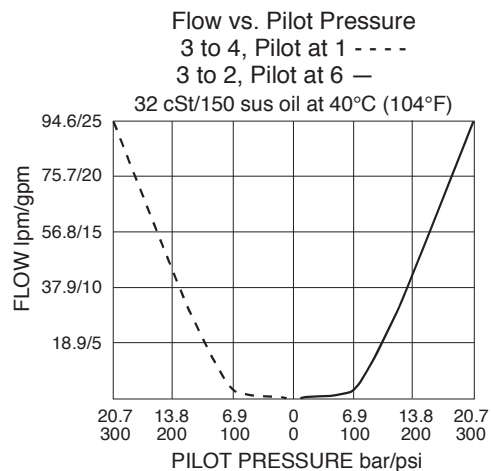
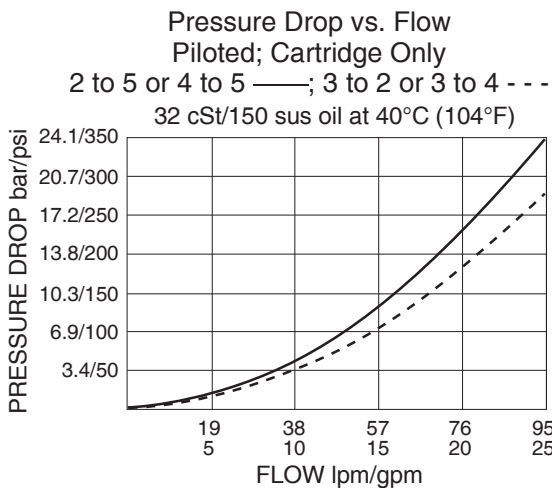
Installation: No restrictions; See page 9.020.1

Cavity: HVC16-S6; See page 9.116.1

Cavity Tool: HCT16-S6; See page 8.600.1

Seal Kit: HSK16-S6U-0000 (Urethane); See page 8.650.1

PERFORMANCE (Cartridge Only)

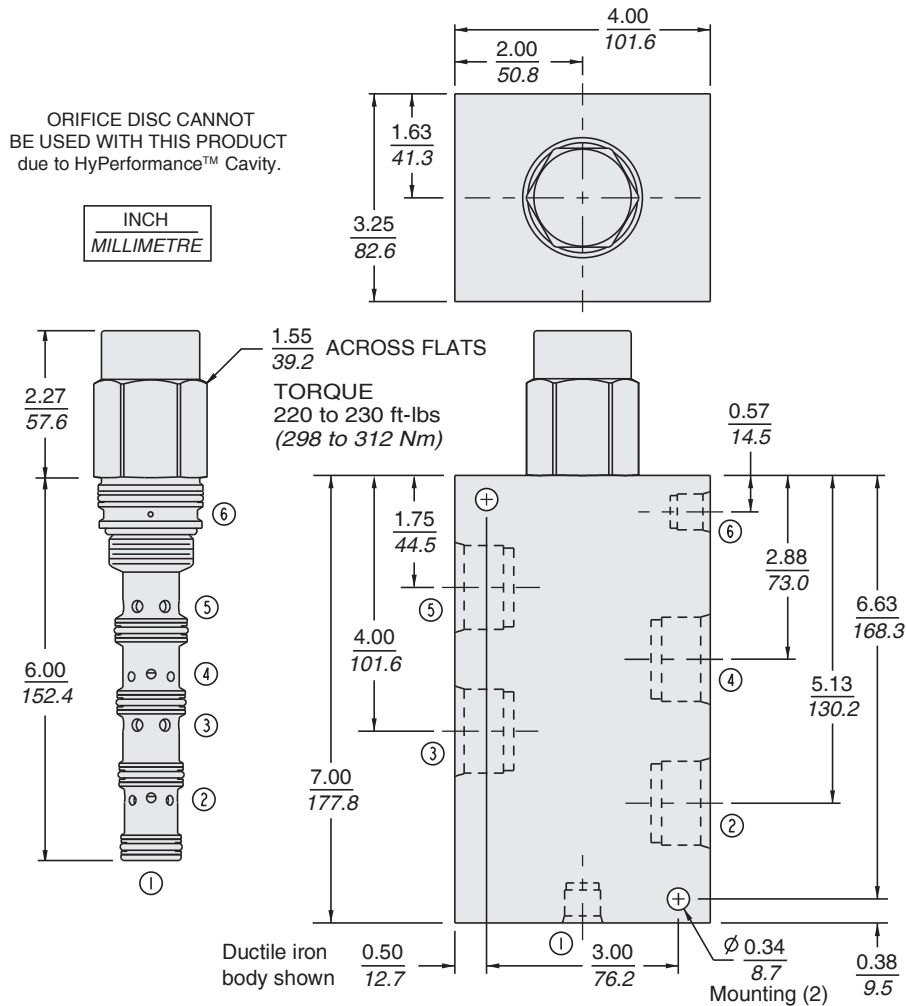


Pilot Operated

HPE16-S67C

DIMENSIONS

U.S. Patent 6,554,014



MATERIALS

Cartridge: Weight: 1.1 kg. (2.4 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Urethane seals without back-up rings standard.

Ported Body: Weight: 9.1 kg. 20.1 lbs.
HyPerformance™ ductile iron (code 'D') standard. Rated to 345 bar (5000 psi).
See page 8.016.1.

TO ORDER

HPE16-S67C - -

Porting

Cartridge Only **0**

SAE 16 **16TD**

1" BSP* **8BD**

Seals

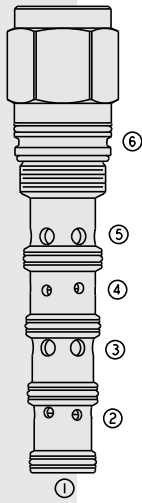
***U** PPDI Urethane

*Urethane seals recommended for operating pressures above 241 bar (3500 psi)

NOTE: Consult factory for additional seal options.

PE42-S67C Proportional, Pilot Operated

U.S. Patent
6,554,014



DESCRIPTION

A screw-in, cartridge-style, proportional, spring-centered, pilot-operated spool-type hydraulic directional valve.

OPERATION

When the **PE42-S67C** is in neutral position all ports are blocked. When the remote pilot signal at 1 exceeds the force of the bias spring, the spool shifts proportionally to the applied pilot pressure to allow flow from 3 to 4 through a load such as a hydraulic cylinder or motor, and from 2 to 5 and to tank. When the pilot signal at 6 exceeds the force of the bias spring the spool shifts proportionally to the applied force to allow flow from 3 to 2 and from 4 to 5. When the pilot signal is less than the force of the bias spring, the spool will return to the center position. **The valve's spool is symmetrical, providing meter-in and meter-out control.**

FEATURES

- Hardened spool and cage for long life.
- Cost-effective cavity.
- Excellent metering characteristics.
- Good linearity.

RATINGS

Maximum Operating Pressure: Port 3: 345 bar (5000 psi)
Ports 2 and 4: 240 bar (3500 psi)
Ports 1 and 6: 27.6 bar (400 psi)

Flow: 0–170 lpm (0–45 gpm); See Performance Chart

Internal Leakage: 590 cc/minute (36 cu. in./minute) at 207 bar (3000 psi)

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

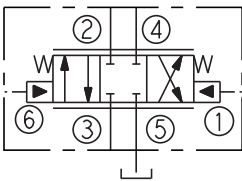
Cavity: VC42-S6; See page 9.142.1

Cavity Tool: CT42-S6; See page 8.600.1

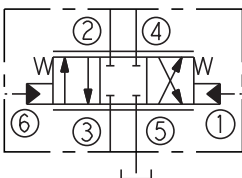
Seal Kit: SK42-S6X-BMMMM; See page 8.650.1

SYMBOLS

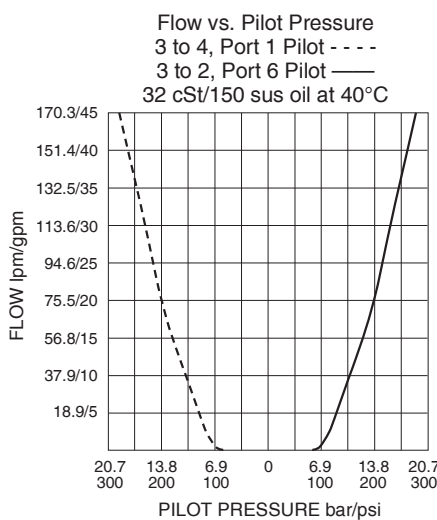
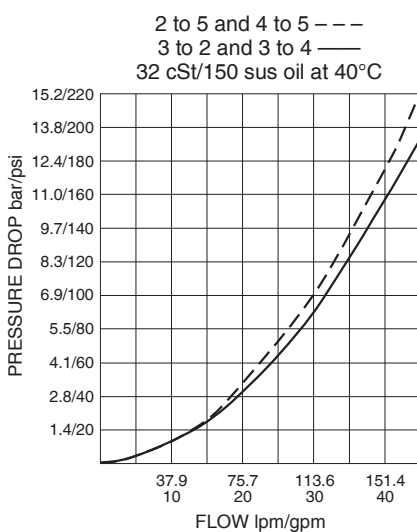
USASI:



ISO:

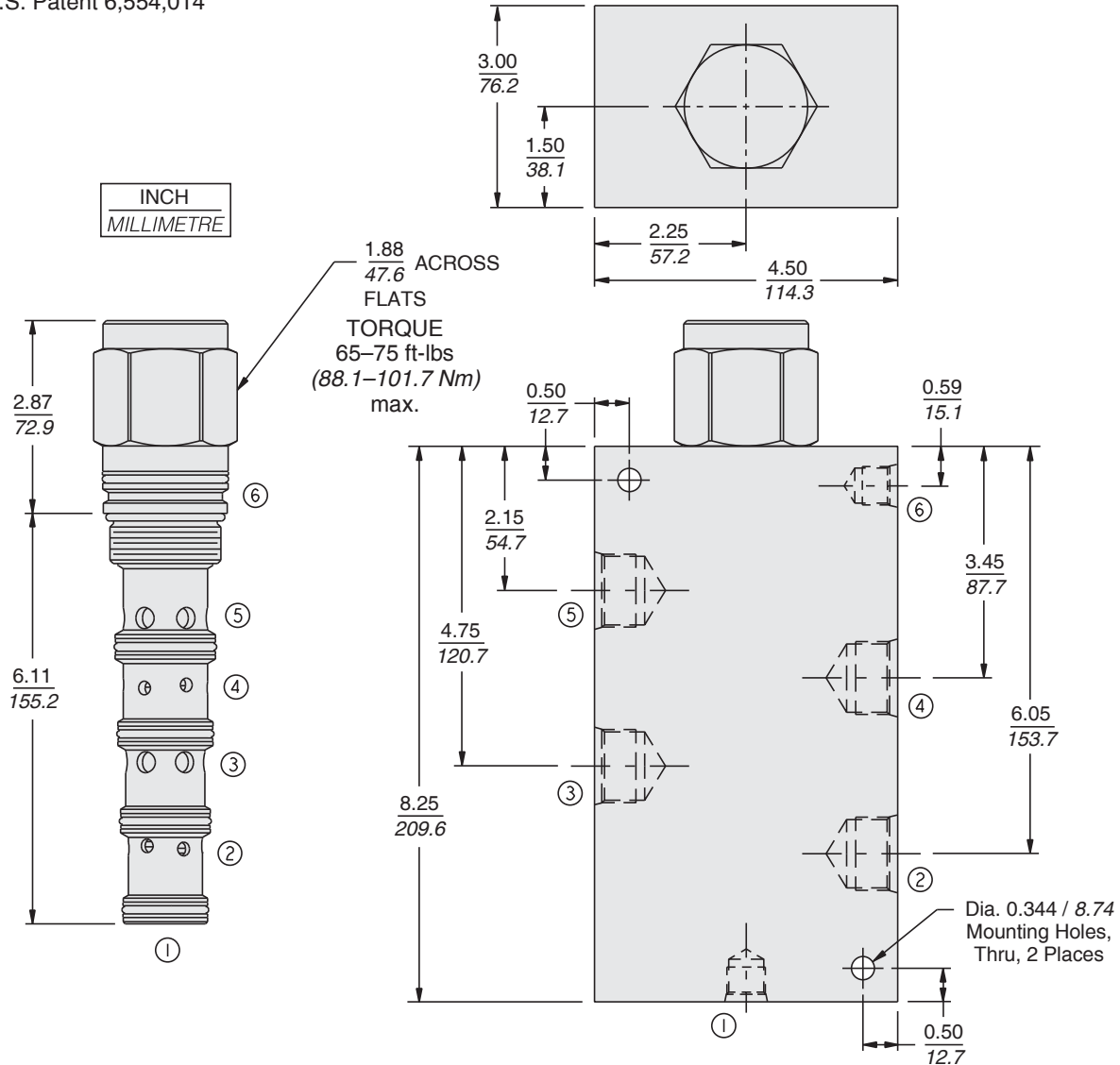


PERFORMANCE (Cartridge Only)



DIMENSIONS

U.S. Patent 6,554,014



MATERIALS

Cartridge: Weight: 0.76 kg. (1.68 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Ported Body: Ductile Iron,
Rated to 345 bar (5000 psi).
See page 8.042.1

TO ORDER

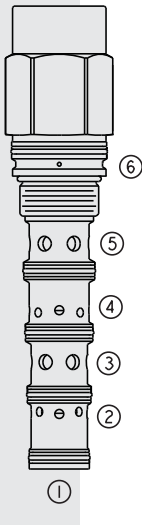
PE42-S67C - -

Porting
Cartridge Only 0
SAE 12 12TD
SAE 16 16TD
SAE 20 20TD
*3/4 in. BSP 6BD
*1 in. BSP 8BD
*1-1/4 in. BSP 10BD
*BSP Body; U.K. Mfr. Only

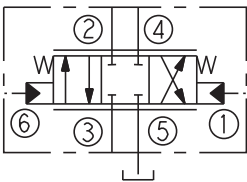
Seals
N Buna N (Std.)
P Polyurethane (Required for pressures over 240 bar/3500 psi)
V Fluorocarbon

HPE42-S67C HyPerformance™, Proportional

U.S. Patent
6,554,014



ISO SYMBOL



DESCRIPTION

A high pressures, screw-in, cartridge-style, proportional, spring-centered, pilot-operated spool-type hydraulic directional valve.

OPERATION

When the **HPE42-S67C** is in neutral position all ports are blocked. When the remote pilot signal at 1 exceeds the force of the bias spring, the spool shifts proportionally to the applied pilot pressure to allow flow from 3 to 4 through a load such as a hydraulic cylinder or motor, and from 2 to 5 and to tank. Port 5 is to be used as a tank port only with maximum pressure of 69 bar (1000 psi). On remote pilot signal at port 6 the spool shifts proportionally to the applied force in the opposite direction, thus reversing the flow direction.

The valve's spool is symmetrical, providing meter-in and meter-out control.

FEATURES

- Hardened spool and cage for long life.
- Cost-effective cavity.
- Excellent metering characteristics.
- Good linearity.
- All HyPerformance™ products are tested to the rigorous standards of NFPA specification T2.6.1.
- All HyPerformance™ valves are tested at a verification level of 90% and an assurance of 99%.

RATINGS

Maximum Operating Pressure: Ports 2, 3, 4 (work): 350 bar (5075 psi);

Ports 2, 3, 4 at 10% cycle life: 420 bar (6090 psi);

Ports 1 and 6 (pilot): 35 bar (500 psi); Port 5 (tank): 69 bar (1000 psi)

Flow: 170 lpm (45 gpm)

Internal Leakage: 590 ml/minute (36 cu. in./minute) at 350 bar (5075 psi)

Temperature: -54°C to 107°C (-65°F to 225°F) with PPDI urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

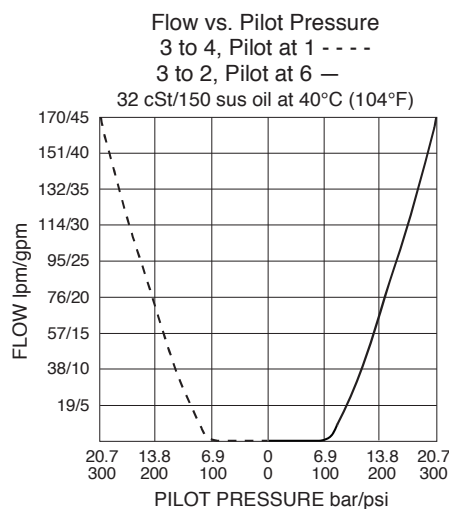
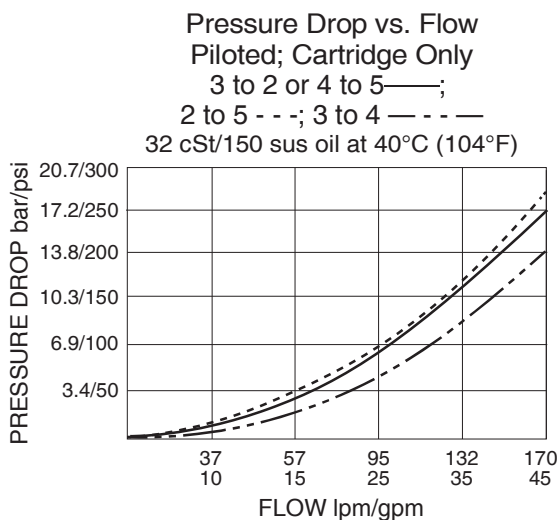
Installation: No restrictions; See page 9.020.1

Cavity: HVC42-S6 Variation A; See page 9.142.1

Cavity Tool: HCT42-S6; See page 8.600.1

Seal Kit: HSK42-S6U-0000; See page 8.650.1

PERFORMANCE (Cartridge Only)

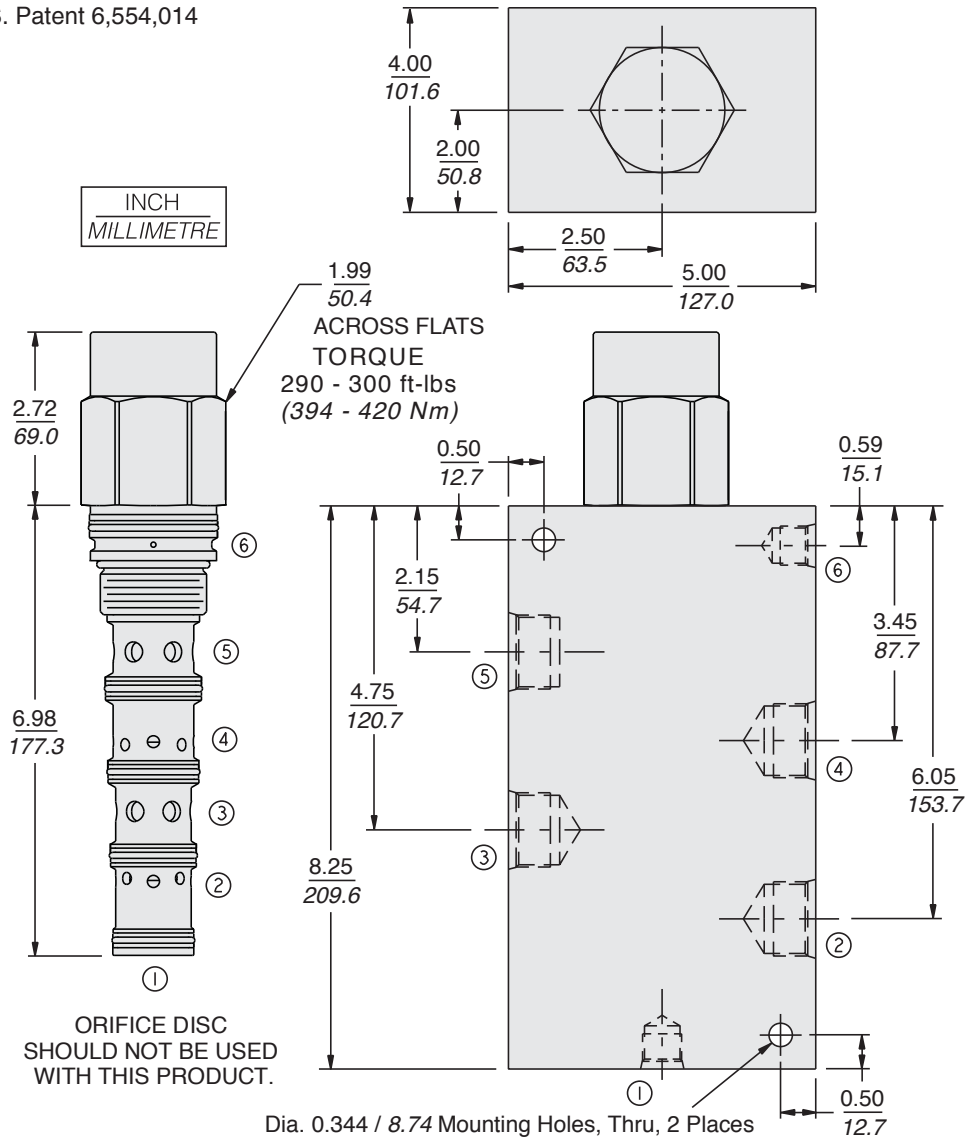


Pilot Operated

HPE42-S67C

DIMENSIONS

U.S. Patent 6,554,014



MATERIALS

Cartridge: Weight: 2.0 kg. (4.5 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Urethane seals without back-up rings standard.

Ported Body: Weight: 16.61 kg. (36.62 lbs.)
HyPerformance™ ductile iron (code 'D') standard. Rated to 345 bar (5000 psi).
See page 8.042.1.

TO ORDER

HPE42-S67C - -

Porting
Cartridge Only **0**
SAE 20 **20TD**
*1-1/4 in. BSP **10BD**
*BSP Body; U.K. Mfr. Only

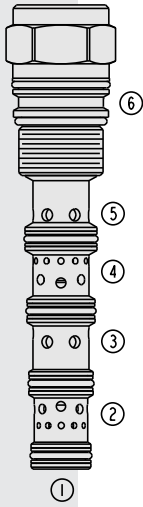
Seals
***U** PPDI Urethane

*Urethane seals recommended for operating pressures above 241 bar (3500 psi).

NOTE: Consult factory for additional seal options.

PE12-S67D Proportional, Pilot Operated

U.S. Patent
6,554,014



DESCRIPTION

A screw-in, cartridge-style, proportional, spring-centered, pilot-operated spool-type hydraulic directional valve.

OPERATION

When the PE12-S67D is in neutral position, port 3 is blocked while 2, 4 and 5 are connected to each other. When the remote pilot signal at 1 exceeds the force of the bias spring, the spool shifts proportionally to the applied pilot pressure to allow flow from 3 to 4 through a load such as a hydraulic cylinder or motor, and from 2 to 5 and to tank. On remote pilot signal at 6, the valve's spool shifts proportionally to the applied pressure in the opposite direction, reversing the flow direction. **The valve's spool is symmetrical, providing meter-in and meter-out control.**

FEATURES

- Hardened parts for long life.
- Excellent metering characteristics.
- Good linearity.

RATINGS

Maximum Operating Pressure:

- Ports 3 and 5: 345 bar (5000 psi), polyurethane seals are recommended.
- Ports 2 and 4: 240 bar (3500 psi)
- Ports 1 and 6: 27.6 bar (400 psi)

Flow: See Performance Chart

Internal Leakage: 36 ml/minute (2.2 cu. in./minute) at 207 bar (3000 psi)

Temperature: -40 to 120°C with standard Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

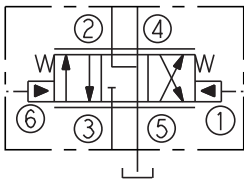
Cavity: VC12-S6; See page 9.112.1

Cavity Tool: CT12-S6; See page 8.600.1

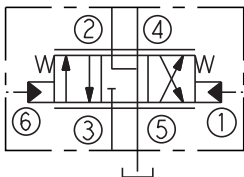
Seal Kit: SK12-6X-BMMMM; See page 8.650.1

SYMBOLS

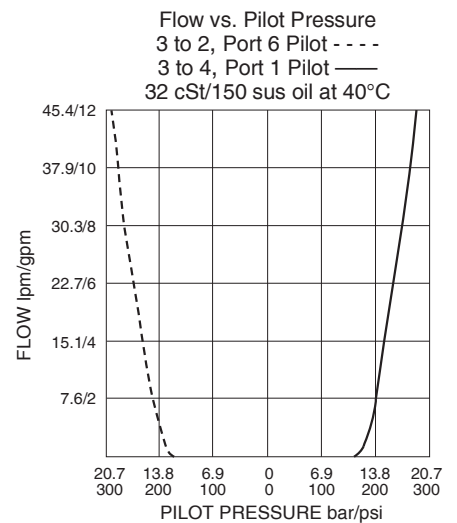
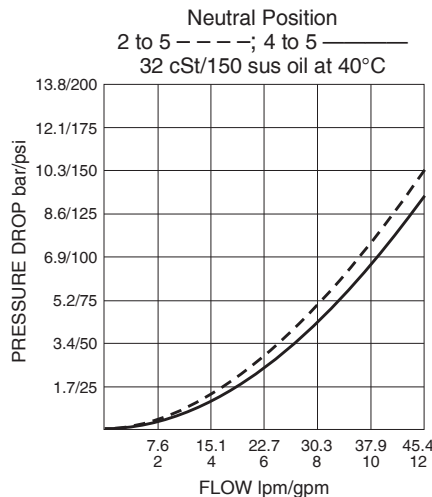
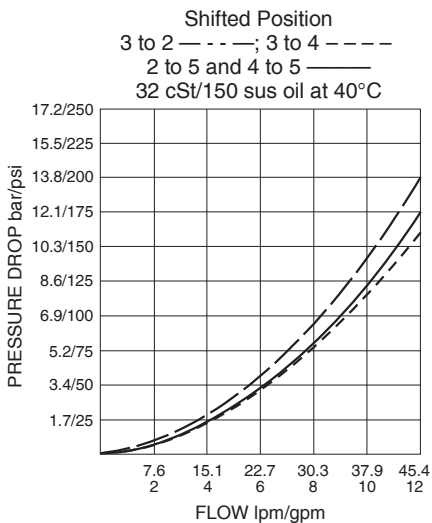
USASI:



ISO:

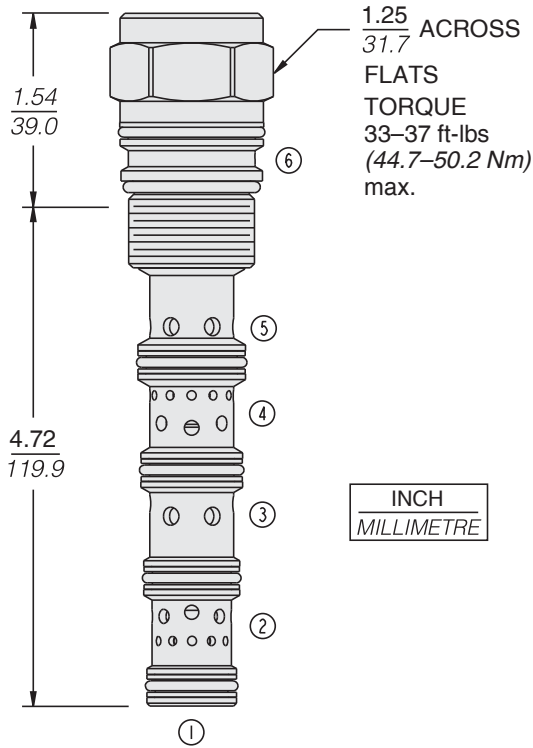


PERFORMANCE (Cartridge Only)



DIMENSIONS

U.S. Patent 6,554,014



MATERIALS

Cartridge: Weight: 0.45 kg. (0.98 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Ported Body: Test housing available.
See page 8.012.1.

TO ORDER

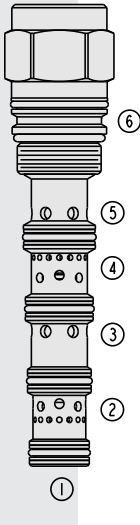
PE12-S67D - -
Porting
Cartridge Only 0

Seals

- N Buna N (Std.)
- P Polyurethane (for pressures over 240 bar/3500 psi)
- V Fluorocarbon

PE16-S67D Proportional, Pilot Operated

U.S. Patent
6,554,014



DESCRIPTION

A screw-in, cartridge-style, proportional, spring-centered, pilot-operated spool-type hydraulic directional valve.

OPERATION

When the **PE16-S67D** is in neutral position, inlet port 3 is blocked while ports 2, 4 and 5 are connected to each other. With remote pilot signal at port 1, the valve's spool shifts proportionally to the applied pilot pressure to allow flow from 3 to 4 through a load such as a hydraulic cylinder or motor, and then from 2 to 5 and to tank. On remote pilot signal at 6, the spool shifts proportionally to the applied pressure in the opposite direction, reversing the flow direction. **The spool is symmetrical, providing both meter-in and meter-out control.**

FEATURES

- Hardened spool and cage for long life.
- Cost-effective cavity.
- Excellent metering characteristics.
- Good linearity.

RATINGS

Maximum Operating Pressure: Port 3: 345 bar (5000 psi)
Ports 2 and 4: 240 bar (3500 psi)
Ports 1 and 6: 27.6 bar (400 psi)

Flow: See Performance Chart

Internal Leakage: 197 ml/minute (12 cu. in./minute) at 207 bar (3000 psi) maximum

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

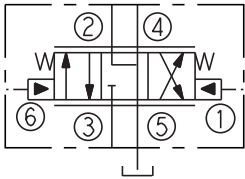
Cavity: VC16-S6; See page 9.116.1

Cavity Tool: CT16-S6; See page 8.600.1

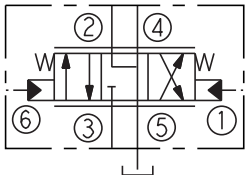
Seal Kit: SK16-S6X-BMMMM; See page 8.650.1

SYMBOLS

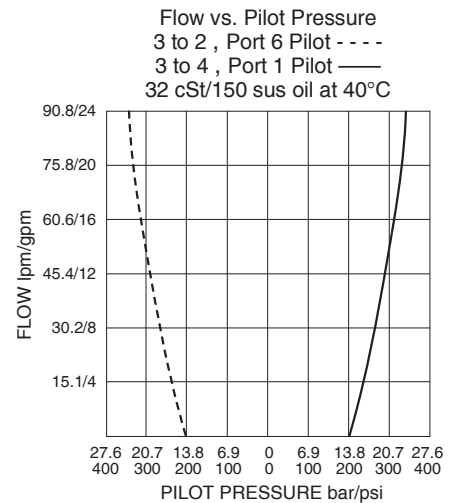
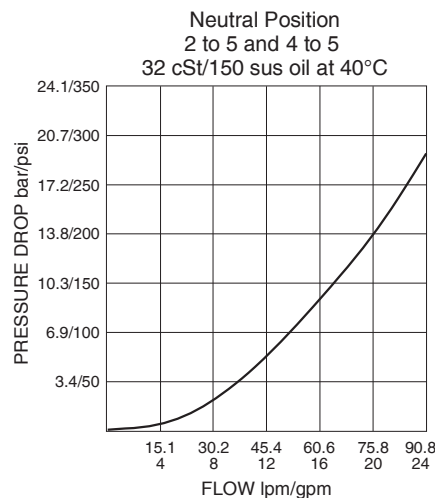
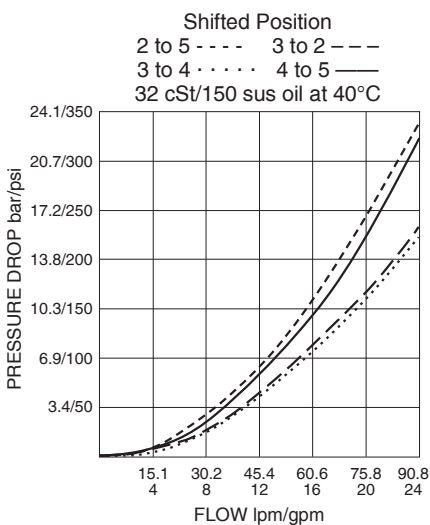
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ISO:

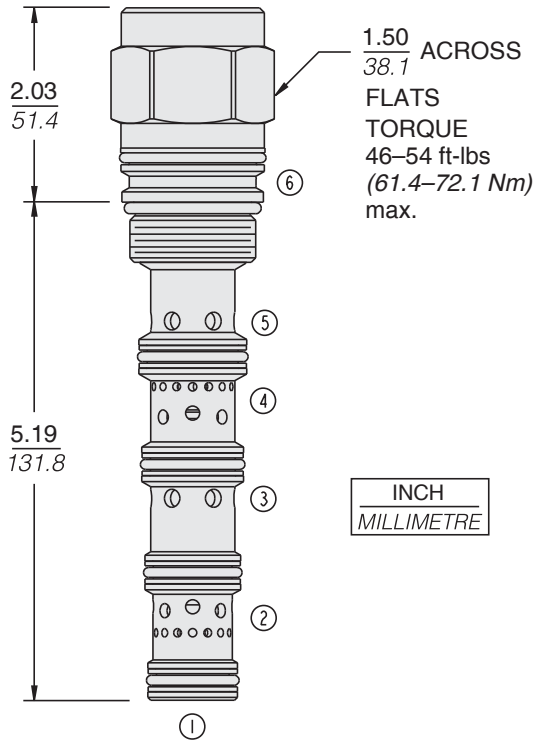


PERFORMANCE (Cartridge Only)



DIMENSIONS

U.S. Patent 6,554,014



MATERIALS

Cartridge: Weight: 0.76 kg. (1.68 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Test Body: Consult Factory

TO ORDER

PE16-S67D - -
 Porting
 Cartridge Only 0

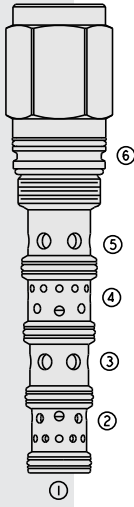
Seals
N Buna N (Std.)
P Polyurethane (for pressures over 240 bar/3500 psi)
V Fluorocarbon

HPE16-S67D

For more information on ***HPE16-S67D***,
please visit our website at
www.hydraforce.com

PE42-S67D Proportional, Pilot Operated

U.S. Patent
6,554,014



DESCRIPTION

A screw-in, cartridge-style, proportional, spring-centered, pilot-operated spool-type hydraulic directional valve.

OPERATION

When the **PE42-S67D** is in neutral position port 3 is blocked and ports 2, 4 and 5 are connected to each other. When the remote pilot signal at 1 exceeds the force of the bias spring the spool shifts proportionally to the applied pilot pressure to allow flow from 3 to 4 and from 2 to 5, and to tank. On remote pilot signal at 6, the spool shifts proportionally to the applied force in the opposite direction, thus reversing the flow direction. **The spool is symmetrical and provides meter-in and meter-out control.**

FEATURES

- Hardened spool and cage for long life.
- Excellent metering characteristics.
- Good linearity.

RATINGS

Maximum Operating Pressure: Port 3: 345 bar (5000 psi)
Ports 2 and 4: 240 bar (3500 psi)
Ports 1 and 6: 27.6 bar (400 psi)

Flow: See Performance Chart

Internal Leakage: 737 ml/minute (45 cu. in./minute) at 207 bar (3000 psi)

Temperature: -40 to 120°C with standard Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

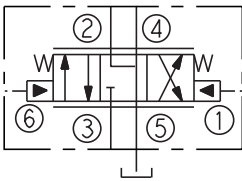
Cavity: VC42-S6; See page 9.142.1

Cavity Tool: CT42-S6; See page 8.600.1

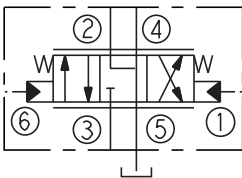
Seal Kit: SK42-S6X-BMMMM; See page 8.650.1

SYMBOLS

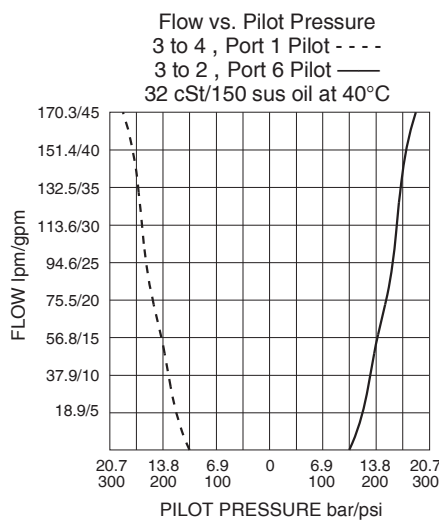
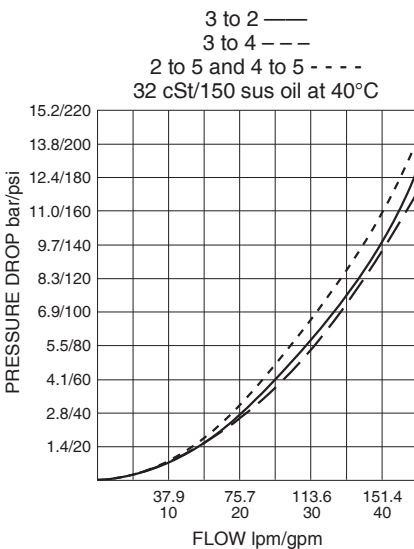
USASI:



ISO:

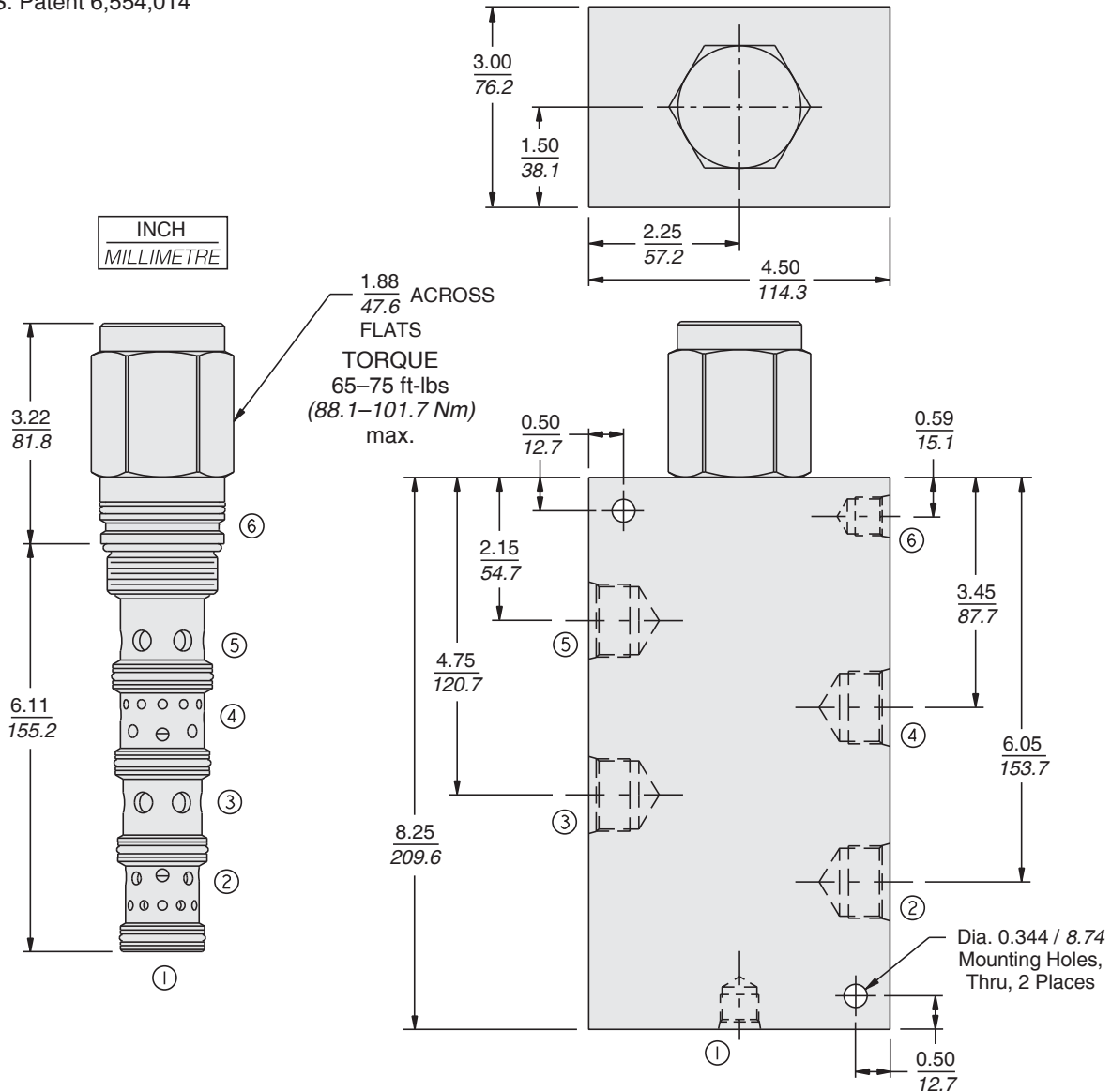


PERFORMANCE (Cartridge Only)



DIMENSIONS

U.S. Patent 6,554,014



MATERIALS

Cartridge: Weight: 0.76 kg. (1.68 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Ported Body: Ductile Iron,
Rated to 345 bar (5000 psi).
See page 8.042.1

TO ORDER

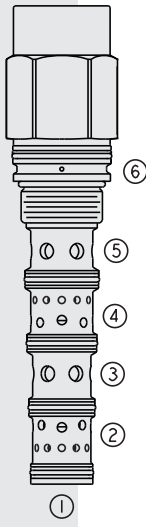
PE42-S67D - -

Porting
Cartridge Only 0
SAE 12 12TD
SAE 16 16TD
SAE 20 20TD
*3/4 in. BSP 6BD
*1 in. BSP 8BD
*1-1/4 in. BSP 10BD
*BSP Body; U.K. Mfr. Only

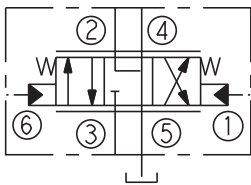
Seals
N Buna N (Std.)
P Polyurethane (Required for pressures over 240 bar/3500 psi)
V Fluorocarbon

HPE42-S67D HyPerformance™, Proportional

U.S. Patent
6,554,014



ISO SYMBOL



DESCRIPTION

A high pressure, screw-in, cartridge-style, proportional, spring-centered, pilot-operated spool-type hydraulic directional valve.

OPERATION

When the **HPE42-S67D** is in neutral position inlet port 3 is blocked and ports 2, 4 and 5 are connected to each other. On remote pilot signal at 1, the spool shifts proportionally to the applied pilot pressure to allow flow from 3 to 4, through a load such as a hydraulic cylinder or motor, and from 2 to 5 and to tank. Port 5 is to be used as a tank port only with maximum pressure of 69 bar (1000 psi). On remote pilot signal at 6, the spool shifts proportionally to the applied force in the opposite direction, thus reversing the flow direction. **The spool is symmetrical and provides meter-in and meter-out control.**

FEATURES

- Hardened spool and cage for long life.
- Excellent metering characteristics.
- Good linearity.
- All HyPerformance™ products are tested to the rigorous standards of the NFPA specification T2.6.1.
- All HyPerformance™ valves are tested at a verification level of 90% and an assurance of 99%.

RATINGS

Maximum Operating Pressure: Ports 2, 3, 4 (work): 350 bar (5075 psi) (10% life cycle) 420 bar (6090 psi); Ports 1 and 6 (pilot): 35 bar (500 psi); Port 5 (tank): 69 bar (1000 psi)

Flow Rating: 170 lpm (45 gpm)

Internal Leakage: 820 ml/minute (50 cu. in./minute) at 350 bar (5075 psi)

Temperature: -54°C to 107°C with urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

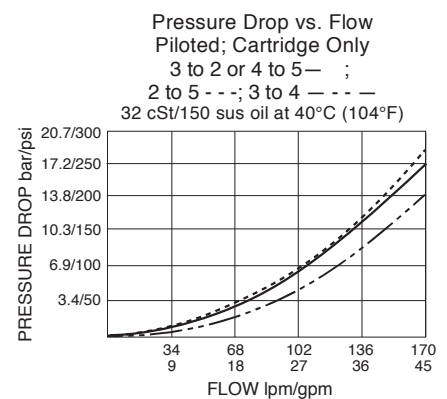
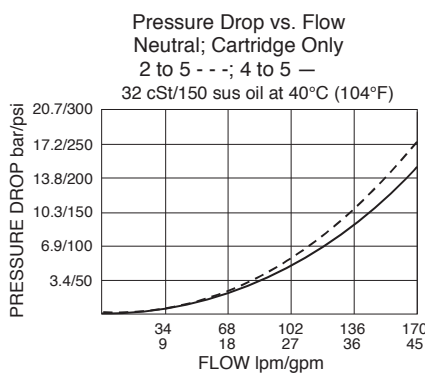
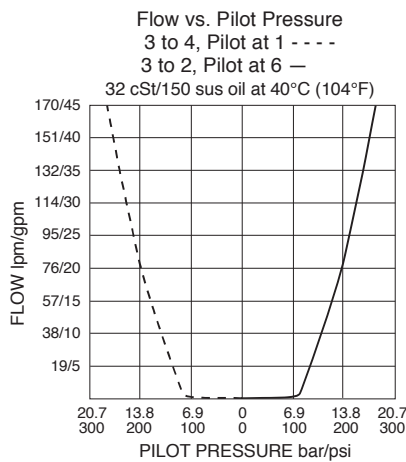
Installation: No restrictions; See page 9.020.1

Cavity: HVC42-S6, Variation A; See page 9.142.1

Cavity Tool: HCT42-S6; See page 8.600.1

Seal Kit: HSK42-S6U-0000; See page 8.650.1

PERFORMANCE (Cartridge Only)

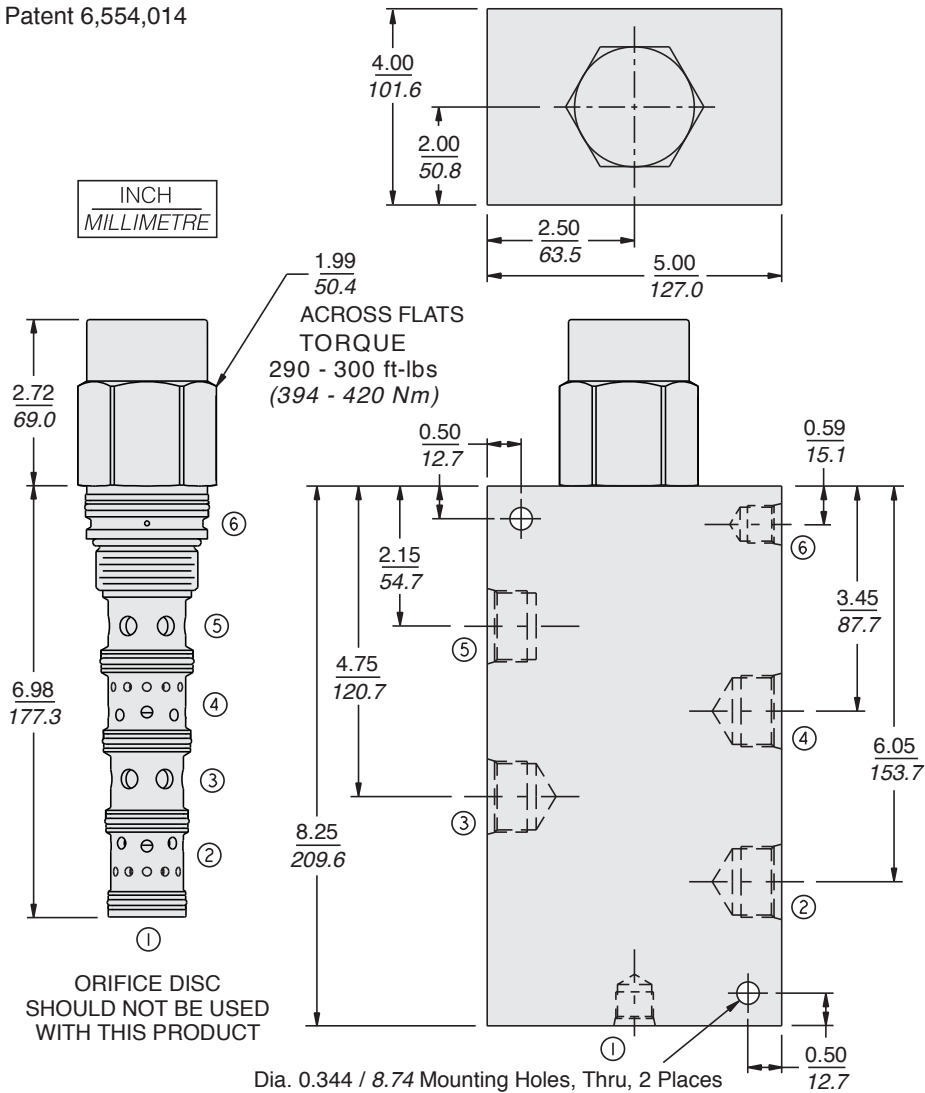


Pilot-Operated Directional Valve

HPE42-S67D

DIMENSIONS

U.S. Patent 6,554,014



MATERIALS

Cartridge: Weight: 2.0 kg. (4.5 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Ported Body: Weight: 16.61 kg. (36.62 lbs.)
HyPerformance™ ductile iron (code 'D') standard. Rated to 345 bar (5000 psi). See page 8.042.1

TO ORDER

HPE42-S67D - -

Porting
Cartridge Only **0**
SAE 20 **20TD**
*1-1/4 in. BSP **10BD**
*BSP Body; U.K. Mfr. Only

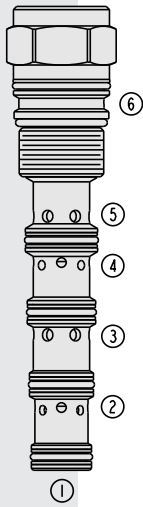
Seals
U PPDI Urethane (Std.)

Note: PPDI Urethane seals are recommended for pressures over 241 bar (3500 psi).

Note: Consult factory for additional seal options.

PE12-S67H Proportional, Pilot Operated

U.S. Patent
6,554,014



DESCRIPTION

A screw-in, cartridge-style, proportional, spring-centered, pilot-operated spool-type hydraulic directional valve.

OPERATION

When the PE12-S67H is in neutral position port 3 is blocked and ports 2, 4 and 5 are in communication with each other. When the remote pilot signal at 1 exceeds the force of the bias spring, the spool shifts proportionally to the applied pilot pressure to allow flow from 3 to 4, through a load such as a hydraulic cylinder or motor, and from 2 to 5 and to tank. On remote pilot signal at 6, the spool shifts proportionally to the applied pressure in the opposite direction, thus reversing the flow direction. **The valve's spool is symmetrical, providing meter-in and meter-out control.**

FEATURES

- Hardened spool and cage for long life.
- Excellent metering characteristics.
- Good linearity.

RATINGS

Maximum Operating Pressure: Ports 3 and 5: 345 bar (5000 psi)
Ports 2 and 4: 240 bar (3500 psi)
Ports 1 and 6: 27.6 bar (400 psi)

Orifice Diameter: Between ports 2 and 4 and port 5 in neutral position: 0.030 in.

Flow: See Performance Chart

Internal Leakage: 100 ml/minute (6 cu. in./minute) at 207 bar (3000 psi)

Temperature: -40 to 120°C with standard Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

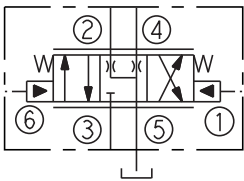
Cavity: VC12-S6; See page 9.112.1

Cavity Tool: CT12-S6; See page 8.600.1

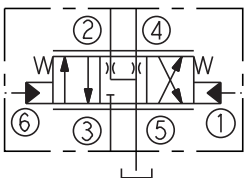
Seal Kit: SK12-6X-BMMMM; See page 8.650.1

SYMBOLS

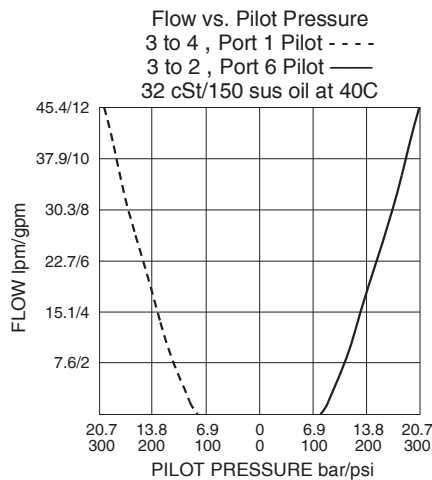
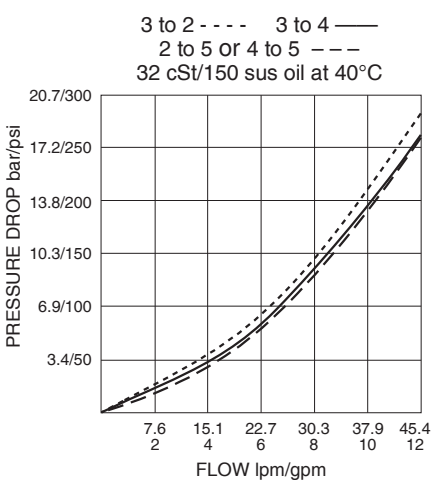
USASI:



ISO:



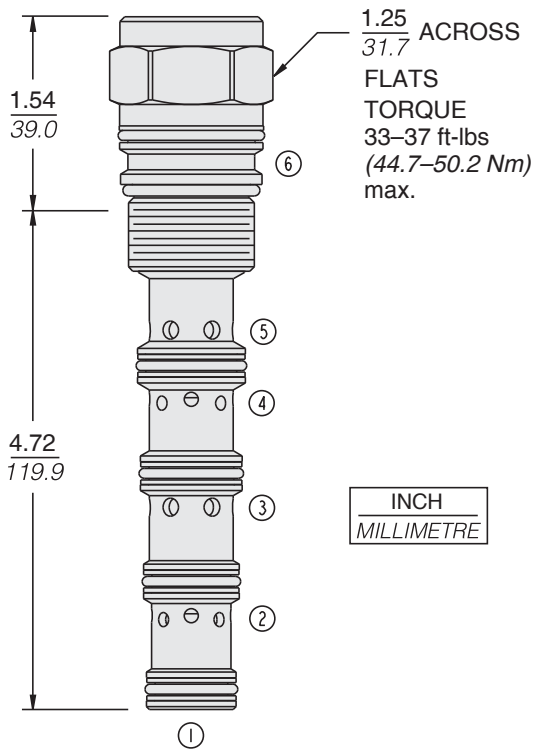
PERFORMANCE (Cartridge Only)



PE12-S67H

DIMENSIONS

U.S. Patent 6,554,014



MATERIALS

Cartridge: Weight: 0.98 kg. (0.45 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Ported Body: Test housing available.
 See page 8.012.1

TO ORDER

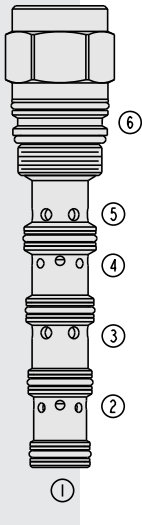
PE12-S67H - -

Porting
 Cartridge Only 0

Seals
N Buna N (Std.)
P Polyurethane (for pressures over 240 bar/3500 psi)
V Fluorocarbon

PE16-S67H Proportional, Pilot Operated

U.S. Patent
6,554,014



DESCRIPTION

A screw-in, cartridge-style, proportional, spring-centered, pilot-operated spool-type hydraulic directional valve.

OPERATION

When the PE16-S67H is in neutral position port 3 is blocked and ports 2, 4 and 5 are in communication with each other. When the remote pilot signal at 1 exceeds the force of the bias spring, the spool shifts proportionally to the applied pilot pressure to allow flow from 3 to 4, through a load such as a hydraulic cylinder or motor, and from 2 to 5 and to tank. On remote pilot signal at 6, the spool shifts proportionally to the applied pressure in the opposite direction, thus reversing the flow direction. **The valve's spool is symmetrical, providing meter-in and meter-out control.**

FEATURES

- Hardened spool and cage for long life.
- Cost-effective cavity.
- Excellent metering characteristics.
- Good linearity.

RATINGS

Maximum Operating Pressure: Port 3: 345 bar (5000 psi)
Ports 2 and 4: 240 bar (3500 psi)
Ports 1 and 6: 27.6 bar (400 psi)

Orifice Diameter: Between ports 2 and 4 and port 5 in neutral position: 0.030 in.

Flow: See Performance Chart

Internal Leakage: 590 ml/minute (36 cu. in./minute) at 207 bar (3000 psi)

Temperature: -40 to 120°C with standard Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

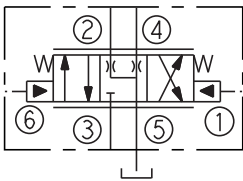
Cavity: VC16-S6; See page 9.116.1

Cavity Tool: CT16-S6; See page 8.600.1

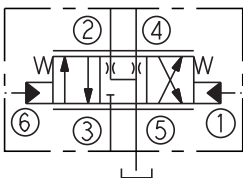
Seal Kit: SK16-S6P-BMMMM; See page 8.650.1

SYMBOLS

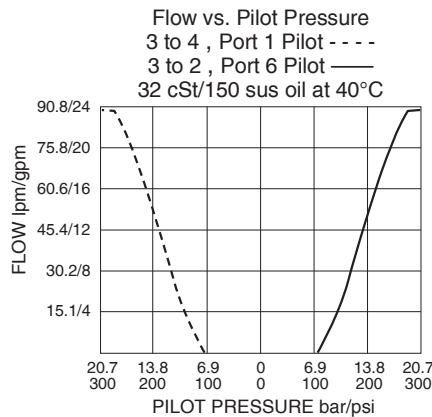
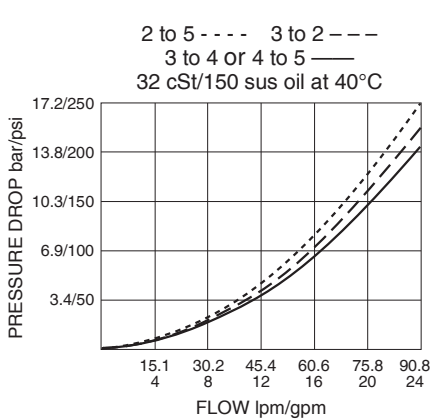
USASI:



ISO:

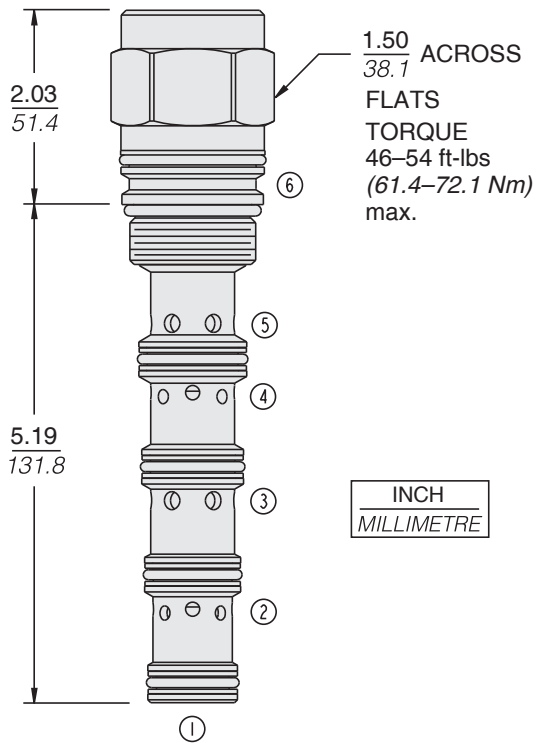


PERFORMANCE (Cartridge Only)



DIMENSIONS

U.S. Patent 6,554,014



MATERIALS

Cartridge: Weight: 0.76 kg. (1.68 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Test Body: Consult Factory

TO ORDER

PE16-S67H - -

Porting
Cartridge Only 0

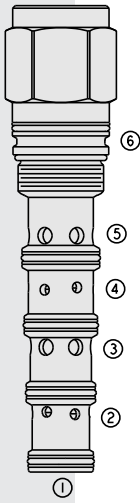
Seals
N Buna N (Std.)
P Polyurethane (for pressures over 240 bar/3500 psi)
V Fluorocarbon

HPE16-S67H

For more information on ***HPE16-S67H***,
please visit our website at
www.hydraforce.com

PE42-S67H Proportional, Pilot Operated

U.S. Patent
6,554,014



DESCRIPTION

A screw-in, cartridge-style, proportional, spring-centered, pilot-operated spool-type hydraulic directional valve with neutral position bleed-to-tank.

OPERATION

When the **PE42-S67H** is in neutral position port 3 is blocked and ports 2 and 4 are connected to 5. When the remote pilot signal at 1 exceeds the force of the bias spring the spool shifts proportionally to the applied pilot pressure to allow flow from 3 to 4 through a load such as a hydraulic cylinder or motor, and then from 2 to 5, and to tank. When the pilot signal at 6 exceeds the force of the bias spring the spool shifts proportionally to the applied force to allow flow from 3 to 2 and from 4 to 5. When the pilot signal is less than the force of the bias spring the spool will return to the center position. **The spool is symmetrical and provides meter-in and meter-out control.**

FEATURES

- Hardened spool and cage for long life.
- Cost-effective cavity.
- Excellent metering characteristics.
- Good linearity.

RATINGS

Maximum Operating Pressure: Port 3: 345 bar (5000 psi)
Ports 2 and 4: 240 bar (3500 psi)
Ports 1 and 6: 27.6 bar (400 psi)

Orifice Diameter: Between ports 2 and 4 and port 5 in neutral position: 0.030 in.

