



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



Model	Typical Application Pressure bar (psi)	Rated Flow L/min (USgpm)	Page
Non-solenoid directional controls - Introduction, features and benefits			D-3
Manual rotary valve			
MRV3-10	210 (3000)	23 (6)	D-4
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MRV4-16	210 (3000)	45 (12)	D-10
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PTS3-10	210 (3000)	30 (8)	D-46
PTS3-16	210 (3000)	132 (35)	D-48
PTS3-20	210 (3000)	265 (70)	D-50
PTS4-16	210 (3000)	132 (35)	D-52
PTS5-10	210 (3000)	11 (3)	D-54
PTS5-16	210 (3000)	132 (35)	D-56
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PTS7-10	210 (3000)	30 (8)	D-62
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Non-solenoid directional controls

Section overview

This section gives the basic specifications for the complete line of Vickers screw-in 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.
- Optional low-cost manual override is available on selected models.
- 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.

D

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

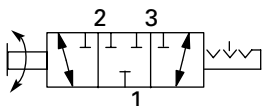
the operator 90°, flow will be directed between ports 1 and 2 and port 3 will be blocked. During

cross-over transition, all ports are blocked.

Functional Symbol

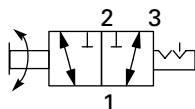
MRV3-10(V)-D/E

3 position models

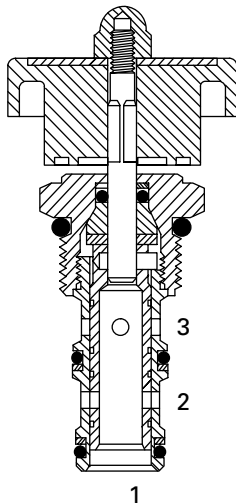


MRV3-10(V)-D2/E2

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)

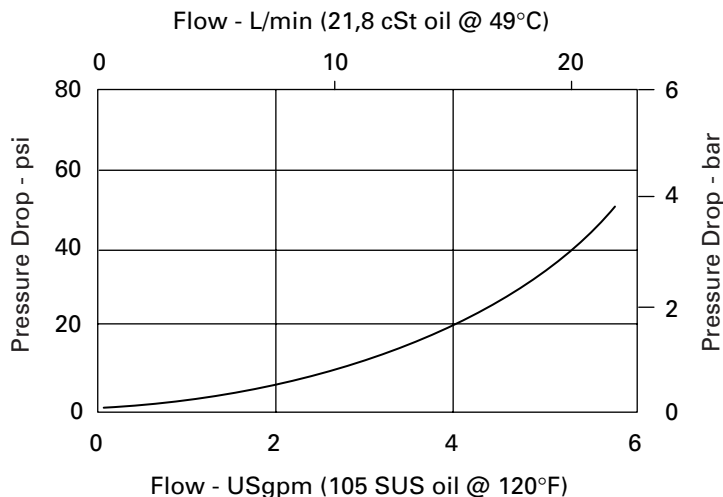
* Light duty housing only.

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®)

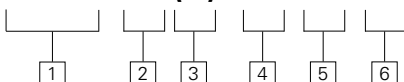
Viton is a registered trademark of E.I. DuPont

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

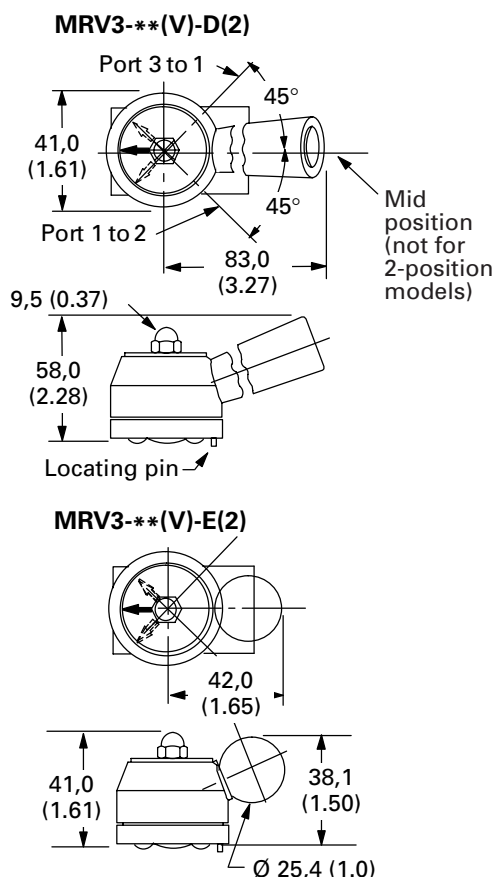
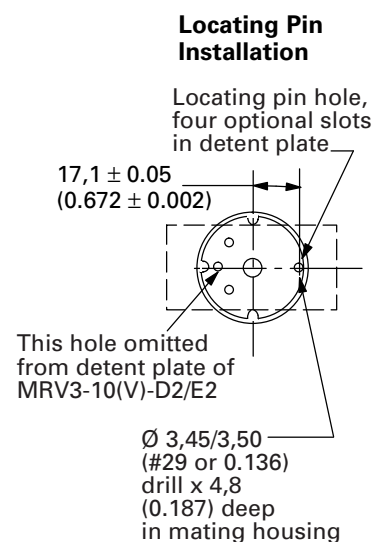
CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-173358	—
6T	SAE 6	566162	—
2G	1/4" BSPP	—	876705
3G	3/8" BSPP	—	876714
6H	SAE 6	—	876704
8H	SAE 8	—	876711

See section J for housing details.

Dimensions

mm (inch)

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



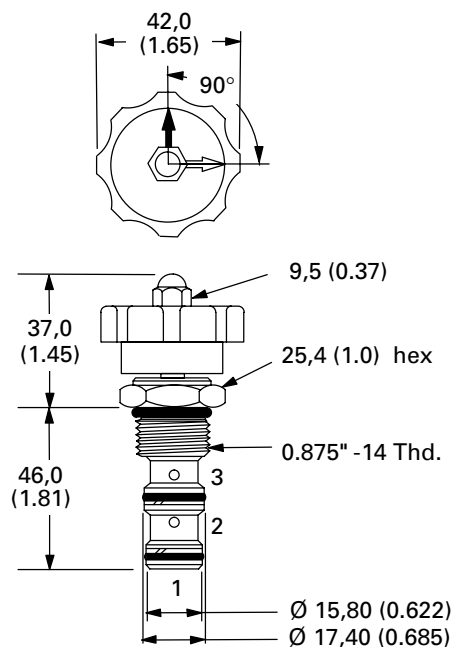
6 Special features

00 - None

(Only required if valve has special features, omitted if "00")

MRV3-10(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

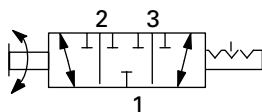
operator 90°, flow will be directed between ports 1 and 2 and port 3 will be blocked. During

cross-over transition, all ports are blocked.

Functional Symbol

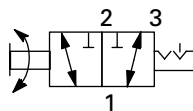
MRV3-16(V)-D

3 position models

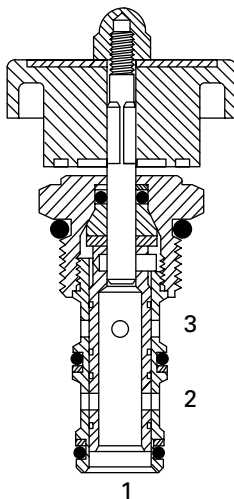


MRV3-16(V)-D2

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)

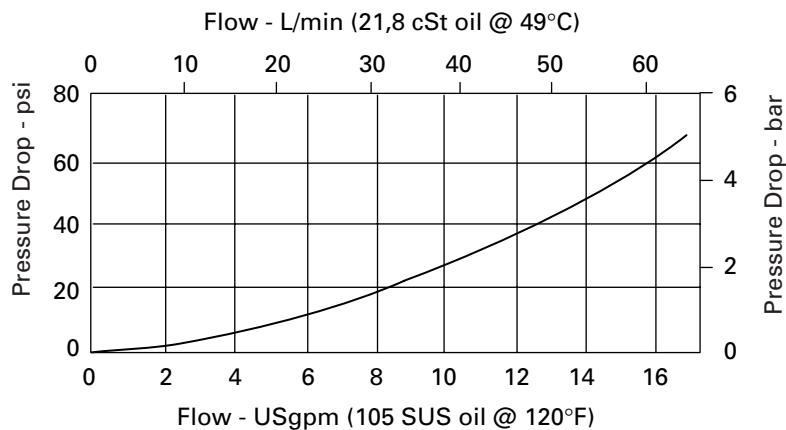
*Light duty housing only.

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®)

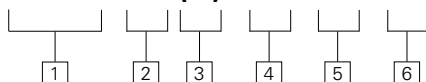
Viton is a registered trademark of E.I. DuPont

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	566162	—
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")

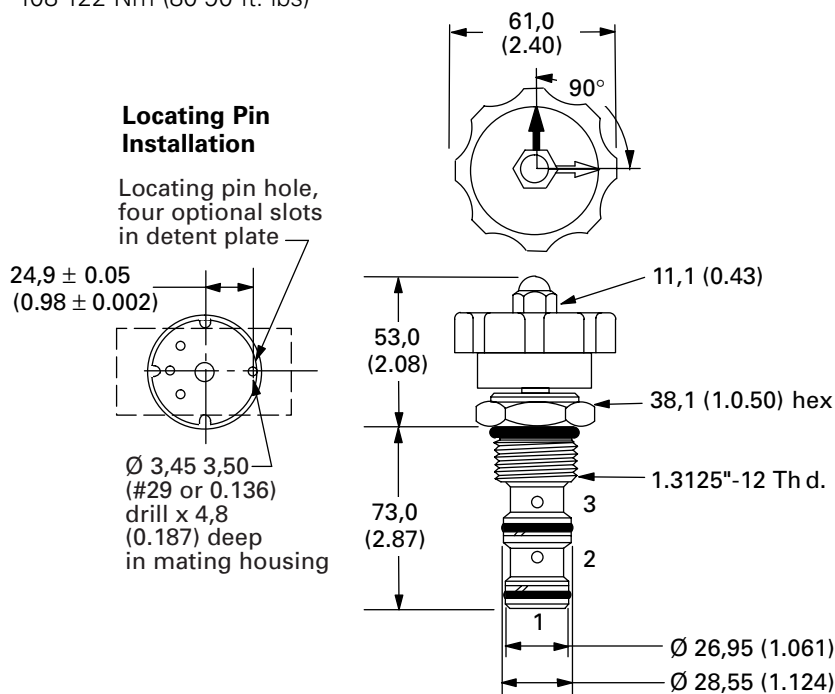
Dimensions

mm (inch)

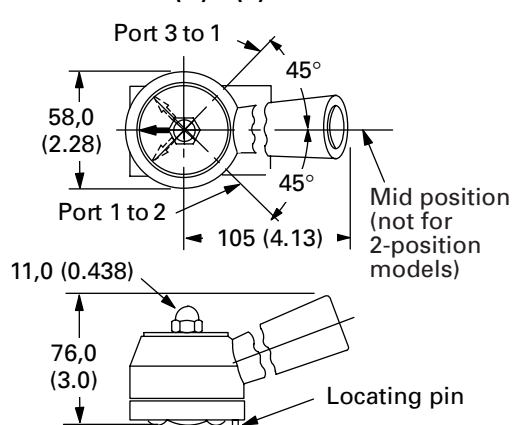
Torque cartridge in aluminum housing
108-122 Nm (80-90 ft. lbs)

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

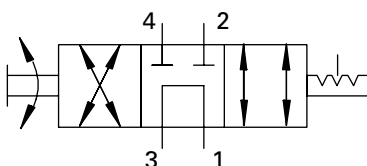
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position. By turning the

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

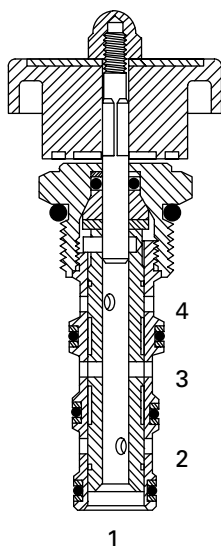
transition, ports 2 and 4 are blocked and ports 1 and 3 are connected.

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)

* 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	0,17 kg (0.38 lbs)
Seal kit	565805 (Buna-N) 889600 (Viton®)

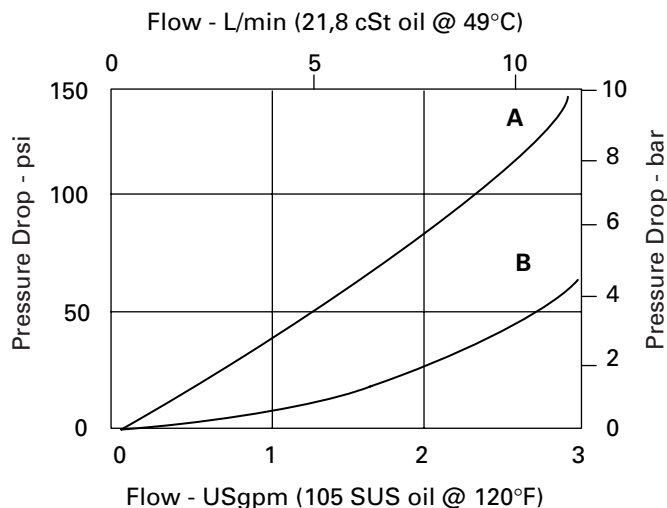
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curves

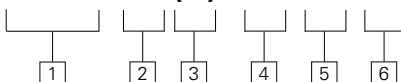
Cartridge only

A - Port 3 to 4
or 3 to 2

B - Port 4 to 1
or 2 to 1



MRV4-10 (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

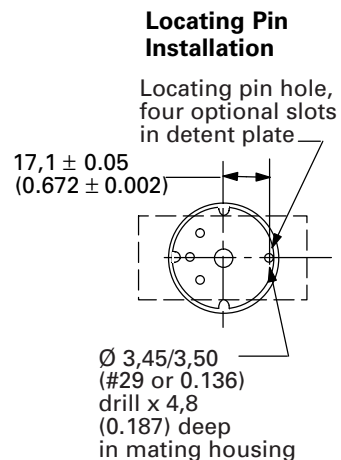
CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-179705	—
6T	SAE 6	566161	—
2G	1/4" BSPP	—	876709
3G	3/8" BSPP	—	876715
6H	SAE 6	—	876708
8H	SAE 8	—	876713

See section J for housing details.

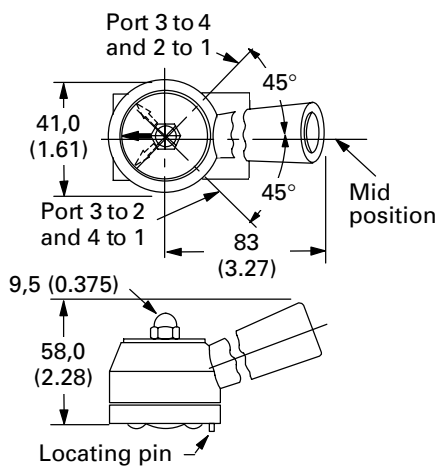
Dimensions

mm (inch)

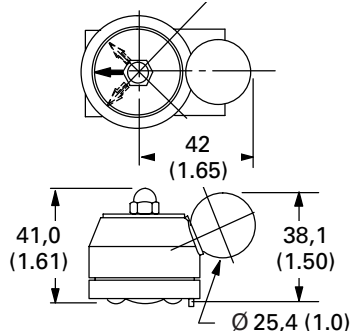
Torque cartridge in
aluminum housing
47-54 Nm (35-40 ft. lbs)



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



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

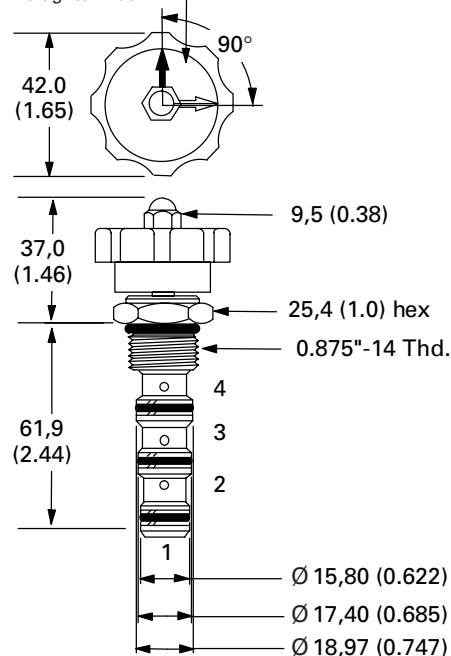


6 Special features

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

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

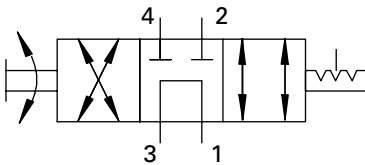
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position. By turning the

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

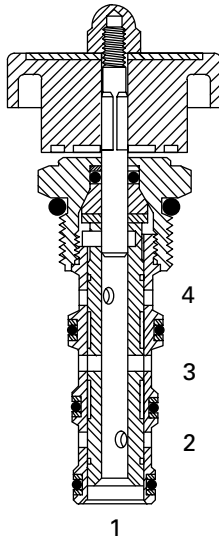
transition, ports 2 and 4 are blocked and ports 1 and 3 are open to each other.

