



Vickers

Directional Controls

Manual and pilot operated directional control valves for applications up to 350 bar (5000 psi) and 265 L/min (70 USgpm)

D



Non-solenoid directional controls

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Non-solenoid directional controls

Section overview

This section gives the basic specifications for the complete line of Vickers threaded cartridge non-solenoid directional control valves. Its purpose is to provide a quick, convenient reference tool when choosing Vickers cartridge valves or designing a system using these components.

Two pressure ratings are shown for all products featured in this catalog – typical application pressure and fatigue pressure. The typical application pressure rating is the maximum recommended operating pressure for the valve in a given system. The fatigue pressure rating is the pressure for the valve to be free for infinite life from metal fatigue.

Features and Benefits

- Products in this catalog have been fatigue tested for one million cycles at 132% or 10 million cycles at 115% of rated pressure.
- All operating parts are hardened steel, ground and honed for long life and low leakage.
- Designed for maximum flexibility and minimal space requirements.
- All exposed cartridge surfaces are zinc dichromate plated to resist corrosion.
- All aluminum manifolds are gold anodized to resist corrosion.
- Desired settings may be locked down.
- Aluminum knob and cap options are available on some models.
- Reliable, economical and compact.



WARNING

For pressure over 210 bar (3000 psi) use steel housing.

MRV3-10

Manual rotary valve

Description

The MRV3-10 is a 3-way, 2 or 3 position, manual semi-rotary directional screw-in cartridge valve.

Operation

This valve will direct flow between ports 1 and 3 and block port 2 in one position, and by turning

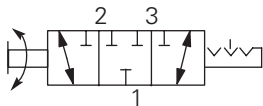
the operator 90°, flow will be directed between ports 1 and 2 and port 3 will be blocked. During

cross-over transition, all ports are blocked.

Functional Symbol

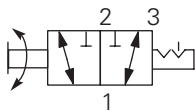
MRV3-10(V)-D/E

3 position models

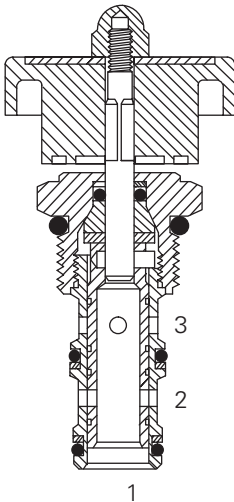


MRV3-10(V)-D2/E2

2 position models



Sectional View



RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	23 L/min (6 USgpm)
Internal leakage	164cc/min (10in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Manual operators	D - Lever (3-position detent)* D2 - Lever (2-position detent)* E - Ball (3-position detent)* E2 - Ball (2-position detent)* K - Knob (2-position, no detent)

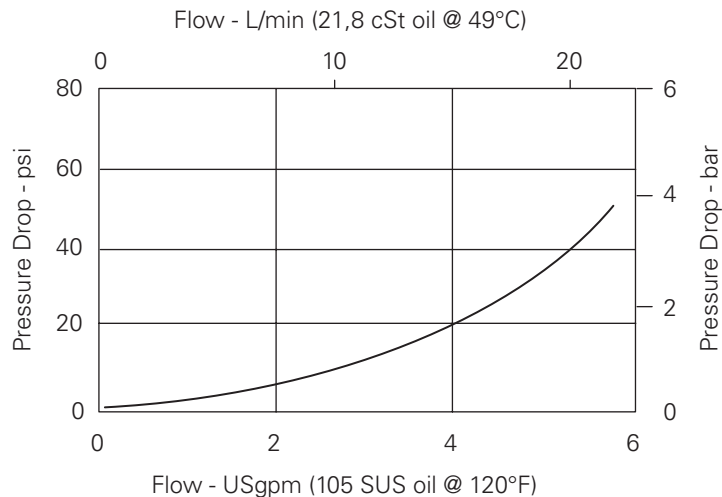
* Light duty housing only.

Cavity	C-10-3
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,22 kg (0.48 lbs)
Seal kit	565804 (Buna-N) 889599 (Viton®)

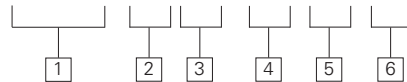
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



MRV3-10 (V) - ** - ** - 00



1 Function

MRV3 - Manual rotary valve

2 Size

10 - 10 Size

3 Seals

Blank - Buna-N
V - Viton®

4 Manual operators

- O - No operator
- D - Lever (3-position detent)*
- D2 - Lever (2-position detent)*
- E - Ball (3-position detent)*
- E2 - Ball (2-position detent)*
- K - Knob (2-position, no detent)

*Light duty housing only.

5 Port size

O - Cartridge only

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-173358	-
6T	SAE 6	566162	-
2G	1/4" BSPP	-	876705
3G	3/8" BSPP	-	876714
6H	SAE 6	-	876704
8H	SAE 8	-	876711

See section J for housing details.

6 Special features

00 - None
(Only required if valve has special features, omitted if "00")

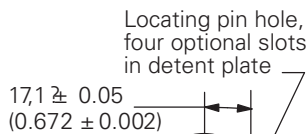
SS - 316 Stainless Steel external components (only available for "O" and "K" options)

Dimensions

mm (inch)

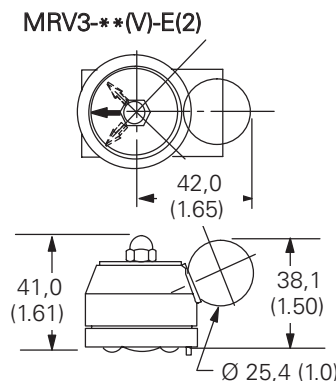
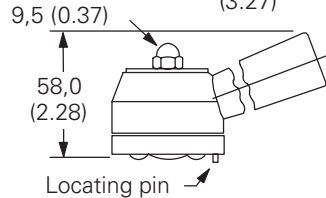
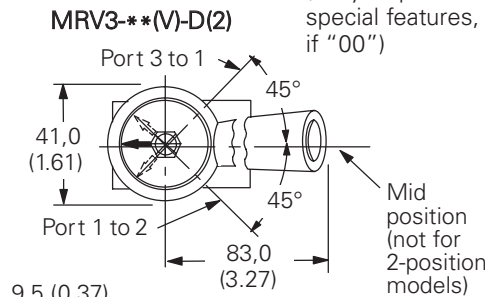
Torque cartridge in aluminum housing
47-54 Nm (35-40 ft. lbs)

Locating Pin Installation



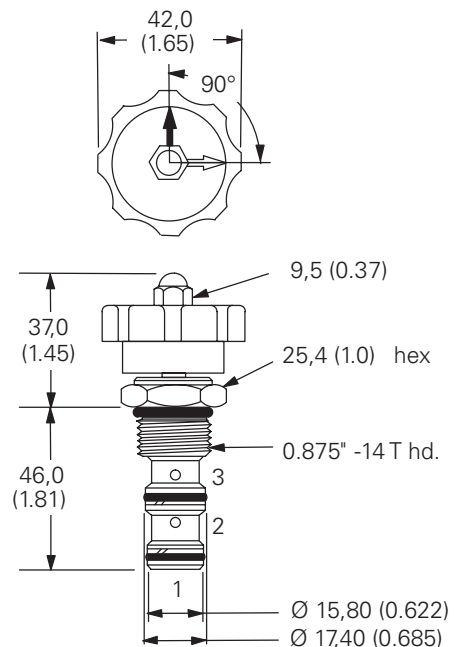
This hole omitted from detent plate of MRV3-10(V)-D2/E2

Ø 3,45/3,50 (#29 or 0.136) drill x 4,8 (0.187) deep in mating housing



MRV3-(V)-K**

Arrow can be relocated by slackening the domed nut and turning the plate. Re-tighten nut.



MRV3-16

Manual rotary valve

Description

The MRV3-16 is a 3-way, 2 or 3 position, manual semi-rotary directional screw-in cartridge valve.

Operation

This valve will direct flow between ports 1 and 3 and block port 2 in one position. By turning the

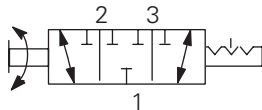
operator 90°, flow will be directed between ports 1 and 2 and port 3 will be blocked. During

cross-over transition, all ports are blocked.

Functional Symbol

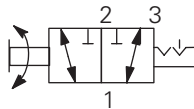
MRV3-16(V)-D

3 position models

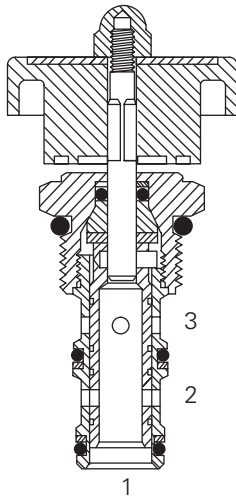


MRV3-16(V)-D2

2 position models



Sectional View



RATINGS AND SPECIFICATIONS

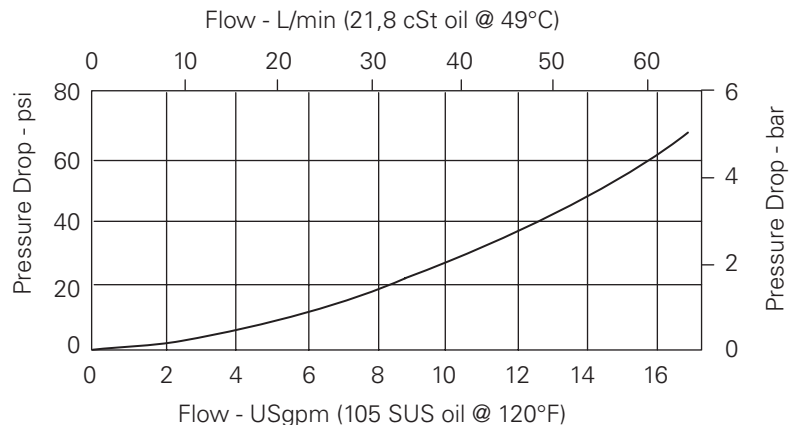
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	64 L/min (17 USgpm)
Internal leakage	164cc/min (10in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Manual operators	D - Lever (3-position detent)* D2 - Lever (2-position detent)* K - Knob (2-position, no detent)
*Light duty housing only.	
Cavity	C-16-3
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,53 kg (1.16 lbs)
Seal kit	889632 (Buna-N) 889636 (Viton®)

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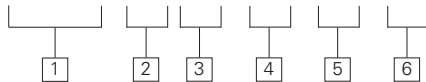
Pressure Drop Curve

Cartridge only





MRV3 - 16 (V) - ** - * - 00**



- 1 Function**
MRV3 - Manual rotary valve

- 2 Size**
16 - 16 Size

- 3 Seals**
Blank - Buna-N
V - Viton®

- 4 Manual operators**
O - No operator
D - Lever (3-position detent)*
D2 - Lever (2-position detent)*
K - Knob (2-position, no detent)
*Light duty housing only

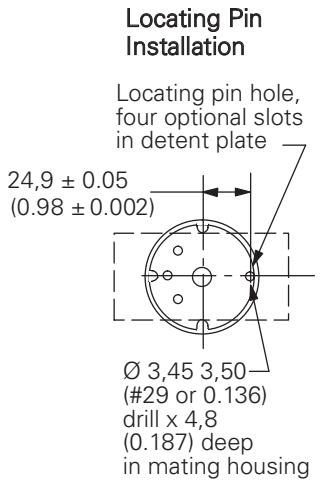
- 5 Port size**
O - Cartridge only

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
12T	SAE 12	566152	–
6B	3/4" BSPP	02-175465	–
10H	SAE 10	–	876721
12H	SAE 12	–	876723
4G	1/2" BSPP	–	876720
8G	3/4" BSPP	–	876722

See section J for housing details..

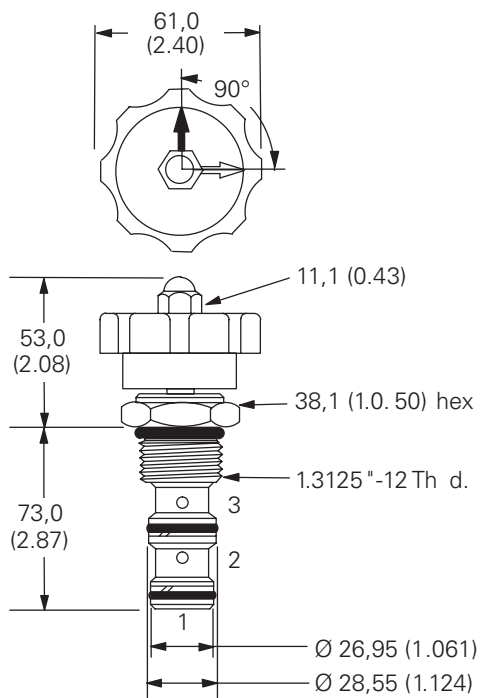
- 6 Special features**
00 - None
(Only required if valve has special features, omitted if "00")

Dimensions
mm (inch)
Torque cartridge in aluminum housing
108-122 Nm (80-90 ft. lbs)

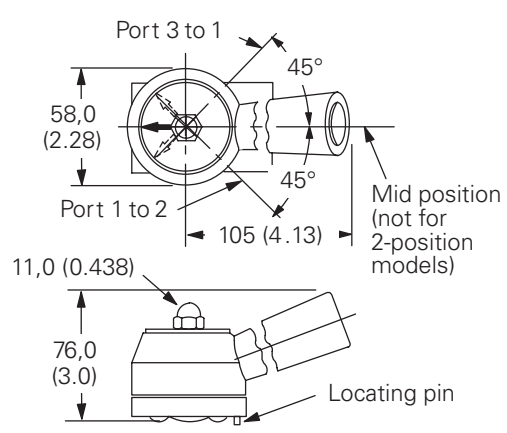


MRV3-(V)-K**

Arrow can be relocated by slackening the domed nut and turning the plate. Re-tighten nut.



MRV3-(V)-D(2)**



MRV4-10

Manual rotary valve

Description

The MRV4-10 is a 4-way, 2 or 3 position, manual semi-rotary directional screw-in cartridge valve.

Operation

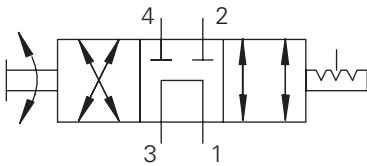
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position. By turning the

operator 90°, flow will be directed between ports 1 and 4 and port 3 to port 2. During the cross-over

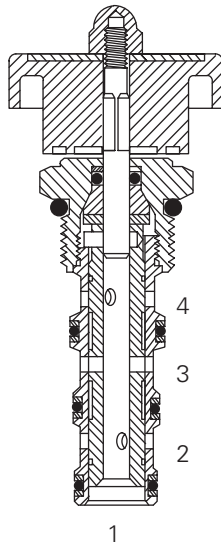
transition, ports 2 and 4 are blocked and ports 1 and 3 are connected.

Functional Symbol

3 position models



Sectional View



RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	11 L/min (3 USgpm)
Internal leakage	164cc/min (10in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Manual operators	D - Lever (3-position detent)* D2 - Lever (2-position detent)* E - Ball (3-position detent)* E2 - Ball (2-position detent)* K - Knob (2-position, no detent)
Cavity	C-10-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,17 kg (0.38 lbs)
Seal kit	565805 (Buna-N) 889600 (Viton®)

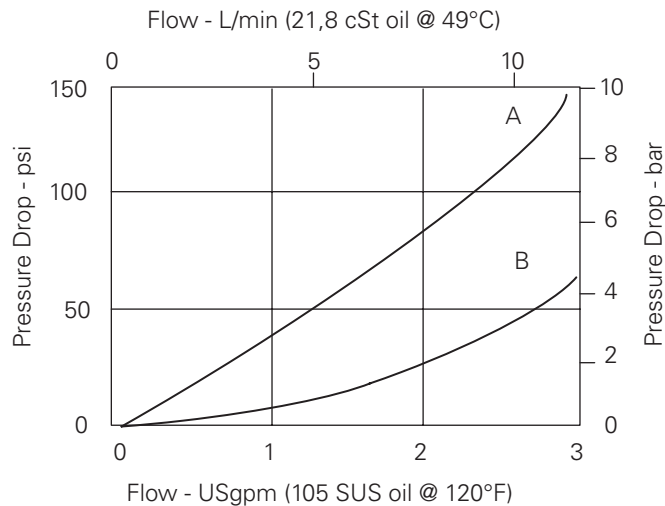
* Light duty housing only.

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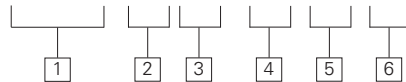
Pressure Drop Curves

Cartridge only

- A - Port 3 to 4 or 3 to 2
- B - Port 4 to 1 or 2 to 1



MRV4-10 (V) - ** - ** - 00



1 Function

MRV4 - Manual rotary valve
4 way

2 Size

10 - 10 Size

3 Seals

Blank - Buna-N
V - Viton®

4 Manual operators

- O - No operator
- D - Lever (3-position detent)*
- D2 - Lever (2-position detent)*
- E - Ball (3-position detent)*
- E2 - Ball (2-position detent)*
- K - Knob (2-position, no detent)

*Light duty housing only.

5 Port size

O - Cartridge only

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-179705	–
6T	SAE 6	566161	–
2G	1/4" BSPP	–	876709
3G	3/8" BSPP	–	876715
6H	SAE 6	–	876708
8H	SAE 8	–	876713

See section J for housing details.

Dimensions

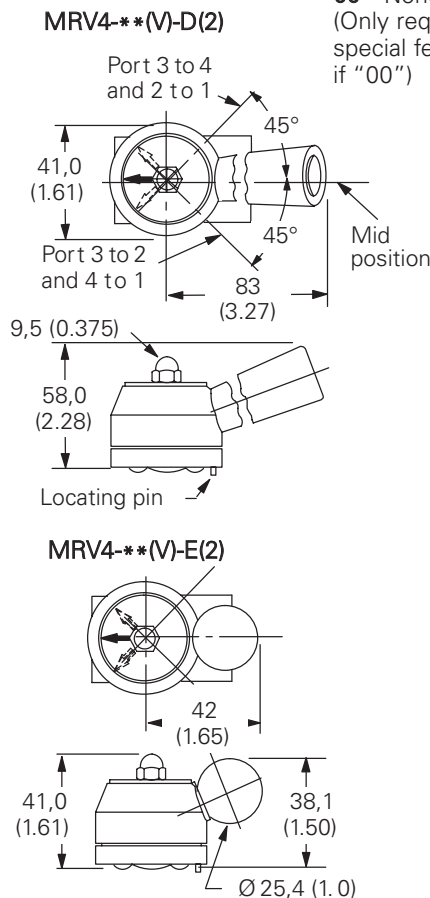
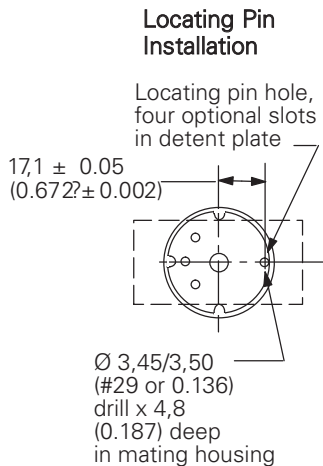
mm (inch)

Torque cartridge in aluminum housing
47-54 Nm (35-40 ft. lbs)

6 Special features

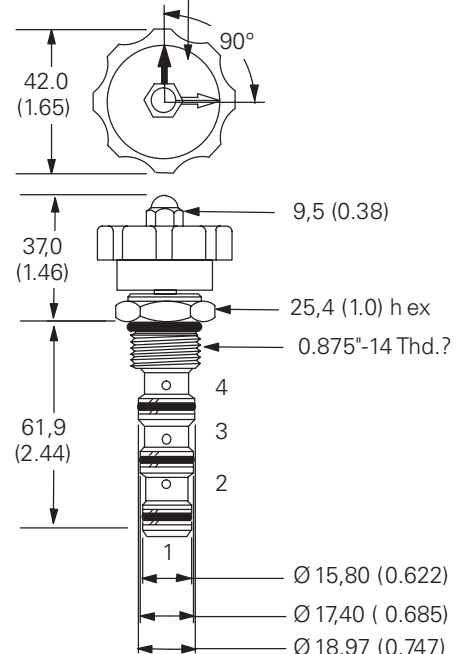
00 - None
(Only required if valve has special features, omitted if "00")

SS - 316 Stainless Steel external components (only available for "O" and "K" options)



MRV4-(V)-K**

Arrow can be relocated by slackening the domed nut and turning the plate. Re-tighten nut.



MRV4-16

Manual rotary valve

Description

The MRV4-16 is a 4-way, 2 or 3 position, manual semi-rotary directional screw-in cartridge valve.

Operation

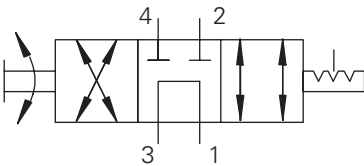
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position. By turning the

operator 90°, flow will be directed between ports 1 and 4 and ports 3 and 2. During the cross-over

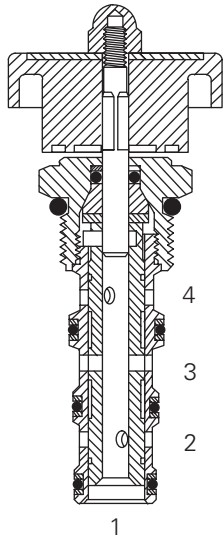
transition, ports 2 and 4 are blocked and ports 1 and 3 are open to each other.

Functional Symbol

3 position models



Sectional View



RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	45 L/min (12 USgpm)
Internal leakage	164cc/min (10in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Manual operators	D - Lever (3-position detent)* D2 - Lever (2-position detent)* K - Knob (2-position, no detent)

* Light duty housing only.

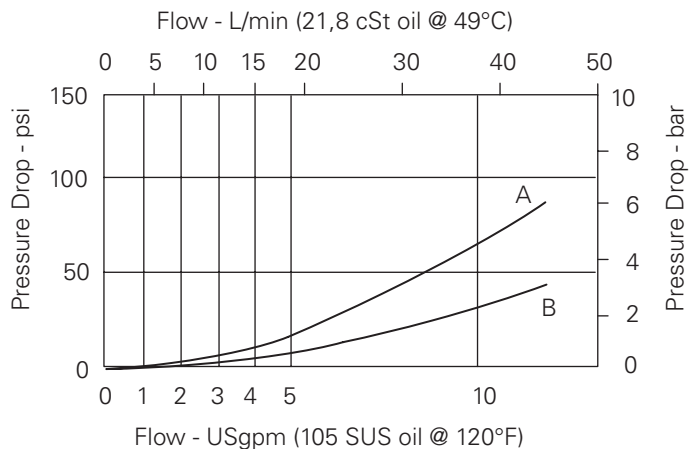
Cavity	C-16-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,65 kg (1.43 lbs)
Seal kit	889634 (Buna-N) 889638 (Viton®)

Viton is a registered trademark of E.I. DuPont

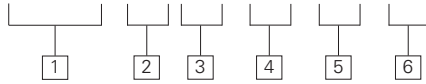
Pressure Drop Curves

Cartridge only

- A - Port 3 to 4 or 3 to 2
- B - Port 4 to 1 or 2 to 1



MRV4 - 16 (V) - ** - * - 00**



1 Function

MRV4 - Manual rotary valve, 4 way

2 Size

16 - 16 Size

3 Seals

Blank - Buna-N
V - Viton®

4 Manual operators

- O - No operator
- D - Lever (3-position detent)*
- D2 - Lever (2-position detent)*
- K - Knob (2-position, no detent)

*Light duty housing only.

5 Port size

O - Cartridge only

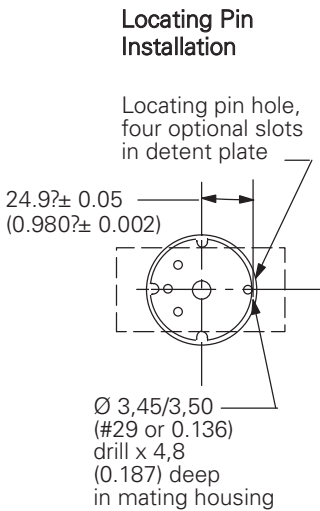
CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
12T	SAE 12	566411	-
6B	3/4" BSPP	02-175468	-
10H	SAE 10	-	876729
12H	SAE 12	-	876731
4G	1/2" BSPP	-	876728
6G	3/4" BSPP	-	876730

See section J for housing details.

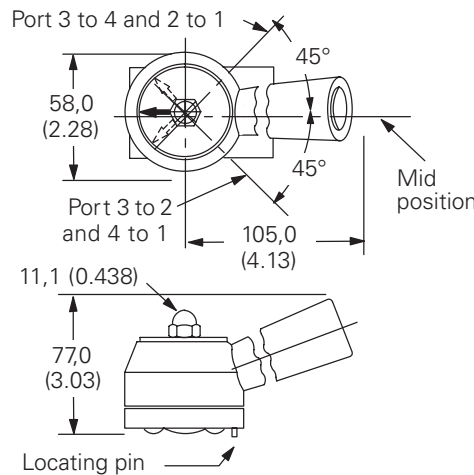
Dimensions

mm (inch)

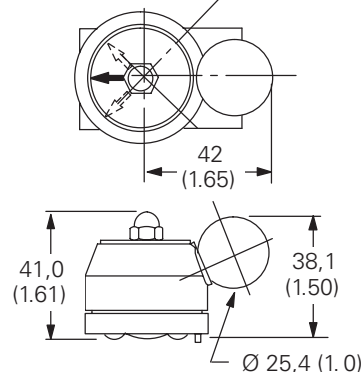
Torque cartridge in aluminum housing
108-122 Nm (80-90 ft. lbs)



MRV4-(V)-D(2)**

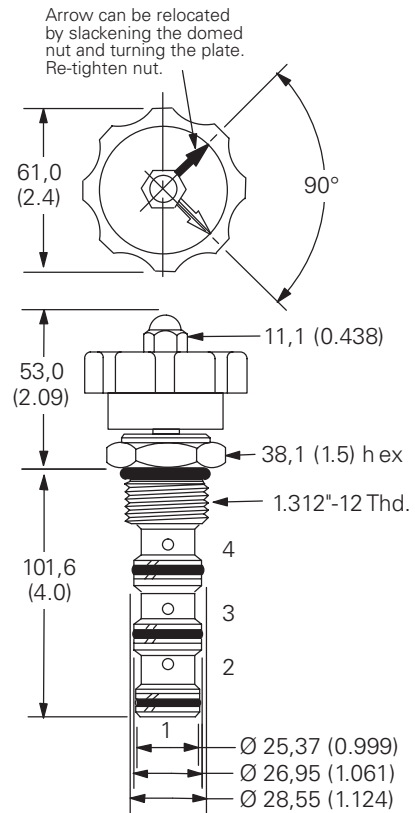


MRV4-(V)-E(2)**



6 Special features

00 - None
(Only required if valve has special features, omitted if "00")



MRV5-10

Manual rotary valve

Description

The MRV5-10 is a 4-way, 3 position, manual semi-rotary directional screw-in cartridge valve.

Operation

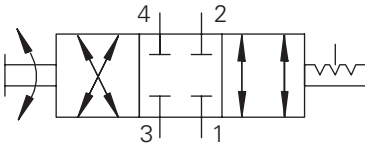
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position. By turning the

operator 90°, flow will be directed between ports 1 and 4 and port 3 to 2. During the cross-over

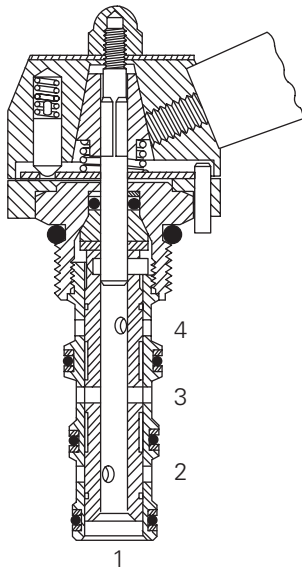
transition, all ports are blocked.