Flow: 0–170 lpm (0–45 gpm); See Performance Chart

Internal Leakage: 1180 ml/minute (72 cu. in./minute) at 207 bar (3000 psi)

Temperature: -40 to 120°C with standard Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

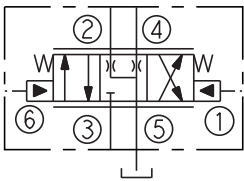
Cavity: VC42-S6; See page 9.142.1

Cavity Tool: CT42-S6; See page 8.600.1

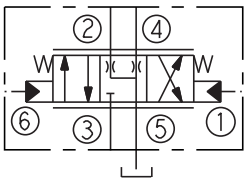
Seal Kit: SK42-S6X-BMMMM; See page 8.650.1

SYMBOLS

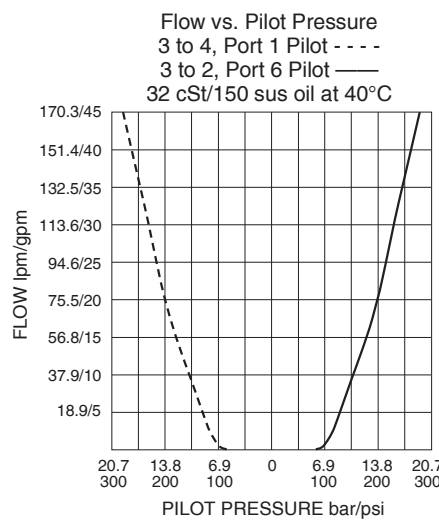
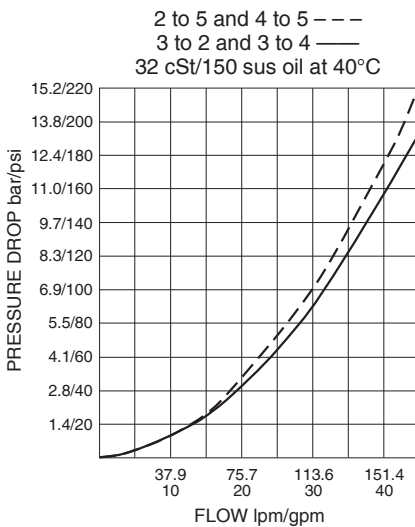
USASI:



ISO:



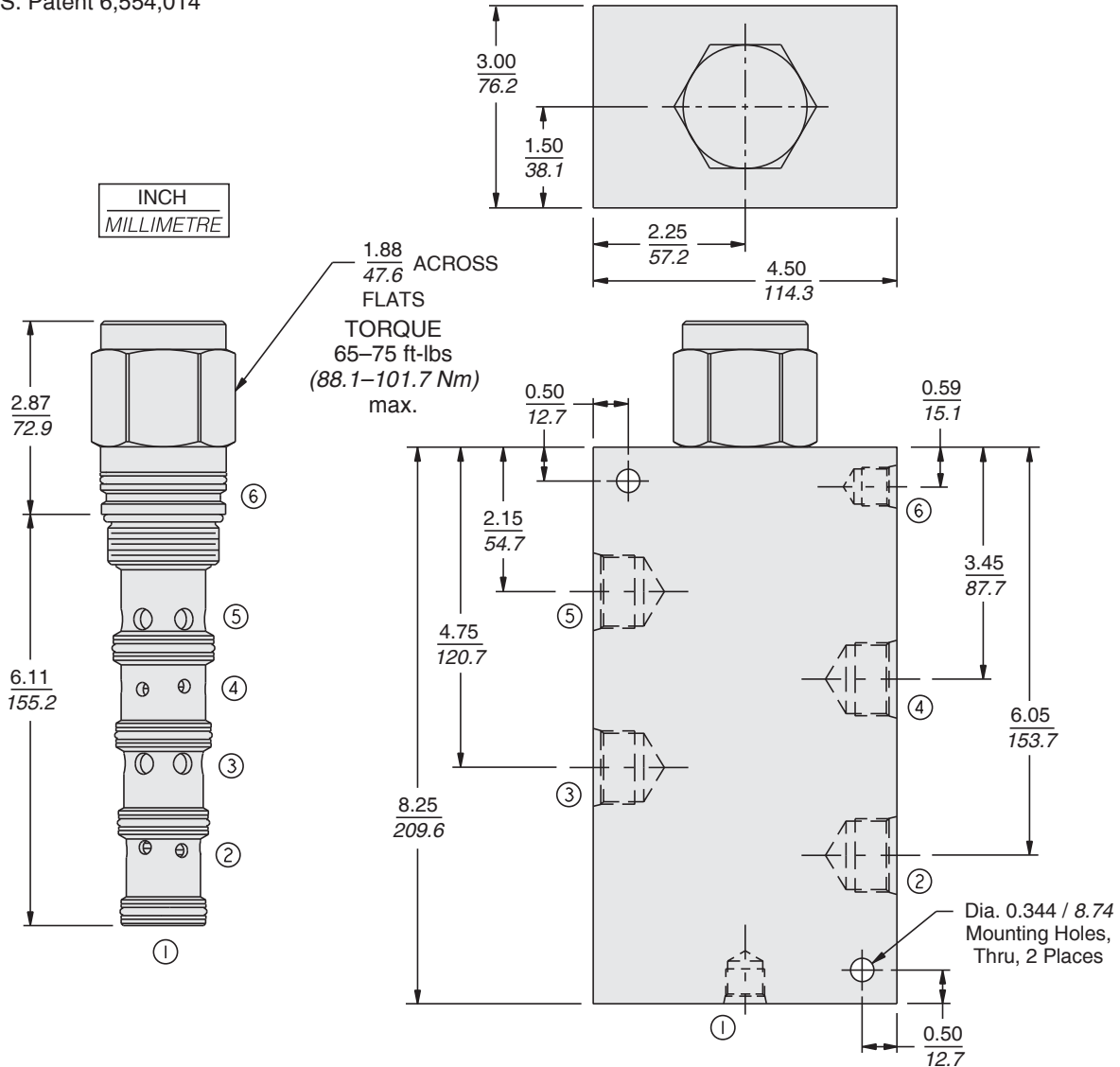
PERFORMANCE (Cartridge Only)



PE42-S67H

DIMENSIONS

U.S. Patent 6,554,014



MATERIALS

Cartridge: Weight: 0.76 kg. (1.68 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Ported Body: Ductile Iron,
Rated to 345 bar (5000 psi).
See page 8.042.1

TO ORDER

PE42-S67H - -

Porting

Cartridge Only **0**

SAE 12 **12TD**

SAE 16 **16TD**

SAE 20 **20TD**

*3/4 in. BSP **6BD**

*1 in. BSP **8BD**

*1-1/4 in. BSP **10BD**

*BSP Body; U.K. Mfr. Only

Seals

N Buna N (Std.)

P Polyurethane (Required for pressures
over 240 bar/3500 psi)

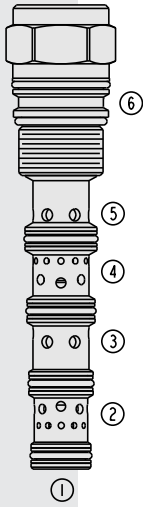
V Fluorocarbon

HPE42-S67H

For more information on ***HPE42-S67H***,
please visit our website at
www.hydraforce.com

PE12-S67K Proportional, Pilot Operated

U.S. Patent
6,554,014



DESCRIPTION

A screw-in, cartridge-style, proportional, spring-centered, pilot-operated spool-type hydraulic directional valve.

OPERATION

When the PE12-S67K is in the neutral position, port 3 is blocked while 2, 4 and 5 are connected to each other. When the remote pilot signal at 1 exceeds the force of the bias spring, the spool shifts proportionally to the applied pilot pressure to allow flow from 3 to 4 through a load such as a hydraulic cylinder or motor, and from 2 to 5 and to tank. On remote pilot signal at 6, the valve's spool shifts proportionally to the applied pressure in the opposite direction, reversing the flow direction.

The valve's spool is non-symmetrical, providing meter-in control.

FEATURES

- Hardened parts for long life.
- Excellent metering characteristics.
- Good linearity.

RATINGS

Maximum Operating Pressure:

- Ports 3 and 5: 345 bar (5000 psi), polyurethane seals are recommended.
- Ports 2 and 4: 240 bar (3500 psi)
- Ports 1 and 6: 27.6 bar (400 psi)

Flow: See Performance Chart

Internal Leakage: 36 ml/minute (2.2 cu. in./minute) at 207 bar (3000 psi)

Temperature: -40 to 120°C with standard Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

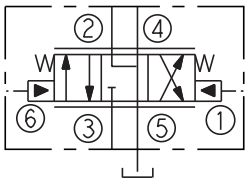
Cavity: VC12-S6; See page 9.112.1

Cavity Tool: CT12-S6; See page 8.600.1

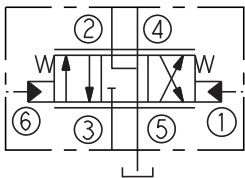
Seal Kit: SK12-6X-BMMMM; See page 8.650.1

SYMBOLS

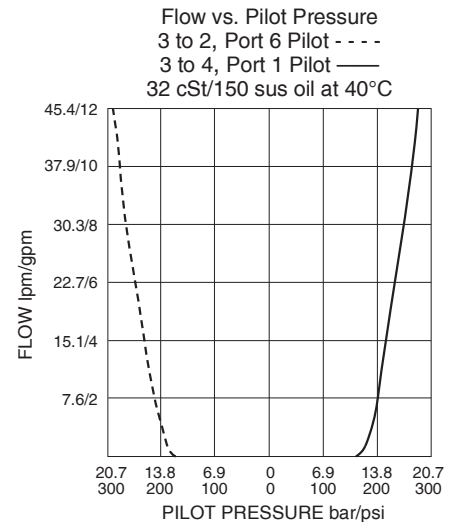
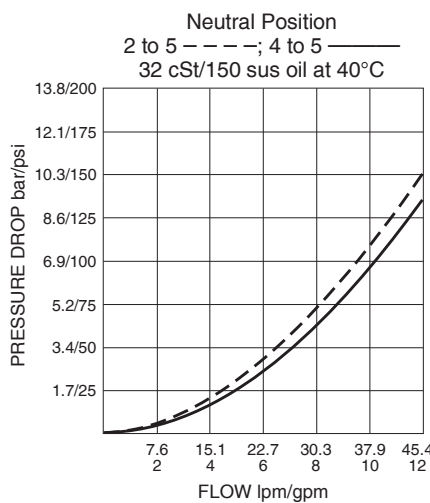
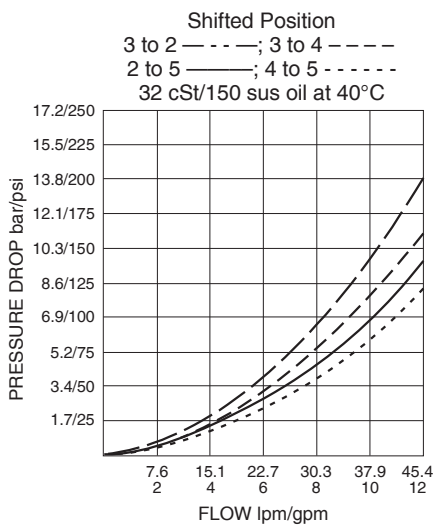
USASI:



ISO:



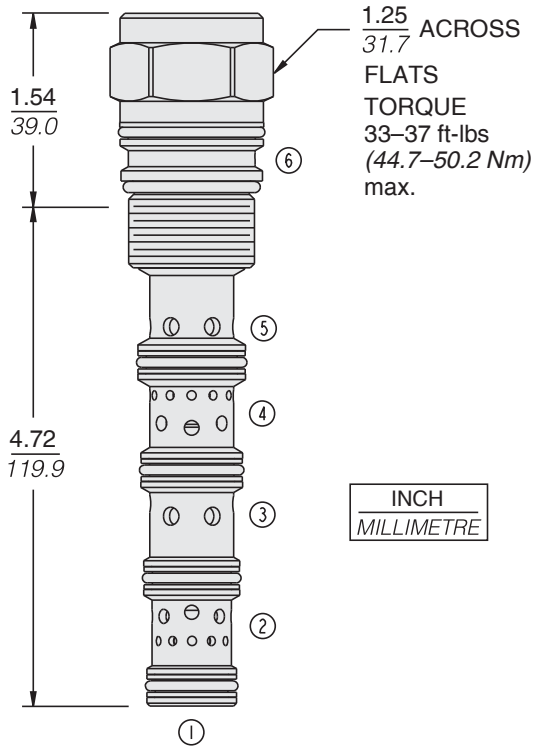
PERFORMANCE (Cartridge Only)



PE12-S67K

DIMENSIONS

U.S. Patent 6,554,014



MATERIALS

Cartridge: Weight: 0.45 kg. (0.98 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Ported Body: Test housing available.
See page 8.012.1

TO ORDER

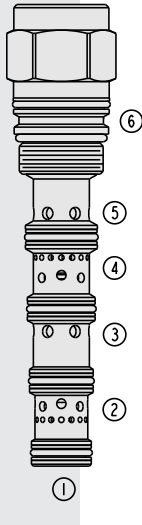
PE12-S67K - -
 Porting
 Cartridge Only 0

Seals

- N Buna N (Std.)
- P Polyurethane (for pressures over 240 bar/3500 psi)
- V Fluorocarbon

PE16-S67K Proportional, Pilot Operated

U.S. Patent
6,554,014



DESCRIPTION

A screw-in, cartridge-style, proportional, spring-centered, pilot operated spool valve.

OPERATION

When the PE16-S67K is in neutral position, inlet port 3 is blocked while ports 2, 4 and 5 are connected to each other. With remote pilot signal at port 1, the valve's spool shifts proportionally to the applied pilot pressure to allow flow from 3 to 4 through a load such as a hydraulic cylinder or motor, and then from 2 to 3 and to tank. Port 2 is open during transition. On remote pilot signal at 6, the spool shifts proportionally to the applied pressure in the opposite direction, reversing the flow direction. Port 4 is open during transition. **The spool is non-symmetrical, providing only meter-in control.**

FEATURES

- Hardened spool and cage for long life.
- Cost-effective cavity.
- Excellent metering characteristics.
- Good linearity.

RATINGS

Maximum Operating Pressure: Port 3: 345 bar (5000 psi)
Ports 2 and 4: 240 bar (3500 psi)
Ports 1 and 6: 27.6 bar (400 psi)

Flow: See Performance Chart

Internal Leakage: 197 ml/minute (12 cu. in./minute) at 207 bar (3000 psi) maximum

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

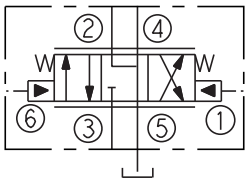
Cavity: VC16-S6; See page 9.116.1

Cavity Tool: CT16-S6; See page 8.600.1

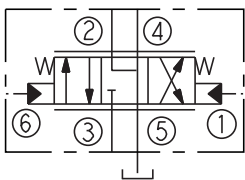
Seal Kit: SK16-S6X-BMMMM; See page 8.650.1

SYMBOLS

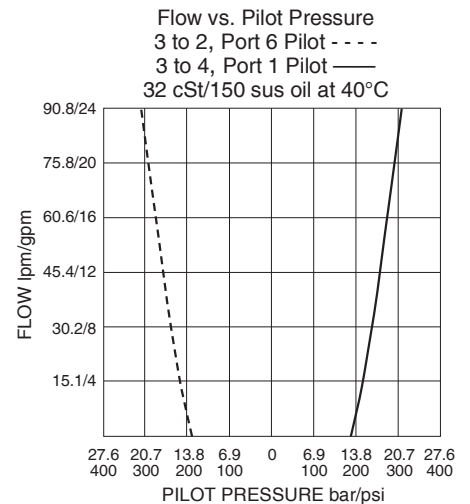
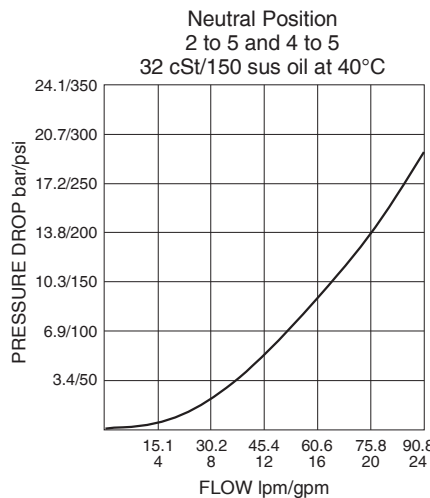
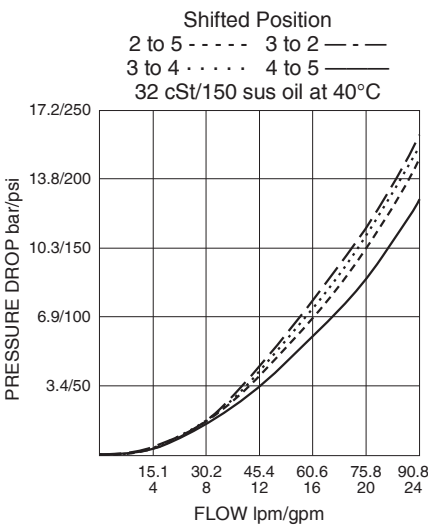
USASI:



ISO:

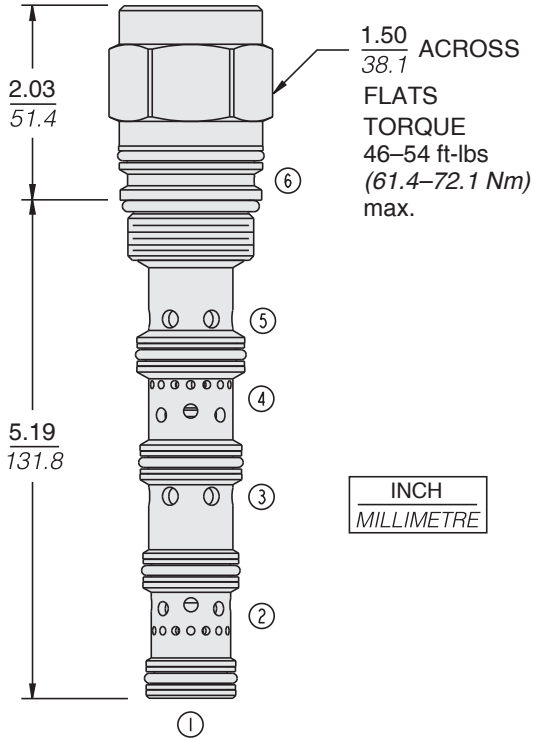


PERFORMANCE (Cartridge Only)



DIMENSIONS

U.S. Patent 6,554,014



MATERIALS

Cartridge: Weight: 0.76 kg. (1.68 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Test Body: Consult Factory

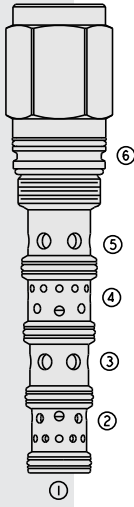
TO ORDER

PE16-S67K - -
Porting
Cartridge Only 0

Seals
N Buna N (Std.)
P Polyurethane (for pressures over 240 bar/3500 psi)
V Fluorocarbon

PE42-S67K Proportional, Pilot Operated

U.S. Patent
6,554,014



DESCRIPTION

A screw-in, cartridge-style, proportional, spring-centered, pilot-operated spool-type hydraulic directional valve.

OPERATION

When the **PE42-S67K** is in neutral position port 3 is blocked and ports 2, 4 and 5 are connected to each other. When the remote pilot signal at 1 exceeds the force of the bias spring, the spool shifts proportionally to the applied pilot pressure to allow flow from 3 to 4 and from 2 to 5, and to tank. On remote pilot signal at 6, the spool shifts proportionally to the applied force in the opposite direction, thus reversing the flow direction. **The spool is non-symmetrical, providing only meter-in control.**

FEATURES

- Hardened spool and cage for long life.
- Excellent metering characteristics.
- Good linearity.

RATINGS

Maximum Operating Pressure: Port 3: 345 bar (5000 psi)
Ports 2 and 4: 240 bar (3500 psi)
Ports 1 and 6: 27.6 bar (400 psi)

Flow: See Performance Chart

Internal Leakage: 737 ml/minute (45 cu. in./minute) at 207 bar (3000 psi)

Temperature: -40 to 120°C with standard Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

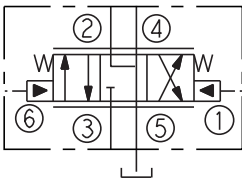
Cavity: VC42-S6; See page 9.142.1

Cavity Tool: CT42-S6; See page 8.600.1

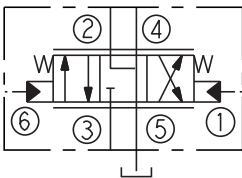
Seal Kit: SK42-S6X-BMMMM; See page 8.650.1

SYMBOLS

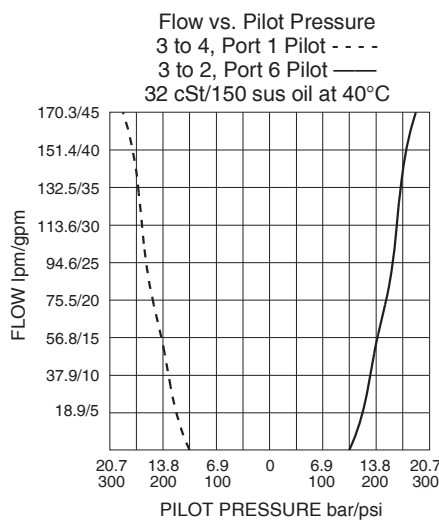
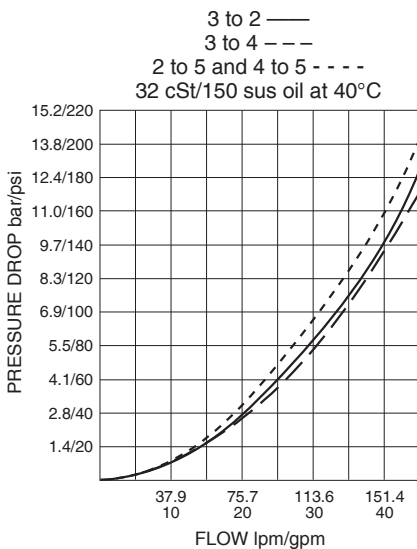
USASI:



ISO:



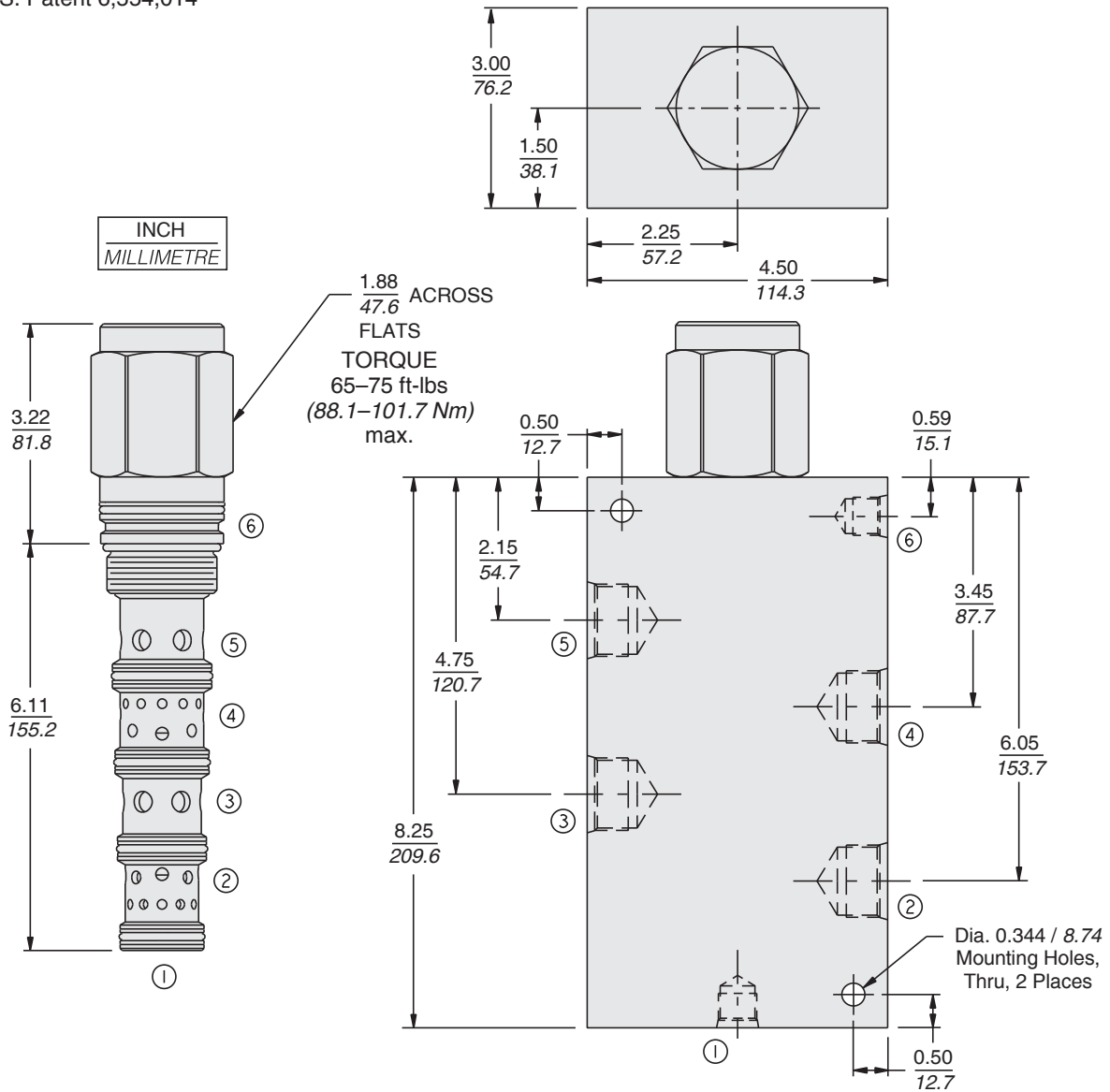
PERFORMANCE (Cartridge Only)



PE42-S67K

DIMENSIONS

U.S. Patent 6,554,014



MATERIALS

Cartridge: Weight: 0.76 kg. (1.68 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Ported Body: Ductile Iron,
Rated to 345 bar (5000 psi).
See page 8.042.1

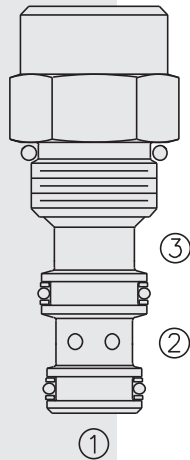
TO ORDER

PE42-S67K - -

Porting
Cartridge Only 0
SAE 12 12TD
SAE 16 16TD
SAE 20 20TD
*3/4 in. BSP 6BD
*1 in. BSP 8BD
*1-1/4 in. BSP 10BD
*BSP Body; U.K. Mfr. Only

Seals
N Buna N (Std.)
P Polyurethane (Required for pressures over 240 bar/3500 psi)
V Fluorocarbon

EPFR58-35 Pressure Compensator with Internal



DESCRIPTION

A screw-in, cartridge-style, bypass-type, pressure-compensating element, with integral flow regulator for load sense signal drain. The internal pressure-compensated flow regulator restricts the load signal bleed flow in order to minimize system losses even at high operating pressures. The main compensator element holds the valves primary flow constant regardless of load pressure changes.

OPERATION

The EPFR58-35 is a spring-biased spool-type valve with an internal pressure-compensated flow regulator between 2 and 3. When used as a pump unloading compensator, this valve will bypass flow to tank at port 2 when system pressure reaches the load pressure plus the bias spring value. When the system load is neutralized, the load signal is bled through the flow regulator bringing the valve to stand-by condition.

FEATURES

- Multiple function in a single cavity.
- Low bleed flow throughout the operating pressure range.
- High system efficiency.
- Industry common cavity

RATINGS

Operating Pressure: Cartridge only: 345 bar (5000 psi); Aluminum housing: 207 bar (3000 psi); Ductile iron housing: 345 bar (5000 psi).

Flow Rate: See Performance Chart

Maximum Flow Loss between 3 and 2: 0.95 lpm (0.25 gpm) at 345 bar (5000 psi)

Bias Springs:

Code 80 5.5 bar (80 psi)

Code 110 7.6 bar (110 psi)

Code 150 10.3 bar (150 psi)

Temperature: -40 to 120°C with standard Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

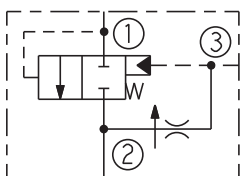
Installation: No restrictions; See page 9.020.1

Cavity: VC08-3; See page 9.108.1

Cavity Tool: CT08-3XX; See page 8.600.1

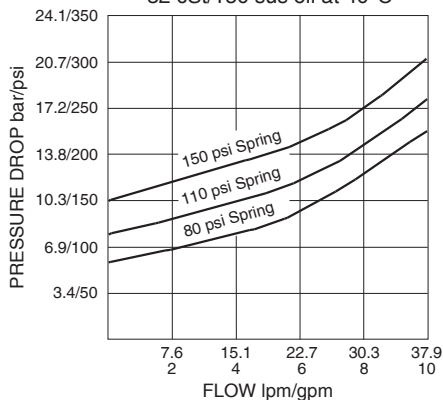
Seal Kit: SK08-3X-MM; See page 8.650.1

SYMBOL

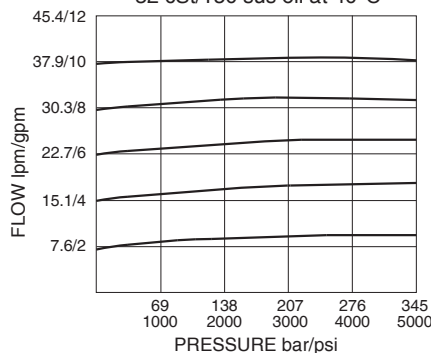


PERFORMANCE (Cartridge Only)

Inlet Pressure vs. Bypass Flow at No-Load Flow Demand 32 cSt/150 sus oil at 40°C



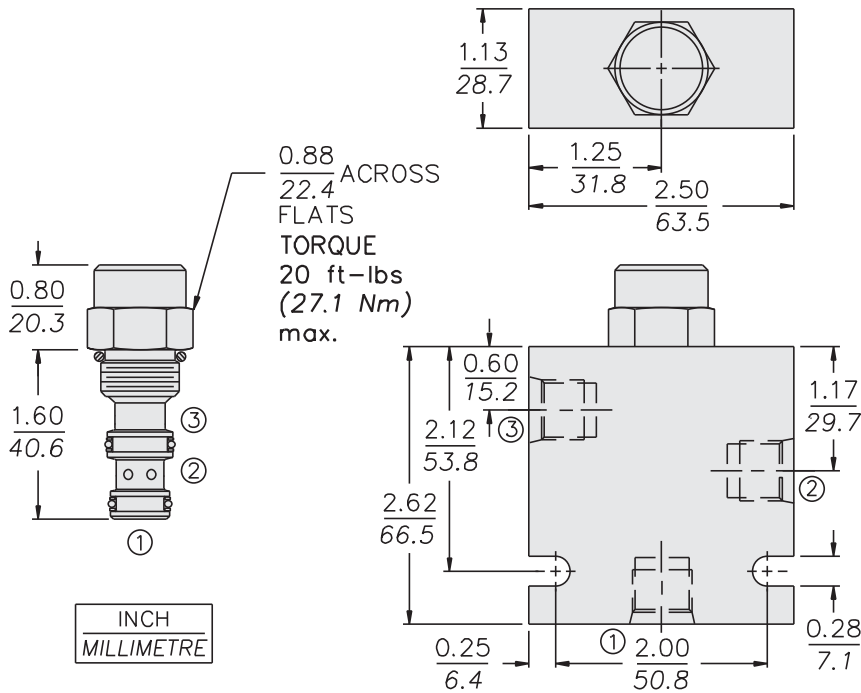
Flow vs. Load Pressure 32 cSt/150 sus oil at 40°C



Load-Sense Drain Flow Control

EPFR58-35

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.11 kg. (0.25 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and back-ups
standard.

Ported Body: Weight: 0.64 kg.
(1.4 lbs.) Ductile Iron (code "D")
standard, dimensions may differ
from illustration; rated to 345 bar
(5000 psi). See page 8.008.1

Ported Body: Weight: 0.36 kg.
(0.80 lbs.) Anodized high-strength
6061 T6 aluminum alloy, rated to
207 bar (3000 psi).
See page 8.008.1

TO ORDER

EPFR58-35 -

Porting

Cartridge Only **0**
SAE 6 (Ductile) **6TD**
SAE 6 (Alum.) **6T**

Note: Aluminum body
rated for 207 bar
(3000 psi) max.

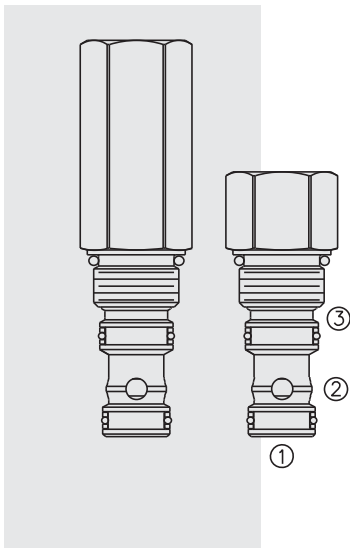
Bias Spring

80 5.5 bar (80 psi)
110 7.6 bar (110 psi)
150 10.3 bar (150 psi)

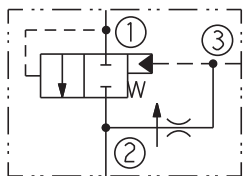
Seals

Buna N (Std.) **N**
Fluorocarbon **V**
Polyurethane **P**

EPFR50-S35 Pressure Compensator with Internal



SYMBOL



DESCRIPTION

A screw-in, cartridge-style, bypass-type, pressure-compensating element, with integral flow regulator for load sense signal drain. The internal pressure-compensated flow regulator restricts the load signal bleed flow in order to minimize system losses even at high operating pressures. The main compensator element holds the valves primary flow constant regardless of load pressure changes.

OPERATION

The EPFR50-S35 is a spring-biased spool-type valve with an internal pressure-compensated flow regulator between 2 and 3. When used as a pump unloading compensator, this valve will bypass flow to tank at port 2 when system pressure reaches the load pressure plus the bias spring value. When the system load is neutralized, the load signal is bled through the flow regulator bringing the valve to stand-by condition.

FEATURES

- Multiple function in a single cavity.
- Low bleed flow throughout the operating pressure range.
- High system efficiency.
- Industry common cavity

RATINGS

Operating Pressure: Cartridge only: 345 bar (5000 psi); Aluminum housing: 207 bar (3000 psi); Ductile iron housing: 345 bar (5000 psi).

Flow: See Performance Chart

Maximum Flow Loss between 3 and 2: 0.95 lpm (0.25 gpm) at 345 bar (5000 psi)

Bias Spring Pressure Options:

- 5.5 bar (80 psi);
- 7.6 bar (110 psi)
- 11.0 bar (160 psi) Tall Cap Required
- 15.9 bar (230 psi) Tall Cap Required

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

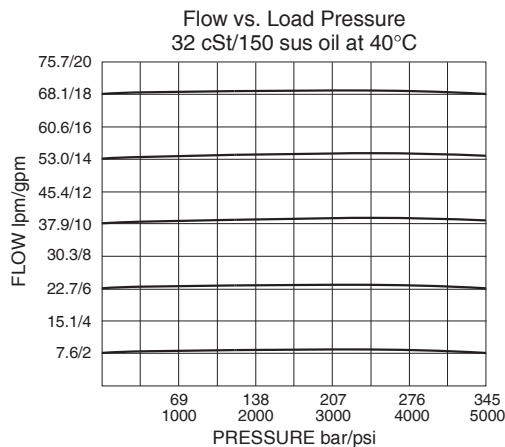
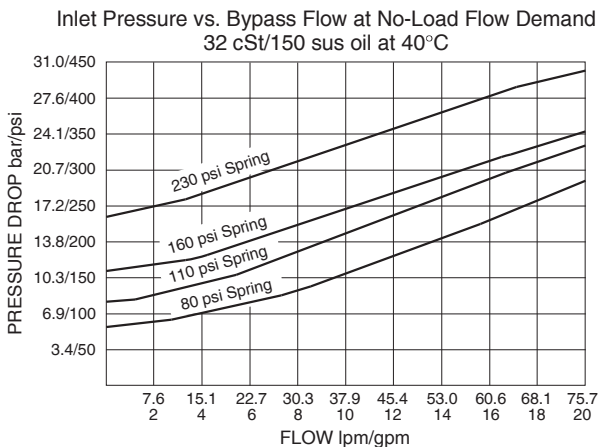
Installation: No restrictions; See page 9.020.1

Cavity: VC10-S3; See page 9.110.1

Cavity Tool: CT10-S3xx; See page 8.600.1

Seal Kit: SK10-S3x-MM; See page 8.650.1

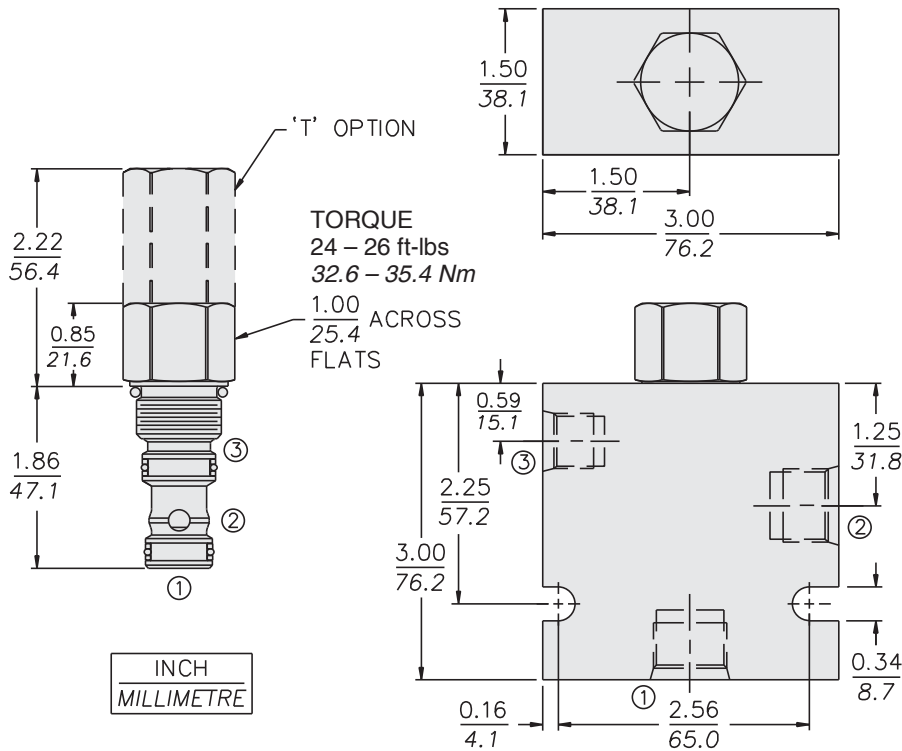
PERFORMANCE (Cartridge Only)



Load-Sense Drain Flow Control

EPFR50-S35

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.15 kg. (0.32 lbs.) with standard. short cap; 0.28 kg. (0.62 lbs.) with tall cap. Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.32 kg. (0.70 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron (8TD) bodies are available for pressures up to 350 bar (5000 psi); Weight and dimensions may differ. See page 8.010.1

TO ORDER

EPFR50-S35

Option
None (Blank)
Tall Cap T

Porting
Cartridge Only 0
SAE 8* 8T
SAE 8* 8TD
SAE 10* 10T
SAE 12* 12T

*SAE 6 pilot port

Ductile iron (8TD) bodies are available for pressures up to 350 bar (5000 psi).

Bias Spring

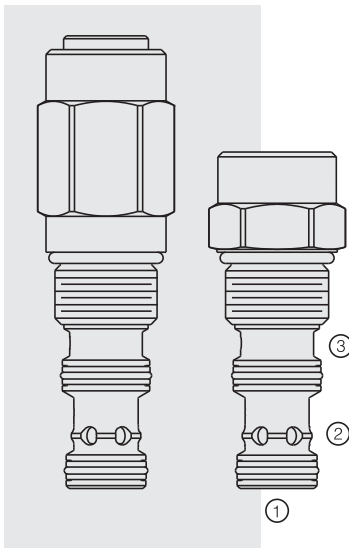
80 5.52 bar (80 psi)
110 7.6 bar (110 psi)
‡160 11.0 bar (160 psi)
‡230 15.9 bar (230 psi)

‡ T Option required

Seals

N Buna N (Std.)
V Fluorocarbon
P Polyurethane (for pressures over 240 bar/3500 psi)

EPFR52-S35 Pressure Compensator with Internal



DESCRIPTION

A screw-in, cartridge-style, bypass-type, pressure-compensating element, with integral flow regulator for load sense signal drain. The internal pressure-compensated flow regulator restricts the load signal bleed flow in order to minimize system losses even at high operating pressures. The main compensator element holds the valves primary flow constant regardless of load pressure changes.

OPERATION

The EPFR52-S35 is a spring-biased spool-type valve with an internal pressure-compensated flow regulator between 2 and 3. When used as a pump unloading compensator, this valve will bypass flow to tank at port 2 when system pressure reaches the load pressure plus the bias spring value. When the system load is neutralized, the load signal is bled through the flow regulator bringing the valve to stand-by condition.

FEATURES

- Multiple function in a single cavity.
- Low bleed flow throughout the operating pressure range.
- High system efficiency.
- Industry common cavity

RATINGS

Operating Pressure: Cartridge only: 350 bar (5000 psi);
Aluminum housing: 207 bar (3000 psi); Ductile iron housing: 350 bar (5000 psi).

Flow: 151 lpm (40 gpm); See Performance Chart

Maximum Flow Loss between 3 and 2: 0.95 lpm (0.25 gpm) at 345 bar (5000 psi)

Bias Spring Pressure Options:

- 5.5 bar (80 psi);
- 7.6 bar (110 psi)
- 11.0 bar (160 psi) Tall Cap Required
- 16.5 bar (240 psi) Tall Cap Required

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

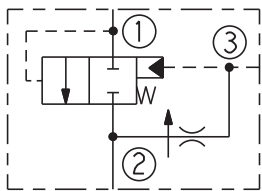
Installation: No restrictions; See page 9.020.1

Cavity: VC12-S3; See page 9.112.1

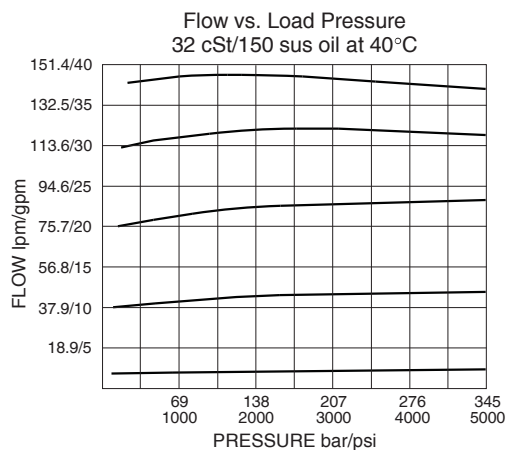
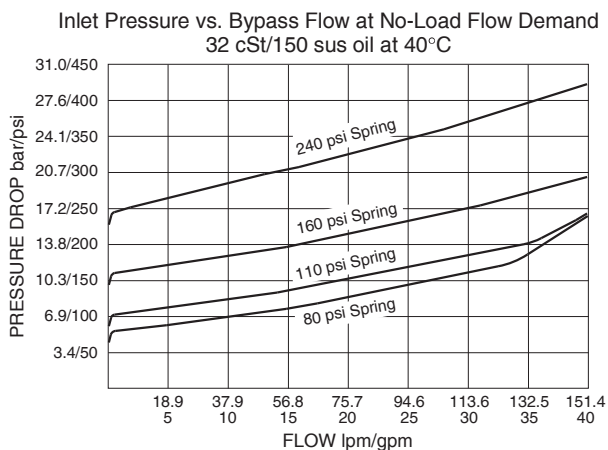
Cavity Tool: CT12-S3xx; See page 8.600.1

Seal Kit: SK12-S3x-MM; See page 8.650.1

SYMBOL



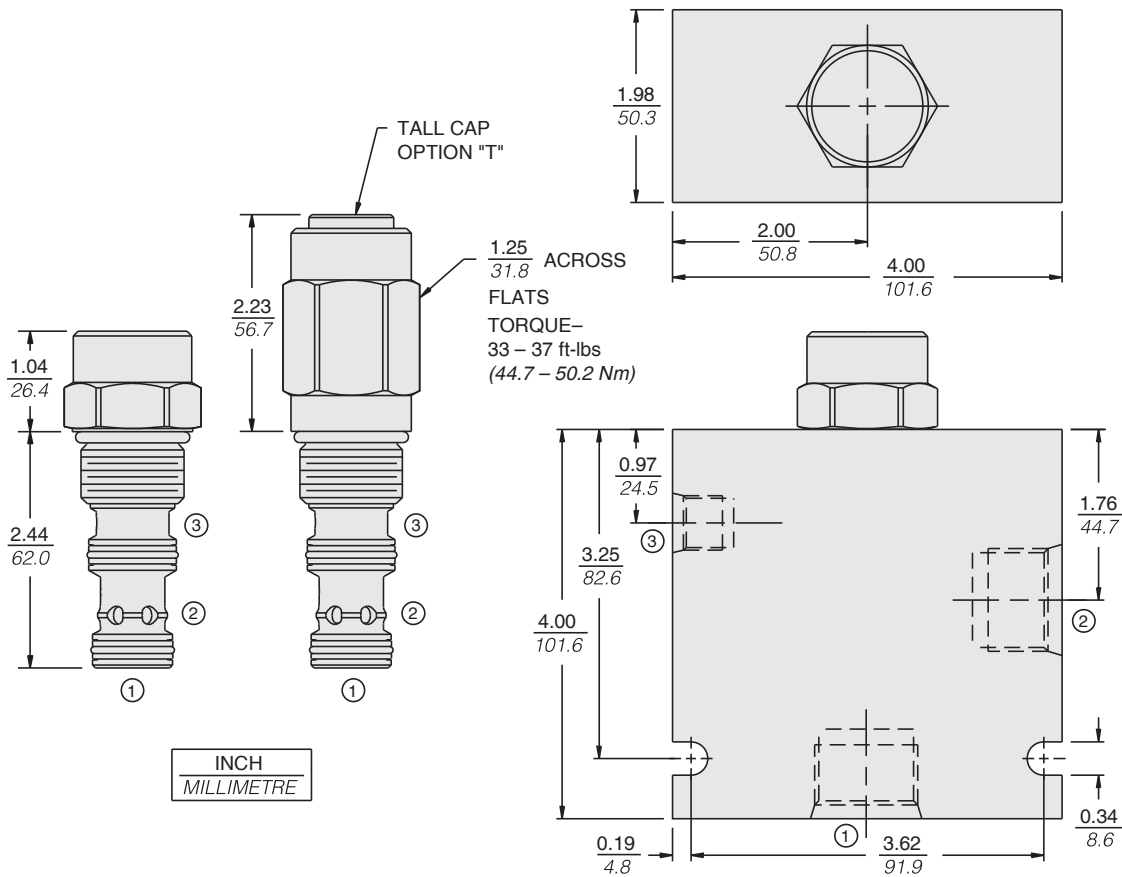
PERFORMANCE (Cartridge Only)



Load-Sense Drain Flow Control

EPFR52-S35

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.45 kg. (1.0 lbs.) with tall cap; 0.30 kg. (0.65 lbs.) with standard cap. Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 1.13 kg. (2.5 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1.

TO ORDER

EPFR52-S35

Option

None (Blank)

Tall Cap **T**

T option required for Bias Springs of 11 bar (160 psi) or higher.

Porting

Cartridge Only **0**

SAE 12* **12T**

*SAE 6 pilot port

Ductile iron bodies are available for pressures up to 350 bar (5000 psi).

Bias Spring

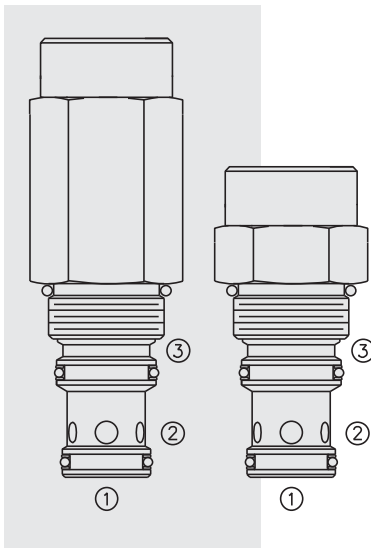
- 80** 5.5 bar (80 psi)
- 110** 7.6 bar (110 psi)
- *160** 11 bar (160 psi)
- *240** 16.5 bar (240 psi)

‡ T Option required

Seals

- N** Buna N (Std.)
- V** Fluorocarbon
- P** Polyurethane (for pressures over 240 bar/3500 psi)

EPFR16-S35 Pressure Compensator with Internal



DESCRIPTION

A screw-in, cartridge-style, bypass-type, pressure-compensating element, with integral flow regulator for load sense signal drain. The internal pressure-compensated flow regulator restricts the load signal bleed flow in order to minimize system losses even at high operating pressures. The main compensator element holds the valves primary flow constant regardless of load pressure changes.

OPERATION

The EPFR16-S35 is a spring-biased spool-type valve with an internal pressure-compensated flow regulator between 2 and 3. When used as a pump unloading compensator, this valve will bypass flow to tank at port 2 when system pressure reaches the load pressure plus the bias spring value. When the system load is neutralized, the load signal is bled through the flow regulator bringing the valve to stand-by condition.

FEATURES

- Multiple function in a single cavity.
- Low bleed flow throughout the operating pressure range.
- High system efficiency.
- Industry common cavity

RATINGS

Operating Pressure: Cartridge only: 241 bar (3500 psi);
 Aluminum housing: 207 bar (3000 psi); Ductile iron housing: 345 bar (5000 psi).

Flow: 189.3 lpm (50 gpm); See Performance Chart

Maximum Flow Loss between 3 and 2: 0.95 lpm (0.25 gpm) at 241 bar (3500 psi)

Bias Spring Pressure Options:

- 6.2 bar (90 psi);
- 7.6 bar (110 psi)
- 11.0 bar (160 psi)
- 16.5 bar (240 psi) Tall Cap Required

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

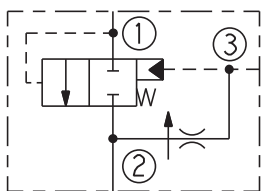
Installation: No restrictions; See page 9.020.1

Cavity: VC16-S3; See page 9.116.1

Cavity Tool: CT16-S3xx; See page 8.600.1

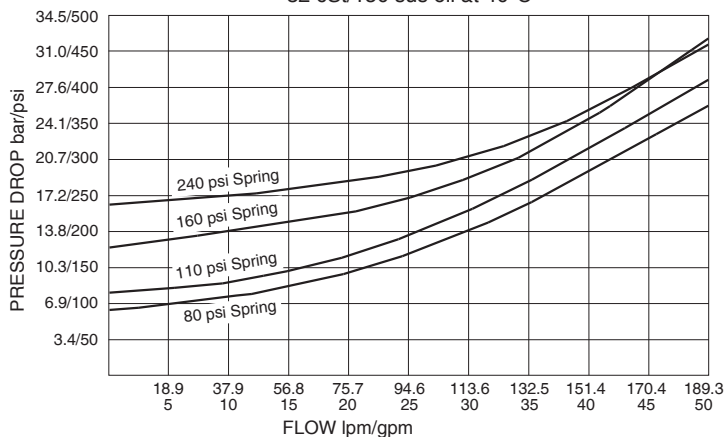
Seal Kit: SK16-S3x-MM; See page 8.650.1

SYMBOL

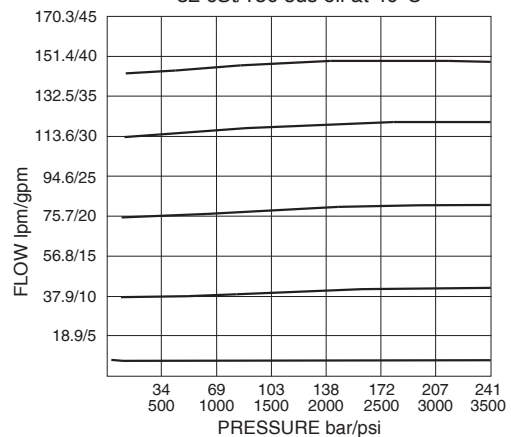


PERFORMANCE (Cartridge Only)

Inlet Pressure vs. Bypass Flow at No-Load Flow Demand
 32 cSt/150 sus oil at 40°C



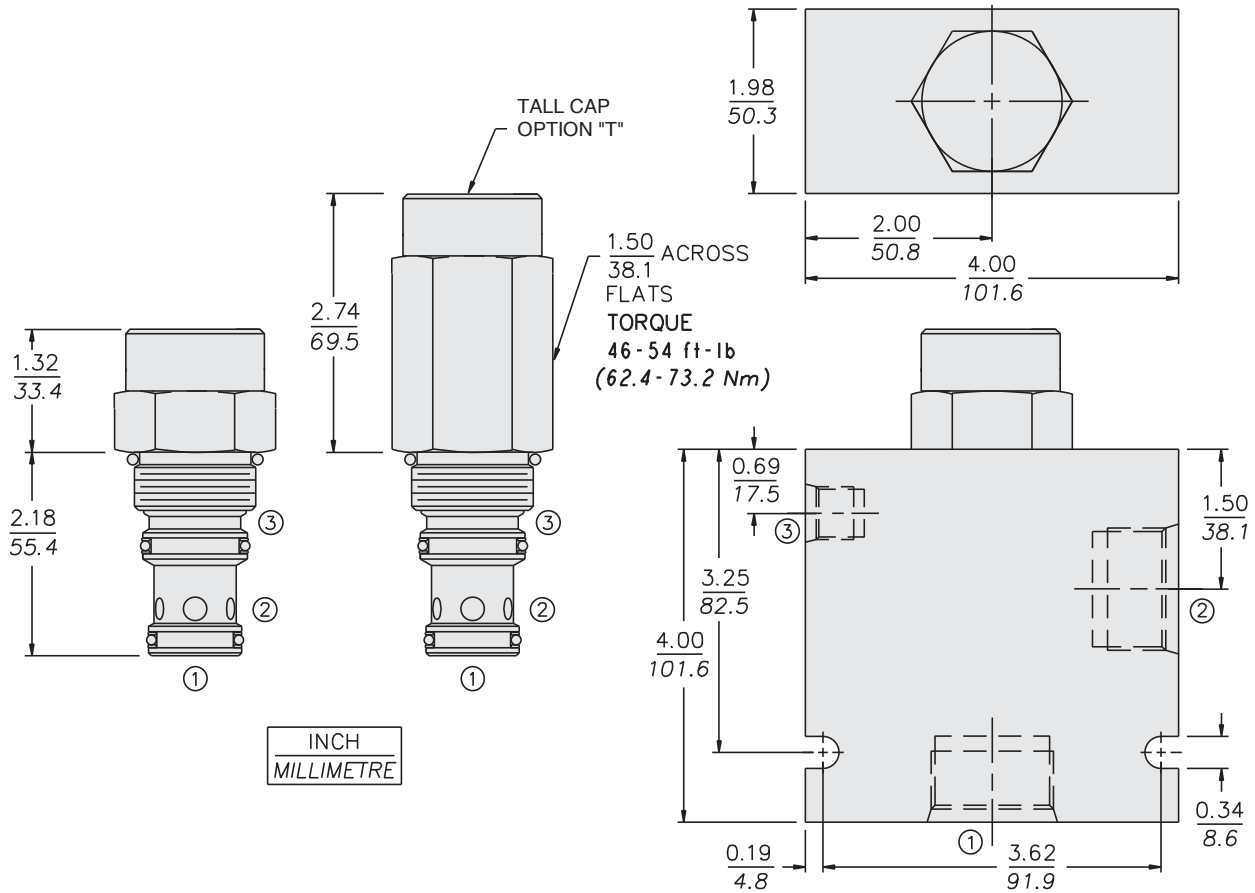
Flow vs. Load Pressure
 32 cSt/150 sus oil at 40°C



Load-Sense Drain Flow Control

EPFR16-S35

DIMENSIONS



MATERIALS

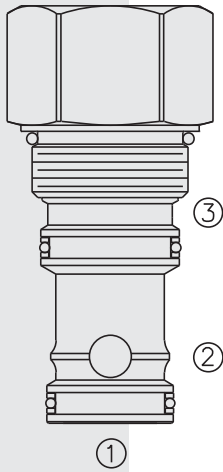
Cartridge: Weight: 0.73 kg. (1.6 lbs.) with tall cap; 0.43 kg. (0.95 lbs.) with standard cap. Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 1.50 kg. (3.3 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.016.1.

TO ORDER

EPFR16-S35 - - -		
Option		Bias Spring
None (Blank)		90 6.2 bar (90 psi)
Tall Cap T		110 7.6 bar (110 psi)
T option required for Bias Spring of 16.5 bar (240 psi).		160 11 bar (160 psi)
		‡240 16.5 bar (240 psi)
		‡ T Option required
Porting		Seals
Cartridge Only 0		N Buna N (Std.)
SAE 16 w/SAE 6 Pilot Port 16T		V Fluorocarbon
Ductile iron bodies are available for pressures up to 350 bar (5000 psi).		P Polyurethane (for pressures over 240 bar/3500 psi)

EPFR20-S35 Pressure Compensator with Internal



DESCRIPTION

A screw-in, cartridge-style, bypass-type, pressure-compensating element, with integral flow regulator for load sense signal drain. The internal pressure-compensated flow regulator restricts the load signal bleed flow in order to minimize system losses even at high operating pressures. The main compensator element holds the valves primary flow constant regardless of load pressure changes.

OPERATION

The EPFR20-S35 is a spring-biased spool-type valve with an internal pressure-compensated flow regulator between 2 and 3. When used as a pump unloading compensator, this valve will bypass flow to tank at port 2 when system pressure reaches the load pressure plus the bias spring value. When the system load is neutralized, the load signal is bled through the flow regulator bringing the valve to stand-by condition.

FEATURES

- Multiple function in a single cavity.
- Low bleed flow throughout the operating pressure range.
- High system efficiency.
- Industry common cavity

RATINGS

Operating Pressure: Cartridge only: 320 bar (4600 psi); Aluminum housing: 207 bar (3000 psi); Ductile iron housing: 345 bar (5000 psi).

Flow: 303 lpm (80 gpm); See Performance Chart

Maximum Flow Loss between 3 and 2: 0.95 lpm (0.25 gpm) at 320 bar (4600 psi)

Bias Spring Pressure Options: 6.2 bar (90 psi); 11.0 bar (160 psi)

Operating Fluid Temperature: -40°C to 120°C with Buna N seals;
-35°C to 204°C with Fluorocarbon seals;
-54°C to 107°C with Polyurethane seals

Filtration: See page 9.010.1

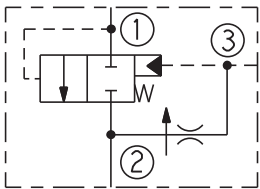
Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

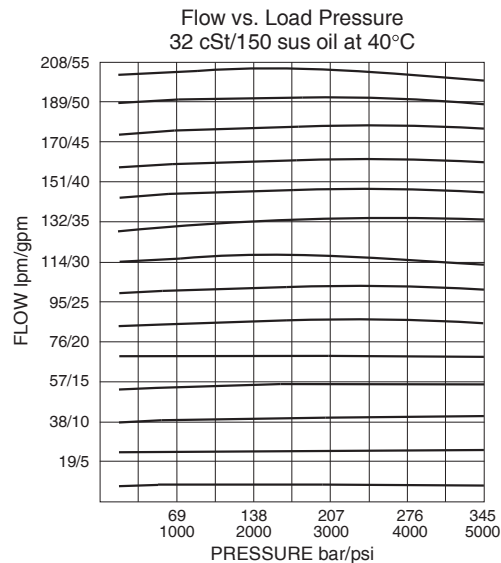
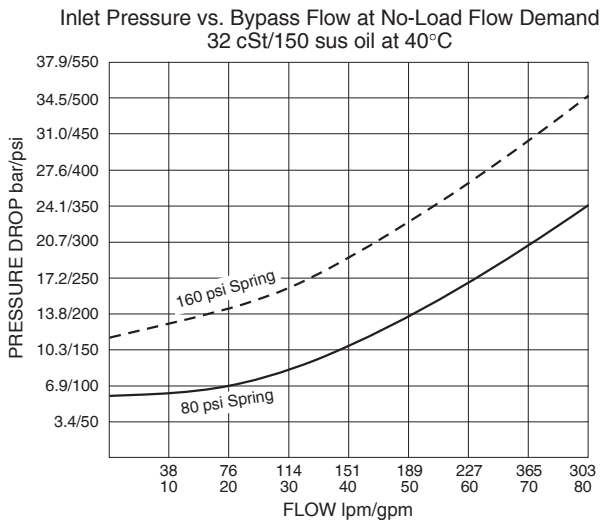
Cavity: VC20-S3; See page 9.120.1; **Cavity Tool:** CT20-S3xx; See page 8.600.1

Seal Kit: SK20-S3x-MM; See page 8.650.1

SYMBOL



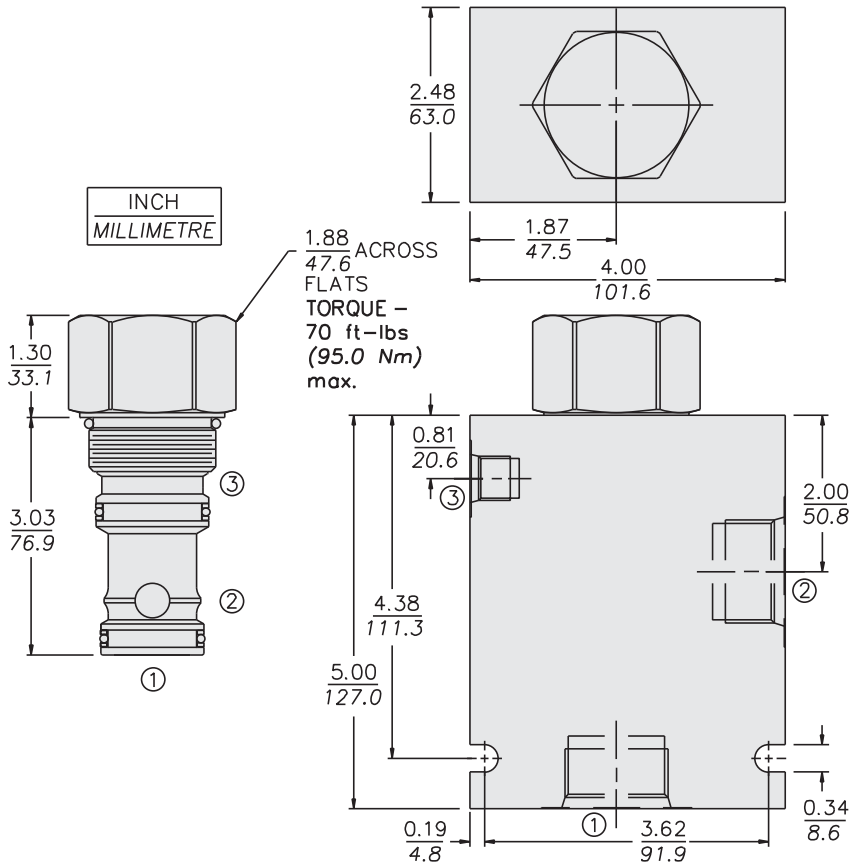
PERFORMANCE (Cartridge Only)



Load-Sense Drain Flow Control

EPFR20-S35

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.77 kg. (1.7 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight:
1.65 kg. (3.65 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.020.1.

