

## Directional controls

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



**HYDRAULIC CONTROLS** Pty Ltd

# Directional controls

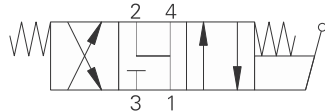
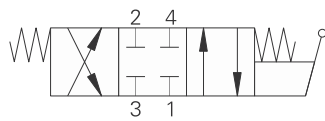
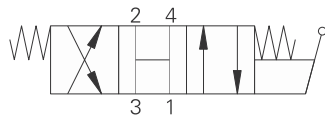
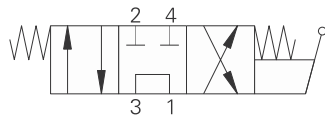
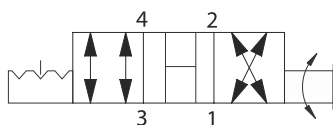
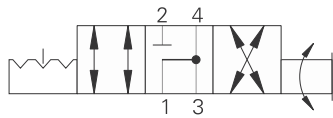
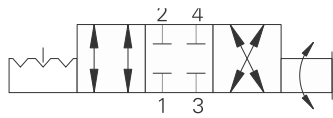
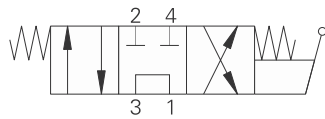
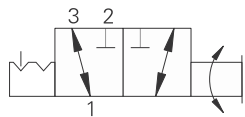
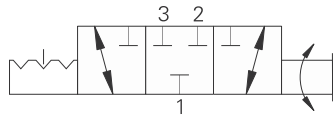
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# Directional controls

## Valve locator

### Functional symbol



Model	Cavity	Flow rating L/min (USgpm)	Typical pressure bar (psi)	Page
<i>Manual rotary valve</i>				
MRV3-10	C-10-3	23 (6)	210 (3000)	D-10
MRV13-10	C-10-3	23 (6)	350 (5000)	D-12
MRV13-12	C-12-3	46 (12)	350 (5000)	D-14
MRV3-16	C-16-3	64 (17)	210 (3000)	D-16
MRV13-16	C-16-3	64 (17)	350 (5000)	D-18

Model	Cavity	Flow rating L/min (USgpm)	Typical pressure bar (psi)	Page
<i>Manual rotary valve</i>				
MRV4-10	C-10-4	11 (3)	210 (3000)	D-20
MRV14-10	C-10-4	11 (3)	350 (5000)	D-22
MRV14-12	C-12-4	23 (6)	350 (5000)	D-24
MRV4-16	C-16-4	45 (12)	210 (3000)	D-26
MRV14-16	C-16-4	45 (12)	350 (5000)	D-28

Model	Cavity	Flow rating L/min (USgpm)	Typical pressure bar (psi)	Page
<i>Manual rotary valve</i>				
MRV5-10	C-10-4	11 (3)	210 (3000)	D-30
MRV15-10	C-10-4	11 (3)	350 (5000)	D-32
MRV15-12	C-12-4	23 (6)	350 (5000)	D-34
MRV5-16	C-16-4	45 (12)	210 (3000)	D-36
MRV15-16	C-16-4	45 (12)	350 (5000)	D-38

Model	Cavity	Flow rating L/min (USgpm)	Typical pressure bar (psi)	Page
<i>Manual rotary valve</i>				
MRV6-10	C-10-4	11 (3)	210 (3000)	D-40
MRV6-16	C-16-4	11 (3)	300 (5000)	D-42

Model	Cavity	Flow rating L/min (USgpm)	Typical pressure bar (psi)	Page
<i>Manual rotary valve</i>				
MRV7-10	C-10-4	11 (3)	210 (3000)	D-44

Model	Cavity	Flow rating L/min (USgpm)	Typical pressure bar (psi)	Page
<i>Manual lever valve, spool</i>				
MLV9-12-A	C-12-4	60 (13.9)	210 (3000)	D-46

Model	Cavity	Flow rating L/min (USgpm)	Typical pressure bar (psi)	Page
<i>Manual lever valve, spool</i>				
MLV9-12-B	C-12-4	60 (15.9)	210 (3000)	D-47

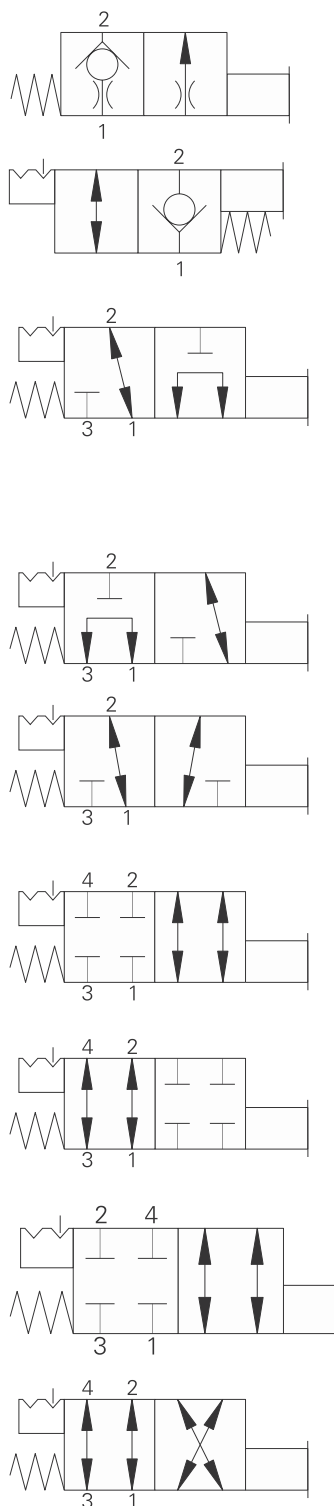
Model	Cavity	Flow rating L/min (USgpm)	Typical pressure bar (psi)	Page
<i>Manual lever valve, spool</i>				
MLV9-12-E	C-12-4	60 (15.9)	210 (3000)	D-48

Model	Cavity	Flow rating L/min (USgpm)	Typical pressure bar (psi)	Page
<i>Manual lever valve, spool</i>				
MLV9-12-F	C-12-4	60 (15.9)	210 (3000)	D-49