Functional Symbol

3 position models



Sectional View



RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	11 L/min (3 USgpm)
Internal leakage	164cc/min (10in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Manual operators	D - Lever (3-position detent)* E - Ball (3-position detent)*

* Light duty housing only.

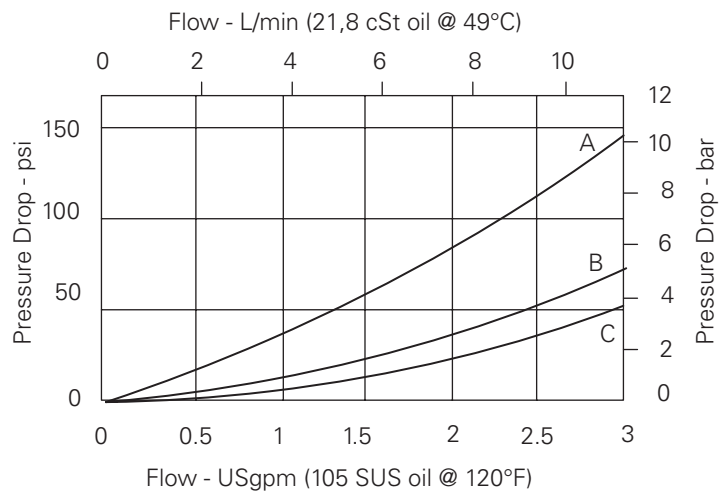
Cavity	C-10-4 (see page 60)
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,27 kg (0.59 lbs)
Seal kit	889625 (Buna-N) 566080 (Viton®)

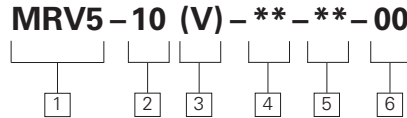
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curves

Cartridge only

- A - Port 3 to 4 or 3 to 2
- B - Port 4 to 1
- C - Port 2 to 1





1 Function

MRV5 - Manual rotary valve, 4 way

2 Size

10 - 10 Size

3 Seals

Blank - Buna-N
V - Viton®

4 Manual operators

- O** - No operator
 - D** - Lever (3-position detent)*
 - E** - Ball (3-position detent)*
 - D2** - Lever (2-position detent)
 - E2** - Ball (2-position detent)
- *Light duty housing only.

5 Port size

O - Cartridge only

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-179705	-
6T	SAE 6	566161	-
2G	1/4" BSPP	-	876709
3G	3/8" BSPP	-	876715
6H	SAE 6	-	876708
8H	SAE 8	-	876713

See section J for housing details.

6 Special features

00 - None
(Only required if valve has special features, omitted if "00")

SS - 316 Stainless Steel external components (only available for "O" options)

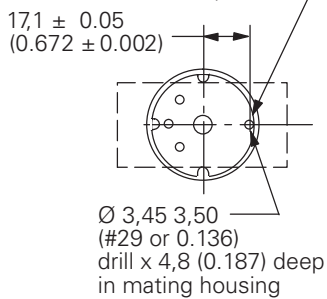
Dimensions

mm (inch)

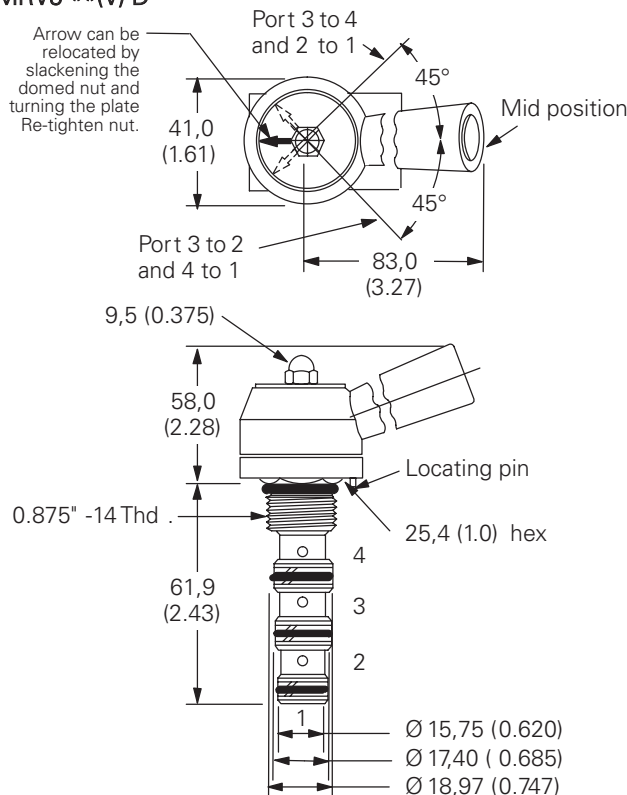
Torque cartridge in aluminum housing
47-54 Nm (35-40 ft. lbs)

Locating Pin Installation

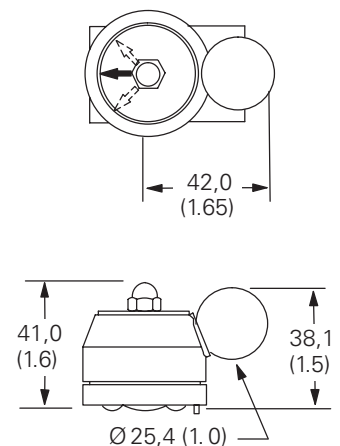
Locating pin hole, four optional slots in detent plate



MRV5-(V)-D**



MRV5-(V)-E**



MRV5-16

Manual rotary valve

Description

The MRV5-16 is a 4-way, 3 position, manual semi-rotary directional screw-in cartridge valve.

Operation

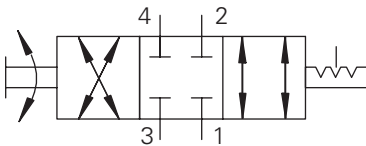
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position and by turning the

operator 90°, flow will be directed between ports 1 and 4 and ports 3 and 2. During the cross-over

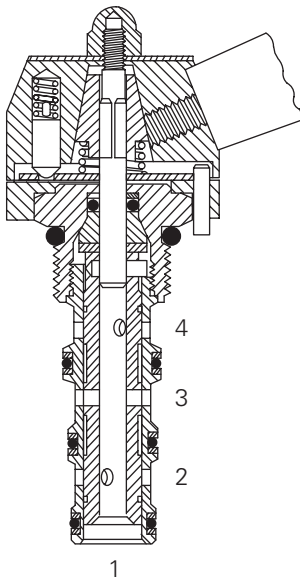
transition, all ports are blocked.

Functional Symbol

3 position models



Sectional View



RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

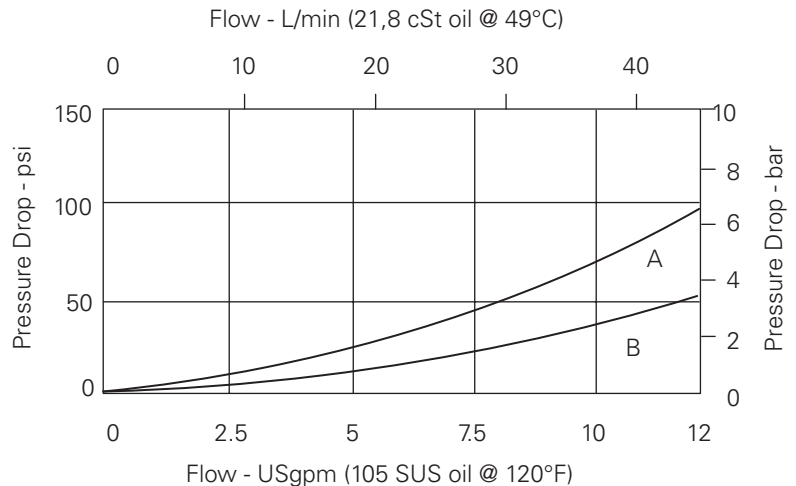
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	45 L/min (12 USgpm)
Internal leakage	164cc/min (10in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Manual operators	D - Lever (3-position detent)*
* Light duty housing only.	
Cavity	C-16-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,65 kg (1.43 lbs)
Seal kit	889634 (Buna-N) 889638 (Viton®)

Viton is a registered trademark of E.I. DuPont

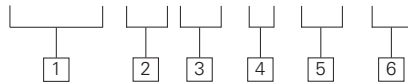
Pressure Drop Curves

Cartridge only

- A - Port 3 to 4 or 3 to 2
- B - Port 4 to 1 or 2 to 1



MRV5-16 (V) - * - * - 00**



1 Function
MRV5 - Manual rotary valve
 4 way

3 Seals
Blank - Buna-N
V - Viton®

5 Port size
O - Cartridge only

2 Size
16 - 16 Size

4 Manual operators
O - No operator
D - Lever (3-position detent)*
 *Light duty housing only.

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
12T	SAE 12	566411	–
6B	3/4" BSPP	02-175468	–
10H	SAE 10	–	876729
12H	SAE 12	–	876731
4G	1/2" BSPP	–	876728
6G	3/4" BSPP	–	876730

See section J for housing details.

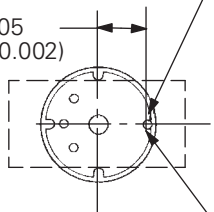
Dimensions
 mm (inch)

Torque cartridge in aluminum housing
 108-122 Nm (80-90 ft. lbs)

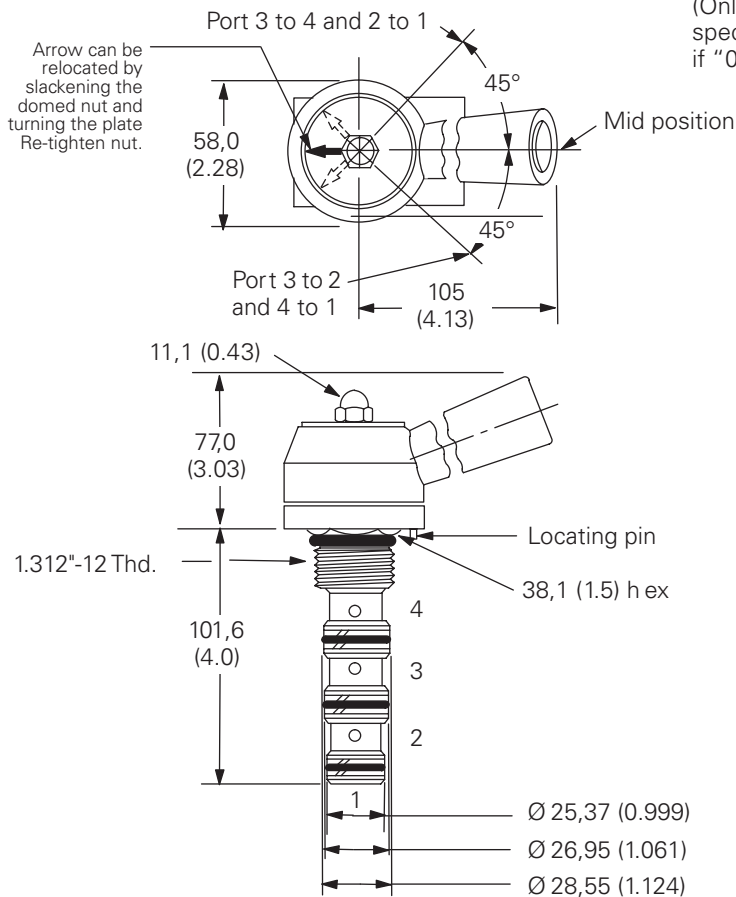
Locating Pin Installation

Locating pin hole, four optional slots in detent plate

24,9 ± 0.05
 (0.980 ± 0.002)



Ø 3,45/3,50 (#29 or 0.136)
 drill x 4,8 (0.187) deep
 in mating housing



6 Special features

00 - None
 (Only required if valve has special features, omitted if "00")

MRV6-10

Manual rotary valve

Description

The MRV6-10 is a 4-way, 3 position, manual semi-rotary directional screw-in cartridge valve.

Operation

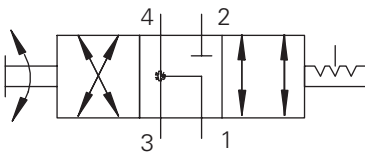
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position. By turning the

operator 90°, flow will be directed between ports 1 and 4 and port 3 to 2. During the cross-over

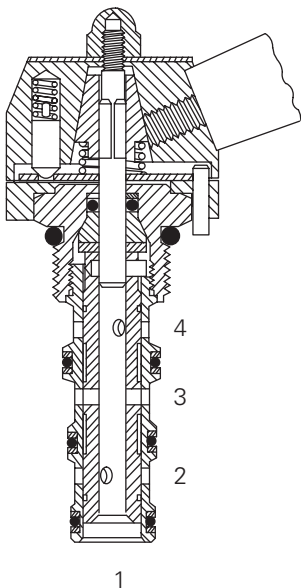
transition all ports 1, 3 and 4 are open to each other and port 2 is blocked.

Functional Symbol

3 position valves



Sectional View



RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	11 L/min (3 USgpm)
Internal leakage	164cc/min (10in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Manual operators	D - Lever (3-position detent)* E - Ball (3-position detent)*

* Light duty housing only.

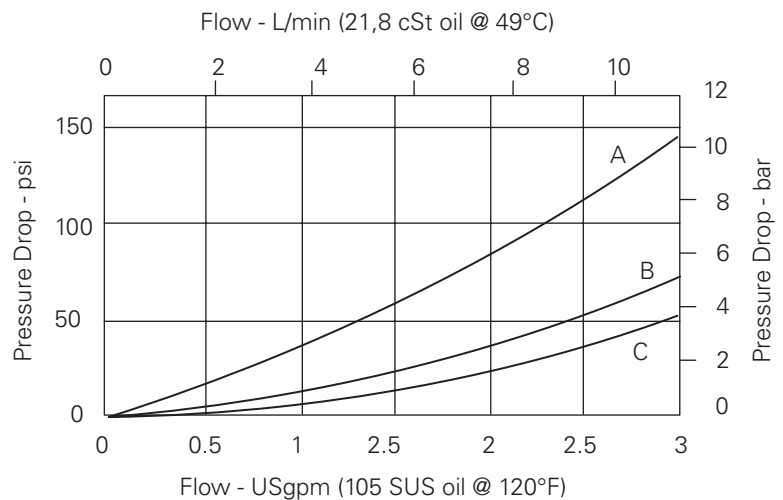
Cavity	C-10-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,27 kg (0.59 lbs)
Seal kit	889625 (Buna-N) 566080 (Viton®)

Viton is a registered trademark of E.I. DuPont

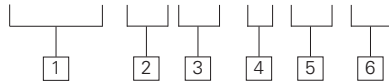
Pressure Drop Curves

Cartridge only

- A - Port 3 to 4 or 3 to 2
- B - Port 4 to 1
- C - Port 2 to 1



MRV6-10 (V) - * - ** - 00



1 Function

MRV6 - Manual rotary valve

2 Size

10 - 10 Size

3 Seals

Blank - Buna-N
V - Viton®

4 Manual operators

- O - No operator
- D - Lever (3-position detent)*
- E - Ball (3-position detent)*

*Light duty housing only.

5 Port size

O - Cartridge only

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-179705	-
6T	SAE 6	566161	-
2G	1/4" BSPP	-	876709
3G	3/8" BSPP	-	876715
6H	SAE 6	-	876708
8H	SAE 8	-	876713

See section J for housing details.

6 Special features

00 - None
(Only required if valve has special features, omitted if "00")

SS - 316 Stainless Steel external components (only available for "O" options)

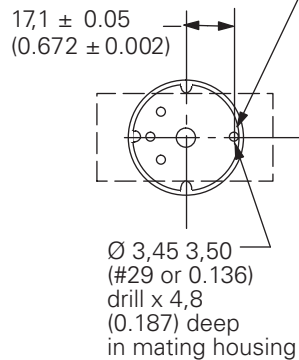
Dimensions

mm (inch)

Torque cartridge in aluminum housing
47-54 Nm (35-40 ft. lbs)

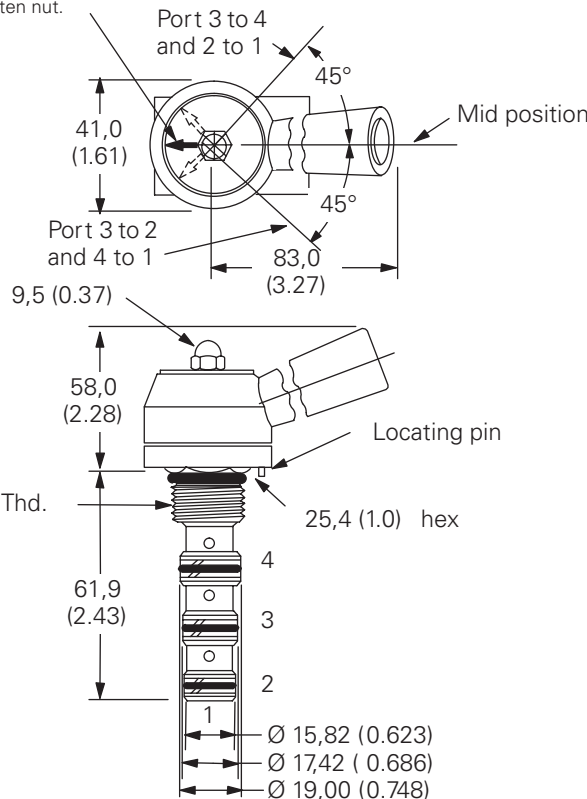
Locating Pin Installation

Locating pin hole, four optional slots in detent plate

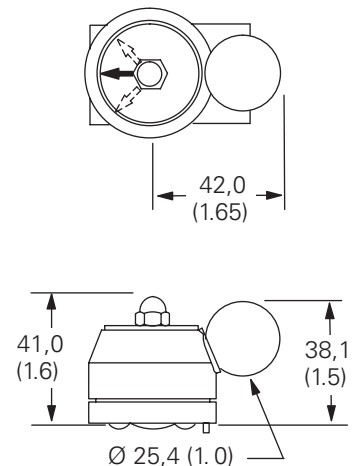


MRV6-(V)-D**

Arrow can be relocated by slackening the domed nut and turning the plate. Re-tighten nut.



MRV6-(V)-E**



DSV2-4

Shuttle valve

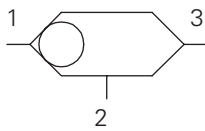
Description

The DSV2-4-B is a direct acting, ball type, shuttle valve.

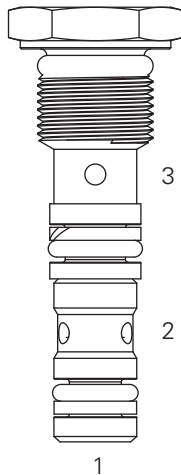
Operation

The DSV2-4-B shuttle valve senses the higher of two pressures at port 3 or port 1 and directs it to port 2.

Functional Symbol



Profile View



RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

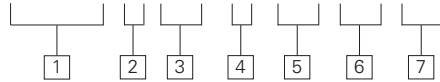
Typical application pressure (all ports)	240 bar (3500 psi) steel housing
Cartridge fatigue pressure (infinite life)	240 bar (3500 psi)
Rated flow	3 L/min (0.75 USgpm)
Internal leakage	Between ports 2 and 1, and 2 and 3; 5 drops/min maximum @ 240 bar (3500 psi)
Cavity	C-4-3
Temperature range	-40° to 120°C (-40° to 248°F)
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Weight cartridge only	0,02 kg (0.044 lbs)
Seal kits	9900176-000 (Buna-N) 9900177-000 (Viton®)

Viton is a registered trademark of E.I. DuPont

Note

This valve is intended for application as a load sense shuttle valve in load sensing systems.

DSV2-4 (V) - B - (*) - ** - 00



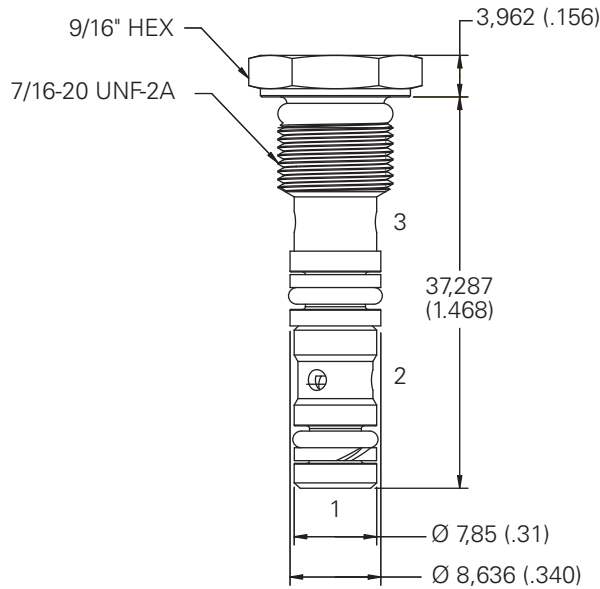
<p>1 Function DSV2 - Shuttle valve</p>	<p>3 Seals Blank - Buna-N V - Viton®</p>	<p>5 Valve housing material Omit for cartridge only A - Aluminum S - Steel</p>	<p>7 Special features 00 - None (Only required if valve has special features, omitted if "00")</p>
<p>2 Size 4 - 4 Size</p>	<p>4 Style B - Ball</p>	<p>6 Port size O - Cartridge only</p>	



Dimensions

mm (inch)

Torque cartridge in aluminum or steel housing
8.1-13.6 Nm (6-10 ft. lbs)



Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings **must** be used for operating pressures **above** 210 bar (3000 psi).

DSV2-8

Shuttle valve

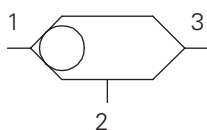
Description

The DSV2-8-B is a direct acting, ball type, shuttle valve.

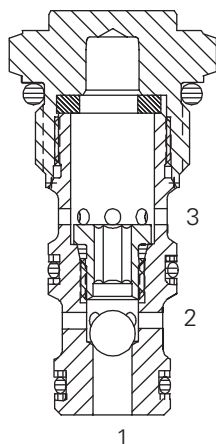
Operation

The DSV2-8-B shuttle valve senses the higher of two pressures at port 3 or port 1 and directs it to port 2.

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	240 bar (3500 psi) steel housing
Cartridge fatigue pressure (infinite life)	240 bar (3500 psi)
Rated flow	23 L/min (6 USgpm)
Internal leakage	Between ports 2 and 1, and 2 and 3; 5 drops/min. maximum @ 240 bar (3500 psi)
Cavity	C-8-3
Standard housing materials	Aluminum or steel
Temperature range	-40° to 120°C (-40° to 248°F)
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Weight cartridge only	0,06 kg (0.14 lbs)
Seal kit	02-160755 (Buna-N) 02-160756 (Viton®)

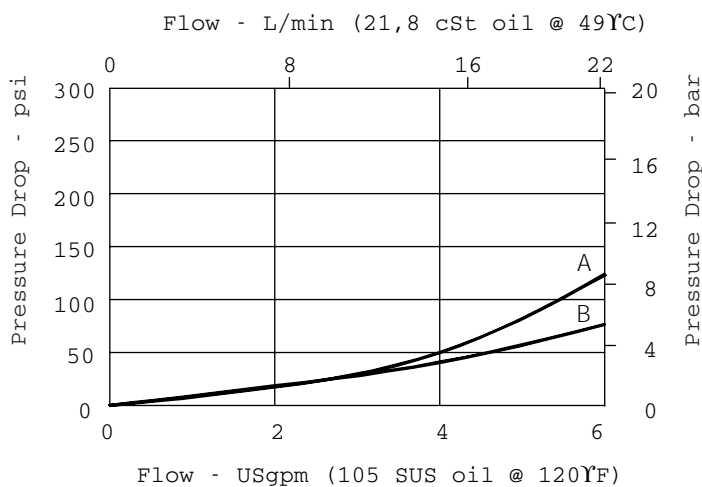
Viton is a registered trademark of E.I. DuPont

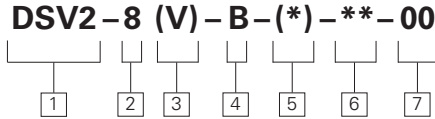
Pressure Drop Curves

Cartridge only

A - Port 1 to port 2

B - Port 3 to port 2





1 Function
DSV2 - Shuttle valve

4 Style
B - Ball

6 Port size
O - Cartridge only

2 Size
8 - 8 Size

5 Valve housing material
Omit for cartridge only
A - Aluminum
S - Steel

3 Seals
Blank - Buna-N
V - Viton®

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Fatigue rated	Steel Fatigue rated
4T	SAE 4	02-160741	02-160745
6T	SAE 6	02-160742	02-160746
2G	1/4" BSPP	02-160739	02-160743
3G	3/8" BSPP	02-160740	02-160744

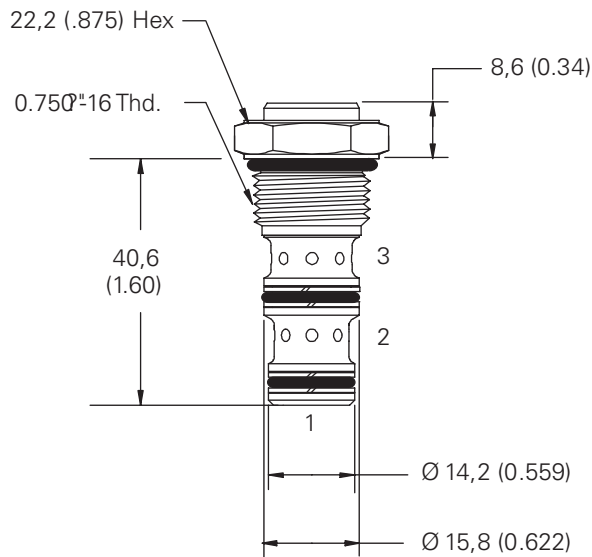
See section J for housing details.

7 Special features
00 - None
(Only required if valve has special features, omitted if "00")
SS - 316TI Stainless Steel external components

Dimensions

mm (inch)

Torque cartridge in aluminum or steel housing
34-41 Nm (25-30 ft. lbs)



Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings **must** be used for operating pressures **above** 210 bar (3000 psi).

DSV1-10

Shuttle valve

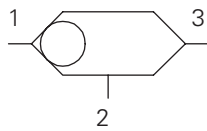
Description

The DSV1-10-B is a ball type, screw-in cartridge type shuttle valve.

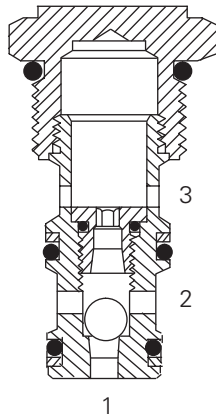
Operation

This valve senses the higher of two pressures at port 3 or port 1 and directs it to port 2.