TO ORDER

EPFR20-S35

Option
None (Blank)

Bias Spring
80 5.5 bar (80 psi)
160 11 bar (160 psi)

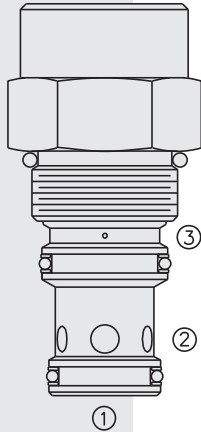
Porting
Cartridge Only 0
SAE 16 w/SAE 6 Pilot Port 16T

Seals

N Buna N (Std.)
V Fluorocarbon
P Polyurethane (for pressures over 240 bar/3500 psi)

Ductile iron bodies are available for pressures up to 350 bar (5000 psi).

ECR16-S35 Piloted Logic Element w/Built-in Relief



DESCRIPTION

A spool-type, screw-in, cartridge-style, hydraulic directional element, with a built-in, non-adjustable pressure relief valve.

OPERATION

The **ECR16-S35** is a spring-biased blocking valve which will shift to allow full flow from 1 to 2 only when pressure at 1 exceeds the cumulative pressure of 3, plus the bias spring pressure value.

If the pressure at 1 and 3 exceeds the relief valve setting, the valve operates as a relief valve, opening the 1 to 2 flow path.

FEATURES

- Multiple function/application potential.
- Low pressure drop.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 420 bar (6090 psi)

Flow: 189 lpm (50 gpm) max.

Internal Leakage: 164 ml/minute (10 cu. in./minute) max. at 207 bar (3000 psi)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

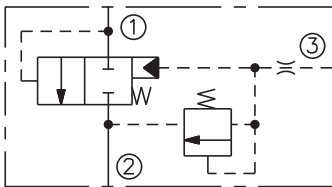
Installation: No restrictions; See page 9.020.1

Cavity: VC16-S3; See page 9.116.1

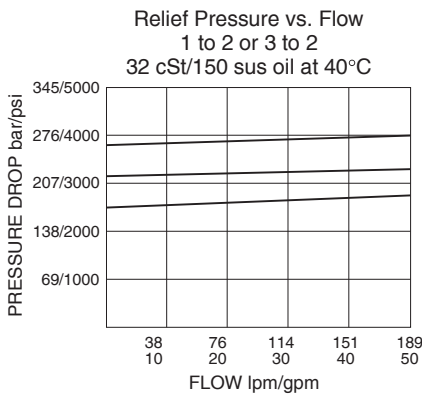
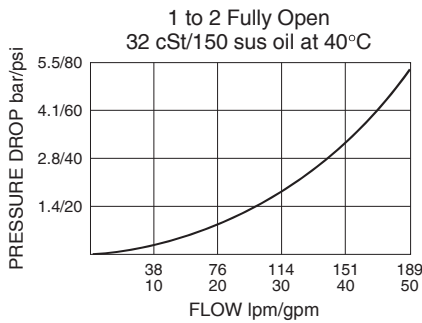
Cavity Tool: CT16-S3xx; See page 8.600.1

Seal Kit: SK16-S3x-MM; See page 8.650.1

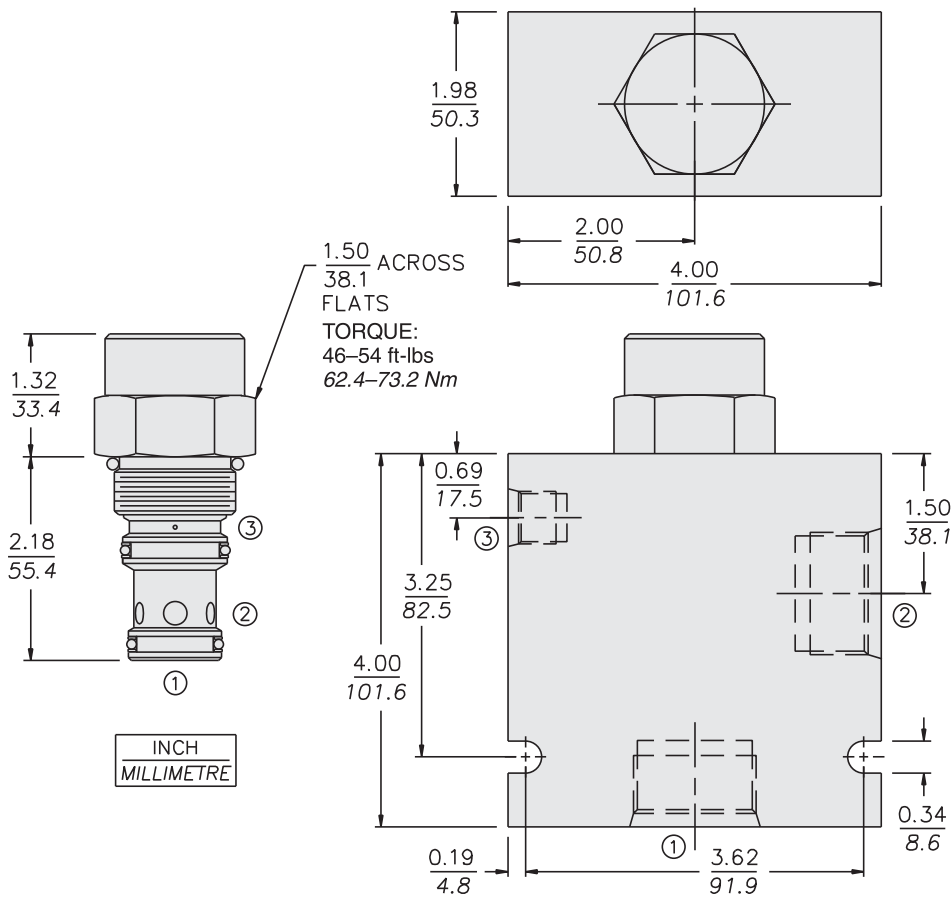
SYMBOL



PERFORMANCE (Cartridge Only)



DIMENSIONS

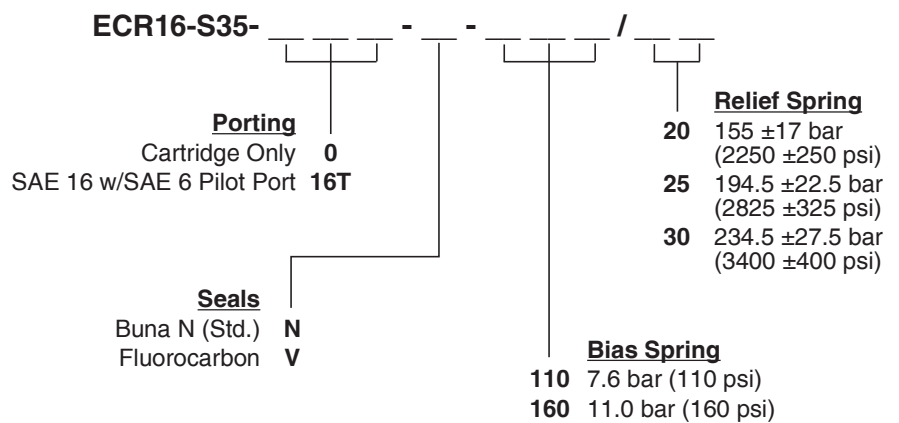


MATERIALS

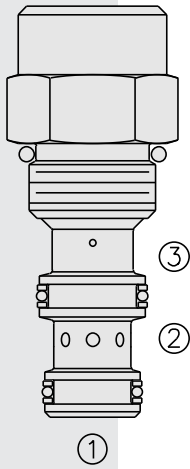
Cartridge: Weight: 0.43 kg. (0.95 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
1.50 kg. (3.3 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.016.1.

TO ORDER

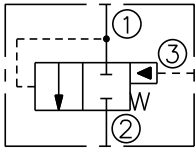


EP08-35 Piloted Directional Element

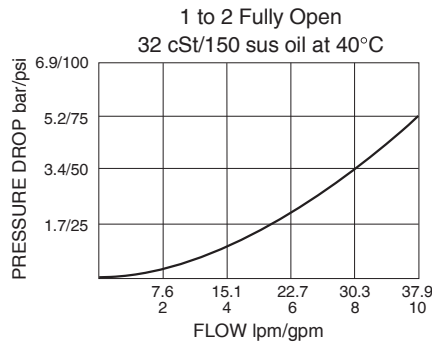


SYMBOLS

USASI/ISO:



PERFORMANCE (Cartridge Only)



DESCRIPTION

A spool-type, screw-in, cartridge-style, hydraulic directional element, with multi-function potential when used with other directional, pressure, or flow control devices.

OPERATION

The EP08-35 is a spring-biased blocking valve which will shift to allow full flow from 1 to 2 only when pressure at 1 exceeds the cumulative pressure of 3, plus the bias spring pressure value.

EP08-35 is a pilot-to-close directional valve.

With no pressure at 3, flow will be allowed from 1 to 2 once the bias spring force is overcome with pressure at 1.

FEATURES

- Multiple function/application potential.
- Low pressure drop.
- Industry common cavity
- Compact size.

RATINGS

Maximum Operating Pressure: 345 bar (5000 psi) with steel or ductile housing;
207 bar (3000 psi) with aluminum housing

Flow Rate: See Performance Chart

Maximum Internal Leakage: 115 ml per minute (7 cu. in. per minute)
at 345 bar (5000 psi)

Bias Springs:

Code 10 0.7 bar (10 psi)

Code 40 2.8 bar (40 psi)

Code 80 5.5 bar (80 psi)

Code 110 7.6 bar (110 psi)

Code 150 10.3 bar (150 psi)

Temperature: -40 to 120°C with standard Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of
7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

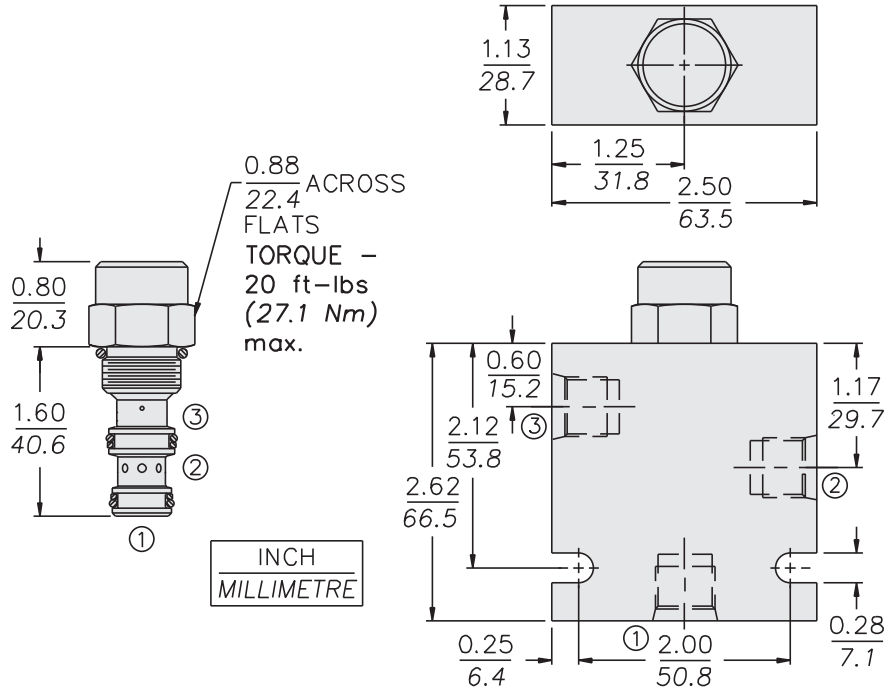
Installation: No restrictions; See page 9.020.1

Cavity: VC08-3; See page 9.108.1

Cavity Tool: CT08-3XX; See page 8.600.1

Seal Kit: SK08-3X-MM; See page 8.650.1

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.11 kg. (0.25 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and back-ups
standard.

Ported Body: Weight: 0.64 kg.
(1.4 lbs.) Ductile Iron (code "D")
standard, dimensions may differ
from illustration; rated to 345 bar
(5000 psi). See page 8.008.1

Ported Body: Weight: 0.36 kg.
(0.80 lbs.) Anodized high-strength
6061 T6 aluminum alloy, rated to
207 bar (3000 psi).
See page 8.008.1

TO ORDER

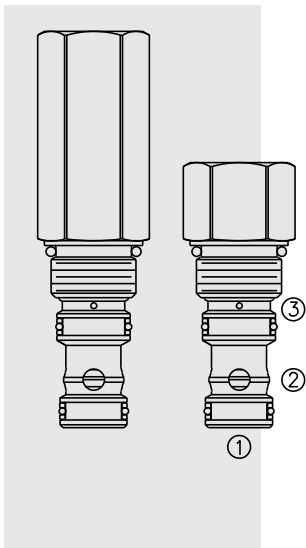
EP08-35 -

Porting	0	10	Bias Spring
Cartridge Only	0	10	0.7 bar (10 psi)
SAE 6 (Ductile)	6TD	40	2.8 bar (40 psi)
SAE 6 (Alum.)	6T	80	5.5 bar (80 psi)
		110	7.6 bar (110 psi)
		150	10.3 bar (150 psi)

Note: Aluminum body
rated for 207 bar
(3000 psi) max.

Seals	
Buna N (Std.)	N
Fluorocarbon	V
Polyurethane	P

EP10-S35 Piloted Spool-Type Logic Element



DESCRIPTION

A spool-type, screw-in, cartridge-style, hydraulic directional element, with multi-function potential when used with other directional, pressure, or flow control devices.

OPERATION

The EP10-S35 is a spring-biased blocking valve which will shift to allow full flow from 1 to 2 only when pressure at 1 exceeds the cumulative pressure of 3, plus the bias spring pressure value.

EP10-S35 is a pilot-to-close directional valve.

With no pressure at 3, flow will be allowed from 1 to 2 once the bias spring force is overcome with pressure at 1.

FEATURES

- Multiple function/application potential.
- Low pressure drop.
- Industry common cavity.

RATINGS

Operating Pressure: 350 bar (5000 psi) cartridge; 207 bar (3000 psi) standard aluminum housing; 350 bar (5000 psi) ductile iron housing.

Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) max. at 207 bar (3000 psi)

Bias Spring Pressure Options:

- 0.7 bar (10 psi);
- 2.8 bar (40 psi);
- 5.5 bar (80 psi);
- 7.6 bar (110 psi)
- 11.0 bar (160 psi)

Note: Tall cap option required for 11.0 bar (160 psi) spring.

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

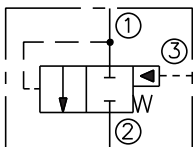
Cavity: VC10-S3; See page 9.110.1

Cavity Tool: CT10-S3xx; See page 8.600.1

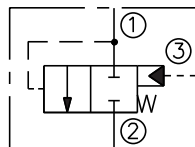
Seal Kit: SK10-S3x-MM; See page 8.650.1

SYMBOLS

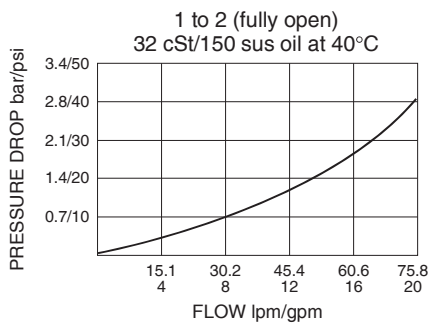
USASI:



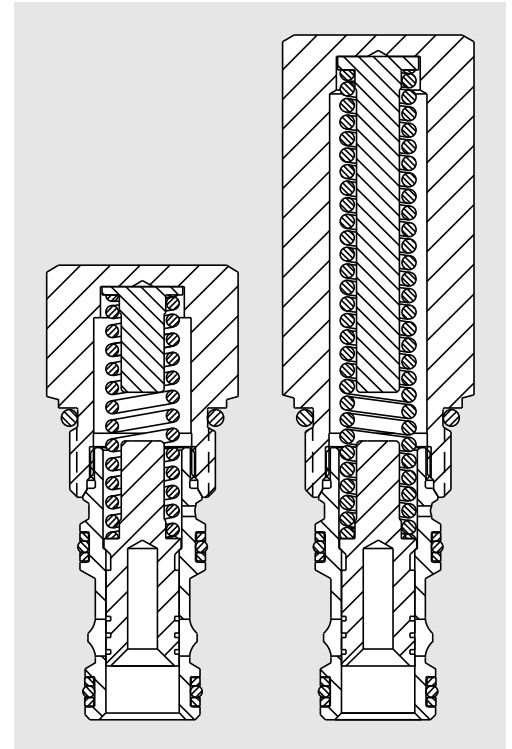
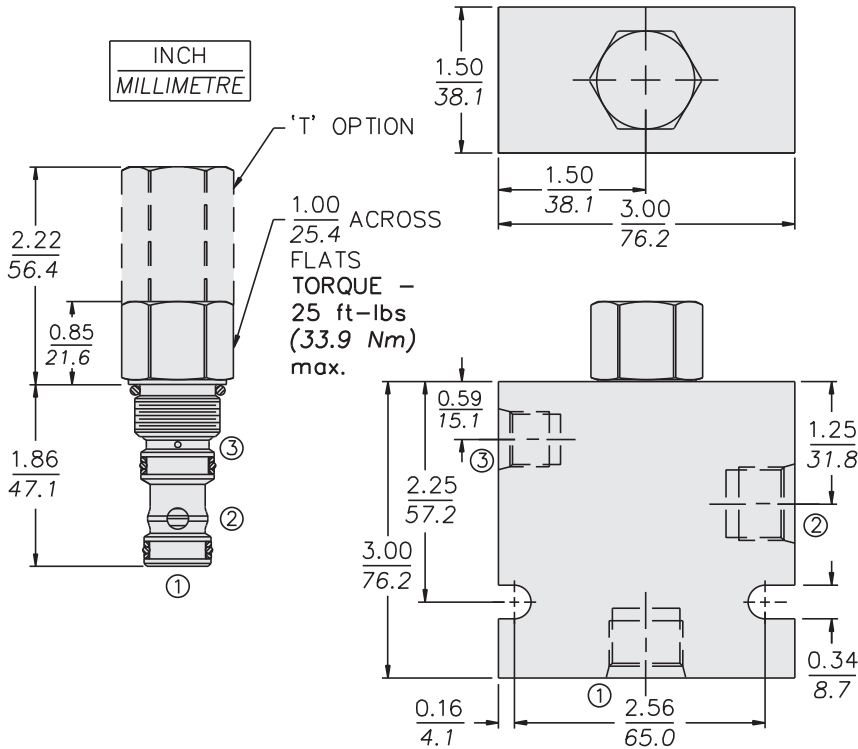
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



ORIFICE DISCS SHOULD NOT BE USED WITH THIS PRODUCT.

MATERIALS

Cartridge: Weight: 0.15 kg. (0.32 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

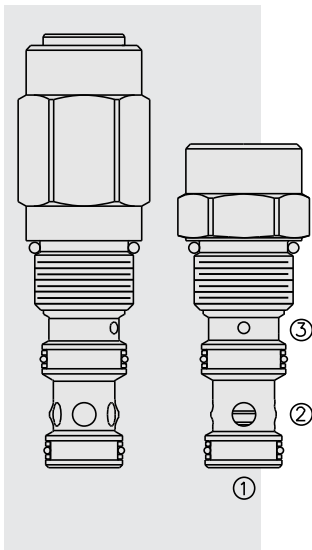
Standard Ported Body: Weight: 0.32 kg. (0.70 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron (8TD) bodies are available for pressures up to 350 bar (5000 psi); Weight and dimensions may differ. See page 8.010.1

TO ORDER

EP10-S35		-	-	-	-
Option					
None (Blank)					
Tall Cap	T				
Porting					
Cartridge Only	0				
SAE 8*	8T				
SAE 8*	8TD				
SAE 10*	10T				
SAE 12*	12T				
*SAE 6 pilot port					
Bias Spring					
10	0.7 bar (10 psi)				
40	2.8 bar (40 psi)				
80	5.52 bar (80 psi)				
110	7.6 bar (110 psi)				
‡160	11.0 bar (160 psi)				
‡230	15.9 bar (230 psi)				
‡ T Option required					
Seals					
N	Buna N (Std.)				
V	Fluorocarbon				
P	Polyurethane (for pressures over 240 bar/3500 psi)				

Ductile iron (8TD) bodies are available for pressures up to 350 bar (5000 psi).

EP12-S35 Piloted Spool-Type Logic Element



DESCRIPTION

A spool-type, screw-in, cartridge-style, hydraulic directional element, with multi-function potential when used with other directional, pressure, or flow control devices.

OPERATION

The EP12-S35 is a spring-biased blocking valve which will shift to allow full flow from 1 to 2 only when pressure at 1 exceeds the cumulative pressure of 3, plus the bias spring pressure value.

EP10-S35 is a pilot-to-close directional valve.

With no pressure at 3, flow will be allowed from 1 to 2 once the bias spring force is overcome with pressure at 1.

FEATURES

- Multiple function/application potential.
- Low pressure drop.
- Industry common cavity.
- Manual override option available with 80 psi spring only.

RATINGS

Operating Pressure: 350 bar (5000 psi) cartridge; 207 bar (3000 psi) standard aluminum housing

Flow: See Performance Chart

Internal Leakage: 131 cc/minute (8 cu. in./minute) max. at 350 bar (5000 psi)

Bias Spring Pressure Options:

- 0.7 bar (10 psi)
- 5.5 bar (80 psi)
- 7.0 bar (100 psi)
- 11.0 bar (160 psi) Tall Cap option required
- 16.5 bar (240 psi) Tall Cap option required

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC12-S3; See page 9.112.1

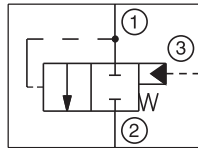
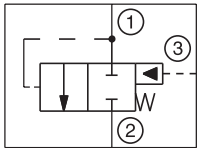
Cavity Tool: CT12-S3xx; See page 8.600.1

Seal Kit: SK12-S3x-MM; See page 8.650.1

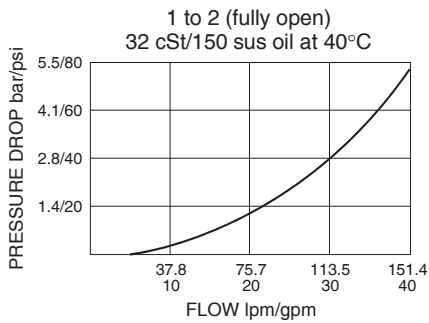
SYMBOLS

USASI:

ISO:

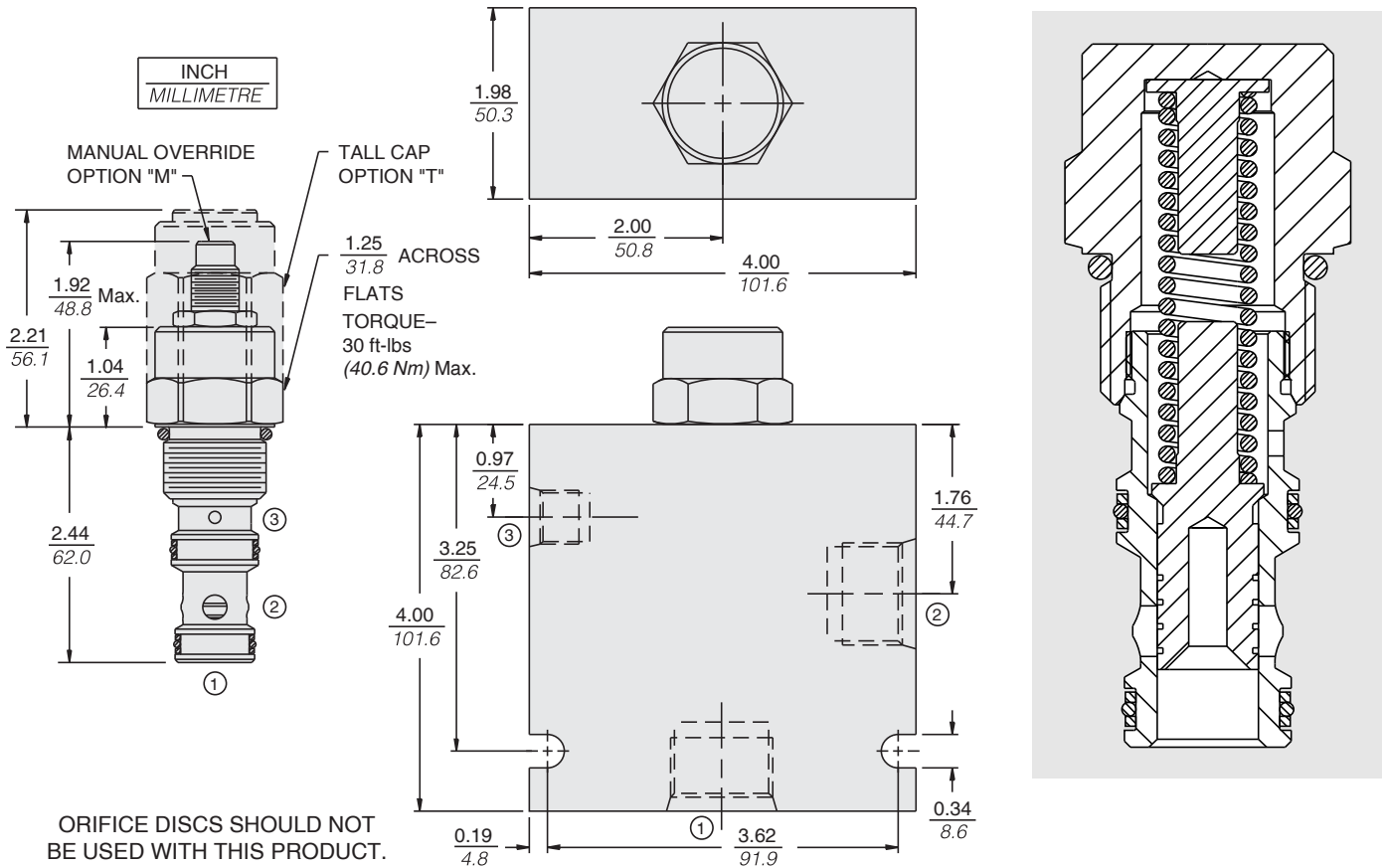


PERFORMANCE (Cartridge Only)



EP12-S35

DIMENSIONS



MATERIALS

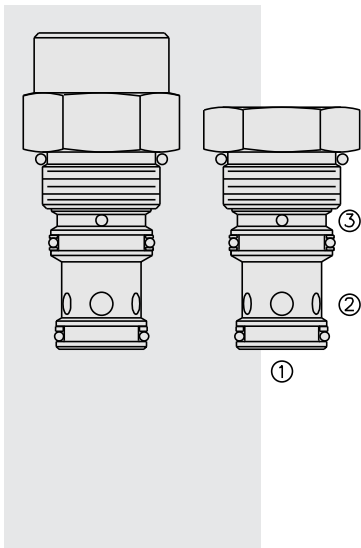
Cartridge: Weight: 0.23 kg. (0.5 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 1.13 kg. (2.5 lbs.)
Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1.

TO ORDER

EP12-S35		-	-	-	-
Option					
None (Blank)					
Tall Cap	T				
Manual Override	M				
Manual Override available with 80 psi spring only.					
Porting					
Cartridge Only	0				
SAE 12*	12T				
*SAE 6 pilot port					
Bias Spring					
10	0.7 bar (10 psi)				
80	5.5 bar (80 psi)				
100	7 bar (100 psi)				
†160	11 bar (160 psi)				
†240	16.5 bar (240 psi)				
† T Option required					
Seals					
N	Buna N (Std.)				
V	Fluorocarbon				
P	Polyurethane (for pressures over 240 bar/3500 psi)				

EP16-S35 Piloted Spool-Type Logic Element



DESCRIPTION

A spool-type, screw-in, cartridge-style, hydraulic directional element, with multi-function potential when used with other directional, pressure, or flow control devices. It requires a tall cap when specified with bias springs from 6,2 to 16,5 bar (90 to 240 psi). The 240 psi spring requires an extra tall cap. A manual override option is also available for valves with bias springs from 6,2 to 16,5 bar (90-240 psi).

NOTE: Orifice discs should not be used with this valve.

OPERATION

The EP16-S35 is a spring-biased blocking valve which will shift to allow full flow from 1 to 2 only when pressure at 1 exceeds the cumulative pressure of 3, plus the bias spring pressure value.

EP16-S35 is a pilot-to-close directional valve.

With no pressure at 3, flow will be allowed from 1 to 2 once the bias spring force is overcome with pressure at 1.

FEATURES

- Multiple function/application potential.
- Low pressure drop.
- Industry common cavity.
- Manual override available with 90, 110, 160 and 240 psi bias springs.
- Tall cap required for 90, 110, 160 and 240 psi bias springs. The 240 psi bias spring requires an extra tall cap.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 420 bar (6090 psi)

Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) max. at 207 bar (3000 psi)

Temperature: -40 to 100°C (-40 to 212° F) with standard Buna seals;

-26 to 204°C (-15 to 400° F) with Fluorocarbon seals;

-54 to 104°C (-65 to 225° F) with Polyurethane seals.

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

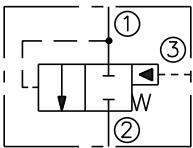
Installation: No restrictions; See page 9.020.1

Cavity: VC16-S3; See page 9.116.1

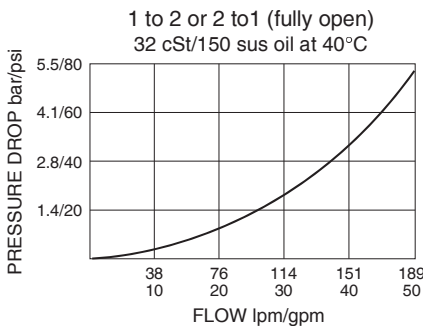
Cavity Tool: CT16-S3xx; See page 8.600.1

Seal Kit: SK16-S3x-MM; See page 8.650.1

ISO SYMBOL

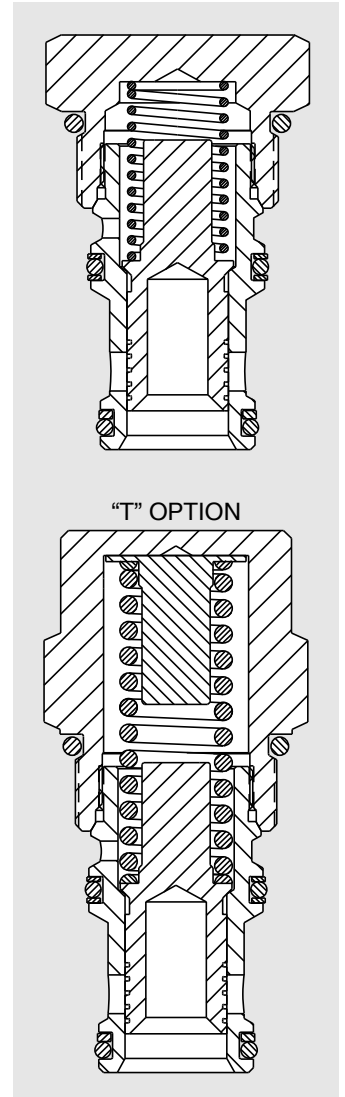
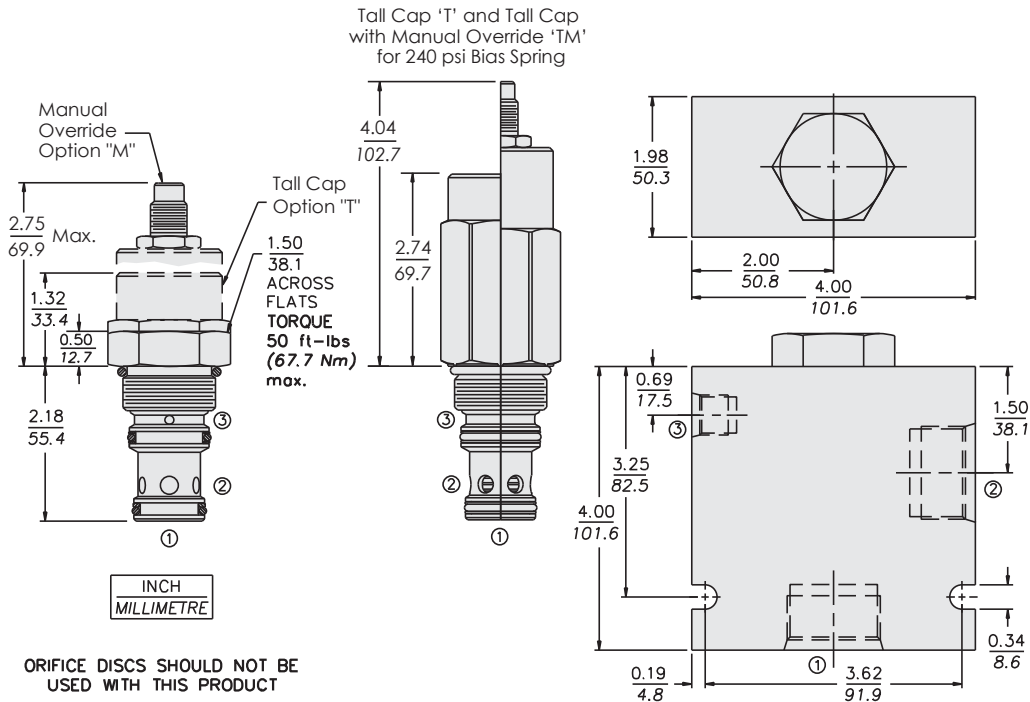


PERFORMANCE (Cartridge Only)



EP16-S35

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.27 kg. (0.60 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

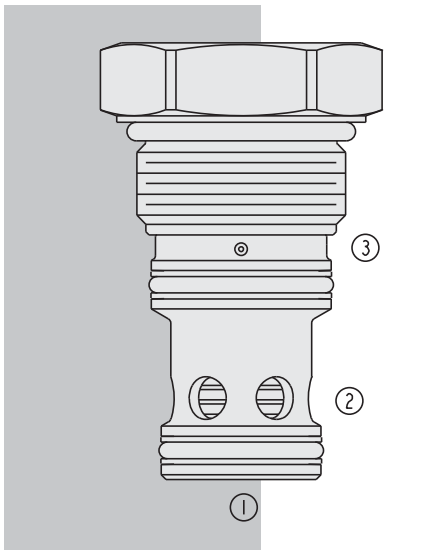
Standard Ported Body: Weight:
1.50 kg. (3.3 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.016.1.

TO ORDER

EP16-S35 - - -		
Option		Bias Spring
None (Blank)		10 0.7 bar (10 psi)
Tall Cap T		20 1.4 bar (20 psi)
Manual Override M		40 2.8 bar (40 psi)
		70 4.8 bar (70 psi)
		‡ 90 6.2 bar (90 psi)
		‡ 110 7.6 bar (110 psi)
		‡ 160 11.0 bar (160 psi)
		‡ 240 16.5 bar (240 psi)
		‡ T Tall Cap Option required for larger springs.
	Porting	Seals
	Cartridge Only 0	N Buna N (Std.)
	SAE 16 w/SAE 6 Pilot Port 16T	V Fluorocarbon
		P Polyurethane

Manual Override available only with 6.2, 7.6, 11.0 and 16.5 bar (90, 110, 160 and 240 psi) bias springs.

HEP16-S35 HyPerformance™ Piloted Spool-Type



DESCRIPTION

A high-pressure spool-type, screw-in, cartridge-style, hydraulic directional element, with multi-function potential when used with other directional, pressure, or flow control devices.

OPERATION

The HEP16-S35 is a spring-biased blocking valve which will shift to allow full flow from 1 to 2 only when pressure at 1 exceeds the cumulative pressure of 3, plus the bias spring pressure value.

HEP16-S35 is a pilot-to-close directional valve.

With no pressure at 3, flow will be allowed from 1 to 2 once the bias spring force is overcome with pressure at 1.

FEATURES

- Multiple function/application potential.
- Low pressure drop.
- All HyPerformance products are tested to the rigorous standards of the NFPA specification T2.6.1.
- All HyPerformance valves are tested at a verification level of 90% and an assurance of 99%.

RATINGS

Operating Pressure: 350 bar (5075 psi); 10% cycle life: 420 bar (6090 psi)

Note: All HyPerformance products are tested for 900K cycles at 350 bar and 100K at 420 bar.

Proof Pressure: 690 bar (10000 psi)

Burst Pressure: 1380 bar (20000 psi)

Flow: 190 lpm (50 gpm)

Internal Leakage: 164 ml/minute (10 cu. in./minute) max. at 350 bar (5075 psi)

Operating Temperature: -54 to 107°C (-65 to 225°F) with Urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

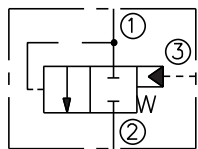
Installation: No restrictions; See page 9.020.1

Cavity: HVC16-S3; See page 9.116.1

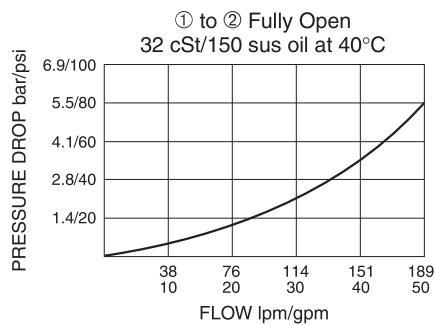
Cavity Tool: HCT16-S3XX; See page 8.600.1

Seal Kit: SK16-S3X-X; See page 8.650.1

SYMBOL



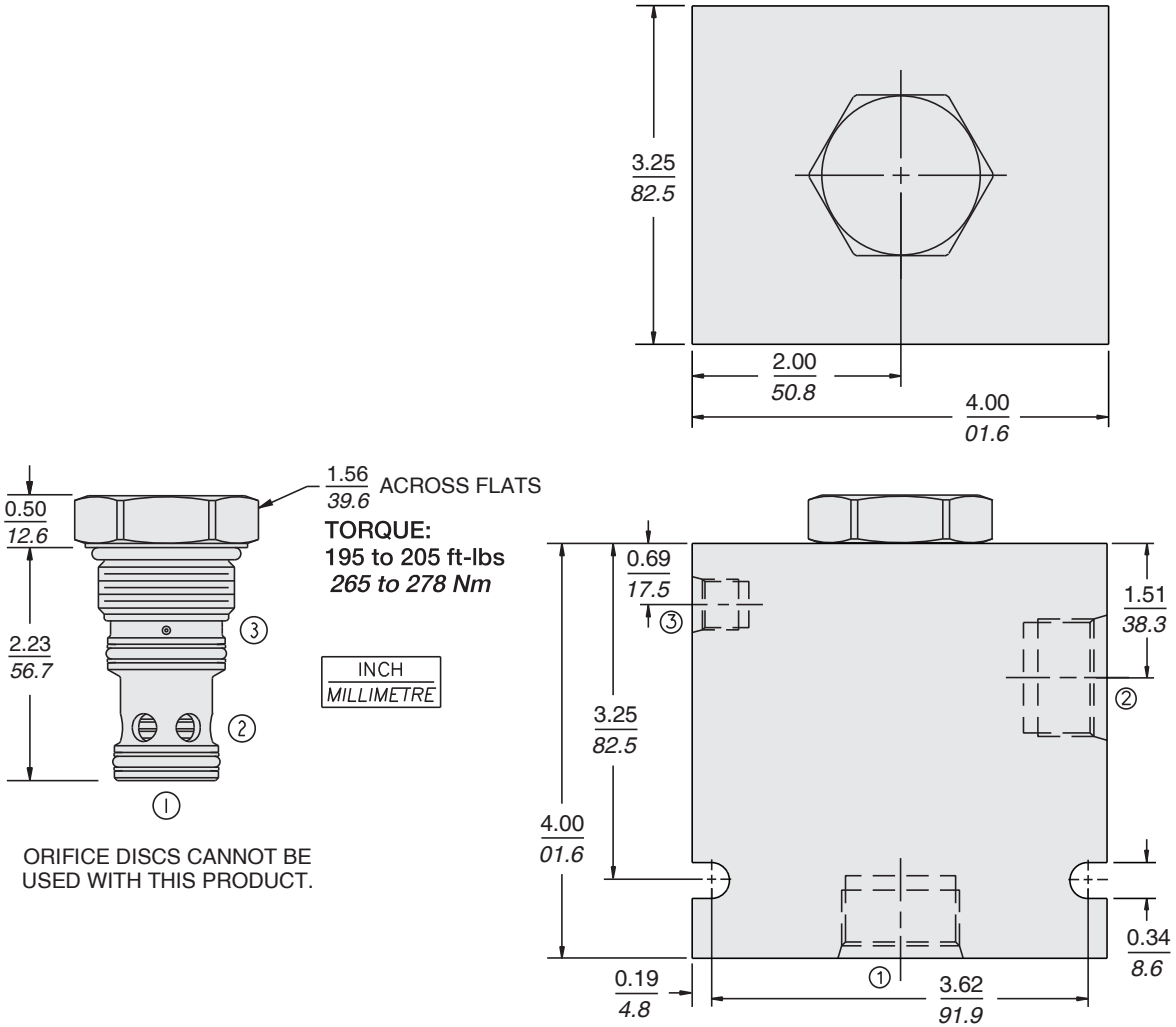
PERFORMANCE (Cartridge Only)



Logic Element

HEP16-S35

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.30 kg. (0.67 lbs.)
Steel with hardened work surfaces.
Zinc-nickel plated exposed surfaces.
PPDI Urethane seals with no backup rings standard.

Ported Body: Weight: 5.34 kg. (11.77 lbs.); HyPerformance™
Ductile iron (code 'D') standard.
Rated to 345 bar (5000 psi).

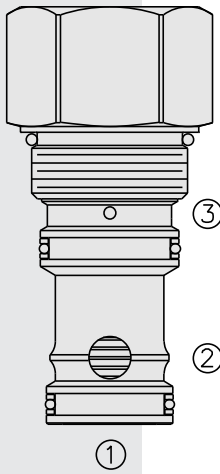
TO ORDER

HEP16-S35 -

Porting	0	Bias Spring Value	10
Cartridge Only	SAE 16	16TD	20
1 in. BSP*	8BD	40	70
*BSP Body; U.K. Mfr. Only		0.7 bar (10 psi)	1.4 bar (20 psi)
		2.8 bar (40 psi)	4.8 bar (70 psi)

Seals
U PPDI Urethane — Recommended for pressures above 241 bar (3500 psi)

EP20-S35 Piloted Spool-Type Logic Element



DESCRIPTION

A spool-type, screw-in, cartridge-style, hydraulic directional element, with multi-function potential when used with other directional, pressure, or flow control devices.

OPERATION

The **EP20-S35** is a spring-biased blocking valve which will shift to allow full flow from 1 to 2 only when pressure at 1 exceeds the cumulative pressure of 3, plus the bias spring pressure value.

EP20-S35 is a pilot-to-close directional valve.

With no pressure at 3, flow will be allowed from 1 to 2 once the bias spring force is overcome with pressure at 1.

FEATURES

- Multiple function/application potential.
- Low pressure drop.
- Industry common cavity.

RATINGS

Maximum Operating Pressure: 345 bar (5000 psi). Polyurethane seals are recommended for operation over 240 bar (3500 psi).

Flow: See Performance Chart

Internal Leakage: 197 cc/minute (12 cu. in./minute) max. at 345 bar (5000 psi)

Bias Spring Pressure Options: 5.5 bar (80 psi); 11.0 bar (160 psi)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

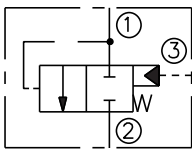
Installation: No restrictions; See page 9.020.1

Cavity: VC20-S3; See page 9.120.1

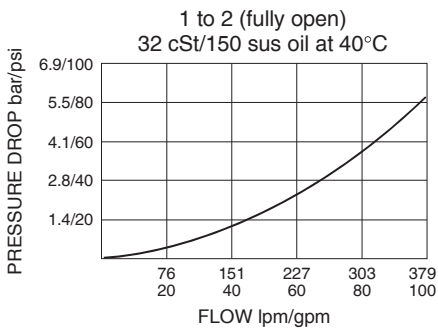
Cavity Tool: CT20-S3xx; See page 8.600.1

Seal Kit: SK20-S3x-MM; See page 8.650.1

ISO SYMBOL

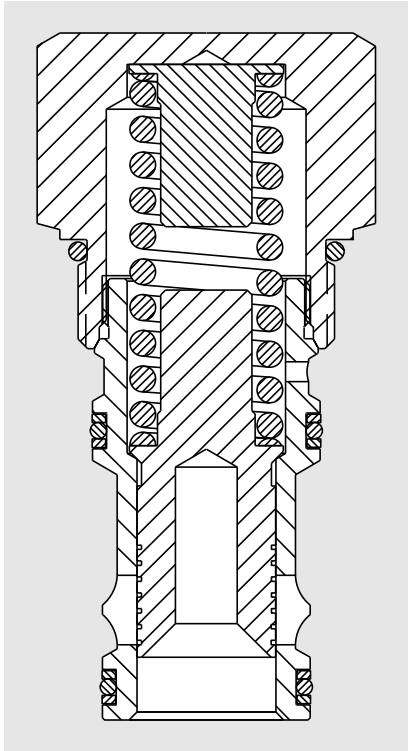
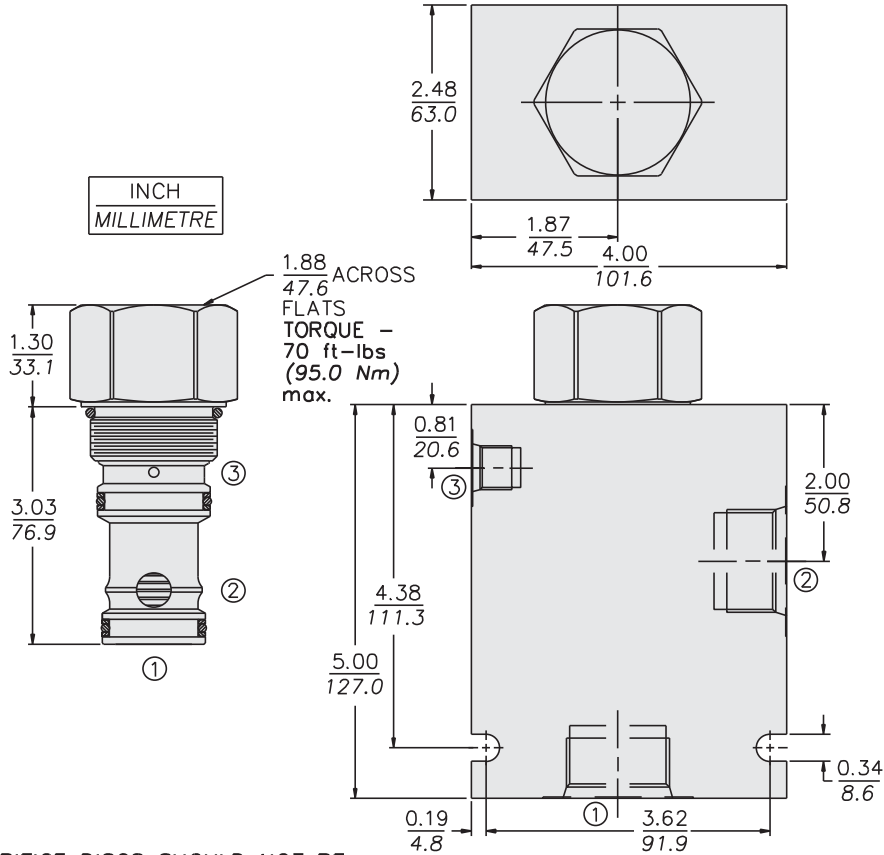


PERFORMANCE (Cartridge Only)



EP20-S35

DIMENSIONS



ORIFICE DISCS SHOULD NOT BE USED WITH THIS PRODUCT.

MATERIALS

Cartridge: Weight: 0.82 kg. (1.8 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

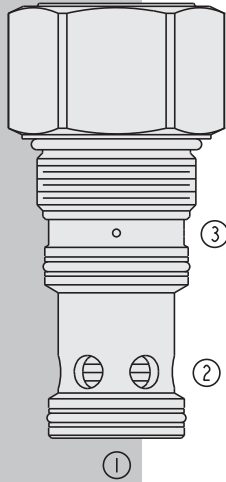
Standard Ported Body: Weight: 1.65 kg. (3.65 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.020.1.

TO ORDER

EP20-S35 -

Porting				Bias Spring
Cartridge Only	0			20 1.4 bar (20 psi)
SAE 16 w/SAE 6 Pilot Port	16T			80 5.52 bar (80 psi)
				160 11.0 bar (160 psi)
				Seals
				N Buna N (Std.)
				V Fluorocarbon
				P Polyurethane (for pressures over 240 bar/3500 psi)

HEP42-S35 HyPerformance™ Piloted Spool-Type



DESCRIPTION

A high-pressure spool-type, screw-in, cartridge-style, hydraulic directional element, with multi-function potential when used with other directional, pressure, or flow control devices.

OPERATION

The HEP42-S35 is a spring-biased blocking valve which will shift to allow full flow from 1 to 2 only when pressure at 1 exceeds the cumulative pressure of 3, plus the bias spring pressure value.

HEP42-S35 is a pilot-to-close directional valve.

With no pressure at 3, flow will be allowed from 1 to 2 once the bias spring force is overcome with pressure at 1.

FEATURES

- Multiple function/application potential.
- Low pressure drop.
- All HyPerformance products are tested to the rigorous standards of the NFPA specification T2.6.1.
- All HyPerformance valves are tested at a verification level of 90% and an assurance of 99%.

RATINGS

Operating Pressure: 350 bar (5075 psi); 10% cycle life: 420 bar (6090 psi)

Note: All HyPerformance products are tested for 900K cycles at 350 bar and 100K at 420 bar.

Fatigue Rating: 2 million cycles at 420 bar

Burst Pressure: 1380 bar (20000 psi)

Flow: 379 lpm (100 gpm)

Internal Leakage: 164 ml/minute (10 cu. in./minute) max. at 350 bar (5075 psi)

Operating Temperature: -40 to 100°C (-40 to 212°F) with Buna N seals
 -26 to 204°C (-15 to 400°F) with Fluorocarbon seals
 -54 to 107°C (-65 to 225°F) with Urethane seals

Ambient Temperature: -40 to 90°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

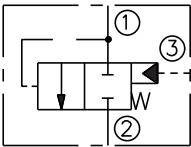
Cavity: HVC42-S3; See page 9.142.1

Cavity Tool: HCT42-S3XX; See page 8.600.1

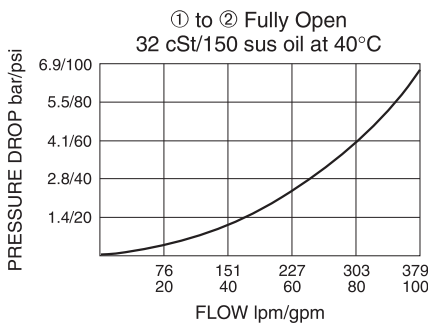
Seal Kit: SK42-S3X-X; See page 8.650.1

SYMBOLS

USASI/ISO:



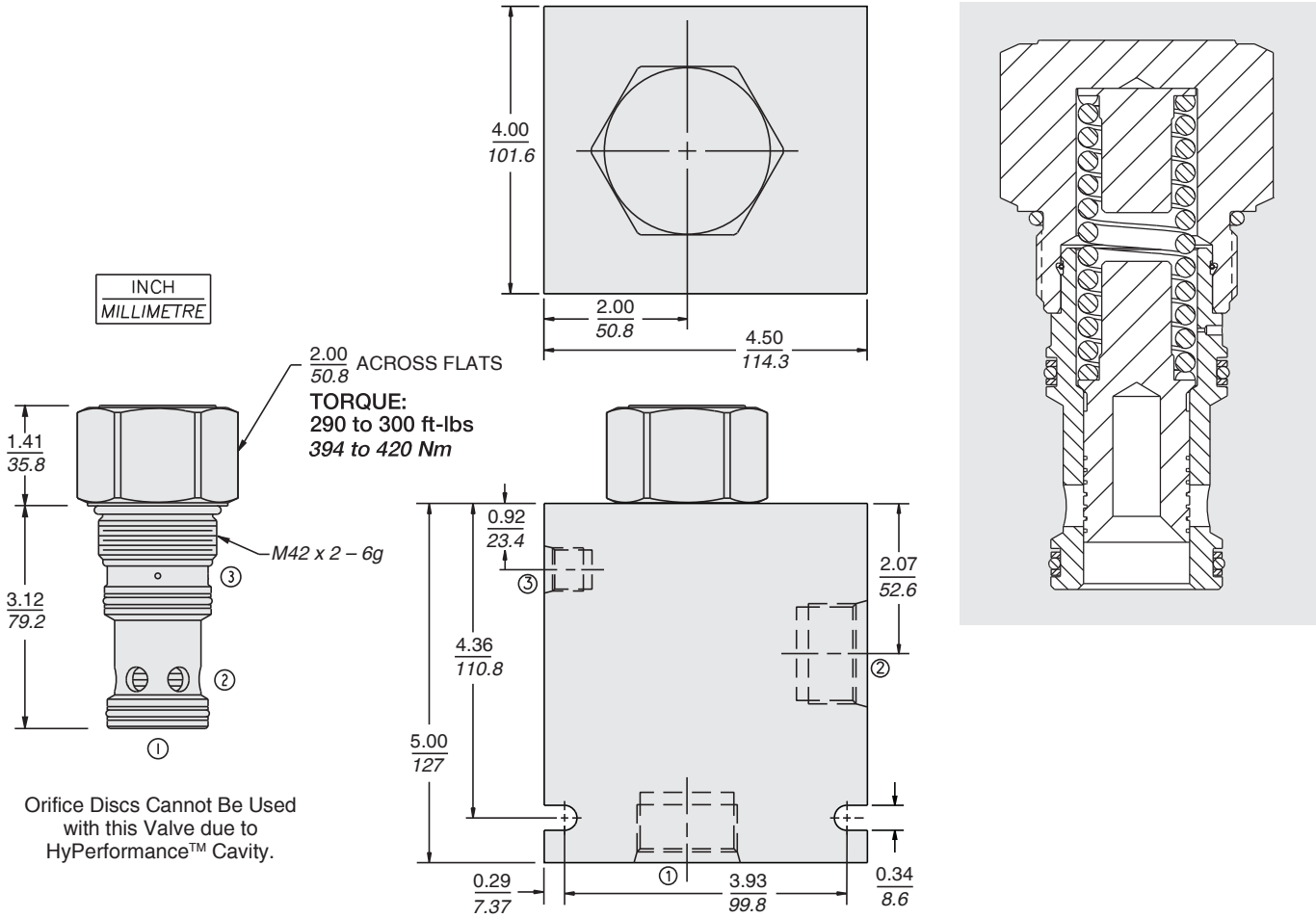
PERFORMANCE (Cartridge Only)



Logic Element

HEP42-S35

DIMENSIONS



MATERIALS

Cartridge: Weight: 1.04 kg. (2.30 lbs.)
Steel with hardened work surfaces.
Zinc-nickel plated exposed surfaces.
PPDI Urethane seals with no backup rings standard.

Ported Body: Weight: 9.03 kg. (19.9 lbs.); HyPerformance™
Ductile iron (code 'D') standard.
Rated to 345 bar (5000 psi).

TO ORDER

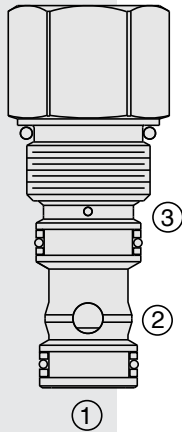
HEP42-S35 -

Porting	0	Bias Spring Value	20
Cartridge Only	SAE 20	1.4 bar (20 psi)	50
1-1/4 in. BSP*	10BD	3.4 bar (50 psi)	80
*BSP Body; U.K. Mfr. Only		5.5 bar (80 psi)	175
		12.1 bar (175 psi)	

Seals

- N** Buna N
- V** Fluorocarbon
- U** PPDI Urethane — Recommended for pressures above 241 bar (3500 psi)

EP10-S38 Piloted Poppet-Type Logic Element



DESCRIPTION

A poppet-type, screw-in, cartridge-style, hydraulic directional element, with multi-function potential when used with other directional, pressure, or flow control devices.

OPERATION

The EP10-S38 is a spring-biased poppet valve which will block 1 to 2 or 2 to 1 until pressure at 1 or 2 exceeds the cumulative pressure at 3 and bias spring. With no pressure at 3, flow will be allowed from 1 to 2 or 2 to 1 once the bias spring force is overcome with pressure at 1 or 2. When the element is in closed state, the ratio of areas 1 and 2 is 1:1, and the ratio of areas 1 or 2 to 3 is 1:2.

FEATURES

- Multiple function/application potential.
- Low pressure drop.
- Industry common cavity.

RATINGS

Operating Pressure: 350 bar (5000 psi) cartridge; 207 bar (3000 psi) standard aluminum housing

Flow: See Performance Chart

Internal Leakage: 0.2 cc/minute (.01 cu. in./minute) max. at 240 bar (3500 psi)

Bias Spring Pressure: 11.0 bar (160 psi)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

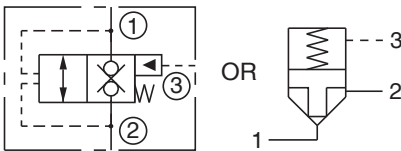
Cavity: VC10-S3; See page 9.110.1

Cavity Tool: CT10-S3xx; See page 8.600.1

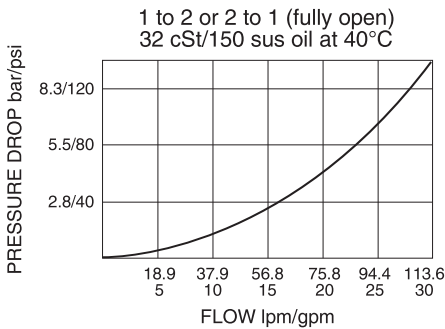
Seal Kit: SK10-S3x-MM; See page 8.650.1

SYMBOLS

USAS/ISO:

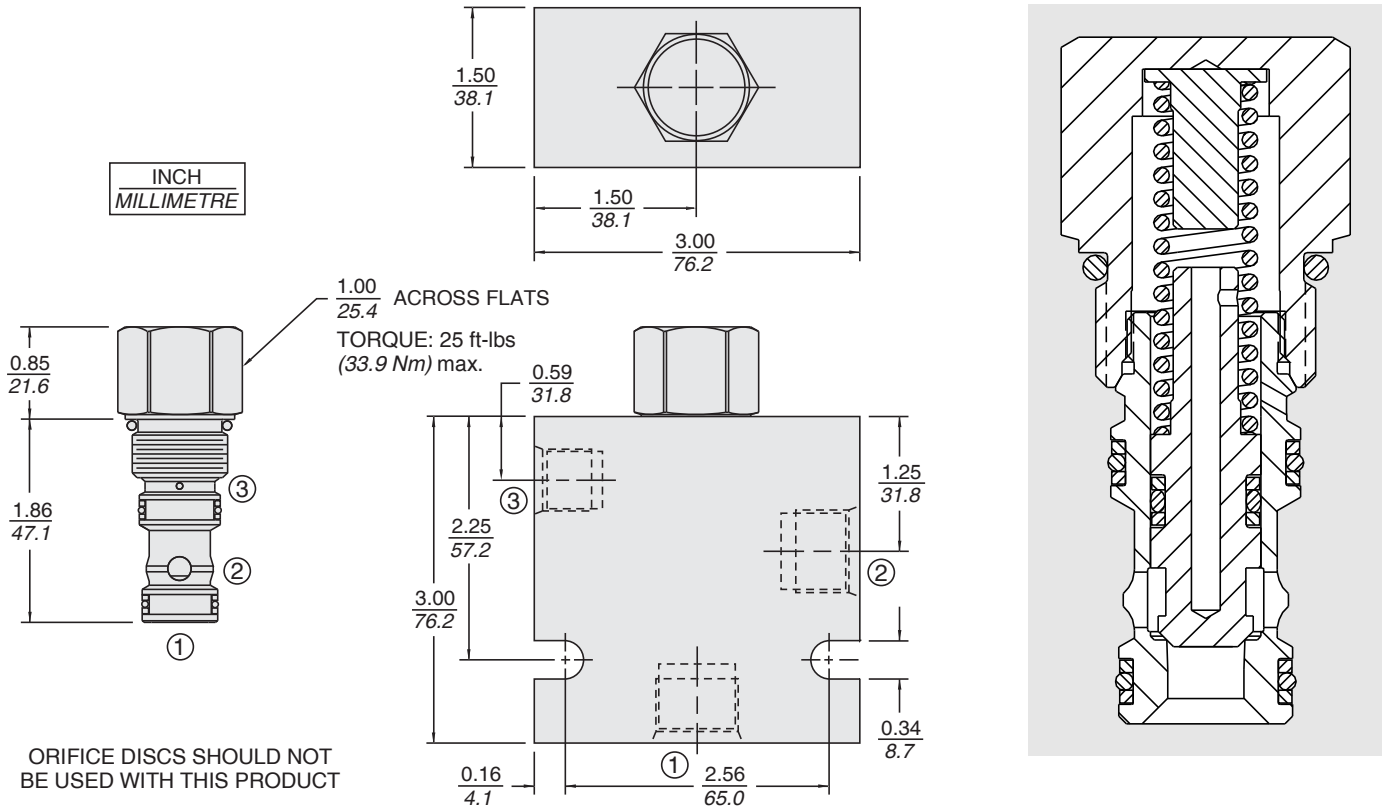


PERFORMANCE (Cartridge Only)



EP10-S38

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.15 kg. (0.32 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.32 kg. (0.70 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ; see page 8.010.1

TO ORDER

EP10-S38 -

Porting
Cartridge Only **0**
SAE 8* **8T**
SAE 10* **10T**
SAE 12* **12T**

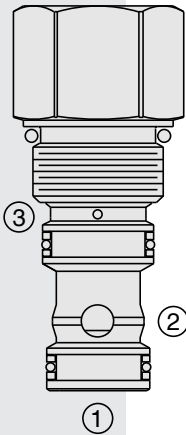
*SAE 6 pilot port

Bias Spring
80 5.52 bar (80 psi)
160 11.0 bar (160 psi)

Seals

N Buna N (Std.)
V Fluorocarbon
P Polyurethane (for pressures over 240 bar/3500 psi)

EP20-S38 Piloted Poppet-Type Logic Element



DESCRIPTION

A poppet-type, screw-in, cartridge-style, hydraulic directional element, with multi-function potential when used with other directional, pressure, or flow control devices.