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



### Functional symbol



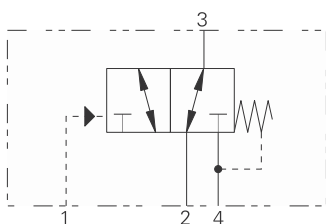
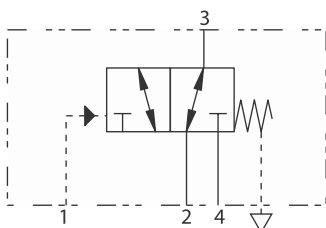
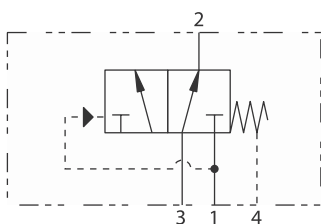
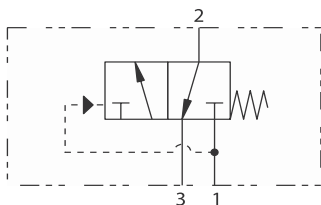
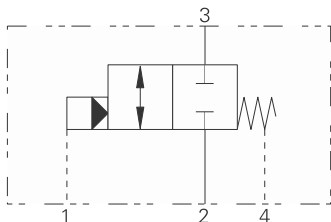
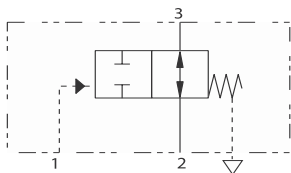
Model	Cavity	Flow rating L/min (USgpm)	Typical pressure bar (psi)	Page
<i>Check MO</i>				
3CP2	A879	5.5-15 (1.4-4)	210 (3000)	D-52
<i>Manual pull valve, NC</i>				
MPV1-10	C-10-2	45 (12)	210 (3000)	D-54
MPV3-10	C-10-2	45 (12)	210 (3000)	D-56
<i>Manual push valve</i>				
MSV1-12	C-12-3	41.8 (11)	210 (3000)	D-58
MSV11-10	C-10-3	23 (6)	350 (5000)	D-60
MSV11-12	C-12-3	30 (8)	350 (5000)	D-62
MSV12-12	C-12-3	38 (10)	350 (5000)	D-66
<i>Manual push valve</i>				
MSV2-12	C-12-3	38 (10)	210 (3000)	D-64
<i>Manual push valve</i>				
MSV5-12	C-12-3	41.8 (11)	210 (3000)	D-68
MSV15-12	C-12-3	41.8 (11)	350 (5000)	D-70
<i>Manual push valve</i>				
MSV3-12	C-12-4	53.2 (14)	210 (3000)	D-72
MSV13-12	C-12-4	53.2 (14)	350 (5000)	D-74
<i>Manual push valve</i>				
MSV4-12	C-12-4	53.2 (14)	210 (3000)	D-76
MSV14-12	C-12-4	53.2 (14)	350 (5000)	D-78
<i>Manual push valve</i>				
MSV6-12	C-12-4	53.2 (14)	210 (3000)	D-80
MSV16-12	C-12-4	53.2 (14)	350 (5000)	D-82
<i>Manual push valve</i>				
MSV17-10	C-12-4	20 (5.3)	350 (5000)	D-84
MSV17-12	C-12-4	45 (11.9)	210 (3000)	D-86
MSV17-12	C-12-4	20 (5)	350 (5000)	D-88

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

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Model	Cavity	Flow rating	Typical pressure	Page
<i>Pilot to shift 2/2 valve</i>		<b>L/min (USgpm)</b>	<b>bar (psi)</b>	
PTS7-10	C-10-3	30 (8)	210 (3000)	D-90
PTS17-10	C-10-3	30 (8)	350 (5000)	D-92
PTS17-12	C-12-3	114 (30)	350 (5000)	D-94

Model	Cavity	Flow rating	Typical pressure	Page
<i>Pilot to shift 2/2 valve</i>		<b>L/min (USgpm)</b>	<b>bar (psi)</b>	
1RDS702	A21145	80 (20)	420 (6090)	D-100

Model	Cavity	Flow rating	Typical pressure	Page
<i>Brake sequence</i>		<b>L/min (USgpm)</b>	<b>bar (psi)</b>	
1SB10	A893	10 (2.5)	350 (5000)	D-96

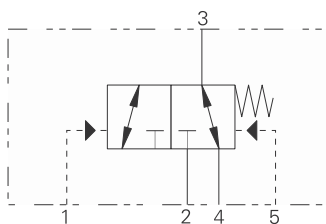
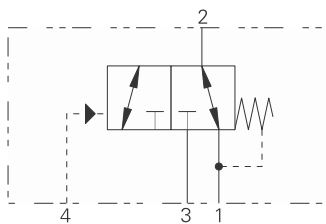
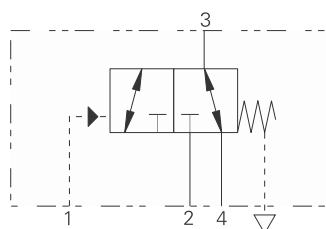
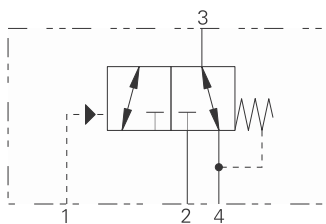
Model	Cavity	Flow rating	Typical pressure	Page
<i>Brake release shuttle</i>		<b>L/min (USgpm)</b>	<b>bar (psi)</b>	
1SB304	A5302	30 (8)	350 (5000)	D-98

Model	Cavity	Flow rating	Typical pressure	Page
<i>Pilot to shift valve</i>		<b>L/min (USgpm)</b>	<b>bar (psi)</b>	
PTS1-10	C-10-4	30 (8)	210 (3000)	D-102
PTS11-12	C-12-4	76 (20)	350 (5000)	D-104
PTS11-10	C-10-4	30 (8)	350 (5000)	D-106
PTS1-16	C-16-4	132 (35)	210 (3000)	D-108
PTS11-16	C-16-4	132 (35)	350 (5000)	D-110
PTS1-20	C-20-4	265 (70)	210 (3000)	D-113

Model	Cavity	Flow rating	Typical pressure	Page
<i>Pilot to shift valve</i>		<b>L/min (USgpm)</b>	<b>bar (psi)</b>	
PTS12-10	C-10-4	30 (8)	350 (5000)	D-114
PTS12-12	C-12-4	114 (30)	350 (5000)	D-116
PTS2-16	C-16-4	132 (35)	210 (3000)	D-118
PTS12-16	C-16-4	132 (35)	350 (5000)	D-120
PTS2-20	C-20-4	265 (70)	210 (3000)	D-122