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

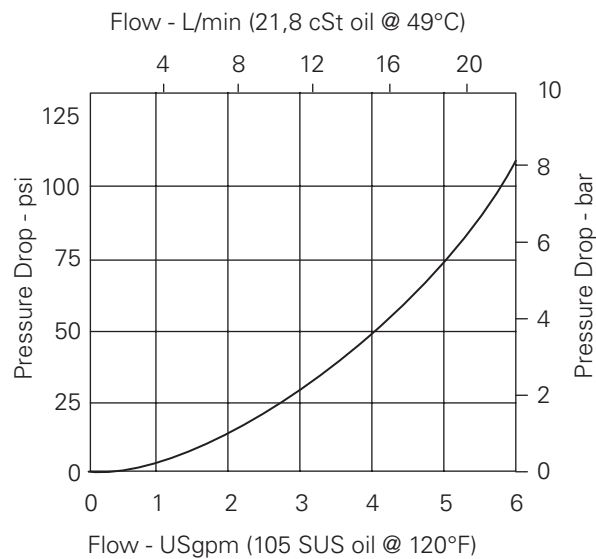
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Maximum pressure	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	23 L/min (6 USgpm)
Internal leakage	Port 2 to 1 and 2 to 3; <5 drops/min. @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-10-3
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,08 kg (0.18 lbs)
Seal kit	565804 (Buna-N) 889599 (Viton®)

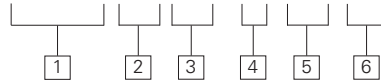
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



DSV1-10 (V)-B--00**



1 Function
DSV1 - Shuttle valve

3 Seals
Blank - Buna-N
V - Viton®

5 Port size
O - Cartridge only

2 Size
10 - 10 Size

4 Style
B - Ball

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-173358	–
6T	SAE 6	566162	–
2G	1/4" BSPP	–	876705
3G	3/8" BSPP	–	876714
6H	SAE 6	–	876704
8H	SAE 8	–	876711

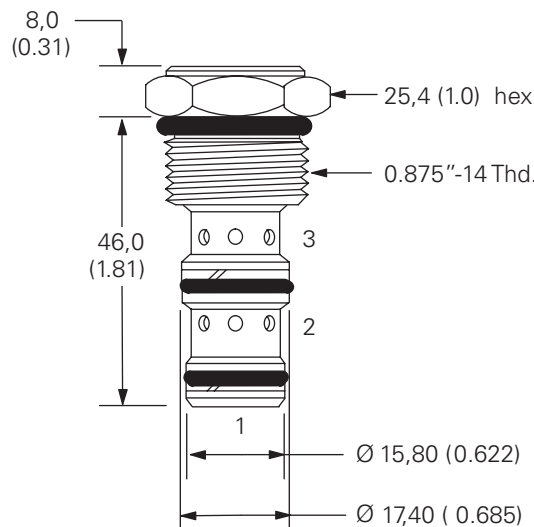
See section J for housing details.

6 Special features
00 - None
(Only required if valve has special features, omitted if "00")
SS - 316TI Stainless Steel external components

Dimensions

mm (inch)

Torque cartridge in aluminum housing
47-54 Nm (35-40 ft. lbs)



DSV3-**-B

Shuttle valve

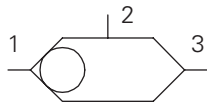
Description

The DSV3-**-B is a ball type, in-line housing type shuttle valve.

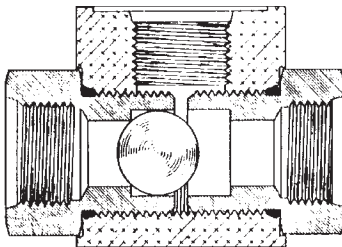
Operation

This valve senses the higher of two pressures at port 3 or port 1 and directs it to port 2.

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

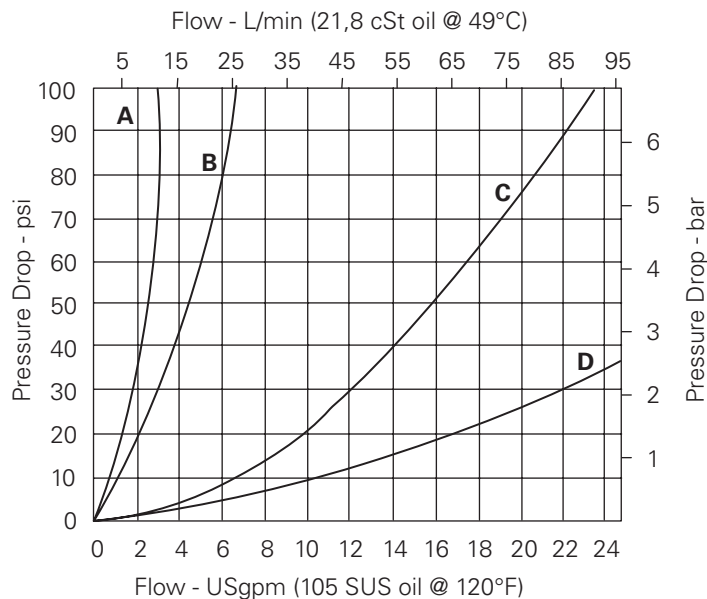
Maximum pressure	210 bar (3000 psi) Aluminum housing 350 bar (5000 psi) Steel housing
Rated flow	6 series - 11 L/min (3 USgpm) 8 series - 24,6 L/min (6.5 USgpm) 12 series - 88,9 L/min (23.5 USgpm) 16 series - 170,3 L/min (45 USgpm)
Internal leakage	Port 2 to 1 and 2 to 3; <5 drops/min @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum or steel
Weight 6 series	(w/aluminum housing) 0,10 kg (0.22 lbs) (w/steel housing) 0,30 kg (0.66 lbs)
Weight 8 series	(w/aluminum housing) 0,28 kg (0.62 lbs) (w/steel housing) 0,90 kg (1.86 lbs)
Weight 12 series	(w/aluminum housing) 0,75 kg (1.65 lbs) (w/steel housing) 2,25 kg (4.95 lbs)
Weight 16 series	(w/aluminum housing) 1,75 kg (3.86 lbs) (w/steel housing) 5,25 kg (11.58 lbs)
Seals (2 req'd)	6 series-154128 (Buna-N)/396096 (Viton®) 8 series-154129 (Buna-N)/396098 (Viton®) 12 series-154131 (Buna-N)/396102 (Viton®) 16 series-154132 (Buna-N)/396105 (Viton®)

Viton is a registered trademark of E.I. DuPont

Pressure Drop Curves

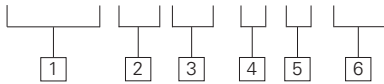
Cartridge only

- A = 6-Series
- B = 8-Series
- C = 12-Series
- D = 16-Series



D

DSV3--*(V)-B-*-*****



1 Function
DSV3 - Shuttle valve

3 Seals
Blank - Buna-N
V - Viton®

4 Style
B - Ball type

6 Port Size
6 Series
1 - 1/8" NPTF

2 Size
6 - 6 size
8 - 8 size
12 - 12 size
16 - 16 size

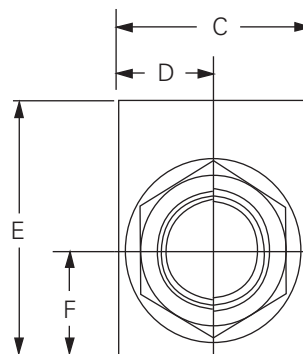
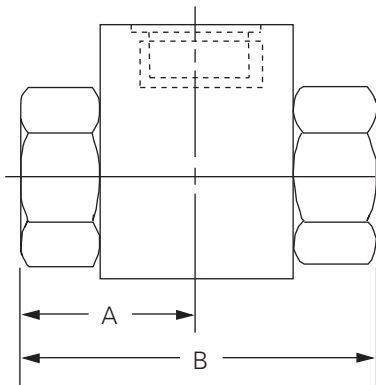
5 Housing material
A - Aluminum
S - Steel

8 Series
2 - 1/4" NPTF
6T - SAE 6

12 Series
4 - 1/2" NPTF
8T - SAE 8

16 Series
6 - 3/4" NPTF
12T - SAE 12

Dimensions
mm (inch)



Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings **must** be used for operating pressures **above** 210 bar (3000 psi).

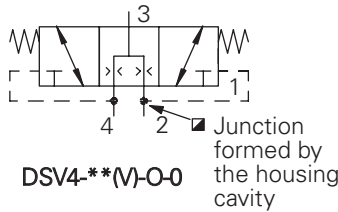
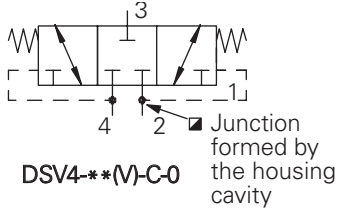
MODEL NUMBER	A	B	C	D	E	F
DSV3-6-B-A1	22,2 (0.87)	44,5 (1.75)	19,0 (0.75)	9,5 (0.37)	25,4 (1.00)	9,5 (0.37)
DSV3-6-B-S1	22,2 (0.87)	44,5 (1.75)	20,6 (0.81)	10,3 (0.41)	31,7 (1.25)	12,7 (0.50)
DSV3-8-B-A2	23,8 (0.94)	47,6 (1.87)	25,4 (1.00)	12,7 (0.50)	38,1 (1.50)	12,7 (0.50)
DSV3-8-B-S2	23,8 (0.94)	47,6 (1.87)	31,7 (1.25)	15,9 (0.63)	43,7 (1.72)	15,9 (0.63)
DSV3-8-B-A6T	23,8 (0.94)	47,6 (1.87)	25,4 (1.00)	12,7 (0.50)	38,1 (1.50)	12,7 (0.50)
DSV3-8-B-S6T	23,8 (0.94)	47,6 (1.87)	31,7 (1.25)	15,9 (0.63)	43,7 (1.72)	15,9 (0.63)
DSV3-12-B-A4	31,7 (1.25)	63,5 (1.50)	38,1 (1.50)	19,1 (0.75)	50,8 (2.00)	19,1 (0.75)
DSV3-12-B-S4	31,7 (1.25)	63,5 (1.50)	43,7 (1.72)	21,8 (0.86)	57,5 (2.50)	22,2 (0.88)
DSV3-12-B-A8T	31,7 (1.25)	63,5 (1.50)	38,1 (1.50)	19,1 (0.75)	50,8 (2.00)	19,1 (0.75)
DSV3-12-B-S8T	31,7 (1.25)	63,5 (1.50)	43,7 (1.72)	21,8 (0.86)	57,5 (2.25)	22,2 (0.88)
DSV3-16-B-A6	47,6 (1.88)	95,3 (3.75)	47,6 (1.88)	23,8 (0.94)	63,5 (2.50)	23,8 (0.94)
DSV3-16-B-S6	47,6 (1.88)	95,3 (3.75)	50,0 (1.97)	25,0 (0.98)	62,7 (2.47)	25,4 (1.00)
DSV3-16-B-A12T	47,6 (1.88)	95,3 (3.75)	47,6 (1.88)	23,8 (0.94)	63,5 (2.50)	23,8 (0.94)
DSV3-16-B-S12T	47,6 (1.88)	95,3 (3.75)	50,0 (1.97)	25,0 (0.98)	62,7 (2.47)	25,4 (1.00)

See section J for housing details.

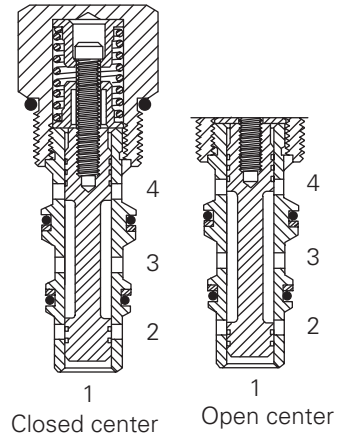
DSV4-10

Shuttle valve

Functional Symbols



Sectional Views



Description

The DSV4-10 is a 3-way, 3 position, spring centered, open or closed center spool, transmission shuttle, screw-in cartridge valve. Usually built into a customized housing along with other transmission components, see "Functional Symbols." The valve should be installed in a Blind C-10-4 cavity or in a standard housing with port 1 plugged.

Operation

When the spring bias is overcome at port 2, the flow is directed from port 4 to port 3 while closing port 2. When the spring bias is overcome at port 4, the flow is directed from port 2 to port 3 while closing port 4. This valve is available in both a closed and open center spool configuration.

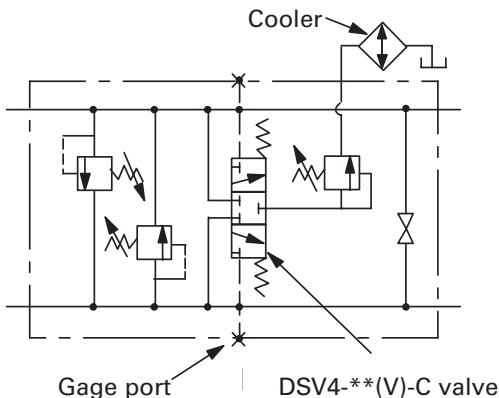
RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	26 L/min (7 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi) 160 - 11,0 bar (160 psi)
Pilot displacement volume	0,49 cm ³ (0.02 in ³)
Cavity	C-10-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum or steel
Weight cartridge only	0,14 kg (0.32 lbs)
Seal kit	889597 (Buna-N) 02-172397 (Viton®)

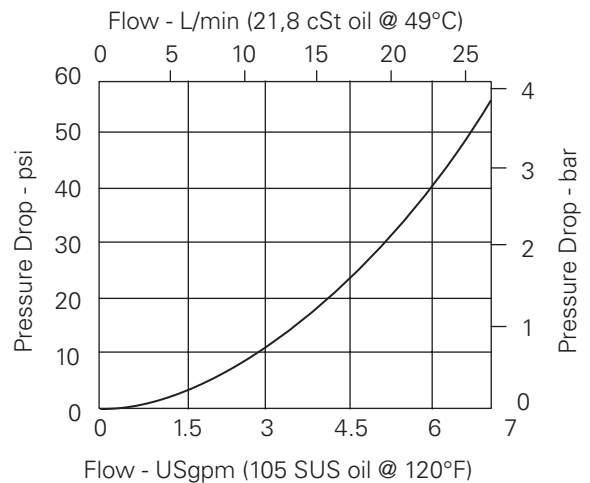
Viton is a registered trademark of E.I. DuPont

Typical Application

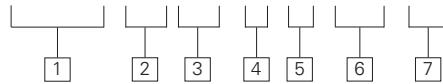


Pressure Drop Curve

Cartridge only



DSV4 – 10 (V) – * – 0 – * – 00**



<p>1 Function DSV4 - Directional shuttle valve</p>	<p>3 Seals Blank - Buna-N V - Viton®</p>	<p>5 Port size O - Cartridge only (Not available with standard housing)</p>	<p>7 Special features 00 - None (Only required if valve has special features, omitted if "00")</p>
<p>2 Size 10 - 10 Size</p>	<p>4 Spool configuration C - Closed center O - Open center</p>	<p>6 Pilot to shift (nominal) 40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi) 160 - 11,0 bar (160 psi)</p>	

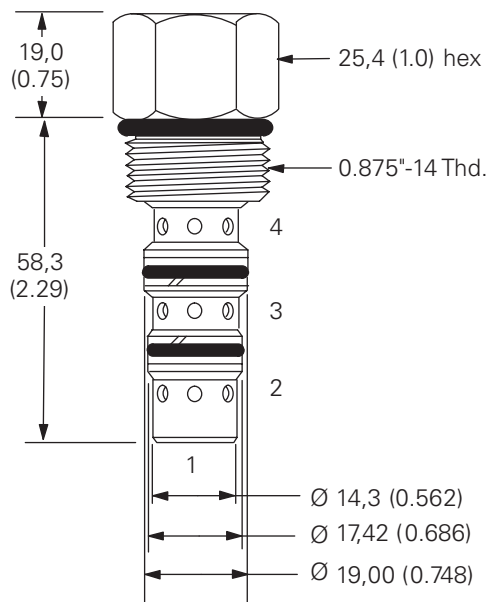


Dimensions

mm (inch)

Torque cartridge in housing

- A - 47-54 Nm (35-40 ft. lbs)
- S - 68-75 Nm (50-55 ft. lbs)

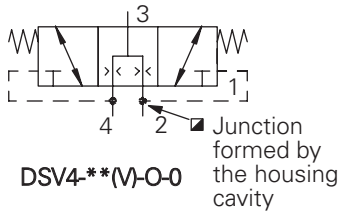
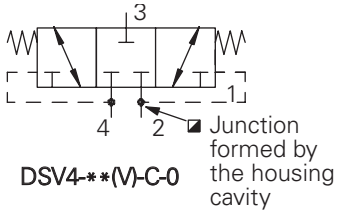


Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings **must** be used for operating pressures **above** 210 bar (3000 psi).

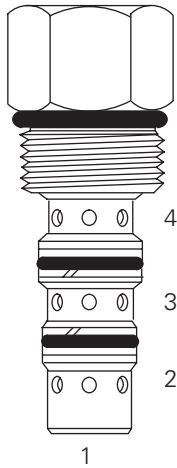
DSV4-16

Shuttle valve

Functional Symbols



Profile Views



Description

The DSV4-16 is a 3-way, 3 position, spring centered, open or closed center spool, transmission shuttle, screw-in cartridge valve. Usually built into a customized housing along with other transmission components, see "Functional Symbols." The valve should be installed in a Blind C-10-4 cavity or in a standard housing with port 1 plugged.

Operation

When the spring bias is overcome at port 2, the flow is directed from port 4 to port 3 while closing port 2. When the spring bias is overcome at port 4, the flow is directed from port 2 to port 3 while closing port 4. This valve is available in both a closed and open center spool configuration.

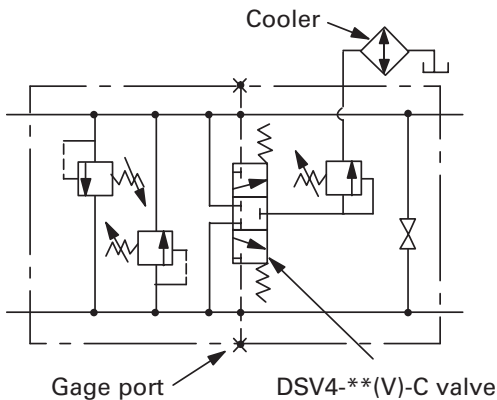
RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	190 L/min (50 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi) 160 - 11,0 bar (160 psi)
Cavity	C-16-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum or steel
Weight cartridge only	0,5 kg (1.12 lbs)
Seal kit	889634 (Buna-N) 889634 (Viton®)

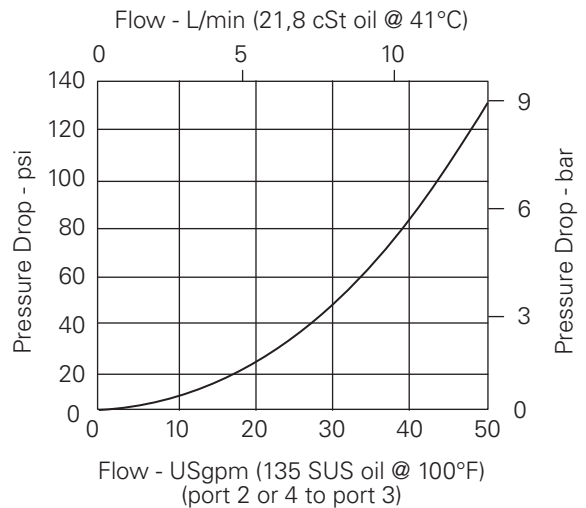
Viton is a registered trademark of E.I. DuPont

Typical Application

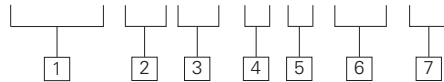


Pressure Drop Curve

Cartridge only



DSV4 - 16 (V) - * - 0 - * - 00**



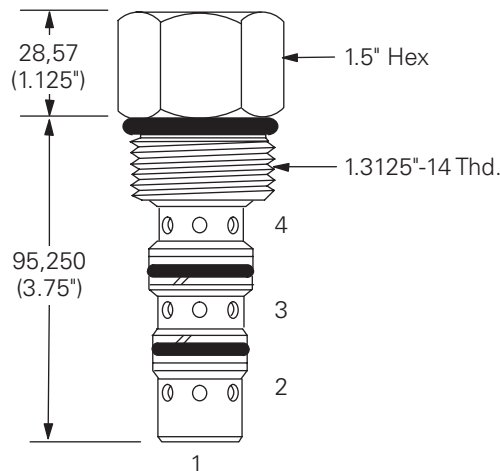
<p>1 Function DSV4 - Directional shuttle valve</p>	<p>3 Seals Blank - Buna-N V - Viton®</p>	<p>5 Port size O - Cartridge only (Not available with standard housing)</p>	<p>7 Special features 00 - None (Only required if valve has special features, omitted if "00")</p>
<p>2 Size 16 - 16 Size</p>	<p>4 Spool configuration C - Closed center O - Open center</p>	<p>6 Pilot to shift (nominal) 40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi) 160 - 11,0 bar (160 psi)</p>	



Dimensions

mm (inch)

Torque cartridge in housing
A - 108-122 Nm (80-90 ft. lbs)
S - 136-149 Nm (100-110 ft. lbs)



Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings **must** be used for operating pressures **above** 210 bar (3000 psi).

MLV9-12-A

4-Way, 3-Position, screw-in cartridge manual lever valve

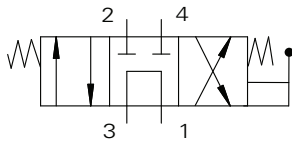
Description

The MLV9-12-A is a 4-way, 3-position, direct acting, spool type directional control valve.

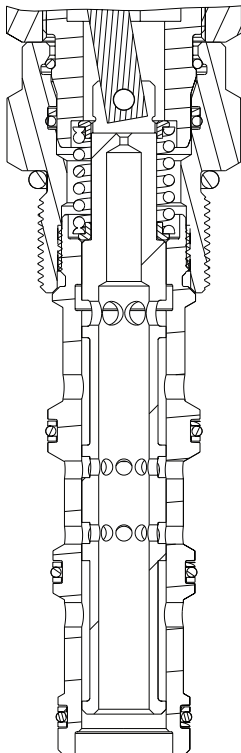
Operation

In the center position, this valve allows flow from port 3 to port 1 and blocks ports 2 and 4. In position 1, flow is directed from port 3 to port 2 and from port 4 to port 1. In position 2, flow is directed from port 3 to port 4 and from port 2 to port 1.

Functional Symbol



Sectional View

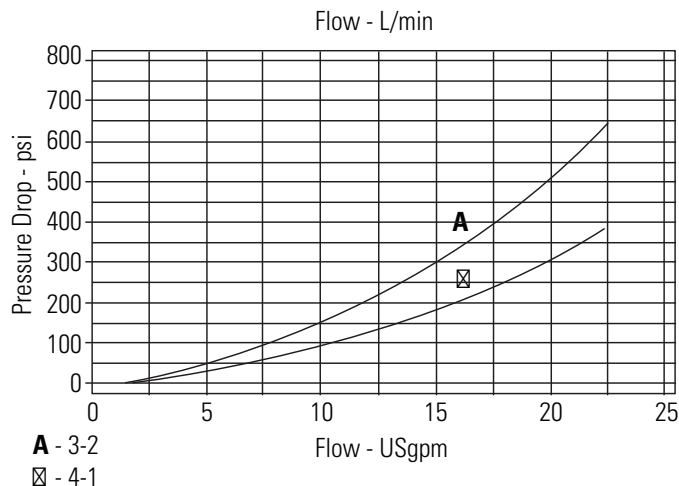


RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cST (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Fatigue pressure	3,000 psi per NFPA/T2-6-1 R2-2000
Rated burst pressure	(626 bar) 9090 psi per NFPA/T2-6-1 R2-2000
Max flow	60 L/min (15 USgpm)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Housing material (standard)	Aluminum
Weight	.57 kg (1.25 lbs)
Seal Kit	9900171-000 (Buna-N), 9900172 (Viton) Viton is a registered trademark of E.I. DuPont
Internal Leakage	246 cm ³ /min (15 in ³ /min) max. @ 210 bar (3000psi)

Endurance tested to 1 million cycles at full rated flow and pressure.



MLV9-12-B

4-Way, 3-Position, screw-in cartridge manual lever valve

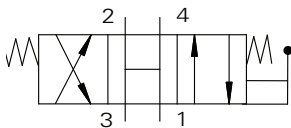
Description

The MLV9-12-B is a 4-way, 3-position, direct acting, spool type directional control valve.

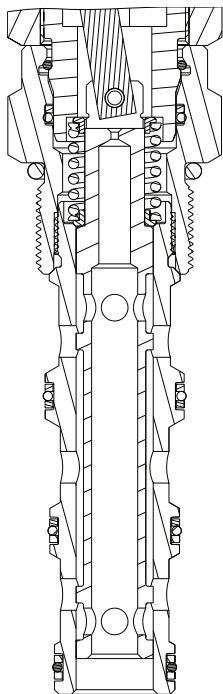
Operation

In the center position, all ports are open to each other. In position 1, flow is directed from port 3 to port 4 and from port 2 to port 1. In position 2, flow is directed from port 3 to port 2 and from port 4 to port 1.

Functional Symbol



Sectional View

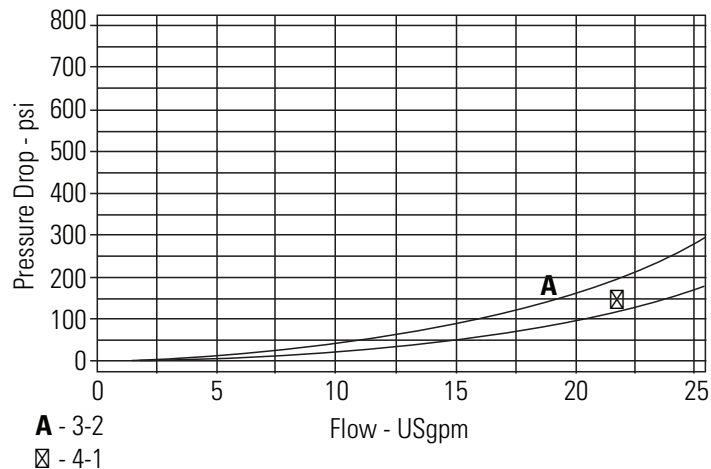


RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cST (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Fatigue pressure	3,000 psi per NFPA/T2-6-1 R2-2000
Rated burst pressure	(626 bar) 9090 psi per NFPA/T2-6-1 R2-2000
Max flow	60 L/min (15 USgpm)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Housing material (standard)	Aluminum
Weight	.57 kg (1.25 lbs)
Seal Kit	9900171-000 (Buna-N), 9900172 (Viton) Viton is a registered trademark of E.I. DuPont
Internal Leakage	246 cm ³ /min (15 in ³ /min) max. @ 210 bar (3000psi)

Endurance tested to 1 million cycles at full rated flow and pressure.



MLV9-12-E

4-Way, 3-Position, screw-in cartridge manual lever valve

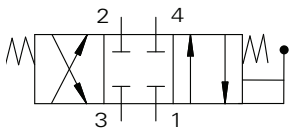
Description

The MLV9-12-E is a 4-way, 3-position, direct acting, spool type directional control valve .

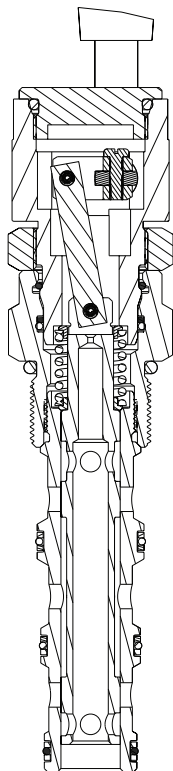
Operation

In the center position, all ports are blocked. In position 1, flow is directed from port 3 to port 4 and from port 2 to port 1. In position 2, flow is directed from port 3 to port 2 and from port 4 to port 1.