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)
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®)

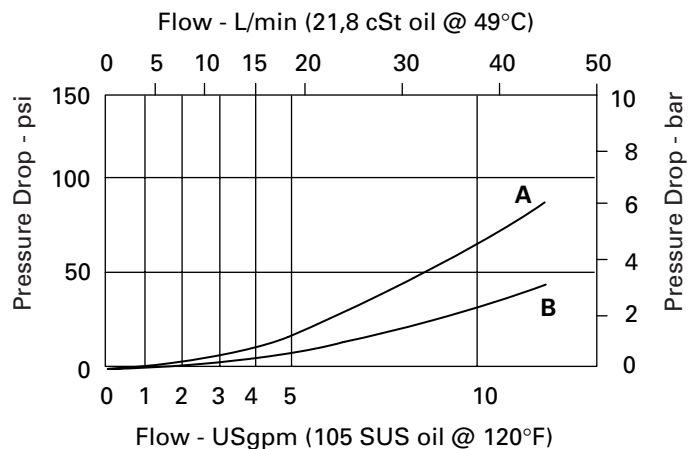
Viton is a registered trademark of E.I. DuPont

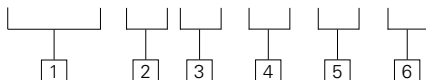
Pressure Drop Curves

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.

6 Special features

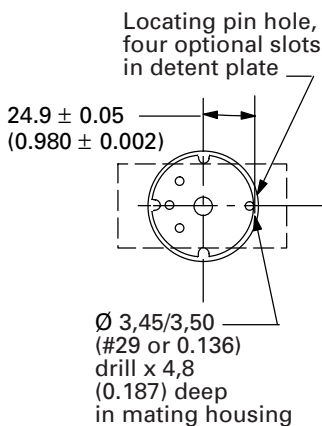
00 - None

(Only required if valve has special features, omitted if "00")

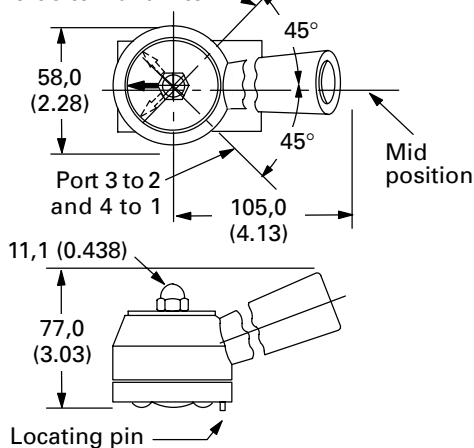
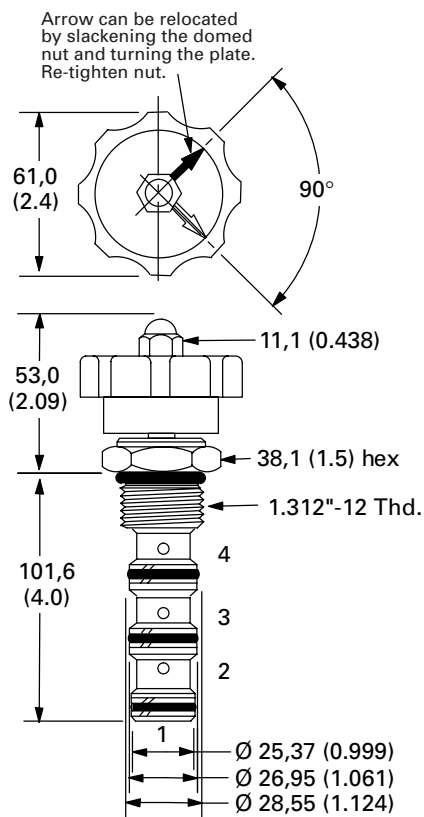
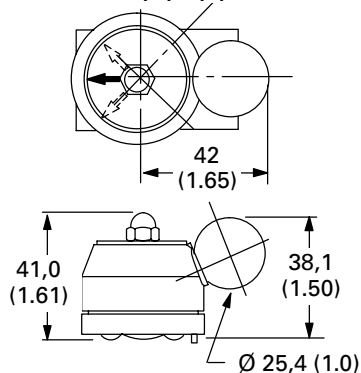
Dimensions

mm (inch)

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

**Locating Pin
Installation****MRV4-**(V)-D(2)**

Port 3 to 4 and 2 to 1

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

MRV5-10

Manual rotary valve

Description

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

Operation

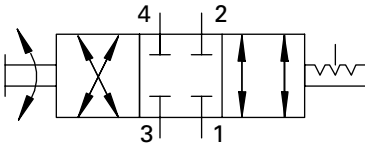
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position. By turning the

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

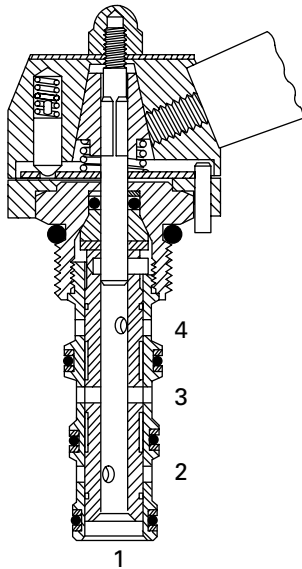
transition, all ports are blocked.

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.

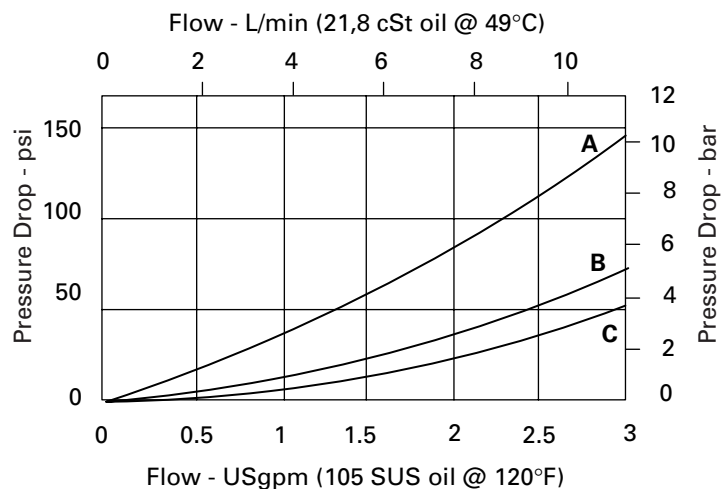
Cavity	C-10-4 (see page 60)
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,27 kg (0.59 lbs)
Seal kit	889625 (Buna-N) 566080 (Viton®)

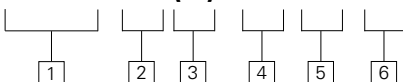
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curves

Cartridge only

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



MRV5-10 (V) - ** - ** - 00**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)*

*Light duty housing only.

5 Port size

- O** - Cartridge only

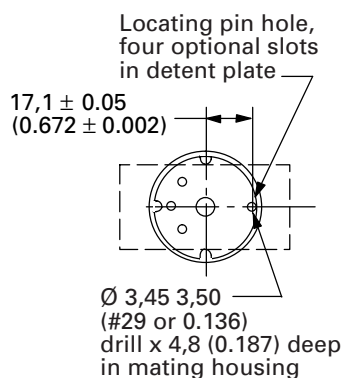
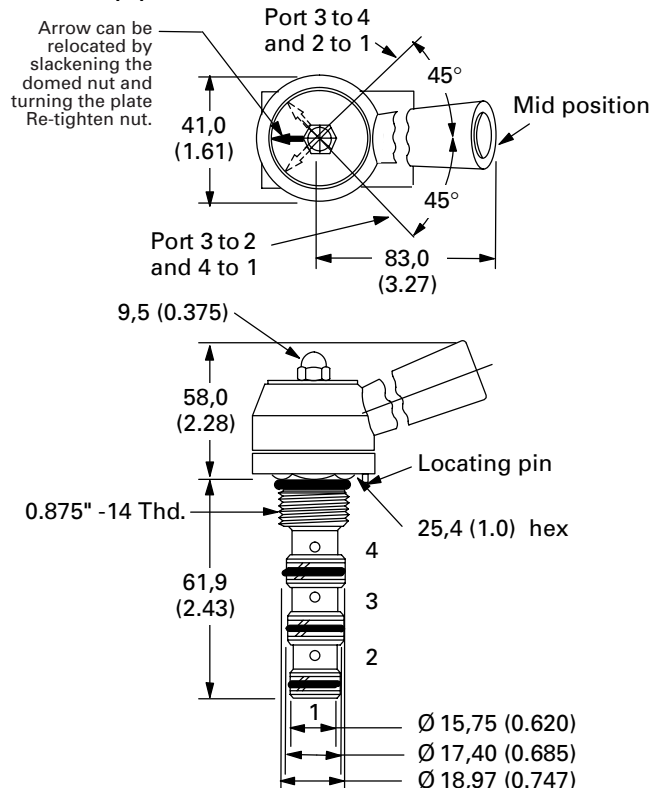
CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-179705	—
6T	SAE 6	566161	—
2G	1/4" BSPP	—	876709
3G	3/8" BSPP	—	876715
6H	SAE 6	—	876708
8H	SAE 8	—	876713

See section J for housing details.

Dimensions

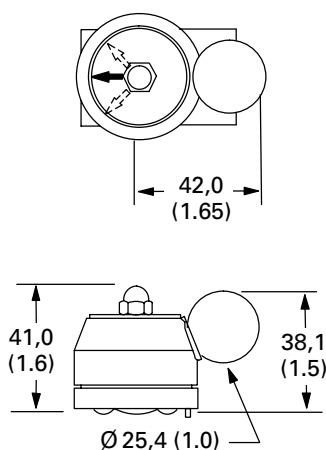
mm (inch)

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

**Locating Pin
Installation****MRV5-**(V)-D****6 Special features**

00 - None

(Only required if valve has
special features, omitted
if "00")

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

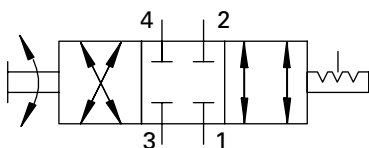
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position and by turning the

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

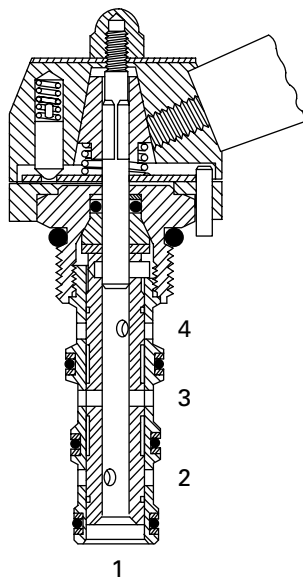
transition, all ports are blocked.

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)

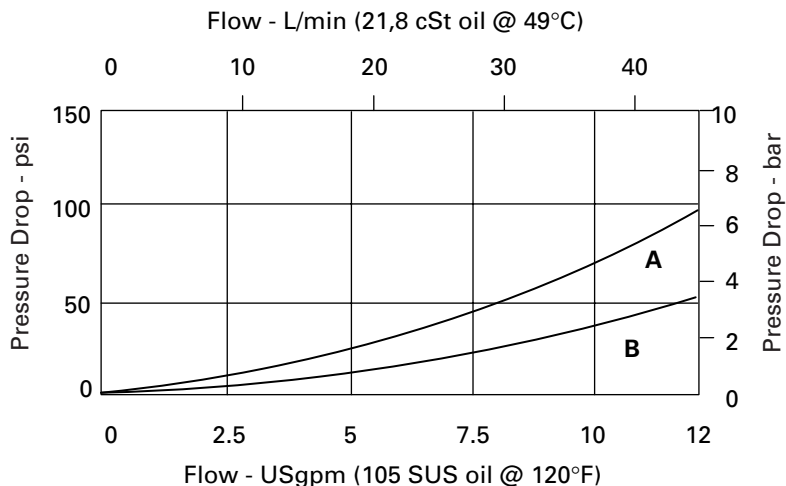
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	45 L/min (12 USgpm)
Internal leakage	164cc/min (10in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Manual operators	D - Lever (3-position 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®)

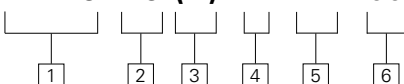
Viton is a registered trademark of E.I. DuPont

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

2 Size

16 - 16 Size

3 Seals

Blank - Buna-N
V - Viton®

5 Port size

O - Cartridge only

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

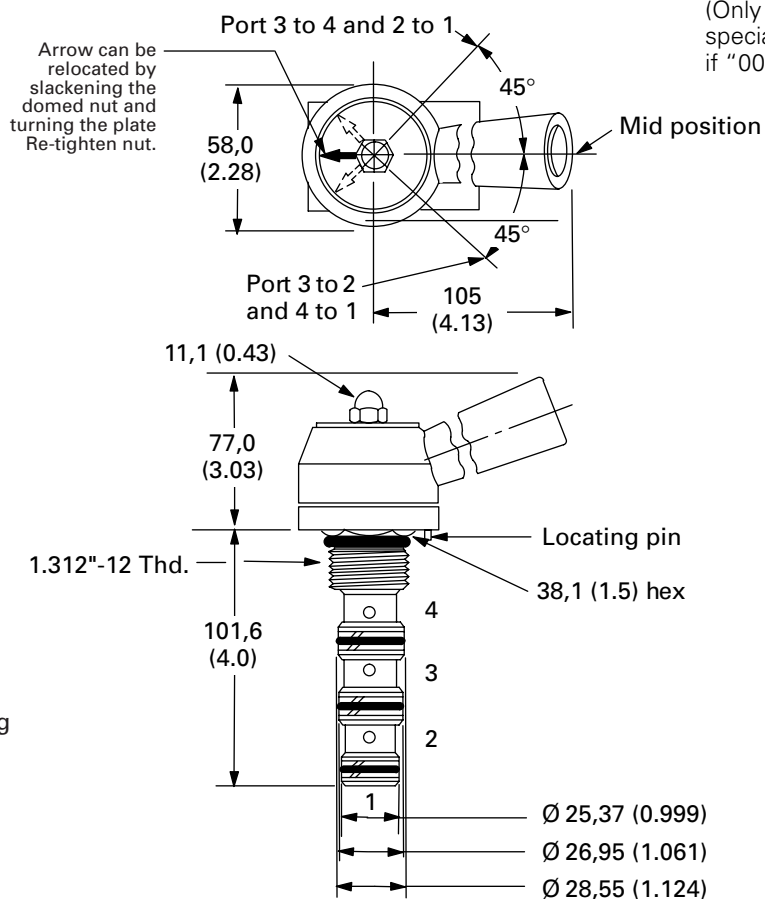
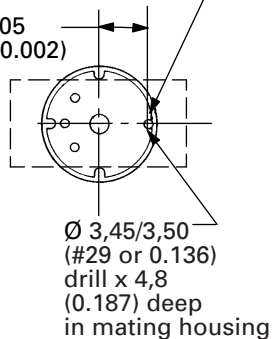
mm (inch)

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

**Locating Pin
Installation**

Locating pin hole,
four optional slots
in detent plate

$24,9 \pm 0,05$
($0,980 \pm 0,002$)

**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

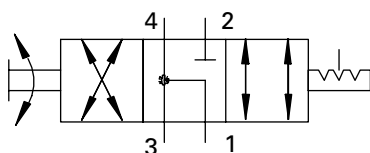
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position. By turning the

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

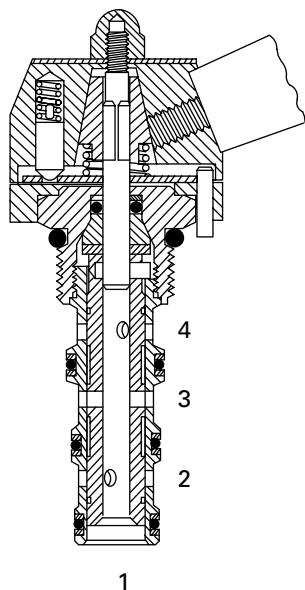
transition all ports 1, 3 and 4 are open to each other and port 2 is blocked.