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

### Functional symbol



Model	Cavity	Flow rating L/min (USgpm)	Typical pressure bar (psi)	Page
<i>Pilot to shift valve</i>				
PTS13-10	C-10-4	30 (8)	350 (5000)	D-124
PTS13-12	C-12-4	114 (30)	350 (5000)	D-126
PTS3-16	C-16-4	132 (35)	210 (3000)	D-128
PTS13-16	C-16-4	132 (35)	350 (5000)	D-130
PTS3-20	C-20-4	265 (70)	210 (3000)	D-132
PTS6-16	C-16-4	132 (35)	210 (3000)	D-146
PTS16-16	C-16-4	132 (35)	350 (5000)	D-148

Model	Cavity	Flow rating L/min (USgpm)	Typical pressure bar (psi)	Page
<i>Pilot to shift valve</i>				
PTS14-12	C-12-4	114 (30)	350 (5000)	D-134
PTS14-16	C-16-4	132 (35)	350 (5000)	D-136
PTS5-16	C-16-4	132 (35)	210 (3000)	D-142
PTS15-16	C-16-4	132 (35)	350 (5000)	D-144

Model	Cavity	Flow rating L/min (USgpm)	Typical pressure bar (psi)	Page
<i>Pilot to shift valve</i>				
PTS5-10	C-10-3	11 (3)	210 (3000)	D-138
PTS15-12	C-12-3	105 (28)	350 (5000)	D-140

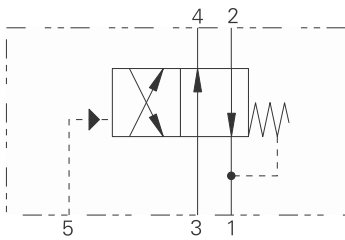
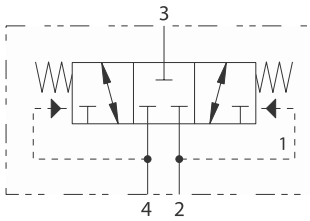
Model	Cavity	Flow rating L/min (USgpm)	Typical pressure bar (psi)	Page
<i>Pilot to shift valve</i>				
PTS9-8	C-8-5S	19 (5)	280 (4000)	D-150
PTS9-10	C-10-5S	38 (10)	280 (4000)	D-152
PTS9-12	C-12-5S	76 (20)	280 (4000)	D-154
PTS9-16	C-16-5S	151 (40)	280 (4000)	D-156
PTS9-20	C-20-5S	230 (60)	280 (4000)	D-158

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### Functional symbol



Model	Cavity	Flow rating	Typical pressure	Page
<i>Sequence</i>		<b>L/min (USgpm)</b>	<b>bar (psi)</b>	
DSV4-10	C-10-4	26 (6.9)	350 (5000)	D-160
DSV4-12	C-12-4	113 (29.9)	350 (5000)	D-162
DSV4-16	C-16-4	190 (50)	350 (5000)	D-164

Model	Cavity	Flow rating	Typical pressure	Page
<i>Pilot to shift valve</i>		<b>L/min (USgpm)</b>	<b>bar (psi)</b>	
PTS6-10	C-10-4	23 (6)	210 (3000)	D-166
PTS16-10	C-10-4	23 (6)	350 (5000)	D-168
PTS16-12	C-12-4	76 (20)	350 (5000)	D-170

# Directional controls

## Introduction

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

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

### Features and benefits

- Products in this catalog have been fatigue tested for one million cycles at 132% or 10 million cycles at 115% of rated pressure.
- All operating parts are hardened steel, ground and honed for long life and low leakage.
- Designed for maximum flexibility and minimal space requirements.
- All exposed cartridge surfaces are zinc dichromate plated to resist corrosion.

- All aluminum manifolds are gold anodized to resist corrosion.
- Desired settings may be locked down.
- Aluminum knob and cap options are available on some models.
- Reliable, economical and compact.

### Warning

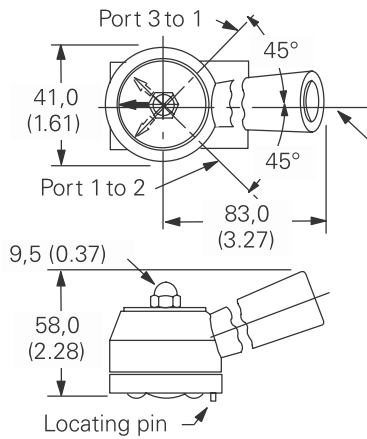
For pressure over 210 bar (3000 psi) use steel housing.

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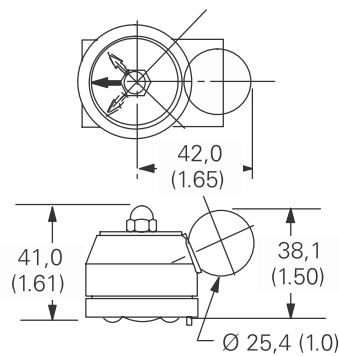
## Alternative adjusters