OPERATION

The EP20-S38 is a spring-biased poppet valve which will block 1 to 2 or 2 to 1 until pressure at 1 or 2 exceeds the cumulative pressure at 3 and bias spring. With no pressure at 3, flow will be allowed from 1 to 2 or 2 to 1 once the bias spring force is overcome with pressure at 1 or 2. When the element is in the closed state, the ratio of areas 1 and 2 is 1:1, and the ratio of areas 1 or 2 to 3 is 1:2.

FEATURES

- Multiple function/application potential.
- Low pressure drop.
- Industry common cavity.

RATINGS

Maximum Operating Pressure: Cartridge Only: Ports 1 & 2, 241 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: 0.6 cc/minute (12 drops/minute) max. at 241 bar (3500 psi)

Bias Spring Pressure Options: 2.8 bar (40 psi); 11.0 bar (160 psi)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

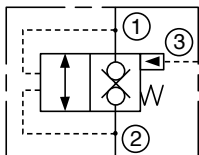
Cavity: VC20-S3; See page 9.120.1

Cavity Tool: CT20-S3xx; See page 8.600.1

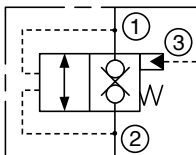
Seal Kit: SK20-S3x-MM; See page 8.650.1

SYMBOLS

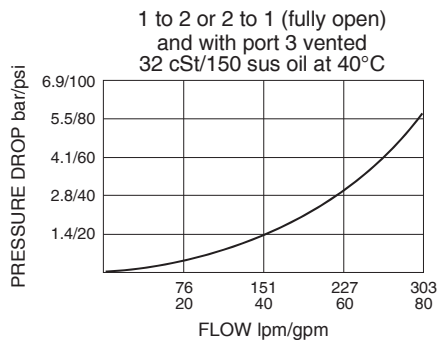
USASI:



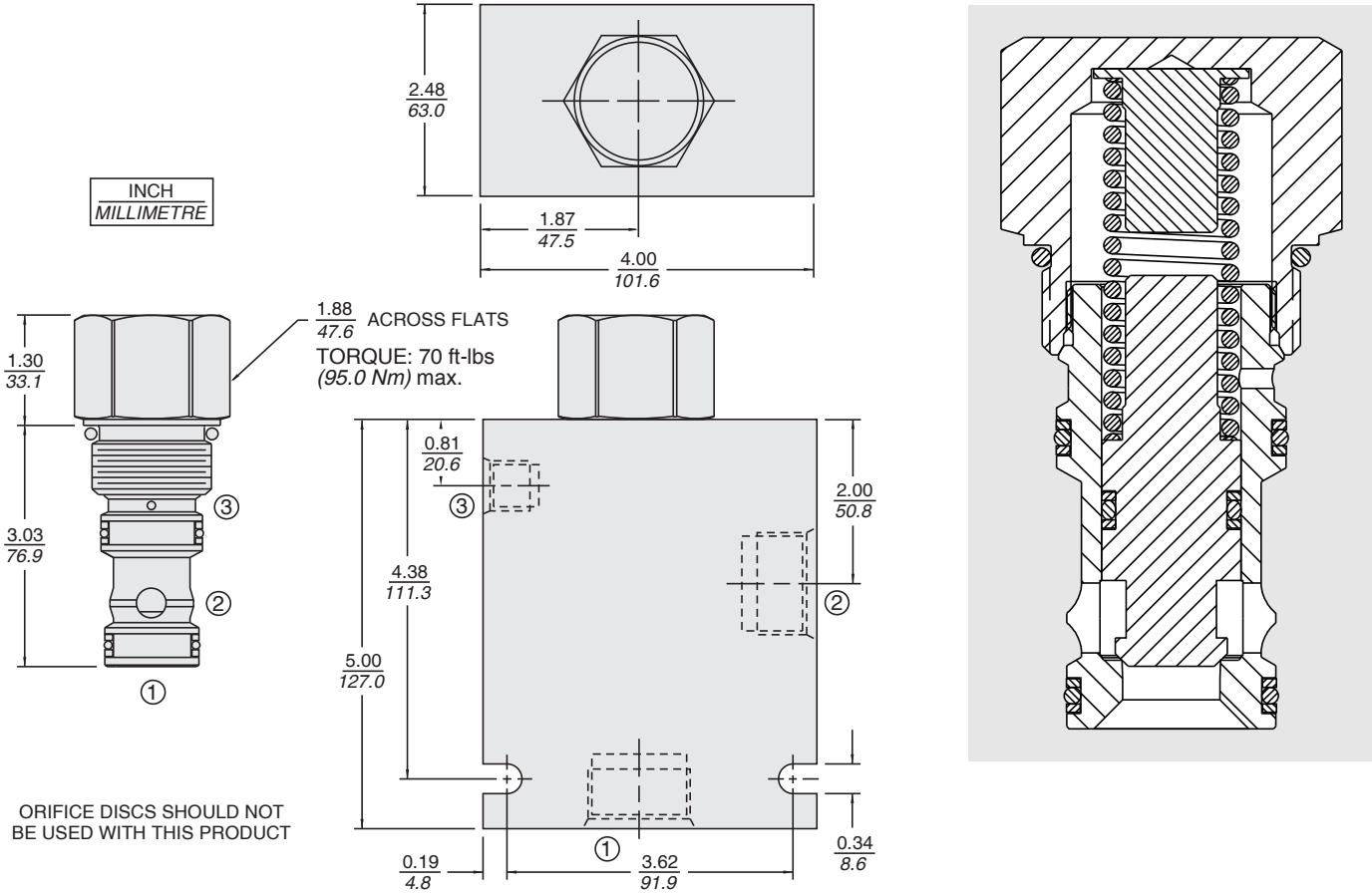
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

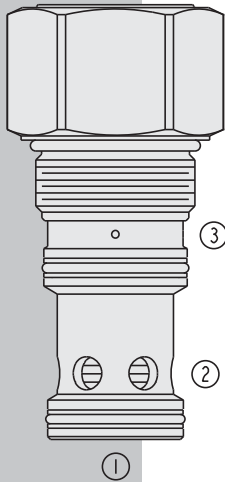
Cartridge: Weight: 0.82 kg. (1.8 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 1.65 kg. (3.65 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies can be made available; dimensions may differ. See page 8.020.1.

TO ORDER

EP20-S38 -		-	-	-
	Porting			
	Cartridge Only	0		
	SAE 16 w/SAE 6 Pilot Port	16T		
			Bias Spring	
			40	2.8 bar (40 psi)
			80	5.5 bar (80 psi)
			160	11.0 bar (160 psi)
			Seals	
			N	Buna N (Std.)
			V	Fluorocarbon

HEP42-S38 HyPerformance™ Piloted Poppet-Type



DESCRIPTION

A high-pressure poppet-type, screw-in, cartridge-style, spring-biased, bi-directional blocking-type hydraulic directional element with multi-function potential when used with other directional, pressure, or flow control devices.

OPERATION

The EP10-S38 is a spring-biased poppet valve which will block 1 to 2 or 2 to 1 until pressure at 1 or 2 exceeds the cumulative pressure at 3 and bias spring. With no pressure at 3, flow will be allowed from 1 to 2 or 2 to 1 once the bias spring force is overcome with pressure at 1 or 2. When the element is in the closed state, the ratio of areas 1 and 2 is 1:1, and the ratio of areas 1 or 2 to 3 is 1:2.

FEATURES

- Multiple function/application potential.
- Low pressure drop.
- All HyPerformance products are tested to the rigorous standards of the NFPA specification T2.6.1.
- All HyPerformance valves are tested at a verification level of 90% and an assurance of 99%.

RATINGS

Operating Pressure: 350 bar (5075 psi); 10% cycle life: 420 bar (6090 psi)

Note: All HyPerformance products are tested for 900K cycles at 350 bar and 100K at 420 bar.

Fatigue Rating: 2 million cycles at 420 bar (6090 psi)

Proof Pressure: 690 bar (10,000 psi)

Burst Pressure: 1380 bar (20000 psi)

Flow: Up to 284 lpm (75 gpm)

Internal Leakage: 12 drops/minute max. at 350 bar (5075 psi)

Operating Temperature: -54 to 107°C (-65 to 225°F) with Urethane seals

Ambient Temperature: -40 to 90°C (-40 to 194°F)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

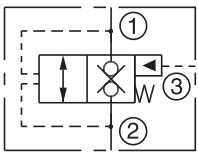
Installation: No restrictions; See page 9.020.1

Cavity: HVC42-S3; See page 9.142.1

Cavity Tool: HCT42-S3XX; See page 8.600.1

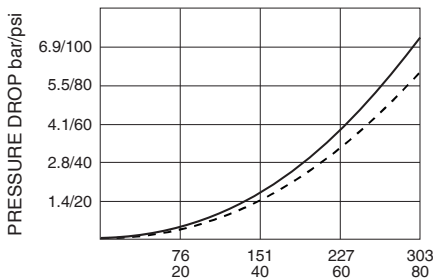
Seal Kit: SK42-S3U-OO with Urethane seals; See page 8.650.1

SYMBOL



PERFORMANCE (Cartridge Only)

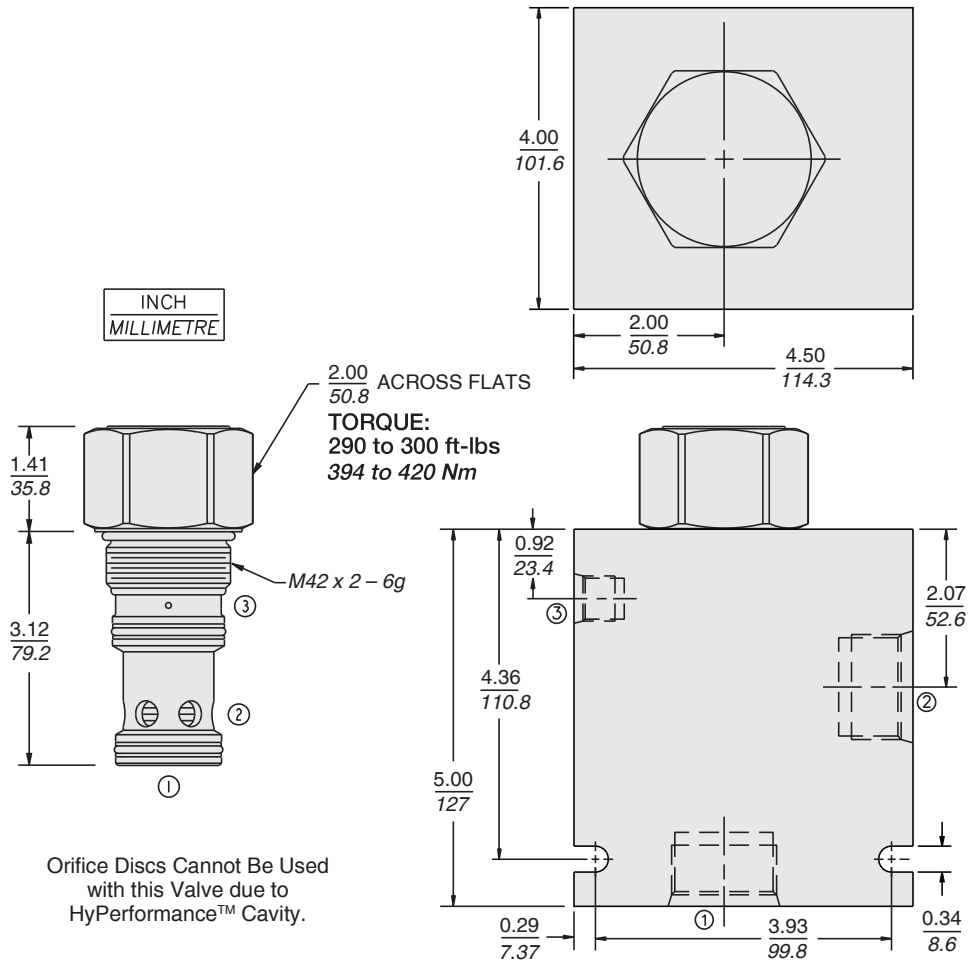
1 to 2 - - - - ; 2 to 1 —
Fully Open, with Port 3 Vented
32 cSt/150 sus oil at 40°C



Directional Element

HEP42-S38

DIMENSIONS



MATERIALS

Cartridge: Weight: 1.04 kg. (2.30 lbs.)
Steel with hardened work surfaces.
Zinc-nickel plated exposed surfaces.
PPDI Urethane seals with no back-up rings standard.

Ported Body: Weight: 9 kg. (19.8 lbs.)
HyPerformance™ Ductile iron (code 'D') standard. Rated to 345 bar (5000 psi).
Consult Factory.

TO ORDER

HEP42-S38 -

Porting

Cartridge Only	0
SAE 20 Ductile Iron	20TD
1-1/4" BSP Ductile Iron*	10BD

*BSP body U.K. Mfr. Only

Bias Spring Value

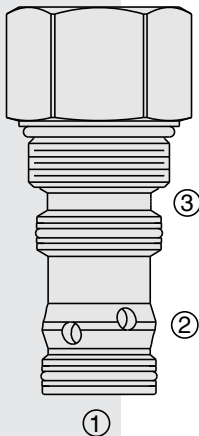
40	2.8 bar (40 psi)
80	5.5 bar (80 psi)
160	11.0 bar (160 psi)

Seals

U PPDI Urethane — Recommended for pressures above 241 bar (3500 psi)

NOTE: Consult factory for additional seal options.

EP20-S39 Vented Poppet-Type Logic Element



DESCRIPTION

A poppet-type, screw-in, cartridge-style, spring-biased, bi-directional blocking-type hydraulic valve with two built-in checks. When used in conjunction with a small pilot solenoid valve, the EP20-S39 is ideal for either high-flow double-blocking circuits or selector circuits. The integral two-check system prevents leakage, maintaining the pilot signal regardless of the transition or the work-port pressure changes.

OPERATION

The EP20-S39 will allow flow from 1 to 2 or 2 to 1 only when 3 is vented to create a pressure drop across the internal orifice which exceeds the pressure value of the bias spring. When the element is in the neutral (closed) state, the ratio of areas 1 and 2 is 1:1, and the ratio of areas 1 or 2 to 3 is 1:2.

FEATURES

- Multiple function/application potential.
- Low pressure drop.
- Industry common cavity.

RATINGS

Maximum Operating Pressure: Cartridge Only: Ports 1 & 2, 241 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: 0.6 ml/minute (12 drops/minute) max. at 241 bar (3500 psi)

Internal Orifice: 0.79 mm (0.031 in.)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

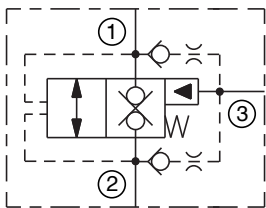
Cavity: VC20-S3; See page 9.120.1

Cavity Tool: CT20-S3xx; See page 8.600.1

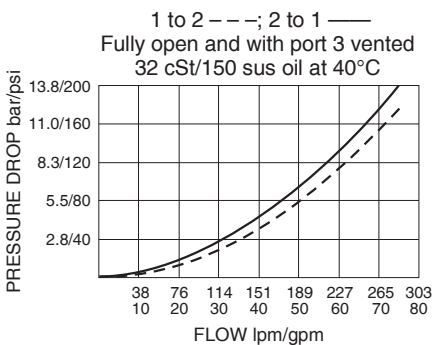
Seal Kit: SK20-S3x-MM; See page 8.650.1

SYMBOL

USASI/ISO:



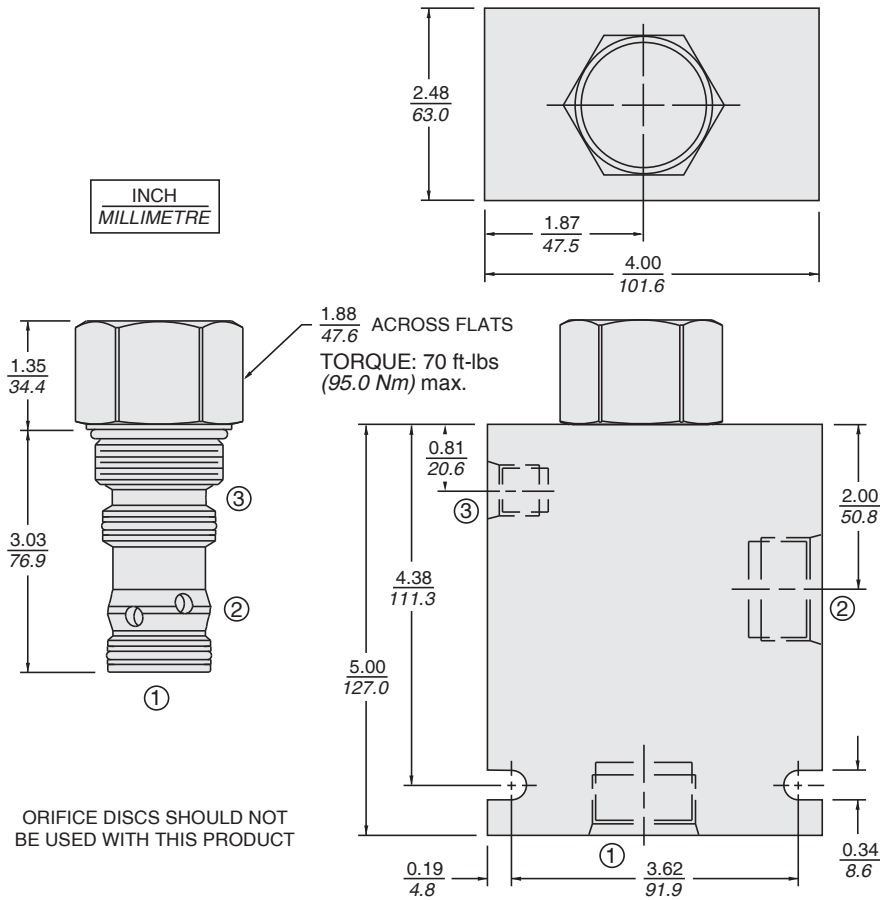
PERFORMANCE (Cartridge Only)



with Two Built-In Checks

EP20-S39

DIMENSIONS

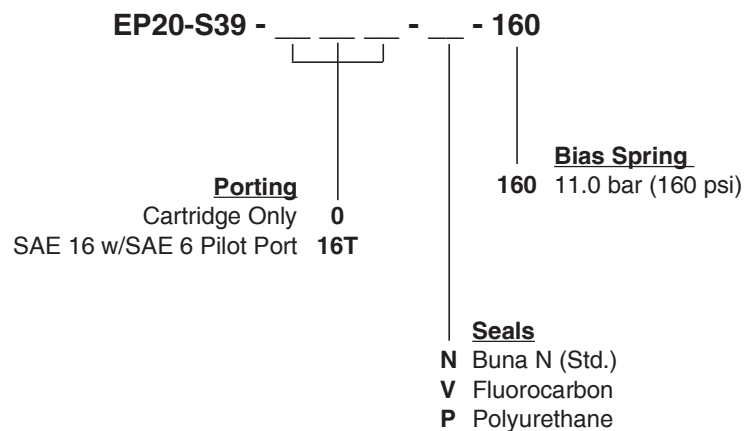


MATERIALS

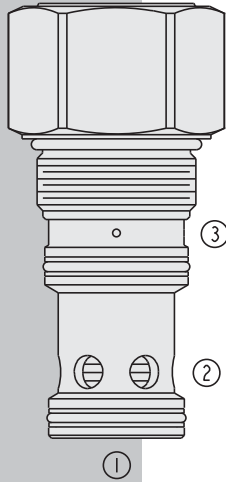
Cartridge: Weight: 0.84 kg. (1.85 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight:
 1.65 kg. (3.65 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron can be made available; dimensions may differ. See page 8.020.1.

TO ORDER



HEP42-S39 HyPerformance™ Vented Poppet-type



DESCRIPTION

A high pressure, poppet-type, screw-in, cartridge-style, spring-biased, bi-directional blocking-type hydraulic valve with two built-in checks. When used in conjunction with a small pilot solenoid valve, the HEP42-S39 is ideal for either high-flow double-blocking circuits or selector circuits. The integral two-check system prevents leakage, maintaining the pilot signal regardless of the transition or the work-port pressure changes.

OPERATION

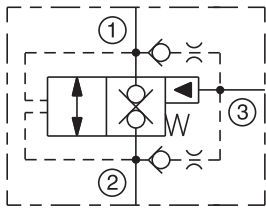
The HEP42-S39 will allow flow from 1 to 2 or 2 to 1 only when 3 is vented to create a pressure differential across the internal orifice which exceeds the pressure value of the bias spring. When the element is in the neutral (closed) state, the ratio of areas 1 and 2 is 1:1, and the ratio of areas 1 or 2 to 3 is 1:2.

FEATURES

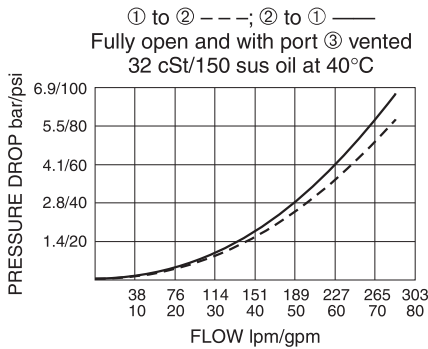
- Multiple function/application potential.
- Low pressure drop.
- All HyPerformance products are tested to the rigorous standards of the NFPA specification T2.6.1.
- All HyPerformance valves are tested at a verification level of 90% and an assurance of 99%.

SYMBOLS

USASI/ISO:



PERFORMANCE (Cartridge Only)



RATINGS

Operating Pressure: 350 bar (5075 psi); 10% cycle life: 420 bar (6090 psi)

Note: All HyPerformance products are tested for 900K cycles at 350 bar and 100K at 420 bar.

Proof Pressure: 690 bar (10000 psi)

Burst Pressure: 1380 bar (20000 psi)

Flow: 284 lpm (75 gpm)

Internal Leakage: 12 drops per minute max. at 350 bar (5075 psi)

Operating Temperature: -54 to 107°C (-65 to 225°F) with Urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: HVC42-S3; See page 9.142.1

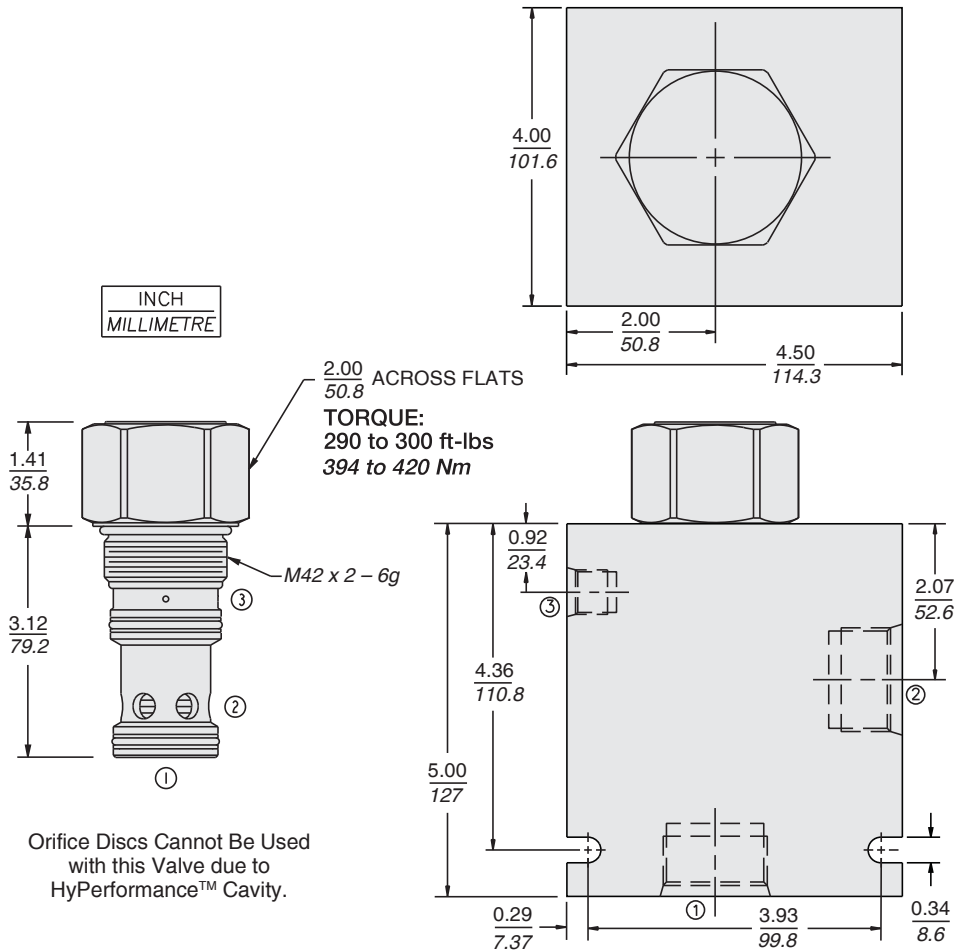
Cavity Tool: HCT42-S3XX; See page 8.600.1

Seal Kit: SK42-S3X-MM; See page 8.650.1

Logic Element w/Built-in Checks

HEP42-S39

DIMENSIONS



MATERIALS

Cartridge: Weight: 1.04 kg. (2.30 lbs.)
Steel with hardened work surfaces.
Zinc-nickel plated exposed surfaces.
PPDI Urethane seals with no backup rings standard.

Ported Body: Weight: 9.03 kg. (19.9 lbs.); HyPerformance™
Ductile iron (code 'D') standard.
Rated to 345 bar (5000 psi).

TO ORDER

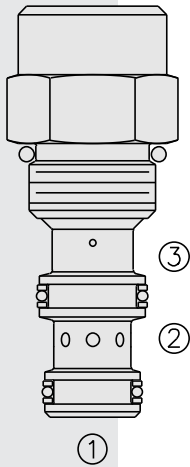
HEP42-S39 - - - 160

Porting
Cartridge Only 0
SAE 20 20TD
1-1/4 in. BSP* 10BD
*BSP Body; U.K. Mfr. Only

Bias Spring Value
160 11.0 bar (160 psi)

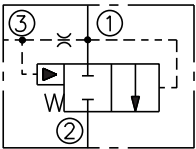
Seals
U PPDI Urethane — Recommended for pressures above 241 bar (3500 psi)

EV58-34 Vented Directional Element

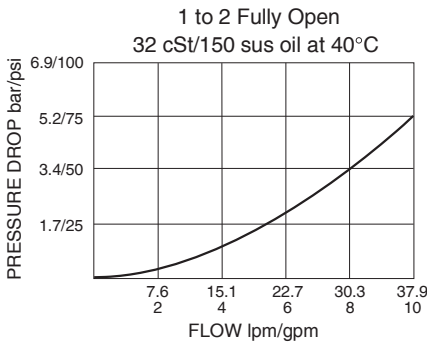


SYMBOLS

USASI/ISO:



PERFORMANCE (Cartridge Only)



DESCRIPTION

A spool-type, screw-in, cartridge-style, hydraulic directional element, with multi-function potential when used with other directional, pressure, or flow control valves.

OPERATION

The EV58-34 is a spring-biased blocking valve which will shift to allow full flow from 1 to 2 only when port 3 is vented to create a pressure drop across the internal orifice which exceeds the pressure of the bias spring value.

FEATURES

- Multiple function/application potential.
- Low pressure drop.
- Industry common cavity
- Compact size.

RATINGS

Maximum Operating Pressure: 345 bar (5000 psi) with steel or ductile housing;
207 bar (3000 psi) with aluminum housing.

Flow Rate: Up to 37.9 lpm (10 gpm)

Maximum Internal Leakage:

131 ml per minute (8 cu. in. per minute) at 207 bar (3000 psi)

229 ml per minute (14 cu. in. per minute) at 345 bar (5000 psi)

Bias Springs:

Code 10 0.7 bar (10 psi)

Code 40 2.8 bar (40 psi)

Code 80 5.5 bar (80 psi)

Code 110 7.6 bar (110 psi)

Code 150 10.3 bar (150 psi)

Temperature: -40 to 160°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

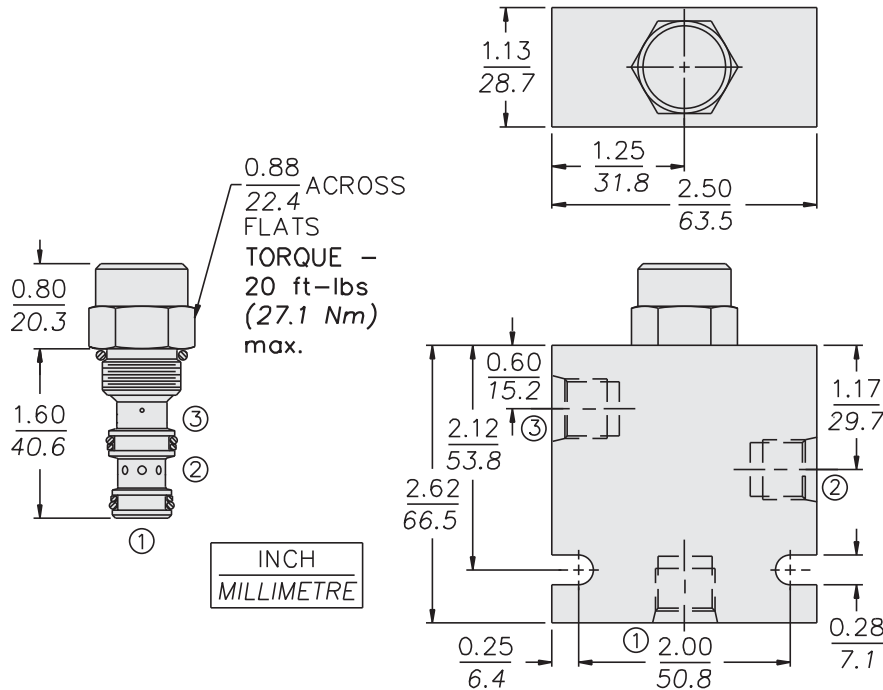
Installation: No restrictions; See page 9.020.1

Cavity: VC08-3; See page 9.108.1

Cavity Tool: CT08-3XX; See page 8.600.1

Seal Kit: SK08-3X-MM; See page 8.650.1

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.11 kg. (0.25 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and back-ups
standard.

Ported Body: Weight: 0.64 kg.
(1.4 lbs.) Ductile Iron (code "D")
standard, dimensions may differ
from illustration; rated to 345 bar
(5000 psi). See page 8.008.1

Ported Body: Weight: 0.36 kg.
(0.80 lbs.) Anodized high-strength
6061 T6 aluminum alloy, rated to
207 bar (3000 psi).
See page 8.008.1

TO ORDER

EV58-34 -

Porting

Cartridge Only **0**
SAE 6 (Ductile) **6TD**
SAE 6 (Alum.) **6T**

Note: Aluminum body
rated for 207 bar
(3000 psi) max.

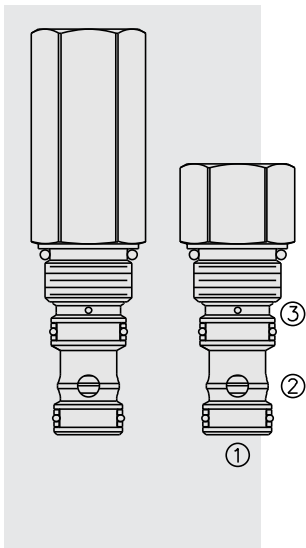
Bias Spring

10 0.7 bar (10 psi)
40 2.8 bar (40 psi)
80 5.5 bar (80 psi)
110 7.6 bar (110 psi)
150 10.3 bar (150 psi)

Seals

Buna N (Std.) **N**
Fluorocarbon **V**
Polyurethane **P**

EV10-S34 Vented Spool-Type Logic Element



DESCRIPTION

A spool-type, screw-in, cartridge-style, hydraulic directional element, with multi-function potential when used with other directional, pressure, or flow control devices.

OPERATION

The EV10-S34 is a spring-biased blocking valve which will shift to allow full flow from 1 to 2 only when 3 is vented to create a pressure drop across the internal orifice which exceeds the pressure value of the selected bias spring force.

EV10-S34 is a vent-to-open directional valve.

FEATURES

- Multiple function/application potential.
- Smooth shift transition.
- Low pressure drop.
- Industry common cavity.

RATINGS

Operating Pressure: 345 bar (5000 psi) cartridge; 240 bar (3500 psi) standard aluminum housing

Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) max. at 207 bar (3000 psi)

Bias Spring Pressure Options:

- 0.7 bar (10 psi);
- 2.8 bar (40 psi);
- 5.5 bar (80 psi);
- 7.6 bar (110 psi);
- 11.0 bar (160 psi);

Note: Tall cap option required for 11.0 bar (160 psi) spring.

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

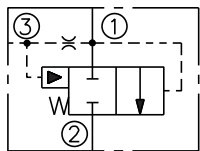
Cavity: VC10-S3; See page 9.110.1

Cavity Tool: CT10-S3xx; See page 8.600.1

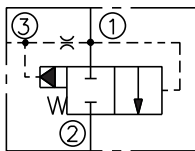
Seal Kit: SK10-S3x-MM; See page 8.650.1

SYMBOLS

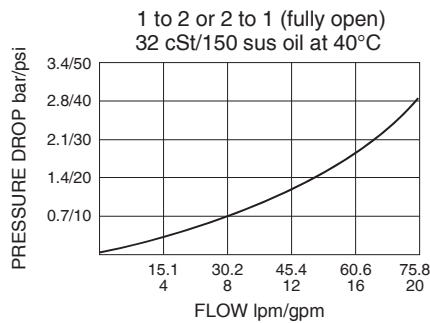
USASI:



ISO:

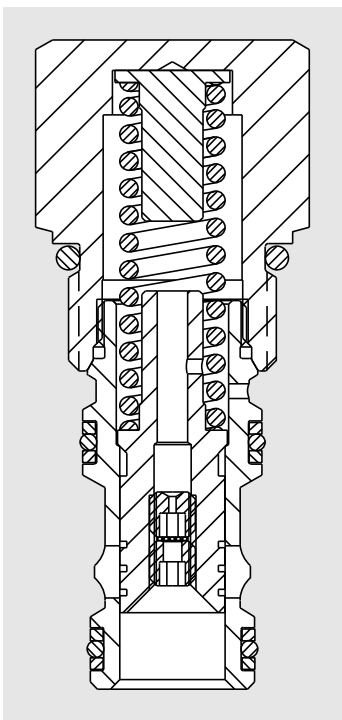
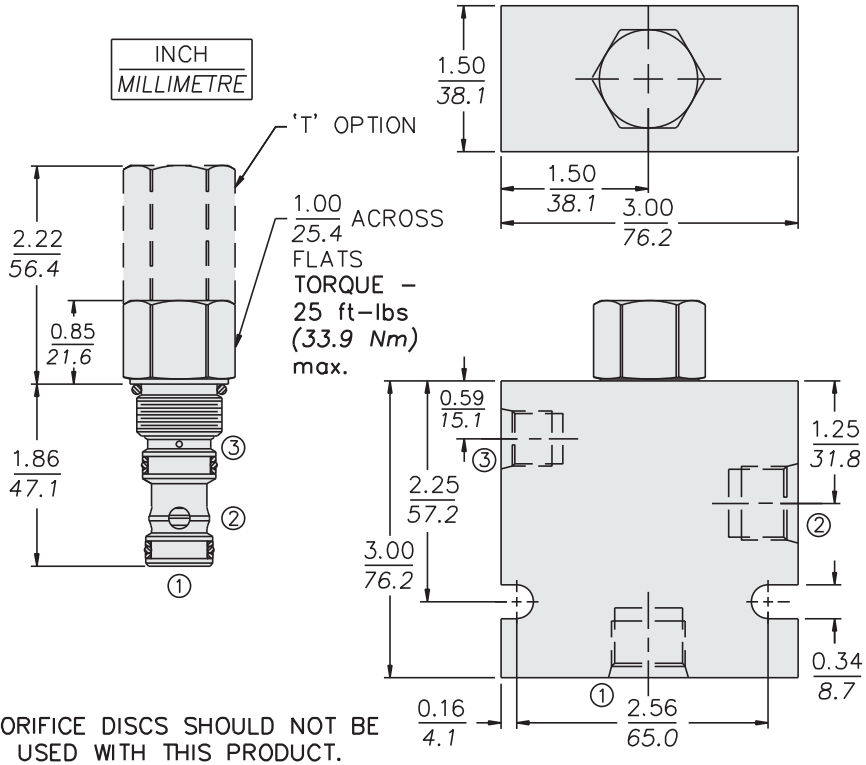


PERFORMANCE (Cartridge Only)



EV10-S34

DIMENSIONS



MATERIALS

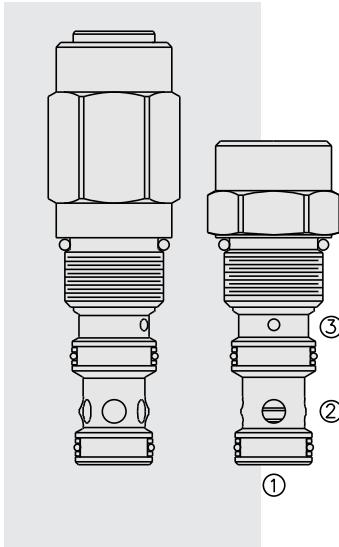
Cartridge: Weight: 0.15 kg. (0.32 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
0.32 kg. (0.70 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.010.1

TO ORDER

EV10-S34		-	-	-	-
Option					
None (Blank)					
Tall Cap	T				
Porting					
Cartridge Only	0				
SAE 8*	8T				
SAE 10*	10T				
SAE 12*	12T				
*SAE 6 vent port					
Bias Spring					
10	0.7 bar (10 psi)				
40	2.8 bar (40 psi)				
80	5.52 bar (80 psi)				
110	7.6 bar (110 psi)				
†160	11.0 bar (160 psi)				
‡230	15.9 bar (230 psi)				
‡ T Option required					
Seals					
N	Buna N (Std.)				
V	Fluorocarbon				
P	Polyurethane (for pressures over 240 bar [3500 psi])				

EV12-S34 Vented Spool-Type Logic Element



DESCRIPTION

A spool-type, screw-in, cartridge-style, hydraulic directional element, with multi-function potential when used with other directional, pressure, or flow control devices.

OPERATION

The **EV12-S34** is a spring-biased blocking valve which will shift to allow full flow from 1 to 2 only when 3 is vented to create a pressure drop across the internal orifice which exceeds the pressure value of the selected bias spring force.

EV12-S34 is a vent-to-open directional valve.

FEATURES

- Multiple function/application potential.
- Smooth shift transition.
- Low pressure drop.
- Industry common cavity.

RATINGS

Operating Pressure: 345 bar (5000 psi) cartridge; 240 bar (3500 psi) standard aluminum housing

Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) max. at 207 bar (3000 psi)

Bias Spring Pressure: 7.6 bar (110 psi)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

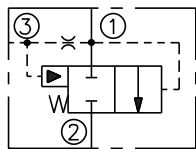
Cavity: VC12-S3; See page 9.112.1

Cavity Tool: CT12-S3xx; See page 8.600.1

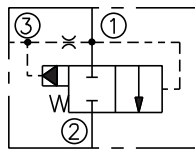
Seal Kit: SK12-S3x-MM; See page 8.650.1

SYMBOLS

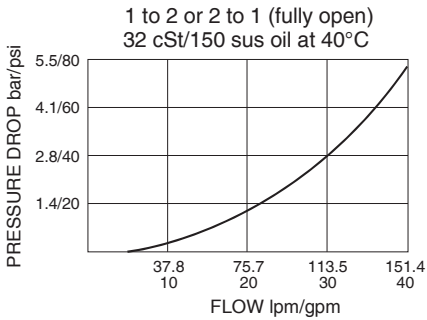
USASI:



ISO:

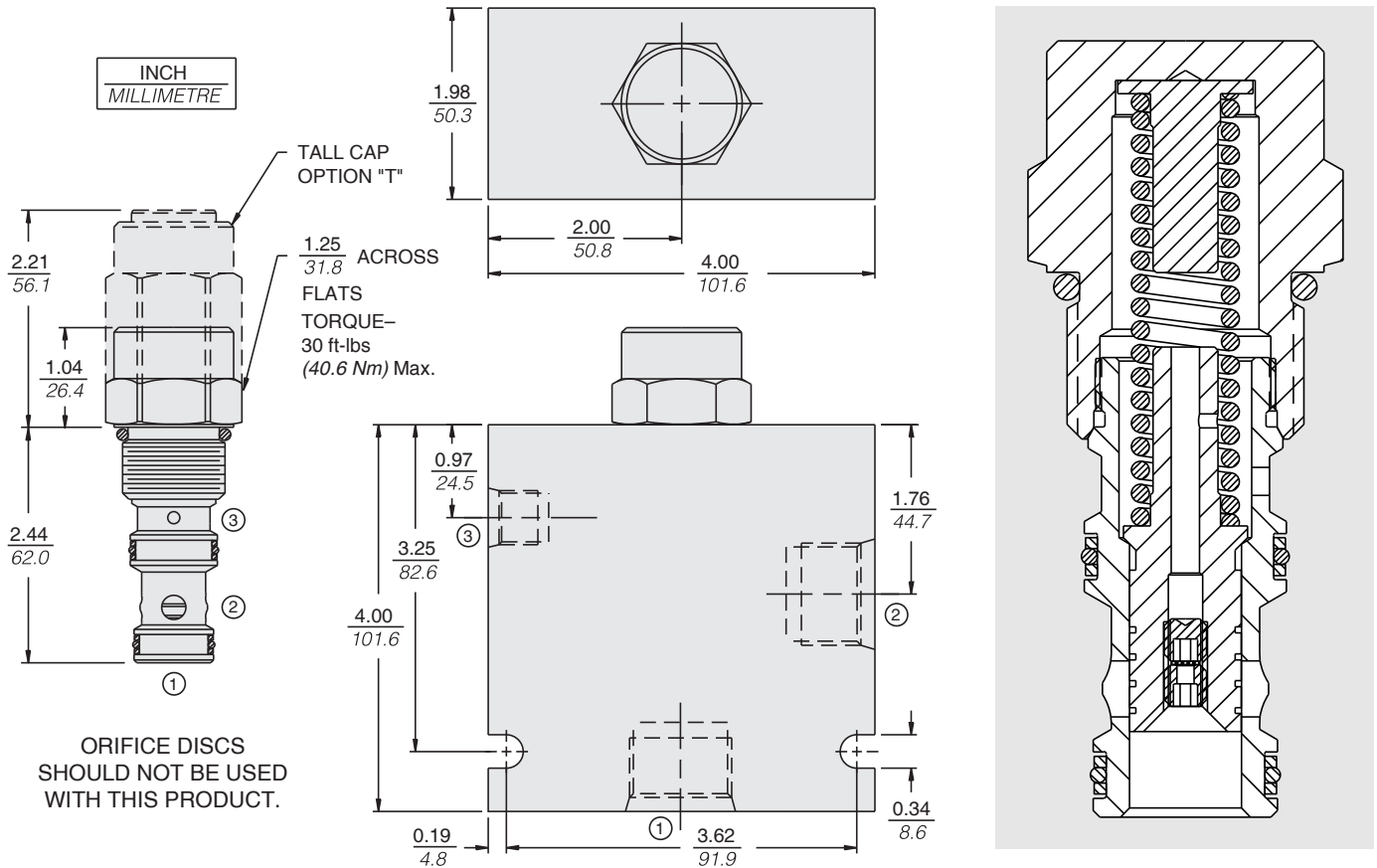


PERFORMANCE (Cartridge Only)



EV12-S34

DIMENSIONS

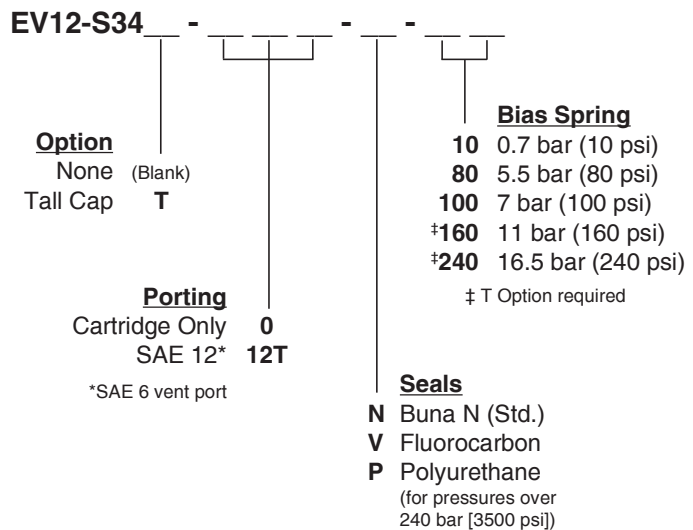


MATERIALS

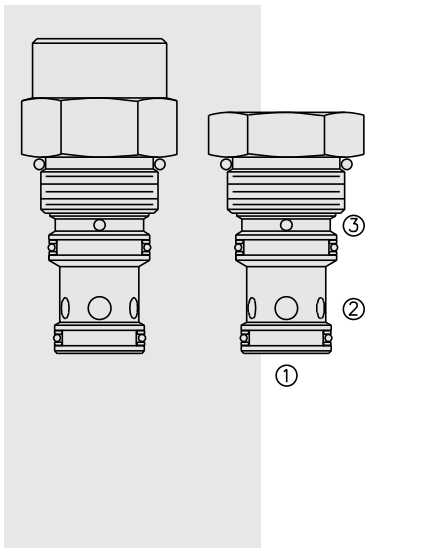
Cartridge: Weight: 0.23 kg. (0.5 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester
 elastomer back-ups standard.

Standard Ported Body: Weight:
 1.13 kg. (2.5 lbs.) Anodized high-
 strength 6061 T6 aluminum alloy,
 rated to 207 bar (3000 psi). Ductile
 iron bodies available; dimensions
 may differ. See page 8.010.1

TO ORDER



EV16-S34 Vented Spool-Type Logic Element



DESCRIPTION

A spool-type, screw-in, cartridge-style, hydraulic directional element, with multi-function potential when used with other directional, pressure, or flow control devices.

OPERATION

The **EV16-S34** is a spring-biased blocking valve which will shift to allow full flow from 1 to 2 only when 3 is vented to create a pressure drop across the internal orifice which exceeds the pressure value of the selected bias spring force. EV16-S34 is a vent-to-open directional valve. It requires a tall cap when specified with bias springs from 6,2 to 16,5 bar (90 to 240 psi). The 240 psi spring requires an extra tall cap.

NOTE: Orifice discs should not be used with this valve.

FEATURES

- Multiple function/application potential.
- Smooth shift transition.
- Low pressure drop.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 420 bar (6090 psi)

Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) max. at 207 bar (3000 psi)

Temperature: -40 to 100°C (-40 to 212° F) with standard Buna seals;

-26 to 204°C (-15 to 400° F) with Fluorocarbon seals;

-54 to 104°C (-65 to 225° F) with Polyurethane seals.

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

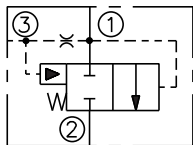
Cavity: VC16-S3; See page 9.116.1

Cavity Tool: CT16-S3xx; See page 8.600.1

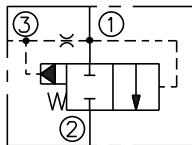
Seal Kit: SK16-S3x-MM; See page 8.650.1

SYMBOLS

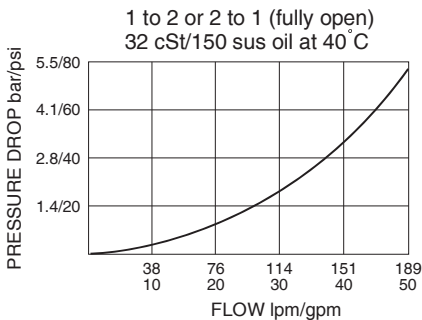
USASI:



ISO:

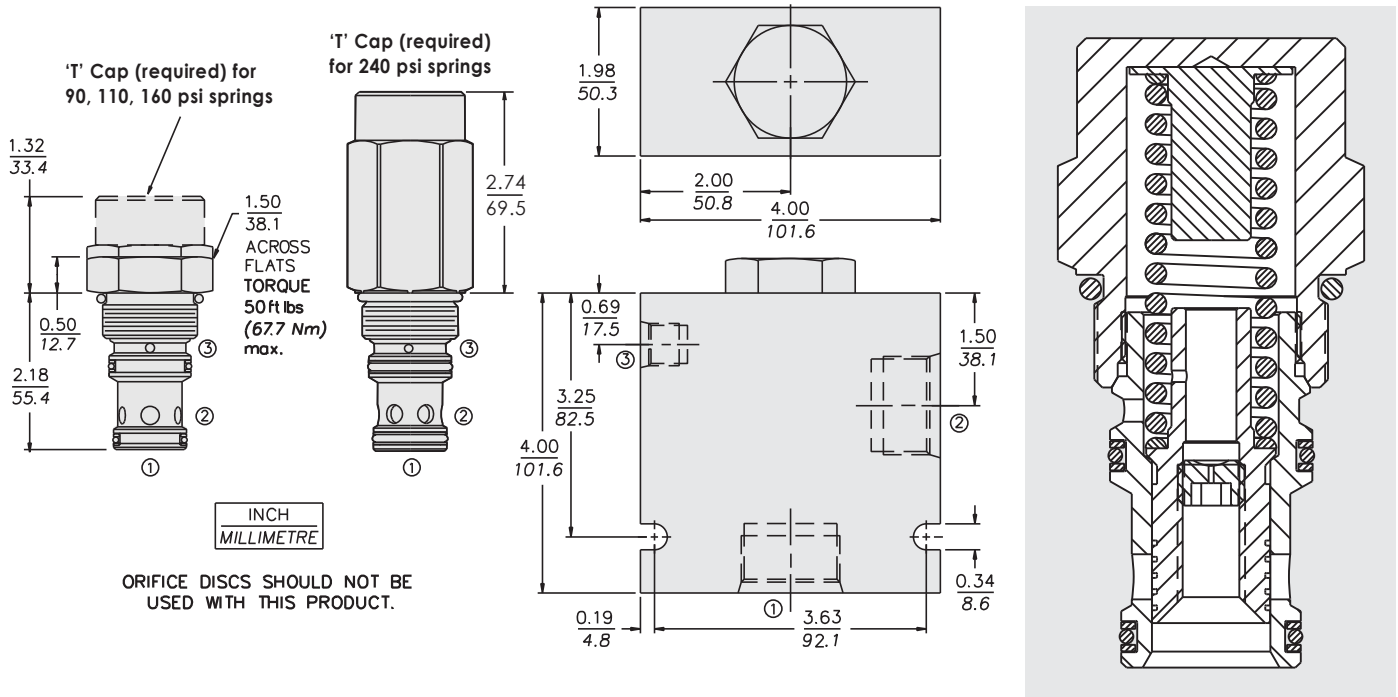


PERFORMANCE (Cartridge Only)



EV16-S34

DIMENSIONS



MATERIALS

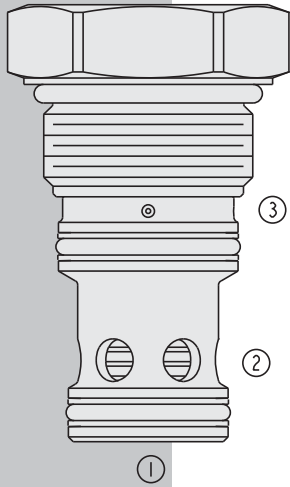
Cartridge: Weight: 0.27 kg. (0.60 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight:
1.50 kg. (3.3 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.016.1.

TO ORDER

EV16-S34 - - -		
Option		Bias Spring (Crack)
None (Blank)		10 0.7 bar (10 psi)
Tall Cap T		20 1.4 bar (20 psi)
		40 2.8 bar (40 psi)
		70 4.8 bar (70 psi)
		*90 6.2 bar (90 psi)
		*110 7.6 bar (110 psi)
		*160 11.0 bar (160 psi)
		*240 16.5 bar (240 psi)
		‡ T Tall Cap Option required for 6.2 - 16.5 bar (90 - 240 psi) bias springs.
Porting		Seals
Cartridge Only 0		N Buna N (Std.)
SAE 16 w/SAE 6 Vent Port 16T		V Fluorocarbon
		P Polyurethane

HEV16-S34 HyPerformance™ Vented Spool-Type



DESCRIPTION

A high-pressure spool-type, screw-in, cartridge-style, hydraulic directional element, with multi-function potential when used with other directional, pressure, or flow control devices.

OPERATION

The HEV16-S34 is a spring-biased blocking valve which will shift to allow full flow from 1 to 2 only when 3 is vented to create a pressure drop across the internal orifice which exceeds the pressure of the selected bias spring.

HEV16-S34 is a vent-to-open directional valve.

FEATURES

- Multiple function/application potential.
- Smooth shift transition.
- Low pressure drop.
- All HyPerformance products are tested to the rigorous standards of the NFPA specification T2.6.1.
- All HyPerformance valves are tested at a verification level of 90% and an assurance of 99%.

RATINGS

Operating Pressure: 350 bar (5075 psi); 10% cycle life: 420 bar (6090 psi)

Note: All HyPerformance products are tested for 900K cycles at 350 bar and 100K at 420 bar.

Proof Pressure: 690 bar (10000 psi)

Burst Pressure: 1380 bar (20000 psi)

Flow: Up to 190 lpm (50 gpm)

Internal Leakage: 164 ml/minute (10 cu. in./minute) max. at 350 bar (5075 psi)

Operating Temperature: -54 to 107°C (-65 to 225°F) with Urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

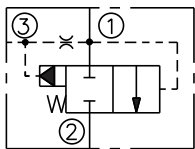
Installation: No restrictions; See page 9.020.1

Cavity: HVC16-S3; See page 9.116.1

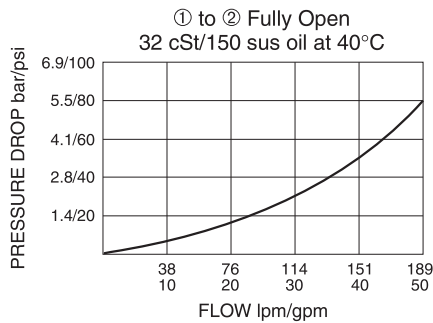
Cavity Tool: HCT16-S3XX; See page 8.600.1

Seal Kit: SK16-S3X-X; See page 8.650.1

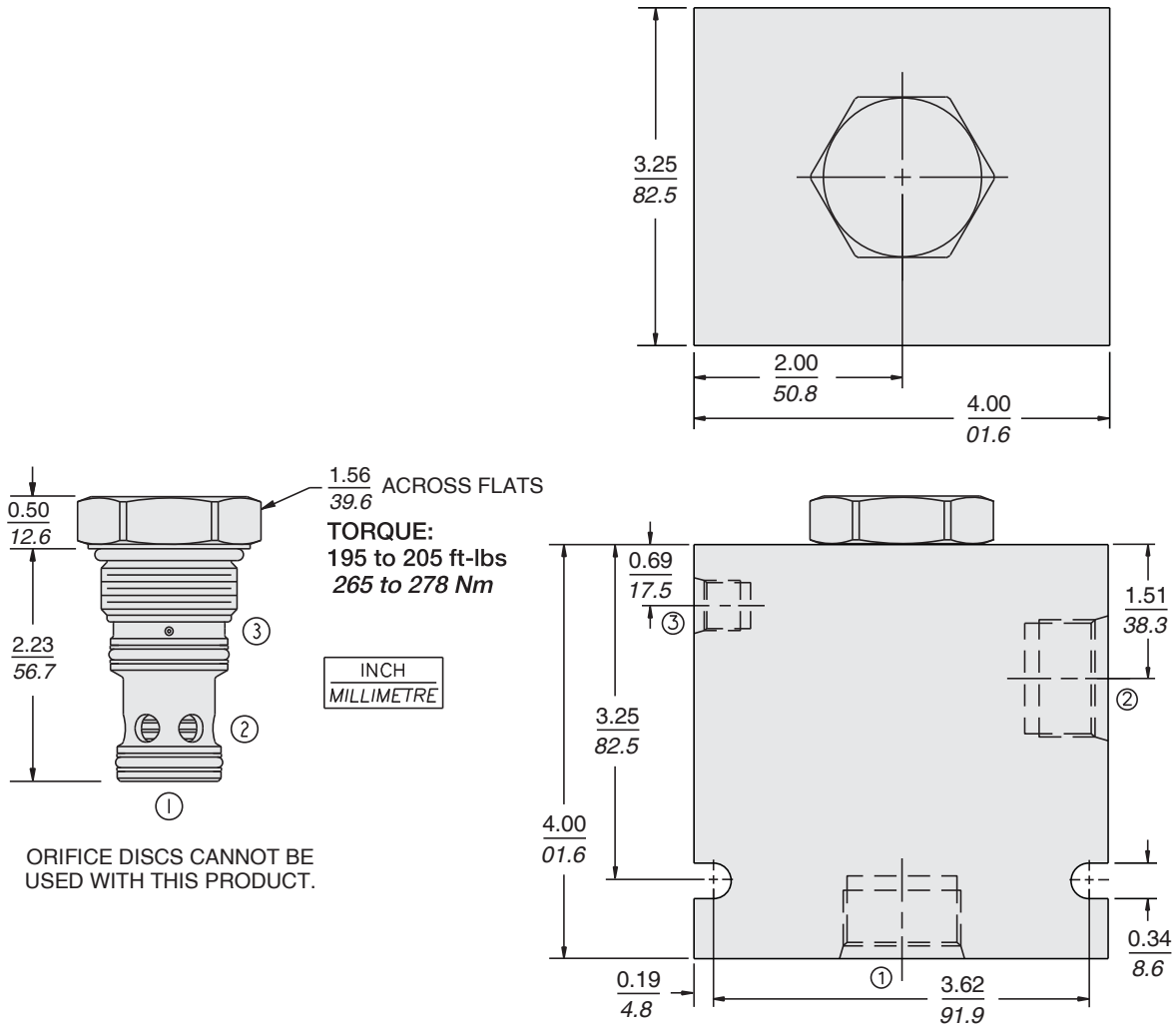
SYMBOL



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.30 kg. (0.67 lbs.)
 Steel with hardened work surfaces.
 Zinc-nickel plated exposed surfaces.
 PPDI Urethane seals with no backup rings standard.

Ported Body: Weight: 5.34 kg. (11.77 lbs.); HyPerformance™
 Ductile iron (code 'D') standard.
 Rated to 345 bar (5000 psi).

TO ORDER

HEV16-S34 - - -

Porting

Cartridge Only **0**
 SAE 16 **16TD**
 1 in. BSP* **8BD**
 *BSP Body; U.K. Mfr. Only

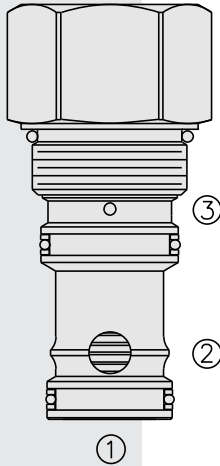
Bias Spring Value

10 0.7 bar (10 psi)
20 1.4 bar (20 psi)
40 2.8 bar (40 psi)
80 5.5 bar (80 psi)

Seals

U PPDI Urethane — Recommended for pressures above 241 bar (3500 psi)

EV20-S34 Vented Spool-Type Logic Element



DESCRIPTION

A spool-type, screw-in, cartridge-style, hydraulic directional element, with multi-function potential when used with other directional, pressure, or flow control devices.