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.

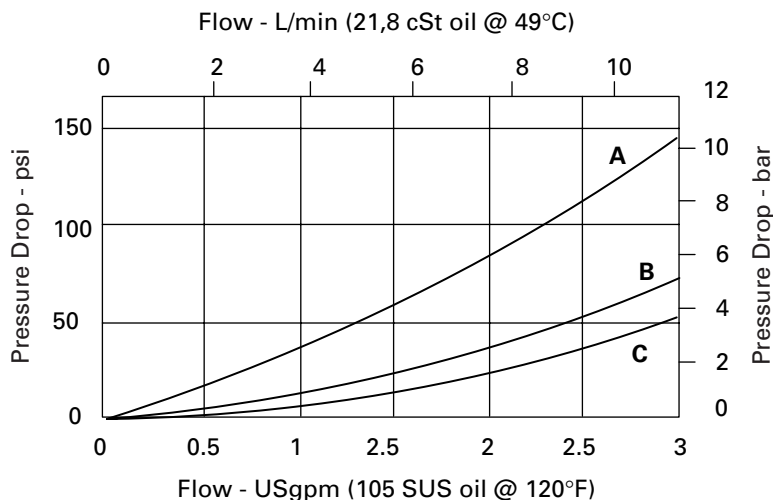
Cavity	C-10-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,27 kg (0.59 lbs)
Seal kit	889625 (Buna-N) 566080 (Viton®)

Viton is a registered trademark of E.I. DuPont

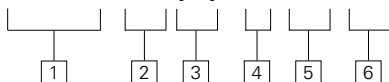
Pressure Drop Curves

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.

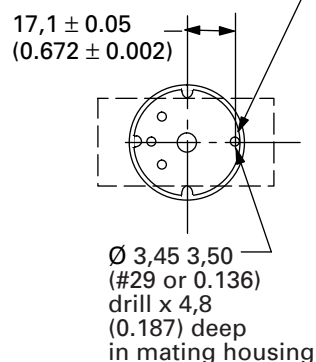
Dimensions

mm (inch)

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

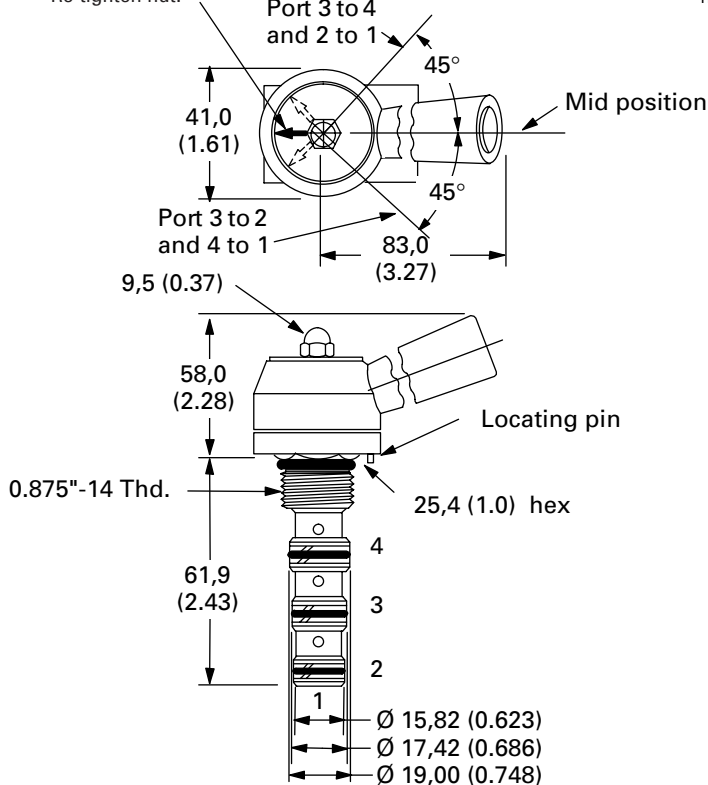
Locating Pin Installation

Locating pin note, 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.

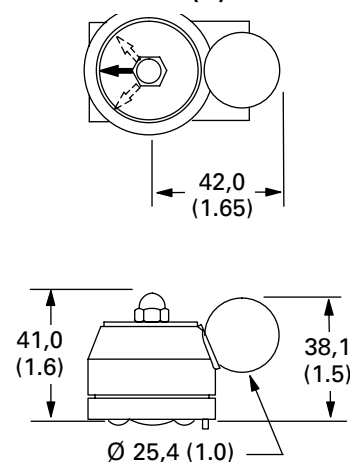


6 Special features

00 - None

(Only required if valve has special features, omitted if "00")

MRV6-**(V)-E



DSV2-4

Shuttle valve

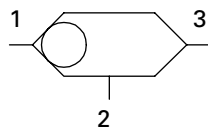
Description

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

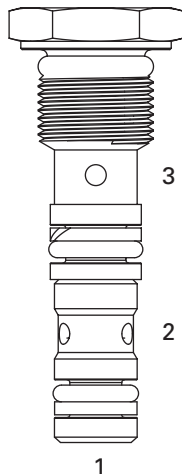
Operation

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



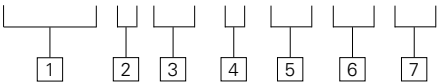
Note

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

RATINGS AND SPECIFICATIONS

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

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



1 **Function**
DSV2 - Shuttle valve

2 **Size**
4 - 4 Size

3 **Seals**
Blank - Buna-N
V - Viton®

4 **Style**
B - Ball

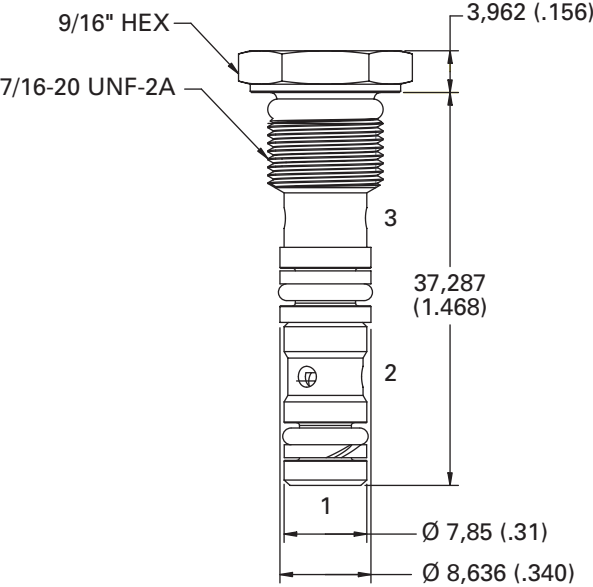
5 **Valve housing material**
Omit for cartridge only
A - Aluminum
S - Steel

6 **Port size**
O - Cartridge only

CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Fatigue rated	Steel
4T	SAE 4	—	—
2G	1/4" BSPP	—	—

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

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

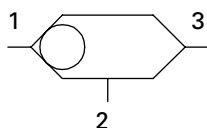
Description

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

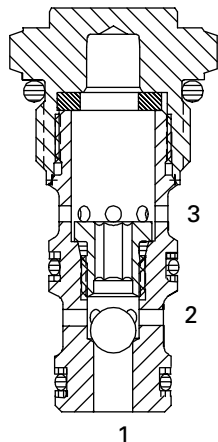
Operation

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®)

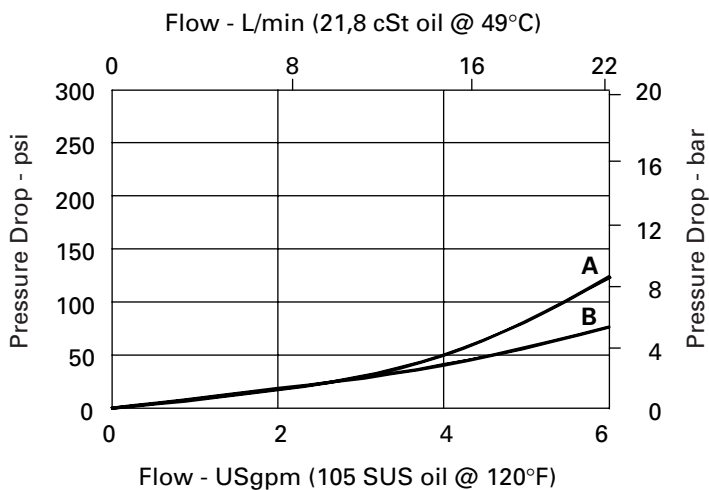
Viton is a registered trademark of E.I. DuPont

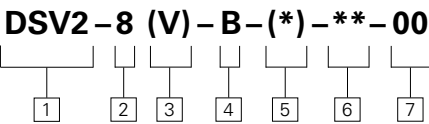
Pressure Drop Curves

Cartridge only

A - Port 1 to port 2

B - Port 3 to port 2





1 **Function**
DSV2 - Shuttle valve

2 **Size**
8 - 8 Size

3 **Seals**
Blank - Buna-N
V - Viton®

4 **Style**
B - Ball

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

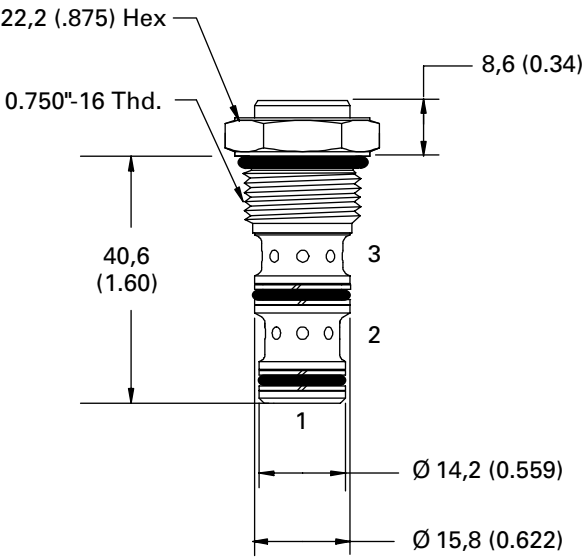
6 **Port size**
O - Cartridge only

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

See section J for housing details.

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

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

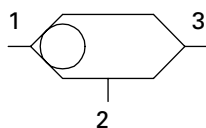
Description

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

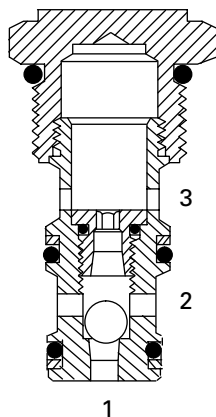
Operation

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

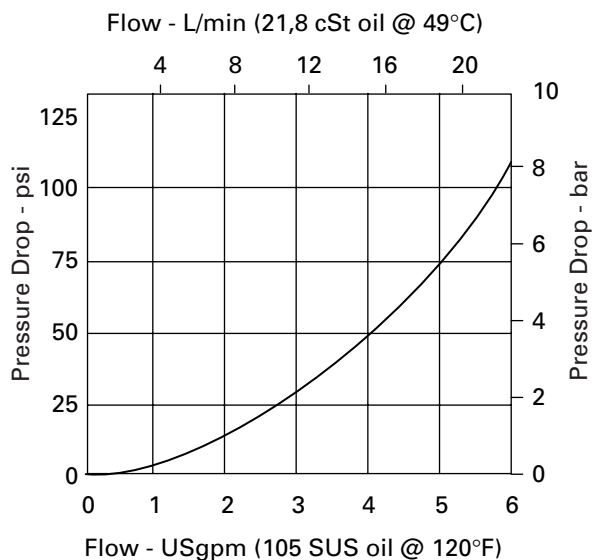
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

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®)

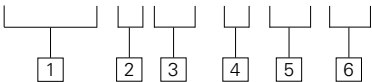
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



DSV1-8 (V)-B-**-00



1 **Function**
DSV1 - Shuttle valve

2 **Size**
10 - 10 Size

3 **Seals**
Blank - Buna-N
V - Viton®

4 **Style**
B - Ball

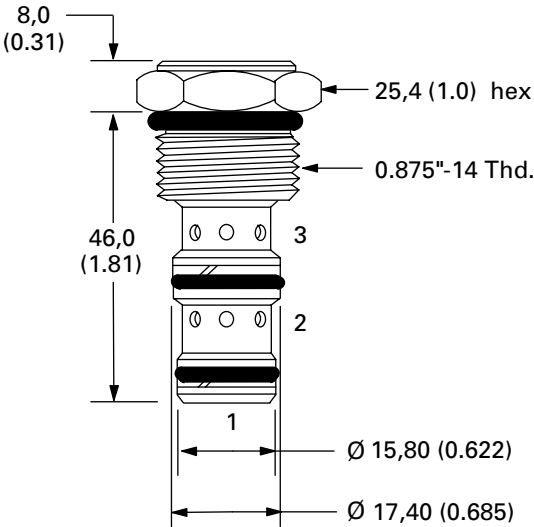
5 **Port size**
O - Cartridge only

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")

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



DSV3-**-B

Shuttle valve

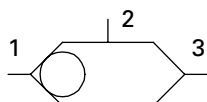
Description

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

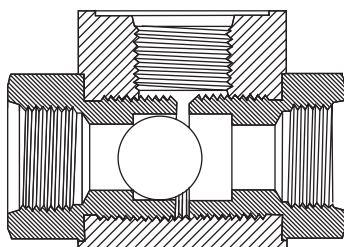
Operation

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)

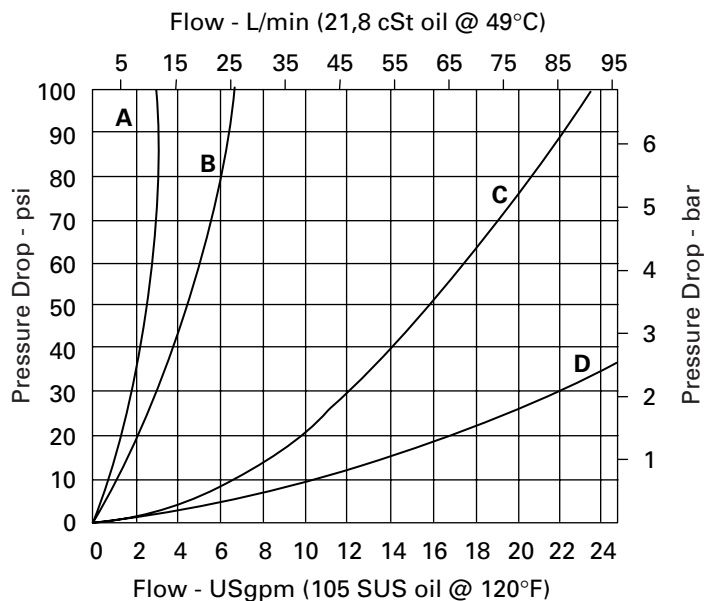
Maximum pressure	210 bar (3000 psi) Aluminum housing 350 bar (5000 psi) Steel housing
Rated flow	6 series - 11 L/min (3 USgpm) 8 series - 24,6 L/min (6.5 USgpm) 12 series - 88,9 L/min (23.5 USgpm) 16 series - 170,3 L/min (45 USgpm)
Internal leakage	Port 2 to 1 and 2 to 3; <5 drops/min @ 210 bar (3000 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

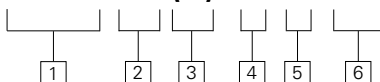
Pressure Drop Curves

Cartridge only

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



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

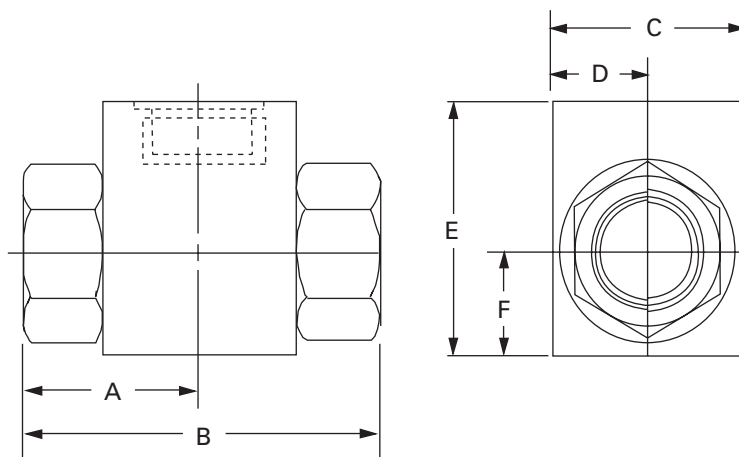
6 - 6 size
8 - 8 size
12 - 12 size
16 - 16 size

5 Housing material

A - Aluminum
S - Steel8 Series
2 - 1/8" NPTF
6T - SAE 612 Series
4 - 1/2" NPTF
8T - SAE 816 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).