For light duty aluminum housings only

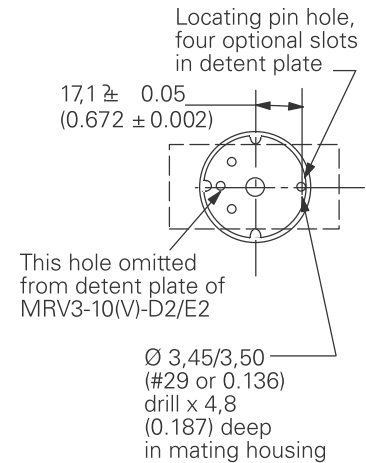
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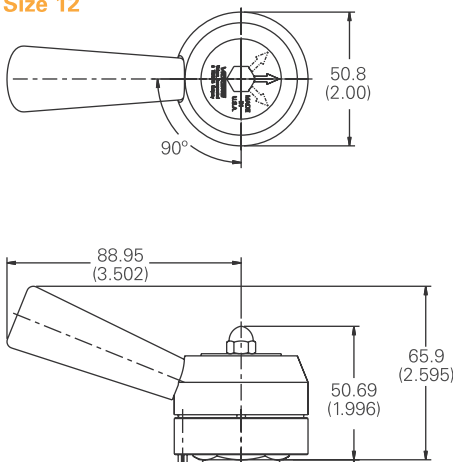
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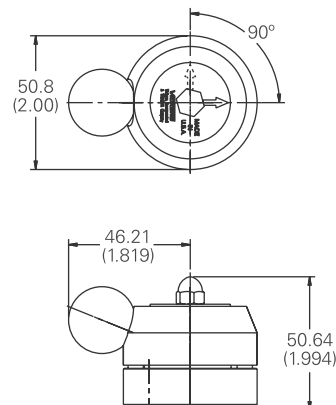
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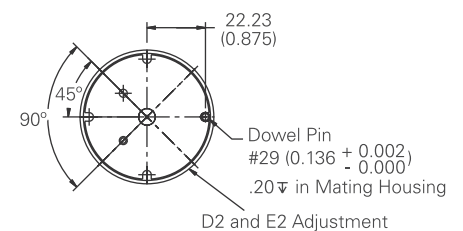
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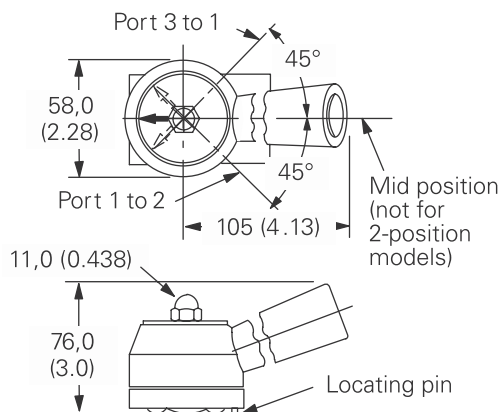
### Size 12 E(2)



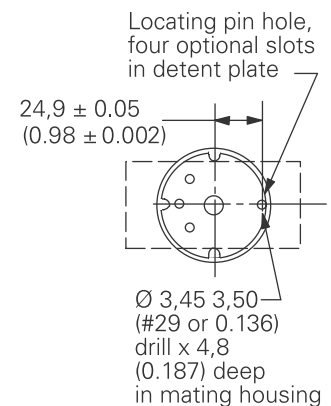
### Size 12 Locating PIN installation



### D(2) Size 16



### Size 16 Locating PIN installation



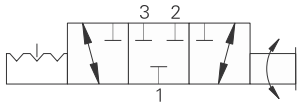
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV3-10 - Manual rotary valve

Manual semi-rotary directional control valve  
23 L/min (6 USgpm) • 210 bar (3000 psi)

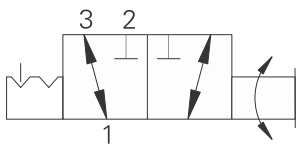
## MRV3-10(V)-D/E

3 position models

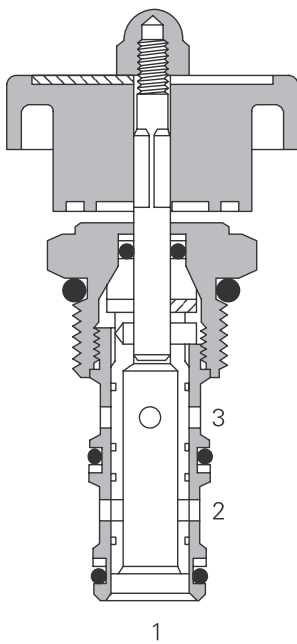


## MRV3-10(V)-D/E

2 position models



## Sectional view



## Description

This is a 3 way 2 or 3 position manual semi-rotary directional control valve. Can be used as a diverter or a dump 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.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Various levers and knobs available with and without detent.

## Performance data

### Ratings and specifications

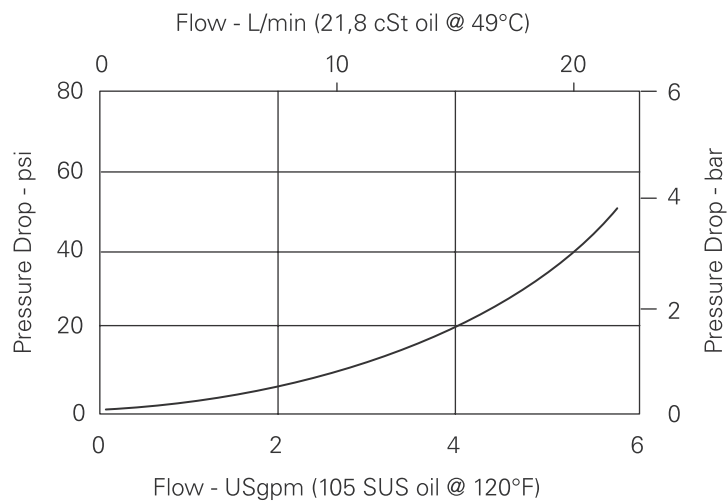
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	23 L/min (6 US gpm)
Temperature range	-40°C to 120°C (-40° to 248°F)
Manual operators	D - Lever (3-position detent)* D2 - Lever (2-position detent)* E - Ball (3-position detent)* E2 - Ball (2-position detent)* K - Knob (2-position, no detent)
Cavity	C-10-3
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing material	Aluminum or Steel
Weight cartridge only	0,22 kg (0.4 lbs)
Seal kit	565804 (Buna-N), 889599 (Viton®)

\*Light duty housing only.  
Viton is a registered trademark of E.I. DuPont

## Pressure drop curves

Cartridge only

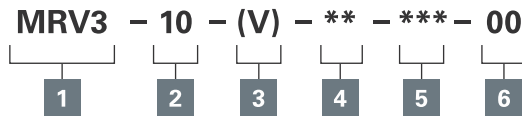


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV3-10 - Manual rotary valve

Manual semi-rotary directional control valve  
23 L/min (6 USgpm) • 210 bar (3000 psi)

## Model code



### 1 Function

**MRV3** - Manual rotary valve  
4-way

### 2 Size

**10** - 10 size

### 3 Seal material

**Blank** - Buna-N  
**V** - Viton

### 4 Manual operator

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

### 5 Port size

Code	Port size	Housing number	
		Aluminum Fatigue Rated	Steel
<b>0</b>	Cartridge		
<b>A3B</b>	3/8" BSPP	02-173358*	
<b>A6T</b>	SAE 6	5566162*	
<b>A2G</b>	1/4" BSPP	876705	
<b>A3G</b>	3/8" BSPP	876714	
<b>A6H</b>	SAE 6	876704	
<b>A8H</b>	SAE 8	876711	
<b>S2G</b>	1/4" BSPP		02-175127
<b>S3G</b>	3/8" SAE		02-175128
<b>S6T</b>	SAE 6		02-175124
<b>S8T</b>	SAE 8		02-175125

See section J for housing details.  
\* Aluminum light duty.