OPERATION

The EV20-S34 is a spring-biased blocking valve which will shift to allow full flow from 1 to 2 only when 3 is vented to create a pressure drop across the internal orifice which exceeds the pressure value of the selected bias spring force.

EV20-S34 is a vent-to-open directional valve.

FEATURES

- Multiple function/application potential.
- Smooth shift transition.
- Low pressure drop.
- Industry common cavity.

RATINGS

Maximum Operating Pressure: Cartridge Only: Ports 1 & 2: 345 bar (5000 psi). Port 3: 320 bar (4600 psi); Polyurethane seals are recommended for 5000 psi operation. Aluminum bodies for this product are rated for 207 bar (3000 psi).

Flow: See Performance Chart

Internal Leakage: 197 cc/minute (12 cu. in./minute) max. at 320 bar (4600 psi)

Bias Spring Pressure Options: 3.5 bar (50 psi); 5.5 bar (80 psi); 11.0 bar (160 psi)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

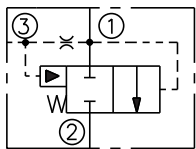
Cavity: VC20-S3; See page 9.120.1

Cavity Tool: CT20-S3xx; See page 8.600.1

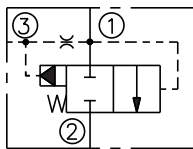
Seal Kit: SK20-S3x-MM; See page 8.650.1

SYMBOLS

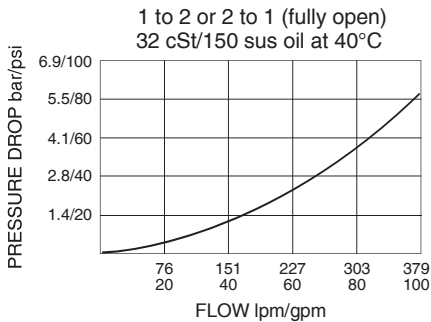
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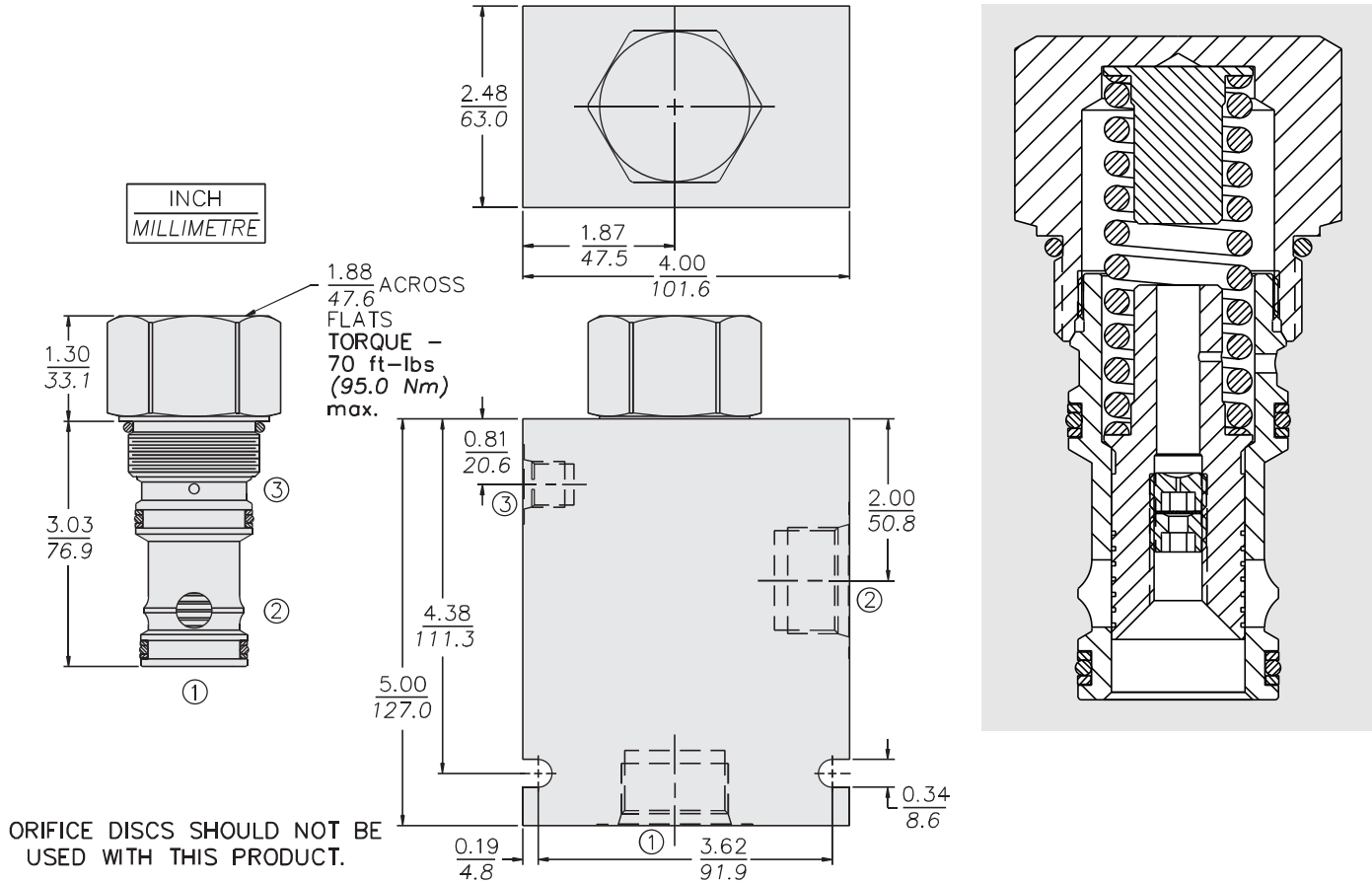
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.82 kg. (1.8 lbs.)
Steel with hardened work surfaces;
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
1.65 kg. (3.65 lbs.). Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.020.1.

TO ORDER

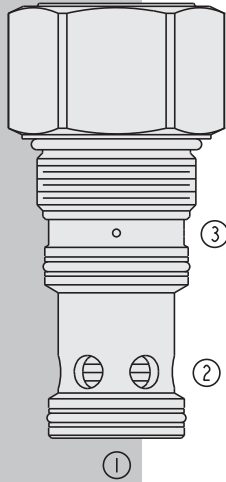
EV20-S34 -

Porting
Cartridge Only **0**
SAE 16 w/SAE 6 Vent Port **16T**

Bias Spring (Crack)
20 1.36 bar (20 psi)
50 3.5 bar (50 psi)
80 5.5 bar (80 psi)
160 11.0 bar (160 psi)

Seals
N Buna N (Std.)
V Fluorocarbon
P Polyurethane (for pressures over
240 bar/3500 psi)

HEV42-S34 HyPerformance™ Vented Spool-Type



DESCRIPTION

A high-pressure spool-type, screw-in, cartridge-style, hydraulic directional element, with multi-function potential when used with other directional, pressure, or flow control devices.

OPERATION

The HEV42-S34 is a spring-biased blocking valve which will shift to allow full flow from 1 to 2 only when 3 is vented to create a pressure drop across the internal orifice which exceeds the pressure value of the selected bias spring force.

HEV42-S34 is a vent-to-open directional element.

FEATURES

- Multiple function/application potential.
- Smooth shift transition.
- Low pressure drop.
- All HyPerformance™ products are tested to the rigorous standards of the NFPA specification T2.6.1.
- All HyPerformance™ valves are tested at a verification level of 90% and an assurance of 99%.

RATINGS

Operating Pressure: 350 bar (5075 psi); 10% cycle life: 420 bar (6090 psi)

Note: All HyPerformance™ products are tested for 900K cycles at 350 bar and 100K at 420 bar.

Fatigue Rating: 2 million cycles at 420 bar

Burst Pressure: 1380 bar (20000 psi)

Flow: Up to 379 lpm (100 gpm)

Internal Leakage: 164 ml/minute (10 cu. in./minute) max. at 350 bar (5075 psi)

Operating Temperature: -54 to 107°C (-65 to 225°F) with Urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

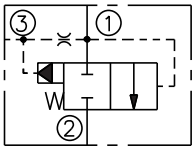
Cavity: HVC42-S3; See page 9.142.1

Cavity Tool: HCT42-S3XX; See page 8.600.1

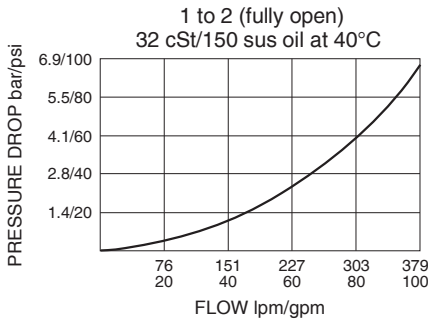
Seal Kit: SK42-S3X-X; See page 8.650.1

SYMBOLS

USASI/ISO:



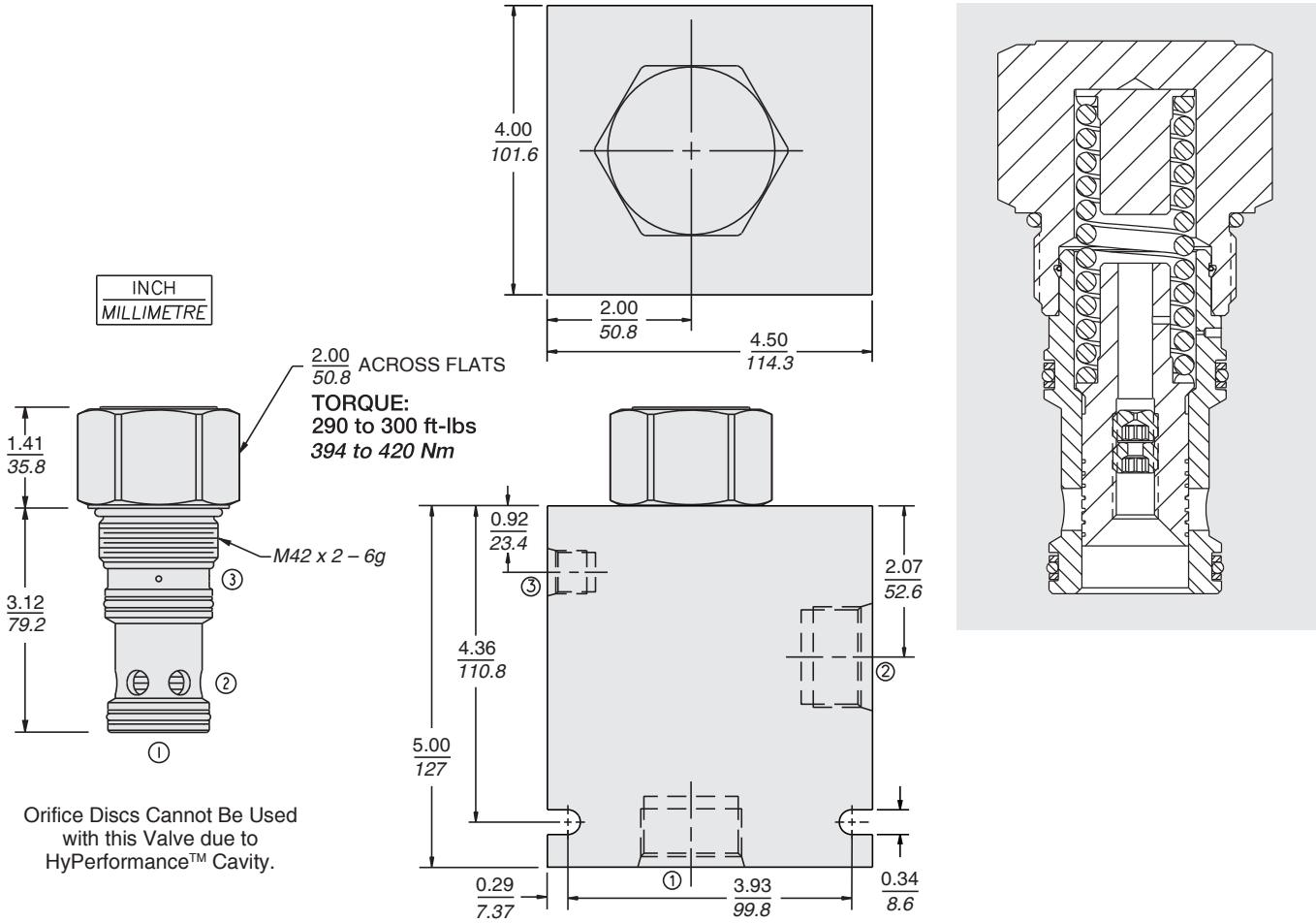
PERFORMANCE (Cartridge Only)



Directional Element

HEV42-S34

DIMENSIONS



MATERIALS

Cartridge: Weight: 1.04 kg. (2.30 lbs.)
 Steel with hardened work surfaces.
 Zinc-nickel plated exposed surfaces.
 PPDI Urethane seals with no backup rings standard.

Ported Body: Weight: 9.03 kg. (19.9 lbs.); HyPerformance™
 Ductile iron (code 'D') standard.
 Rated to 345 bar (5000 psi).

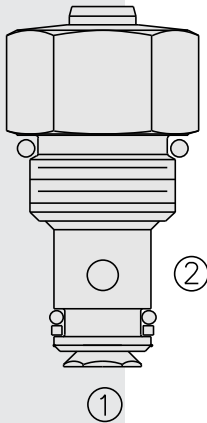
TO ORDER

HEV42-S34 -

Porting	0	Bias Spring Value	20
Cartridge Only	SAE 20	20TD	50
1-1/4 in. BSP*	10BD	80	190
*BSP Body; U.K. Mfr. Only		190	

Seals
U PPDI Urethane — Recommended for pressures above 241 bar (3500 psi)

MV08-22 Manual Release Valve



DESCRIPTION

A cam-operated, two-way, normally-closed poppet-type directional valve.

OPERATION

The **MV08-22** blocks flow in the 2 to 1 flow path until cam force is supplied sufficient to overcome the spring bias plus load force.

Note: For applications requiring the 1 to 2 flow path, consult factory.

FEATURES

- Hardened seat and poppet for long life.
- Stainless steel cam button.

RATINGS

Operating Pressure: 207 bar (3000 psi)

Flow: 15.1 lpm (4 gpm)

Internal Leakage: 0.15 cc/minute (3 drops/minute) max. from 20.7 to 207 bar (300 to 3000 psi) on port 2

Required Cam Force for Operation Port 2 Loaded:

- No load: 9.1 kgs. (20 lbs.)
- 69 bar (1000 psi): 20.9 kgs. (46 lbs.)
- 138 bar (2000 psi): 32.7 kgs. (72 lbs.)
- 207 bar (3000 psi): 44.5 kgs. (98 lbs.)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: Position unlimited. 11.9 mm (15/32 in.) diameter drill, 32.5 mm (1.28 in.) from spotface required minimum.

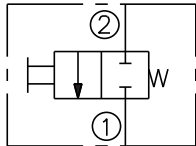
Cavity: VC08-2, Cavity Variation "A"; See page 9.108.1

Cavity Tool: CT08-2; See page 8.600.1

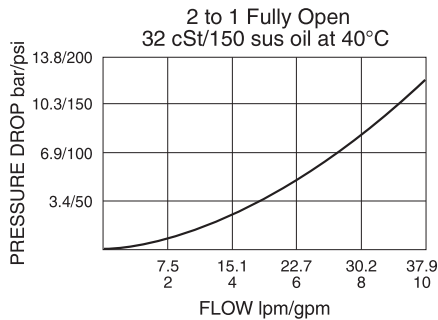
Seal Kit: SK08-2X-T; See page 8.650.1

SYMBOLS

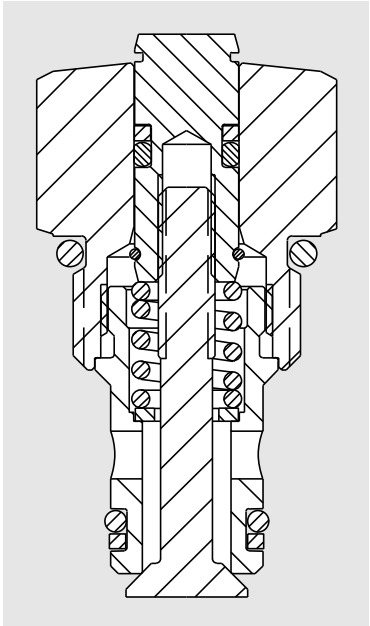
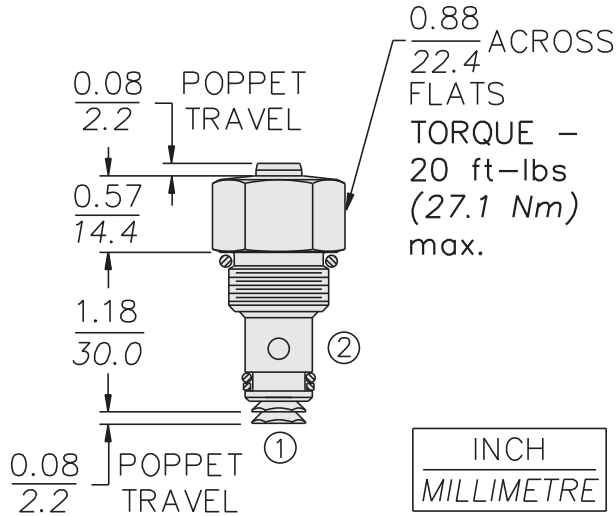
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



ORIFICE DISCS SHOULD NOT BE USED WITH THIS PRODUCT.

MATERIALS

Cartridge: Weight: 0.05 kg. (0.12 lbs.)
Stainless steel pin. Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and back-up standard.

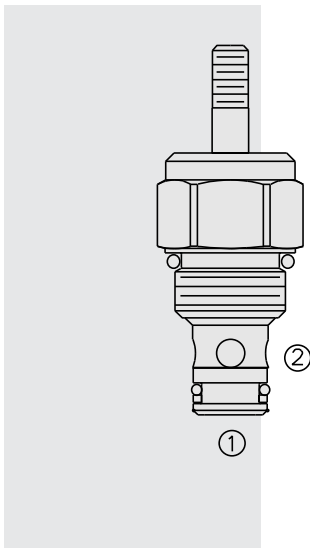
Standard Ported Body: None.
Consult factory.

TO ORDER

MV08-22-0-

- Seals**
N Buna N (Std.)
V Fluorocarbon

MP08-20 Manual, Spring Return, Pull-to-Open



DESCRIPTION

A manual, 2-way, pull-to-open, screw-in hydraulic directional valve.

OPERATION

The **MP08-20** blocks flow from 2 to 1 until an operator pulls the shaft outward.

Note: Pressure at port 1 will directly act on the spool and spring. Port 1 is intended to be a tank port only.

The bias spring allows for up to 12.4 bar (180 psi) back-pressure at 1 before the valve will open.

FEATURES

- Hardened seat for long life and low leakage.
- Remains closed to 12.4 bar (180 psi) back-pressure.
- Industry common cavity.

RATINGS

Operating Pressure:

- Port 2: 207 bar (3000 psi)
- Port 1: 12.4 bar (180 psi) max.

Proof Pressure: 350 bar (5075 psi)

Flow: See Performance Chart

Internal Leakage 2 to 1: 0.25 cc/minute (5 drops/minute) max. at 207 bar (3000 psi)

Mechanical Pull Effort Required at Rated Pressure: 4.5 kg. (10.0 lbs.) initial; 6.8 kg. (15.0 lbs.) full shift

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

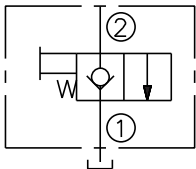
Cavity: VC08-2; See page 9.108.1

Cavity Tool: CT08-2XX; See page 8.600.1

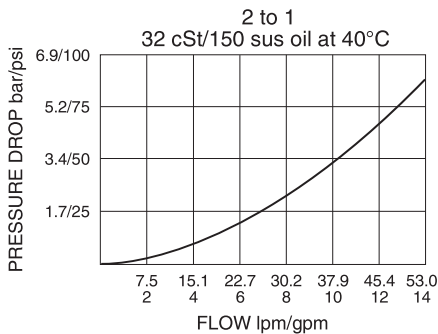
Seal Kit: SK08-2X-T; See page 8.650.1

SYMBOLS

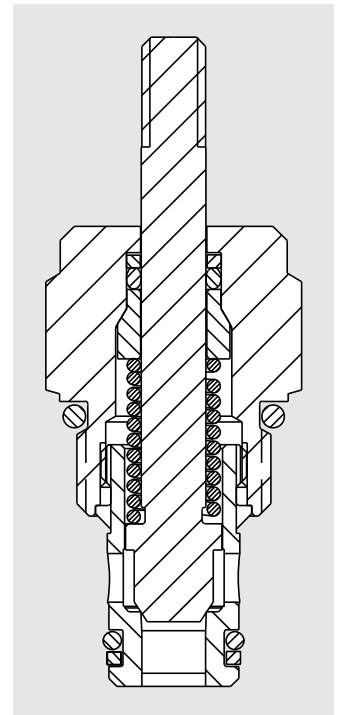
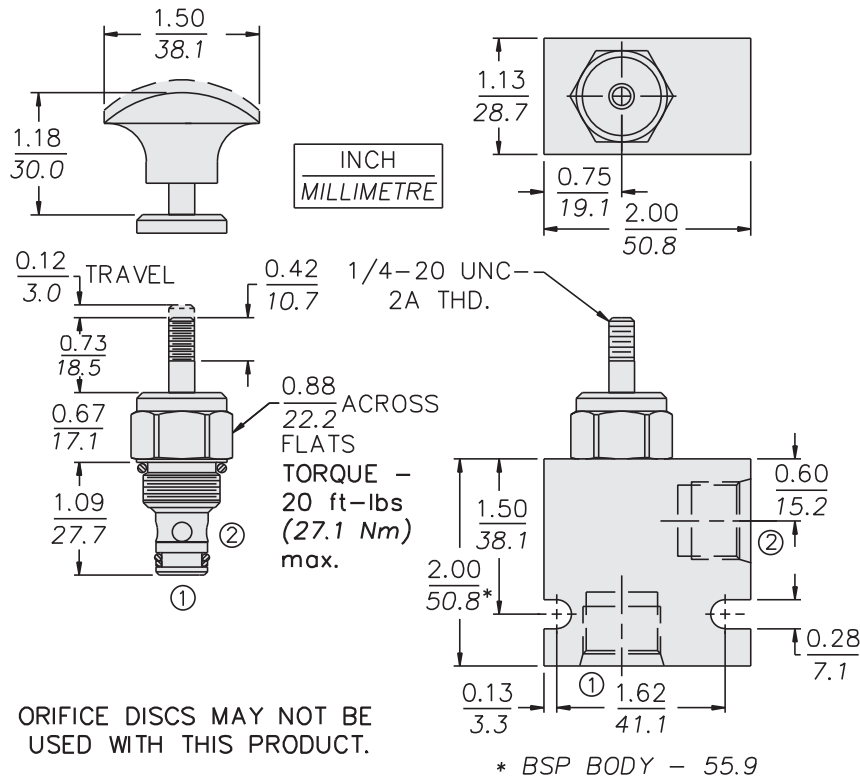
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.10 kg. (0.22 lbs.)
Steel with hardened work surfaces;
Zinc-plated exposed surfaces.
Buna N O-rings and back-ups
standard. Plastic knob optional.

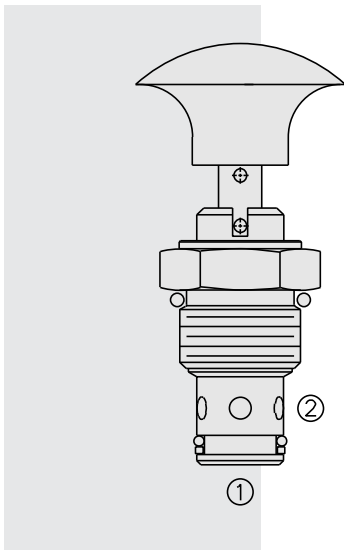
Standard Ported Body: Weight:
0.16 kg. (0.35 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.008.1

TO ORDER

MP08-20		-	-
	Option		Seals
	Threaded Shaft w/Spring Return	T	N Buna N (Std.)
	Black Plastic Knob w/Spring Return	K	V Fluorocarbon
	Red Plastic Knob w/Spring Return	J	
	Porting		
	Cartridge Only	0	
	SAE 4	4T	
	SAE 6	6T	
	1/4 in. BSP*	2B	
	3/8 in. BSP*	3B	
	1/2 in. BSP*	4B	

*BSP Body; U.K. Mfr. Only

MP10-20 Manual, Spring Return, Pull-to-Open



DESCRIPTION

A manual, 2-way, pull-to-open, screw-in hydraulic directional valve.

OPERATION

The **MP10-20** blocks flow from 2 to 1 until an operator pulls the shaft outward. The bias spring allows for up to 12.4 bar (180 psi) back-pressure at 1 before the valve will open.

Note: Pressure at port 1 will directly act on the spool and spring. Port 1 is intended to be a tank port only.

A unique 90° rotational lock is optional for positive “open” position holding. The valve resets to spring return-to-close with a 90° turn from the locked-open position.

FEATURES

- Hardened seat for long life and low leakage.
- Remains closed to 12.4 bar (180 psi) back-pressure.
- Optional rotational lock position.
- Industry common cavity.

RATINGS

Operating Pressure: 207 bar (3000 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: See Performance Chart

Internal Leakage 2 to 1: 0.25 cc/minute (5 drops/minute) max. at 207 bar (3000 psi)

Mechanical Pull Effort Required at Rated Pressure: 7.3 kg. (16 lbs.)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

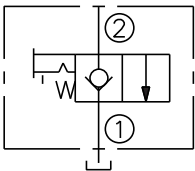
Cavity: VC10-2; See page 9.110.1

Cavity Tool: CT10-2XX; See page 8.600.1

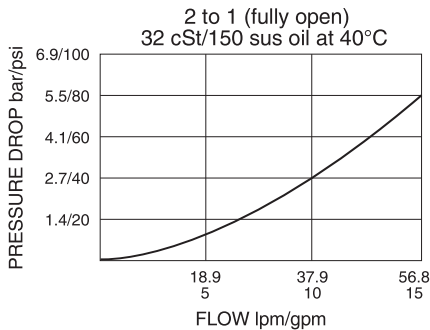
Seal Kit: SK10-2X-T; See page 8.650.1

SYMBOLS

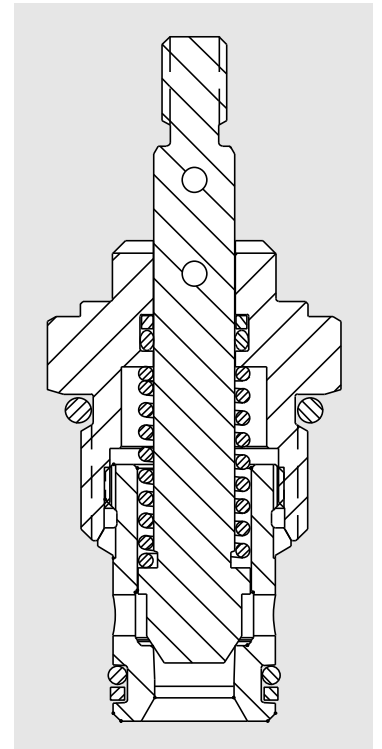
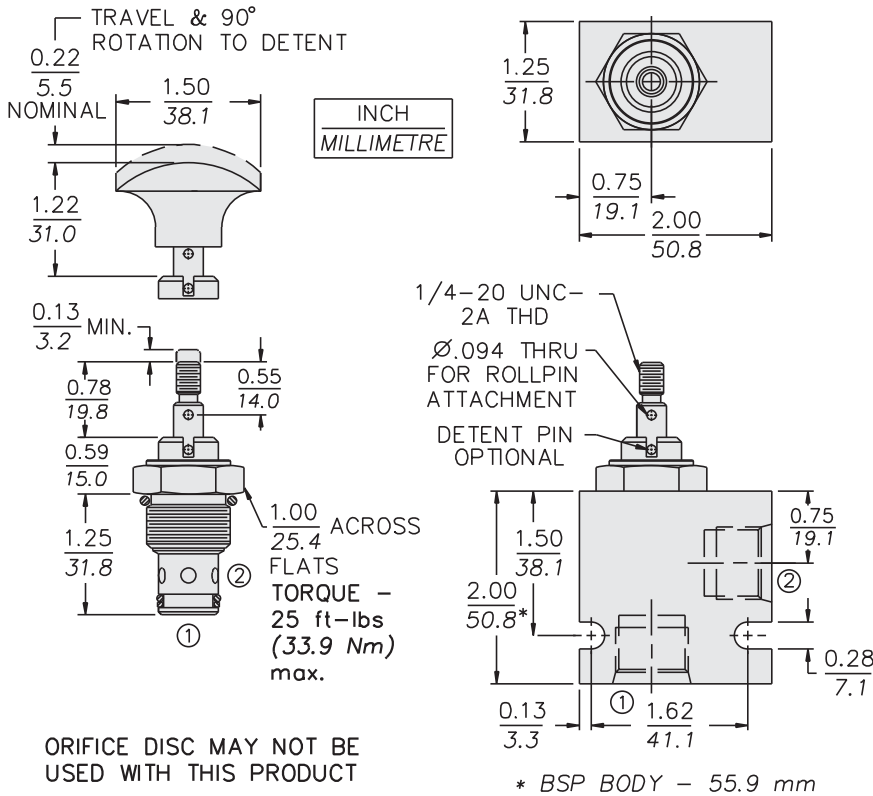
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



ORIFICE DISC MAY NOT BE USED WITH THIS PRODUCT

MATERIALS

Cartridge: Weight: 0.11 kg. (0.25 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.
Plastic knob optional.

Standard Ported Body: Weight: 0.16 kg. (0.35 lbs.)
Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1.

TO ORDER

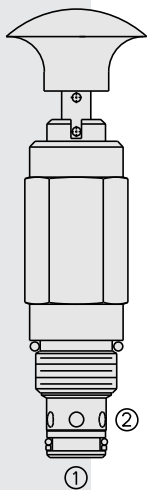
MP10-20	-	-	-
Option			
Threaded Shaft/ Spring Return	T		
Threaded Shaft/ Lock Position Pin	R		
Black Plastic Knob/ Spring Return	K		
Black Plastic Knob/ Lock Position Pin	D		
Red Plastic Knob/ Spring Return	J		
Red Plastic Knob/ Lock Position Pin	L		
Seals			
N Buna N (Std.)			
V Fluorocarbon			
Porting			
0 Cartridge Only			
6T SAE 6			
8T SAE 8			
2B 1/4 in. BSP*			
3B 3/8 in. BSP*			
4B 1/2 in. BSP*			

*BSP Body; U.K. Mfr. Only

MP10-21

For more information on **MP10-21**,
please visit our website at
www.hydraforce.com

MP10-22 Manual, Spring Return, Pull-to-Open



DESCRIPTION

A manual, 2-way, normally closed, pull-to-open, spring-return, screw-in, hydraulic cartridge, system unloading valve for higher tank pressure applications.

OPERATION

The **MP10-22** blocks flow from 2 to 1 until an operator pulls the shaft outward.

The bias spring allows for up to 27.6 bar (400 psi) back-pressure at 1 before the valve will open.

When passing high flow rates, a combination of the differential pressure across the valve (flowing 2 to 1) and 2 downstream back-pressure may require the operator to push the shaft to close.

Note: Pressure at port 1 will directly act on the spool and spring. Port 1 is intended to be a tank port only.

A unique 90° rotational lock is optional for positive “open” position holding. The valve resets to spring return-to-close with a 90° turn from the locked-open position.

FEATURES

- Hardened seat for long life and low leakage.
- Remains closed to 27.6 bar (400 psi) back-pressure.
- Optional rotational lock position.
- Industry common cavity.

RATINGS

Operating Pressure: 207 bar (3000 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: See Performance Chart

Internal Leakage 2 to 1: 0.25 cc/minute (5 drops/minute) max. at 207 bar (3000 psi)

Mechanical Pull Effort Required: 14.1 kg. (31 lbs.) installed; 16.3 kg. (36 lbs.) to travel 3.18 mm (0.125 in.); 17.3 kg. (39 lbs.) to detent

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

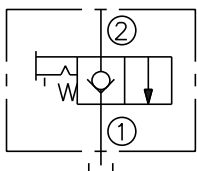
Cavity: VC10-2; See page 9.110.1

Cavity Tool: CT10-2XX; See page 8.600.1

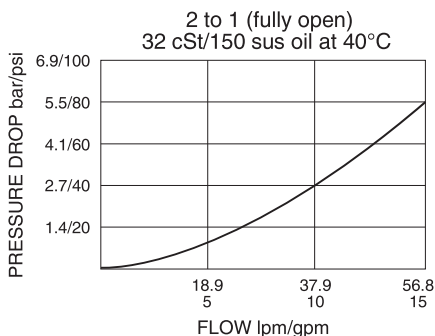
Seal Kit: SK10-2X-T; See page 8.650.1

SYMBOLS

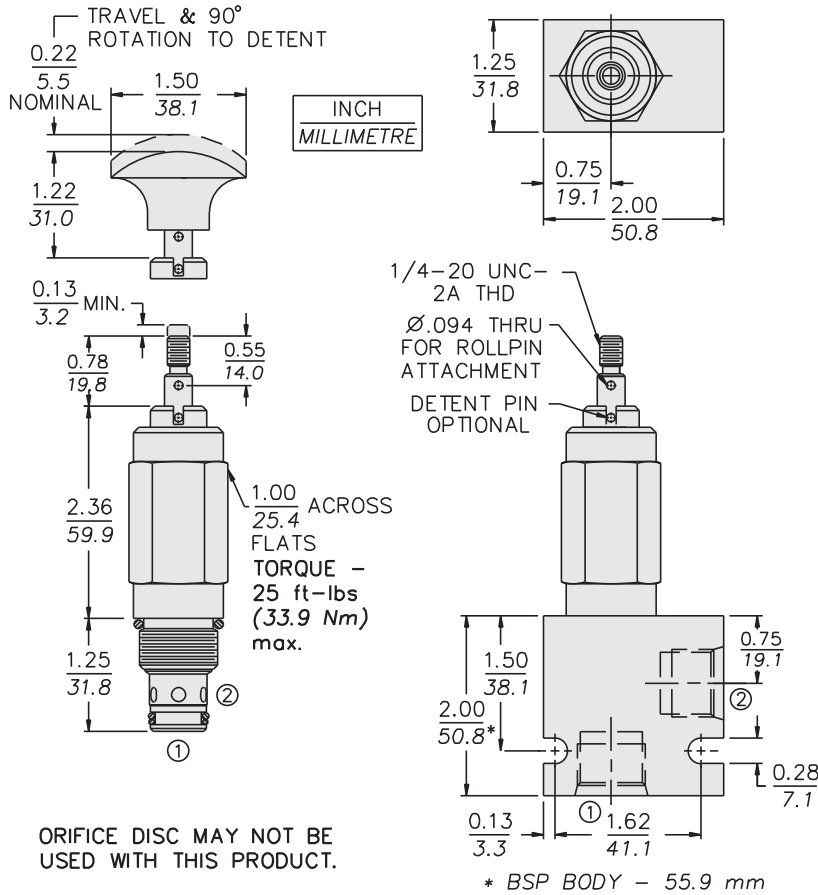
USASI/ISO:



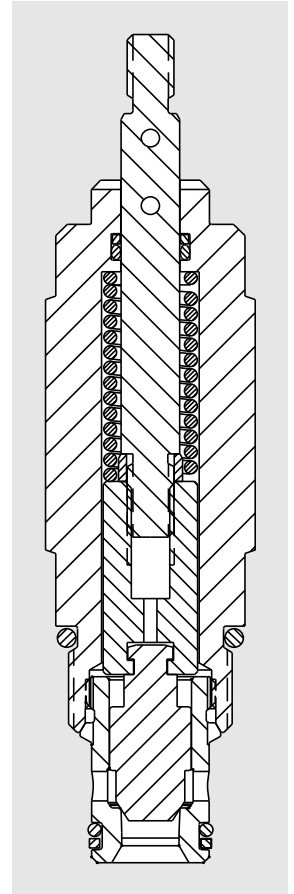
PERFORMANCE (Cartridge Only)



DIMENSIONS



ORIFICE DISC MAY NOT BE USED WITH THIS PRODUCT.



MATERIALS

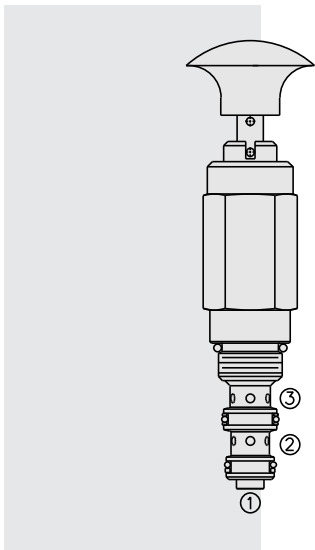
Cartridge: Weight: 0.23 kg. (0.50 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-up standard.
Plastic knob optional.

Standard Ported Body: Weight:
0.16 kg. (0.35 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

MP10-22		-	-	-
	Option			Seals
	Threaded Shaft/ Spring Return	T		N Buna N (Std.)
	Threaded Shaft/ Lock Position Pin	R		V Fluorocarbon
	Black Plastic Knob/ Spring Return	K		
	Black Plastic Knob/ Lock Position Pin	D		Porting
	Red Plastic Knob/ Spring Return	J	0	Cartridge Only
	Red Plastic Knob/ Lock Position Pin	L	6T	SAE 6
			8T	SAE 8
			2B	1/4 in. BSP*
			3B	3/8 in. BSP*
			4B	1/2 in. BSP*
			*BSP Body; U.K. Mfr. Only	

MP08-30 Manual, Spring Return, Pull-to-Shift



DESCRIPTION

A 3-way, manual, pull-to-shift, spring-return, directional hydraulic cartridge valve. Series operation is prohibited due to the tank port (1) pressure rating.

OPERATION

In its steady-state, spring-offset position, the **MP08-30** directs flow from 2 to 1, while blocking at 3.

In the actuated (pulled) position, the cartridge directs flow from 3 to 2, blocking 1. The spring chamber is vented at 1.

Note: Pressure at port 1 will directly act on the spool and spring. Port 1 is intended to be a tank port only.

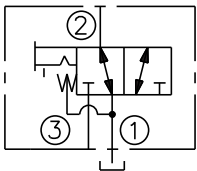
A unique pull-and-rotate feature for holding the positive actuated position is optional. A 90° rotation is required to position at the hold slot. The valve resets to spring-return de-actuated with a slight pull and a 90° turn from the locked actuated position.

FEATURES

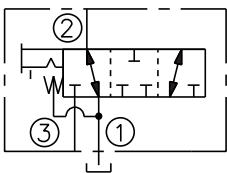
- Hardened spool and cage for long life.
- Pressure to 14 bar (200 psi) on 1.
- Optional rotational lock position.
- Compact size.

SYMBOLS

USASI/ISO:



TRANSITION:



RATINGS

Operating Pressure:

- On 3 to 2: 240 bar (3500 psi)
- On 1 (Max.): 14 bar (200 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max.

Mechanical Pull Effort Required: 7.7 kg. (17 lbs.) installed; 8.6 kg. (19 lbs.) to travel 3.2 mm (0.125 in.); 9.1 kg. (20 lbs.) to detent

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

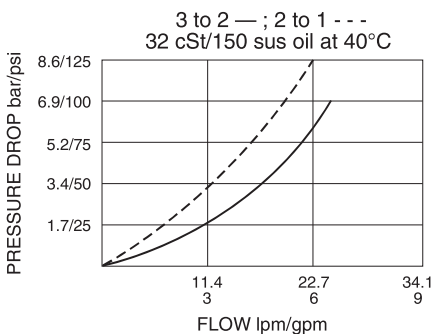
Installation: No restrictions; See page 9.020.1

Cavity: VC08-3; See page 9.108.1

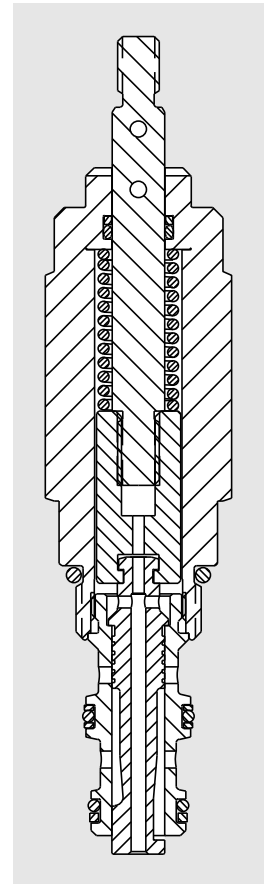
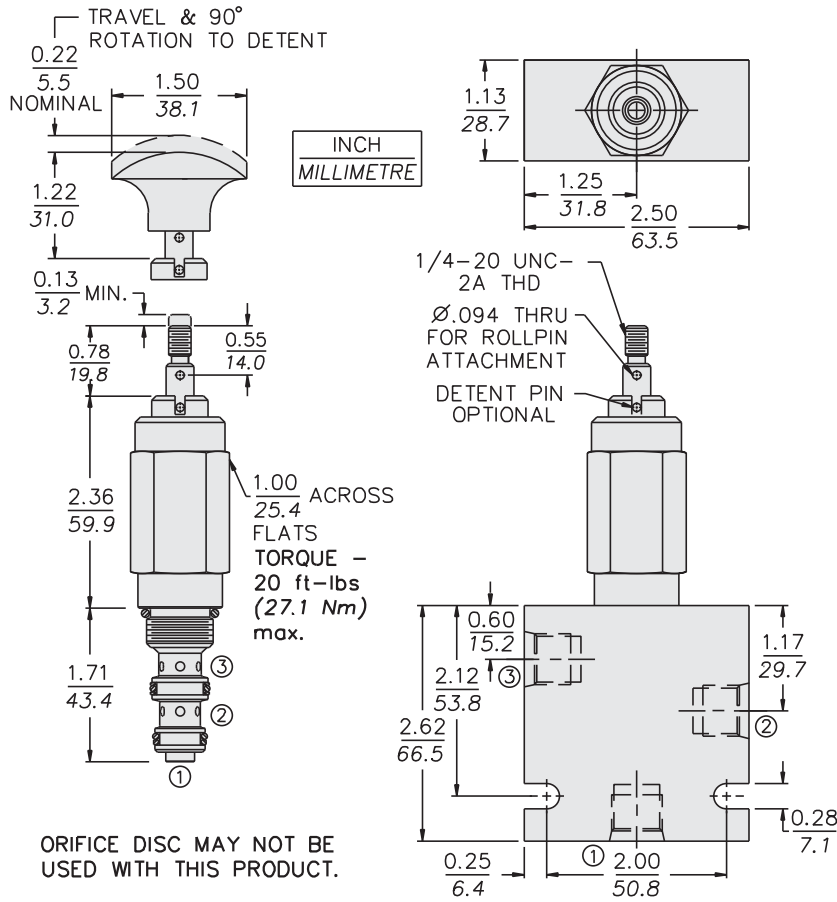
Cavity Tool: CT08-3XX; See page 8.600.1

Seal Kit: SK08-3X-MT; See page 8.650.1

PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

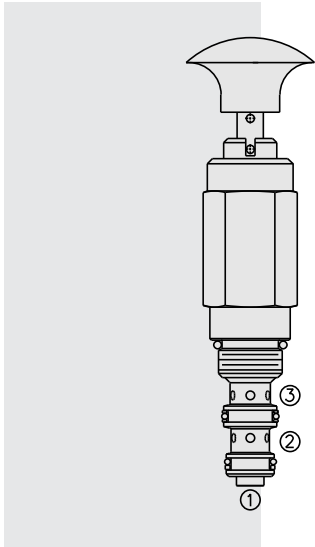
Cartridge: Weight: 0.23 kg. (0.50 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.
Plastic knob optional.

Standard Ported Body: Weight: 0.27 kg. (0.60 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.008.1

TO ORDER

MP08-30		-	-	-
	Option			Seals
	Threaded Shaft/ Spring Return	T		N Buna N (Std.)
	Threaded Shaft/ Lock Position Pin	R		V Fluorocarbon
	Black Plastic Knob/ Spring Return	K		
	Black Plastic Knob/ Lock Position Pin	D		Porting
	Red Plastic Knob/ Spring Return	J		0 Cartridge Only
	Red Plastic Knob/ Lock Position Pin	L		6T SAE 6
				2B 1/4 in. BSP*
				3B 3/8 in. BSP*
				*BSP Body; U.K. Mfr. Only

MP58-30 Manual, Spring Return, Pull-to-Shift



DESCRIPTION

A 3-way, manual, pull-to-shift, spring-return, directional hydraulic cartridge valve. Series operation is prohibited due to the tank port (1) pressure rating.

OPERATION

In its steady-state, spring-offset position, the **MP58-30** directs flow from 2 to 1, while blocking at 3.

In the actuated (pulled) position, the cartridge directs flow from 3 to 2, blocking 1. The spring chamber is vented at 1.

Note: Pressure at port 1 will directly act on the spool and spring. Port 1 is intended to be a tank port only.

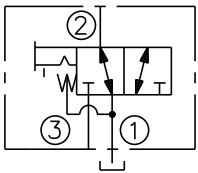
A unique pull-and-rotate feature for holding the positive actuated position is optional. A 90° rotation is required to position at the hold slot. The valve resets to spring-return de-actuated with a slight pull and a 90° turn from the locked actuated position.

FEATURES

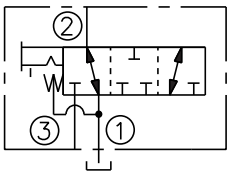
- Hardened spool and cage for long life.
- Pressure to 14 bar (200 psi) on 1.
- Optional rotational lock position.
- Compact size.

SYMBOLS

USASI/ISO:



TRANSITION:



RATINGS

Operating Pressure:

- On 3 to 2: 345 bar (5000 psi)
- On 1 (Max.): 14 bar (200 psi)

Flow: See Performance Chart

Internal Leakage: 147 cc/minute (9 cu. in./minute) max. at 345 bar (5000 psi)

Mechanical Pull Effort Required: 7.7 kg. (17 lbs.) installed; 8.6 kg. (19 lbs.) to travel 3.2 mm (0.125 in.); 9.1 kg. (20 lbs.) to detent

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

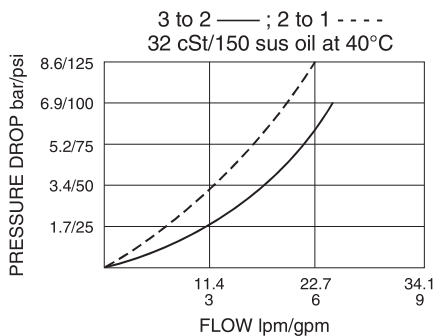
Installation: No restrictions; See page 9.020.1

Cavity: VC08-3; See page 9.108.1

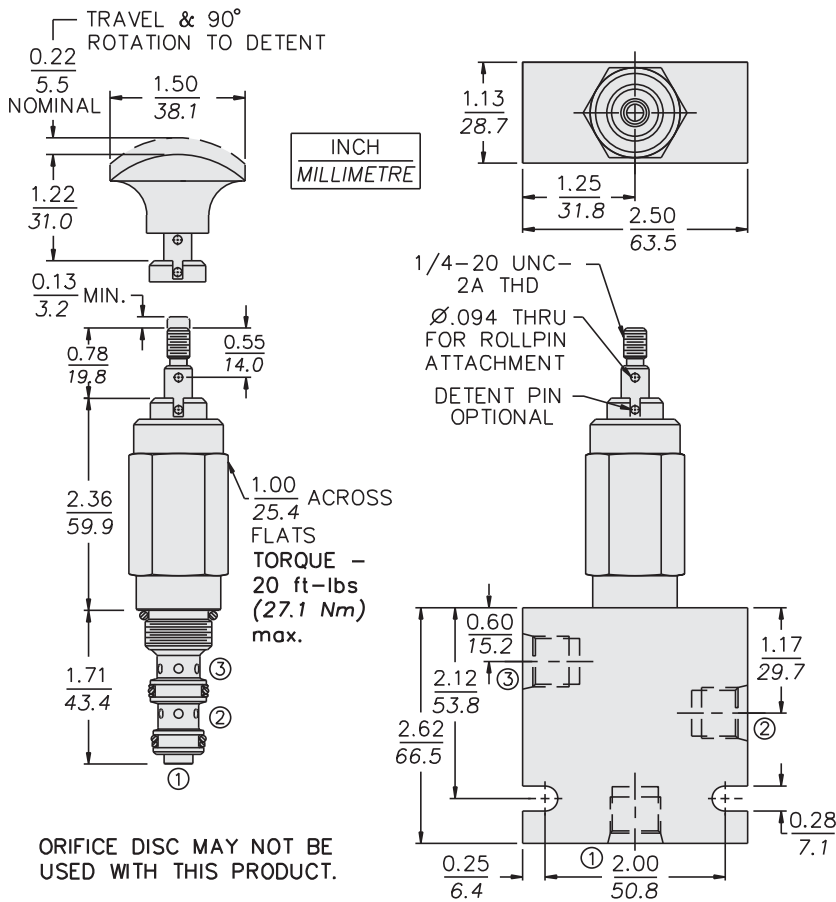
Cavity Tool: CT08-3XX; See page 8.600.1

Seal Kit: SK08-3P-MT; See page 8.650.1

PERFORMANCE (Cartridge Only)



DIMENSIONS

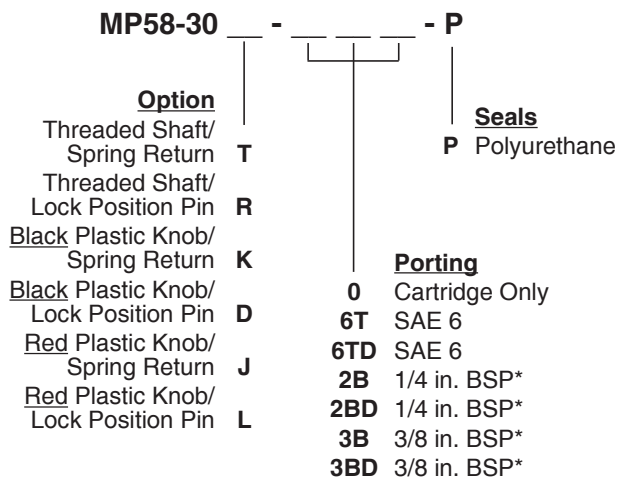


MATERIALS

Cartridge: Weight: 0.23 kg. (0.50 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Polyurethane cast O-rings and
 Fluorocarbon back-up standard.
 Plastic knob optional.

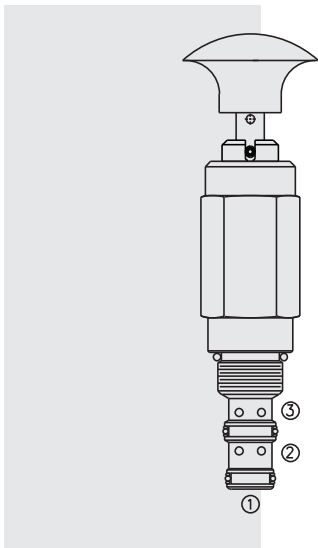
Standard Ported Body: Weight:
 0.27 kg. (0.60 lbs.) Anodized
 high-strength 6061 T6 aluminum
 alloy, rated to 207 bar (3000 psi).
 Ductile iron (code D) bodies are
 required for operation over 207 bar
 (3000 psi), dimensions may differ.
 See page 8.008.1

TO ORDER



*BSP Body;
 U.K. Mfr. Only

MP08-34 Manual, Spring Return, Pull-to-Shift



DESCRIPTION

A 3-way, manual, pull-to-shift, spring-return, directional hydraulic cartridge valve.

OPERATION

In its steady-state, spring-offset position, the **MP08-34** blocks flow from 2 to 3. In the actuated (pulled) position, the cartridge directs flow from 3 to 2. The spring chamber is vented at 1. When released, the valve returns to its steady state.

Note: Pressure at port 1 will directly act on the spool and spring. Port 1 is intended to be a tank port only.

FEATURES

- Hardened spool and cage for long life.
- Pressure to 14 bar (200 psi) on 1.
- Optional rotational lock position.
- Compact size.

RATINGS

Operating Pressure:

On 3 to 2: 240 bar (3500 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: See Performance Chart

Internal Leakage: 33 cc/minute (2 cu. in./minute) max. at 207 bar (3000 psi)

Mechanical Pull Effort Required: 7.3 kg. (17 lbs.) installed; 8.6 kg. (19 lbs.) to travel 3.2 mm (0.125 in.); 9.1 kg. (20 lbs.) to detent

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

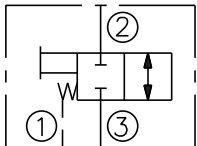
Cavity: VC08-3; See page 9.108.1

Cavity Tool: CT08-3XX; See page 8.600.1

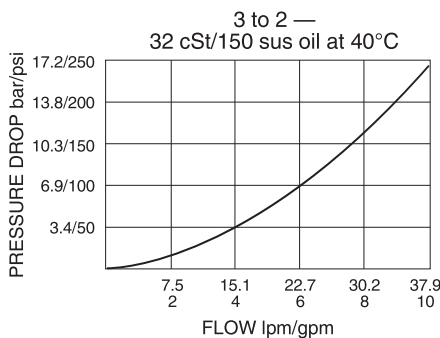
Seal Kit: SK08-3X-MT; See page 8.650.1

SYMBOLS

USASI/ISO:

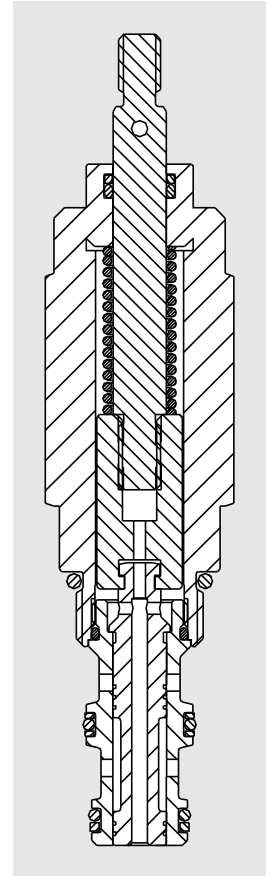
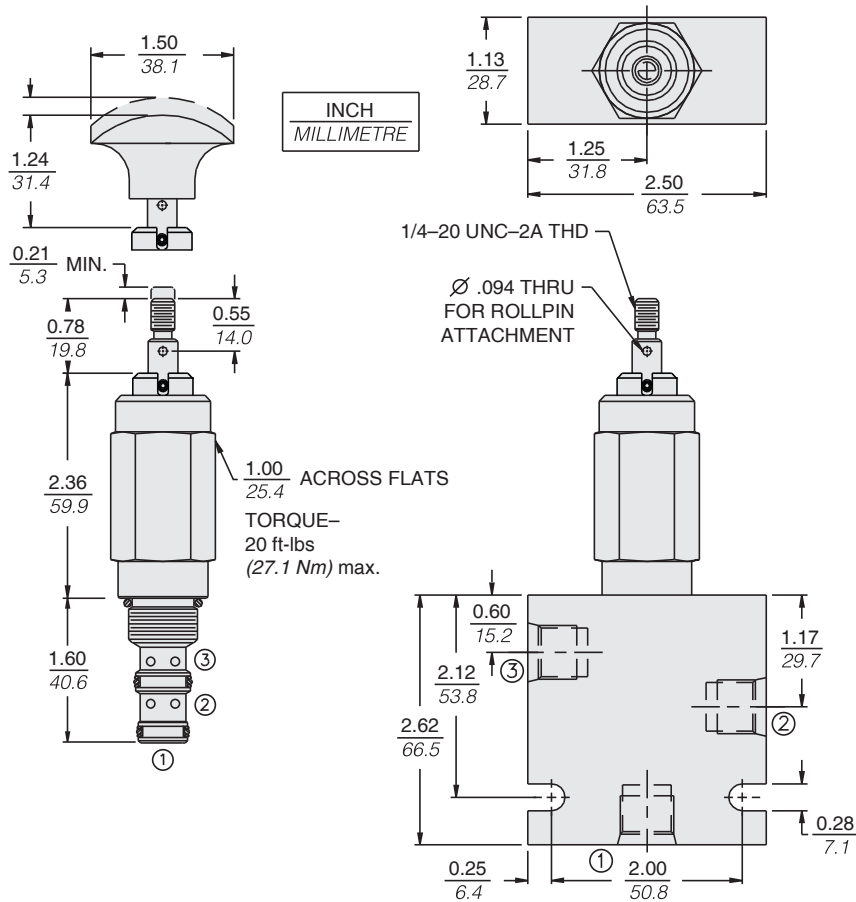


PERFORMANCE (Cartridge Only)



Note: This product replaces MP08-36

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.23 kg. (0.50 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.
Plastic knob optional.

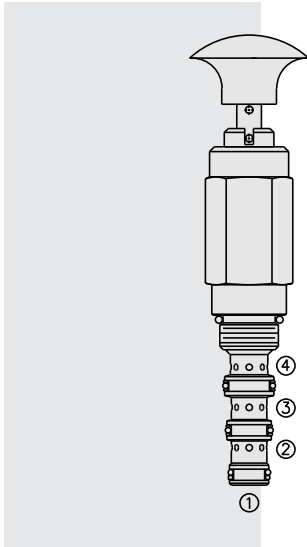
Standard Ported Body: Weight:
0.27 kg. (0.60 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.008.1

TO ORDER

MP08-34		-	-	-
Option				
Threaded Shaft/ Spring Return	T			
Threaded Shaft/ Lock Position Pin	R			
Black Plastic Knob/ Spring Return	K			
Black Plastic Knob/ Lock Position Pin	D			
Red Plastic Knob/ Spring Return	J			
Red Plastic Knob/ Lock Position Pin	L			
			Seals	
			N	Buna N (Std.)
			V	Fluorocarbon
			P	Polyurethane
			Porting	
			0	Cartridge Only
			6T	SAE 6
			2B	1/4 in. BSP*
			3B	3/8 in. BSP*

*BSP Body; U.K. Mfr. Only

MP08-40 Manual, Spring Return, Pull-to-Shift



DESCRIPTION

A 4-way, manual, pull-to-shift, spring-return, directional hydraulic cartridge valve. Series operation is prohibited due to the tank port (1) pressure rating.

OPERATION

In its steady-state, spring-offset position, the **MP08-40** directs flow from 3 to 2, and from 4 to 1.

In the actuated (pulled) position, the cartridge directs flow from 3 to 4, and from 2 to 1. The spring chamber is vented at 1.

Note: Pressure at port 1 will directly act on the spool and spring. Port 1 is intended to be a tank port only.

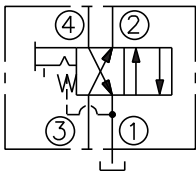
A unique pull-and-rotate feature for holding the positive actuated position is optional. A 90° rotation is required to position at the hold slot. The valve resets to spring-return de-actuated with a slight pull and a 90° turn from the locked actuated position.

FEATURES

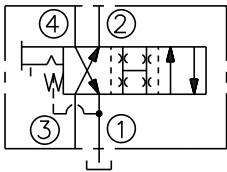
- Hardened spool and cage for long life.
- Pressure to 14 bar (200 psi) on 1.
- Optional rotational lock position.
- Compact size.

SYMBOLS

USASI/ISO:



TRANSITION:



RATINGS

Operating Pressure:

- On 2, 3 and 4: 240 bar (3500 psi)
- On 1 (Max.): 14 bar (200 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max.