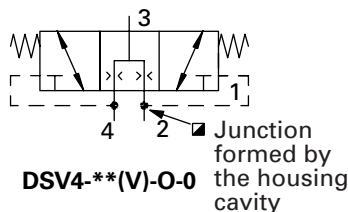
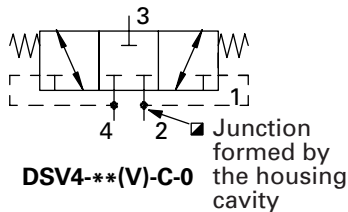
MODEL NUMBER	A	B	C	D	E	F
DSV3-6-B-A1	22,2 (0.87)	44,5 (1.75)	19,0 (0.75)	9,5 (0.37)	25,4 (1.00)	9,5 (0.37)
DSV3-6-B-S1	22,2 (0.87)	44,5 (1.75)	20,6 (0.81)	10,3 (0.41)	31,7 (1.25)	12,7 (0.50)
DSV3-8-B-A2	23,8 (0.94)	47,6 (1.87)	25,4 (1.00)	12,7 (0.50)	38,1 (1.50)	12,7 (0.50)
DSV3-8-B-S2	23,8 (0.94)	47,6 (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.

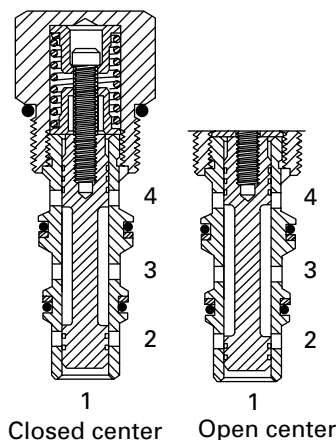
DSV4-10

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.

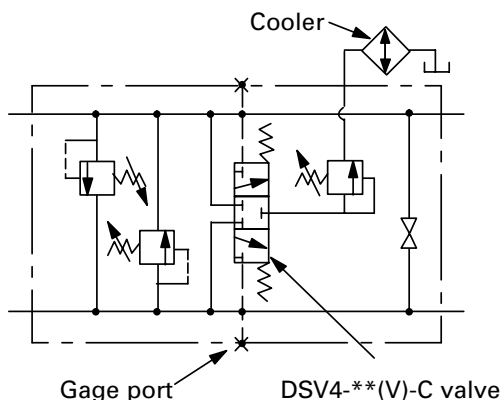
RATINGS AND SPECIFICATIONS

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®)

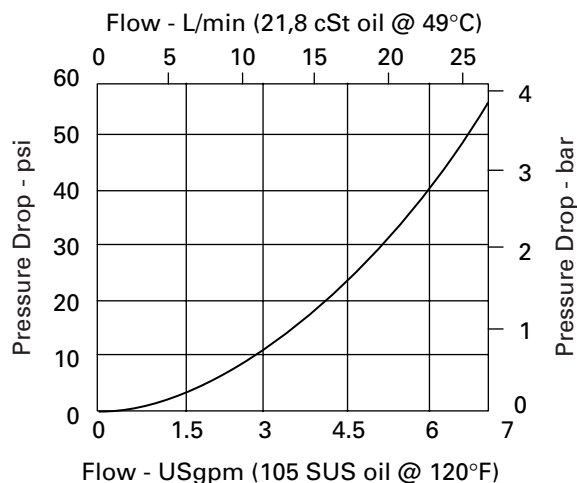
Viton is a registered trademark of E.I. DuPont

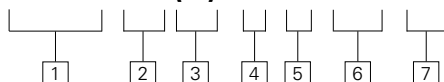
Typical Application



Pressure Drop Curve

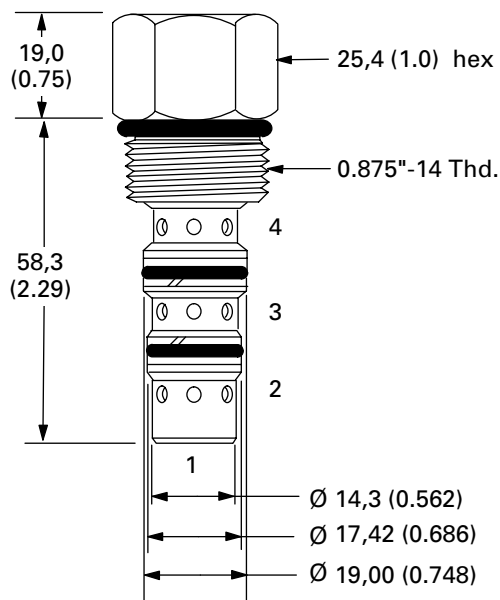
Cartridge only



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

mm (inch)

Torque cartridge in housing

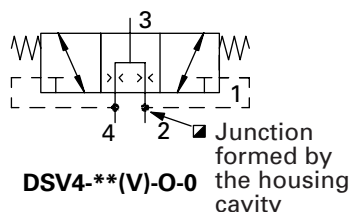
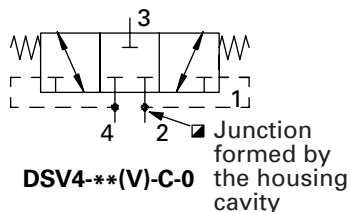
A - 47-54 Nm (35-40 ft. lbs)**S** - 68-75 Nm (50-55 ft. lbs)

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).

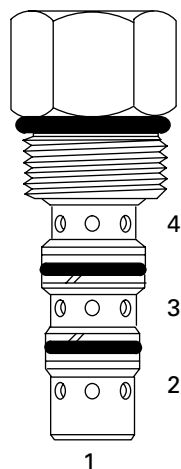
DSV4-16

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.

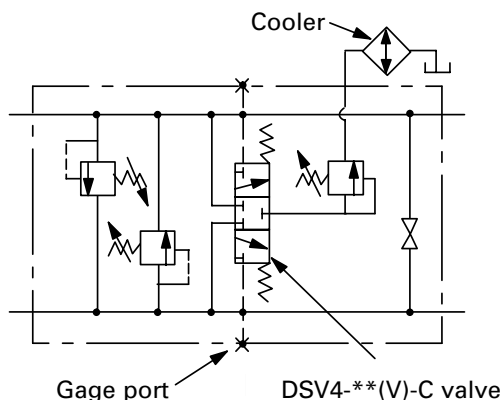
RATINGS AND SPECIFICATIONS

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®)

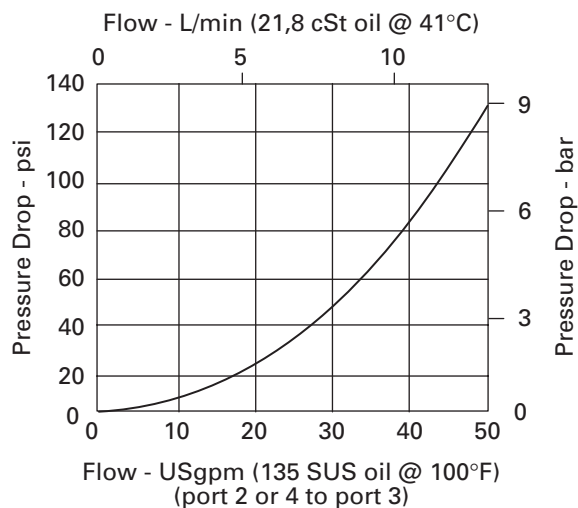
Viton is a registered trademark of E.I. DuPont

Typical Application

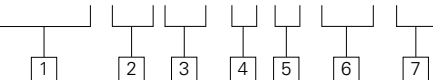


Pressure Drop Curve

Cartridge only



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



1 Function

DSV4 - Directional shuttle valve

2 Size

16 - 16 Size

3 Seals

Blank - Buna-N
V - Viton®

4 Spool configuration

C - Closed center
O - Open center

5 Port size

O - Cartridge only
(Not available with standard housing)

6 Pilot to shift (nominal)

40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)
160 - 11,0 bar (160 psi)

7 Special features

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

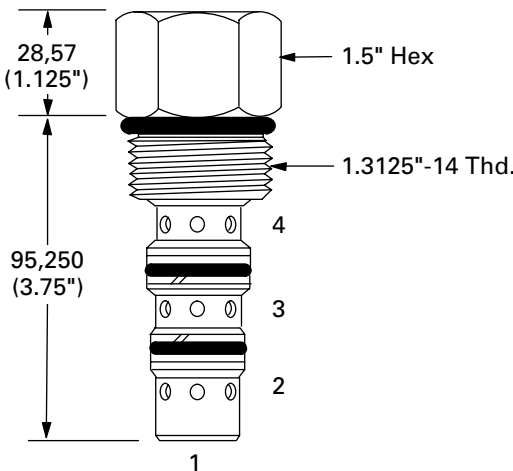
Dimensions

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).

MPV1-10

Manual pull valve

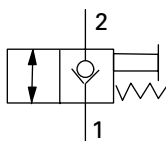
Description

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

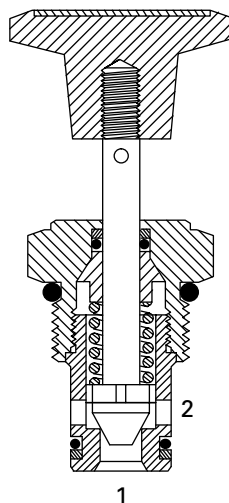
Operation

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

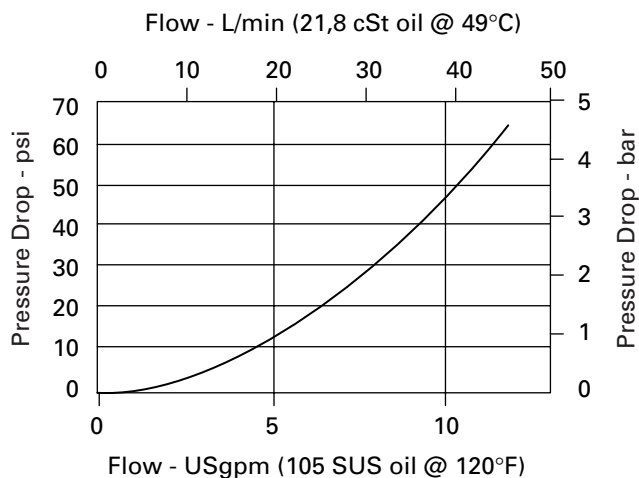
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

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®)

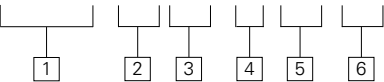
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



MPV1 – 10 (V) – * – ** – 00



1 Function
MPV1 - Manual pull valve

2 Size
10 - 10 Size

3 Seals
Blank - Buna-N
V - Viton®

4 Type
T - Stem only
K - Knob

5 Port size
O - 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

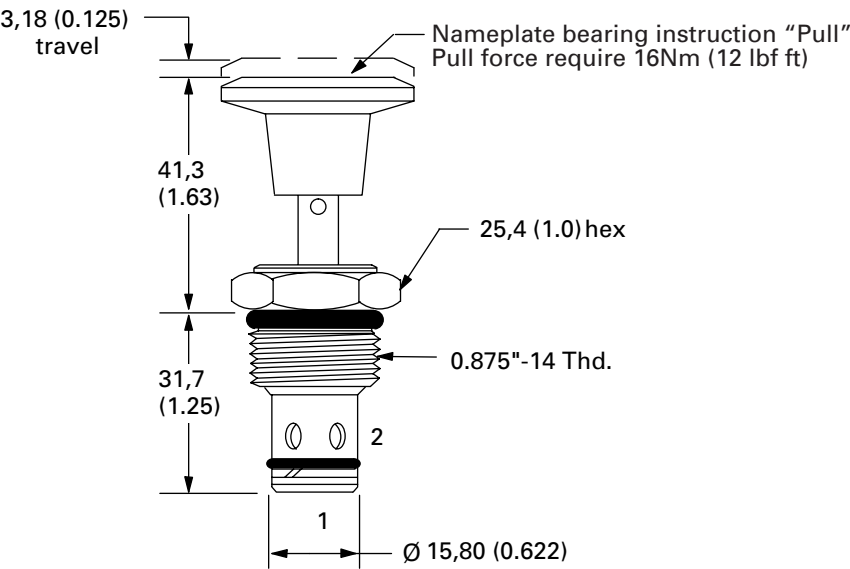
See section J for housing details.

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)



MPV3-10

Manual pull valve
with detent

Description

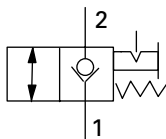
The MPV3-10 is a 2-way, 2 position, manually operated, normally closed, pull-to-open, directional screw-in cartridge valve, **with detent**.

Operation

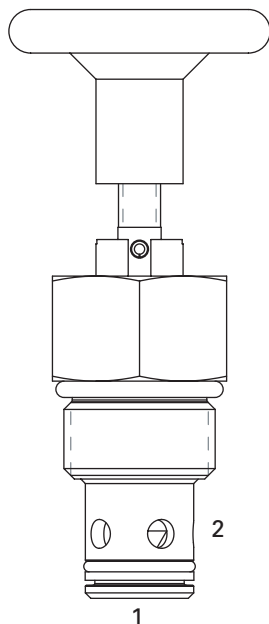
This valve blocks flow from port 2 to port 1 and will allow flow from port 1 to port 2 when the spring bias is overcome. When

the valve is actuated free flow is allowed in both directions.

Functional Symbol



Profile View



Caution

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

RATINGS AND SPECIFICATIONS

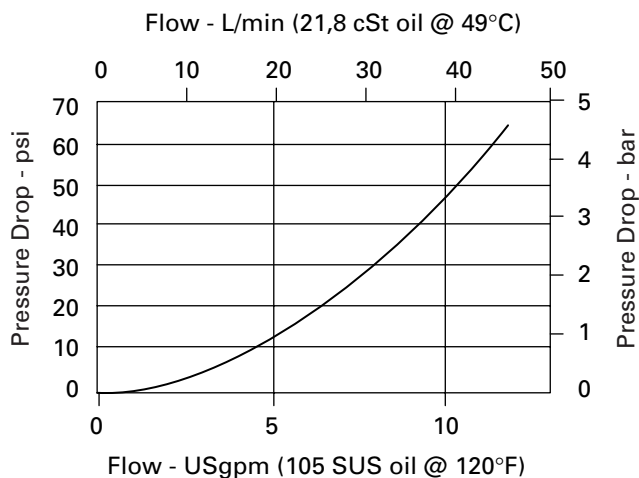
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

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®)

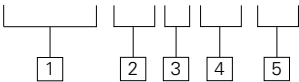
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only



MPV3 10 * ** 00



1 Function
MPV3 - Manual pull valve,
with detent

2 Size
10 - 10 Size

3 Seals
N - Buna-N
V - Viton®

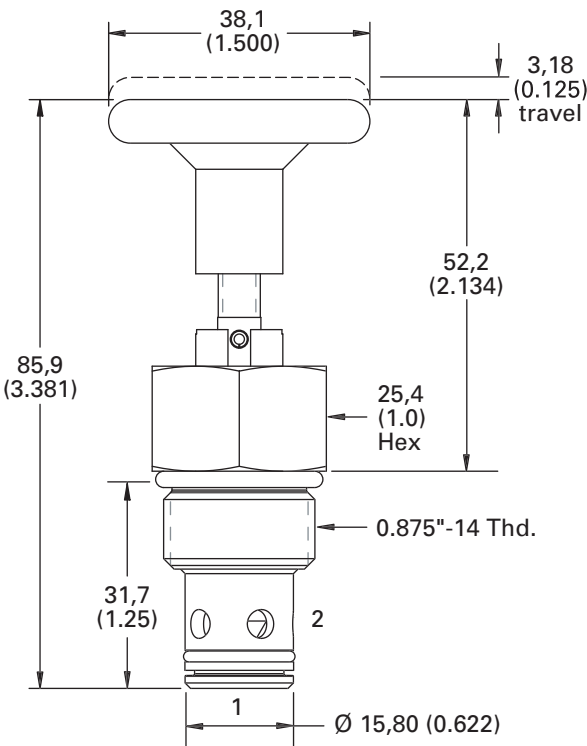
4 Port size
00 - Cartridge only

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

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)



PTS1-10

Pilot to shift valve

Description

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

Operation

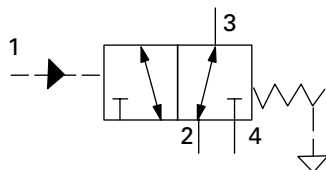
This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied to port 1 and the

spring bias is overcome.