### 6 Special features

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

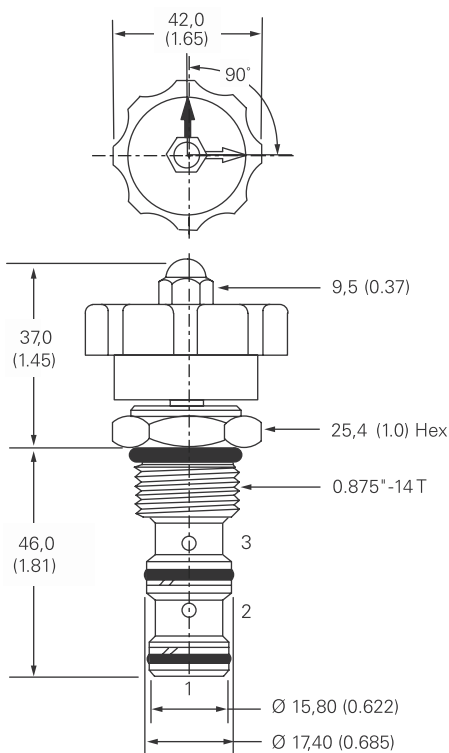
**SS** - 316 stainless steel external components (only available for "0" and "F" options).

## Dimensions

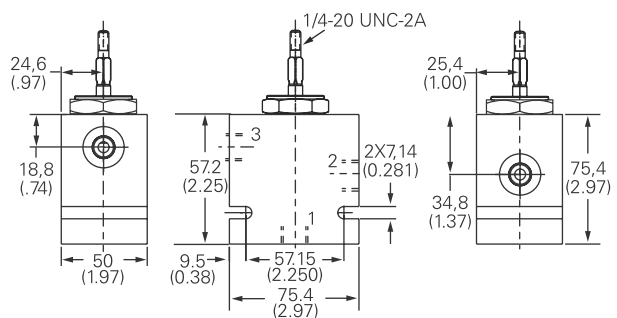
mm (inch)

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

## Cartridge only



## Installation drawing (aluminum)

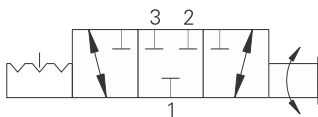


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

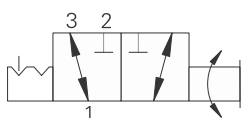
# MRV13-10 - Manual rotary valve

Manual semi-rotary directional control valve  
23 L/min (6 USgpm) • 350 bar (5000 psi)

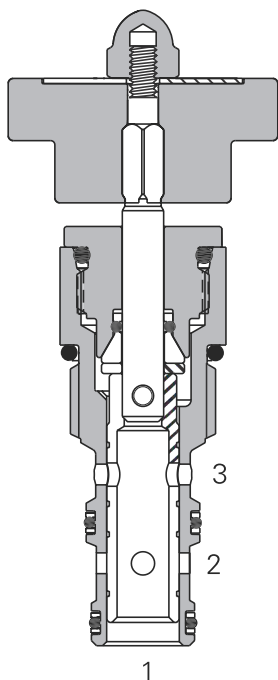
**MRV13-10(V)-D/E**  
3 position models



**MRV13-10(V)-D2/2E**  
2 position models



## Sectional view



"K" TYPE OPTION

## Description

This is a high pressure 3 way 2 or 3 position manual semi-rotary directional control valve. Can be used as a diverter or a dump 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.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Various levers and knobs available with and without detent. Working pressure 350 bar.

## Performance data

### Ratings and specifications

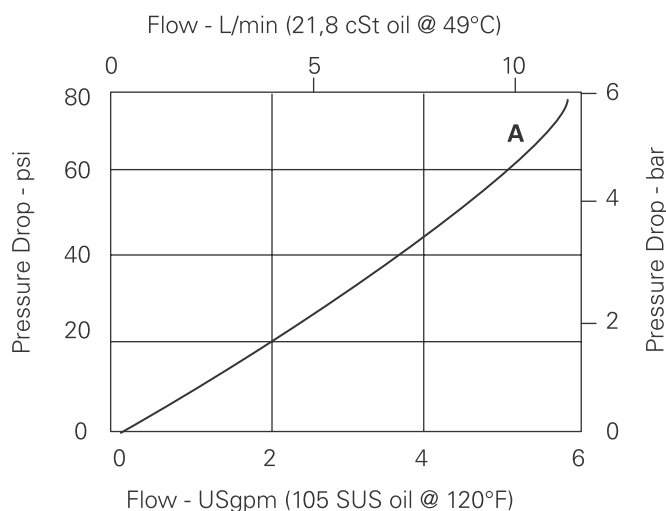
*Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)*

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	23 L/min (6 USgpm)
Internal leakage	250 cc/min (15in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Manual operators	D- Lever (3-position detent)* D2 - Lever (2-position detent)* E - Ball (3-position detent)* E2- Ball (2-position detent)* K- Knob (2-position, no detent)
Cavity	C-10-3
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 or Steel
Weight cartridge only	0,22 kg (0.48 lbs)
Seal kit	565804 (Buna-N), 889599 (Viton®)

\* Light duty housing only.  
Viton is a registered trademark of E.I. DuPont

## Pressure drop curves

Cartridge only



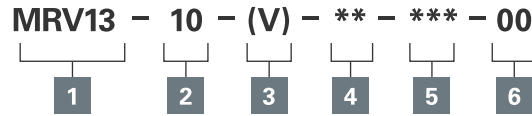
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# MRV13-10 - Manual rotary valve

Manual semi-rotary directional control valve  
23 L/min (6 USgpm) • 350 bar (5000 psi)

## Model code



- 1 Function**  
MRV13 - Manual rotary valve

---

- 2 Size**  
10 - 10 size

---

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

- 4 Manual operator**  
0 - No operator  
D - Level (3-position detent)  
D2 - Level (2-position detent)  
E - Ball (3-position detent)  
E2 - Ball (2-position detent)  
K - Knob (2-position, no detent)

- 5 Port size**  
0 - Cartridge only

- 6 Special features**  
00 - Non (Only required if valve has special features, omitted if "00").