Mechanical Pull Effort Required: 7.7 kg. (17 lbs.) installed; 8.6 kg. (19 lbs.) to travel 3.2 mm (0.125 in.); 9.1 kg. (20 lbs.) to detent

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

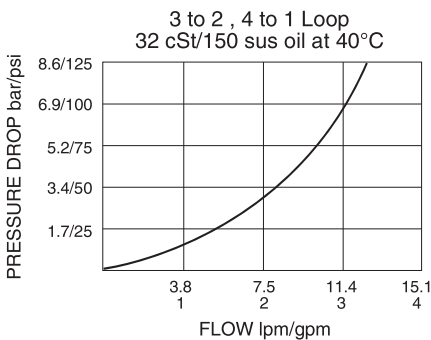
Installation: No restrictions; See page 9.020.1

Cavity: VC08-4; See page 9.108.1

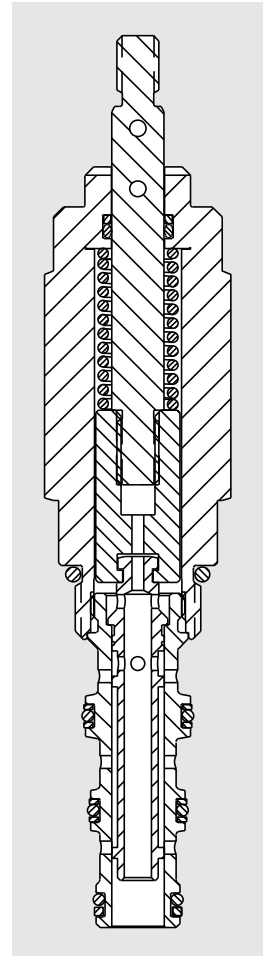
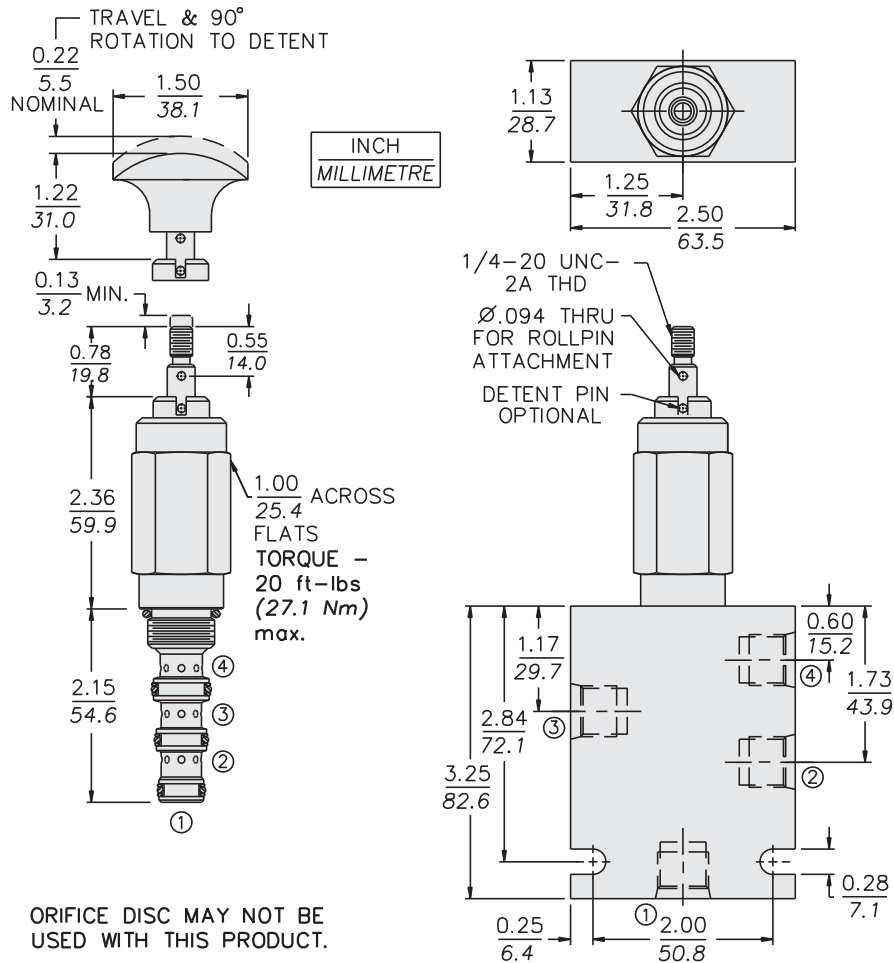
Cavity Tool: CT08-4XX; See page 8.600.1

Seal Kit: SK08-4X-MMT; See page 8.650.1

PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.25 kg. (0.55 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and back-ups standard. Plastic knob optional.

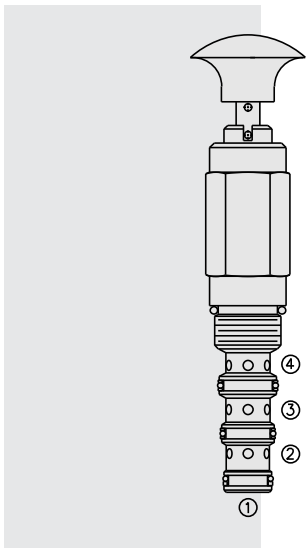
Standard Ported Body: Weight: 0.18 kg. (0.40 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.008.1

TO ORDER

MP08-40

Option		Seals
Threaded Shaft/ Spring Return	T	N Buna N (Std.)
Threaded Shaft/ Lock Position Pin	R	V Fluorocarbon
Black Plastic Knob/ Spring Return	K	
Black Plastic Knob/ Lock Position Pin	D	
Red Plastic Knob/ Spring Return	J	
Red Plastic Knob/ Lock Position Pin	L	
		Porting
		0 Cartridge Only
		6T SAE 6
		2B 1/4 in. BSP*
		3B 3/8 in. BSP*
		*BSP Body; U.K. Mfr. Only

MP10-40 Manual, Spring Return, Pull-to-Shift



DESCRIPTION

A 4-way, manual, pull-to-shift, spring-return, directional hydraulic cartridge valve. Series operation is prohibited due to the tank port (1) pressure rating.

OPERATION

In its steady-state spring-offset position, the **MP10-40** directs flow from 3 to 2, and from 4 to 1 (tank).

In the actuated (pulled) position, the cartridge directs flow from 3 to 4, and from 2 to 1. Note that all ports are open in transition.

Note: Pressure at port 1 will directly act on the spool and spring. Port 1 is intended to be a tank port only.

A unique pull-and-rotate feature for holding the positive actuated position is optional. A 90° rotation is required to position at the hold slot. The valve resets to spring-return de-actuated with a slight pull and a 90° turn from the locked actuated position.

FEATURES

- Hardened spool and cage for long life.
- Remains closed to 14 bar (200 psi) back-pressure.
- Optional rotational lock position.
- Industry common cavity.

RATINGS

Operating Pressure:

- On 2, 3 and 4: 207 bar (3000 psi)
- On 1 (Max.): 14 bar (200 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max.

Mechanical Pull Effort Required: 7.3 kg. (16 lbs.) installed; 8.2 kg. (18 lbs.) to travel 3.2 mm (0.125 inch); 8.6 kg. (19 lbs.) to detent

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

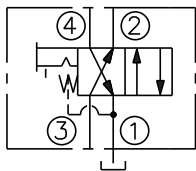
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

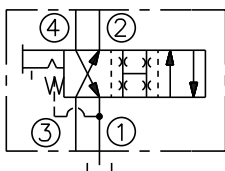
Seal Kit: SK10-4X-MMT; See page 8.650.1

SYMBOLS

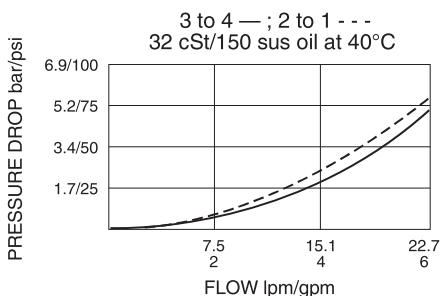
USASI/ISO:



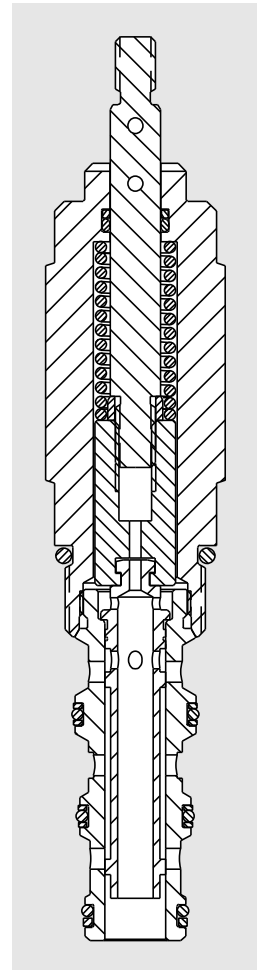
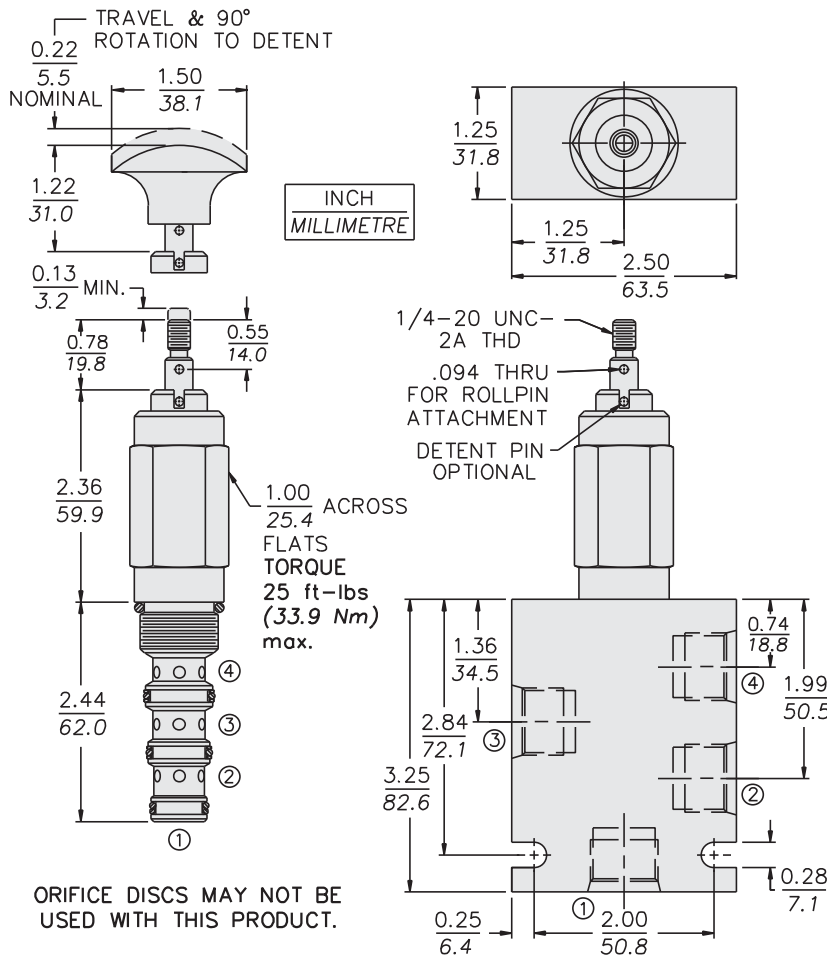
TRANSITION:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.32 kg. (0.70 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.
Plastic knob optional.

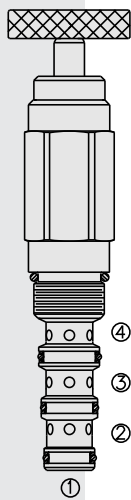
Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

MP10-40		-	-	-
Option				Seals
Threaded Shaft/ Spring Return	T			N Buna N (Std.)
Threaded Shaft/ Lock Position Pin	R			V Fluorocarbon
<u>Black</u> Plastic Knob/ Spring Return	K			
<u>Black</u> Plastic Knob/ Lock Position Pin	D			
<u>Red</u> Plastic Knob/ Spring Return	J			Porting
<u>Red</u> Plastic Knob/ Lock Position Pin	L			0 Cartridge Only
				6T SAE 6
				8T SAE 8
				2B 1/4 in. BSP*
				3B 3/8 in. BSP*
				*BSP Body; U.K. Mfr. Only

MD10-40 Manual, Spring Return, Push-to-Shift

Patent Pending



DESCRIPTION

A 4-way, manual, push-to-shift, spring-return, directional hydraulic cartridge valve. Series operation is prohibited due to the tank port (1) pressure rating.

OPERATION

In its steady-state spring-offset position, the MD10-40 directs flow from 4 to 3, and from 2 to 1 (tank).

In the actuated (pushed) position, the cartridge directs flow from 2 to 3, and from 4 to 1. Note that all ports are open in transition.

Note: Pressure at port 1 will directly act on the spool and spring. Port 1 is intended to be a tank port only.

When the valve is actuated (pushed in) it can be detented by holding in and turning the knob clockwise 90°. When released, the valve will remain in the actuated position. To return the valve to its steady state, push in the knob and turn the handle counterclockwise.

FEATURES

- Hardened spool and cage for long life.
- Optional detent position.
- Industry common cavity.

RATINGS

Operating Pressure:

- On 2, 3 and 4: 207 bar (3000 psi)
- On 1 (Max.): 14 bar (200 psi)

Cycle Life: 100,000

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max.

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

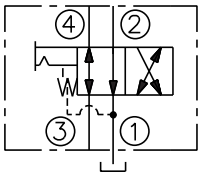
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

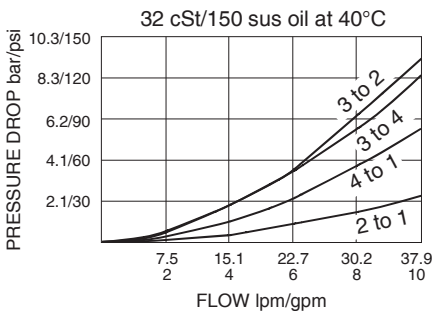
Seal Kit: SK10-4X-MMT; See page 8.650.1

SYMBOLS

USASI/ISO:



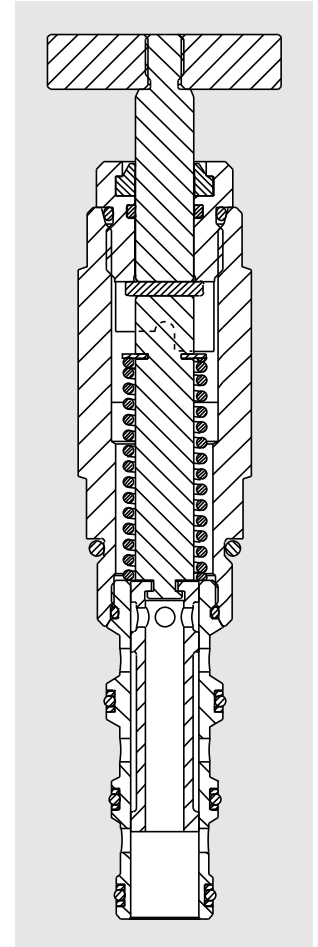
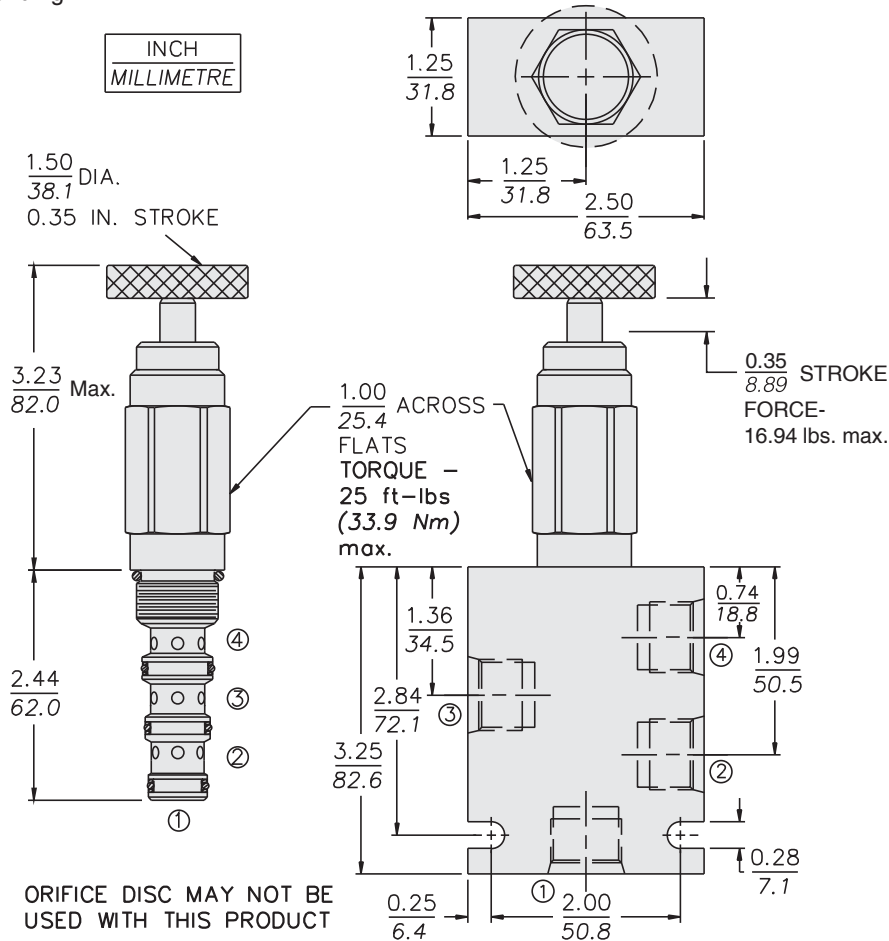
PERFORMANCE (Cartridge Only)



MD10-40

DIMENSIONS

Patent Pending



MATERIALS

Cartridge: Weight: 0.32 kg. (0.70 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.
Aluminum knob.

Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.)
Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

MD10-40

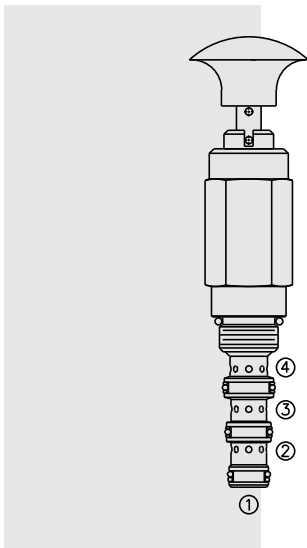
- Option**
- Threaded Shaft w/o Detent **T**
 - Threaded Shaft with Detent **R**
 - Aluminum Knob w/o Detent **K**
 - Aluminum Knob with Detent **D**

- Seals**
- N** Buna N (Std.)
 - V** Fluorocarbon

- Porting**
- Cartridge Only **0**
 - SAE 6 **6T**
 - SAE 8 **8T**
 - 1/4 in. BSP* **2B**
 - 3/8 in. BSP* **3B**

*BSP Body; U.K. Mfr. Only

MP08-41 Manual, Spring Return, Pull-to-Shift



DESCRIPTION

A 4-way, manual, pull-to-shift, spring-return, directional hydraulic cartridge valve. Series operation is prohibited due to the tank port (1) pressure rating.

OPERATION

In its steady-state, spring-offset position, the **MP08-41** blocks flow in all directions. In the actuated (pulled) position, the cartridge directs flow from 3 to 4, and from 2 to 1. The spring chamber is vented at 1.

Note: Pressure at port 1 will directly act on the spool and spring. Port 1 is intended to be a tank port only.

A unique pull-and-rotate feature for holding the positive actuated position is optional. A 90° rotation is required to position at the hold slot. The valve resets to spring-return de-actuated with a slight pull and a 90° turn from the locked actuated position.

FEATURES

- Hardened spool and cage for long life.
- Pressure to 14 bar (200 psi) on 1.
- Optional rotational lock position.
- Compact size.

RATINGS

Operating Pressure:

- On 2, 3 and 4: 240 bar (3500 psi)
- On 1 (Max.): 14 bar (200 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max.

Mechanical Pull Effort Required: 7.7 kg. (17 lbs.) installed; 8.6 kg. (19 lbs.) to travel 3.2 mm (0.125 in.); 7.1 kg. (20 lbs.) to detent

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

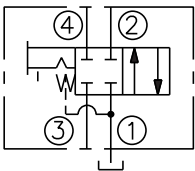
Cavity: VC08-4; See page 9.108.1

Cavity Tool: CT08-4XX; See page 8.600.1

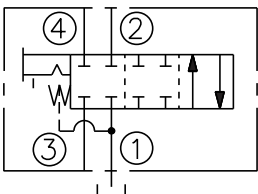
Seal Kit: SK08-4-MMT; See page 8.650.1

SYMBOLS

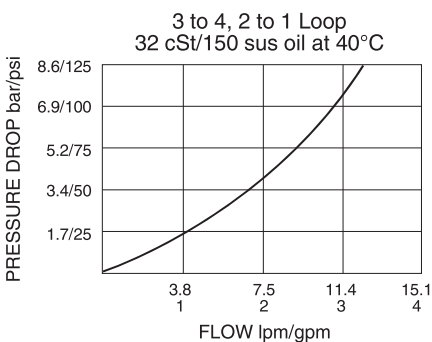
USASI/ISO:



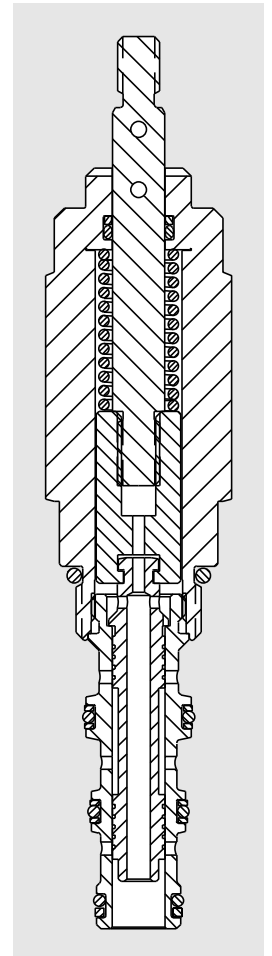
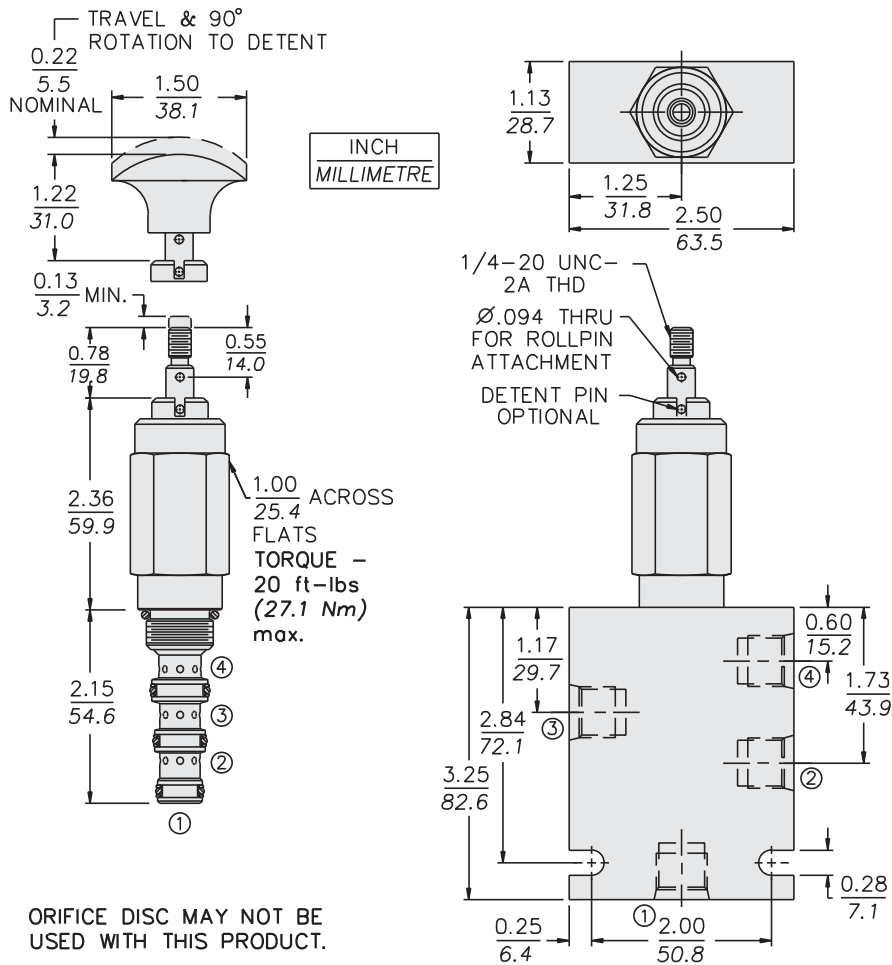
TRANSITION:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

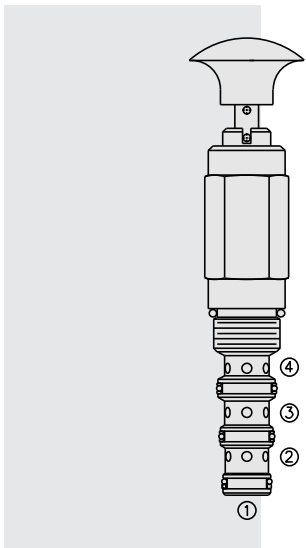
Cartridge: Weight: 0.25 kg. (0.55 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and back-ups standard. Plastic knob optional.

Standard Ported Body: Weight: 0.18 kg. (0.40 lbs.)
Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.008.1.

TO ORDER

MP08-41		-	-	-
Option				Seals
Threaded Shaft/ Spring Return	T			N Buna N (Std.)
Threaded Shaft/ Lock Position Pin	R			V Fluorocarbon
Black Plastic Knob/ Spring Return	K			
Black Plastic Knob/ Lock Position Pin	D			
Red Plastic Knob/ Spring Return	J			
Red Plastic Knob/ Lock Position Pin	L			
				Porting
				0 Cartridge Only
				6T SAE 6
				2B 1/4 in. BSP*
				3B 3/8 in. BSP*
				*BSP Body; U.K. Mfr. Only

MP10-41 Manual, Spring Return, Pull-to-Shift



DESCRIPTION

A 4-way, manual, pull-to-shift, spring-return, screw-in, directional hydraulic cartridge valve.

Series operation is prohibited due to the tank port (1) pressure rating.

OPERATION

In its steady-state spring-offset position, the **MP10-41** blocks flow in all directions. In the actuated (pulled) position, the cartridge directs flow from 3 to 4, and from 2 to 1.

Note: Pressure at port 1 will directly act on the spool and spring. Port 1 is intended to be a tank port only.

A unique pull-and-rotate feature for holding the positive actuated position is optional. A 90° rotation is required to position at the hold slot. The valve resets to spring-return de-actuated with a slight pull and a 90° turn from the locked actuated position.

FEATURES

- Hardened spool and cage for long life.
- Remains closed to 12.4 bar (180 psi) back-pressure.
- Optional rotational lock position.
- Industry common cavity.

RATINGS

Operating Pressure:

- On 2, 3 and 4: 207 bar (3000 psi)
- On 1 (Max.): 12.4 bar (180 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max.

Mechanical Pull Effort Required: 7.3 kg. (16 lbs.) installed; 8.2 kg. (18 lbs.) to travel 3.2 mm (0.125 inch); 8.6 kg. (19 lbs.) to detent

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

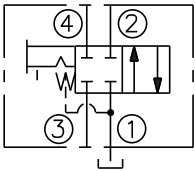
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

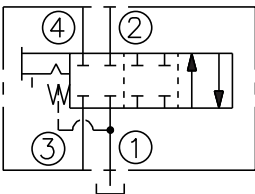
Seal Kit: SK10-4X-MMT; See page 8.650.1

SYMBOLS

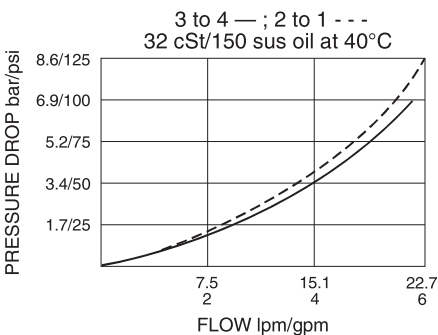
USASI/ISO:



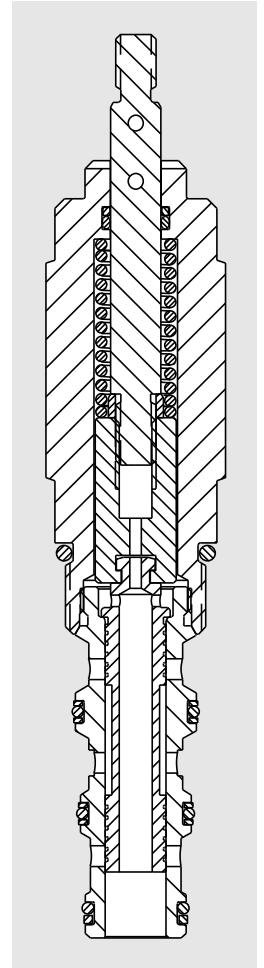
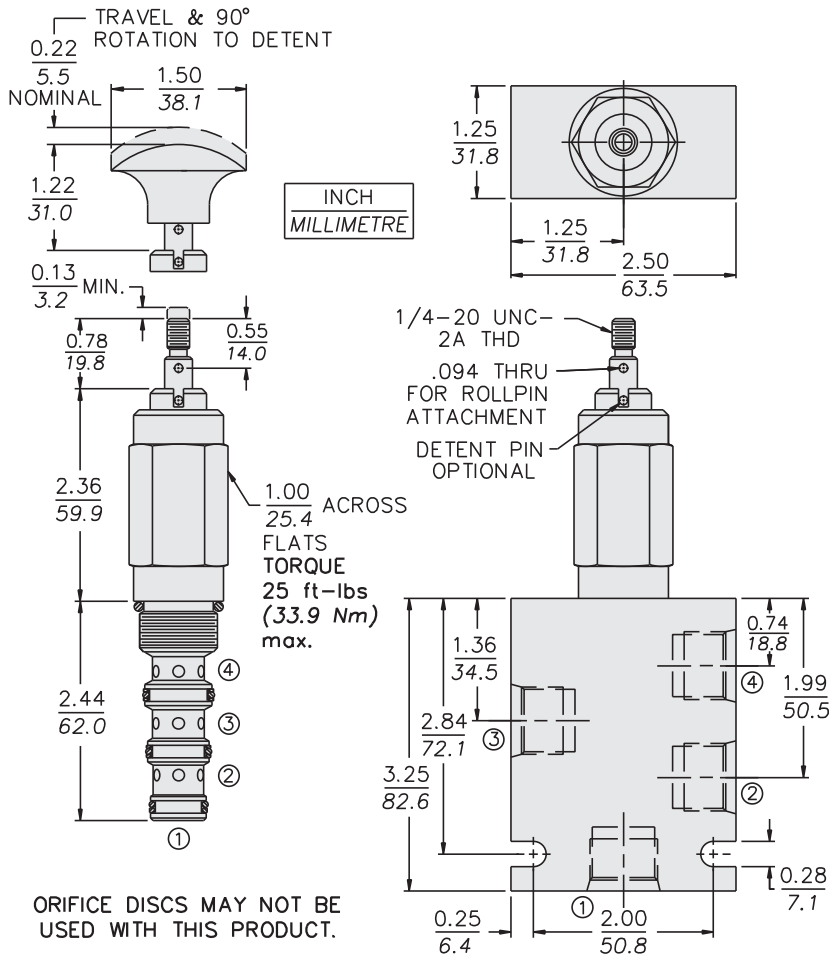
TRANSITION:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

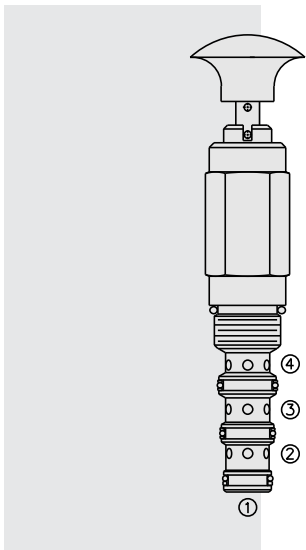
Cartridge: Weight: 0.32 kg. (0.70 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.
Plastic knob optional.

Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1.

TO ORDER

MP10-41		-	-
Option			Seals
Threaded Shaft/ Spring Return	T		N Buna N (Std.)
Threaded Shaft/ Lock Position Pin	R		V Fluorocarbon
Black Plastic Knob/ Spring Return	K		
Black Plastic Knob/ Lock Position Pin	D		
Red Plastic Knob/ Spring Return	J		
Red Plastic Knob/ Lock Position Pin	L		
		Porting	
		0	Cartridge Only
		6T	SAE 6
		8T	SAE 8
		2B	1/4 in. BSP*
		3B	3/8 in. BSP*
			*BSP Body; U.K. Mfr. Only

MP10-42 Manual, Spring Return, Pull-to-Shift



DESCRIPTION

A 4-way, manual, pull-to-shift, spring-return, screw-in, directional hydraulic cartridge valve.

Series operation is prohibited due to the tank port (1) pressure rating.

OPERATION

In its steady-state spring-offset position, the **MP10-42** directs flow between ports 3 and 2.

In the actuated (pulled) position, the cartridge directs flow from 3 to 4.

Note: Pressure at port 1 will directly act on the spool and spring. Port 1 is intended to be a tank port only.

A unique pull-and-rotate feature for holding the positive actuated position is optional. A 90° rotation is required to position at the hold slot. The valve resets to spring-return de-actuated with a slight pull and a 90° turn from the locked actuated position.

FEATURES

- Hardened spool and cage for long life.
- Remains closed to 12.4 bar (180 psi) back-pressure.
- Optional rotational lock position.
- Industry common cavity.

RATINGS

Operating Pressure:

On 2, 3 and 4: 240 bar (3500 psi)

On 1 (Max.): 12.4 bar (180 psi)

Proof Pressure: 420 bar (6090 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max.

Mechanical Pull Effort Required: 7.3 kg. (16 lbs.) installed; 8.2 kg. (18 lbs.) to travel 3.2 mm (0.125 inch); 8.6 kg. (19 lbs.) to detent

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

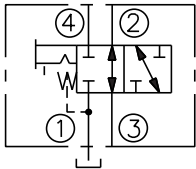
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

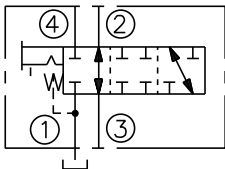
Seal Kit: SK10-4X-MMT; See page 8.650.1

SYMBOLS

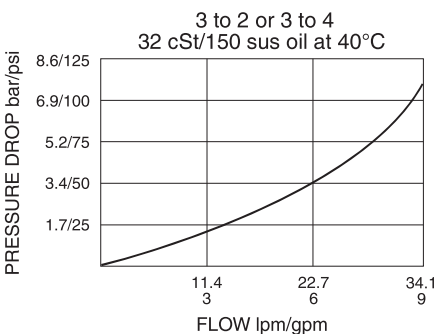
USASI/ISO:



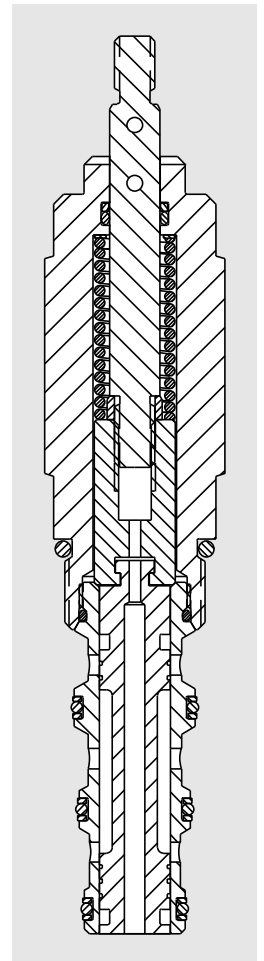
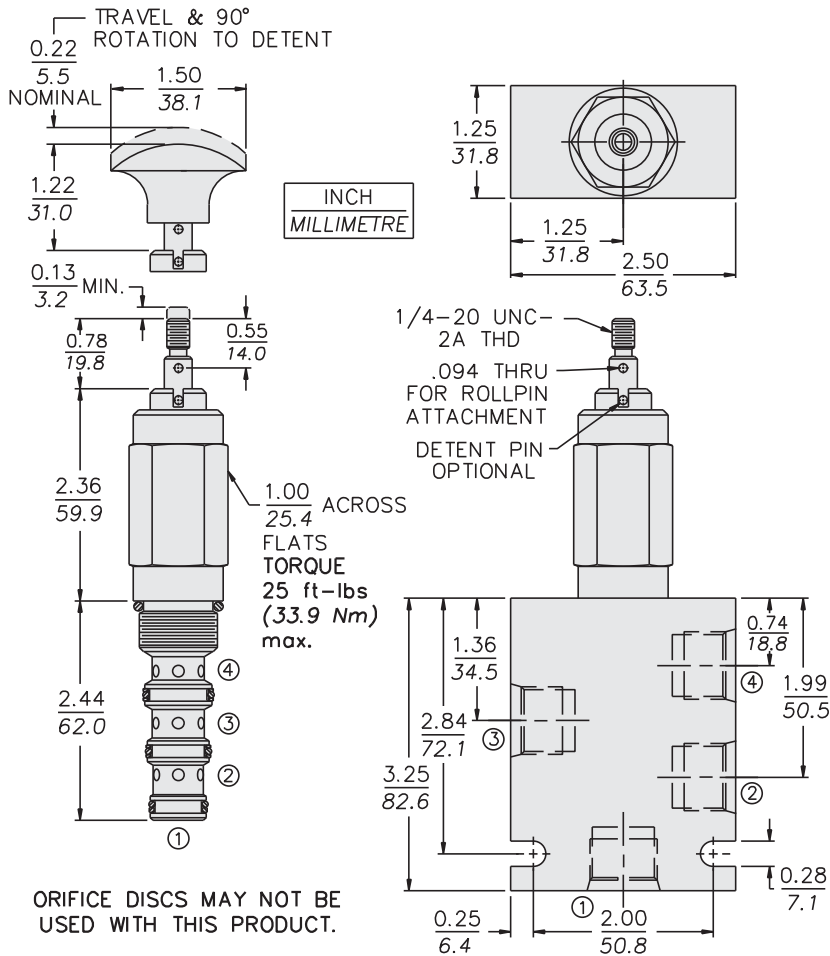
TRANSITION:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.32 kg. (0.70 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.
Plastic knob optional.

Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

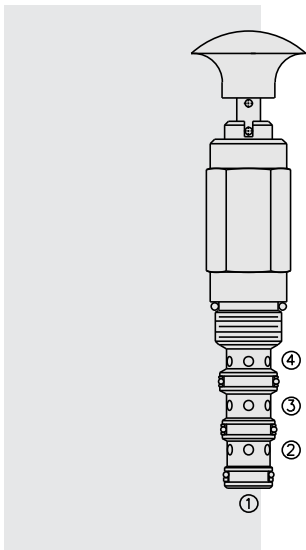
TO ORDER

MP10-42

Option			
Threaded Shaft/ Spring Return	T		
Threaded Shaft/ Lock Position Pin	R		
Black Plastic Knob/ Spring Return	K		
Black Plastic Knob/ Lock Position Pin	D		
Red Plastic Knob/ Spring Return	J		
Red Plastic Knob/ Lock Position Pin	L		
		Porting	
		0	Cartridge Only
		6T	SAE 6
		8T	SAE 8
		2B	1/4 in. BSP*
		3B	3/8 in. BSP*
			Seals
		N	Buna N (Std.)
		V	Fluorocarbon
		NS	Buna N with Sealed Spool
		VS	Fluorocarbon with Sealed Spool

*BSP Body; U.K. Mfr. Only

MP10-43 Manual, Spring Return, Pull-to-Shift



DESCRIPTION

A 4-way, manual, pull-to-shift, spring-return, screw-in, directional hydraulic cartridge valve.

Series operation is prohibited due to the tank port (1) pressure rating.

OPERATION

In its steady-state spring-offset position, the **MP10-43** blocks flow at 3 and at 2, while 4 is open to 1. In the actuated (pulled) position, the cartridge directs flow from 3 to 4 and from 2 to 1. Note that all ports are restricted/open in transition.

Note: Pressure at port 1 will directly act on the spool and spring. Port 1 is intended to be a tank port only.

A unique pull-and-rotate feature for a positive actuated position hold is optional. A 90° rotation is required to position at the hold slot. The valve resets to spring-return de-actuated with a slight pull and 90° turn from the locked actuated position.

FEATURES

- Hardened spool and cage for long life.
- Remains closed to 10.3 bar (150 psi) back-pressure.
- Optional rotational lock position.
- Industry common cavity.

RATINGS

Operating Pressure:

- On 2, 3 and 4: 207 bar (3500 psi)
- On 1 (Max.): 12.4 bar (180 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max.

Mechanical Pull Effort Required: 7.3 kg. (16 lbs.) installed; 8.2 kg. (18 lbs.) to travel 3.2 mm (0.125 inch); 8.6 kg. (19 lbs.) to detent

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

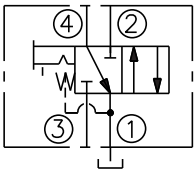
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

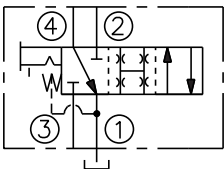
Seal Kit: SK10-4X-MMT; See page 8.650.1

SYMBOLS

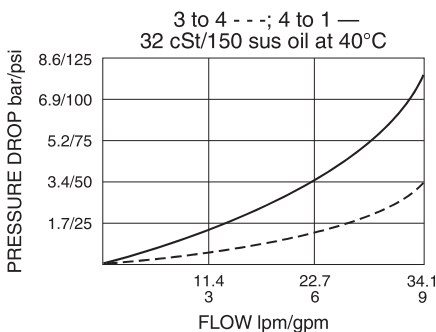
USASI/ISO:



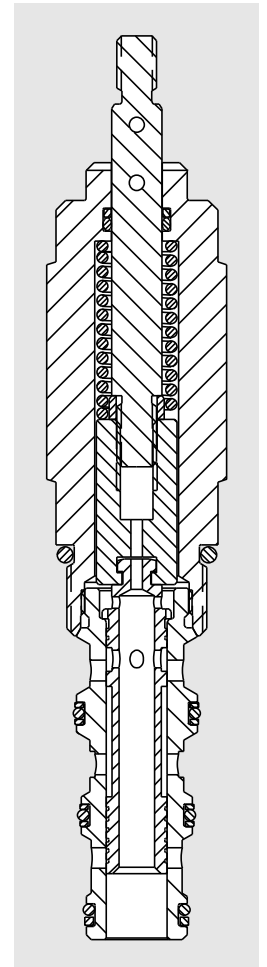
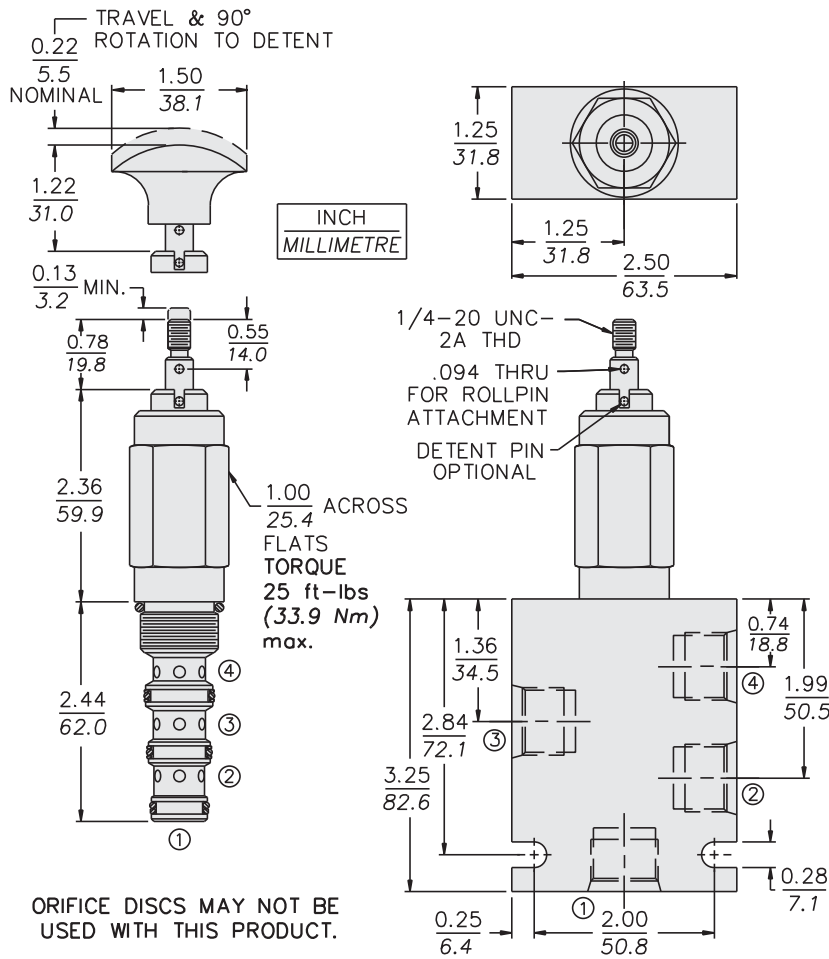
TRANSITION:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

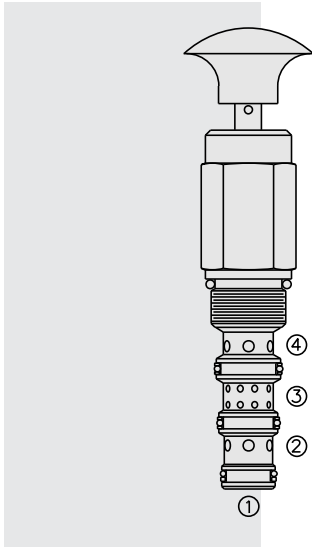
Cartridge: Weight: 0.32 kg. (0.70 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.
Plastic knob optional.

Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1.

TO ORDER

MP10-43		-	-
Option			Seals
Threaded Shaft/ Spring Return	T		N Buna N (Std.)
Threaded Shaft/ Lock Position Pin	R		V Fluorocarbon
Black Plastic Knob/ Spring Return	K		
Black Plastic Knob/ Lock Position Pin	D		
Red Plastic Knob/ Spring Return	J		
Red Plastic Knob/ Lock Position Pin	L		
			Porting
		0	Cartridge Only
		6T	SAE 6
		8T	SAE 8
		2B	1/4 in. BSP*
		3B	3/8 in. BSP*
			*BSP Body; U.K. Mfr. Only

MP10-47A Manual Pull/Push-to-Shift, 3-Position,



DESCRIPTION

A 4-way, 3-position, spool-type, tandem center, manual pull/push-to-shift, spring-return, directional hydraulic cartridge valve.

OPERATION

In its neutral position, the **MP10-47A** blocks ports 2 and 4, while allowing flow from 3 to 1. In the pulled position, flow is allowed bi-directionally between ports 3 and 2 and from 4 to 1. In the pushed position, flow is allowed between ports 3 and 4 and from 2 to 1.

FEATURES

- Hardened spool and cage for long life.
- Industry common cavity.

RATINGS

Operating Pressure:

- Ports 2, 3 and 4: 207 bar (3000 psi)
- Port 1 (Max.): 14 bar (200 psi)

Flow: See Performance Chart

Internal Leakage: 41 cc/minute (2.5 cu. in./minute) at 207 bar (3000 psi) max.

Mechanical Pull/Push Effort Required: 9.0 kg. (20 lbs.) initial;
11.3 kg. (25 lbs.) full stroke

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

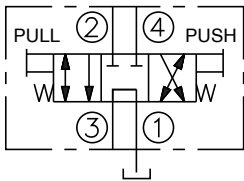
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

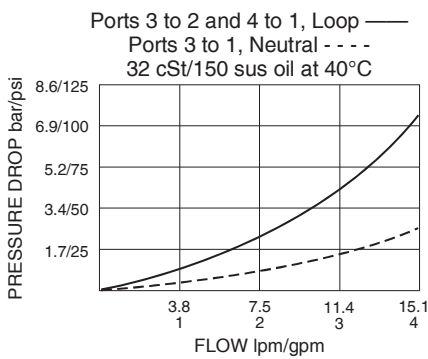
Seal Kit: SK10-4X-MMT; See page 8.650.1

SYMBOLS

USASI/ISO:



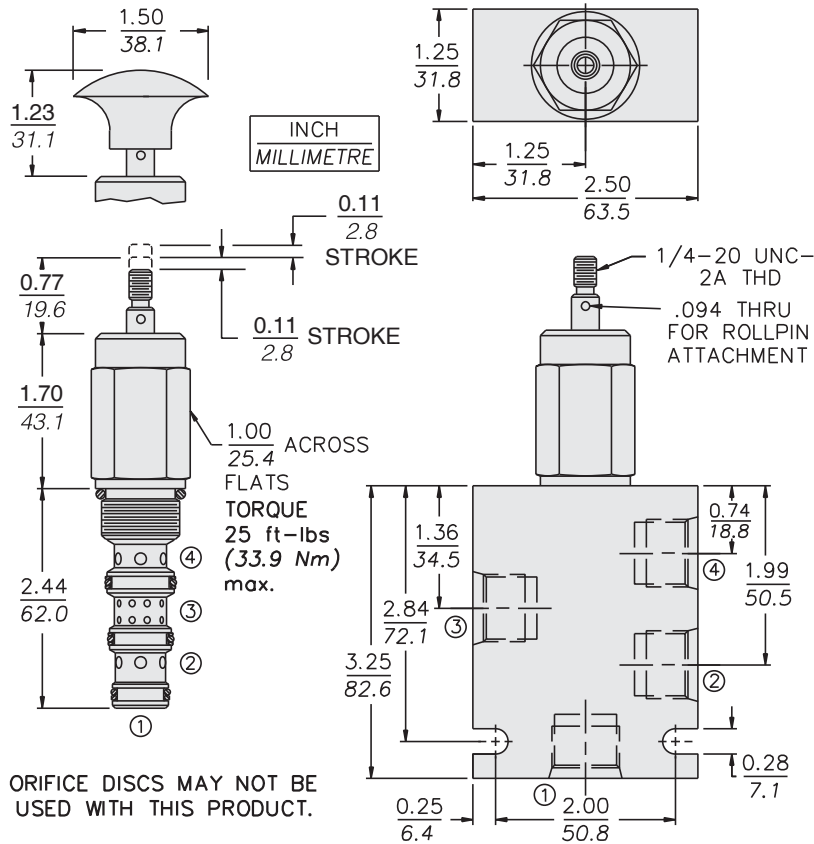
PERFORMANCE (Cartridge Only)



4-Way, Tandem Center

MP10-47A

DIMENSIONS



MATERIALS

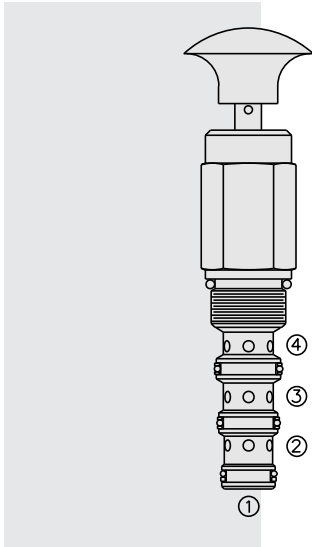
Cartridge: Weight: 0.32 kg. (0.70 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.
Plastic knob optional.

Standard Ported Body: Weight:
0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1.

TO ORDER

MP10-47A		-	-	-
Option				Seals
Threaded Shaft/ Spring Return	T			N Buna N (Std.)
Black Plastic Knob/ Spring Return	K			V Fluorocarbon
Red Plastic Knob/ Spring Return	J			
				Porting
				0 Cartridge Only
				6T SAE 6
				8T SAE 8
				2B 1/4 in. BSP*
				3B 3/8 in. BSP*
				*BSP Body; U.K. Mfr. Only

MP10-47B Manual Pull/Push-to-Shift, 3-Position,



DESCRIPTION

A 4-way, 3-position, spool-type, open center, manual pull/push-to-shift, spring-return, directional hydraulic cartridge valve.

OPERATION

In its neutral position, the **MP10-47B** has all ports open. In the pulled position, flow is allowed bi-directionally between ports 3 and 4 and from 2 to 1. In the pushed position, flow is allowed between ports 3 and 2 and from 4 to 1.

FEATURES

- Hardened spool and cage for long life.
- Industry common cavity.

RATINGS

Operating Pressure:

- Ports 2, 3 and 4: 207 bar (3000 psi)
- Port 1 (Max.): 14 bar (200 psi)

Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) at 207 bar (3000 psi) max.

Mechanical Pull/Push Effort Required: 9.0 kg. (20 lbs.) initial;
11.3 kg. (25 lbs.) full stroke

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

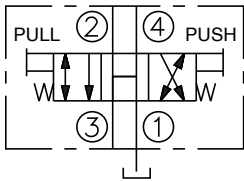
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

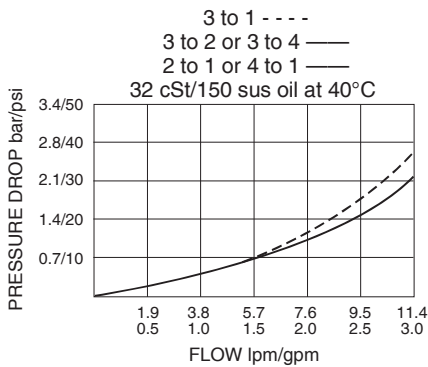
Seal Kit: SK10-4X-MMT; See page 8.650.1

SYMBOLS

USASI/ISO:



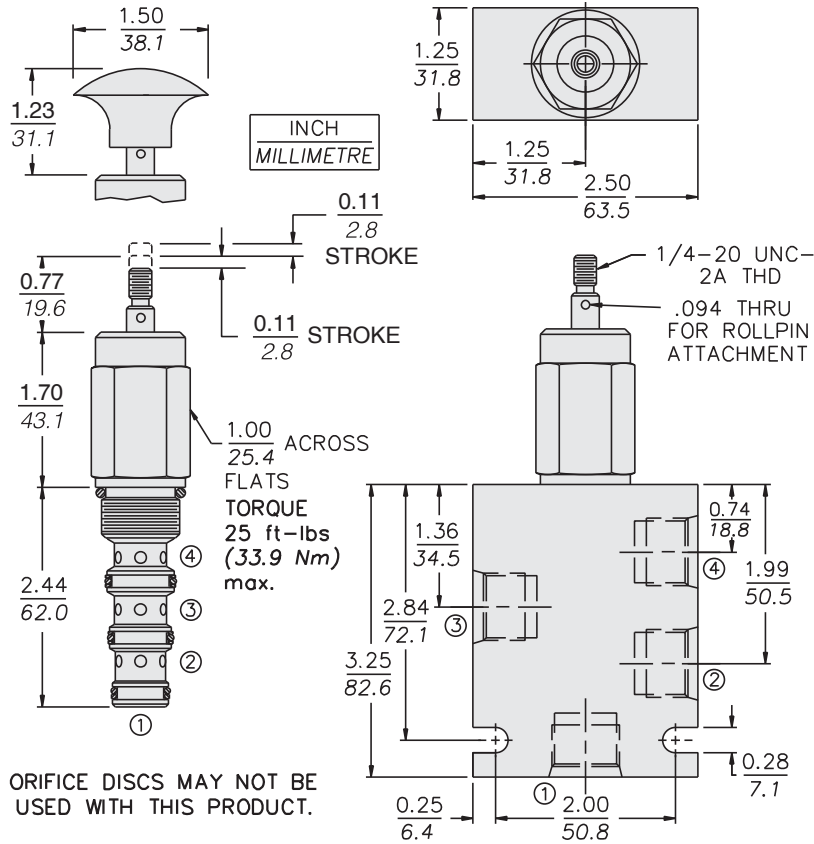
PERFORMANCE (Cartridge Only)



4-Way, Open Center

MP10-47B

DIMENSIONS

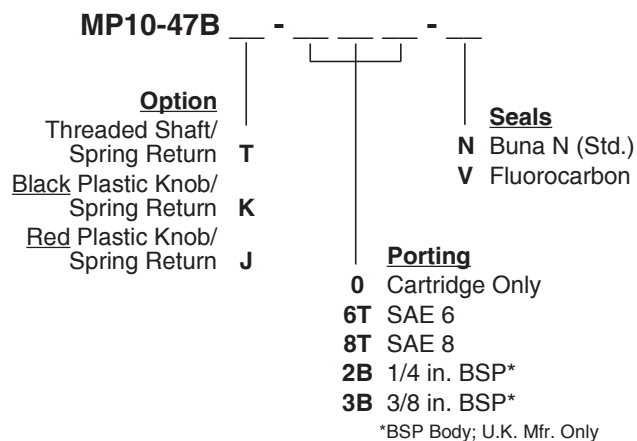


MATERIALS

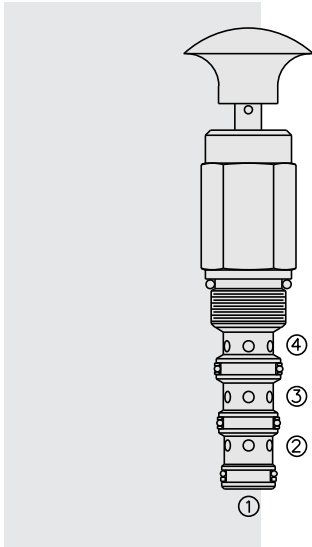
Cartridge: Weight: 0.32 kg. (0.70 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.
Plastic knob optional.

Standard Ported Body: Weight:
0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER



MP10-47C Manual Pull/Push-to-Shift, 3-Position,



DESCRIPTION

A 4-way, 3-position, spool-type, closed center, manual pull/push-to-shift, spring-return, directional hydraulic cartridge valve.

OPERATION

In its neutral position, the **MP10-47C** blocks all ports. In the pulled position, flow is allowed bi-directionally between ports 3 and 4 and from 2 to 1. In the pushed position, flow is allowed between ports 3 and 2 and from 4 to 1.

FEATURES

- Hardened spool and cage for long life.
- Industry common cavity.

RATINGS

Operating Pressure:

- Ports 2, 3 and 4: 207 bar (3000 psi)
- Port 1 (Max.): 14 bar (200 psi)

Flow: See Performance Chart

Internal Leakage: 41 cc/minute (2.5 cu. in./minute) at 207 bar (3000 psi) max.

Mechanical Pull/Push Effort Required: 9.0 kg. (20 lbs.) initial;
11.3 kg. (25 lbs.) full stroke

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

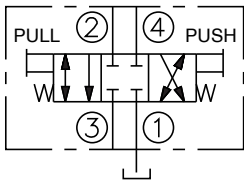
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

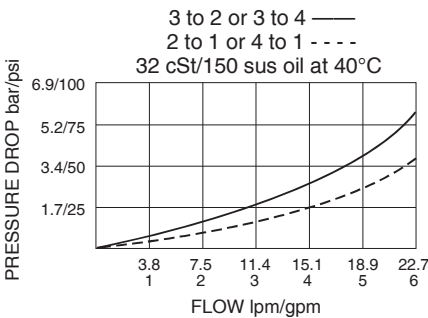
Seal Kit: SK10-4X-MMT; See page 8.650.1

SYMBOLS

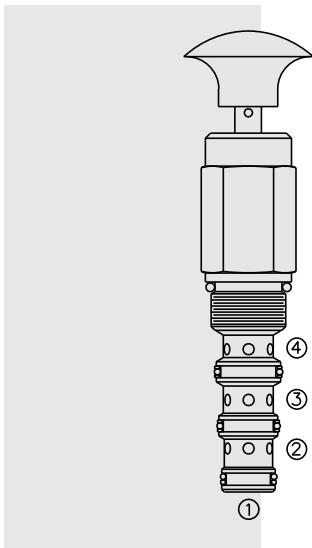
USASI/ISO:



PERFORMANCE (Cartridge Only)



MP10-47D Manual Pull/Push-to-Shift, 3-Position,



DESCRIPTION

A 4-way, 3-position, spool-type, motor spool, manual pull/push-to-shift, spring-return, directional hydraulic cartridge valve.

OPERATION

In its neutral position, the **MP10-47D** blocks port 3, while allowing flow from 2 to 1. In the pulled position, flow is allowed bi-directionally between ports 3 and 4 and from 2 to 1. In the pushed position, flow is allowed between ports 3 and 2 and from 4 to 1.

FEATURES

- Hardened spool and cage for long life.
- Industry common cavity.

RATINGS

Operating Pressure:

- Ports 2, 3 and 4: 207 bar (3000 psi)
- Port 1 (Max.): 14 bar (200 psi)

Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) at 207 bar (3000 psi) max.

Mechanical Pull/Push Effort Required: 9.0 kg. (20 lbs.) initial;
11.3 kg. (25 lbs.) full stroke

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

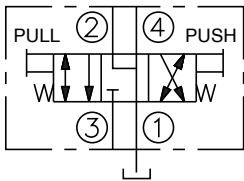
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

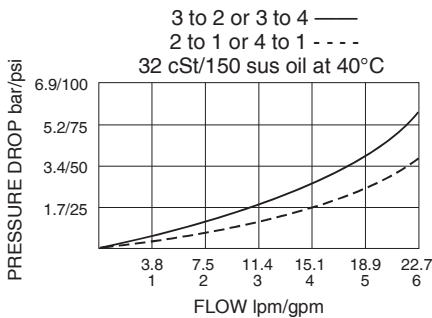
Seal Kit: SK10-4X-MMT; See page 8.650.1

SYMBOLS

USASI/ISO:



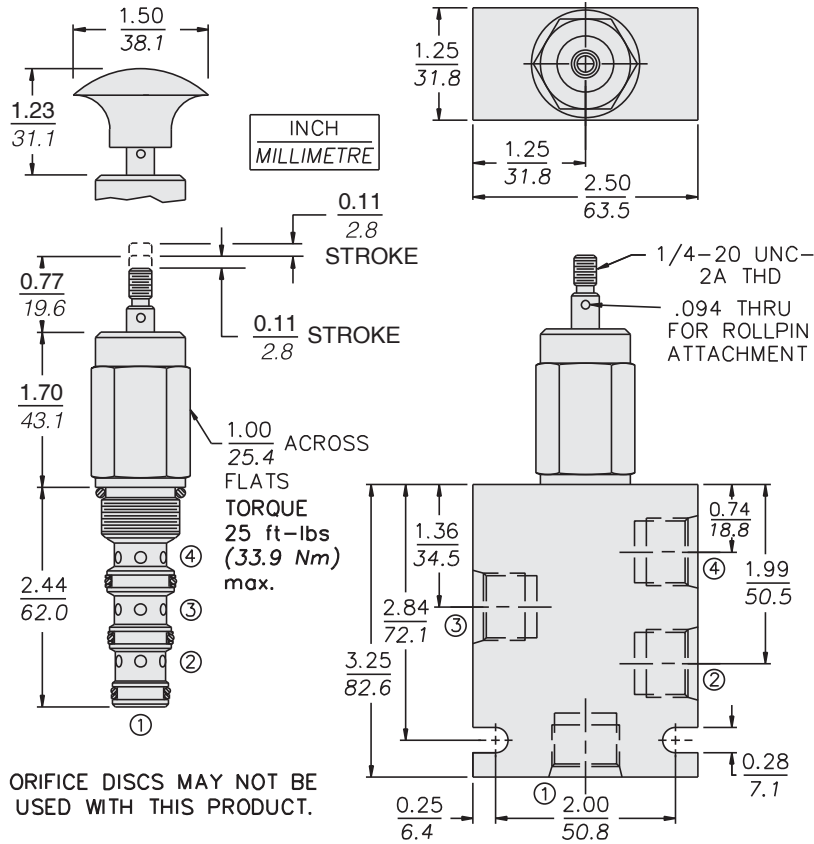
PERFORMANCE (Cartridge Only)



4-Way, Motor Spool

MP10-47D

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.32 kg. (0.70 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.
Plastic knob optional.

Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

MP10-47D

Option

Threaded Shaft/
Spring Return **T**

Black Plastic Knob/
Spring Return **K**

Red Plastic Knob/
Spring Return **J**

Seals

N Buna N (Std.)

V Fluorocarbon

Porting

0 Cartridge Only

6T SAE 6

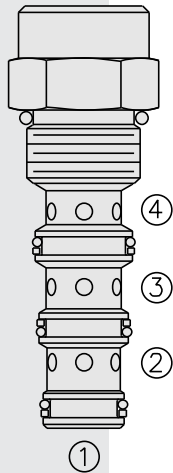
8T SAE 8

2B 1/4 in. BSP*

3B 3/8 in. BSP*

*BSP Body; U.K. Mfr. Only

BV10-40 Brake Release Valve



DESCRIPTION

A screw-in, cartridge-style, spool-type, hydraulic directional valve which operates by pressure-to-shift spring return. It is normally used to release a spring-applied brake whenever hydraulic power is directed to move a load.

OPERATION

In neutral, the BV10-40 allows flow from 2 to 3. When the pressure differential between the 1 and 4 ports exceeds approximately 5.5 bar (80 psi), the spool has moved far enough to close 2 to 3 flow, while opening the higher pressure of 1 or 4 to 2.

FEATURES

- Hardened spool and cage for long life.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 390 bar (5700 psi)

Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) max. at 207 bar (3000 psi) 2 to 3 (shifted)

Differential Pressure Required (1 > 4, 4 > 1) to Shift to Close 2 to 3 / Open 1 or 4 to 2: 5.5 bar (80 psi)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

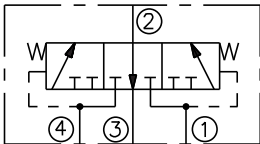
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

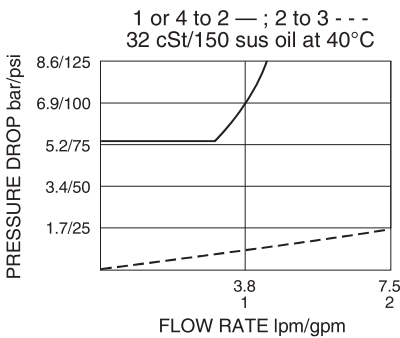
Seal Kit: SK10-4X-TBT; See page 8.650.1

SYMBOLS

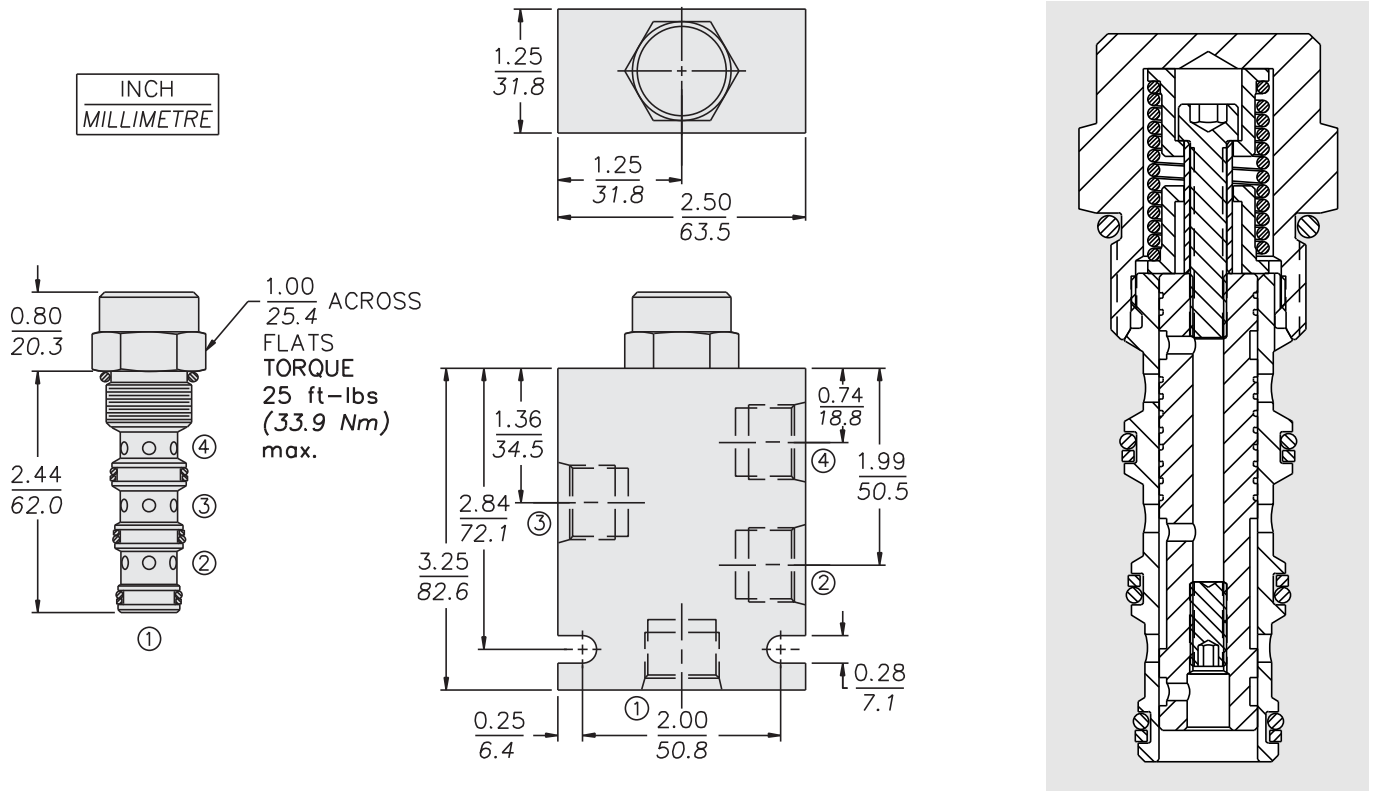
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.16 kg. (0.35 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.)
Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

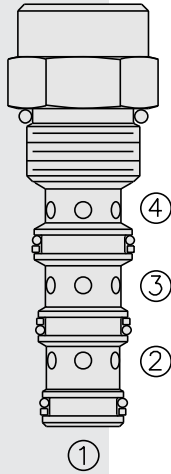
TO ORDER

BV10-40 - -

Porting		Seals	
Cartridge Only	0	N	Buna N (Std.)
SAE 6	6T	V	Fluorocarbon
SAE 8	8T		
1/4 in. BSP*	2B		
3/8 in. BSP*	3B		

*BSP Body; U.K. Mfr. Only

BV10-42 Brake Release Valve, 2-Position



DESCRIPTION

A screw-in, cartridge-style, spool-type, hydraulic directional valve which operates by pressure-to-shift spring return. It is normally used to release a spring-applied brake whenever hydraulic power is directed to move a load.

OPERATION

In neutral, the BV10-42 allows flow from 2 to 3. When the pressure differential between the 1 and 2 ports exceeds approximately 5.5 bar (80 psi), the spool has moved far enough to close 2 to 3 flow, while opening the higher pressure of 4 to 2.

FEATURES

- Hardened spool and cage for long life.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: 82 cc/minute (5 cu. in./minute) max. at 207 bar (3000 psi) 2 to 3 (shifted)

Differential Pressure Required (4 > 1) to Shift to Close 2 to 3 / Open 4 to 2: 5.5 bar (80 psi)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

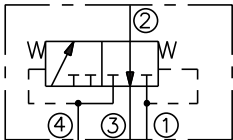
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

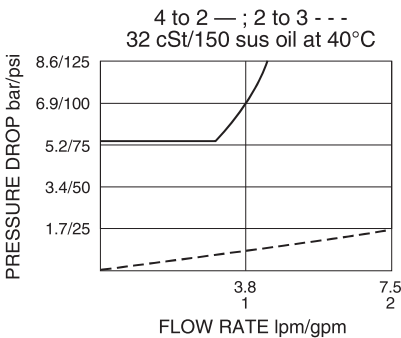
Seal Kit: SK10-4X-TBT; See page 8.650.1

SYMBOLS

USASI/ISO:



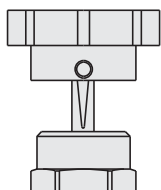
PERFORMANCE (Cartridge Only)



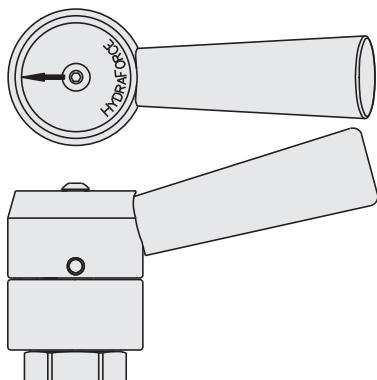
Operator Options – MR Series

2-POSITION, 90° ROTATION, POINTER IN-LAY

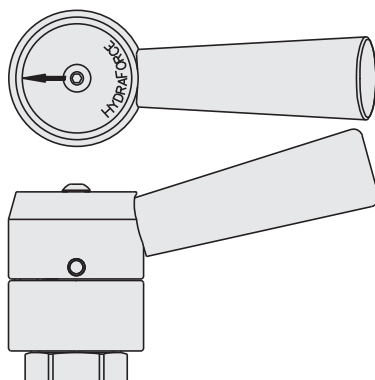
Plastic Knob
Pointer In-Lay
Kit P/N 5341010



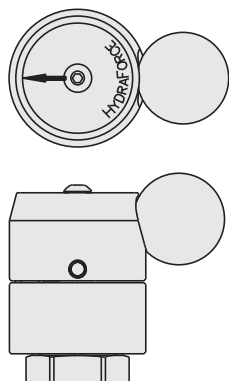
Lever Handle
Friction Lock
Kit P/N 5342020



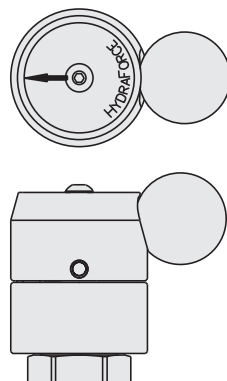
Lever Handle
2-Position Detent
Kit P/N 5342030



Ball Handle
Friction Lock
Kit P/N 5342050



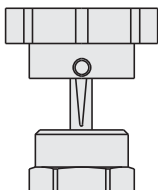
Ball Handle
2-Position Detent
Kit P/N 5342060



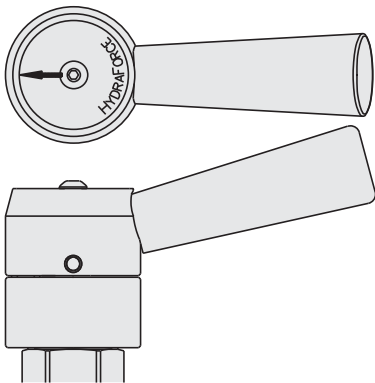
Operator Options - MR Series

3-POSITION, 45°-0-45° ROTATION, POINTER IN-LAY

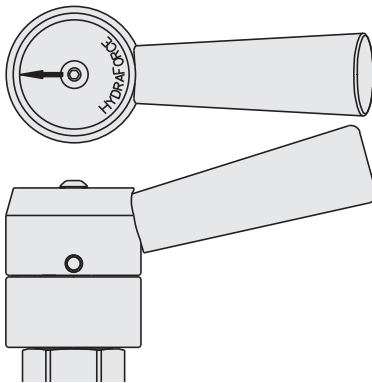
**Plastic Knob
Pointer In-Lay
Kit P/N 5341010**



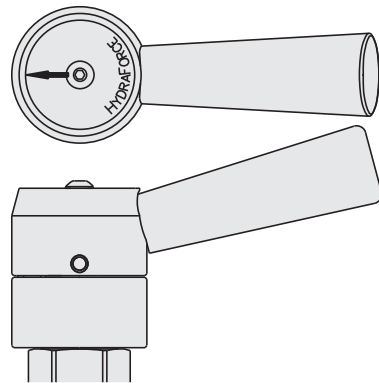
**Lever Handle
Friction Lock**
Kit P/N 5343020**



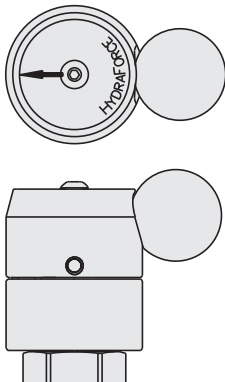
**Lever Handle
3-Position Detent
Kit P/N 5343030**



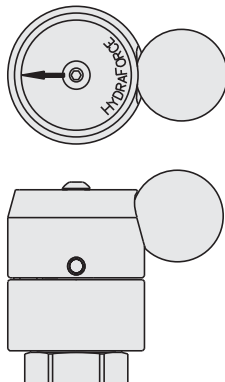
**Lever Handle
Spring Return
Kit P/N 5343040**



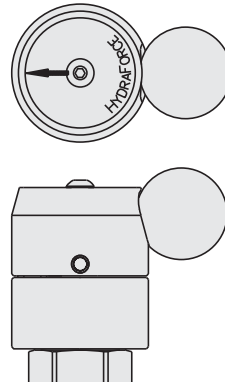
**Ball Handle
Friction Lock**
Kit P/N 5343050**



**Ball Handle
3-Position Detent
Kit P/N 5343060**

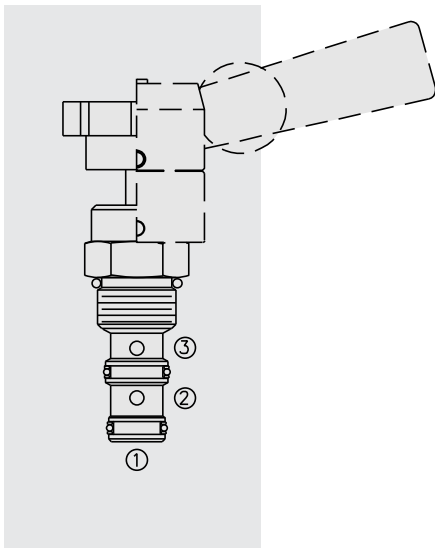


**Ball Handle
Spring Return
Kit P/N 5343070**



**Detented on neutral.

MR10-31 Manual Rotary 3-Way, 2-Pos. Directional Valve



DESCRIPTION

A manually-operated three-way, two-position directional valve with adaptability to a variety of adjustment operators (ordered separately).

OPERATION

Rotation of 90°, 2-position. In extreme counterclockwise position, ports 1 and 2 are open while port 3 is closed. In extreme clockwise position, ports 1 and 2 are open while port 2 is closed. All ports are closed in transition.

FEATURES

- Two-position detent or infinite friction lock ordered separately.
- May be fully pressurized at all ports.
- Optional lock-down bracket.
- Heavy-duty construction.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Max. Flow: See Performance Chart

Internal Leakage: 164 cc/min. (10 cu. in./min.) at 240 bar (3500 psi)

Temperature: -40 to 120°C with standard Buna N seals

Spring Return Option: Returns clockwise

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No position restrictions; See page 9.020.1

See page 4.990.2 for operator handles/knobs installation;

See page 4.990.1 for lock-down bracket installation.

Cavity: VC10-3; See page 9.110.1

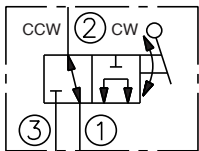
Cavity Tool: CT10-3XX; See page 8.600.1

Seal Kit: SK10-3X-MM; See page 8.650.1

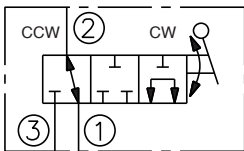
Lock-Down Bracket Kit: Part Number 5399000

SYMBOLS

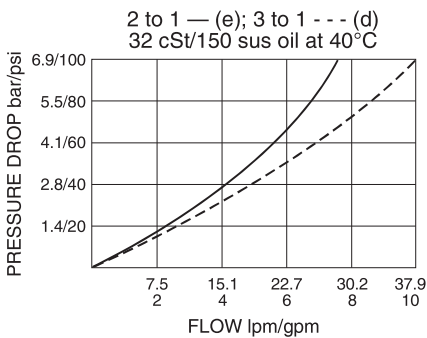
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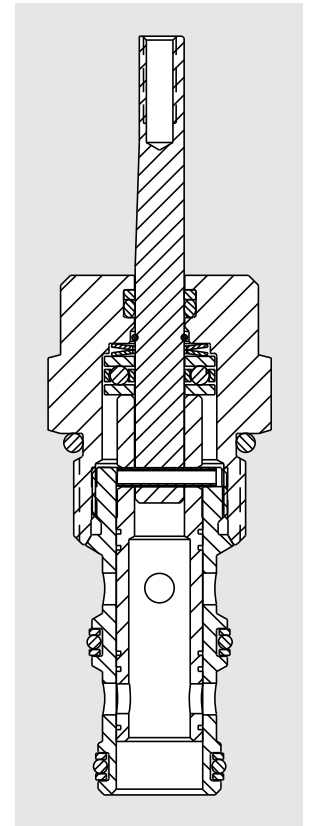
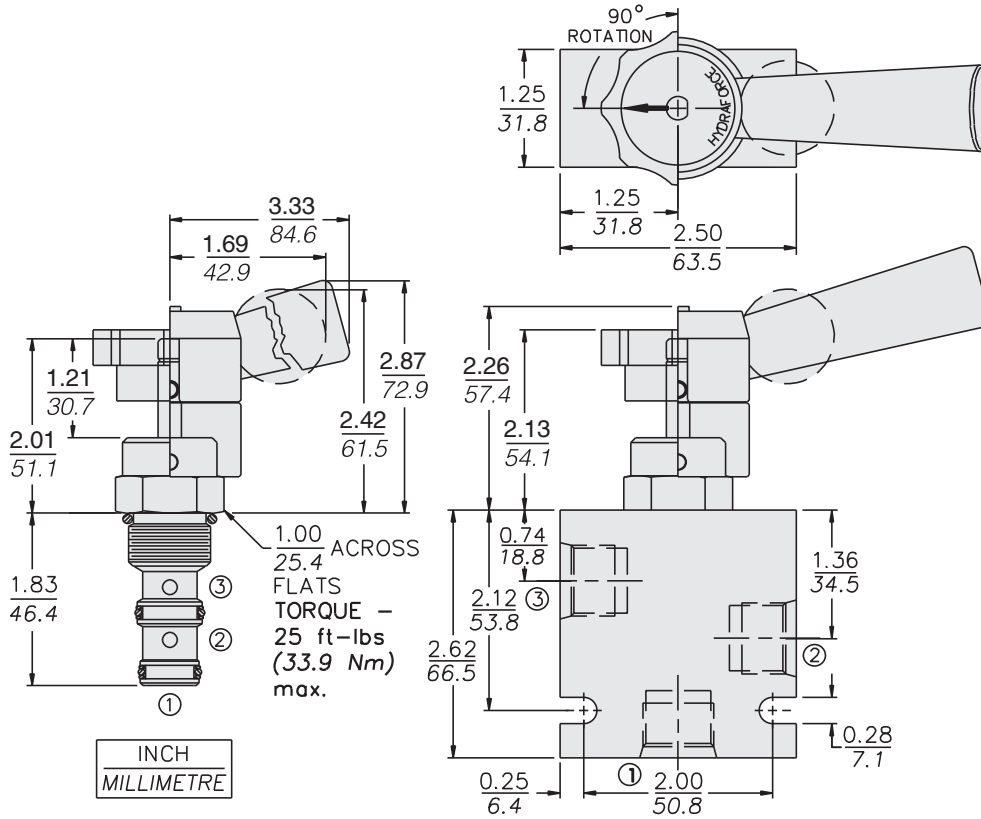
TRANSITION:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.12 kg. (0.27 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and Fluorocarbon back-ups standard.

Standard Ported Body: Weight: 0.27 kg. (0.60 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

Lever-Type Handle: (Sold Separately)
Weight: 0.18 kg. (0.38 lbs.) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Plastic lever arm.

TO ORDER

MR10-31

Option

None (Blank)

Seals

N Buna N (Std.)

V Fluorocarbon

Porting

Cartridge Only **0**

SAE 6 **6T**

SAE 8 **8T**

SAE 8 with Lock-Down Bracket **8TL**

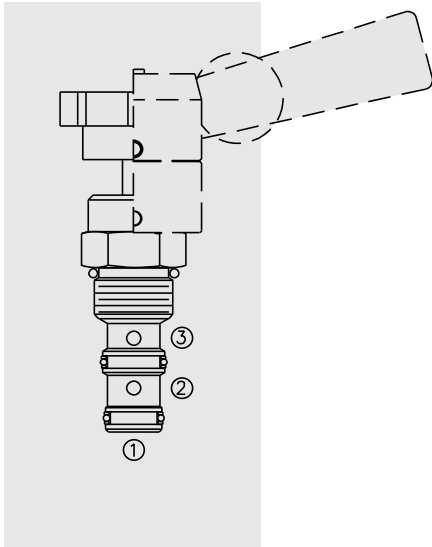
1/4 in. BSP* **2B**

3/8 in. BSP* **3B**

*BSP Body; U.K. Mfr. Only

NOTE: To order standard operator kits, refer to pages 4.770.1 and 4.770.2

MR10-37A Manual Rotary, 3-Way, 3-Position



DESCRIPTION

Manually-operated three-way, three-position directional valve, with adaptability to a variety of adjustment operators (ordered separately), in a variety of spool configurations.

OPERATION

Three positions: centered, 45° counterclockwise, and 45° clockwise. In the center position all ports are closed. In the 45° counterclockwise from center position, ports 2 and 3 are open while port 1 is closed. In the 45° clockwise from center position, ports 1 and 2 are open while port 3 is closed. All ports are closed in transition.

FEATURES

- Three-position detent, friction lock (with detented neutral), or spring return operators may be ordered separately.
- May be fully pressurized at all ports.
- Optional lock-down bracket.
- Heavy-duty construction.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Max. Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) at 240 bar (3500 psi)

Temperature: -40 to 120°C with standard Buna N seals

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No position restrictions; See page 9.020.1

See page 4.990.2 for operator handles/knobs installation;

See page 4.990.1 for lock-down bracket installation.

Cavity: VC10-3; See page 9.110.1

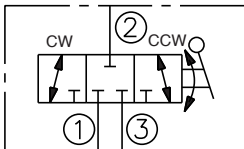
Cavity Tool: CT10-3XX; See page 8.600.1

Seal Kit: SK10-3X-MM; See page 8.650.1

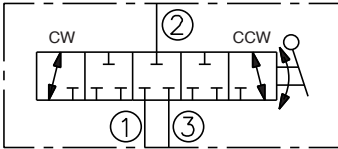
Lock-Down Bracket Kit: Part Number 5399000

SYMBOLS

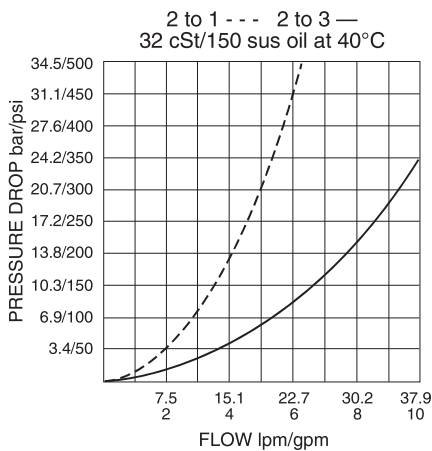
USASI/ISO:



TRANSITION:

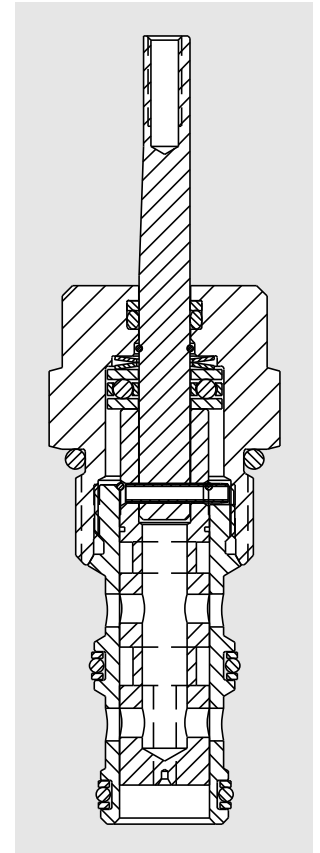
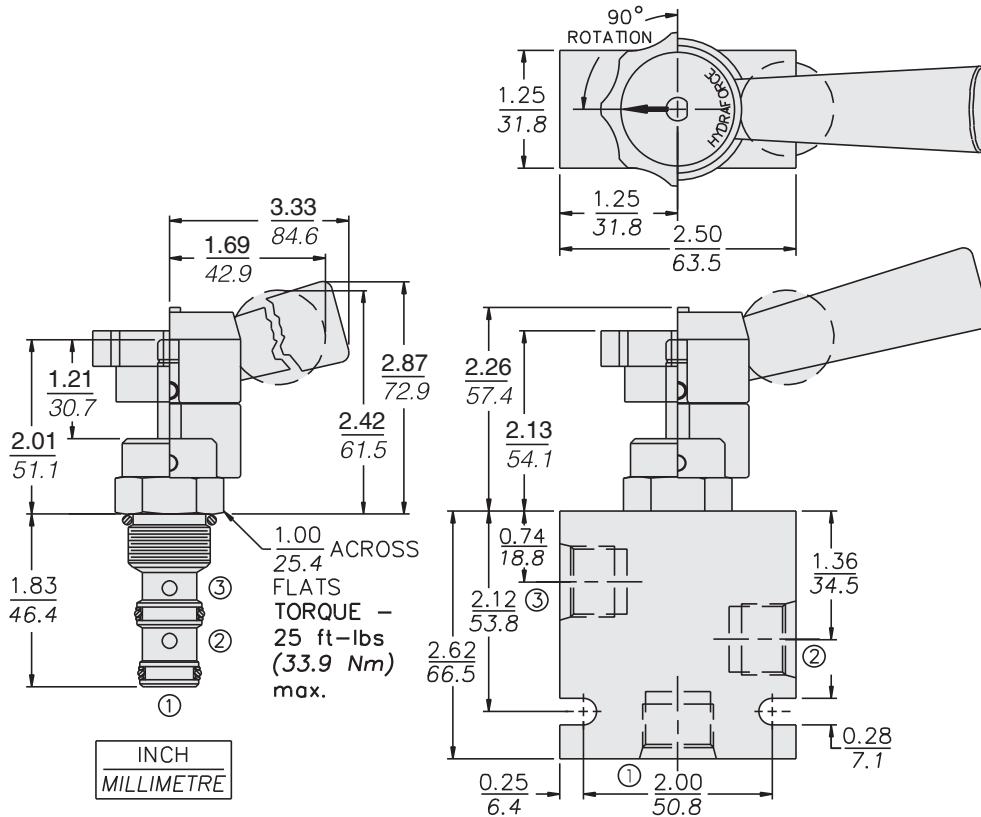


PERFORMANCE (Cartridge Only)



MR10-37A

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.11 kg. (0.25 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and Fluorocarbon back-ups standard.

Standard Ported Body: Weight: 0.32 kg. (0.70 lbs.)
Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1.

Lever-Type Handle: (Sold Separately)
Weight: 0.18 kg. (0.38 lbs.) Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Plastic lever arm.

TO ORDER

MR10-37A

Option

None (Blank)

Seals

N Buna N (Std.)

V Fluorocarbon

Porting

Cartridge Only **0**

SAE 6 **6T**

SAE 8 **8T**

SAE 8 with Lock-Down Bracket **8TL**

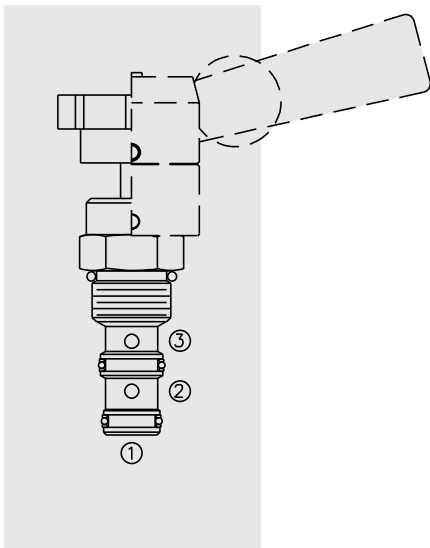
1/4 in. BSP* **2B**

3/8 in. BSP* **3B**

*BSP Body;
U.K. Mfr. Only

NOTE: To order standard operator kits, refer to pages 4.770.1 and 4.770.2

MR10-37B Manual Rotary, 3-Way, 3-Position



DESCRIPTION

Manually-operated three-way, three-position directional valve, with adaptability to a variety of adjustment operators (ordered separately), in a variety of spool configurations.

OPERATION

Three positions: centered, 45° counterclockwise, and 45° clockwise. In the center position all ports are open. In the 45° counterclockwise from center position, ports 2 and 3 are open while port 1 is closed. In the 45° clockwise from center position, ports 1 and 2 are open while port 3 is closed. All ports are partially open in transition.

FEATURES

- Three-position detent, friction lock (with detented neutral), or spring return operators may be ordered separately.
- May be fully pressurized at all ports.
- Optional lock-down bracket.
- Heavy-duty construction.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Max. Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) at 240 bar (3500 psi)

Temperature: -40 to 120°C with standard Buna N seals

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No position restrictions; See page 9.020.1

See page 4.990.2 for operator handles/knobs installation;

See page 4.990.1 for lock-down bracket installation.

Cavity: VC10-3; See page 9.110.1

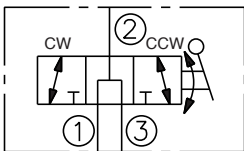
Cavity Tool: CT10-3XX; See page 8.600.1

Seal Kit: SK10-3X-MM; See page 8.650.1

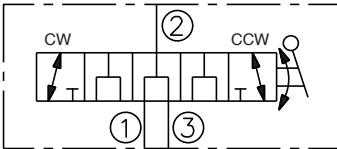
Lock-Down Bracket Kit: Part Number 5399000

SYMBOLS

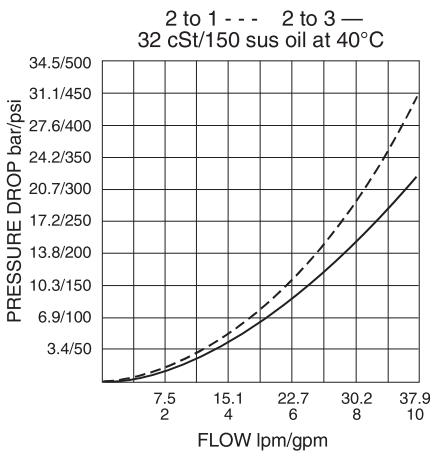
USASI/ISO:



TRANSITION:

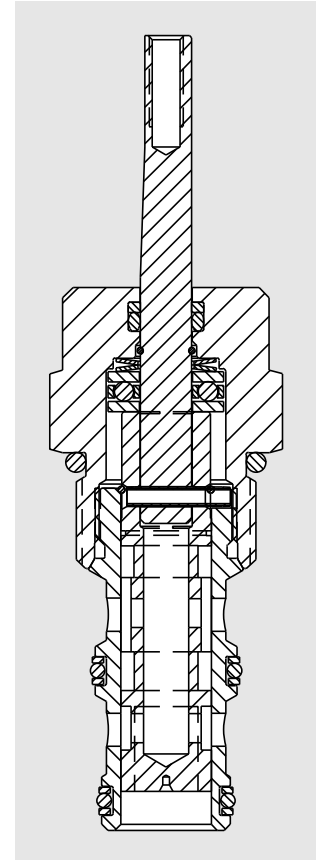
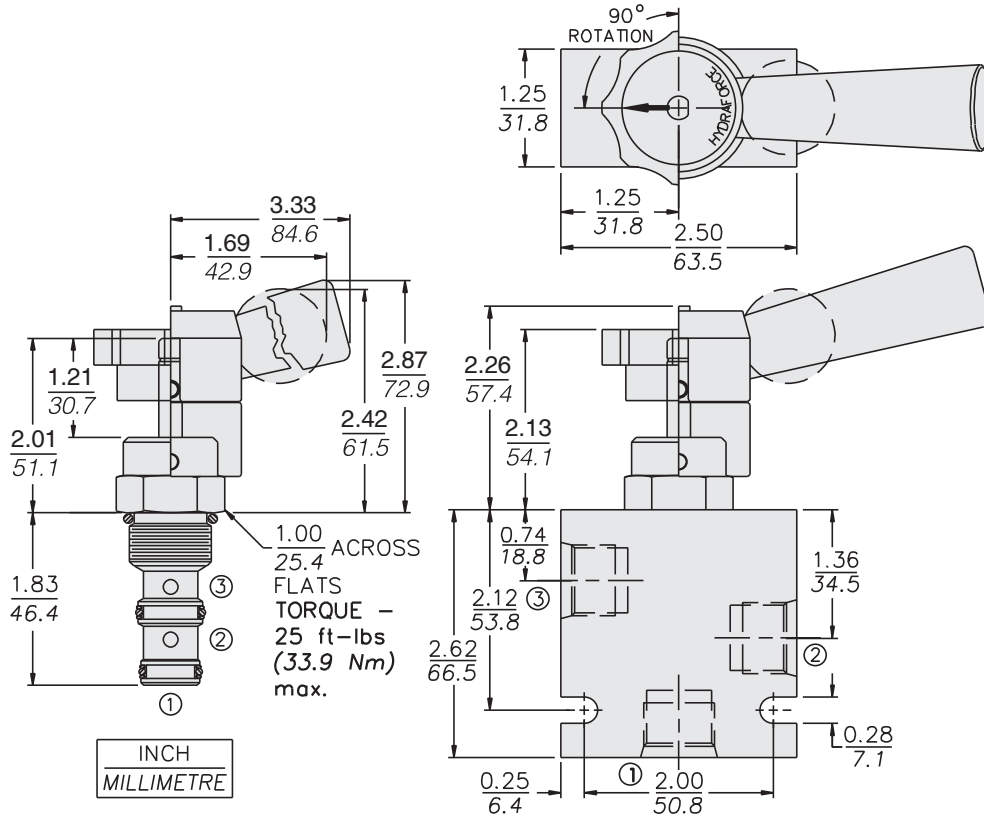


PERFORMANCE (Cartridge Only)



MR10-37B

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.11 kg. (0.25 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and Fluorocarbon back-ups standard.

Standard Ported Body: Weight: 0.32 kg. (0.70 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

Lever-Type Handle: (Sold Separately)
Weight: 0.18 kg. (0.38 lbs.) Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Plastic lever arm.

TO ORDER

MR10-37B

Option

None (Blank)

Seals

N Buna N (Std.)

V Fluorocarbon

Porting

Cartridge Only **0**

SAE 6 **6T**

SAE 8 **8T**

SAE 8 with Lock-Down Bracket **8TL**

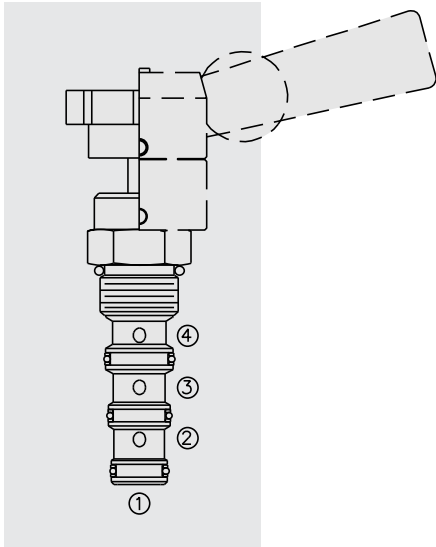
1/4 in. BSP* **2B**

3/8 in. BSP* **3B**

*BSP Body;
U.K. Mfr. Only

NOTE: To order standard operator kits, refer to pages 4.770.1 and 4.770.2

MR10-40 Manual Rotary 4-Way, 2-Pos. Directional Valve



DESCRIPTION

A manually-operated four-way, two-position directional valve, with adaptability to a variety of adjustment operators (ordered separately).

OPERATION

Two positions, 90° rotation. In extreme counterclockwise position, ports 1 and 4 are open while ports 2 and 3 are open. In extreme clockwise position, ports 1 and 2 are open while ports 3 and 4 are open. All ports are closed in transition.

FEATURES

- Two position detent or infinite friction lock operators may be ordered separately.
- May be fully pressurized at all ports.
- Optional lock-down bracket.
- Heavy-duty construction.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Max. Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) at 240 bar (3500 psi)

Temperature: -40 to 120°C with standard Buna N seals

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No position restrictions; See page 9.020.1

See page 4.990.2 for operator handles/knobs installation;

See page 4.990.1 for lock-down bracket installation.

Cavity: VC10-4; See page 9.110.1

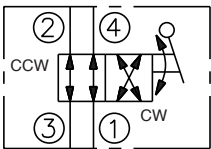
Cavity Tool: CT10-4XX; See page 8.600.1

Seal Kit: SK10-4X-MMM; See page 8.650.1

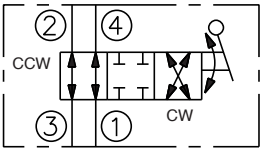
Lock-Down Bracket Kit: Part Number 5399000

SYMBOLS

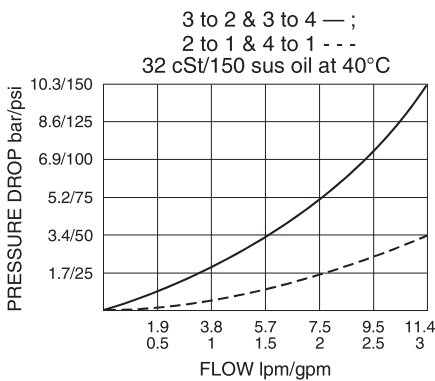
USASI/ISO:



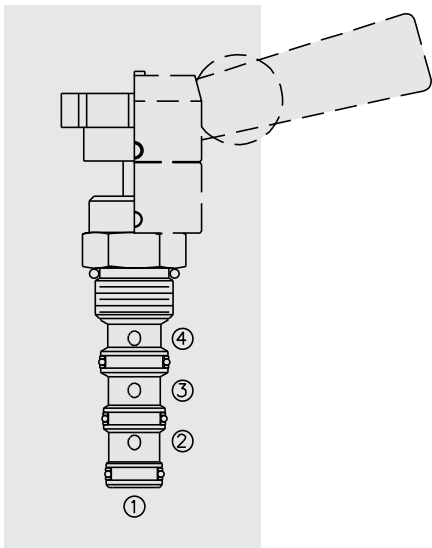
TRANSITION:



PERFORMANCE (Cartridge Only)



MR10-41 Manual Rotary 4-Way, 2-Pos. Directional Valve



DESCRIPTION

A manually-operated four-way, two-position directional valve, with adaptability to a variety of adjustment operators (ordered separately).

OPERATION

Two positions, 90° rotation. In extreme counterclockwise position all ports are closed. In extreme clockwise position, ports 1 and 4 are open while ports 2 and 3 are open. All ports are closed in transition.

FEATURES

- Two-position detent or infinite friction lock may be ordered separately.
- May be fully pressurized at all ports.
- Optional lock-down bracket.
- Heavy-duty construction.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Max. Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) at 240 bar (3500 psi)

Temperature: -40 to 120°C with standard Buna N seals

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No position restrictions; See page 9.020.1

See page 4.990.2 for operator handles/knobs installation;

See page 4.990.1 for lock-down bracket installation.

Cavity: VC10-4; See page 9.110.2

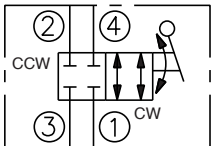
Cavity Tool: CT10-4XX; See page 8.600.1

Seal Kit: SK10-4X-MMM; See page 8.650.1

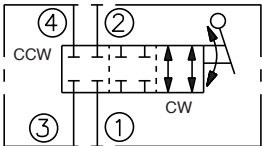
Lock-Down Bracket Kit: Part Number 5399000

SYMBOLS

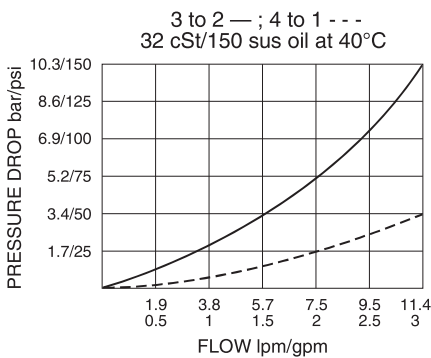
USASI/ISO:



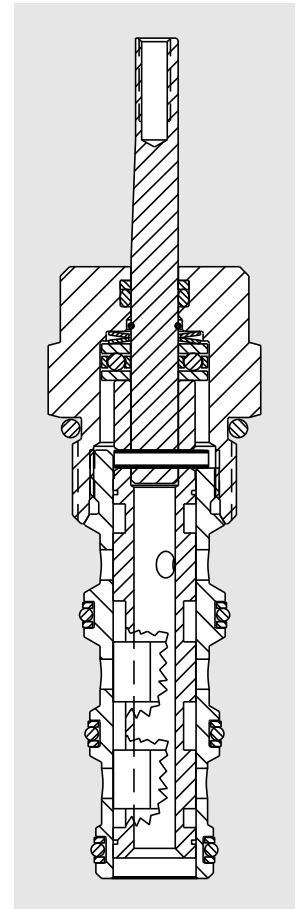
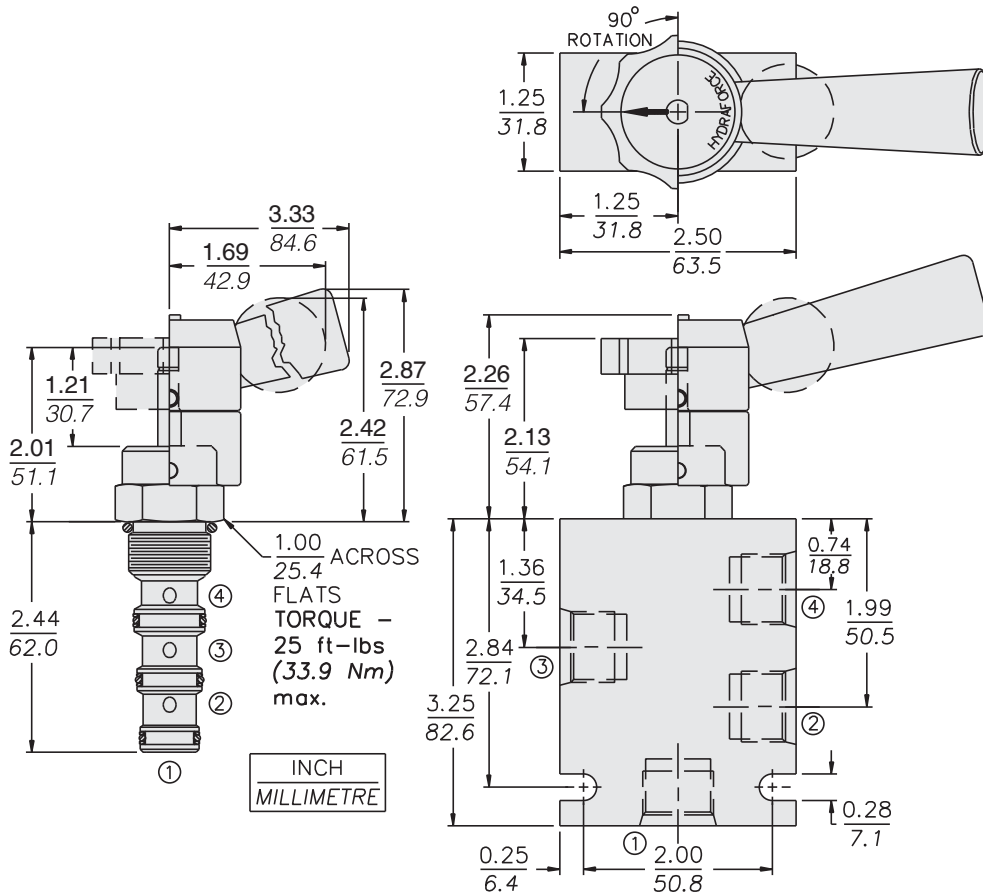
TRANSITION:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.13 kg. (0.29 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and Fluorocarbon back-ups standard.

Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.)
Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

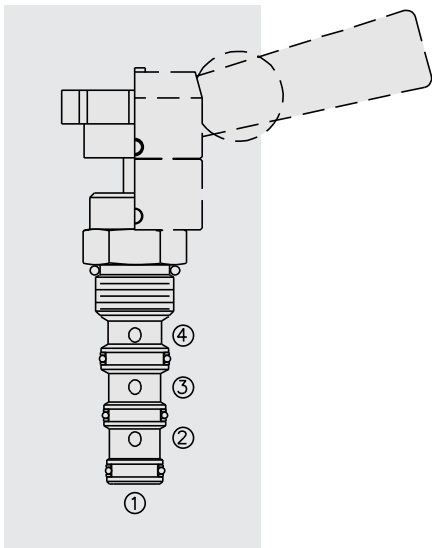
Lever-Type Handle: (Sold Separately)
Weight: 0.18 kg. (0.38 lbs.) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Plastic lever arm.

TO ORDER

MR10-41 - - -		
Option		Seals
None (Blank)		N Buna N (Std.)
		V Fluorocarbon
Porting		
Cartridge Only	0	
SAE 6	6T	
SAE 8	8T	
SAE 8 with Lock-Down Bracket	8TL	
1/4 in. BSP*	2B	
3/8 in. BSP*	3B	

NOTE: To order standard operator kits, refer to pages 4.770.1 and 4.770.2

MR10-43 Manual Rotary 4-Way, 2-Pos. Directional Valve



DESCRIPTION

A manually-operated four-way, two-position directional valve, with adaptability to a variety of adjustment operators (ordered separately).

OPERATION

Two positions, 90° rotation. In extreme counterclockwise position ports 1 and 2 are open while ports 3 and 4 are closed. In extreme clockwise position, ports 1 and 4 are open while ports 2 and 3 are open. In transition, ports 1, 2 and 3 are partially open while port 4 is closed.

FEATURES

- Two-position detent or infinite friction lock may be ordered separately.
- May be fully pressurized at all ports.
- Optional lock-down bracket.
- Heavy-duty construction.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Max. Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) at 240 bar (3500 psi)

Temperature: -40 to 120°C with standard Buna N seals

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No position restrictions; See page 9.020.1
See page 4.990.2 for operator handles/knobs installation;
See page 4.990.1 for lock-down bracket installation.

Cavity: VC10-4; See page 9.110.2

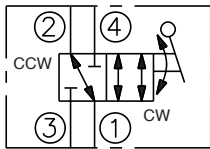
Cavity Tool: CT10-4XX; See page 8.600.1

Seal Kit: SK10-4X-MMM; See page 8.650.1

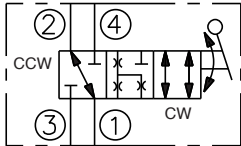
Lock-Down Bracket Kit: Part Number 5399000

SYMBOLS

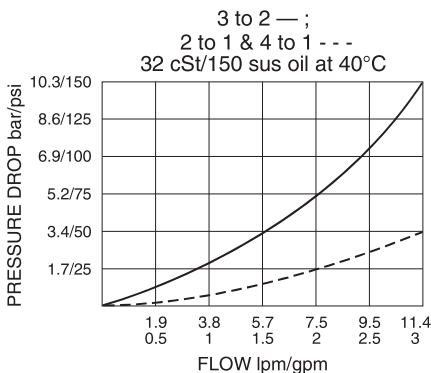
USASI/ISO:



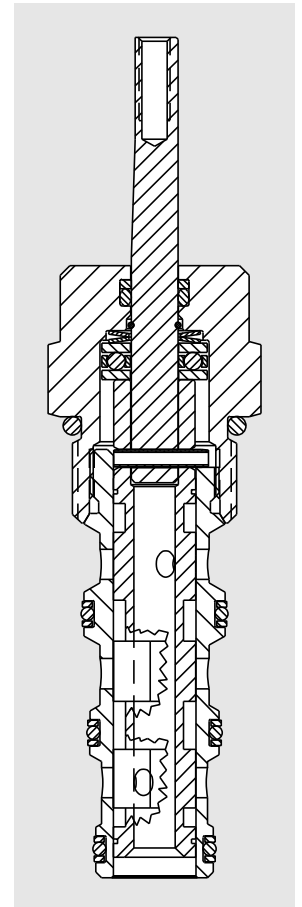
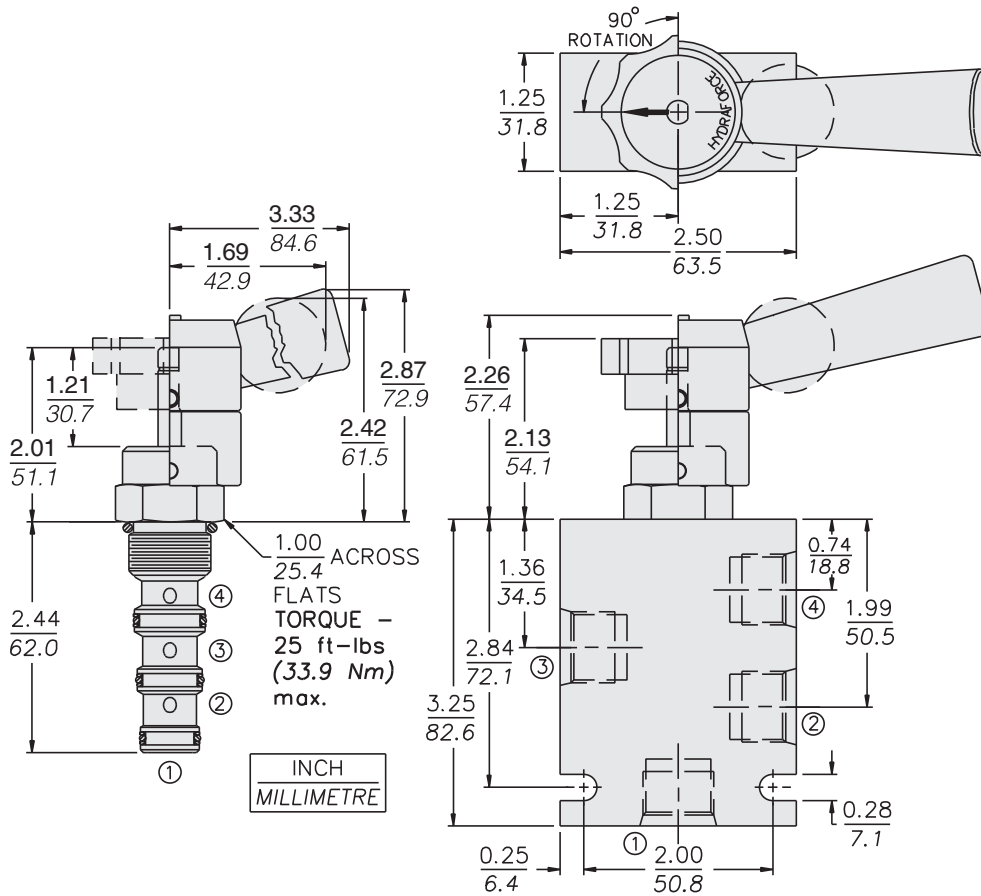
TRANSITION:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.13 kg. (0.29 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and Fluorocarbon back-ups standard.

Standard Ported Body: Weight:
0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

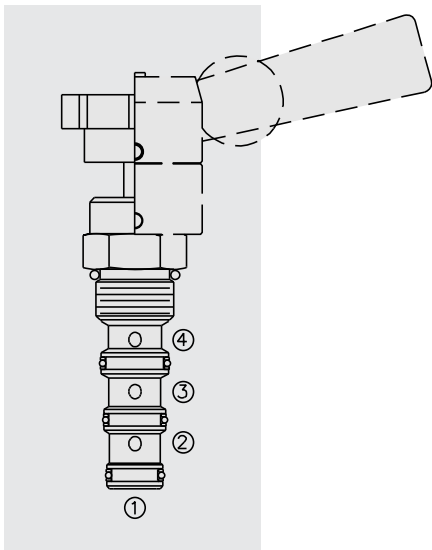
Lever-Type Handle: (Sold Separately)
Weight: 0.18 kg. (0.38 lbs.) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Plastic lever arm.

TO ORDER

MR10-43		-	-	-
Option	None (Blank)			
Porting	Cartridge Only	0		
	SAE 6	6T		
	SAE 8	8T		
	SAE 8 with Lock-Down Bracket	8TL		
	1/4 in. BSP*	2B		
	3/8 in. BSP*	3B		
	*BSP Body; U.K. Mfr. Only			
Seals	N Buna N (Std.)			
	V Fluorocarbon			

NOTE: To order standard operator kits, refer to pages 4.770.1 and 4.770.2

MR10-47A Manual Rotary, 4-Way, 3-Pos. Tandem Center



DESCRIPTION

Manually-operated four-way, three-position directional valve, with adaptability to a variety of adjustment operators (ordered separately), in a variety of spool configurations.

OPERATION

Three positions: centered, 45° counterclockwise, and 45° clockwise. In the center position ports 1 and 3 are open while ports 2 and 4 are closed. In the 45° counterclockwise from center position, ports 1 and 4 are open while ports 2 and 3 are open. In the 45° clockwise from center position, ports 1 and 2 are open while ports 3 and 4 are open. All ports are partially open in transition.

FEATURES

- Three-position detent, friction lock (with detented neutral), or spring return operators may be ordered separately.
- May be fully pressurized at all ports.
- Optional lock-down bracket.
- Heavy-duty construction.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Max. Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) at 240 bar (3500 psi)

Temperature: -40 to 120°C with standard Buna N seals

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No position restrictions; See page 9.020.1
See page 4.990.2 for operator handles/knobs installation;
See page 4.990.1 for lock-down bracket installation.

Cavity: VC10-4; See page 9.110.1

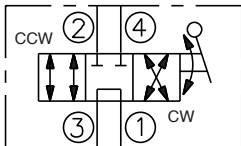
Cavity Tool: CT10-4XX; See page 8.600.1

Seal Kit: SK10-4X-MMM; See page 8.650.1

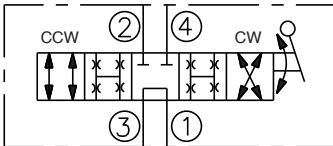
Lock-Down Bracket Kit: Part Number 5399000

SYMBOLS

USASI/ISO:

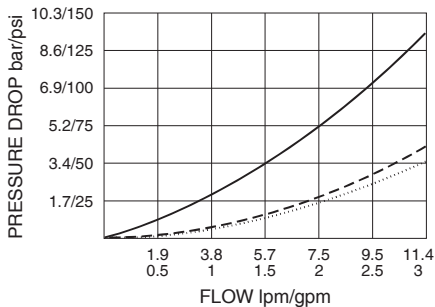


TRANSITION:



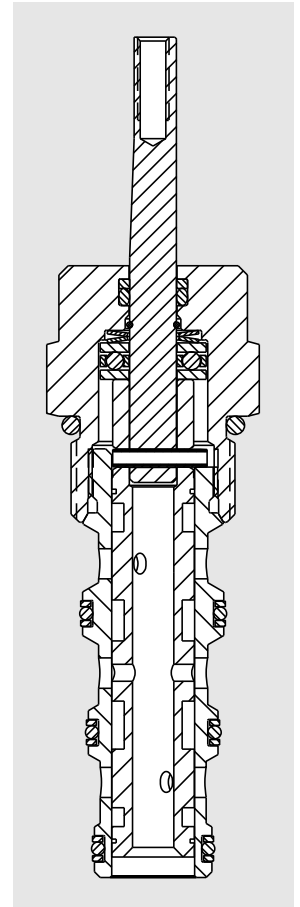
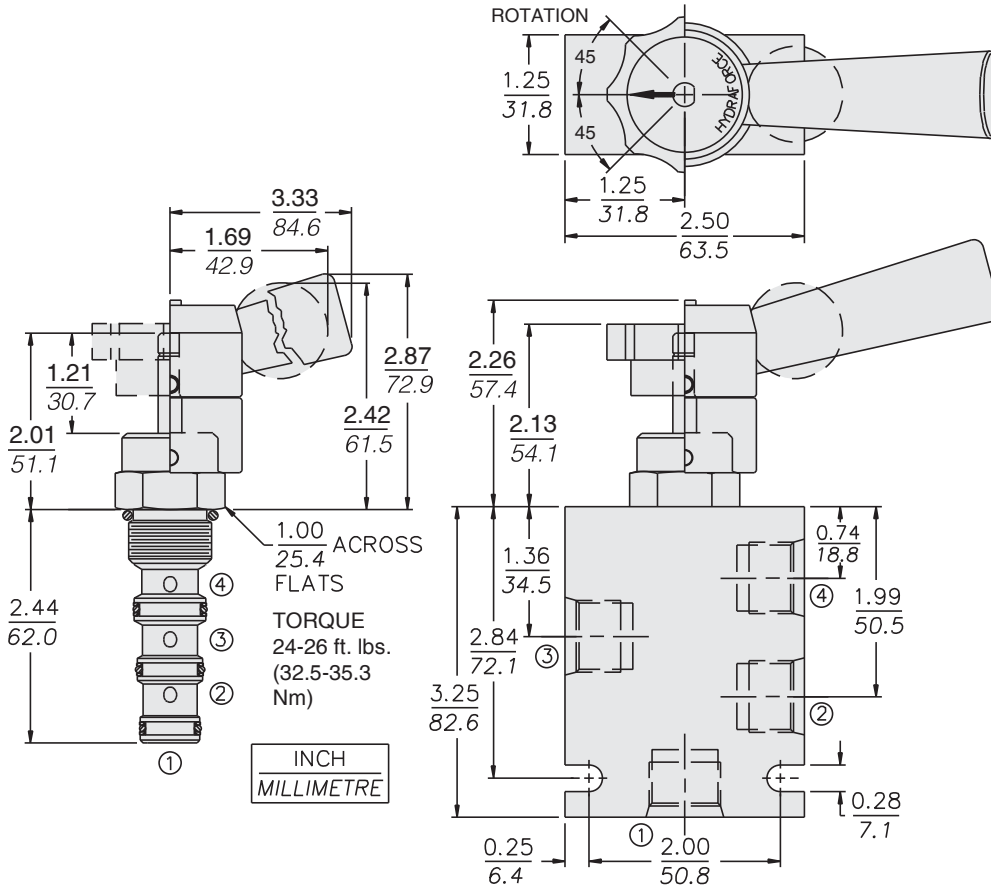
PERFORMANCE (Cartridge Only)

Port 3 to 2 & 3 to 4 — ;
Port 3 to 1 - - - ;
Port 2 to 1 & 4 to 1 •••
32 cSt/150 sus oil at 40°C



MR10-47A

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.17 kg. (0.37 lbs.) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and Fluorocarbon back-ups standard.

Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

Lever-Type Handle: (Sold Separately) Weight: 0.18 kg. (0.38 lbs.) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Plastic lever arm.

TO ORDER

MR10-47A - -

Option

None (Blank)

Porting

Cartridge Only **0**
 SAE 6 **6T**
 SAE 8 **8T**
 SAE 8 with Lock-Down Bracket **8TL**
 1/4 in. BSP* **2B**
 3/8 in. BSP* **3B**

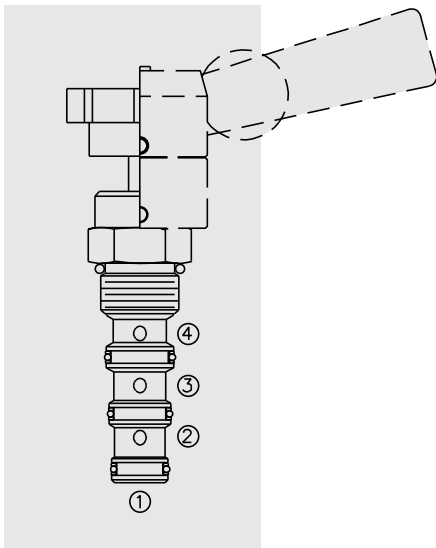
*BSP Body; U.K. Mfr. Only

Seals

N Buna N (Std.)
V Fluorocarbon
P Polyurethane

NOTE: To order standard operator kits, refer to pages 4.770.1 and 4.770.2

MR10-47B Manual Rotary, 4-Way, 3-Pos., Open Center



DESCRIPTION

Manually-operated four-way, three-position directional valve, with adaptability to a variety of adjustment operators (ordered separately), in a variety of spool configurations.

OPERATION

Three positions: centered, 45° counterclockwise, and 45° clockwise. In the center position all ports are open. In the 45° counterclockwise from center position, ports 1 and 4 are open while ports 2 and 3 are open. In the 45° clockwise from center position, ports 1 and 2 are open while ports 3 and 4 are open. All ports are partially open in transition.

FEATURES

- Three-position detent, friction lock (with detented neutral), or spring return operators may be ordered separately.
- May be fully pressurized at all ports.
- Optional lock-down bracket.
- Heavy-duty construction.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Max. Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) at 240 bar (3500 psi)

Temperature: -40 to 120°C with standard Buna N seals

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No position restrictions; See page 9.020.1
See page 4.990.2 for operator handles/knobs installation;
See page 4.990.1 for lock-down bracket installation.