Functional Symbol



Sectional View

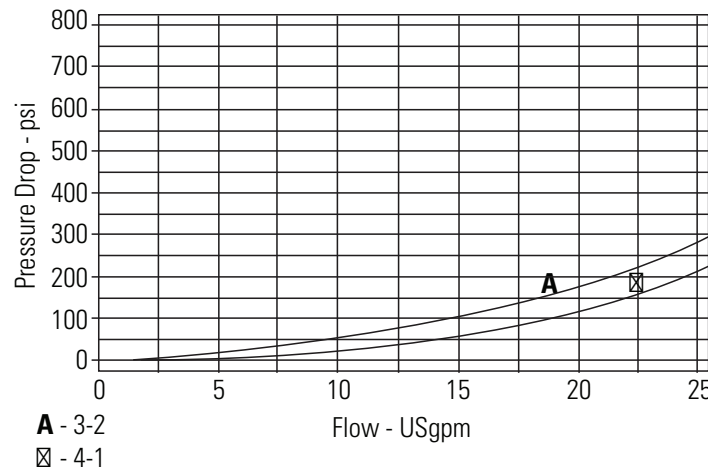


RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cST (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Fatigue pressure	3,000 psi per NFPA/T2-6-1 R2-2000
Rated burst pressure	626 bar) 9090 psi per NFPA/T2-6-1 R2-2000
Max flow	60 L/min (15 USgpm)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Housing material (standard)	Aluminum
Weight	.57 kg (1.25 lbs)
Seal Kit	9900171-000 (Buna-N), 9900172 (Viton) Viton is a registered trademark of E.I. DuPont
Internal Leakage	246 cm ³ /min (15 in ³ /min) max. @ 210 bar (3000psi)

Endurance tested to 1 million cycles at full rated flow and pressure.



MLV9-12-F

4-Way, 3-Position, screw-in cartridge manual lever valve

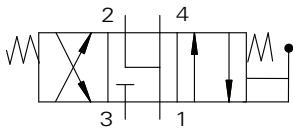
Description

The MLV9-12-F is a 4-way, 3-position, direct acting, spool type directional control valve.

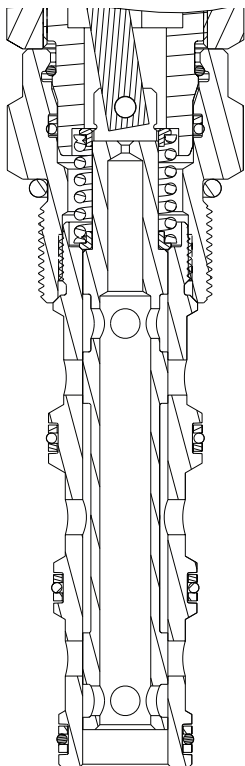
Operation

In the center position, port 1, port 2, and port 4 are open to each other while port 3 is blocked. In position 1, flow is directed from port 3 to port 4 and from port 2 to port 1. In position 2, flow is directed from port 3 to port 2 and from port 4 to port 1.

Functional Symbol



Sectional View

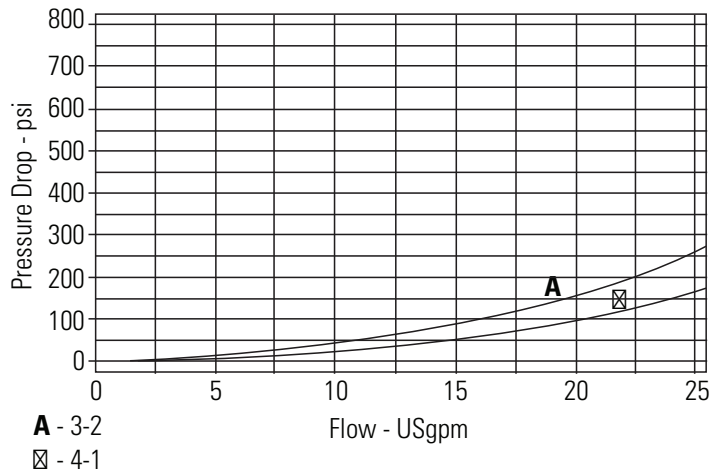


RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cST (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Fatigue pressure	3,000 psi per NFPA/T2-6-1 R2-2000
Rated burst pressure	(626 bar) 9090 psi per NFPA/T2-6-1 R2-2000
Max flow	60 L/min (15 USgpm)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Housing material (standard)	Aluminum
Weight	.57 kg (1.25 lbs)
Seal Kit	9900171-000 (Buna-N), 9900172 (Viton) Viton is a registered trademark of E.I. DuPont
Internal Leakage	246 cm ³ /min (15 in ³ /min) max. @ 210 bar (3000psi)

Endurance tested to 1 million cycles at full rated flow and pressure.



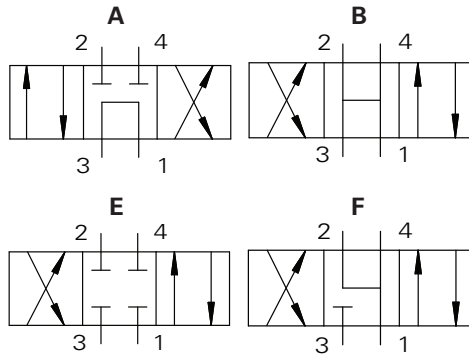
MLV9 - 12 X - X - X L - X XXX - XX
 1 2 3 4 5 6 7 8 9

1 Function
MLV9 - Manual Lever Valve

2 Size
 12 - 12 Size

3 Seal Material
N - Buna N
V - Viton

4 Spool Center Condition



9 Lever Position

- 00** - 90°
- 01** - 45°
- 02** - 0°
- 03** - 135°
- 04** - 180°

5 Dentent Option

- O** - Spring Return

6 Lever

- L** - Lever

7 Housing Material

- Blank** - Cartridge only
- A** - Aluminum

8 Port Size

CODE	PORT SIZE	HOUSING NUMBER
		Aluminum
0	Cartridge Only	
A4G	1/2" BSPP	5986431-001
A6G	3/4" BSPP	5986432-001
A8H	SAE 8	5986433-001
A10H	SAE 10	5986434-001
A12H	SAE 12	5986436-001

MLV9-12

4-Way, 3-Position, screw-in cartridge manual lever valve



Dimensions

mm (inch)

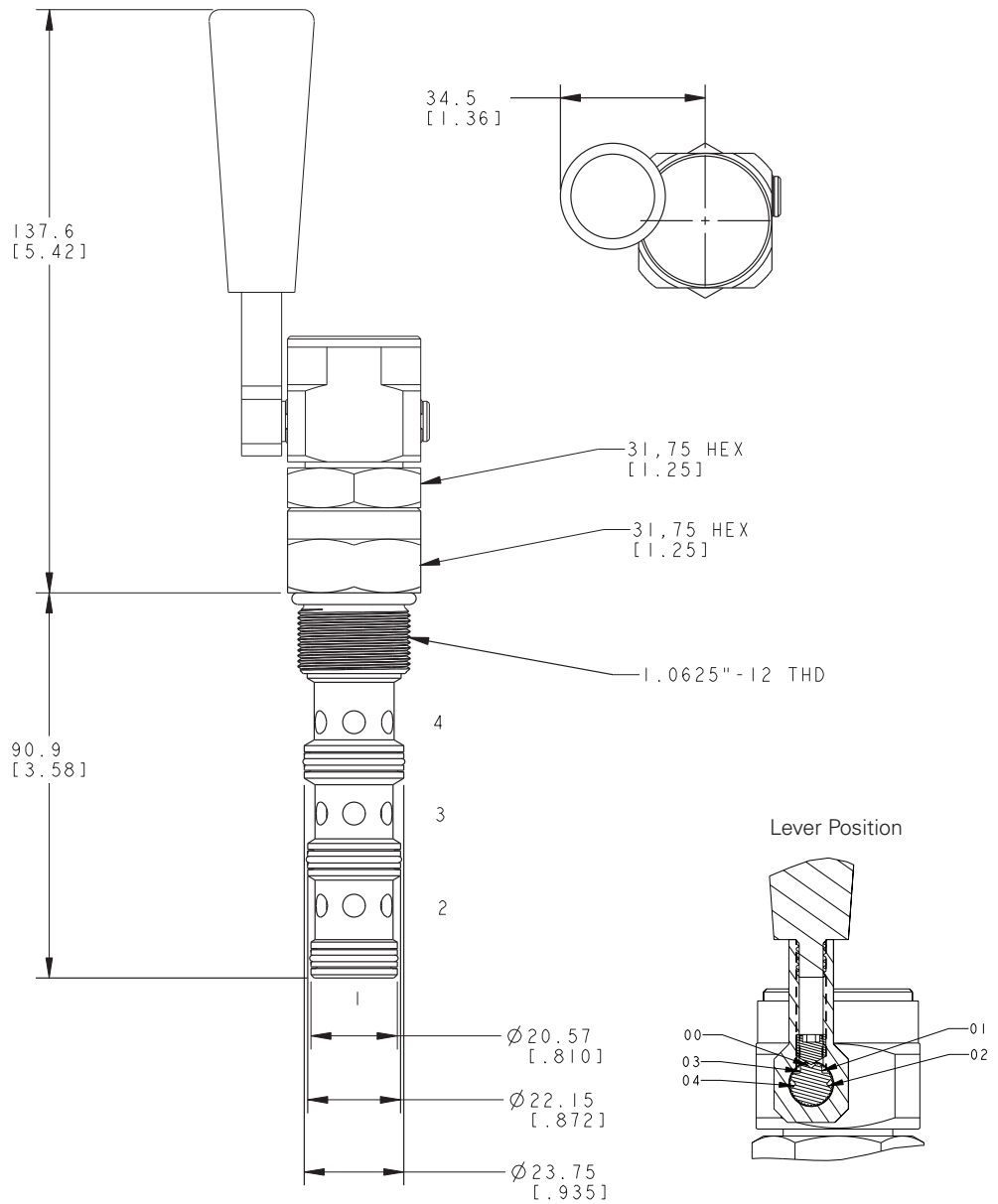
Torque cartridge in aluminum or steel housing
34-41 Nm (25-30 ft. lbs).

SPARE PARTS

Lever	21113
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WARNING

Maintain 5-8Nm (4-6 ft. lbs) maximum torque on valve tube nut. Overtightening may cause valve failure.



MPV1-10

Manual pull valve

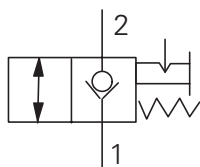
Description

The MPV1-10 is a 2-way, 2 position, manually operated, normally closed, pull-to-open, directional screw-in cartridge valve.

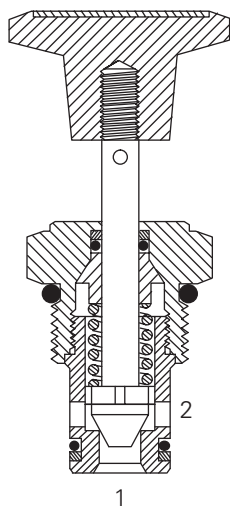
Operation

This valve blocks flow from port 2 to port 1 and will allow flow from port 1 to port 2 when the spring bias is overcome.

Functional Symbol



Sectional View



Caution

Back pressure of 16 bar (240 psi) will unseat the poppet.

RATINGS AND SPECIFICATIONS

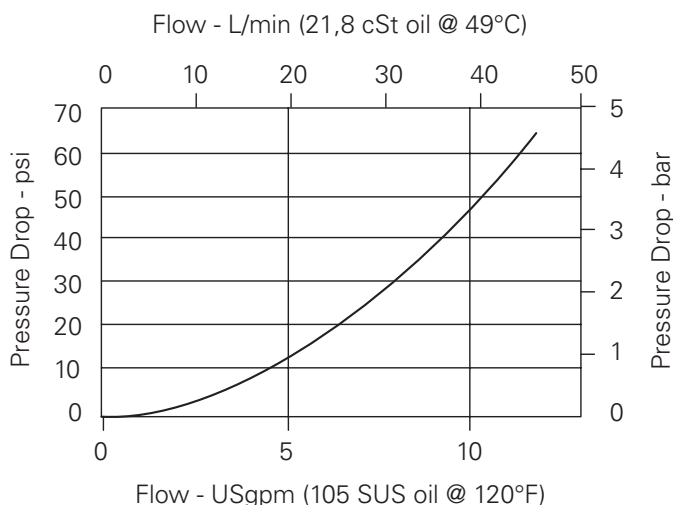
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	45 L/min (12 USgpm)
Internal leakage (port 2 to port 1)	5 drops/min. maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-10-2
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,11 kg (0.24 lbs)
Seal kit	565803 (Buna-N) 566086 (Viton®)

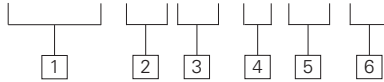
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



MPV1 – 10 (V) – * – ** – 00



1 Function
MPV1 - Manual pull valve

3 Seals
Blank - Buna-N
V - Viton®

5 Port size
O - Cartridge only

2 Size
10 - 10 Size

4 Type
T - Stem only
K - Knob

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-175462	–
6T	SAE 6	566151	–
2G	1/4" BSPP	–	876702
3G	3/8" BSPP	–	876703
6H	SAE 6	–	876700
8H	SAE 8	–	876701

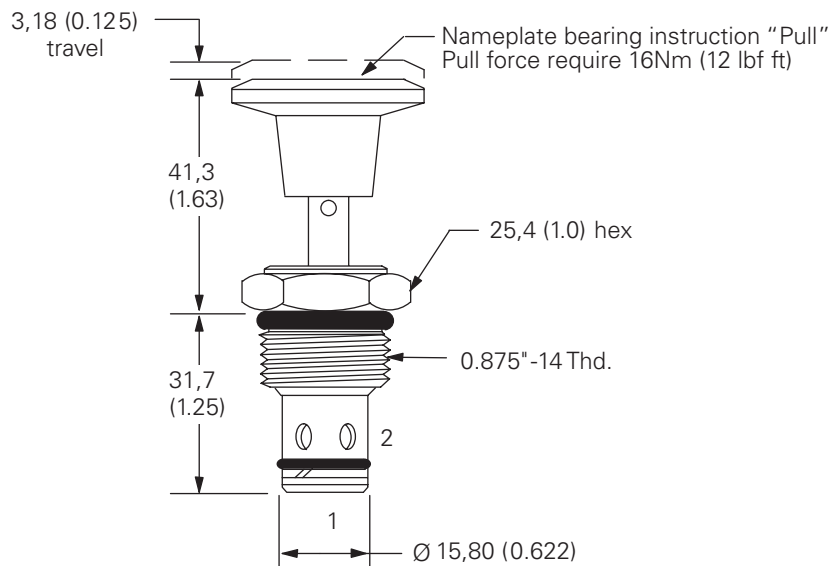
See section J for housing details.

6 Special features
00 - None
(Only required if valve has special features, omitted if "00")
SS - 316 Stainless Steel external components

Dimensions

mm (inch)

Torque cartridge in aluminum housing
47-54 Nm (35-40 ft. lbs)



MPV3-10

Manual pull valve with detent

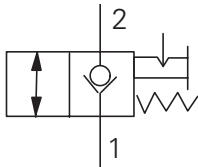
Description

The MPV3-10 is a 2-way, 2 position, manually operated, normally closed, pull-to-open, directional screw-in cartridge valve, **with detent**.

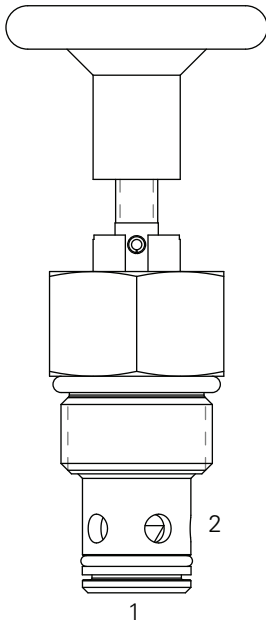
Operation

This valve blocks flow from port 2 to port 1 and will allow flow from port 1 to port 2 when the spring bias is overcome. When the valve is actuated free flow is allowed in both directions.

Functional Symbol



Profile View



RATINGS AND SPECIFICATIONS

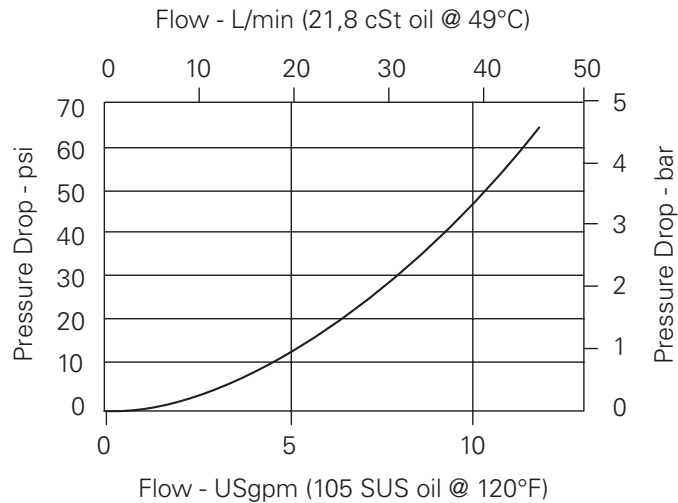
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	45 L/min (12 USgpm)
Internal leakage (port 2 to port 1)	5 drops/min. maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-10-2
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,11 kg (0.24 lbs)
Seal kit	565803 (Buna-N) 566086 (Viton®)

Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

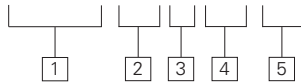
Cartridge only



Caution

Back pressure of 16 bar (240 psi) will unseat the poppet.

MPV3 10 * ** 00



1 Function
MPV3 - Manual pull valve,
 with detent

3 Seals
N - Buna-N
V - Viton®

5 Special features
00 - None
 (Only required if valve has
 special features, omitted
 if "00")

2 Size
10 - 10 Size

4 Port size
00 - Cartridge only

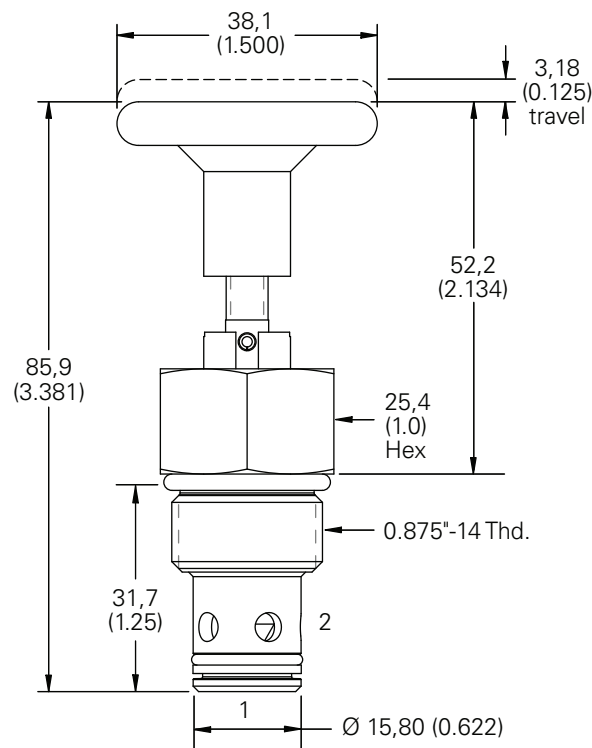
CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-175462	–
6T	SAE 6	566151	–
2G	1/4" BSPP	–	876702
3G	3/8" BSPP	–	876703
6H	SAE 6	–	876700
8H	SAE 8	–	876701

See section J for housing details.

Dimensions

mm (inch)

Torque cartridge in
 aluminum housing
 47-54 Nm (35-40 ft. lbs)



MSV1-12

Manual 'push and twist' valve

Description

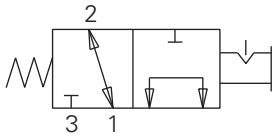
The MSV1-12 is a 3-way, 2 position manual 'push and twist' to actuate type valve.

Operation

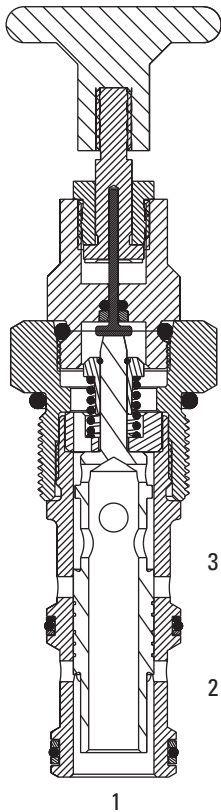
In the normal position, the valve allows flow from port 1 to port 2 while port 3 is blocked.

In the actuated position, flow is allowed from port 3 to port 1 while port 2 is blocked.

Functional Symbol



Profile View



RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	41,8 L/min (11 USgpm)
Internal leakage	350 cc/min (21.5 in ³ /min)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-3
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,29 kg (0.66 lbs)
Seal kit	9900171-000 (Buna-N) 9900172-000 (Viton®)

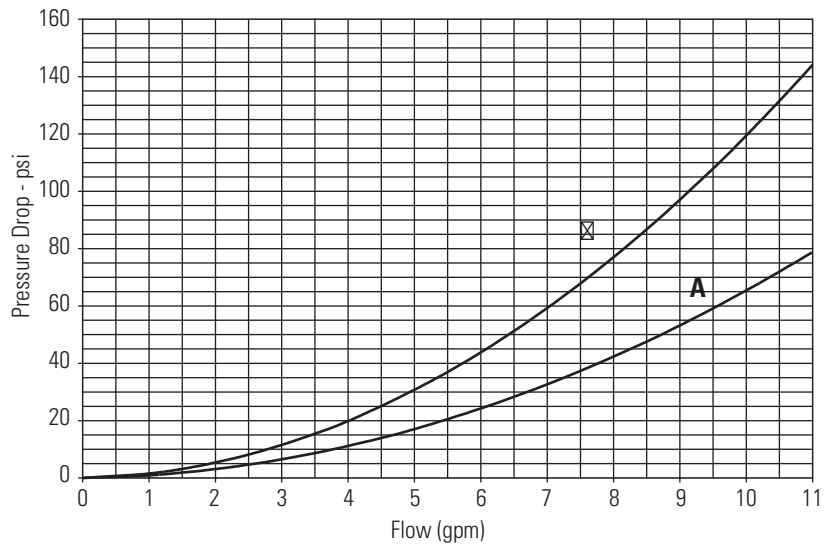
Viton is a registered trademark of E.I. DuPont

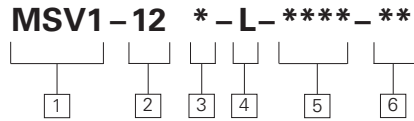
Pressure Drop Curve

Cartridge only

A - P1 to P2

B - P3 to P1





1 **Function**
MSV1 - 3-way, 2 position manual push valve

2 **Size**
12 - 10 Size

3 **Seals**
Blank - Buna-N
V - Viton[®]

4 **Actuation Option**
L - 2 position 'push and twist' actuation
E - Emergency stop actuation
N - No Detent

5 **Port Size**
0 - Cartridge only

6 **Special features**
Blank - No special features

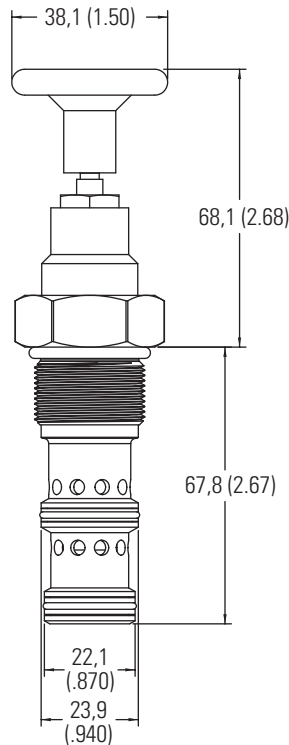


CODE	PORT SIZE	HOUSING NUMBER
		Aluminum
A6G	3/4" BSPP	02-161816
A12H	SAE 12	02-160646

Dimensions

mm (inch)

Torque cartridge in aluminum housing
 81-95 Nm (60-70 ft. lbs)



MSV2-12

Manual 'push and twist' valve

Description

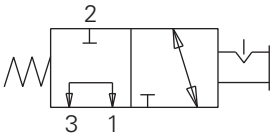
The MSV2-12 is a 3-way, 2 position manual 'push and twist' to actuate type valve.

Operation

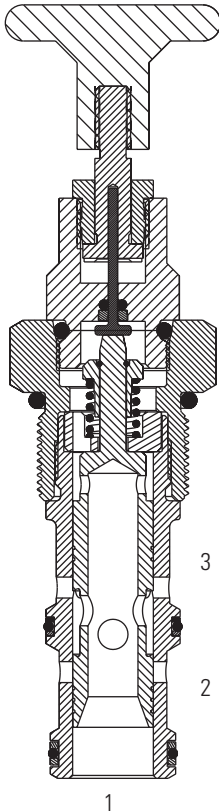
In the normal position, the valve allows flow from port 1 to port 3 while port 2 is blocked.

In the actuated position, flow is allowed from port 2 to port 1 while port 3 is blocked.

Functional Symbol



Profile View



RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	38 L/min (10 USgpm)
Internal leakage	350 cc/min (21.5 in ³ /min)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-3
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,29 kg (0.66 lbs)
Seal kit	9900171-000 (Buna-N) 9900172-000 (Viton®)

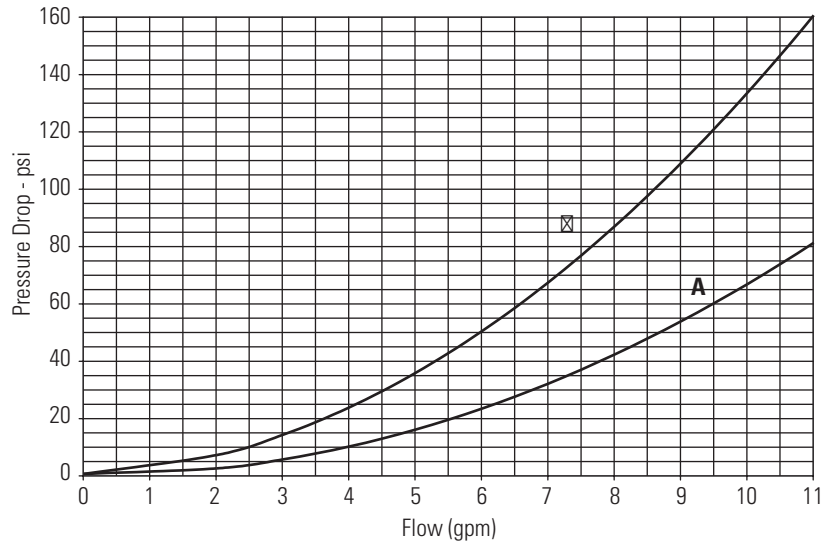
Viton is a registered trademark of E.I. DuPont

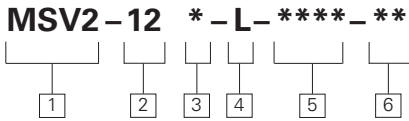
Pressure Drop Curve

Cartridge only

A - P2 to P1

B - P1 to P3





1 **Function**
MSV2 - 3-way, 2 position manual push valve

2 **Size**
12 - 12 Size

3 **Seals**
Blank - Buna-N
V - Viton®

4 **Actuation Option**
L - 2 position 'push and twist' actuation
E - Emergency stop actuation
N - No Detent

5 **Port Size**
0 - Cartridge only

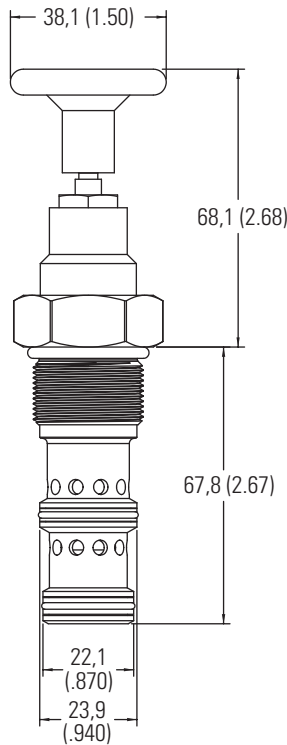
6 **Special features**
Blank - No special features

CODE	PORT SIZE	HOUSING NUMBER
		Aluminum
A6G	3/4" BSPP	02-161816
A12H	SAE 12	02-160646

Dimensions

mm (inch)

Torque cartridge in aluminum housing
 81-95 Nm (60-70 ft. lbs)



MSV5-12

Manual 'push and twist' valve

Description

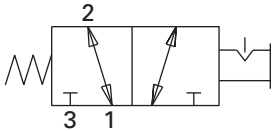
The MSV5-12 is a 3-way, 2 position manual 'push and twist' to actuate type valve.