Code	Port size	Housing number	
0		Aluminum Fatigue Rated	Steel
A2G	1/4" BSPP	02-185804	
A3G	3/8" BSPP	02-185805	
A6H	SAE 6	02-185802	
A8H	SAE 8	02-185803	
S2G	1/4" BSPP		02-175127
S3G	1/3" BSPP		02-175128
S6T	SAE 6		02-175124
S8T	SAE 8		02-175125

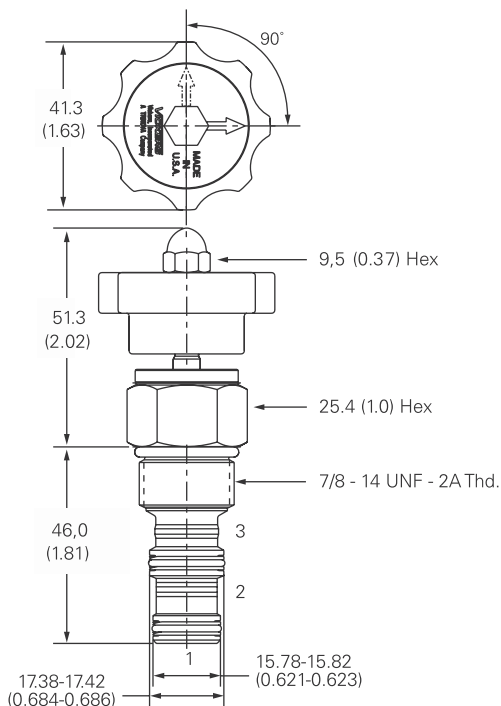
## Dimensions

mm (inch)

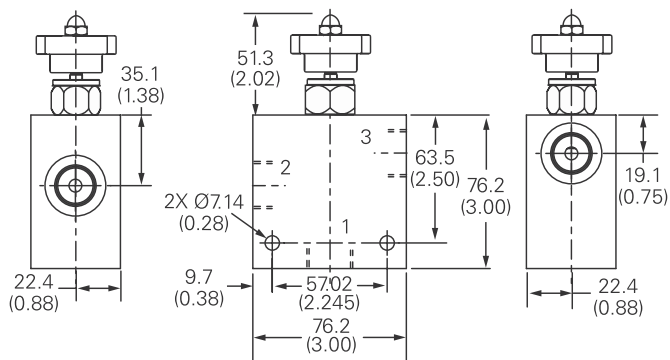
Torque cartridge in housing

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

## Cartridge only



## Installation drawing (steel)



### Warning

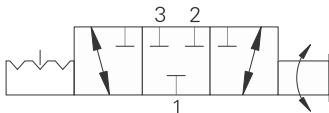
Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings must be used for operating pressures above 210 bar (3000 psi).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

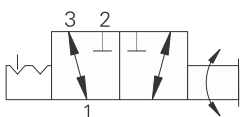
# MRV13-12 - Manual rotary valve

Manual semi-rotary directional control valve  
46 L/min (12 USgpm) • 350 bar (5000 psi)

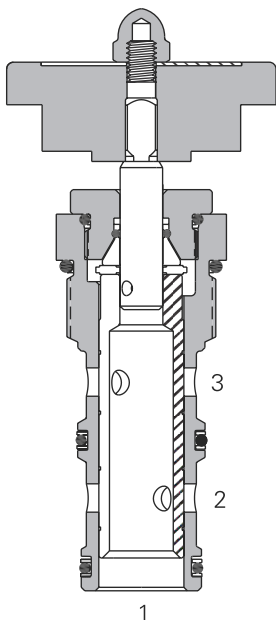
**MRV13-12(V)-D/E**  
3 position models



**MRV13-12(V)-D2/2E**  
2 position models



## Sectional view



## Description

This is a high pressure 3 way 2 or 3 position manual semi-rotary directional control valve. Can be used as a diverter or a dump 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.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Various levers and knobs available with and without detent. Working pressure 350 bar.

## Performance data

### Ratings and specifications

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

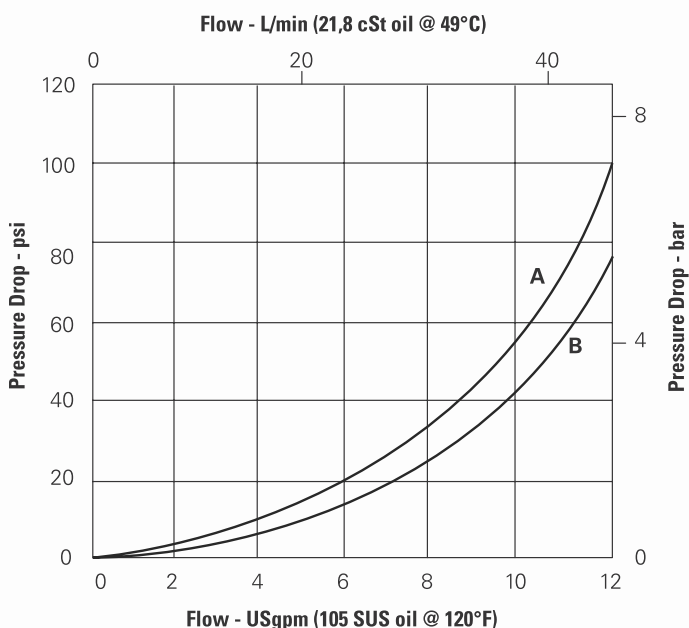
Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	46 L/min (12 USgpm)
Internal leakage	250 cc/min (15in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Manual operators	D- Lever (3-position detent)* D2 - Lever (2-position detent)* E - Ball (3-position detent)* E2- Ball (2-position detent)* K- Knob (2-position, no detent)
Cavity	C-12-3
Fluids	All general purpose hydraulic fluids such as: MIL-H -5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum or Steel
Weight cartridge only	0.32 kg (0.70 lbs)
Seal kit	02-180095 (Buna-N), 02-165887 (Viton®)

\* Light duty housing only.  
Viton is a registered trademark of E.I. DuPont

## Pressure drop curves

Cartridge only

**A** - Port 1-3  
**B** - Port 1-2

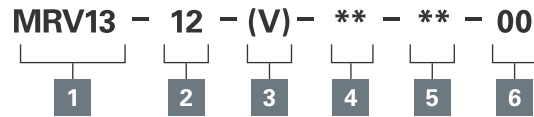


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV13-12 - Manual rotary valve