Cavity: VC10-4; See page 9.110.1

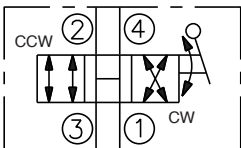
Cavity Tool: CT10-4XX; See page 8.600.1

Seal Kit: SK10-4X-MMM; See page 8.650.1

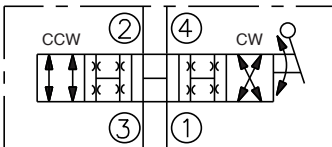
Lock-Down Bracket Kit: Part Number 5399000

SYMBOLS

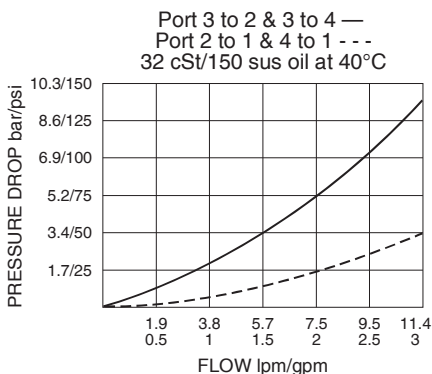
USASI/ISO:



TRANSITION:

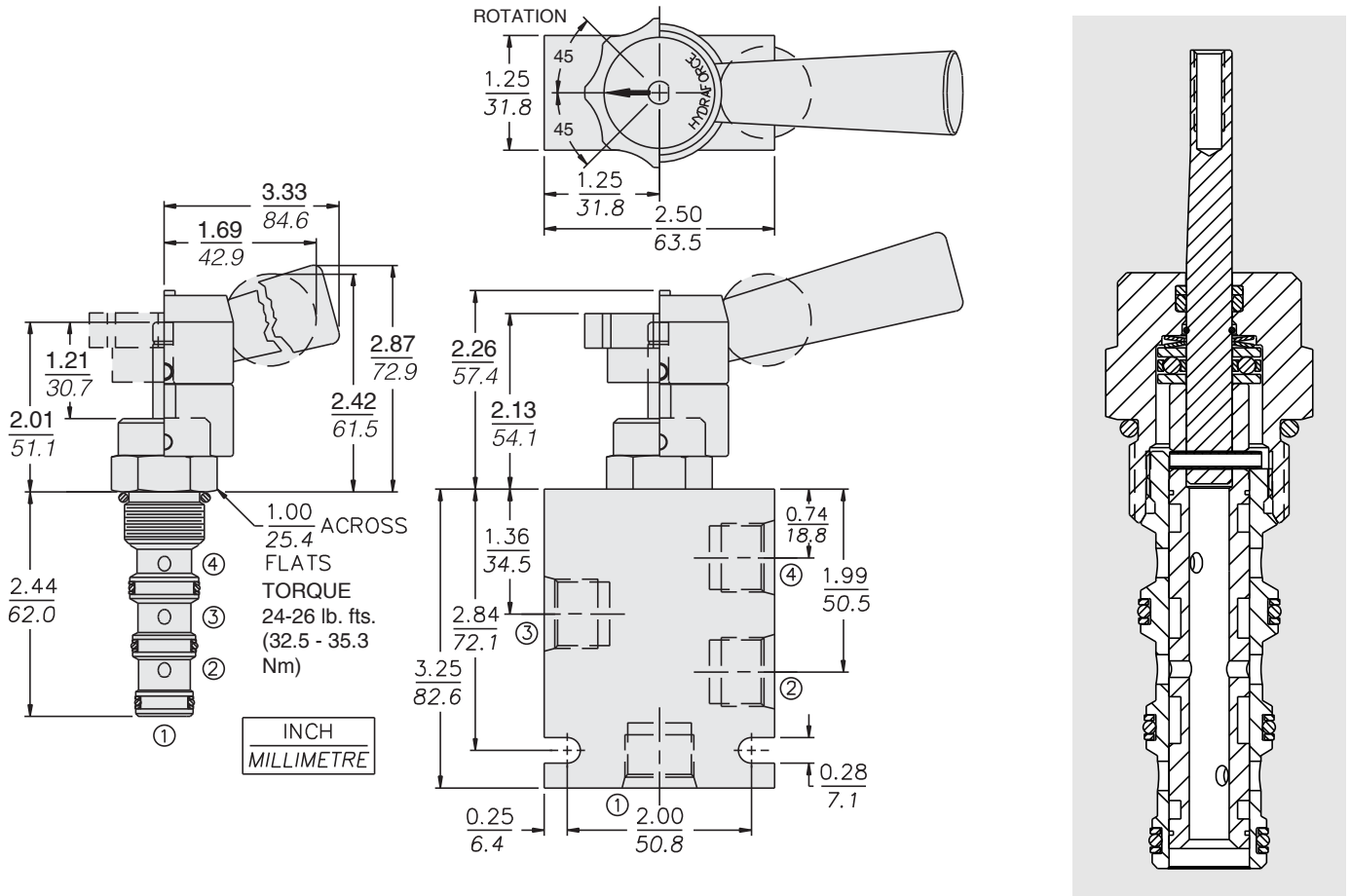


PERFORMANCE (Cartridge Only)



MR10-47B

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.17 kg. (0.37 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and Fluorocarbon back-ups standard.

Standard Ported Body: Weight:
0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

Lever-Type Handle: (Sold Separately)
Weight: 0.18 kg. (0.38 lbs.) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Plastic lever arm.

TO ORDER

MR10-47B

Option

None (Blank)

Porting

Cartridge Only **0**
SAE 6 **6T**
SAE 8 **8T**
SAE 8 with
Lock-Down Bracket **8TL**
1/4 in. BSP* **2B**
3/8 in. BSP* **3B**

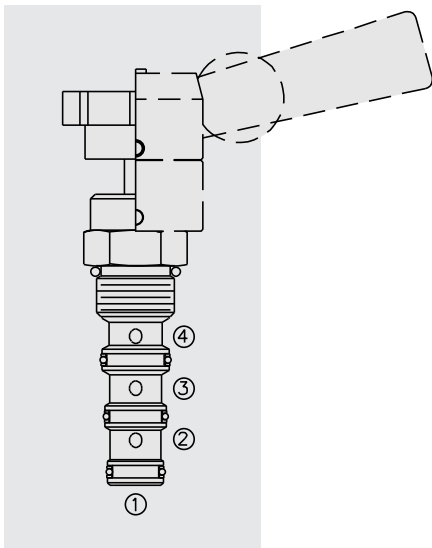
*BSP Body;
U.K. Mfr. Only

Seals

N Buna N (Std.)
V Fluorocarbon
P Polyurethane

NOTE: To order standard operator kits, refer to pages 4.770.1 and 4.770.2

MR10-47C Manual Rotary, 4-Way, 3-Pos., Closed Center



DESCRIPTION

Manually-operated four-way, three-position directional valve, with adaptability to a variety of adjustment operators (ordered separately), in a variety of spool configurations.

OPERATION

Three positions: centered, 45° counterclockwise, and 45° clockwise. In the center position all ports are closed. In the 45° counterclockwise from center position, ports 1 and 4 are open while ports 2 and 3 are open. In the 45° clockwise from center position, ports 1 and 2 are open while ports 3 and 4 are open. All ports are closed in transition.

FEATURES

- Three-position detent, friction lock (with detented neutral), or spring return operators may be ordered separately.
- May be fully pressurized at all ports.
- Optional lock-down bracket.
- Heavy-duty construction.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Max. Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) at 240 bar (3500 psi)

Temperature: -40 to 120°C with standard Buna N seals

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No position restrictions; See page 9.020.1
See page 4.990.2 for operator handles/knobs installation;
See page 4.990.1 for lock-down bracket installation.

Cavity: VC10-4; See page 9.110.1

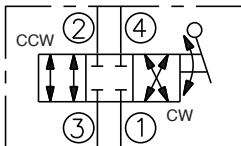
Cavity Tool: CT10-4XX; See page 8.600.1

Seal Kit: SK10-4X-MMM; See page 8.650.1

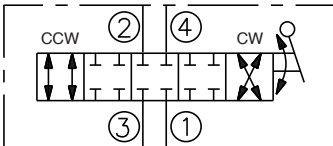
Lock-Down Bracket Kit: Part Number 5399000

SYMBOLS

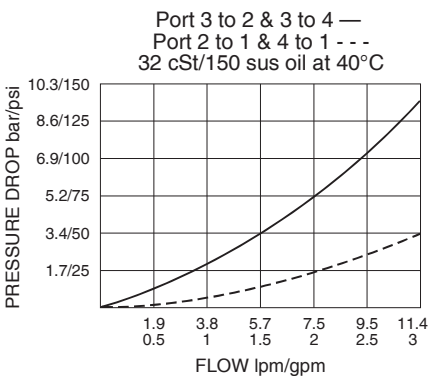
USASI/ISO:



TRANSITION:

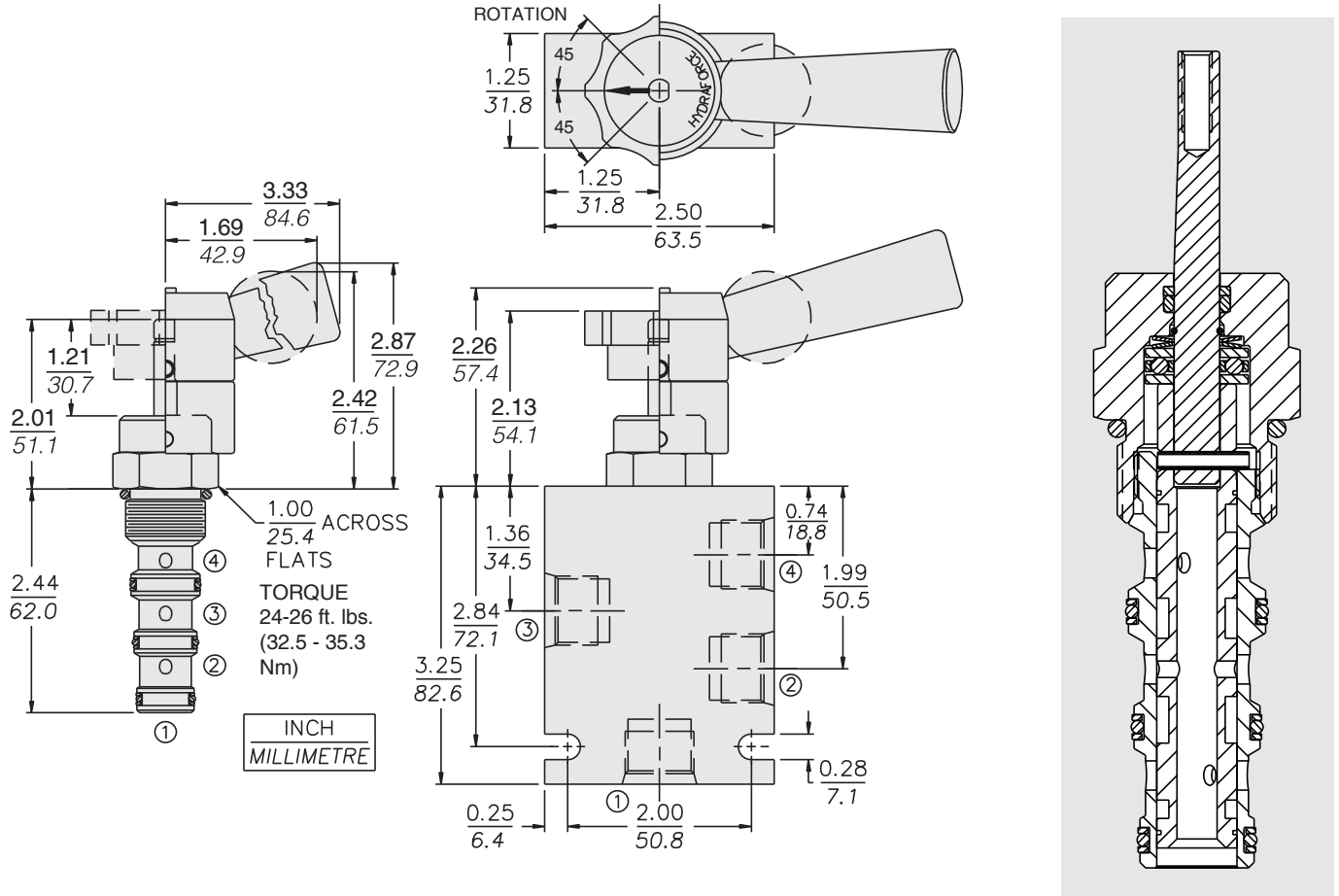


PERFORMANCE (Cartridge Only)



MR10-47C

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.17 kg. (0.37 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and Fluorocarbon back-ups standard.

Standard Ported Body: Weight:
0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

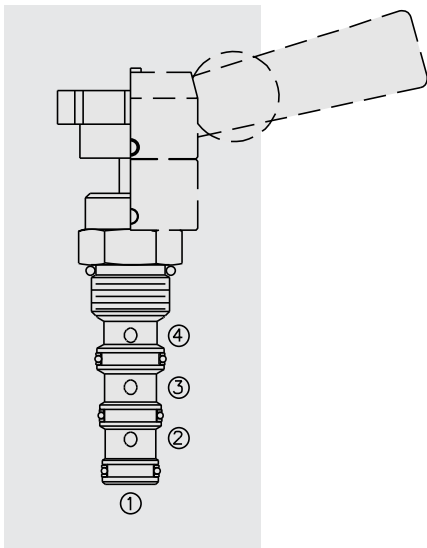
Lever-Type Handle: (Sold Separately)
Weight: 0.18 kg. (0.38 lbs.) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Plastic lever arm.

TO ORDER

MR10-47C - - -		
Option		Seals
None (Blank)		N Buna N (Std.)
		V Fluorocarbon
		P Polyurethane
Porting		
Cartridge Only	0	
SAE 6	6T	
SAE 8	8T	
SAE 8 with Lock-Down Bracket	8TL	
1/4 in. BSP*	2B	
3/8 in. BSP*	3B	
*BSP Body; U.K. Mfr. Only		

NOTE: To order standard operator kits, refer to pages 4.770.1 and 4.770.2

MR10-47D Manual Rotary, 4-Way, 3-Pos., Motor Spool



DESCRIPTION

Manually-operated four-way, three-position directional valve, with adaptability to a variety of adjustment operators (ordered separately), in a variety of spool configurations.

OPERATION

Three positions: centered, 45° counterclockwise, and 45° clockwise. In the center position ports 1, 2 and 4 are open while port 3 is closed. In the 45° counterclockwise from center position, ports 1 and 4 are open while ports 2 and 3 are open. In the 45° clockwise from center position, ports 1 and 2 are open while ports 3 and 4 are open. All ports are partially open in transition.

FEATURES

- Three-position detent, friction lock (with detented neutral), or spring return operators may be ordered separately.
- May be fully pressurized at all ports.
- Optional lock-down bracket.
- Heavy-duty construction.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Max. Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) at 240 bar (3500 psi)

Temperature: -40 to 120°C with standard Buna N seals

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No position restrictions; See page 9.020.1
See page 4.990.2 for operator handles/knobs installation;
See page 4.990.1 for lock-down bracket installation.

Cavity: VC10-4; See page 9.110.1

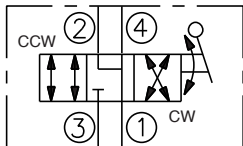
Cavity Tool: CT10-4XX; See page 8.600.1

Seal Kit: SK10-4X-MMM; See page 8.650.1

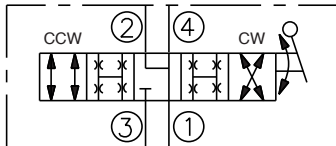
Lock-Down Bracket Kit: Part Number 5399000

SYMBOLS

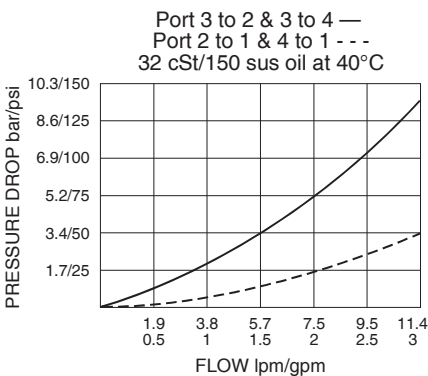
USASI/ISO:



TRANSITION:

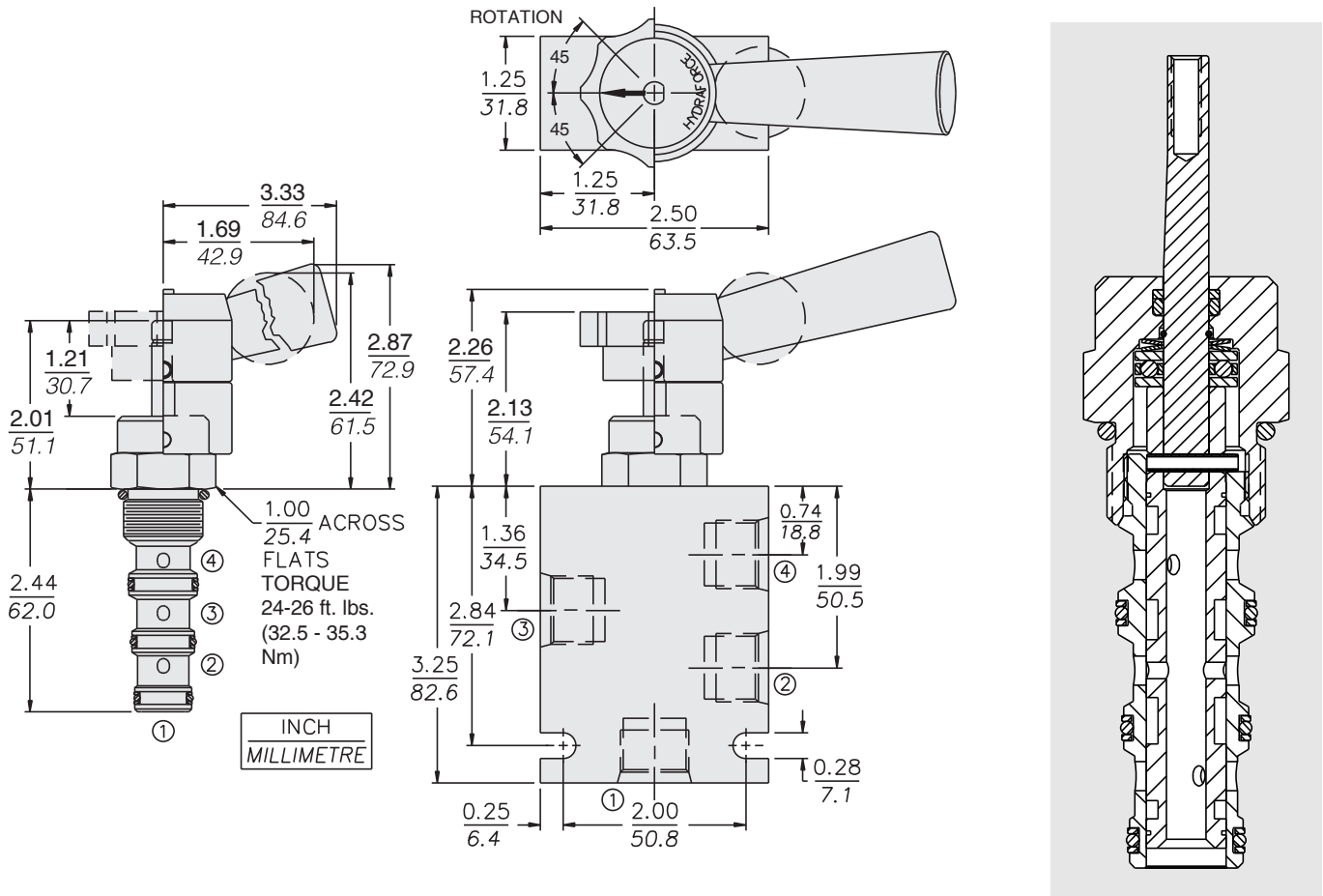


PERFORMANCE (Cartridge Only)



MR10-47D

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.17 kg. (0.37 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and Fluorocarbon back-ups standard.

Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile bodies available; dimensions may differ. See page 8.010.1

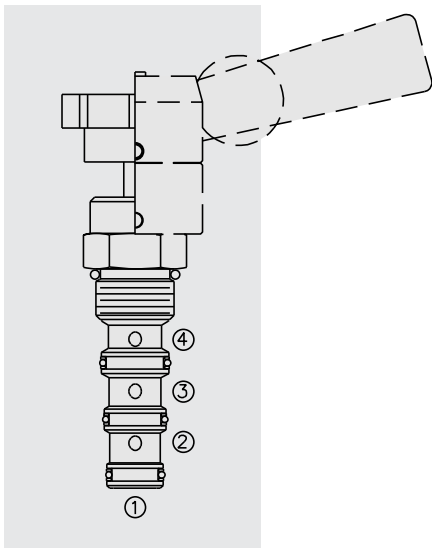
Lever-Type Handle: (Sold Separately)
Weight: 0.18 kg. (0.38 lbs.) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Plastic lever arm.

TO ORDER

MR10-47D		-	-	-
Option				
None (Blank)				
Porting				
Cartridge Only	0			
SAE 6	6T			
SAE 8	8T			
SAE 8 with Lock-Down Bracket	8TL			
1/4 in. BSP*	2B			
3/8 in. BSP*	3B			
*BSP Body; U.K. Mfr. Only				
Seals				
N Buna N (Std.)				
V Fluorocarbon				
P Polyurethane				

NOTE: To order standard operator kits, refer to pages 4.770.1 and 4.770.2

MR10-47F Manual Rotary, 4-Way, 3-Position



DESCRIPTION

Manually-operated four-way, three-position directional valve, with adaptability to a variety of adjustment operators (ordered separately), in a variety of spool configurations.

OPERATION

Three positions: centered, 45° counterclockwise, and 45° clockwise. In the center position ports 1 and 3 are open while ports 2 and 4 are closed. In the 45° counterclockwise from center position, ports 3 and 4 are open while ports 1 and 2 are open. In the 45° clockwise from center position, ports 2 and 3 are open while ports 1 and 4 are closed. All ports are partially open in transition, except for clockwise from center rotation when port 4 remains closed in transition.

FEATURES

- Three-position detent, friction lock (with detented neutral), or spring return operators may be ordered separately.
- May be fully pressurized at all ports.
- Optional lock-down bracket.
- Heavy-duty construction.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Max. Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) at 240 bar (3500 psi)

Temperature: -40 to 120°C with standard Buna N seals

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No position restrictions; See page 9.020.1

See page 4.990.2 for operator handles/knobs installation;

See page 4.990.1 for lock-down bracket installation.

Cavity: VC10-4; See page 9.110.1

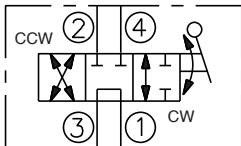
Cavity Tool: CT10-4XX; See page 8.600.1

Seal Kit: SK10-4X-MMM; See page 8.650.1

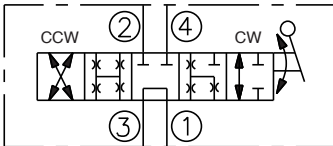
Lock-Down Bracket Kit: Part Number 5399000

SYMBOLS

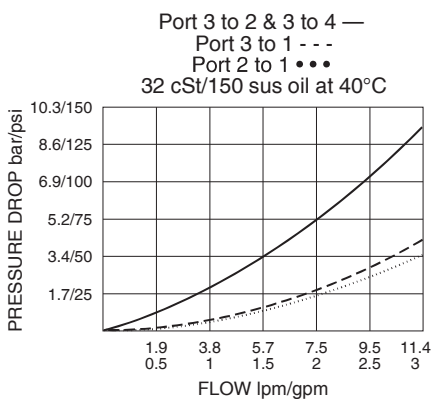
USASI/ISO:



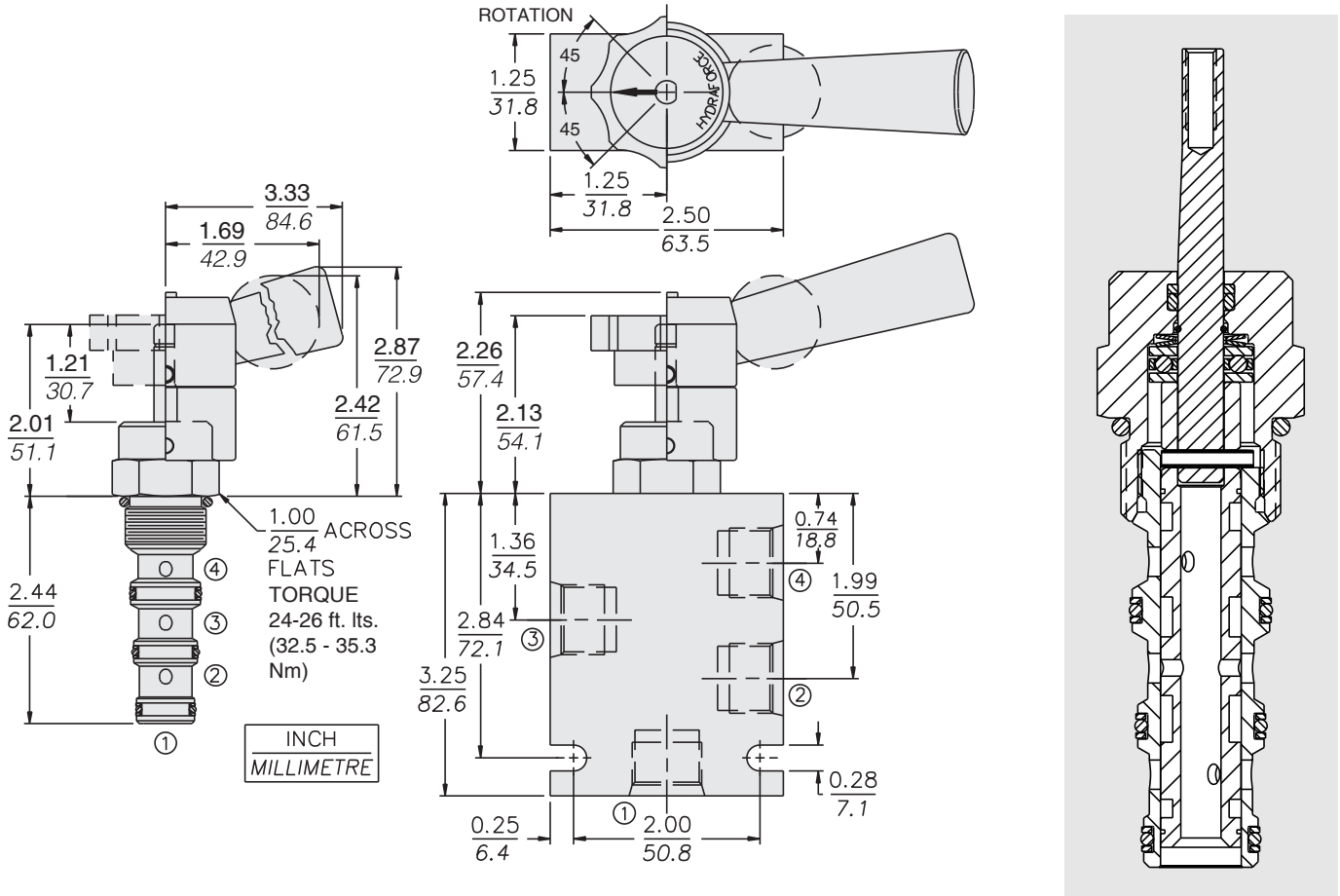
TRANSITION:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.17 kg. (0.37 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and Fluorocarbon back-ups standard.

Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

Lever-Type Handle: (Sold Separately)
Weight: 0.18 kg. (0.38 lbs.) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Plastic lever arm.

TO ORDER

MR10-47F - -

Option

None (Blank)

Porting

- Cartridge Only **0**
- SAE 6 **6T**
- SAE 8 **8T**
- SAE 8 with Lock-Down Bracket **8TL**
- 1/4 in. BSP* **2B**
- 3/8 in. BSP* **3B**

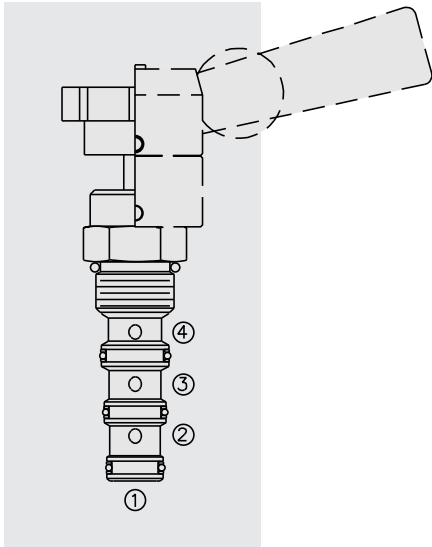
*BSP Body; U.K. Mfr. Only

Seals

- N** Buna N (Std.)
- V** Fluorocarbon
- P** Polyurethane

NOTE: To order standard operator kits, refer to pages 4.770.1 and 4.770.2

MR10-47G Manual Rotary, 4-Way, 3-Position



DESCRIPTION

Manually-operated four-way, three-position directional valve, with adaptability to a variety of adjustment operators (ordered separately), in a variety of spool configurations.

OPERATION

Three positions: centered, 45° counterclockwise, and 45° clockwise. In the center position ports 1, 3 and 4 are open while port 2 is closed. In the 45° counterclockwise from center position, ports 1 and 4 are open while ports 2 and 3 are open. In the 45° clockwise from center position, ports 1 and 2 are open while ports 3 and 4 are open. All ports are partially open in transition.

FEATURES

- Three-position detent, friction lock (with detented neutral), or spring return operators may be ordered separately.
- May be fully pressurized at all ports.
- Optional lock-down bracket.
- Heavy-duty construction.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Max. Flow: See Performance Chart

Internal Leakage: 164 cc/minute (10 cu. in./minute) at 240 bar (3500 psi)

Temperature: -40 to 120°C with standard Buna N seals

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No position restrictions; See page 9.020.1
See page 4.990.2 for operator handles/knobs installation;
See page 4.990.1 for lock-down bracket installation.

Cavity: VC10-4; See page 9.110.1

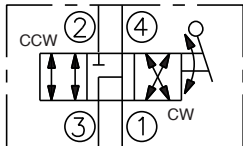
Cavity Tool: CT10-4XX; See page 8.600.1

Seal Kit: SK10-4X-MMM; See page 8.650.1

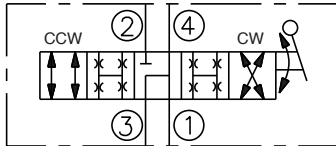
Lock-Down Bracket Kit: Part Number 5399000

SYMBOLS

USASI/ISO:

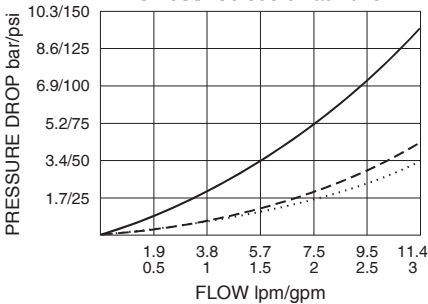


TRANSITION:



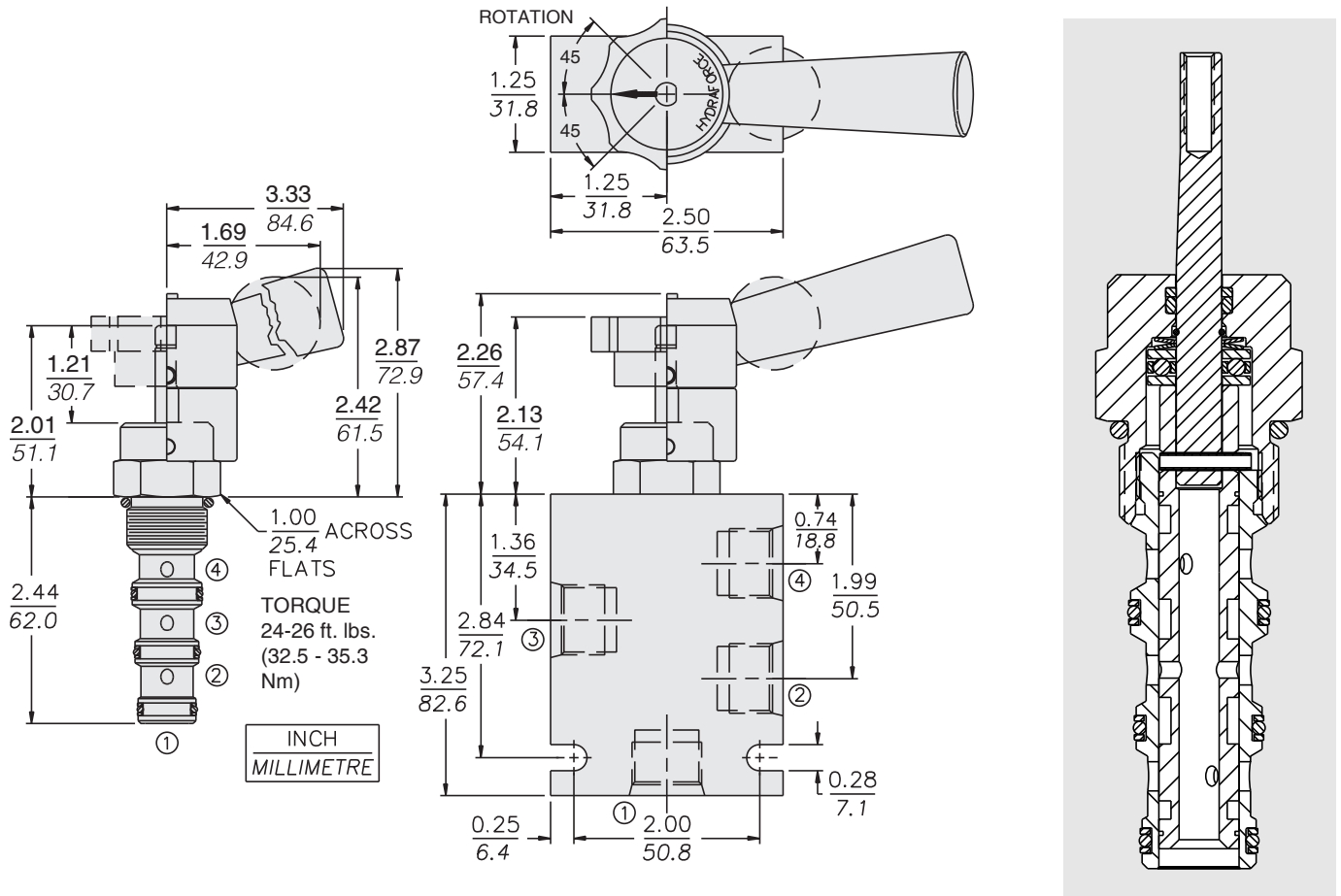
PERFORMANCE (Cartridge Only)

Port 3 to 2 & 3 to 4 —
Port 3 to 1 - - -
Port 2 to 1 & 4 to 1 •••
32 cSt/150 sus oil at 40°C



MR10-47G

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.17 kg. (0.37 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and Fluorocarbon back-ups standard.

Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

Lever-Type Handle: (Sold Separately)
Weight: 0.18 kg. (0.38 lbs.) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Plastic lever arm.

TO ORDER

MR10-47G - -

Option

None (Blank)

Porting

Cartridge Only **0**
SAE 6 **6T**
SAE 8 **8T**
SAE 8 with Lock-Down Bracket **8TL**
1/4 in. BSP* **2B**
3/8 in. BSP* **3B**

*BSP Body;
U.K. Mfr. Only

Seals

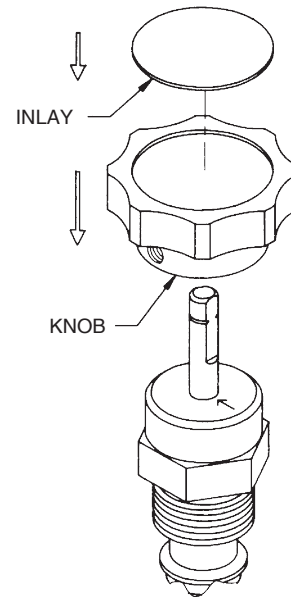
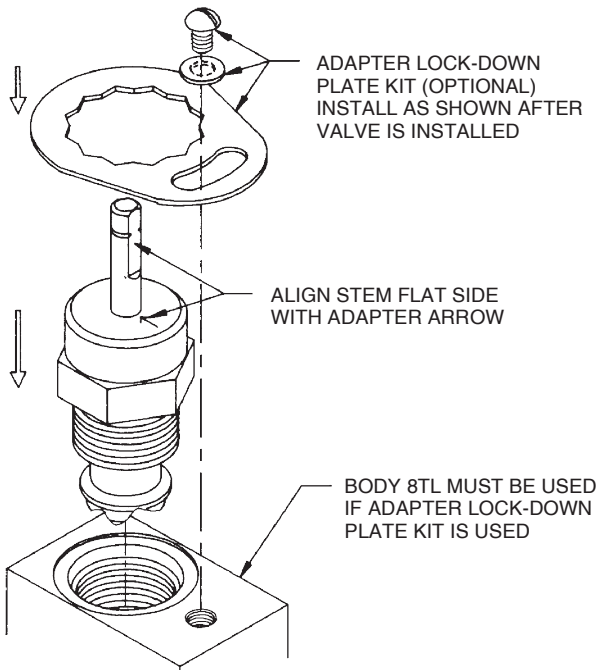
N Buna N (Std.)
V Fluorocarbon
P Polyurethane

NOTE: To order standard operator kits, refer to pages 4.770.1 and 4.770.2

Plastic Knob Installation Instructions

Standard plastic knob kits feature very low effort adjustments and infinite positioning.

- 1 Install the cartridge and optional lock-down plate as indicated. See cartridge torque specifications in the Technical Data section, page 9.020.1.
- 2 Rotate the knob to the Start position by turning the shaft to alignment with the stamped screw.
- 3 Install the knob on the stem and align the Allen head set screw with the flat surface on the stem and tighten the set screw.
- 4 Peel the adhesive from the inlay and install it as desired. (Note that the inlay will be very difficult to re-position, so be careful.)

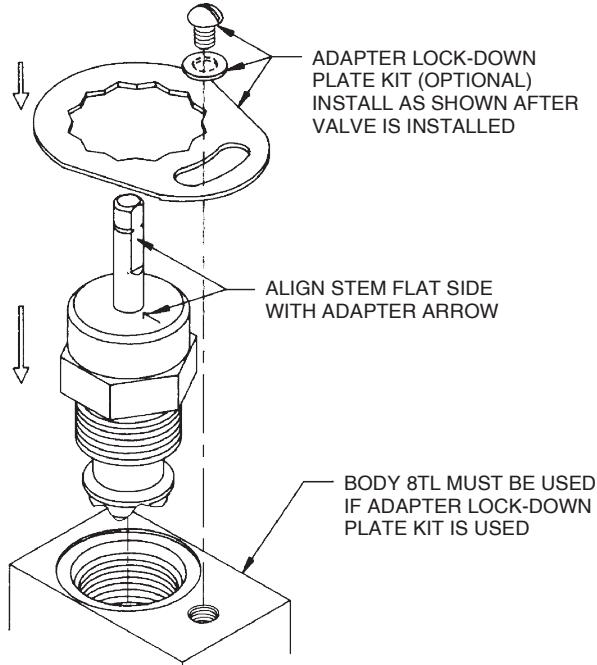


LOCK-DOWN PLATE KIT	KNOB KIT PARTS
Optional, Order Separately: 5399000	5341010 - Includes Knob & Inlay "A" 5341020 - Includes Knob & Inlay "B" 5341030 - Includes Knob & Inlay "C"
<p>1/4-20 SCREW AND WASHER</p>	<p>INLAY: 6109620</p> <p>6109621</p> <p>6109622</p> <p>KNOB: 6113220</p>

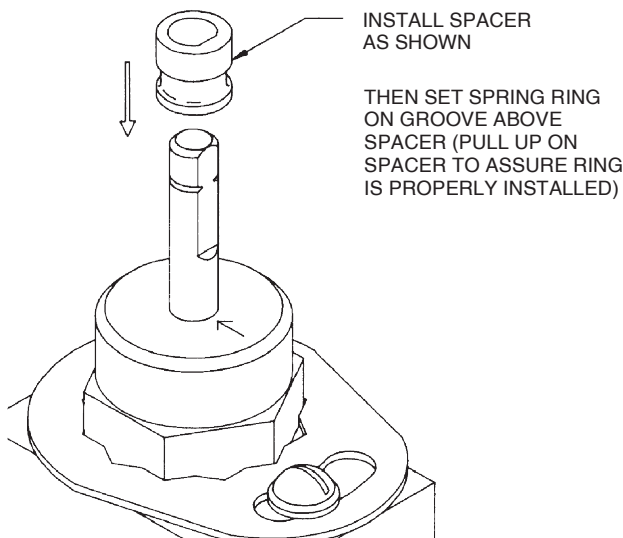
Ball & Lever Handle Installation Instructions

Preliminary Cartridge Installation:

- 1 Install the cartridge and optional lock-down plate as indicated. See cartridge torque specifications in the Technical Data section, page 9.020.1.

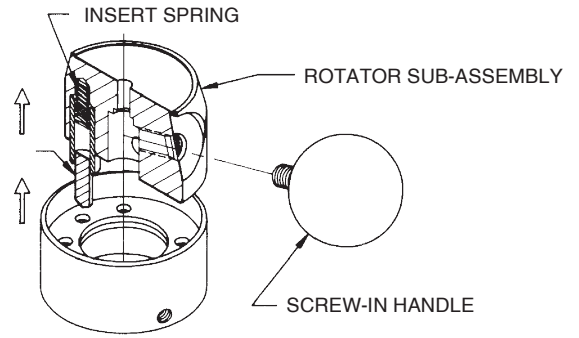


- 2 Install the spacer as shown. Note that an extra spring ring is provided should one get damaged or lost.



Handle Sub-Assembly:

- 3 Install the ball or lever, the spring, and the position pin into the top rotator. Note that the rotator inlay is fastened, but may be repositioned later.

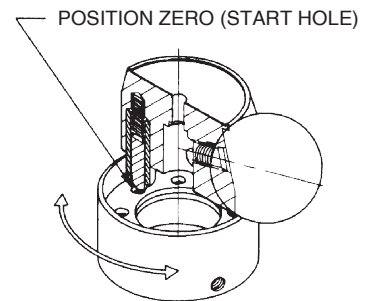


FIRST INSTALL SPRING, THEN PIN AS SHOWN

- 4 Turn the rotator to position the pin in the correct start hole position. Refer to the **Start Hole Position illustrations** on the following page for proper position.

HydraForce has pre-assembled the position ring in the adapter plate per the kit ordered. Use the drive stud to find the appropriate start position.

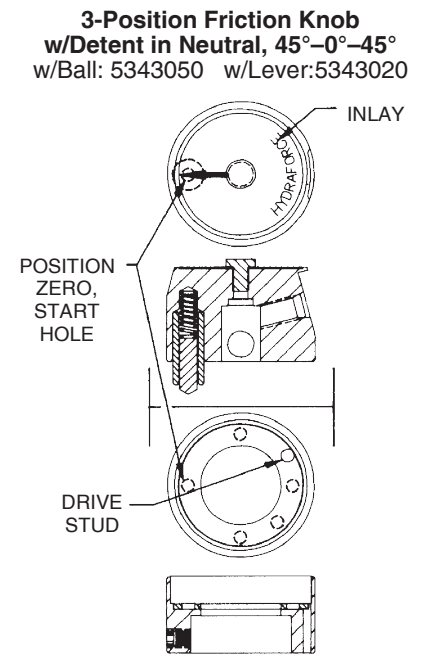
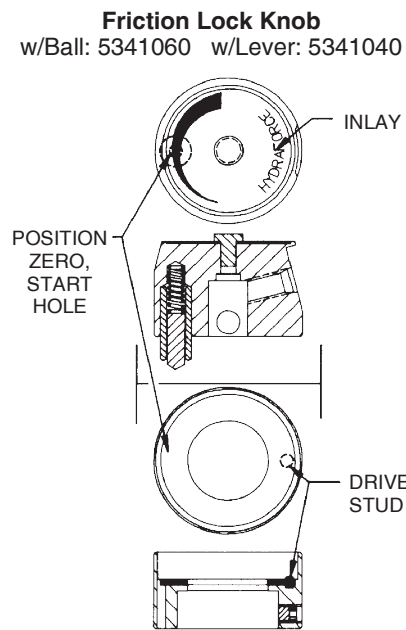
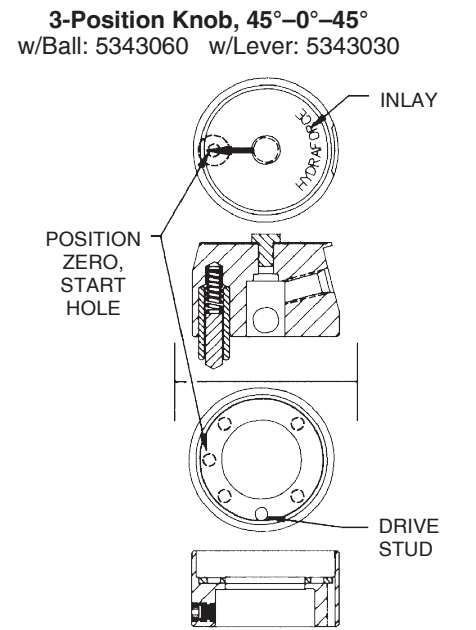
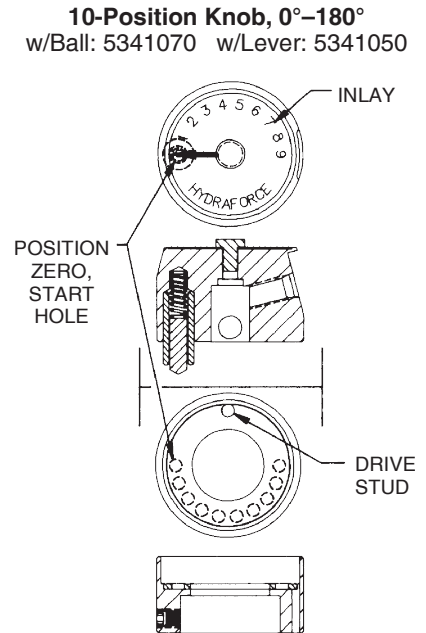
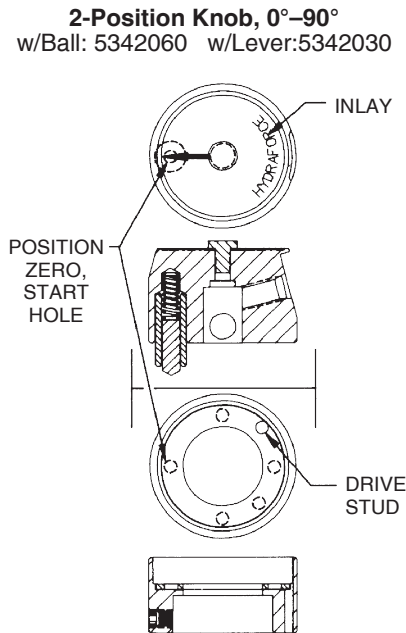
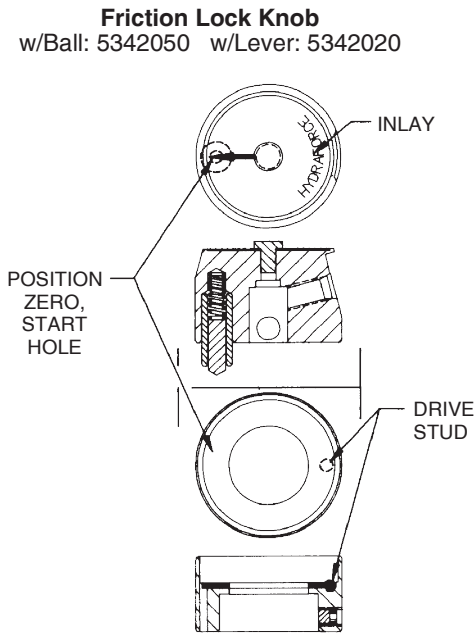
Hold this sub-assembly together manually or with tape until ready to proceed.



Ball & Lever Handle Installation Instructions (cont'd)

Start Hole Position Illustrations (refer to step 4 on previous page)

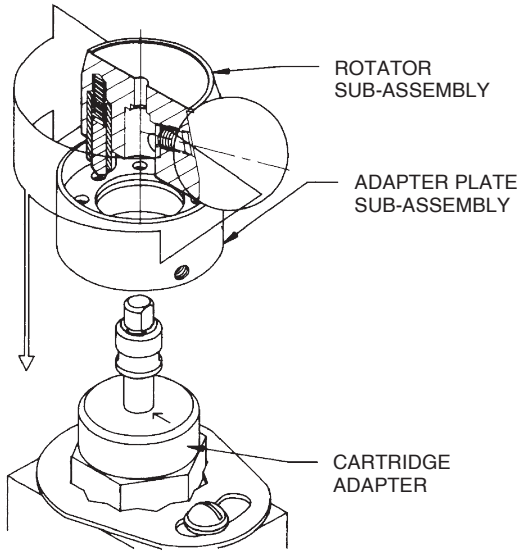
- Identify your handle kit part number from these illustrations.
- Align position zero on the inlay and adapter plate subassembly as illustrated.
- All set screws are tightened to 0.03–0.04 Nm (3–4 ft.-lbs.).



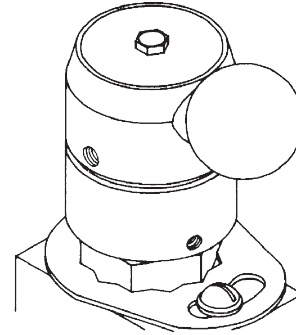
Ball & Lever Handle Installation Instructions (cont'd)

Handle Sub-Assembly to Cartridge Valve:

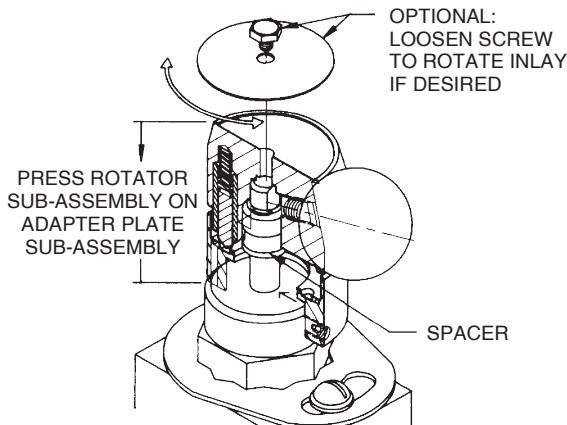
5 Turn handle sub-assembly to the desired position on the cartridge shaft. Push the adapter plate to a flush position with the cartridge adapter and tighten the three set screws to 0.03–0.04 Nm (3–4 ft.-lbs.) in the adapter plate sub-assembly to the cartridge adapter.



7 After all the set screws are tightened, the knob should move slightly upward. This allows the assembly to rotate from one position to the next.



6 Push the rotator subassembly to a flush position with the cartridge shaft spacer. Tighten the two set screws on the rotator into the spacer at 0.03–0.04 Nm (3–4 ft.-lbs.). If necessary, loosen the inlay screw to reposition.



HANDLE KIT PARTS

- SELF-THREADING SCREW: 6111021
- INLAY (ONE INCLUDED): 619610, 6119611, OR 6119612
- ROTATOR SUB-ASSEMBLY: 6503510
- SPRING: 7001570
- DETTENT PIN: 7010246
- SPACER: 7010281
- ADAPTER PLATE SUB-ASSEMBLY (ONLY ONE INCLUDED)
FRICTION LOCK: 6503560
10-POSITION: 6503500
ALL OTHERS: 6503540
- 1/4-20 SCREW AND WASHER

KNOB OPTIONS (ONE INCLUDED)
BALL: 6113210
LEVER: 6113200

LOCK-DOWN PLATE KIT
Optional, Order Separately:
5399000

Spring Centered Knob Installation

Spring Centered Knob Kit Piece Part List

Description (part no.) qty.

- Handle (see Figure 1) qty: 1
- Knob Screw (6111021) qty: 1
- Inlay (6109610) qty: 1
- Knob Subassembly (6503420) qty: 1
 - Subassembly includes:
 - Set Screws (6111011) qty: 2
 - Spacer (7010281) qty: 1
 - Plunger Subassembly (6503410) qty: 1
 - Retainer (7011881) qty: 1
 - Spring (7010416) qty: 1
 - Spring (7010426) qty: 1
 - Knob (7011271) qty: 1

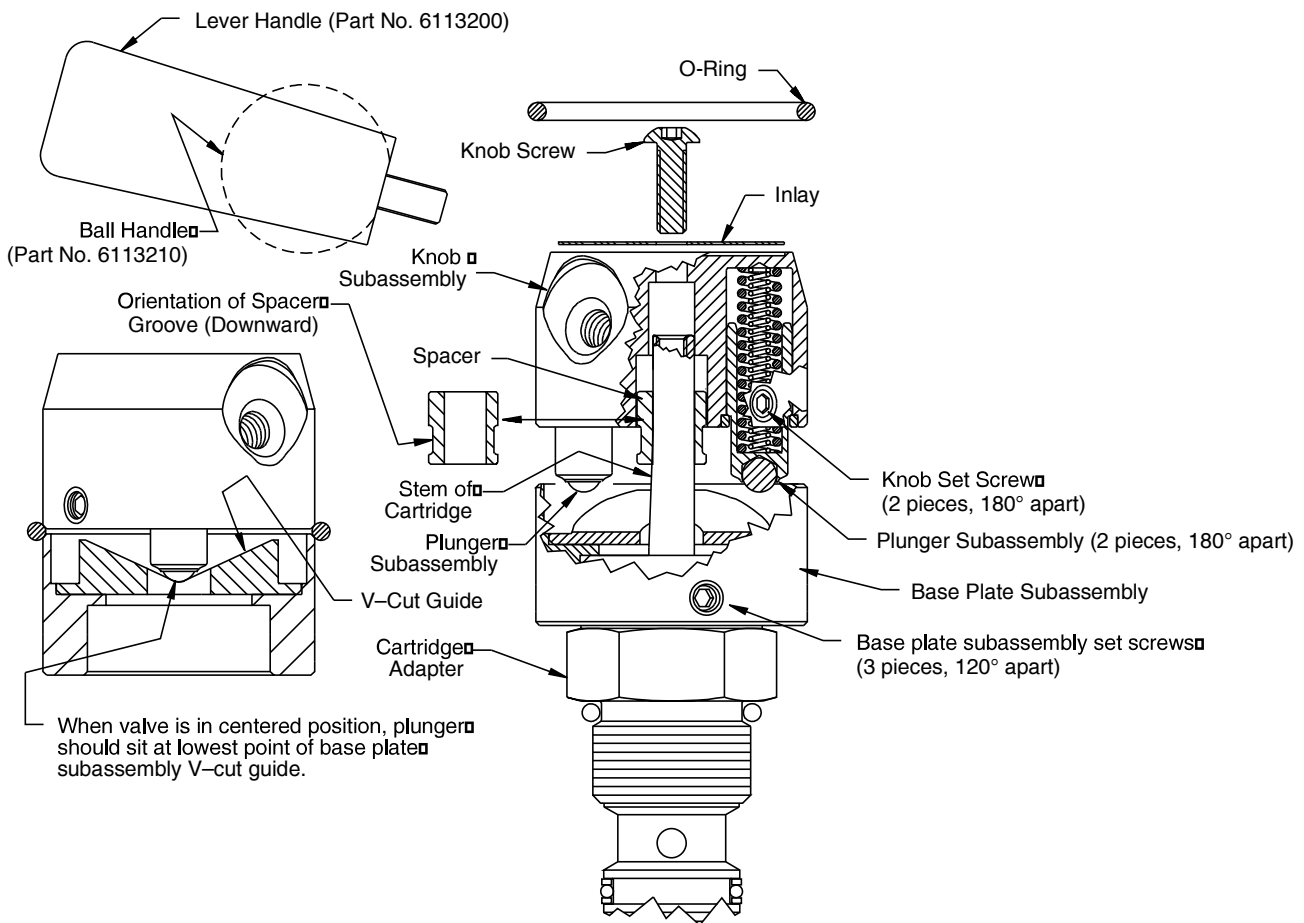
Description (part no.) qty.

- Base Plate Subassembly (6503620) qty: 1
 - Subassembly includes:
 - Set Screws (6111012) qty: 3
 - V-Cut Guide (7010376) qty: 1
 - Stud (6107500) qty: 1
 - Base Plate (7010271) qty: 1
- O-Ring (6023001) qty: 1
- 3/32 Hex Key Wrench, not shown (6107490) qty: 1

Tools Required

- 3/32 Hex Key Wrench (included in kit)
- 1" Hex Torque Wrench
- 1/4" Flat Head Screwdriver (for adapter lock-down kit only)

Figure 1: Exploded Assembly



Spring Centered Knob Installation (cont'd)

Figure 2: Centering the Valve

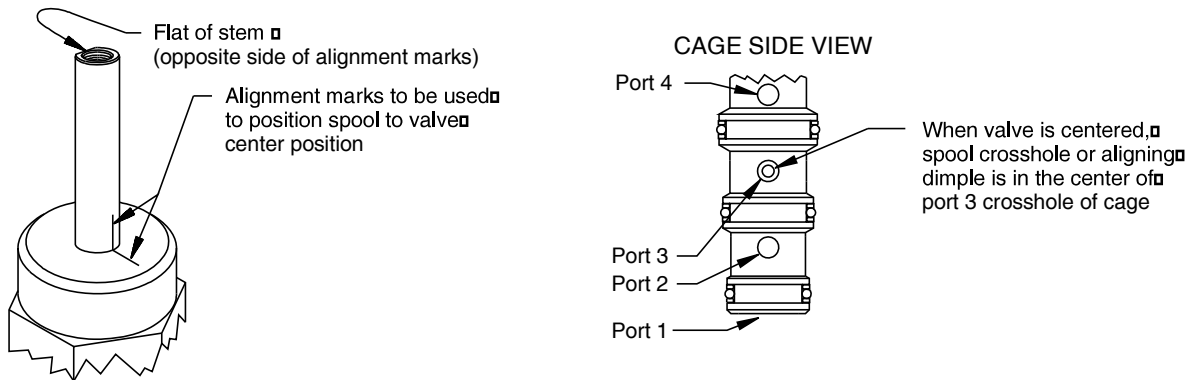
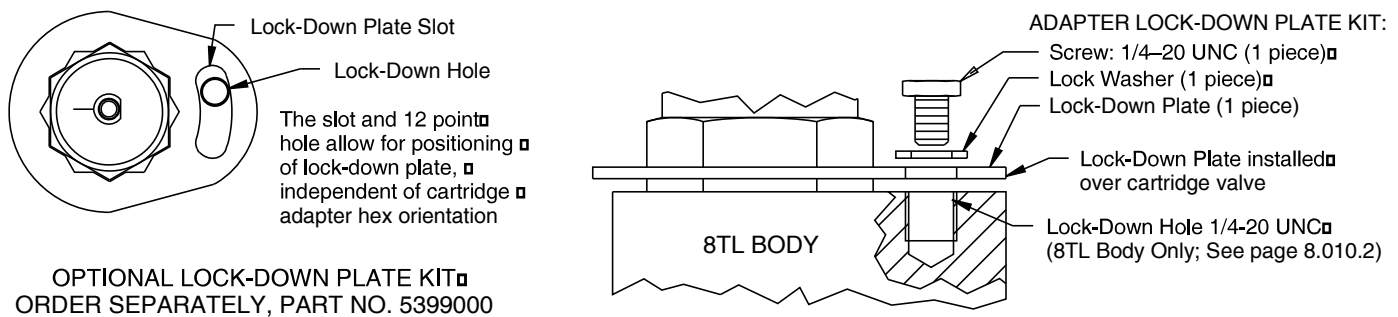


Figure 3: Lock-Down Plate Kit (Optional) for use with 8TL Body Only



Spring Centered Knob Installation Instructions

Please read these instructions and review Figures 1, 2 & 3 before assembling

- 1) With cartridge valve in hand, line up the alignment marks of the stem and adapter as shown in Figure 3. (This will locate valve center position which is critical to valve operation.)
- 2) Install cartridge valve.
- 3) Verify that alignment marks are aligned after installing valve.
- 4) If lock-down plate kit is being used, see Figure 3.
 - A) Body or manifold must have 1/4–20 UNC threaded hole.
 - B) Place lock-down plate over cartridge hex and position slot over body or manifold lock-down hole (1/4–20 UNC threaded hole) Install 1/4–20 UNC screw and washer; tighten to 7-8 ft-lbs.
- 5) Place base plate subassembly (V-cut up) over stem and adapter of cartridge (see Figure 1). Do not tighten base plate subassembly set screws at this time.
- 6) Place spacer onto adjusting stem positioning the outer groove of spacer downward (toward cartridge adapter) as shown in Figure 1.
- 7) If handle is not attached to knob, screw handle into knob.
- 8) Make sure knob subassembly set screws are flush with outside diameter of knob. Carefully place knob subassembly (with plungers facing downward) over stem, aligning plungers with the lowest point of the V-cut in the base plate subassembly, as shown in Figure 1. (Optional: Lightly grease V-cut Guide.)
- 9) Gently rotate knob subassembly and base plate subassembly together, keeping plunger aligned in lowest point of V-cut, and orienting handle to the desired position when valve is centered. It is important that stem does not rotate while rotating knob subassembly and base plate subassembly. If stem does rotate, repeat steps beginning from step 1.
- 10) Once handle is in desired centered position, hold base plate subassembly down on adapter and tighten the three base plate set screws, alternating tightening sequence to center base plate on adapter as best as possible. Tighten to 1-1/2 to 2 ft-lbs.
- 11) After base plate is secure, screw in knob subassembly set screws until they contact the spacer. Then press down firmly on knob and tighten two knob set screws to 1-1/2 to 2 ft-lbs, alternating tightening sequence, as done in step 10. Knob may lift when released.
- 12) Position inlay on top of knob as desired and insert knob screw into top hole of knob. Tighten knob screw, drawing knob toward adjusting stem until knob bottoms out on stem.
- 13) To verify proper assembly, rotate handle both CW and CCW and make sure rotation in both directions is equal (45°).
- 14) Optional: Install O-ring in the gap between the knob subassembly and base plate subassembly, as shown in Figure 1. This step is recommended when operating in an environment where dust and moisture may be present.
- 15) If rotation is unequal in both directions or desired handle position is incorrect, remove knob screw, loosen base plate subassembly set screws, and loosen knob set screws, making sure there is no contact between knob set screws and spacer. Repeat steps 3-12.