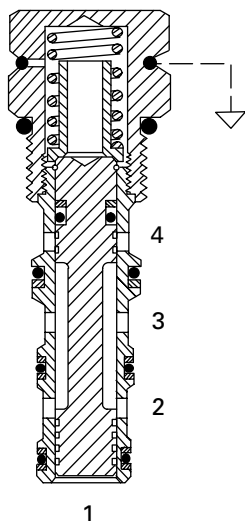
At this time, flow is directed between port 3 and port 4 while blocking port 2. **During the cross-over transition, all**

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

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

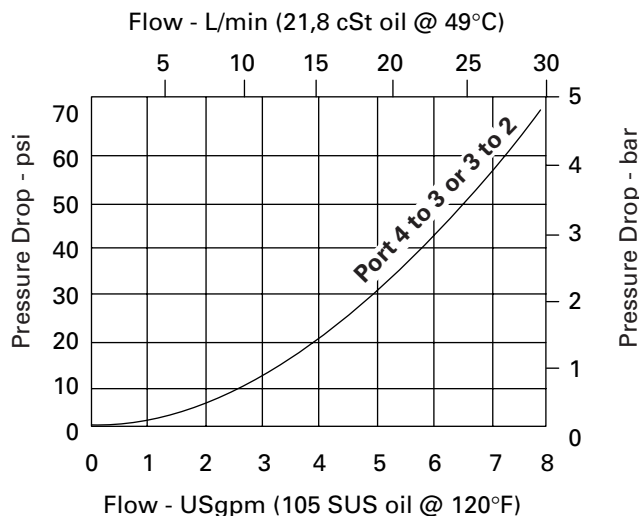
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

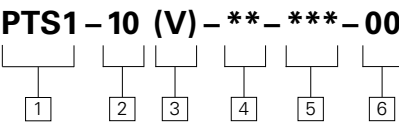
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	30 L/min (8 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (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





1 Function
PTS1 - Pilot to shift valve

2 Size
10 - 10 Size

3 Seals
Blank - Buna-N
V - Viton®

4 Port size
O - Cartridge only

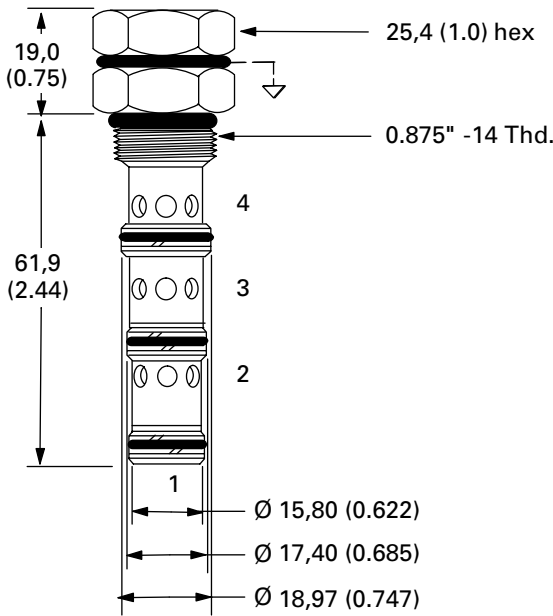
5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)
160 - 11,0 bar (160 psi)

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")

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.

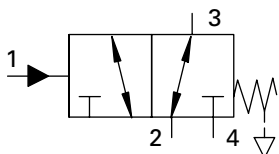
Operation

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

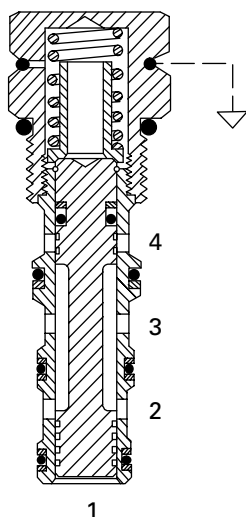
spring bias is overcome. At this time, flow is directed between port 3 and port 4 while blocking port 2. **During the cross-**

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

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

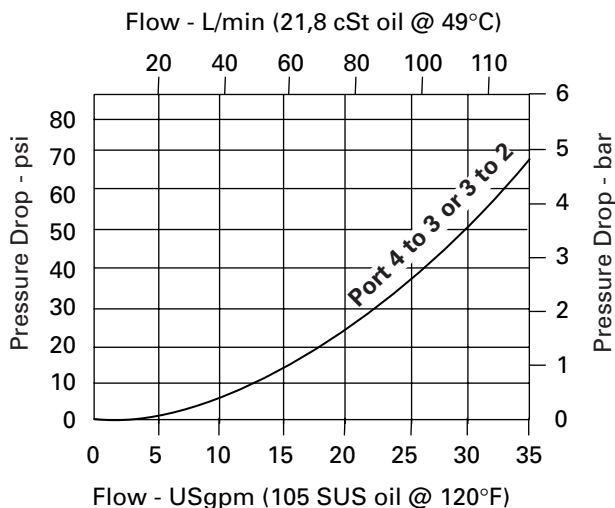
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

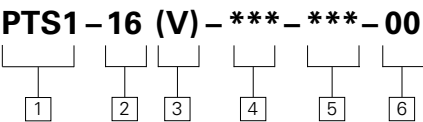
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	132 L/min (35 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (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





1 Function
PTS1 - Pilot to shift valve

2 Size
16 - 16 Size

3 Seals
Blank - Buna-N
V - Viton®

4 Port size
O - Cartridge only

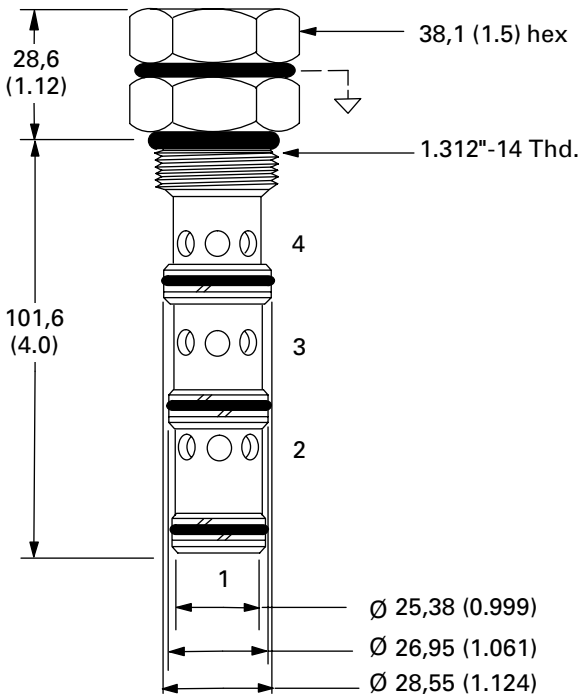
5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)
160 - 11,0 bar (160 psi)

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.

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)



PTS1-20

Pilot to shift valve

Description

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

Operation

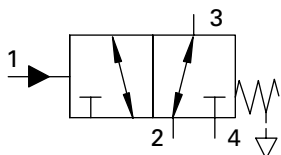
This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied to port 1 and the

spring bias is overcome.

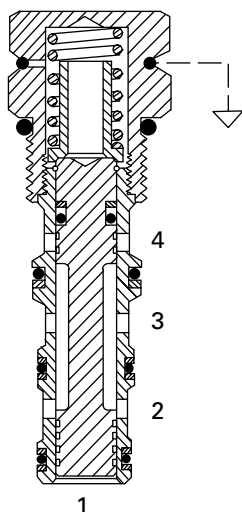
At that time, flow is directed between ports 3 and 4 while blocking port 2. **During the cross-over transition, all**

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

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

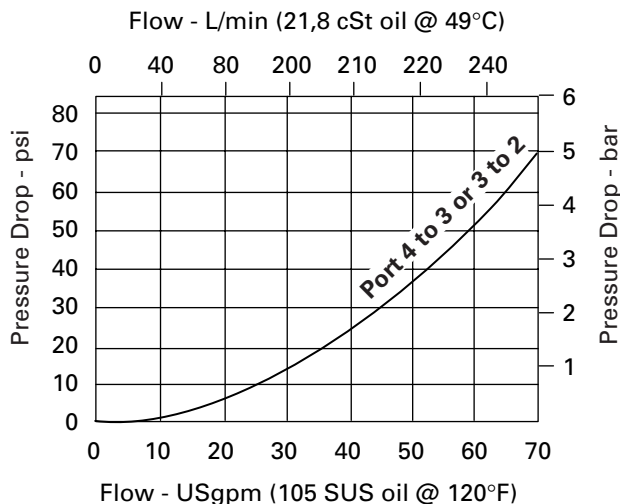
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

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

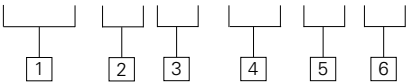
Pressure Drop Curve

Cartridge only





PTS1 – 20 (V) – *** – ** – 00



1 Function
PTS1 - Pilot to shift valve

2 Size
20 - 20 Size

3 Seals
Blank - Buna-N
V - Viton®

4 Port size
O - Cartridge only

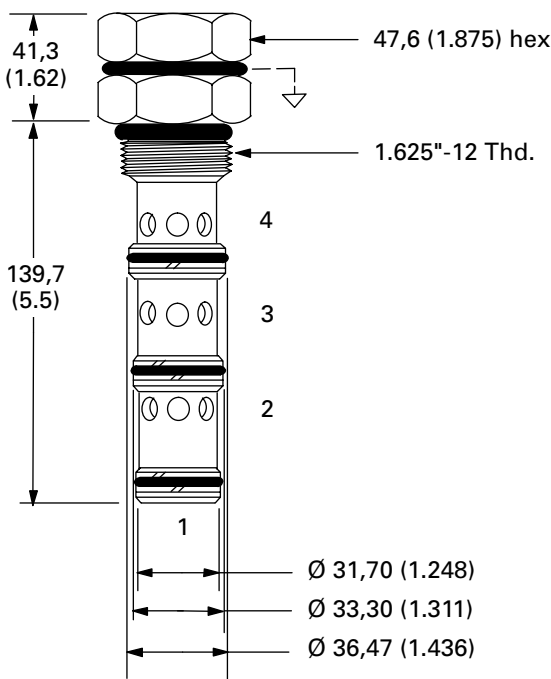
5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)

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.

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)



PTS2-10

Pilot to shift valve

Description

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

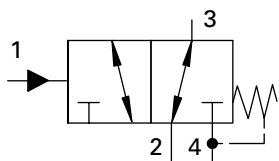
Operation

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

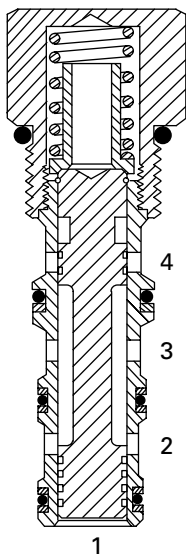
spring bias is overcome. At this time, flow is directed between ports 3 and 4 while blocking port 2. **During the cross-over transition all**

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

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

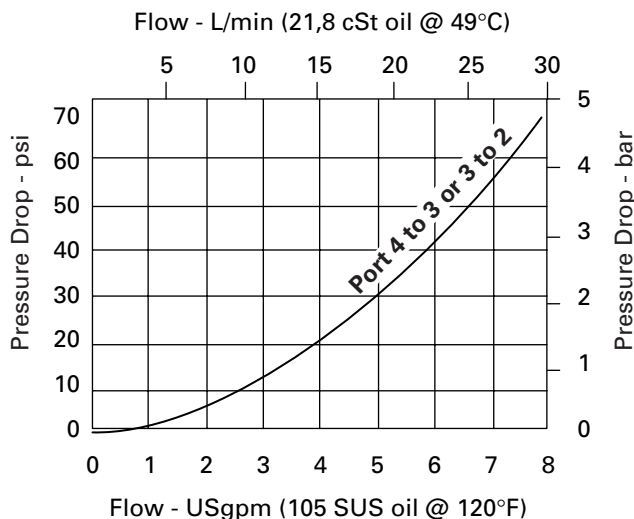
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

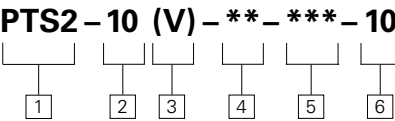
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	30 L/min (8 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (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





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

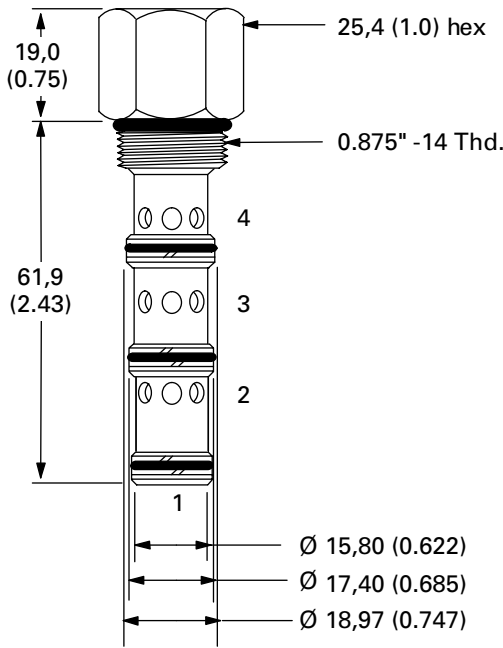
CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-179705	–
6T	SAE 6	566161	–
2G	1/4" BSPP	–	876709
3G	3/8" BSPP	–	876715
6H	SAE 6	–	876708
8H	SAE 8	–	876713

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

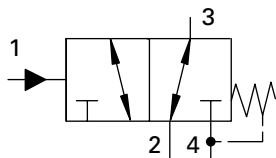
This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied to port 1 and the

spring bias is overcome.

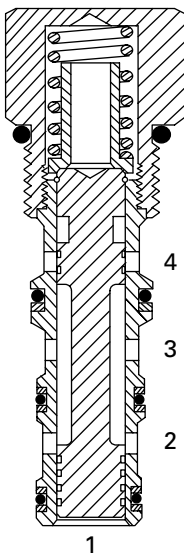
At that time, flow is directed between ports 3 and 4 while blocking port 2. **During the cross-over transition, all**

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

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

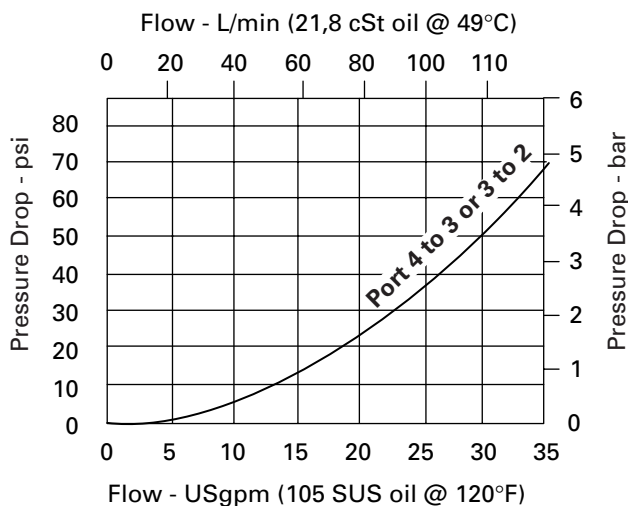
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

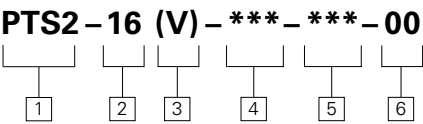
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	132 L/min (35 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (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





1 Function
PTS2 - Pilot to shift valve

2 Size
16 - 16 Size

3 Seals
Blank - Buna-N
V - Viton®

4 Port size
O - Cartridge only

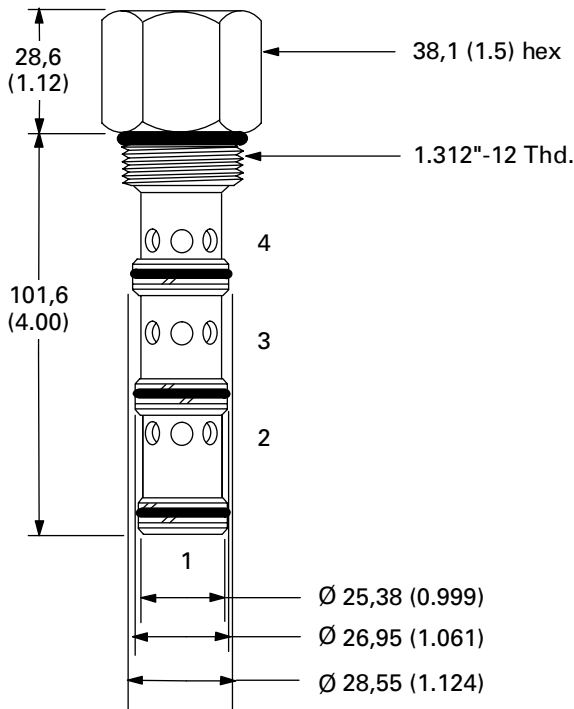
5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)
160 - 11,0 bar (160 psi)

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.