Operation

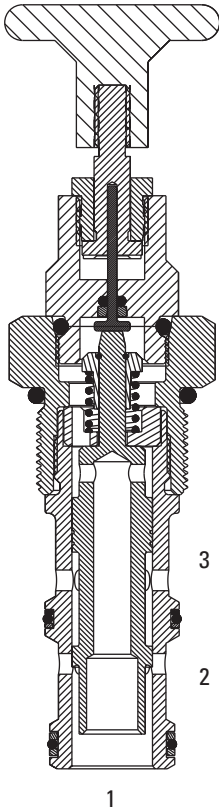
In the normal position, the valve allows flow from port 2 to port 1 while port 3 is blocked.

In the actuated position, flow is allowed from port 3 to port 2 while port 1 is blocked.

Functional Symbol



Profile View



RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	41,8 L/min (11 USgpm)
Internal leakage	350 cc/min (21.5 in ³ /min)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-3
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,29 kg (0.66 lbs)
Seal kit	9900171-000 (Buna-N) 9900172-000 (Viton®)

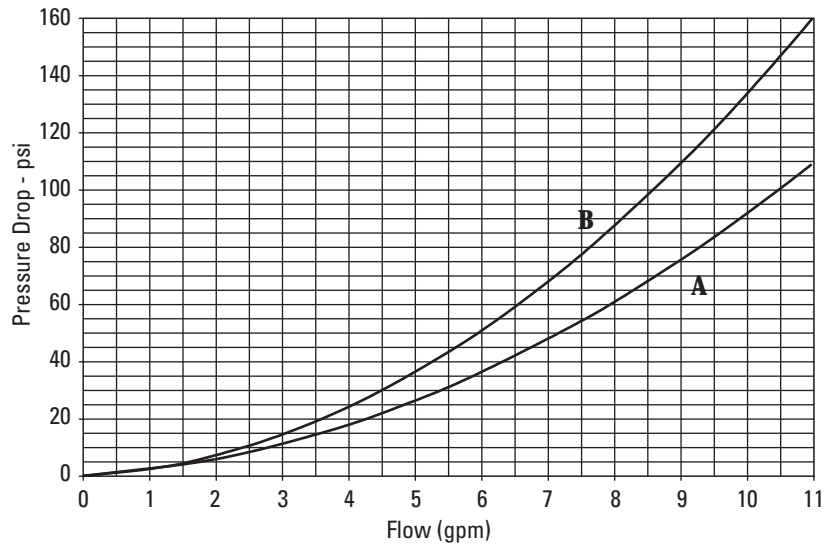
Viton is a registered trademark of E.I. DuPont

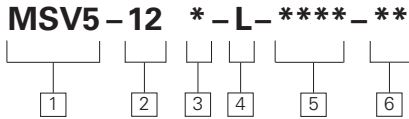
Pressure Drop Curve

Cartridge only

A - P2 to P1

B - P3 to P2





1 **Function**
MSV5 - 3-way, 2 position manual push valve

2 **Size**
12 - 12 Size

3 **Seals**
Blank - Buna-N
V - Viton®

4 **Actuation Option**
L - 2 position 'push and twist' actuation
E - Emergency stop actuation
N - No Detent

5 **Port Size**
0 - Cartridge only

6 **Special features**
Blank - No special features

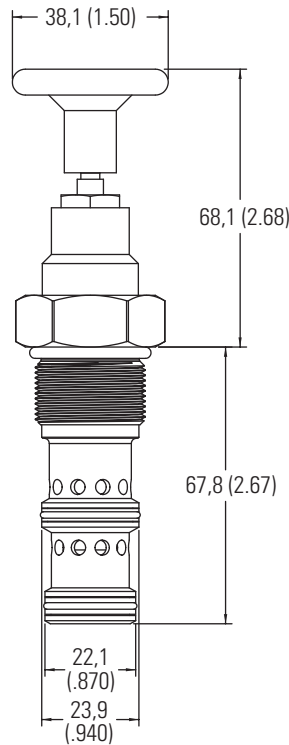


CODE	PORT SIZE	HOUSING NUMBER
		Aluminum
A6G	3/4" BSPP	02-161816
A12H	SAE 12	02-160646

Dimensions

mm (inch)

Torque cartridge in aluminum housing
 81-95 Nm (60-70 ft. lbs)



MSV3-12

Manual 'push and twist' valve

Description

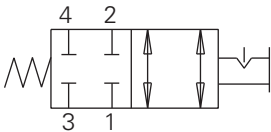
The MSV3-12 is a 4-way, 2 position manual 'push and twist' to actuate type valve.

Operation

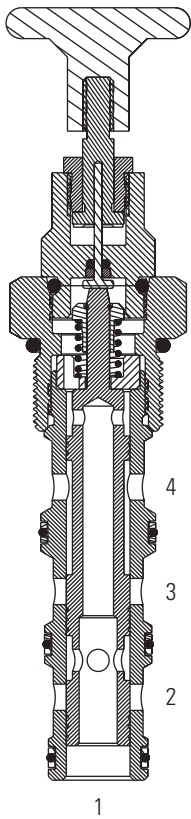
In the normal position, all ports are blocked. In the actuated position, flow is

allowed from port 3 to port 4 and from port 2 to port 1.

Functional Symbol



Profile View



RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	53,2 L/min (14 USgpm)
Internal leakage	350 cc/min (21.5 in ³ /min)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,32 kg (0.71 lbs)
Seal kit	02-160979 (Buna-N) 02160980 (Viton®)

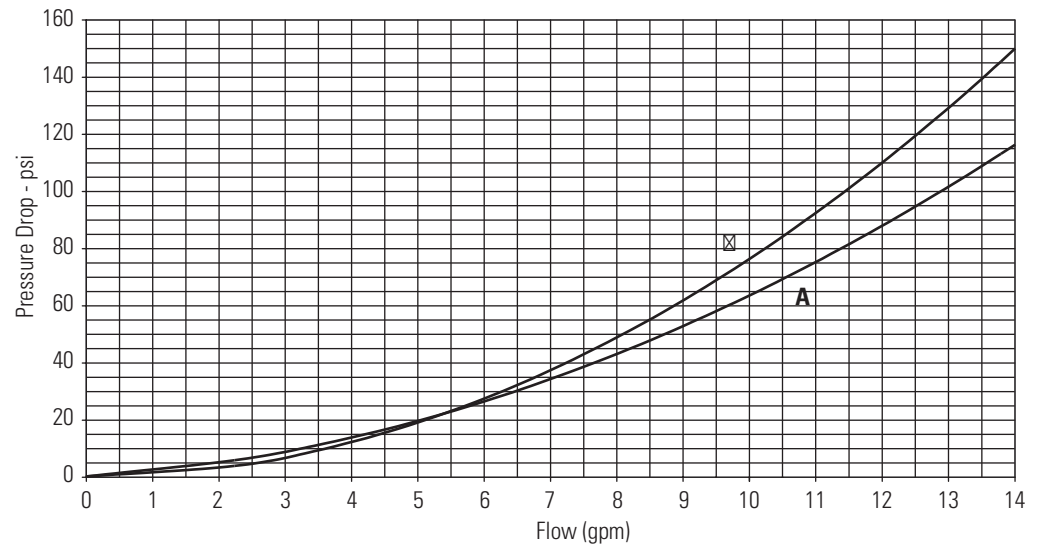
Viton is a registered trademark of E.I. DuPont

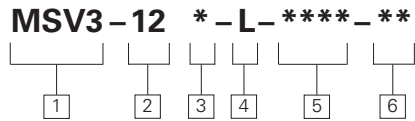
Pressure Drop Curve

Cartridge only

A - P3 to P4

B - P2 to P1





1 Function
MSV3 - 4-way, 2 position manual push valve

2 Size
12 - 12 Size

3 Seals
Blank - Buna-N
V - Viton®

4 Actuation Option
L - 2 position 'push and twist' actuation
E - Emergency stop actuation
N - No Detent

5 Port Size
0 - Cartridge only

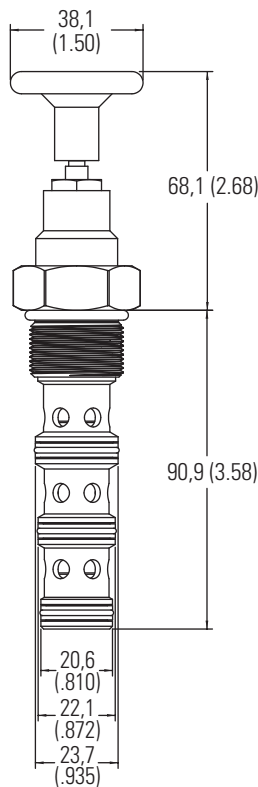
6 Special features
Blank - No special features

CODE	PORT SIZE	HOUSING NUMBER
		Aluminum
A6G	3/4" BSPP	5986432-001
A10H	SAE 10	5986434-001
A12H	SAE 12	5986436-001

Dimensions

mm (inch)

Torque cartridge in aluminum housing
 81-95 Nm (60-70 ft. lbs)



MSV4-12

Manual 'push and twist' valve

Description

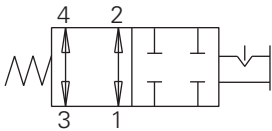
The MSV4-12 is a 4-way, 2 position manual 'push and twist' to actuate type valve.

Operation

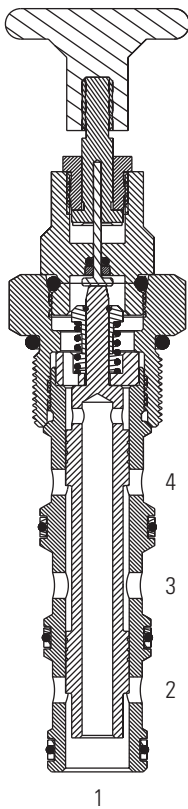
In the normal position, flow is allowed from port 3 to port 4 and from port 2 to port 1.

In the actuated position, all ports are blocked.

Functional Symbol



Profile View



RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	53,2 L/min (14 USgpm)
Internal leakage	350 cc/min (21.5 in ³ /min)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,32 kg (0.71 lbs)
Seal kit	02-160979 (Buna-N) 02160980 (Viton®)

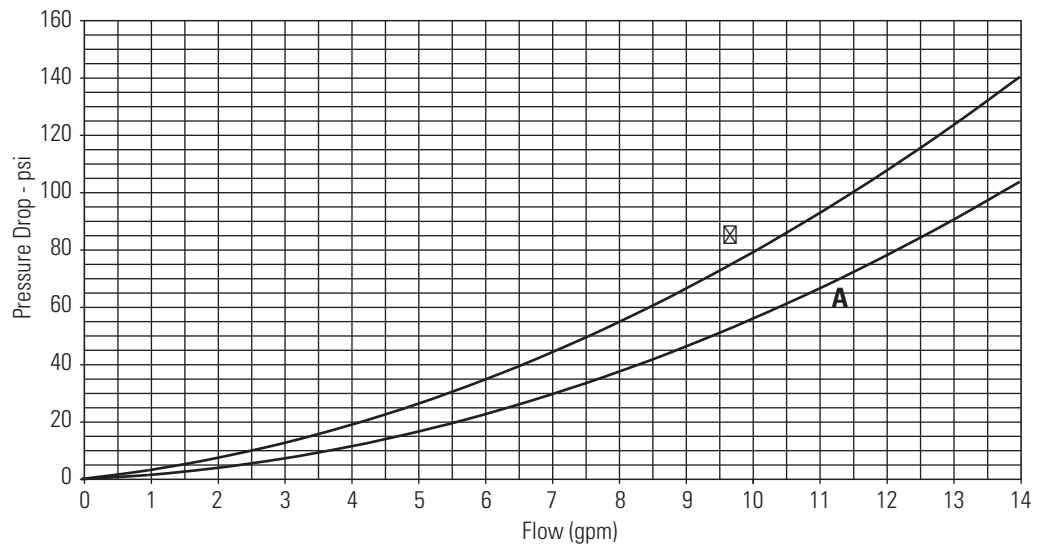
Viton is a registered trademark of E.I. DuPont

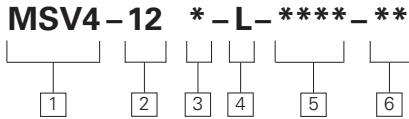
Pressure Drop Curve

Cartridge only

A - P3 to P4

B - P2 to P1





1 **Function**
MSV3 - 4-way, 2 position manual push valve

2 **Size**
 12 - 12 Size

3 **Seals**
Blank - Buna-N
V - Viton®

4 **Actuation Option**
L - 2 position 'push and twist' actuation
E - Emergency stop actuation
N - No Detent

5 **Port Size**
0 - Cartridge only

6 **Special features**
Blank - No special features

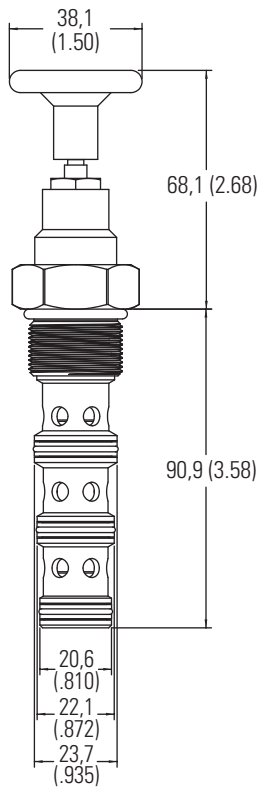


CODE	PORT SIZE	HOUSING NUMBER
		Aluminum
A6G	3/4" BSPP	5986432-001
A10H	SAE 10	5986434-001
A12H	SAE 12	5986436-001

Dimensions

mm (inch)

Torque cartridge in aluminum housing
 81-95 Nm (60-70 ft. lbs)



MSV6-12

Manual 'push and twist' valve

Description

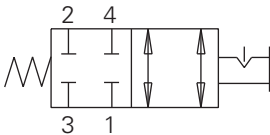
The MSV6-12 is a 4-way, 2 position manual 'push and twist' to actuate type valve.

Operation

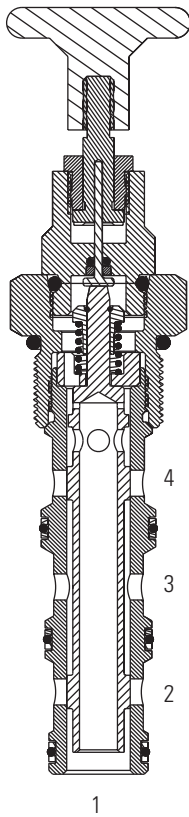
In the normal position, all ports are blocked. In the actuated position, flow is allowed from port 3 to

port 2 and from port 4 to port 1.

Functional Symbol



Profile View



RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	53,2 L/min (14 USgpm)
Internal leakage	350 cc/min (21.5 in ³ /min)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,32 kg (0.71 lbs)
Seal kit	02-160979 (Buna-N) 02-160980 (Viton®)

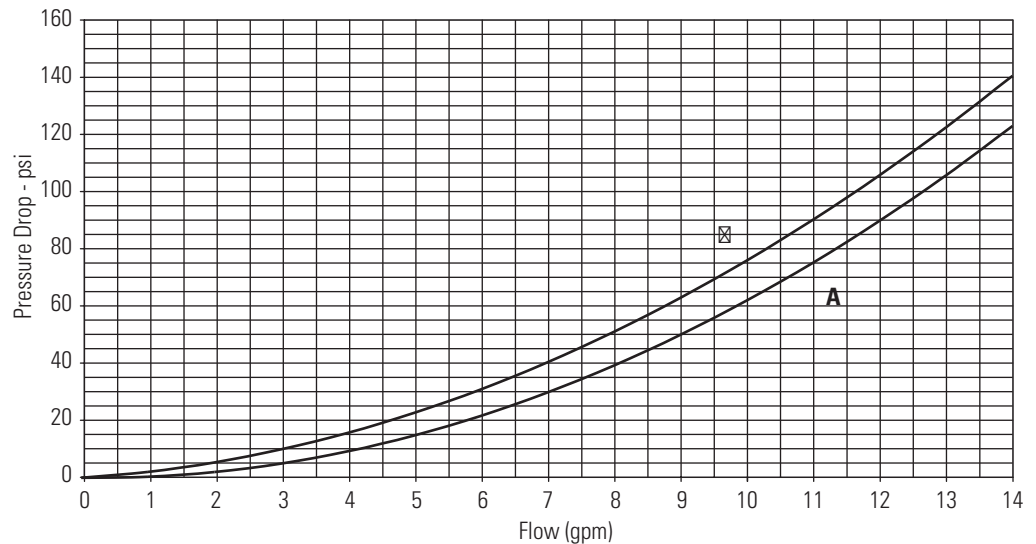
Viton is a registered trademark of E.I. DuPont

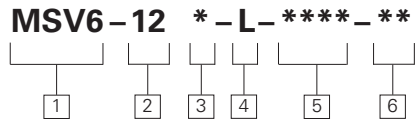
Pressure Drop Curve

Cartridge only

A - P4 to P1

B - P3 to P2





1 Function
MSV6 - 4-way, 2 position manual push valve

2 Size
12 - 12 Size

3 Seals
Blank - Buna-N
V - Viton®

4 Actuation Option
L - 2 position 'push and twist' actuation
E - Emergency stop actuation
N - No Detent

5 Port Size
0 - Cartridge only

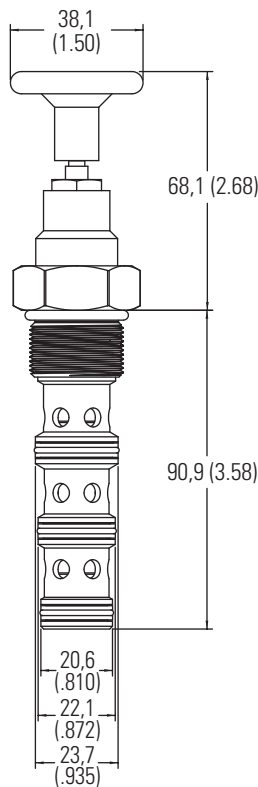
6 Special features
Blank - No special features

CODE	PORT SIZE	HOUSING NUMBER
		Aluminum
A6G	3/4" BSPP	5986432-001
A10H	SAE 10	5986434-001
A12H	SAE 12	5986436-001

Dimensions

mm (inch)

Torque cartridge in aluminum housing
 81-95 Nm (60-70 ft. lbs)



MSV7-12

Manual 'push and twist' valve

Description

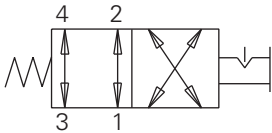
The MSV7-12 is a 4-way, 2 position manual 'push and twist' to actuate type valve.

Operation

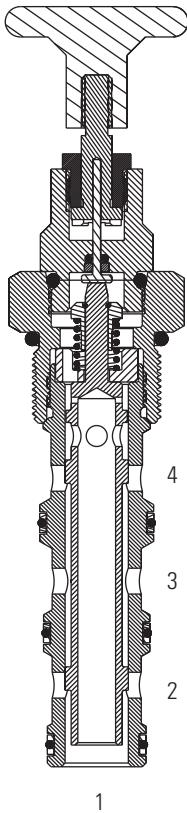
In the normal position, flow is allowed from port 3 to port 4 and from port 2 to port 1.

In the actuated position, flow is allowed from port 3 to port 2 and from port 4 to port 1.

Functional Symbol



Profile View



RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	45 L/min (12 USgpm)
Internal leakage	350 cc/min (21.5 in ³ /min)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,32 kg (0.71 lbs)
Seal kit	02-160979 (Buna-N) 02-160980 (Viton®)

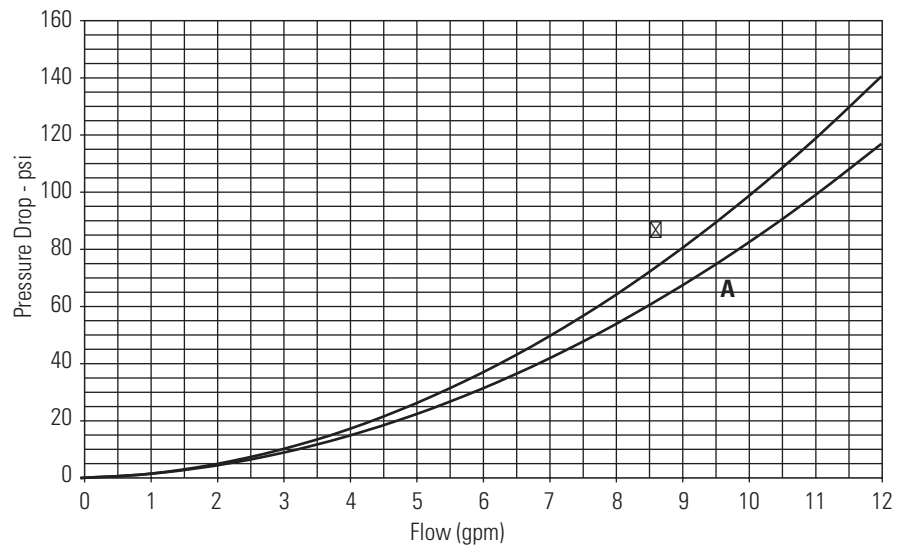
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

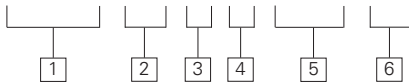
Cartridge only

A - P4 to P1, P3 to P2

B - P2 to P1, P3 to P4



MSV7-12 * - L-**- ****



1 Function
MSV7 - 4-way, 2 position manual push valve

2 Size
12 - 12 Size

3 Seals
Blank - Buna-N
V - Viton®

4 Actuation Option
L - 2 position 'push and twist' actuation
E - Emergency stop actuation
N - No Detent

5 Port Size
0 - Cartridge only

6 Special features
Blank - No special features

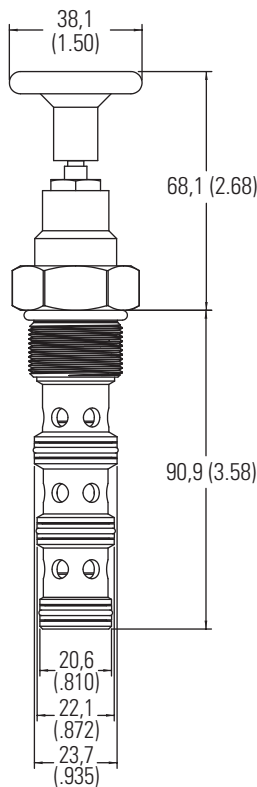


CODE	PORT SIZE	HOUSING NUMBER
		Aluminum
A6G	3/4" BSPP	5986432-001
A10H	SAE 10	5986434-001
A12H	SAE 12	5986436-001

Dimensions

mm (inch)

Torque cartridge in aluminum housing
81-95 Nm (60-70 ft. lbs)



PTS1-10

Pilot to shift valve

Description

The PTS1-10 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

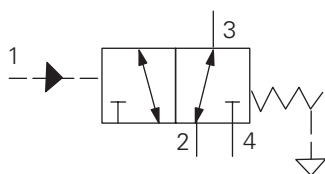
Operation

This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied to port 1 and the

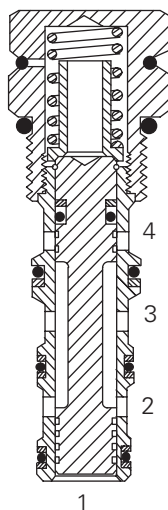
spring bias is overcome. At this time, flow is directed between port 3 and port 4 while blocking port 2. **During the cross-over transition, all**

ports are blocked. The spring chamber for this valve is externally vented to atmosphere.

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

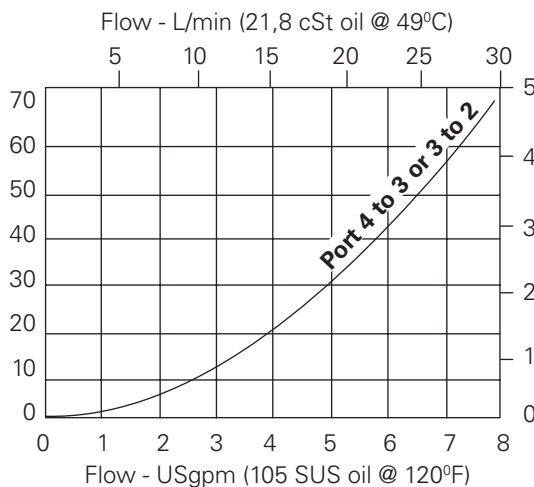
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	30 L/min (8 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi) 160 - 11,0 bar (160 psi)
Pilot displacement volume	0,49 cm ³ (0.02 in ³)
Cavity	C-10-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,14 kg (0.32 lbs)
Seal kit	889625 (Buna-N) 566080 (Viton®)

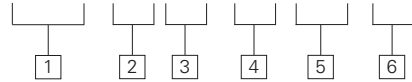
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



PTS1 - 10 (V) - ** - * - 00**



1 Function
PTS1 - Pilot to shift valve

4 Port size
O - Cartridge only

5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)
160 - 11,0 bar (160 psi)

2 Size
10 - 10 Size

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-179705	-
6T	SAE 6	566161	-
2G	1/4" BSPP	-	876709
3G	3/8" BSPP	-	876715
6H	SAE 6	-	876708
8H	SAE 8	-	876713

6 Special features
00 - None
(Only required if valve has special features, omitted if "00")

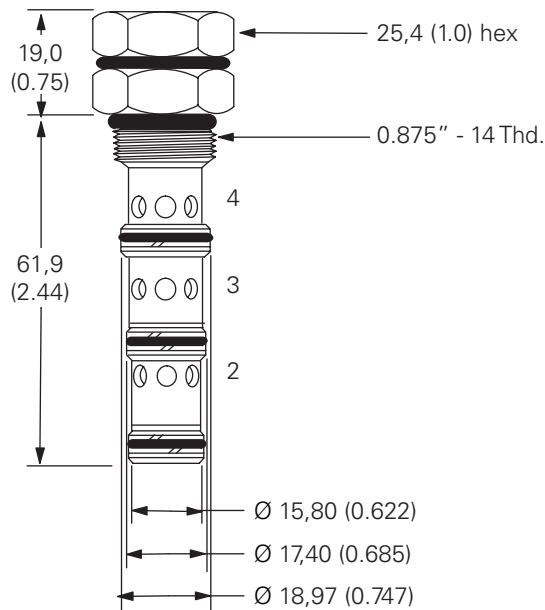
3 Seals
Blank - Buna-N
V - Viton®

See section J for housing details.

Dimensions

mm (inch)

Torque cartridge in aluminum housing
47-54 Nm (35-40 ft. lbs)



PTS1-16

Pilot to shift valve

Description

The PTS1-16 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

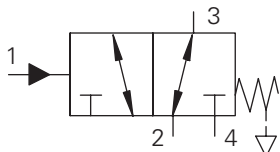
Operation

This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied to port 1 and the

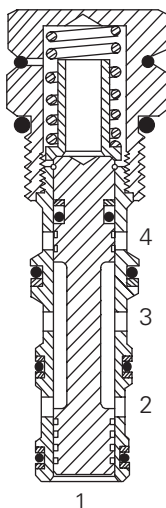
spring bias is overcome. At this time, flow is directed between port 3 and port 4 while blocking port 2. **During the cross-**

over transition, all ports are blocked. The spring chamber for this valve is externally vented to atmosphere.