Manual semi-rotary directional control valve  
46 L/min (12 USgpm) • 350 bar (5000 psi)

## Model code



- 1 Function**  
MRV13 - Manual rotary valve

---

- 2 Size**  
12 - 12 size

---

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

- 4 Manual operator**  
0 - No operator  
D - Level (3-position detent)  
D2 - Level (2-position detent)  
E - Ball (3-position detent)  
E2 - Ball (2-position detent)  
K - Knob (2-position, no detent)

- 5 Port size**  
0 - Cartridge only

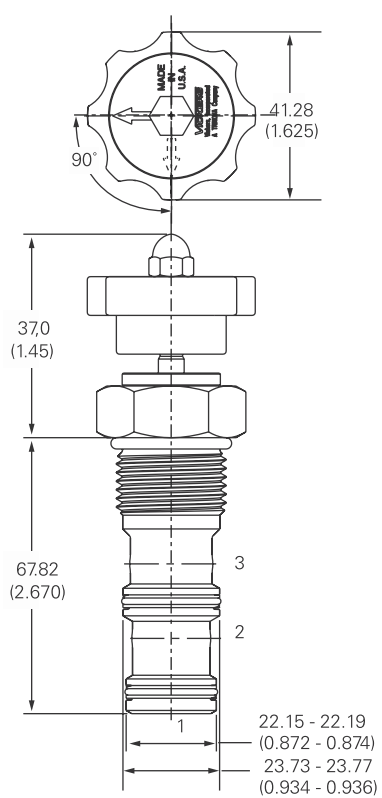
- 6 Special features**  
00 - Non (Only required if valve has special features, omitted if "00").

Code	Port size	Housing number	
		Aluminum fatigue rated	Steel
0			
A4G	1/2" BSPP	02-161817	
A6G	3/4" BSPP	02-161816	
A10H	SAE 10	02-160642	
A12H	SAE 12	02-160646	
S4G	1/2" BSPP		02-169815
S6G	3/4" BSPP		02-169814
S10T	SAE 10		02-161070
S12T	SAE 12		02-169816

## Dimensions

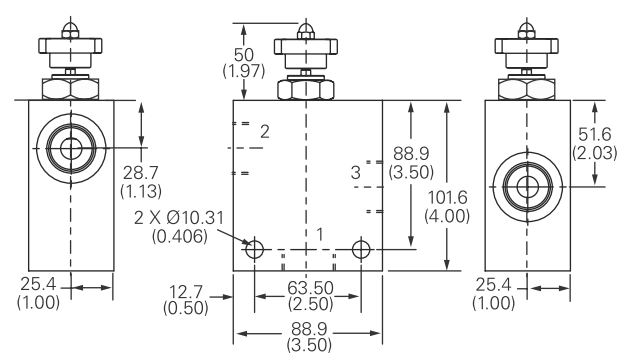
mm (inch)

## Cartridge only



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

## Installation drawing (steel)



**Warning**  
 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).

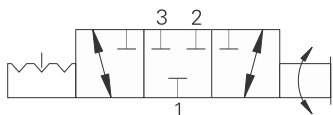
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV3-16 - Manual rotary valve

Manual semi-rotary directional control valve  
64 L/min (17 USgpm) • 210 bar (3000 psi)

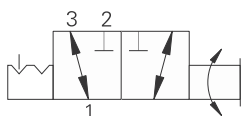
## MRV3-16(V)-D

3 position models

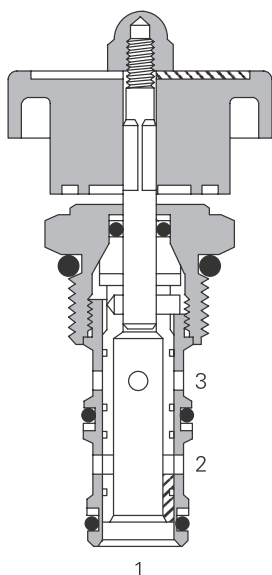


## MRV3-16(V)-D2

2 position models



## Sectional view



## Description

This is a 3 way 2 or 3 position manual semi-rotary directional control valve. Can be used as a diverter or a dump 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.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Various levers and knobs available with and without detent.

## Performance data

### Ratings and specifications

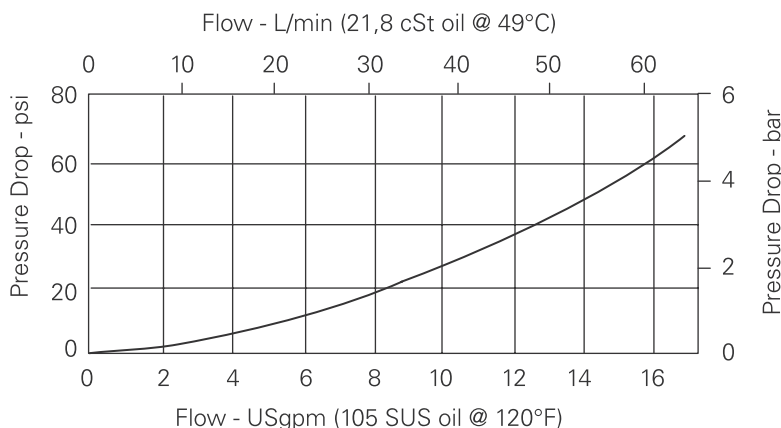
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	64 L/min (17 US gpm)
Temperature range	-40°C 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-16-3
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing material	Aluminum or Steel
Weight cartridge only	0,53 kg (1.16 lbs)
Seal kit	889632 (Buna-N), 889636 (Viton®)

\* Light duty housing only.  
Viton is a registered trademark of E.I. DuPont

## Pressure drop curves

Cartridge only

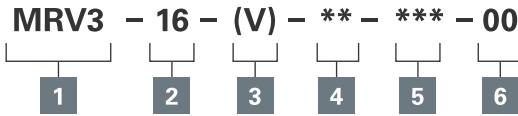


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV3-16 - Manual rotary valve

Manual semi-rotary directional control valve  
64 L/min (17 USgpm) • 210 bar (3000 psi)