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)



PTS2-20

Pilot to shift valve

Description

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

Operation

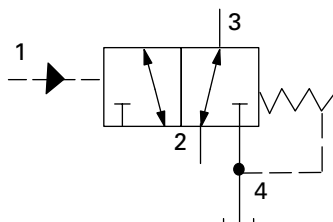
This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied at port 1 and the

spring bias is overcome.

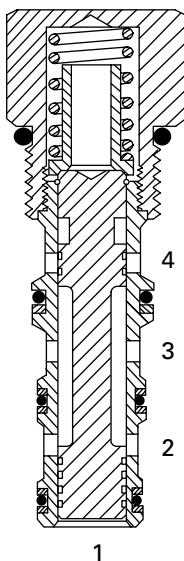
At that time, flow is directed between ports 3 and 4 while blocking port 2. **During the cross-over transition, all**

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

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

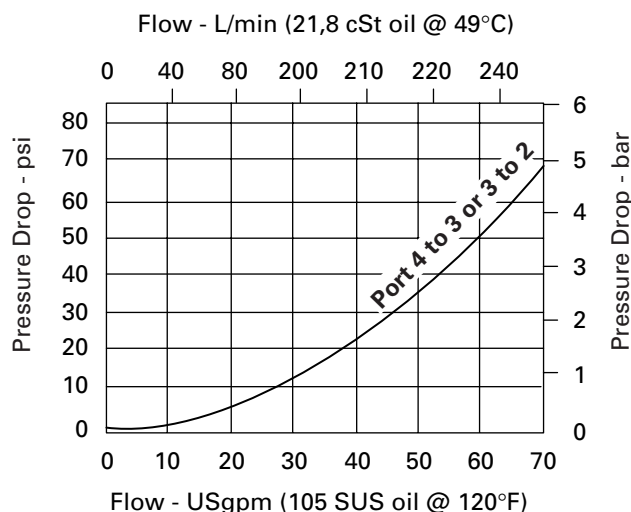
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

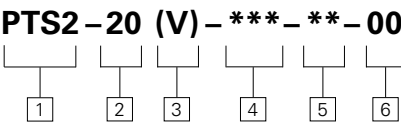
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	265 L/min (70 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (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





1 Function
PTS2 - Pilot to shift valve

2 Size
20 - 20 Size

3 Seals
Blank - Buna-N
V - Viton®

4 Port size
O - Cartridge only

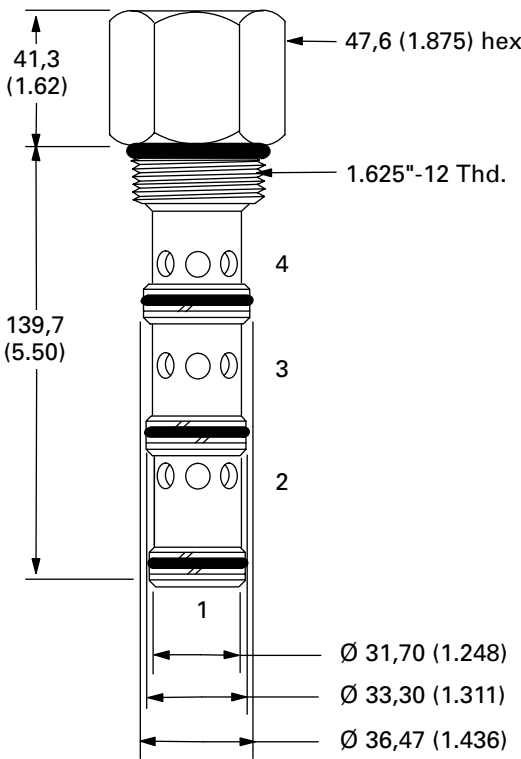
5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)

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.

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.

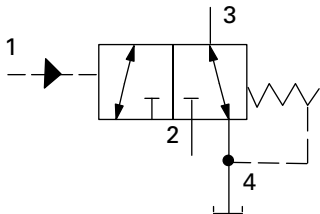
Operation

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

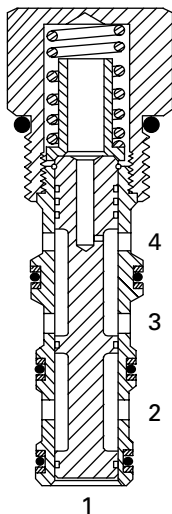
spring bias is overcome. At that time, flow is directed between ports 2 and 3 while blocking port 4. **During the cross-over transition, all**

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)

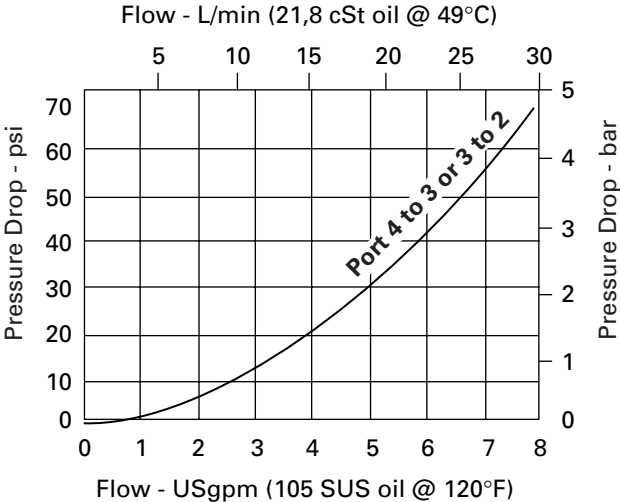
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	30 L/min (8 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi) 160 - 11,0 bar (160 psi)

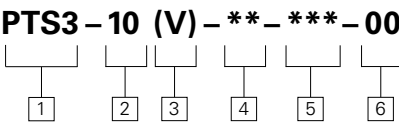
Pilot displacement volume	0,49 cm ³ (0.02 in ³)
Cavity	C-10-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,14 kg (0.32 lbs)
Seal kit	889625 (Buna-N) 566080 (Viton®)

Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only





1 Function
PTS3 - Pilot to shift valve

2 Size
10 - 10 Size

3 Seals
Blank - Buna-N
V - Viton®

4 Port size
O - Cartridge only

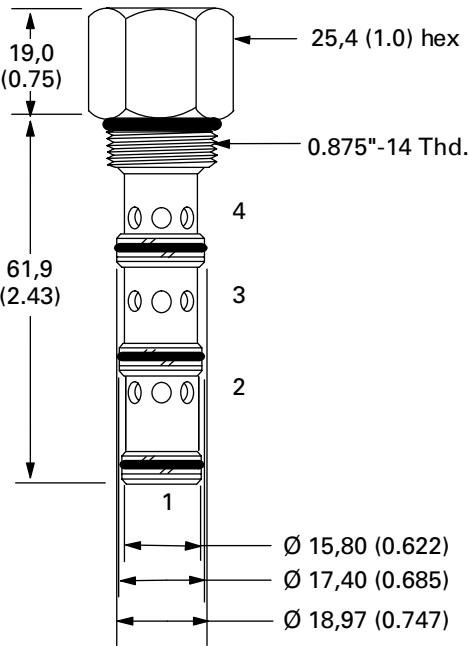
CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-179705	–
6T	SAE 6	566161	–
2G	1/4" BSPP	–	876709
3G	3/8" BSPP	–	876715
6H	SAE 6	–	876708
8H	SAE 8	–	876713

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)



PTS3-16

Pilot to shift valve

Description

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

Operation

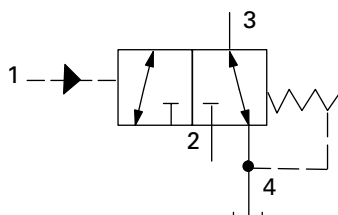
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the

spring bias is overcome.

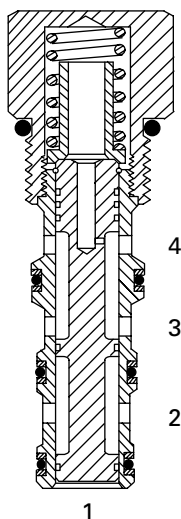
At that time, flow is directed between ports 2 and 3 while blocking port 4. **During the cross-over transition, all**

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)

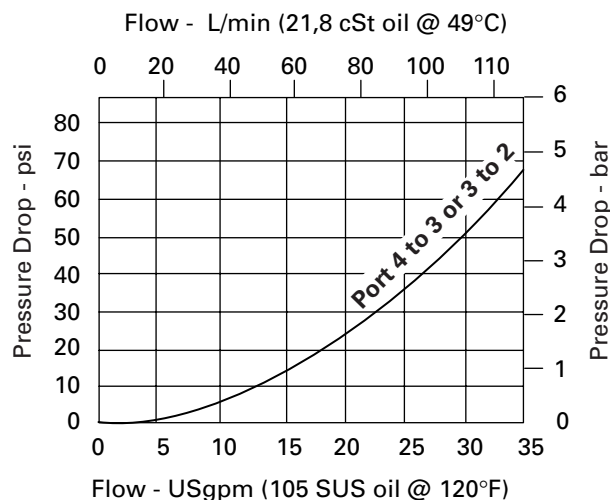
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	132 L/min (35 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi) 160 - 11,0 bar (160 psi)

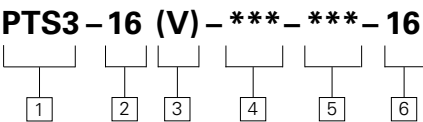
Pilot displacement volume	1,97 cm ³ (0.12 in ³)
Cavity	C-16-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,5 kg (1.12 lbs)
Seal kit	889634 (Buna-N) 889638 (Viton®)

Viton is a registered trademark of E.I. DuPont

Pressure Drop Curve

Cartridge only





1 Function
PTS3 - Pilot to shift valve

2 Size
16 - 16 Size

3 Seals
Blank - Buna-N
V - Viton®

4 Port size
O - Cartridge only

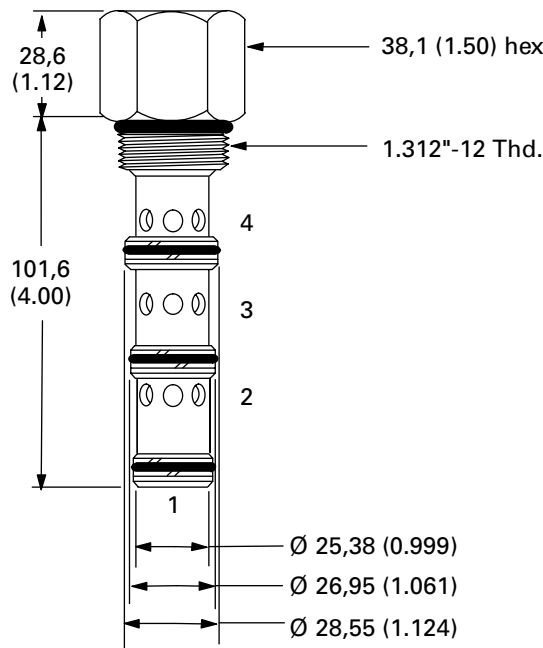
5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)
160 - 11,0 bar (160 psi)

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.

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)



PTS3-20

Pilot to shift valve

Description

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

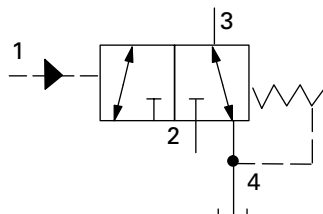
Operation

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

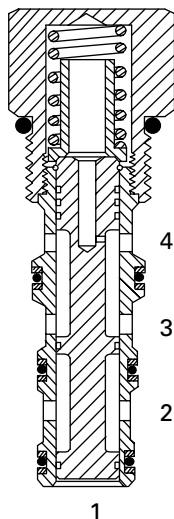
spring bias is overcome. At that time, flow is directed between ports 2 and 3 while blocking port 4. **During the cross-over transition, all**

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

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

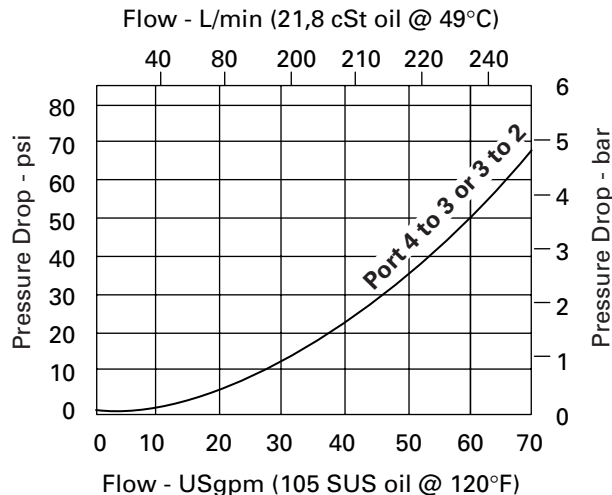
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

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

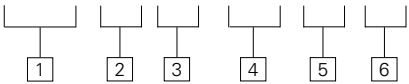
Pressure Drop Curve

Cartridge only





PTS3 – 20 (V) – *** – ** – 00



1 Function
PTS3 - Pilot to shift valve

2 Size
20 - 20 Size

3 Seals
Blank - Buna-N
V - Viton®

4 Port size
O - Cartridge only

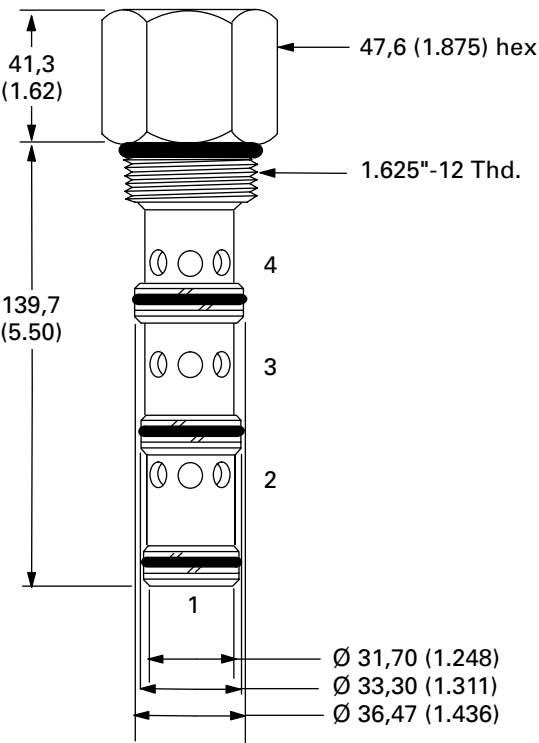
5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)

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.