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

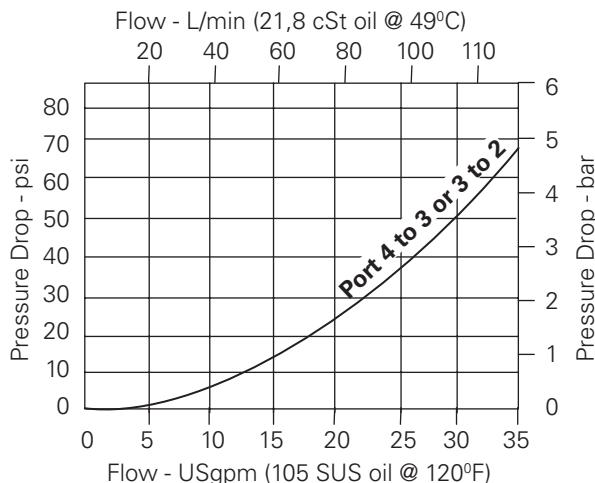
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	132 L/min (35 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi) 160 - 11,0 bar (160 psi)
Pilot displacement volume	1,97 cm ³ (0.12 in ³)
Cavity	C-16-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,5 kg (1.12 lbs)
Seal kit	889634 (Buna-N) 889638 (Viton®)

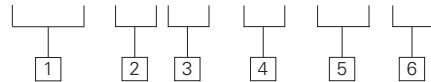
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



PTS1 - 16 (V) - * - *** - 00**



1 Function
PTS1 - Pilot to shift valve

4 Port size
O - Cartridge only

5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)
160 - 11,0 bar (160 psi)

2 Size
16 - 16 Size

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
12T	SAE 12	566411	-
6B	3/4" BSPP	02-175468	-
10H	SAE 10	-	876729
12H	SAE 12	-	876731
4G	1/2" BSPP	-	876728
6G	3/4" BSPP	-	876730

6 Special features
00 - None
(Only required if valve has special features, omitted if "00")

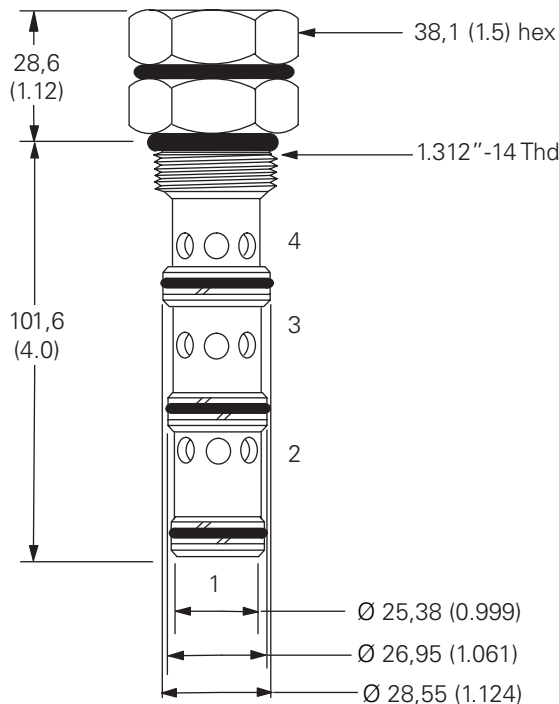
3 Seals
Blank - Buna-N
V - Viton®

See section J for housing details.

Dimensions

mm (inch)

Torque cartridge in aluminum housing
108-122 Nm (80-90 ft. lbs)



PTS1-20

Pilot to shift valve

Description

The PTS1-20 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

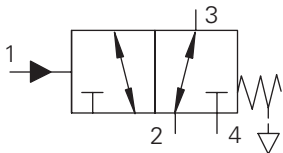
Operation

This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied to port 1 and the

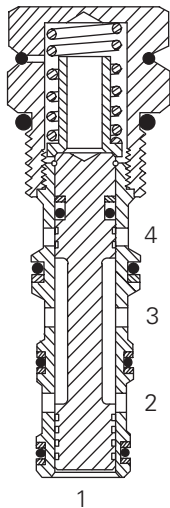
spring bias is overcome. At that time, flow is directed between ports 3 and 4 while blocking port 2. **During the cross-over transition, all ports**

are blocked. The spring chamber for this valve is externally vented to atmosphere.

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

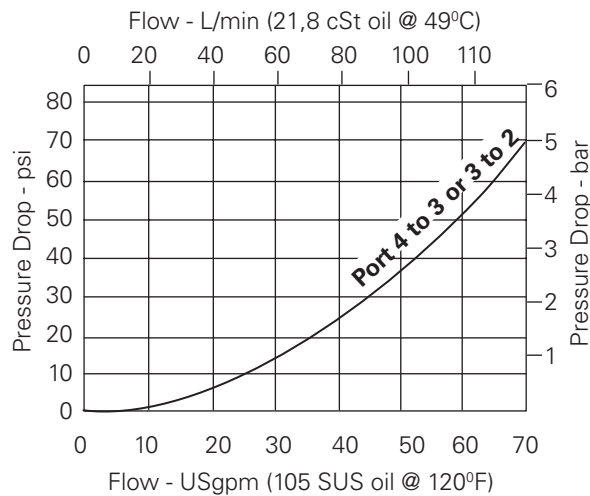
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	265 L/min (70 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi)
Pilot displacement volume	6,72 cm ³ (0.41 in ³)
Cavity	C-20-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	1,1 kg (2.40 lbs)
Seal kit	565916 (Buna-N) 889646 (Viton®)

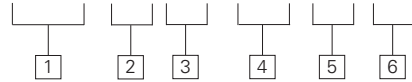
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



PTS1 - 20 (V) - * - ** - 00**



1 Function
PTS1 - Pilot to shift valve

4 Port size
O - Cartridge only

5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)

2 Size
20 - 20 Size

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
16T	SAE 16	566412	-
8B	1" BSPP	02-175469	-
12H	SAE 12	-	876745
16H	SAE 16	-	876747
6G	3/4" BSPP	-	876744
8G	1" BSPP	-	876746

6 Special features
00 - None
(Only required if valve has special features, omitted if "00")

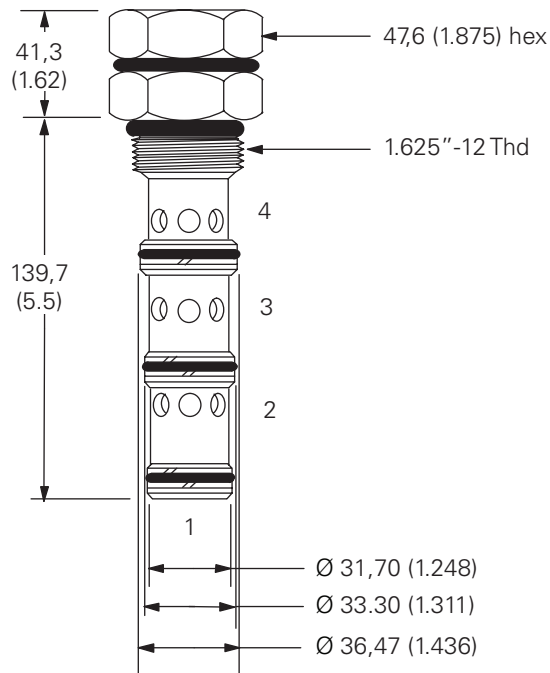
3 Seals
Blank - Buna-N
V - Viton®

See section J for housing details.

Dimensions

mm (inch)

Torque cartridge in aluminum housing
128-155 Nm (95-115 ft. lbs)



PTS2-10

Pilot to shift valve

Description

The PTS2-10 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

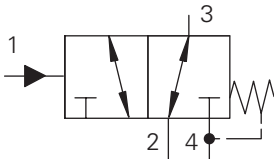
Operation

This valve allows flow between ports 2 and 3 while port 4 is blocked until sufficient pressure has been applied to port 1 and the

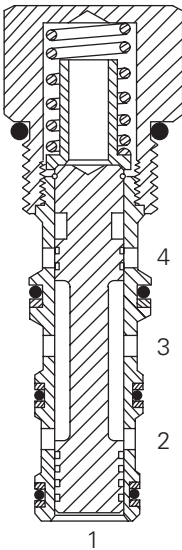
spring bias is overcome. At this time, flow is directed between ports 3 and 4 while blocking port 2. **During the cross-over transition all ports**

are blocked. The spring chamber for this valve is vented internally to port 4 (tank).

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

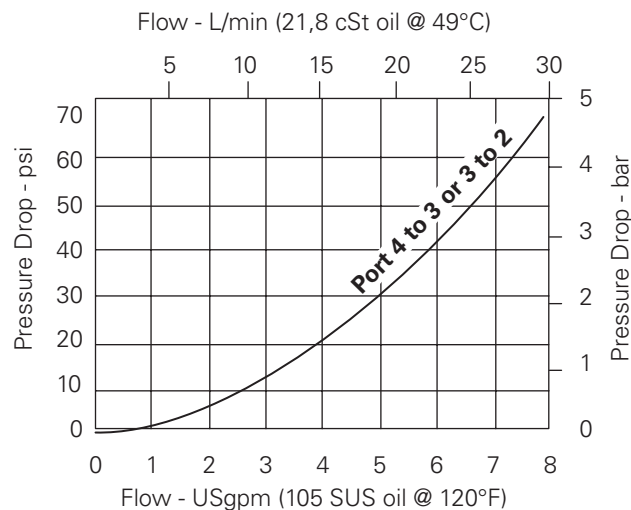
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	30 L/min (8 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi) 160 - 11,0 bar (160 psi)
Pilot displacement volume	0,49 cm ³ (0.02 in ³)
Cavity	C-10-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,14 kg (0.32 lbs)
Seal kit	889625 (Buna-N) 566080 (Viton®)

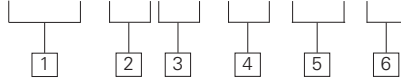
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



PTS2 - 10 (V) - ** - * - 10**



1 Function
PTS2 - Pilot to shift valve

2 Size
10 - 10 Size

3 Seals
Blank - Buna-N
V - Viton®

4 Port size
O - Cartridge only

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-179705	-
6T	SAE 6	566161	-
2G	1/4" BSPP	-	876709
3G	3/8" BSPP	-	876715
6H	SAE 6	-	876708
8H	SAE 8	-	876713

See section J for housing details.

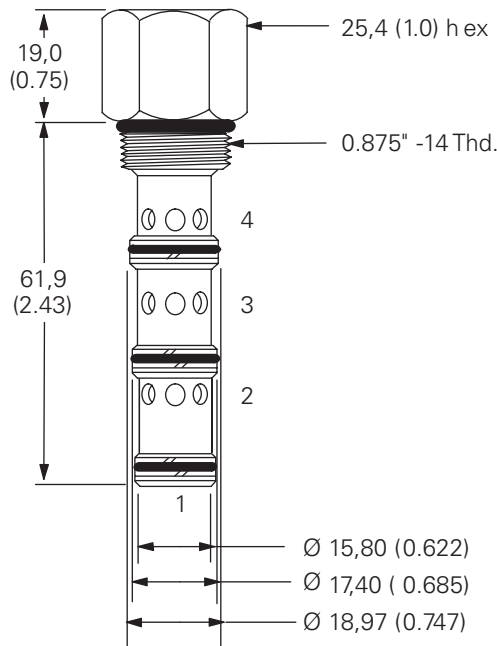
5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)
160 - 11,0 bar (160 psi)

6 Special features
00 - None
(Only required if valve has special features, omitted if "00")

Dimensions

mm (inch)

Torque cartridge in aluminum housing
47-54 Nm (35-40 ft. lbs)



PTS2-16

Pilot to shift valve

Description

The PTS2-16 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

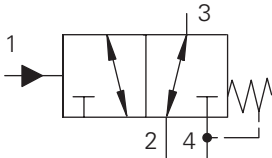
Operation

This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied to port 1 and the

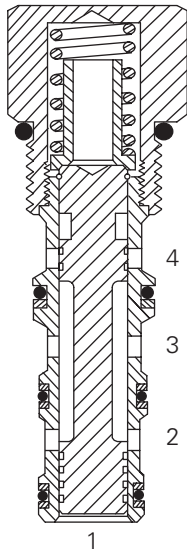
spring bias is overcome. At that time, flow is directed between ports 3 and 4 while blocking port 2. **During the**

cross-over transition, all ports are blocked. The spring chamber for this valve is internally vented to port 4 (tank).

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

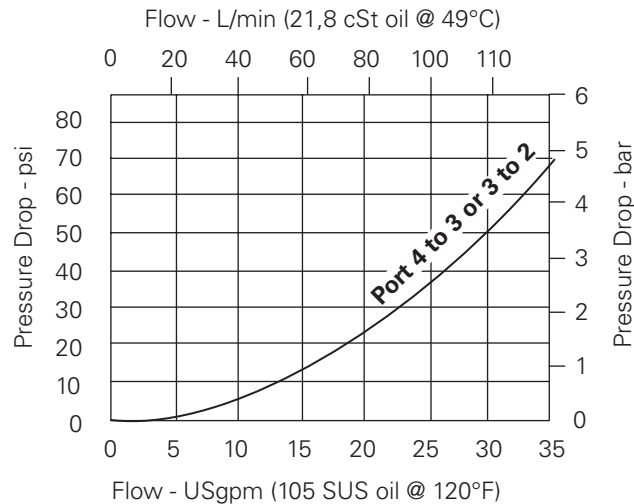
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	132 L/min (35 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi) 160 - 11,0 bar (160 psi)
Pilot displacement volume	1,97 cm ³ (0.12 in ³)
Cavity	C-16-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,5 kg (1.12 lbs)
Seal kit	889634 (Buna-N) 889638 (Viton®)

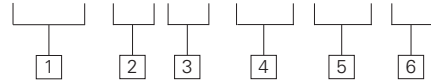
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



PTS2 - 16 (V) - * - *** - 00**



1 Function
PTS2 - Pilot to shift valve

4 Port size
O - Cartridge only

5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)
160 - 11,0 bar (160 psi)

2 Size
16 - 16 Size

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
12T	SAE 12	566411	-
6B	3/4" BSPP	02-175468	-
10H	SAE 10	-	876729
12H	SAE 12	-	876731
4G	1/2" BSPP	-	876728
6G	3/4" BSPP	-	876730

6 Special features
00 - None
(Only required if valve has special features, omitted if "00")
SS - 316TI Stainless Steel external components

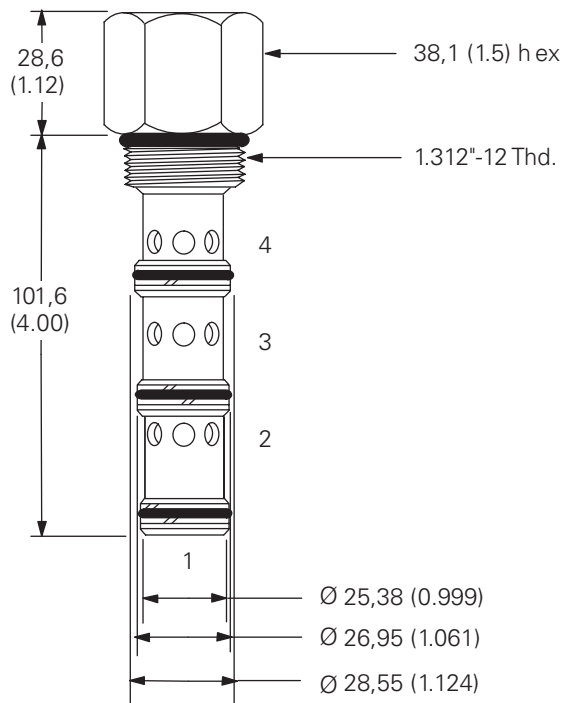
3 Seals
Blank - Buna-N
V - Viton®

See section J for housing details.

Dimensions

mm (inch)

Torque cartridge in aluminum housing
47-54 Nm (35-40 ft. lbs)



PTS2-20

Pilot to shift valve

Description

The PTS2-20 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

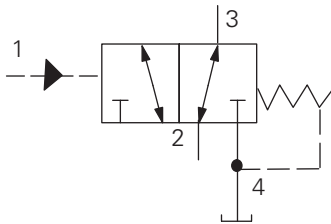
Operation

This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied at port 1 and the

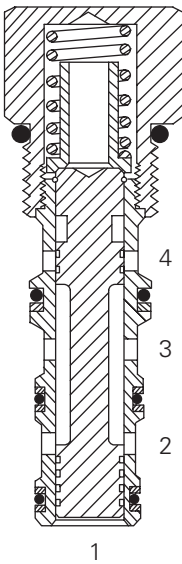
spring bias is overcome. At that time, flow is directed between ports 3 and 4 while blocking port 2. **During the**

cross-over transition, all ports are blocked. The spring chamber for this valve is vented internally to port 4 (tank).

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

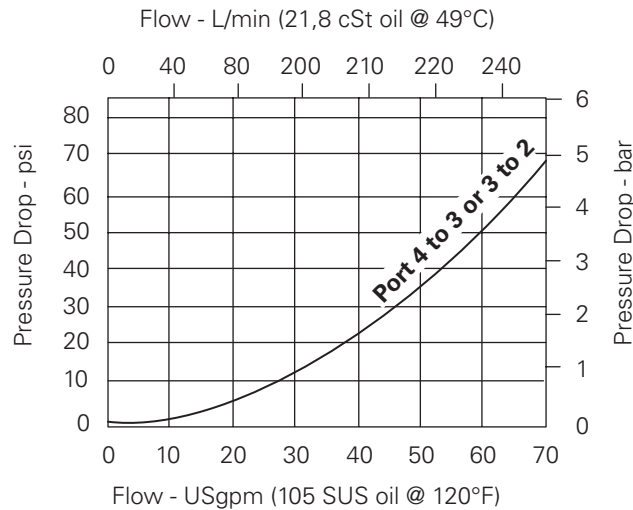
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	265 L/min (70 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi)
Pilot displacement volume	6,72 cm ³ (0.41 in ³)
Cavity	C-20-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,5 kg (1.12 lbs)
Seal kit	565916 (Buna-N) 889646 (Viton®)

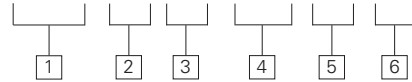
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



PTS2 - 20 (V) - * - ** - 00**



1 Function
PTS2 - Pilot to shift valve

2 Size
20 - 20 Size

3 Seals
Blank - Buna-N

4 Port size
O - Cartridge only

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
16T	SAE 16	566412	-
8B	1" BSPP	02-175469	-
12H	SAE 12	-	876745
16H	SAE 16	-	876747
6G	3/4" BSPP	-	876744
8G	1" BSPP	-	876746

See section J for housing details.

V - Viton®

5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)

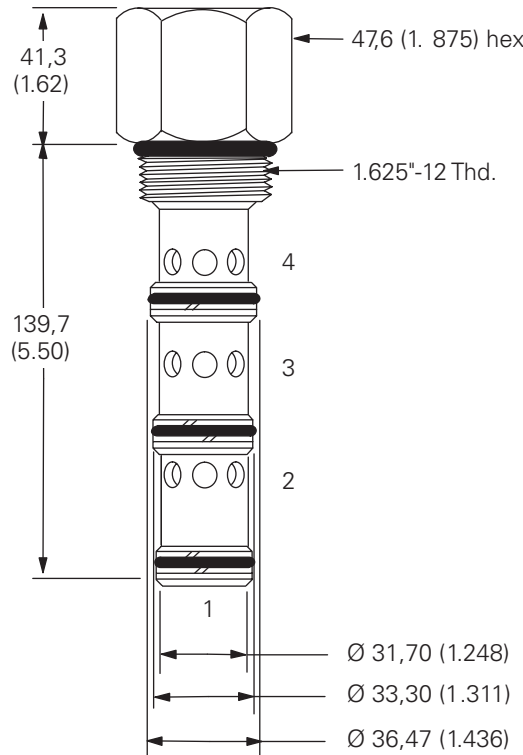
6 Special features
00 - None
(Only required if valve has special features, omitted if "00")



Dimensions

mm (inch)

Torque cartridge in aluminum housing
128-155 Nm (95-115 ft. lbs)



PTS3-10

Pilot to shift valve

Description

The PTS3-10 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

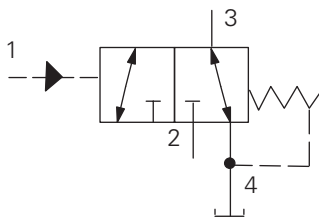
Operation

This valve allows flow between ports 3 and 4 while port 2 is blocked until sufficient pressure has been applied at port 1 and the

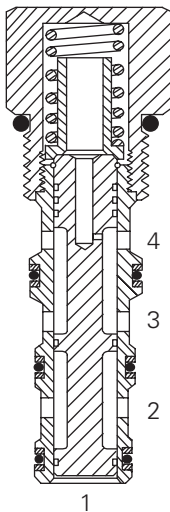
spring bias is overcome. At that time, flow is directed between ports 2 and 3 while blocking port 4. **During the cross-over transition, all ports**

are blocked. The spring chamber for this valve is vented internally to port 4 (tank).

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

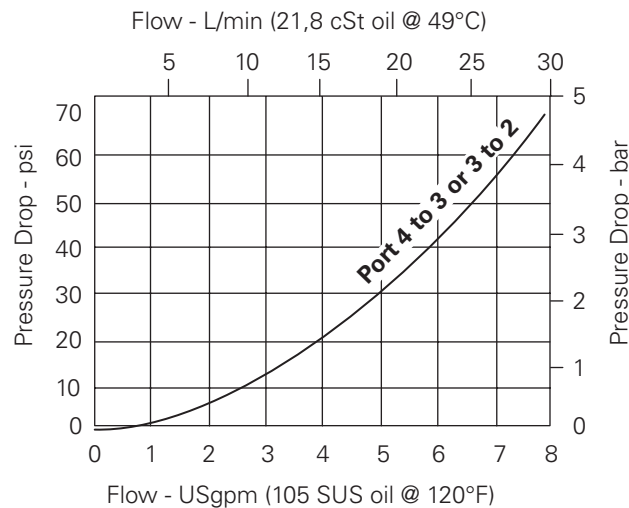
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	30 L/min (8 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi) 160 - 11,0 bar (160 psi)
Pilot displacement volume	0,49 cm ³ (0.02 in ³)
Cavity	C-10-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,14 kg (0.32 lbs)
Seal kit	889625 (Buna-N) 566080 (Viton®)

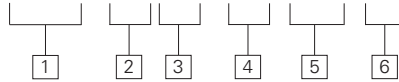
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



PTS3 - 10 (V) - ** - * - 00**



1 Function
PTS3 - Pilot to shift valve

4 Port size
O - Cartridge only

5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)
160 - 11,0 bar (160 psi)

2 Size
10 - 10 Size

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-179705	-
6T	SAE 6	566161	-
2G	1/4" BSPP	-	876709
3G	3/8" BSPP	-	876715
6H	SAE 6	-	876708
8H	SAE 8	-	876713

6 Special features
00 - None
(Only required if valve has special features, omitted if "00")

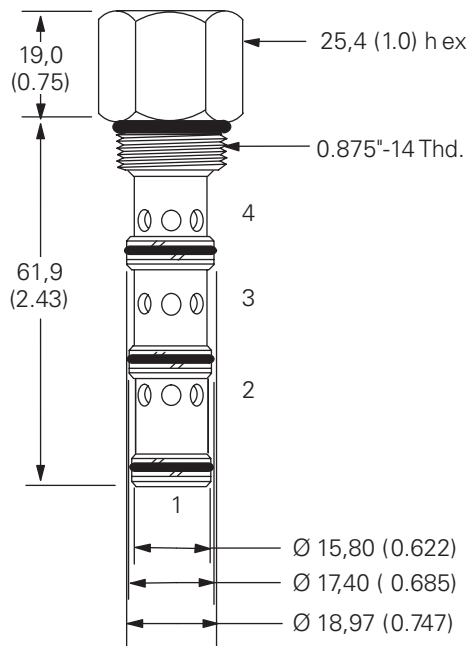
3 Seals
Blank - Buna-N
V - Viton®

See section J for housing details.

Dimensions

mm (inch)

Torque cartridge in aluminum housing
47-54 Nm (35-40 ft. lbs)



PTS3-16

Pilot to shift valve

Description

The PTS3-16 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

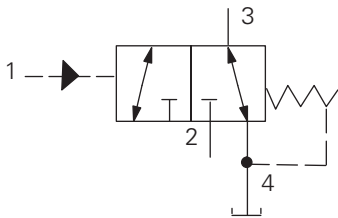
Operation

This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the

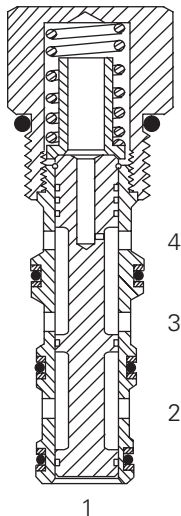
spring bias is overcome. At that time, flow is directed between ports 2 and 3 while blocking port 4. **During the cross-over transition, all ports**

are blocked. The spring chamber for this valve is internally vented to port 4 (tank).

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

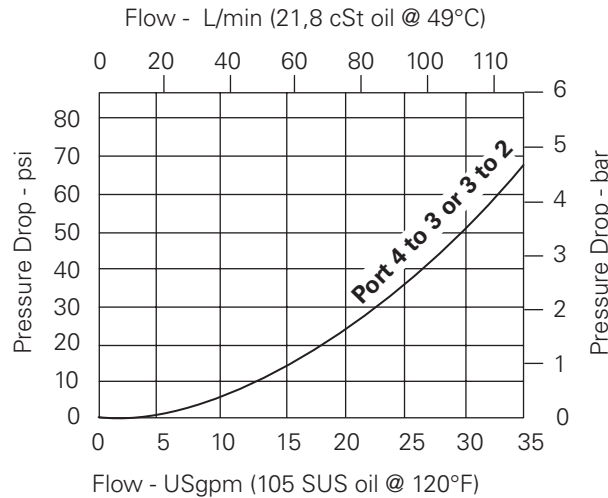
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	132 L/min (35 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi) 160 - 11,0 bar (160 psi)
Pilot displacement volume	1,97 cm ³ (0.12 in ³)
Cavity	C-16-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,5 kg (1.12 lbs)
Seal kit	889634 (Buna-N) 889638 (Viton®)

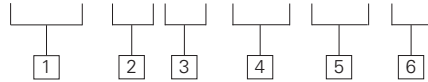
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



PTS3 – 16 (V) – * – *** – 16**



1 Function
PTS3 - Pilot to shift valve

4 Port size
O - Cartridge only

5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)
160 - 11,0 bar (160 psi)

2 Size
16 - 16 Size

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
12T	SAE 12	566411	–
6B	3/4" BSPP	02-175468	–
10H	SAE 10	–	876729
12H	SAE 12	–	876731
4G	1/2" BSPP	–	876728
6G	3/4" BSPP	–	876730

6 Special features
00 - None
(Only required if valve has special features, omitted if "00")
SS - 316TI Stainless Steel external components

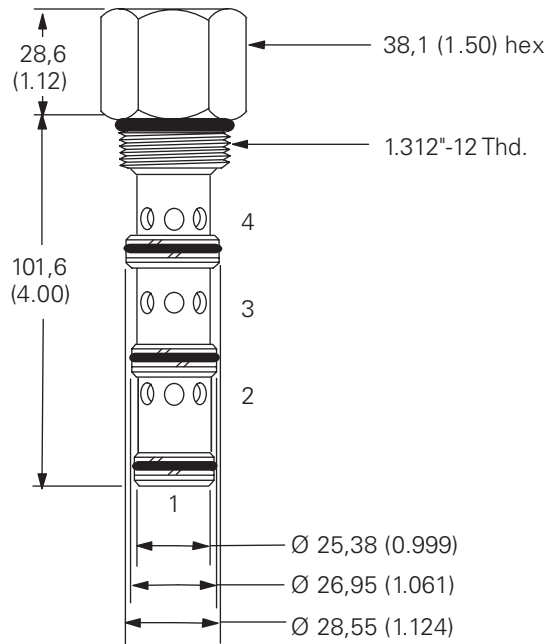
3 Seals
Blank - Buna-N
V - Viton®

See section J for housing details.