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)



PTS4-16

Pilot to shift valve

Description

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

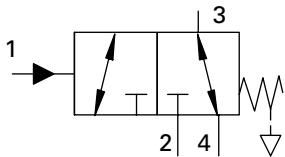
Operation

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

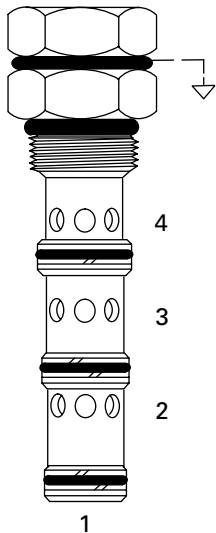
spring bias is overcome. At that time, flow is directed between ports 2 and 3 while blocking port 4. **During the cross-over transition, all**

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

Functional Symbol



Profile View



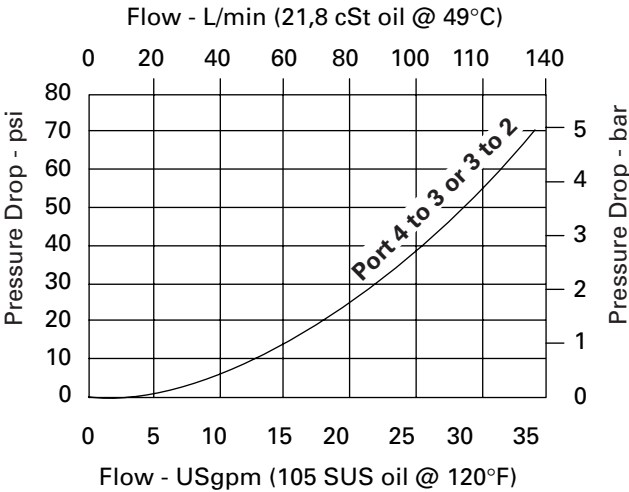
RATINGS AND SPECIFICATIONS

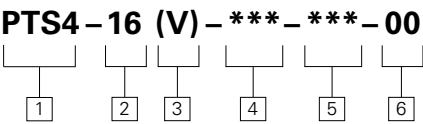
<i>Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)</i>	
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	132 L/min (35 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (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





1 Function
PTS4 - Pilot to shift valve

2 Size
16 - 16 Size

3 Seals
Blank - Buna-N
V - Viton®

4 Port size
O - Cartridge only

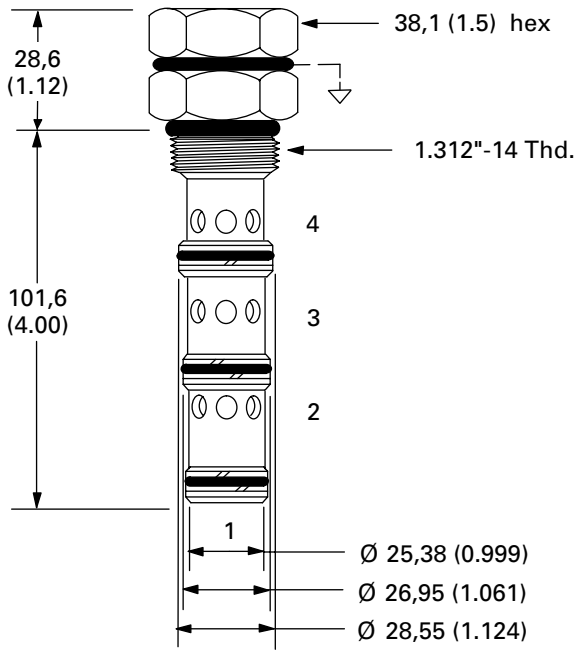
5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)
160 - 11,0 bar (160 psi)

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.

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)



PTS5-10

Pilot to shift valve

Description

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

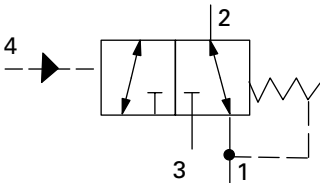
Operation

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

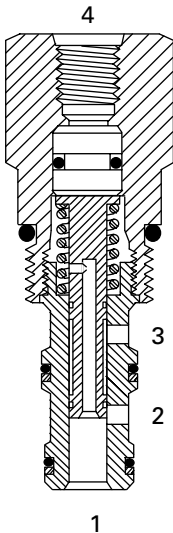
spring bias is overcome. At that time, flow is directed between ports 2 and 3 while blocking port 1. **During the cross-over transition, all**

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)

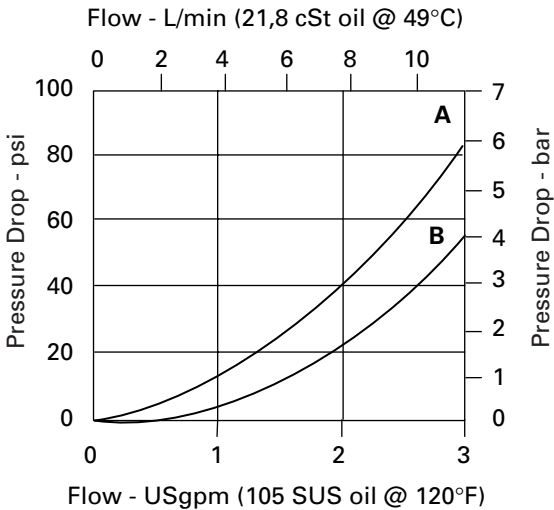
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	11 L/min (3 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressure	3,45 bar (50 psi)
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®)

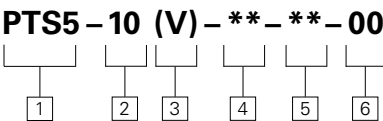
Viton is a registered trademark of E.I. DuPont

Pressure Drop Curves

Cartridge only

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





1 **Function**
PTS5 - Pilot to shift valve

2 **Size**
10 - 10 Size

3 **Seals**
Blank - Buna-N
V - Viton®

4 **Port size**
O - Cartridge only

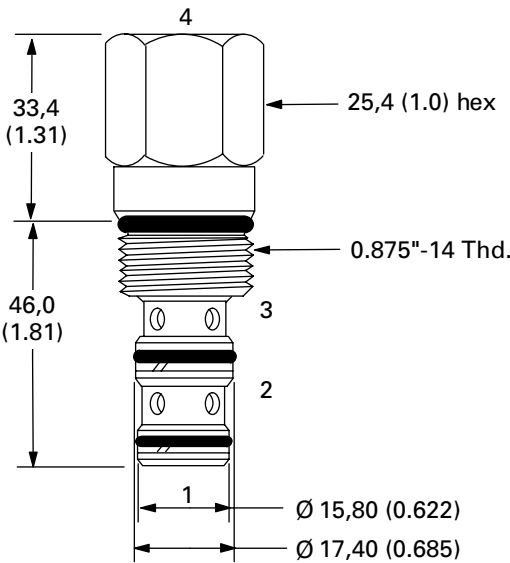
5 **Pilot to shift (nominal)**
50 - 3,45 bar (50 psi)

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")

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.

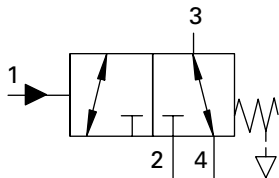
Operation

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

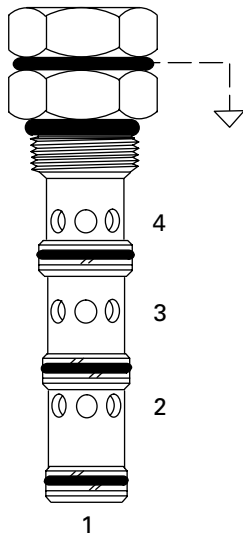
spring bias is overcome. At that time, flow is directed between ports 3 and 2 while blocking port 4. **During the cross-over transition, all**

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

Functional Symbol



Profile View



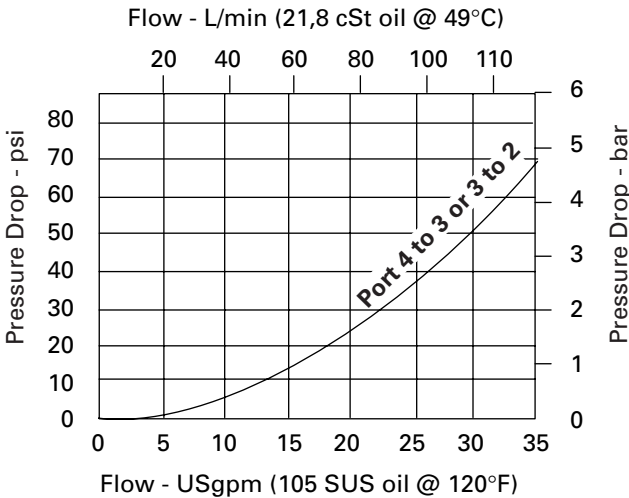
RATINGS AND SPECIFICATIONS

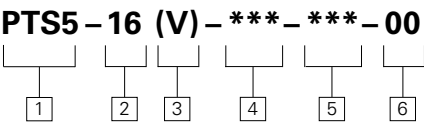
<i>Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)</i>	
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	132 L/min (35 USgpm)
Internal leakage	164 cc/min (10 in³/min) maximum @ 210 bar (3000 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 cm³ (0.12 in³)
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





1 Function
PTS5 - Pilot to shift valve

2 Size
16 - 16 Size

3 Seals
Blank - Buna-N
V - Viton®

4 Port size
O - Cartridge only

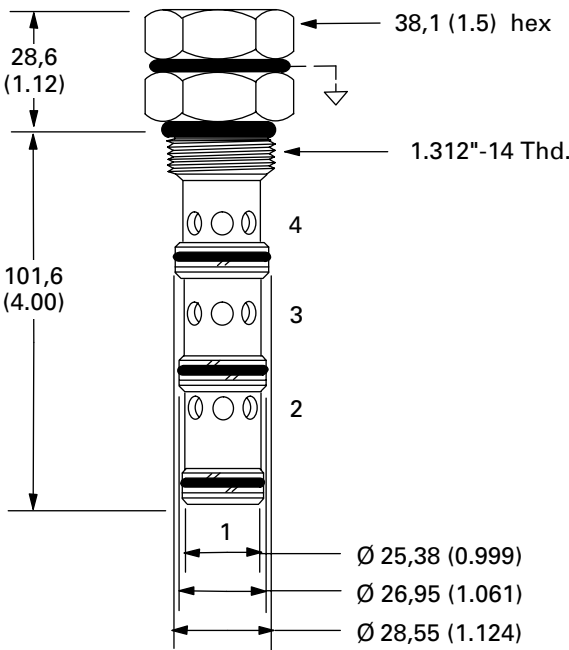
5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)
160 - 11,0 bar (160 psi)

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.

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.

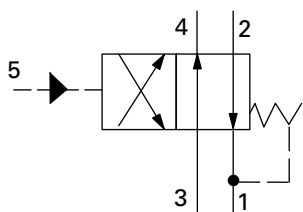
Operation

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

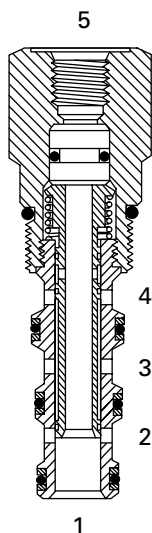
is overcome. At that time, flow is directed between ports 1 and 4 and ports 3 and 2. **During the cross-over transition, all ports are**

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)

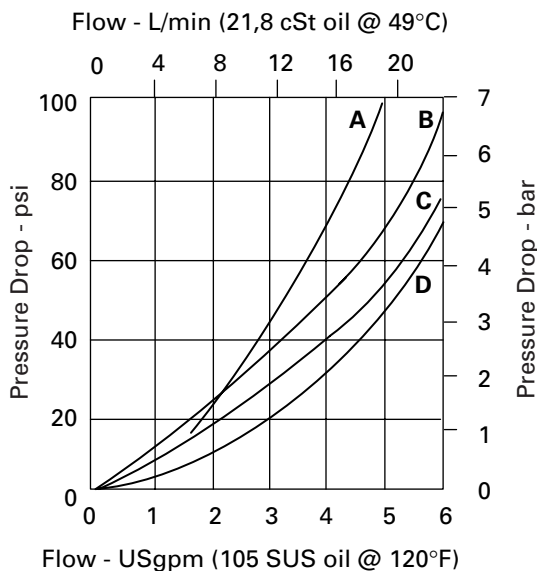
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	23 L/min (6 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressure	4,2 bar (60 psi)
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

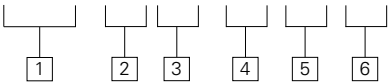
Cartridge only

- 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

2 Size
10 - 10 Size

3 Seals
Blank - Buna-N
V - Viton®

4 Port size
O - Cartridge only

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

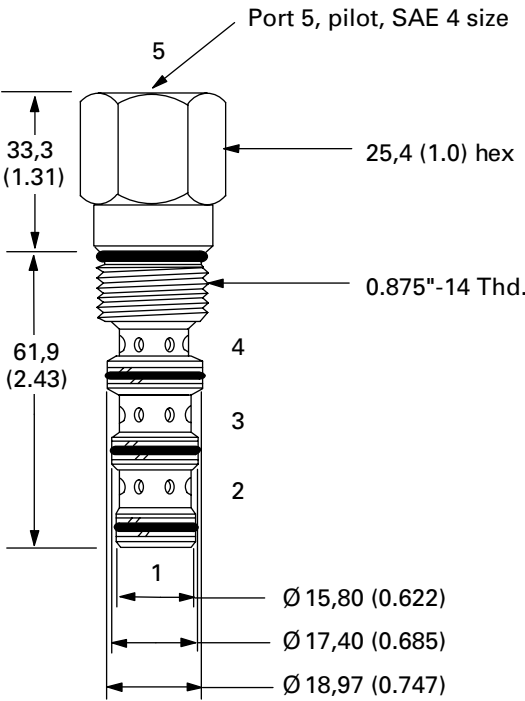
CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02-179705	–
6T	SAE 6	566161	–
2G	1/4" BSPP	–	876709
3G	3/8" BSPP	–	876715
6H	SAE 6	–	876708
8H	SAE 8	–	876713

See section J for housing details.

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

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.

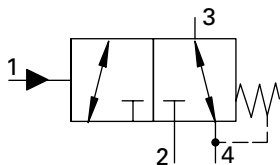
Operation

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

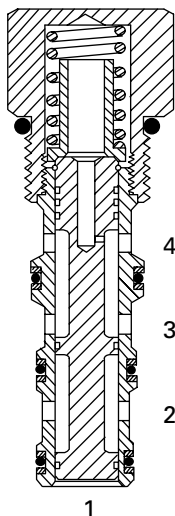
spring bias is overcome. At that time, flow is directed between ports 3 and 2 while blocking port 4. **During the cross-over transition, all**

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

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

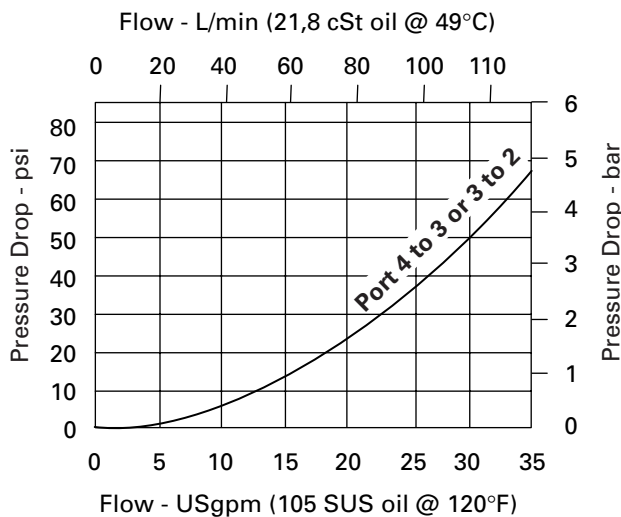
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

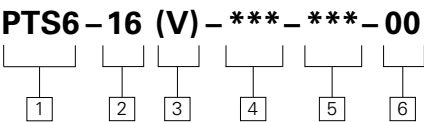
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	132 L/min (35 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (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





1 Function
PTS6 - Pilot to shift valve

2 Size
16 - 16 Size

3 Seals
Blank - Buna-N
V - Viton®

4 Port size
O - Cartridge only

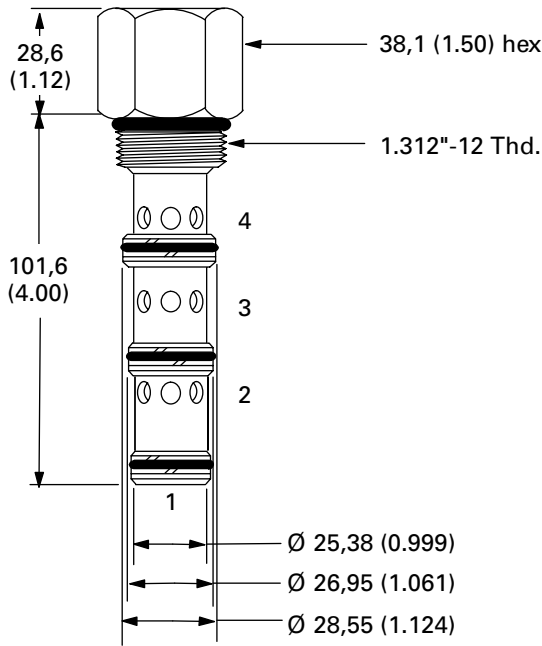
CODE	PORT SIZE	HOUSING NUMBER	
		Aluminum Light duty	Aluminum Fatigue rated
12T	SAE 12	566411	–
6B	3/4" BSPP	02-175468	–
10H	SAE 10	–	876729
12H	SAE 12	–	876731
4G	1/2" BSPPSAE 6	–	876728
6G	3/4" BSPP	–	876730

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
108-122 Nm (80-90 ft. lbs)



PTS7-10

Pilot to shift valve

Description

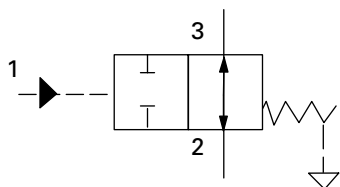
The PTS7-10 is a 2-way, 2 position, pilot operated, directional screw-in cartridge valve.