Dimensions

mm (inch)

Torque cartridge in aluminum housing
108-122 Nm (80-90 ft. lbs)



PTS3-20

Pilot to shift valve

Description

The PTS3-20 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

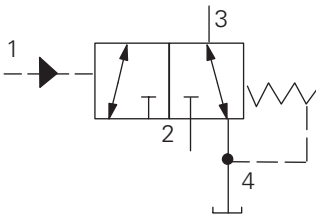
Operation

This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the

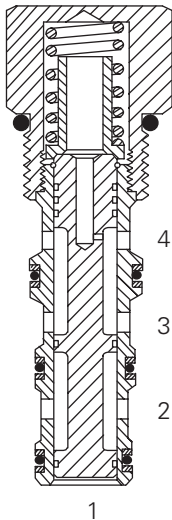
spring bias is overcome. At that time, flow is directed between ports 2 and 3 while blocking port 4. **During the cross-over transition, all ports**

are blocked. The spring chamber for this valve is vented internally to port 4 (tank).

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

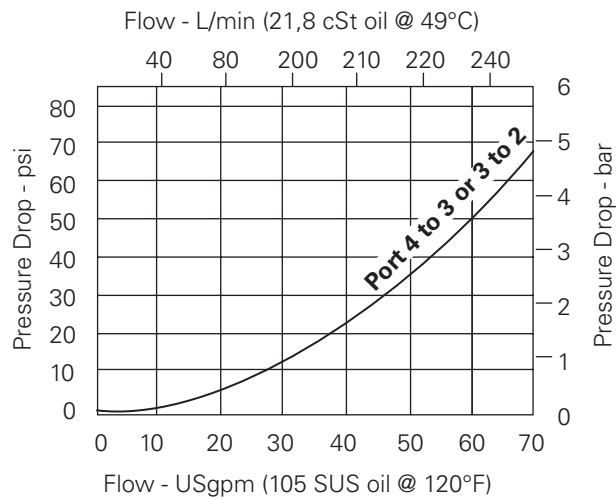
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	265 L/min (70 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	2,75 bar (40 psi) 5,5 bar (80 psi)
Pilot displacement volume	6,72 cm ³ (0.41 in ³)
Cavity	C-20-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,5 kg (1.12 lbs)
Seal kit	565916 (Buna-N) 889646 (Viton®)

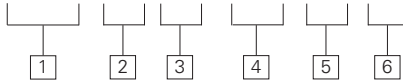
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



PTS3-20 (V) - *-**-00**



1 Function
PTS3 - Pilot to shift valve

4 Port size
O - Cartridge only

5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)

2 Size
20 - 20 Size

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
16T	SAE 16	566412	-
8B	1" BSPP	02-175469	-
12H	SAE 12	-	876745
16H	SAE 16	-	876747
6G	3/4" BSPP	-	876744
8G	1" BSPP	-	876746

6 Special features
00 - None
(Only required if valve has special features, omitted if "00")

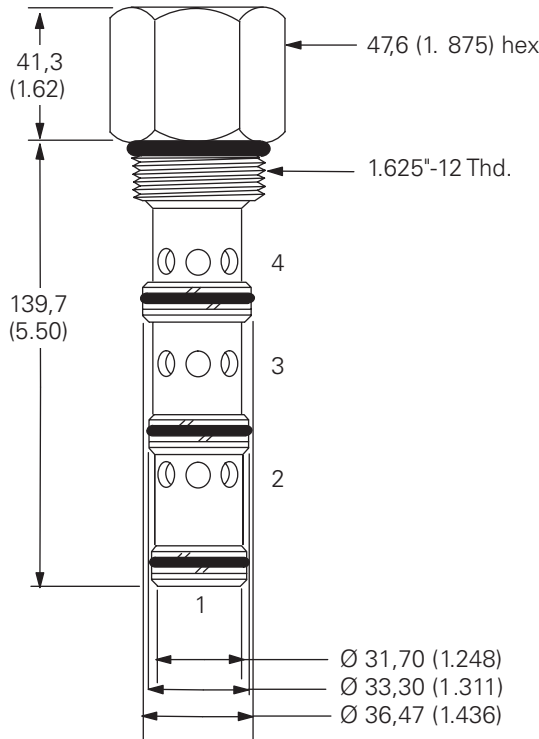
3 Seals
Blank - Buna-N
V - Viton®

See section J for housing details.

Dimensions

mm (inch)

Torque cartridge in aluminum housing
128-155 Nm (95-115 ft. lbs)



PTS4-16

Pilot to shift valve

Description

The PTS4-16 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

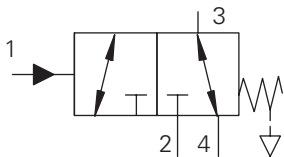
Operation

This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the

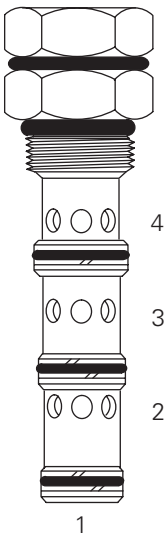
spring bias is overcome. At that time, flow is directed between ports 2 and 3 while blocking port 4. **During the cross-over transition, all ports**

are blocked. The spring chamber for this valve is externally vented to atmosphere.

Functional Symbol



Profile View



RATINGS AND SPECIFICATIONS

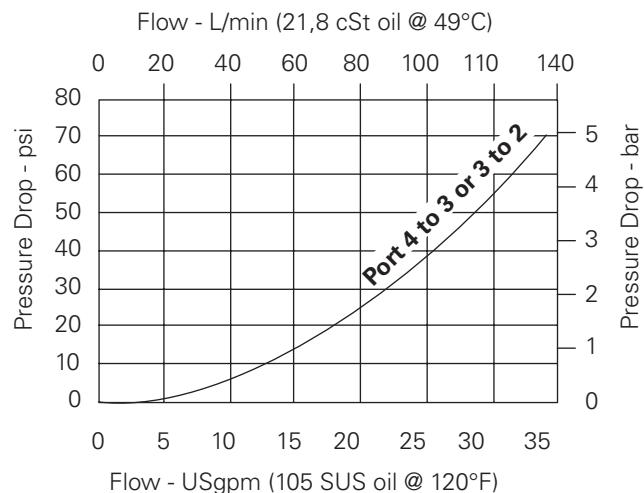
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	132 L/min (35 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi) 160 - 11,0 bar (160 psi)
Pilot displacement volume	1,97 cm ³ (0.12 in ³)
Cavity	C-16-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,5 kg (1.12 lbs)
Seal kit	889634 (Buna-N) 889638 (Viton®)

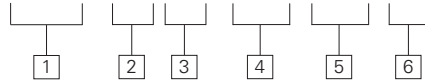
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



PTS4 – 16 (V) – * – *** – 00**



1 Function
PTS4 - Pilot to shift valve

4 Port size
O - Cartridge only

5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)
160 - 11,0 bar (160 psi)

2 Size
16 - 16 Size

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
12T	SAE 12	566411	–
6B	3/4" BSPP	02-175468	–
10H	SAE 10	–	876729
12H	SAE 12	–	876731
4G	1/2" BSPP	–	876728
6G	3/4" BSPP	–	876730

6 Special features
00 - None
(Only required if valve has special features, omitted if "00")

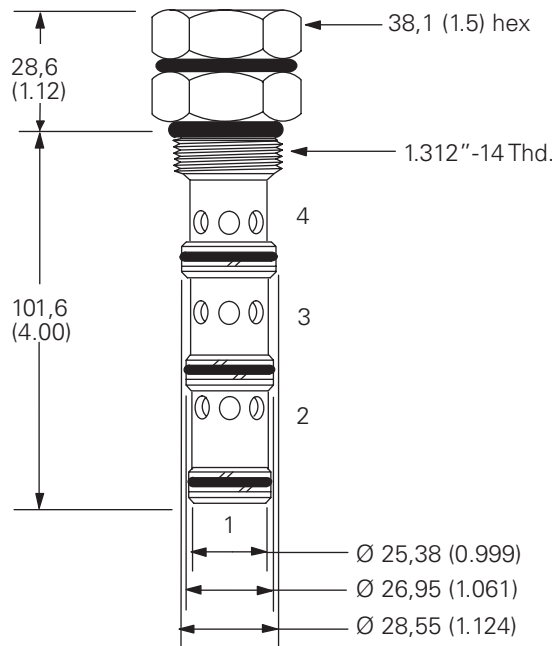
3 Seals
Blank - Buna-N
V - Viton®

See section J for housing details.

Dimensions

mm (inch)

Torque cartridge in aluminum housing
108-122 Nm (80-90 ft. lbs)



PTS5-10

Pilot to shift valve

Description

The PTS5-10 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

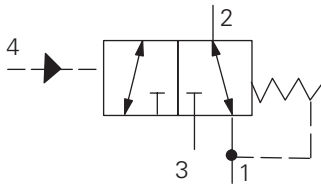
Operation

This valve allows flow between ports 1 and 2 while port 3 is blocked until sufficient pressure has been applied at port 4 and the

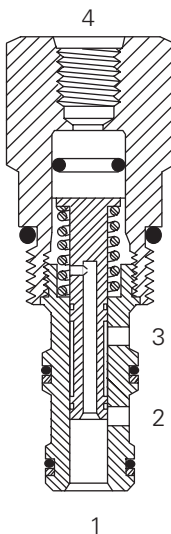
spring bias is overcome. At that time, flow is directed between ports 2 and 3 while blocking port 1. **During the cross-over transition, all ports**

are blocked. The spring chamber for this valve is vented internally to port 1.

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

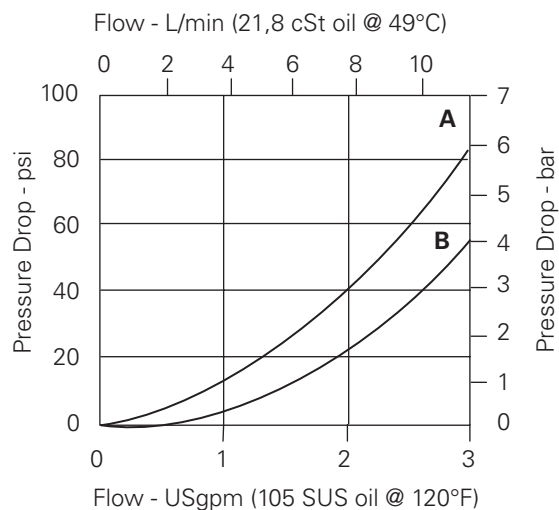
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	11 L/min (3 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressure	3,45 bar (50 psi)
Pilot displacement volume	0,49 cm ³ (0.02 in ³)
Cavity	C-10-3
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,14 kg (0.32 lbs)
Seal kit	889624 (Buna-N) 889628 (Viton®)

Viton is a registered trademark of E.I. DuPont

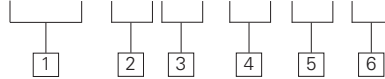
Pressure Drop Curves

Cartridge only

A - Port 3 to 2
B - Port 2 to 1



PTS5 - 10 (V) - ** - ** - 00



1 Function
PTS5 - Pilot to shift valve

4 Port size
O - Cartridge only

5 Pilot to shift (nominal)
50 - 3,45 bar (50 psi)

2 Size
10 - 10 Size

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-173358	-
6T	SAE 6	566162	-
2G	1/4" BSPP	-	876705
3G	3/8" BSPP	-	876714
6H	SAE 6	-	876704
8H	SAE 8	-	876711

6 Special features
00 - None
(Only required if valve has special features, omitted if "00")

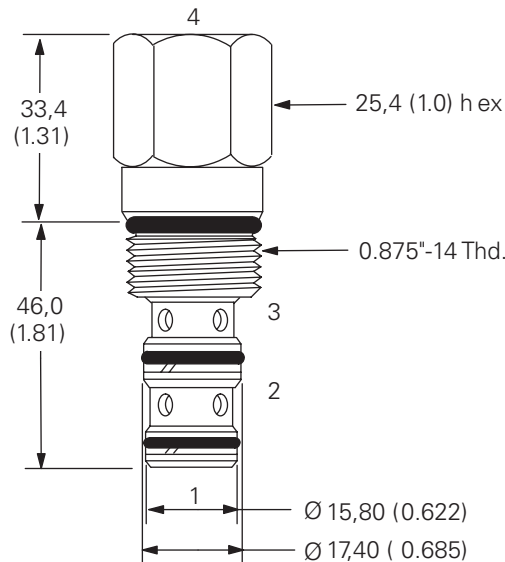
3 Seals
Blank - Buna-N
V - Viton®

See section J for housing details.

Dimensions

mm (inch)

Torque cartridge in aluminum housing
47-54 Nm (35-40 ft. lbs)



PTS5-16

Pilot to shift valve

Description

The PTS5-16 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

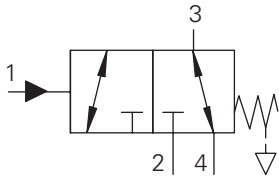
Operation

This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the

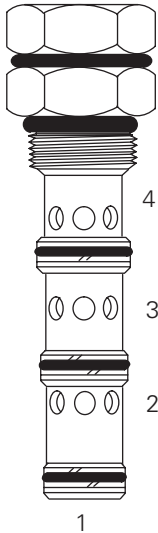
spring bias is overcome. At that time, flow is directed between ports 3 and 2 while blocking port 4. **During the cross-over transition, all ports**

are open. The spring chamber for this valve is externally vented to atmosphere.

Functional Symbol



Profile View



RATINGS AND SPECIFICATIONS

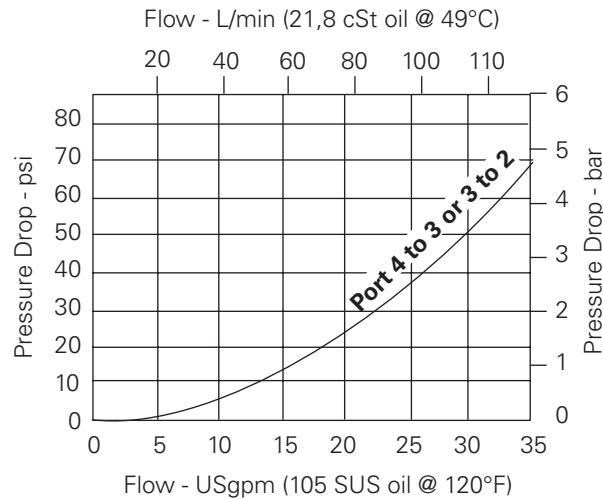
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	132 L/min (35 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi) 160 - 11,0 bar (160 psi)
Pilot displacement volume	1,97 cm ³ (0.12 in ³)
Cavity	C-16-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,5 kg (1.12 lbs)
Seal kit	889634 (Buna-N) 889638 (Viton®)

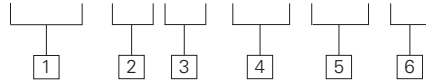
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



PTS5 – 16 (V) – * – *** – 00**



1 Function
PTS5 - Pilot to shift valve

2 Size
16 - 16 Size

3 Seals
Blank - Buna-N

4 Port size
O - Cartridge only

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
12T	SAE 12	566411	–
6B	3/4" BSPP	02-175468	–
10H	SAE 10	–	876729
12H	SAE 12	–	876731
4G	1/2" BSPP	–	876728
6G	3/4" BSPP	–	876730

See section J for housing details.

V - Viton®

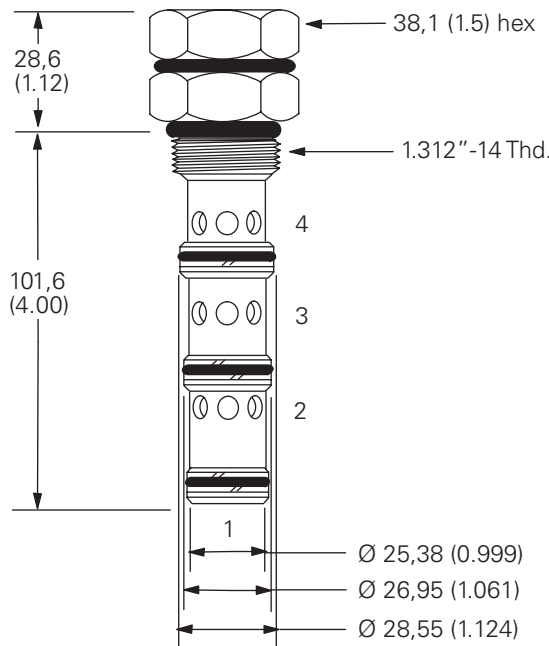
5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)
160 - 11,0 bar (160 psi)

6 Special features
00 - None
(Only required if valve has special features, omitted if "00")

Dimensions

mm (inch)

Torque cartridge in aluminum housing
108-122 Nm (80-90 ft. lbs)



PTS6-10

Pilot to shift valve

Description

The PTS6-10 is a 4-way, 2 position, pilot operated, directional screw-in cartridge valve.

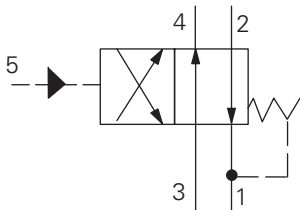
Operation

This valve allows flow between ports 1 and 2 and ports 3 and 4 until sufficient pressure has been applied at port 5 and the spring bias

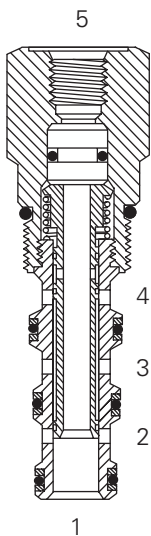
is overcome. At that time, flow is directed between ports 1 and 4 and ports 3 and 2. **During the cross-over transition, all ports are**

blocked. The spring chamber for this valve is vented internally to port 1.

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

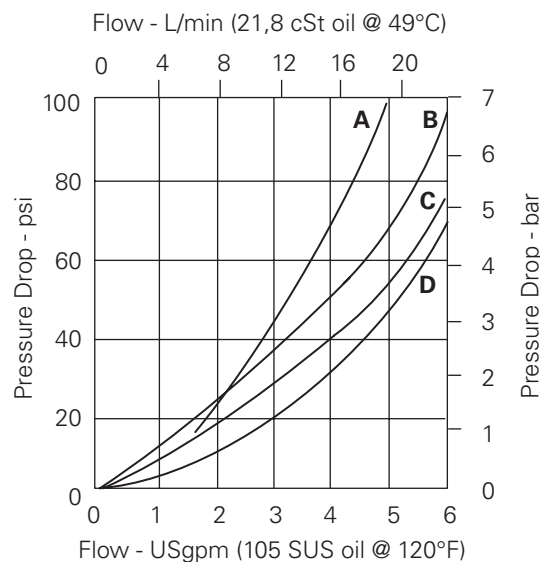
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	23 L/min (6 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressure	4,2 bar (60 psi)
Pilot displacement volume	0,49 cm ³ (0.02 in ³)
Cavity	C-10-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,15 kg (0.33 lbs)
Seal kit	889625 (Buna-N) 566080 (Viton®)

Viton is a registered trademark of E.I. DuPont

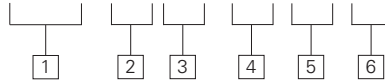
Pressure Drop Curves

Cartridge only

- A - Port 3 to 4
- B - Port 4 to 1
- C - Port 3 to 2
- D - Port 2 to 1



PTS6-10 (V) - ** - ** - 00



1 Function
PTS6 - Pilot to shift valve

4 Port size
O - Cartridge only

5 Pilot to shift (nominal)
60 - 4,2 bar (60 psi)

2 Size
10 - 10 Size

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-179705	-
6T	SAE 6	566161	-
2G	1/4" BSPP	-	876709
3G	3/8" BSPP	-	876715
6H	SAE 6	-	876708
8H	SAE 8	-	876713

6 Special features
00 - None
(Only required if valve has special features, omitted if "00")

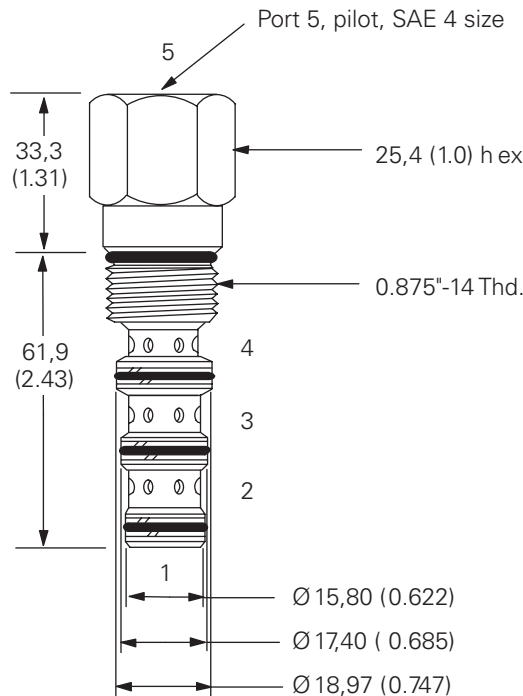
3 Seals
Blank - Buna-N
V - Viton®

See section J for housing details.

Dimensions

mm (inch)

Torque cartridge in aluminum housing
47-54 Nm (35-40 ft. lbs)



PTS6-16

Pilot to shift valve

Description

The PTS6-16 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

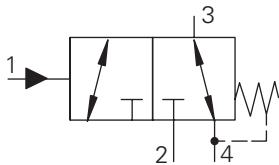
Operation

This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the

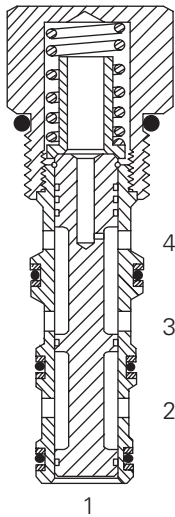
spring bias is overcome. At that time, flow is directed between ports 3 and 2 while blocking port 4. **During the cross-over transition, all ports**

are open. The spring chamber for this valve is externally vented to Port 4 (tank).

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

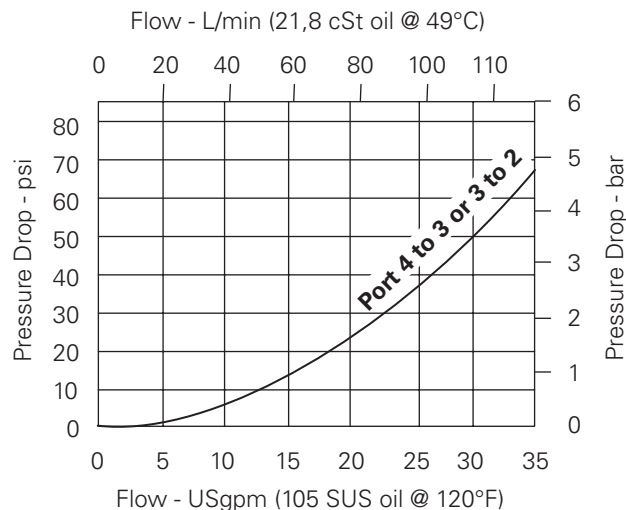
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	132 L/min (35 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi) 160 - 11,0 bar (160 psi)
Pilot displacement volume	1,97 cm ³ (0.12 in ³)
Cavity	C-16-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,5 kg (1.12 lbs)
Seal kit	889634 (Buna-N) 889638 (Viton®)

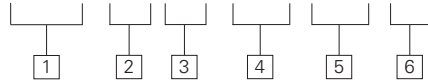
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



PTS6 – 16 (V) – * – *** – 00**



1 Function
PTS6 - Pilot to shift valve

4 Port size
O - Cartridge only

5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)
160 - 11,0 bar (160 psi)

2 Size
16 - 16 Size

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
12T	SAE 12	566411	–
6B	3/4" BSPP	02-175468	–
10H	SAE 10	–	876729
12H	SAE 12	–	876731
4G	1/2" BSPPSAE 6	–	876728
6G	3/4" BSPP	–	876730

6 Special features
00 - None
(Only required if valve has special features, omitted if "00")
SS - 316TI Stainless Steel external components

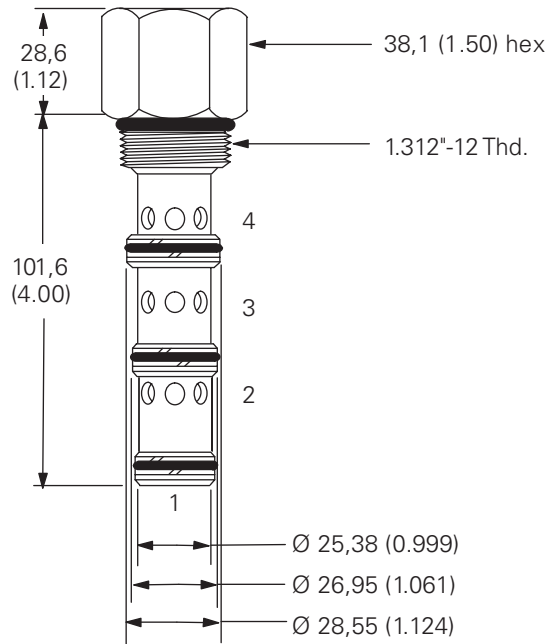
3 Seals
Blank - Buna-N
V - Viton®

See section J for housing details.

Dimensions

mm (inch)

Torque cartridge in aluminum housing
108-122 Nm (80-90 ft. lbs)



PTS7-10

Pilot to shift valve

Description

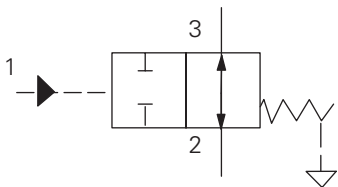
The PTS7-10 is a 2-way, 2 position, pilot operated, directional screw-in cartridge valve.

Operation

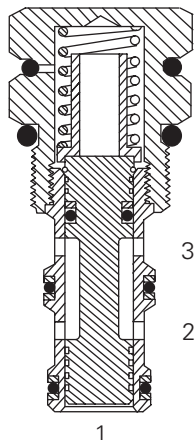
This valve allows flow between ports 2 and 3 until sufficient pressure at port 1 overcomes the spring bias, which closes both ports.

The spring chamber for this valve is externally vented to atmosphere.