Operation

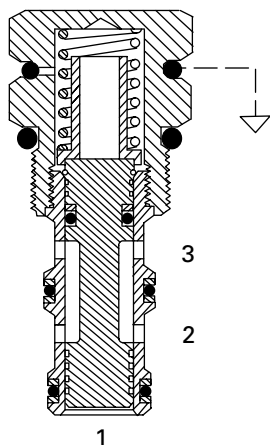
This valve allows flow between ports 2 and 3 until sufficient pressure at port 1 overcomes the spring bias, which closes both ports.

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

Functional Symbol



Sectional View



RATINGS AND SPECIFICATIONS

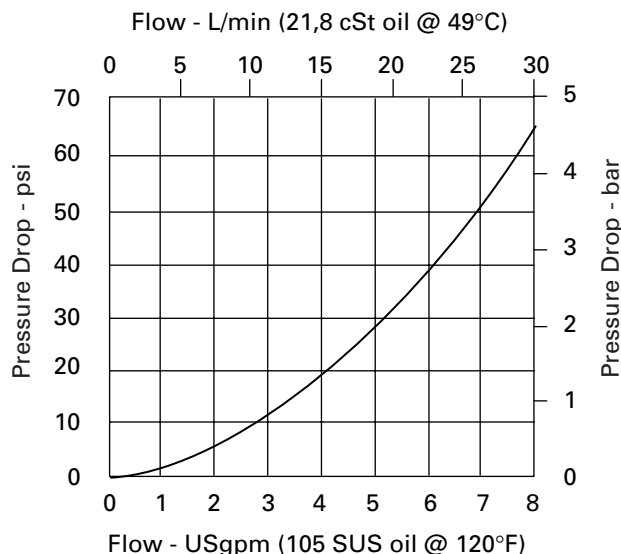
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

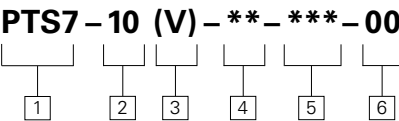
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	30 L/min (8 USgpm)
Internal leakage	164 cc/min (10 in ³ /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (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





1 Function
PTS7 - Pilot to shift valve

2 Size
10 - 10 Size

3 Seals
Blank - Buna-N
V - Viton®

4 Port size
O - Cartridge only

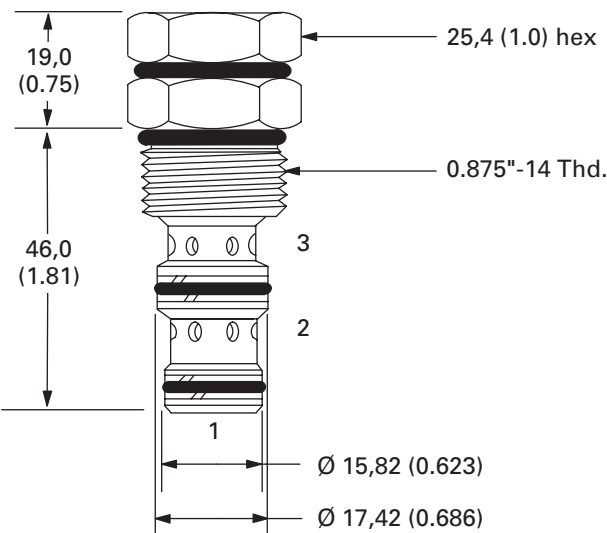
5 Pilot to shift (nominal)
40 - 2,75 bar (40 psi)
80 - 5,5 bar (80 psi)
160 - 11,0 bar (160 psi)

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")

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



PTS9-12

Pilot to shift valve

Description

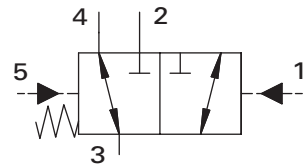
The PTS 9-12 is a 3-way, 2 position, pilot operated, directional screw-in cartridge valve.

Operation

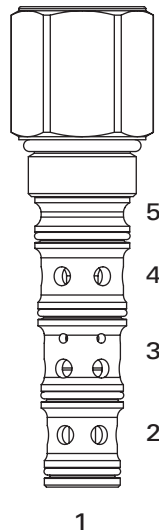
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome. At that time flow is

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

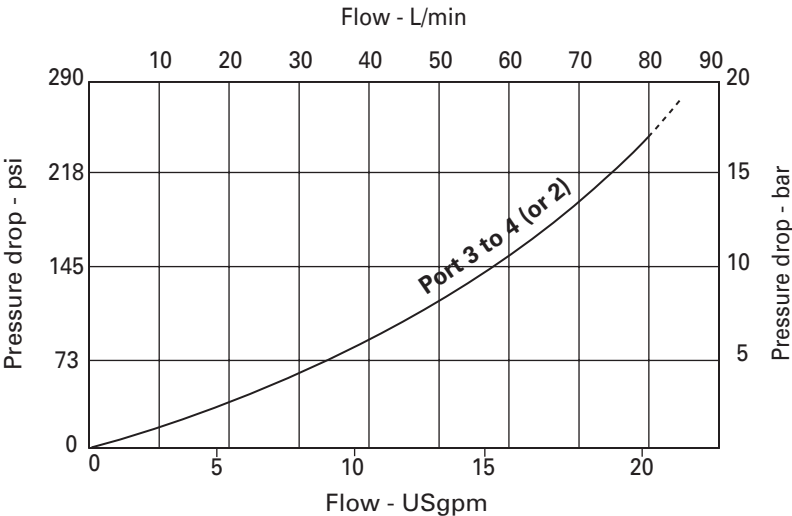


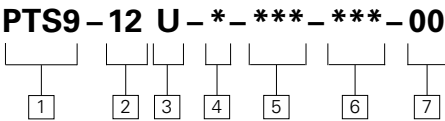
RATINGS AND SPECIFICATIONS

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





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*

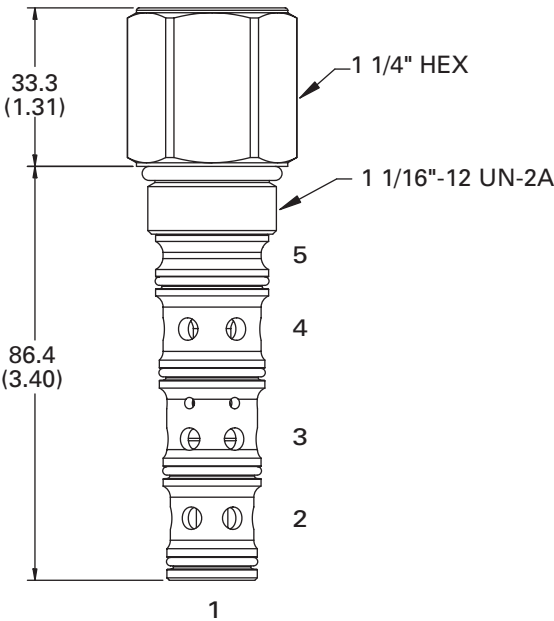
CODE	PORT SIZE		HOUSING NUMBER	
	Port 1, 2, 3 & 4	Port 5	Aluminum	Steel
000	No Body	—	—	—
12T	SAE 10	SAE 4	—	—
16T	SAE 12	SAE 4	—	—
06G	1/2" BSPP	1/4" BSPP	—	—
08G	3/4" BSPP	1/4" BSPP	—	—

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

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")

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

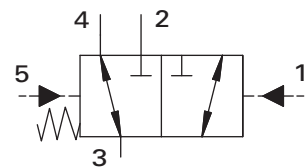
Description

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

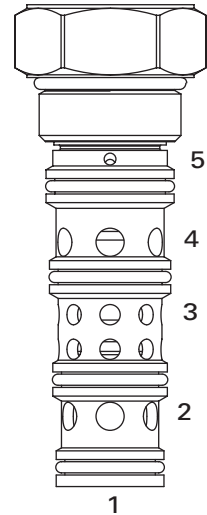
Operation

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

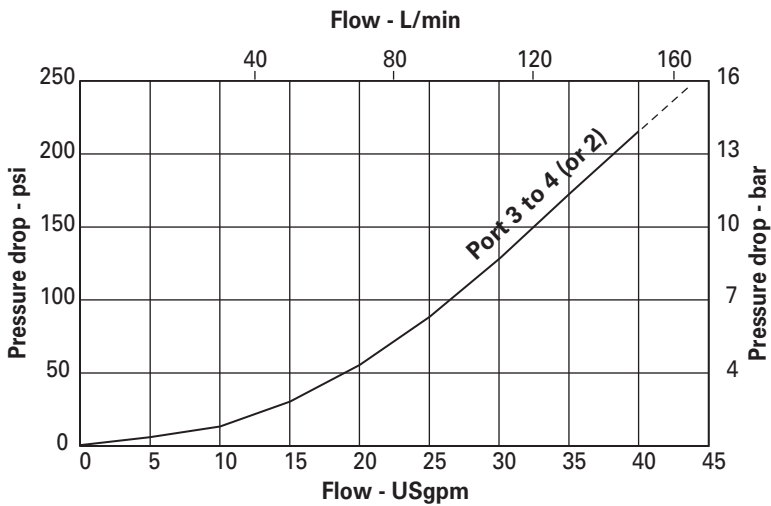


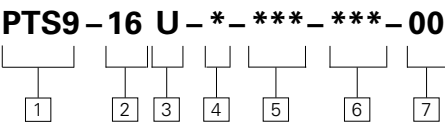
RATINGS AND SPECIFICATIONS

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





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	—	—	—
12T	SAE 12	SAE 4	—	—
16T	SAE 16	SAE 4	—	—
06G	3/4" BSPP	1/4" BSPP	—	—
08G	1" BSPP	1/4" BSPP	—	—

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

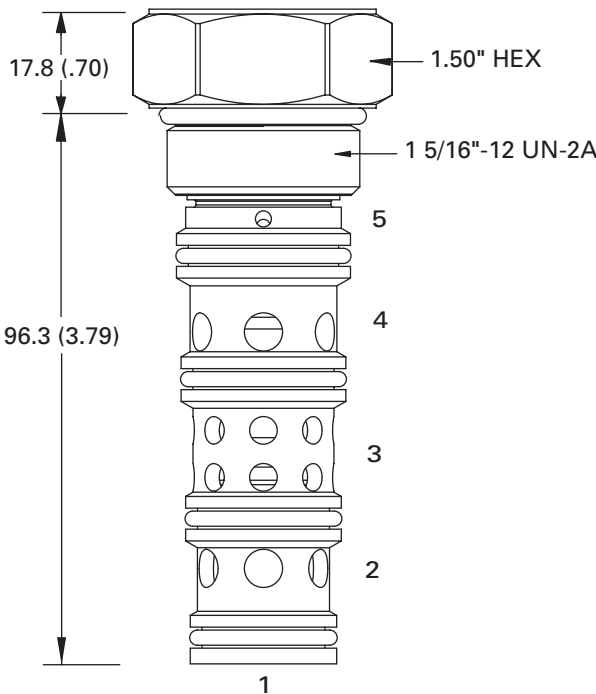
6 Shift Pressure
030 psi (2 bar)
050 psi (3,5 bar)
070 psi (4,8 bar)

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

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

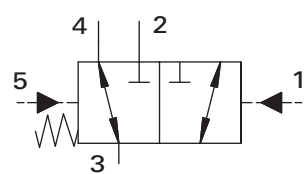
Description

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

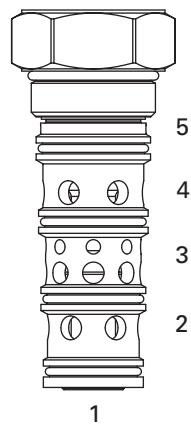
Operation

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

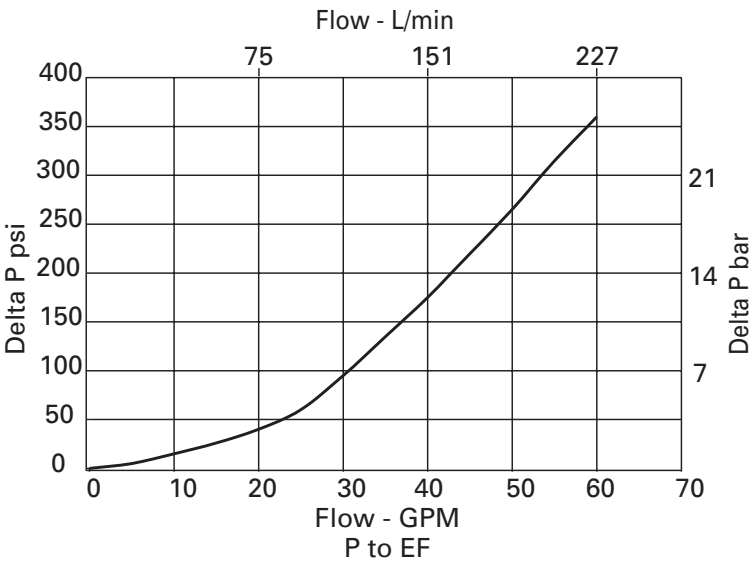


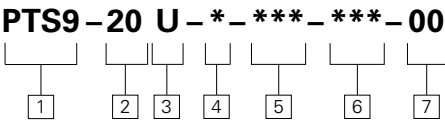
RATINGS AND SPECIFICATIONS

<i>Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)</i>	
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 in³/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





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*

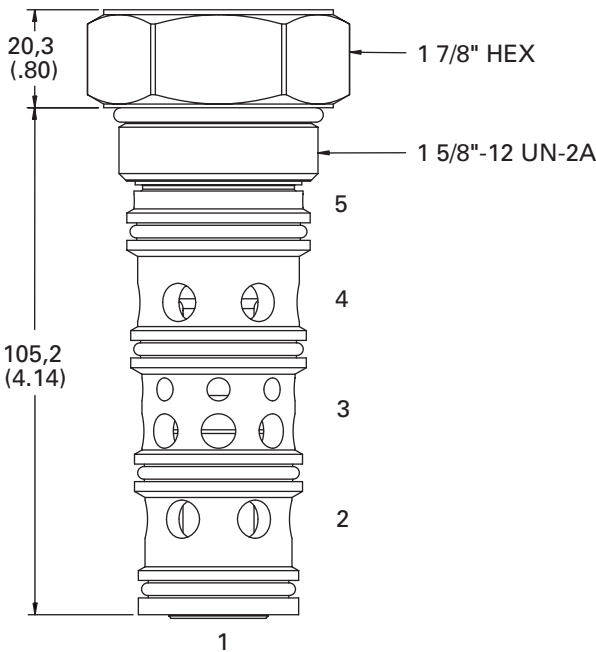
CODE	PORT SIZE		HOUSING NUMBER	
	Port 1, 2, 3 & 4	Port 5	Aluminum	Steel
000	No Body	—	—	—
12T	SAE 12	SAE 4	—	—
16T	SAE 16	SAE 4	—	—
06G	3/4" BSPP	1/4" BSPP	—	—
08G	1" BSPP	1/4" BSPP	—	—


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

6 Shift Pressure
080 psi (5.2 bar)
100 psi (8.6 bar)

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

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).