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

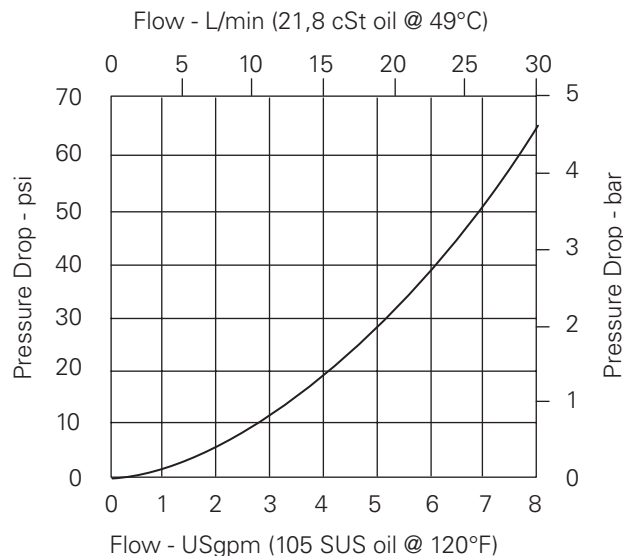
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	30 L/min (8 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi) 160 - 11,0 bar (160 psi)
Pilot displacement volume	0,49 cm ³ (0.02 in ³)
Cavity	C-10-3
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,10 kg (0.23 lbs)
Seal kit	889624 (Buna-N) 889628 (Viton®)

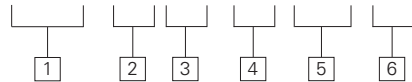
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



PTS7-10 (V) - ** - * - 00**



1 Function
PTS7 - Pilot to shift valve

4 Port size
O - Cartridge only

5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)
160 - 11,0 bar (160 psi)

2 Size
10 - 10 Size

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-173358	-
6T	SAE 6	566162	-
2G	1/4" BSPP	-	876705
3G	3/8" BSPP	-	876714
6H	SAE 6	-	876704
8H	SAE 8	-	876711

6 Special features
00 - None
(Only required if valve has special features, omitted if "00")

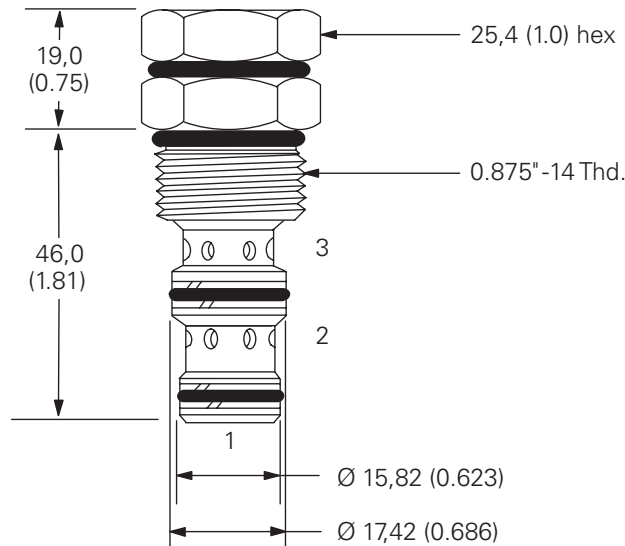
3 Seals
Blank - Buna-N
V - Viton®

See section J for housing details.

Dimensions

mm (inch)

Torque cartridge in aluminum housing
47-54 Nm (35-40 ft. lbs)



PTS9-8

Pilot to shift valve

Description

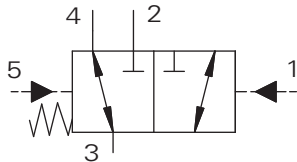
The PTS 9-8 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

Operation

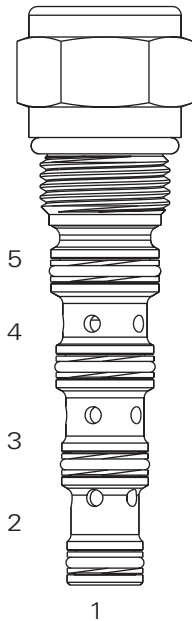
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome. At that time flow is

directed between ports 3 and 2 while blocking port 4. **During the cross-over transition, all ports are open.** The spring chamber for this valve is vented to port 5.

Functional Symbol



Profile View



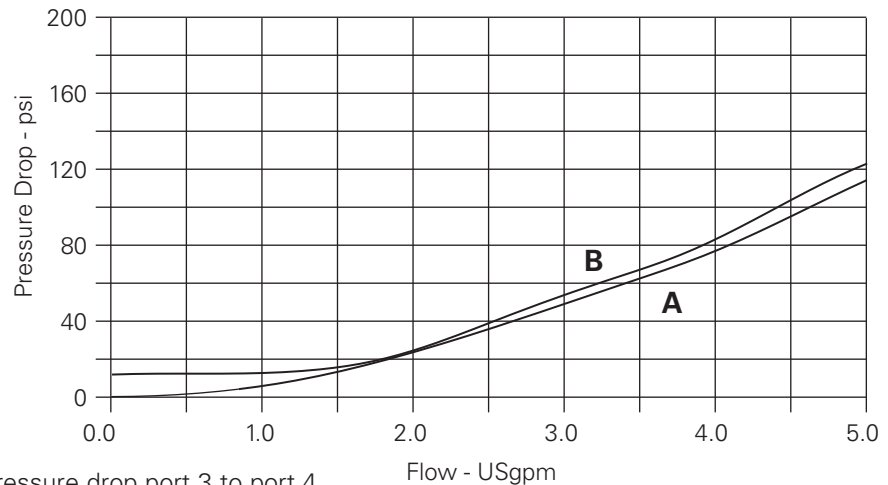
RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

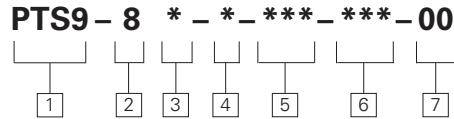
Typical application pressure (all ports)	280 bar (4000 psi)
Cartridge fatigue pressure (infinite life)	280 bar (4000 psi)
Rated inlet flow	19 L/min (5 USgpm)
Transition	All ports open
Internal leakage	164 cc/min (10 in ³ /min) @ 3000 PSID
Temperature range	-40° to 100°C (-40° to 210°F)
Cavity	C-8-5S
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing material	Aluminum or steel
Weight cartridge only	
Seal kit	

Performance Curves

Cartridge only



A - Pressure drop port 3 to port 4
B - Pressure drop port 3 to port 2



1 Function
PTS9 - Pilot to shift valve

4 Body
O - Cartridge only

5 Ports*

CODE	PORT SIZE		HOUSING NUMBER	
	Port 2, 3 & 4	Port 1 & 5	Aluminum	Steel
000	No Body	-	-	-

2 Size
8 - C-8-5S Cavity

3 Seals
N - Buna-N
V - Viton

6 Shift Pressure
080 psi (5,5 bar)
160 psi (11,0 bar)

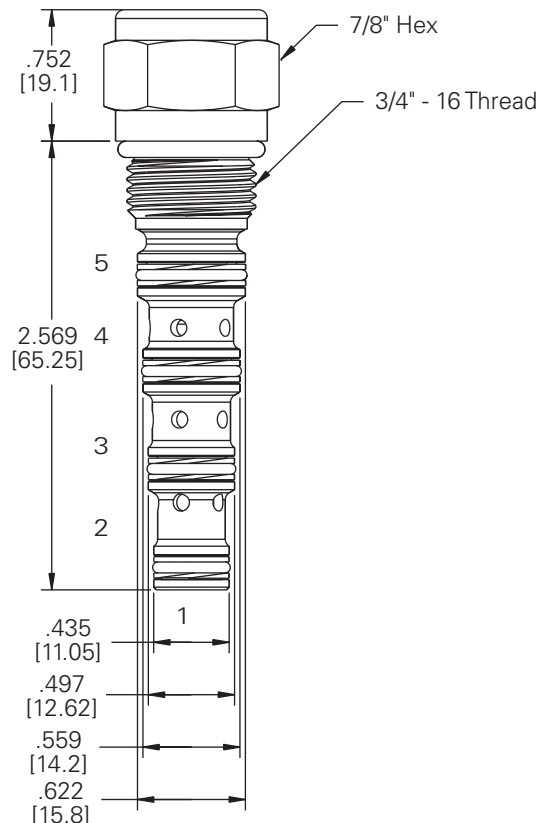
7 Special features
00 - None
(Only required if valve has special features, omitted if "00")

* These model digits will not be stamped on the valve.

Dimensions

mm (inch)

Torque cartridge in housing:
A - 34-41 Nm (25-30 ft. lbs)
S - 34-41 Nm (25-30 ft. lbs)



Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings **must** be used for operating pressures **above** 210 bar (3000 psi).

PTS9-10

Pilot to shift valve

Description

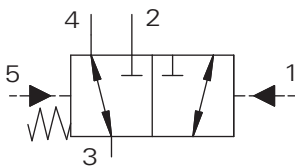
The PTS 9-10 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

Operation

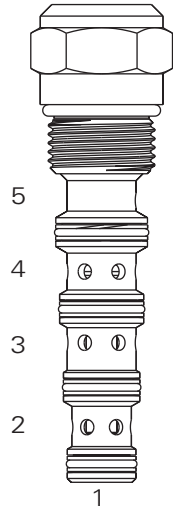
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome. At that time flow is

directed between ports 3 and 2 while blocking port 4. **During the cross-over transition, all ports are open.** The spring chamber for this valve is vented to port 5.

Functional Symbol



Profile View



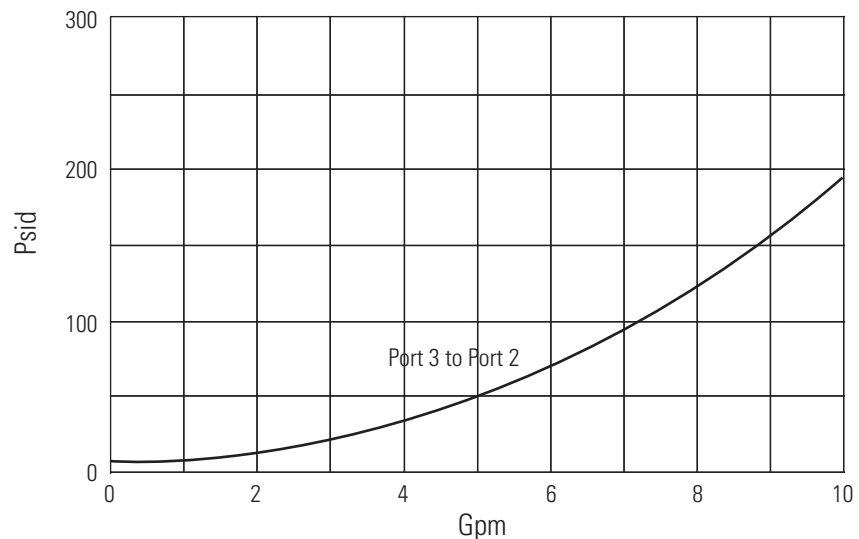
RATINGS AND SPECIFICATIONS

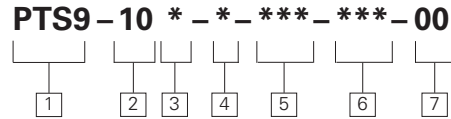
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	280 bar (4000 psi)
Cartridge fatigue pressure (infinite life)	280 bar (4000 psi)
Rated inlet flow	38 L/min (10 USgpm)
Transition	All ports open
Internal leakage	164 cc/min (10 in ³ /min) @ 3000 PSID
Temperature range	-40° to 100°C (-40° to 210°F)
Cavity	C-10-5S
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing material	Aluminum or steel
Weight cartridge only	
Seal kit	

Performance Curves

Cartridge only





1 Function
PTS9 - Pilot to shift valve

4 Body
O - Cartridge only

5 Ports*

CODE	PORT SIZE		HOUSING NUMBER	
	Port 1, 2, 3 & 4	Port 5	Aluminum	Steel
000	No Body	-	-	-

2 Size
10 - C-10-5S Cavity

3 Seals
N - Buna-N
V - Viton

6 Shift Pressure
080 psi (5,5 bar)
100 psi (6,9 bar)
160 psi (11,0 bar)

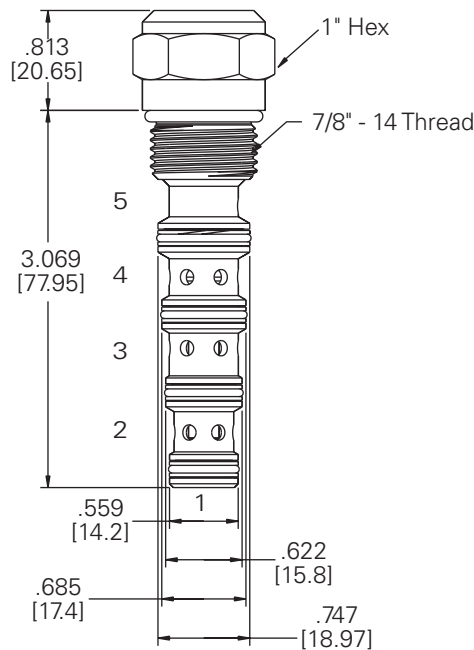
7 Special features
00 - None
(Only required if valve has special features, omitted if "00")

* These model digits will not be stamped on the valve.

Dimensions

mm (inch)

Torque cartridge in housing:
A - 47-54 Nm (35-40 ft. lbs)
S - 68-75 Nm (50-55 ft. lbs)



Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings **must** be used for operating pressures **above** 210 bar (3000 psi).

PTS9-12

Pilot to shift valve

Description

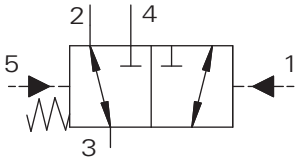
The PTS 9-12 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

Operation

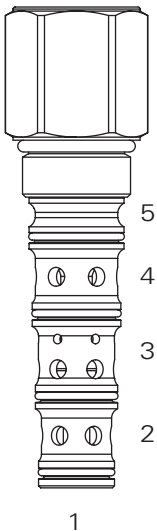
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome. At that time flow is

directed between ports 3 and 2 while blocking port 4. **During the cross-over transition, all ports are open.** The spring chamber for this valve is vented to port 5.

Functional Symbol



Profile View



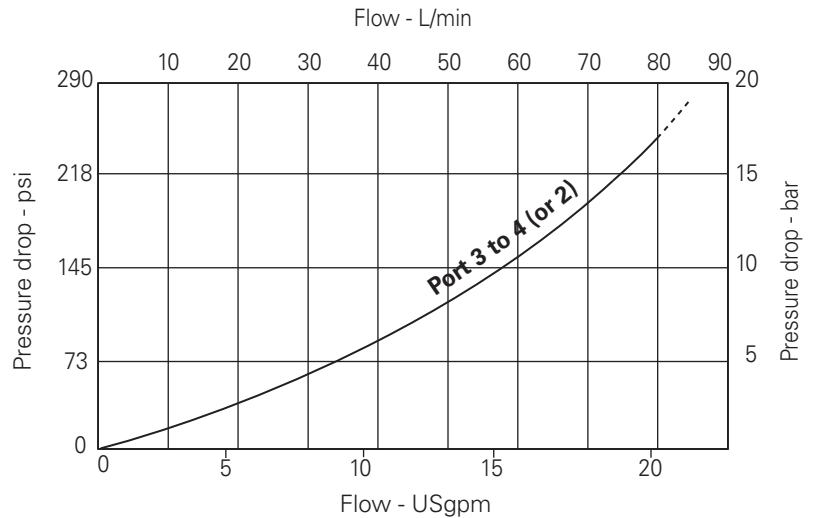
RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

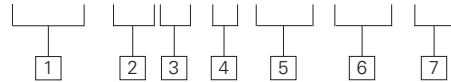
Typical application pressure (all ports)	280 bar (4000 psi)
Cartridge fatigue pressure (infinite life)	280 bar (4000 psi)
Rated inlet flow	76 L/min (20 USgpm)
Transition	All ports open
Internal leakage	164 cc/min (10 in ³ /min) @ 3000 PSID
Temperature range	-40° to 100°C (-40° to 210°F)
Cavity	C-12-5S
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing material	Aluminum or steel
Weight cartridge only	0,36 kg (0.79 lbs)
Seal kit (Urethane)	202914-921

Performance Curves

Cartridge only



PTS9 - 12 U - * - * - *** - 00**



1 Function
PTS9 - Pilot to shift valve

2 Size
12 - C12-5S Cavity

3 Seals
U - Urethane (standard)

4 Body
O - Cartridge only
A - Aluminum
S - Steel

5 Ports*

CODE	PORT SIZE		HOUSING NUMBER	
	Port 1, 2, 3 & 4	Port 5	Aluminum	Steel
000	No Body	—	—	—
12T	SAE 12	SAE 4	4998820-002	4998821-002
06G	3/4" BSPP	1/4" BSPP	4998820-004	4998821-004

6 Shift Pressure
075 psi (5,2 bar)
110 psi (7,6 bar)

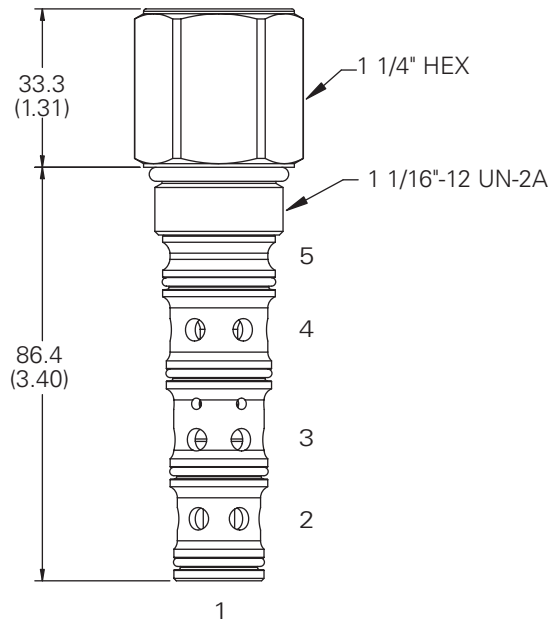
7 Special features
00 - None
(Only required if valve has special features, omitted if "00")

* These model digits will not be stamped on the valve.

Dimensions

mm (inch)

Torque cartridge in housing
A - 81-95 Nm (60-70 ft. lbs)
S - 102-115 Nm (75-85 ft. lbs)



Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings **must** be used for operating pressures **above** 210 bar (3000 psi).

PTS9-16

Pilot to Shift Valve

Description

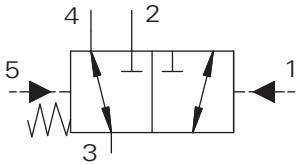
The PTS 9-16 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

Operation

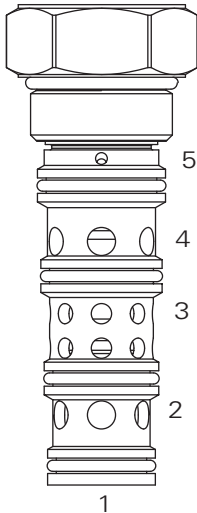
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome. At that time flow

is directed between ports 3 and 2 while blocking port 4. During the cross-over transition, all ports are open. The spring chamber for this valve is vented to port 5.

Functional Symbol



Profile View



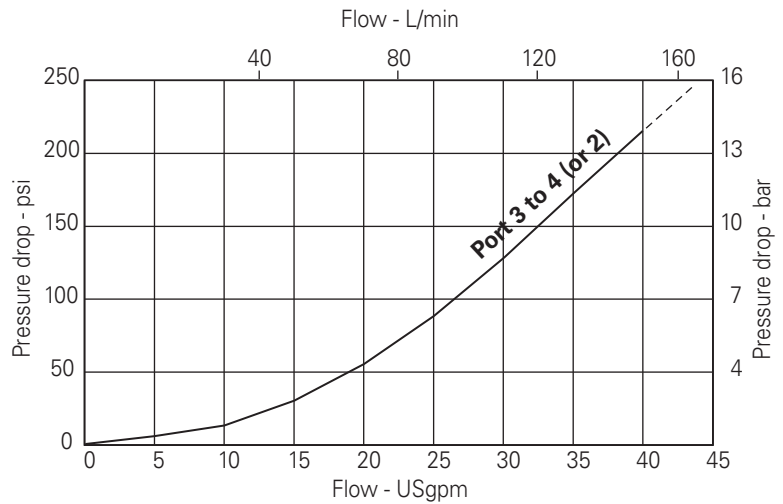
RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	280 bar (4000 psi)
Cartridge fatigue pressure (infinite life)	280 bar (4000 psi)
Rated inlet flow	151 L/min (40 gpm)
Transition	Ports open
Temperature range	-40° to 100°C (-40° to 210°F)
Cavity	C-16-5S
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing material	Aluminum or steel
Weight cartridge only	0,47 kg (1.05 lbs)
Seal kit (Urethane)	202915-922

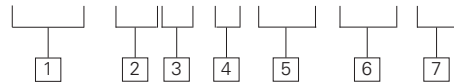
Performance Curves

Cartridge only





PTS9-16 U-*-*-*-*-***-00**



1 Function
PTS9 - Pilot to shift valve

2 Size
16 - C16-5S Cavity

3 Seals
U - Urethane (standard)

4 Body
O - Cartridge only
A - Aluminum
S - Steel

5 Ports*

CODE	PORT SIZE		HOUSING NUMBER	
	Port 1, 2, 3 & 4	Port 5	Aluminum	Steel
000	No Body	—	—	—
16T	SAE 16	SAE 4	4994880-002	4994881-002
08G	1" BSPP	1/4" BSPP	4994880-004	4994881-004

6 Shift Pressure
030 psi (2 bar)
050 psi (3,5 bar)
070 psi (4,8 bar)

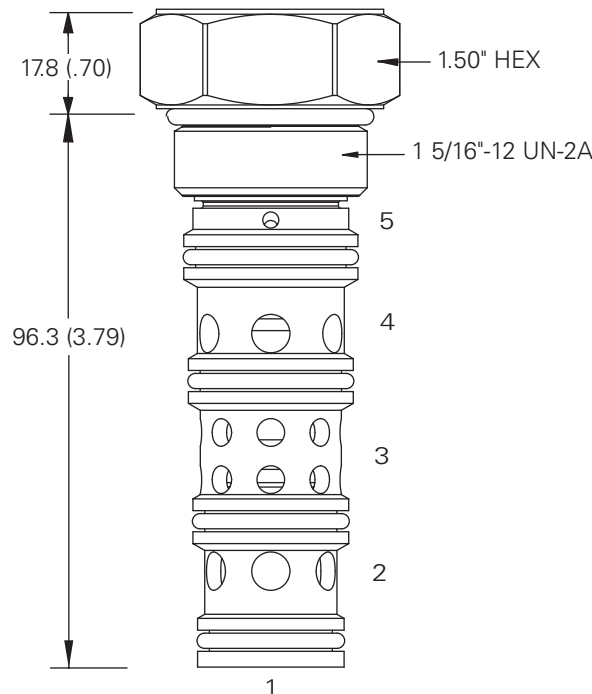
7 Special features
00 - None
(Only required if valve has special features, omitted if "00")

* These model digits will not be stamped on the valve.

Dimensions

mm(inch)

Torque cartridge in housing
A - 108-122 Nm (80-90 ft. lbs)
S - 136-149Nm (100-110 ft. lbs)



Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings **must** be used for operating pressures **above** 210 bar (3000 psi).

PTS9-20

Pilot to Shift Valve

Description

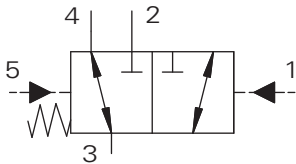
The PTS 9-20 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

Operation

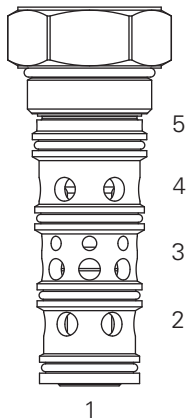
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome. At that time flow is

directed between ports 3 and 2 while blocking port 4. **During the cross-over transition, all ports are open.** The spring chamber for this valve is typically vented to port 5 (tank).

Functional Symbol



Profile View



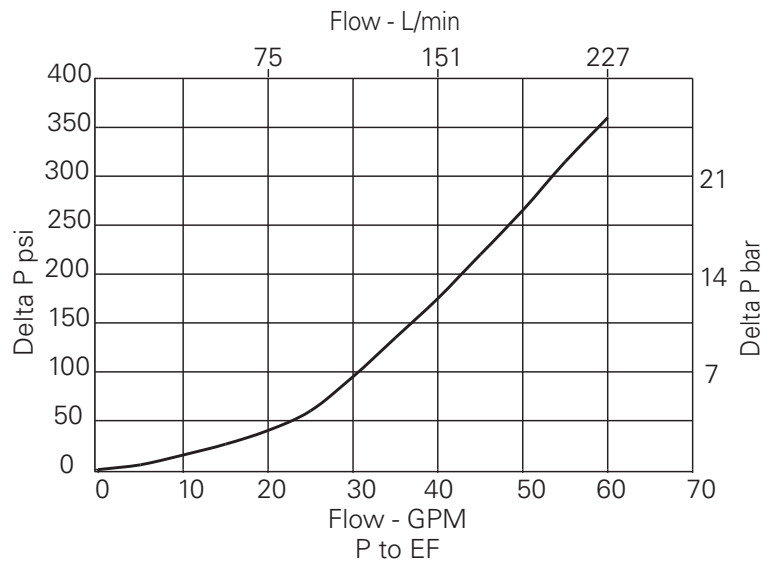
RATINGS AND SPECIFICATIONS

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

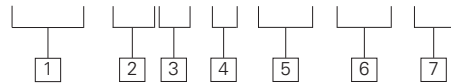
Typical application pressure (all ports)	280 bar (4000 psi)
Cartridge fatigue pressure (infinite life)	280 bar (4000 psi)
Rated inlet flow	230 L/min (60 USgpm)
Transition	All ports open
Internal leakage	164 cc/min (10 in ³ /min) @ 3000 PSID
Temperature range	-40° to 100°C (-40° to 210°F)
Cavity	C-20-5S
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing material	Steel
Weight cartridge only	0,86 kg (1.9 lbs)
Seal kit (Urethane)	02-187543

Performance Curves

Cartridge only



PTS9-20 U-*-*-*--*-00**



1 Function
PTS9 - Pilot to shift valve

2 Size
20 - C20-5S Cavity

3 Seals
U - Urethane (standard)

4 Body
O - Cartridge only
A - Aluminum
S - Steel

5 Ports*

CODE	PORT SIZE		HOUSING NUMBER	
	Port 1, 2, 3 & 4	Port 5	Aluminum	Steel
000	No Body	-	-	-
16T	SAE 16	SAE 4	4998822-002	4998823-002
08G	1" BSPP	1/4" BSPP	4998822-004	4998823-004

6 Shift Pressure
040 psi (4.3 bar)
080 psi (5.2 bar)

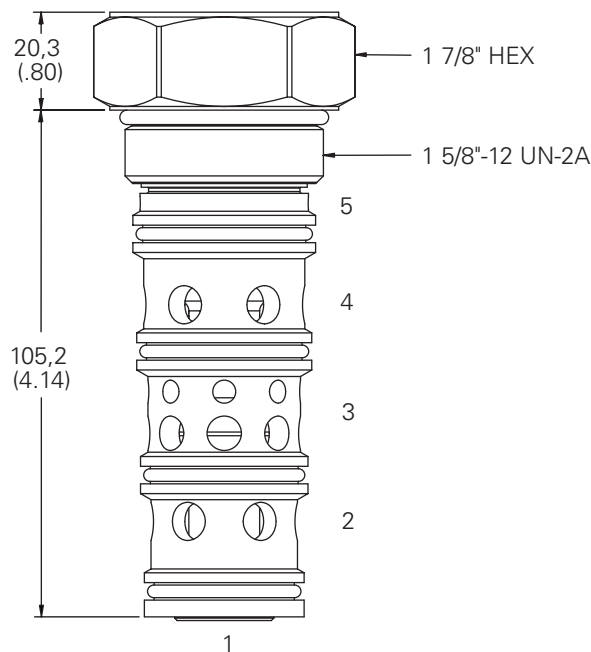
7 Special features
00 - None
(Only required if valve has special features, omitted if "00")

* These model digits will not be stamped on the valve.

Dimensions

mm (inch)

Torque cartridge in housing
S - 160-180Nm (120-135 ft. lbs)
A - 130-155 Nm (95-115 ft. lbs)



Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings **must** be used for operating pressures **above** 210 bar (3000 psi).