## Model code



- 1 Function**  
MRV13 - Manual rotary valve  
4-way

---

- 2 Size**  
16 - 16 size

---

- 3 Seal material**  
Blank - Buna-N  
V - Viton

---

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

**5 Port size**

Code	Port size	Housing number	
		Aluminum fatigue rated	Steel
0	Cartridge		
A12T	SAE12	566152*	
A6B	3/4" BSPP	02-1754165*	
A10H	SAE10	876721	
A12H	SAE12	876723	
A4G	1/2" BSPP	876720	
A6G	3/4" BSPP	876722	
S4G	1/2" BSPP		02-175131
S6G	3/4" BSPP		02-175132
S10T	SAE 10		02-175129
S12T	SAE 12		02-175130

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

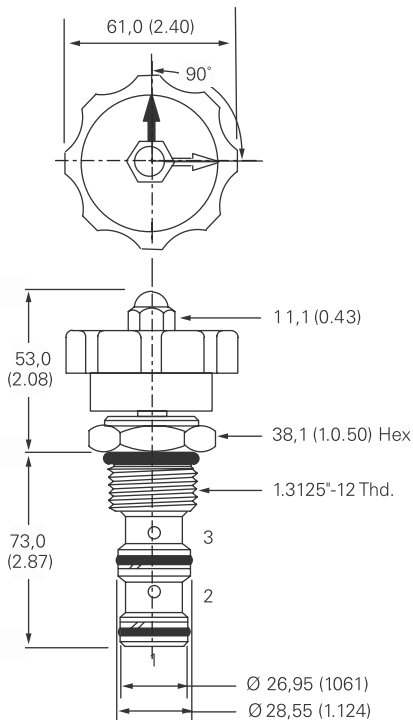
See section J for housing details.  
\* Aluminum light duty.

## Dimensions

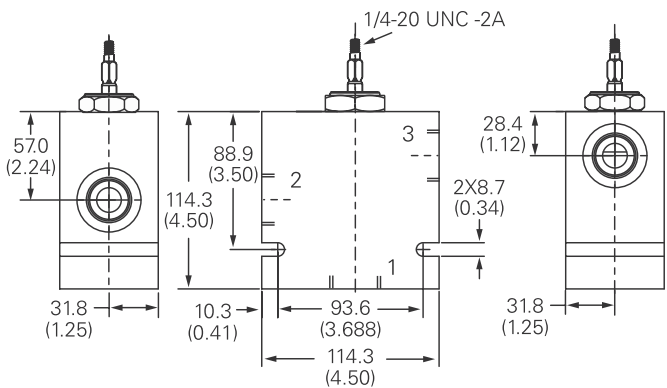
mm (inch)

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

## Cartridge only



## Installation drawing (aluminum)

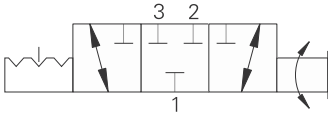


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

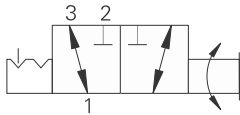
# MRV13-16 - Manual rotary valve

Manual semi-rotary directional control valve  
64 L/min (17 USgpm) • 350 bar (5000 psi)

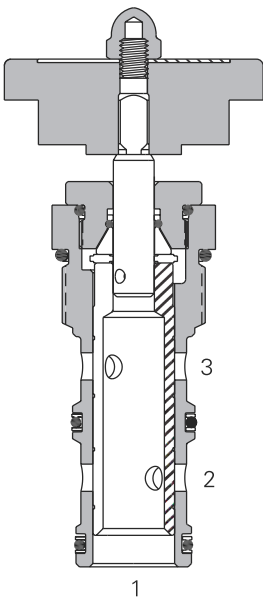
**MRV13-16(V)-D**  
3 position models



**MRV13-16(V)-D2**  
2 position models



## Sectional view



## Description

This is a high pressure 3 way 2 or 3 position manual semi-rotary directional control valve. Can be used as a diverter or a dump 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.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Various levers and knobs available with and without detent. Working pressure 350 bar.

## Performance data

### Ratings and specifications

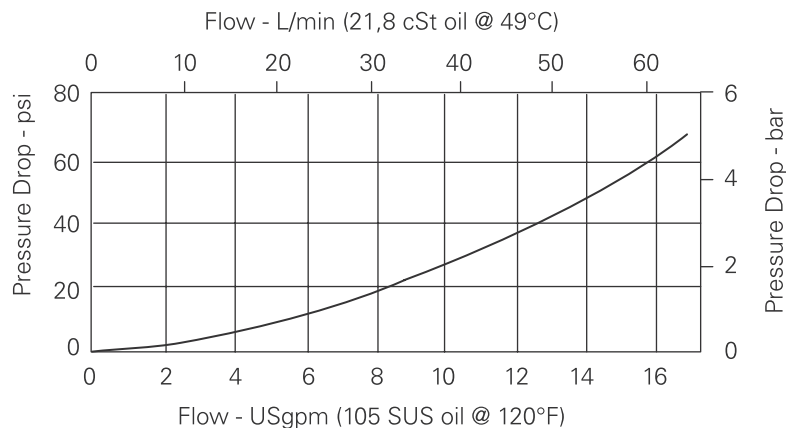
*Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)*

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	64 L/min (17 USgpm)
Internal leakage	250 cc/min (15in <sup>3</sup> /min) @ 350 bar (5000 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-16-3
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 or Steel
Weight cartridge only	0.53 kg (1.16 lbs)
Seal kit	889632 (Buna-N), 889636 (Viton®)

\* Light duty housing only.  
Viton is a registered trademark of E.I. DuPont

## Pressure drop curves

Cartridge only

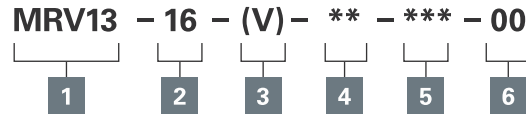


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV13-16 - Manual rotary valve

Manual semi-rotary directional control valve  
64 L/min (17 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

**MRV13** - 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)

### 5 Port size

**0** - Cartridge only

Code	Port size	Housing number
<b>0</b>		<b>Aluminum Fatigue rated</b> <b>Steel</b>
<b>A10H</b>	SAE 10	876721
<b>A12H</b>	SAE 12	876723
<b>A4G</b>	1/2" BSPP	876720
<b>A6G</b>	3/4" BSPP	876722
<b>S4G</b>	1/2" BSPP	02-175131
<b>S6T</b>	3/4" BSPP	02-175132
<b>S10T</b>	SAE 10	02-175129
<b>S12T</b>	SAE 12	02-175130

### 6 Special features

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

## Dimensions

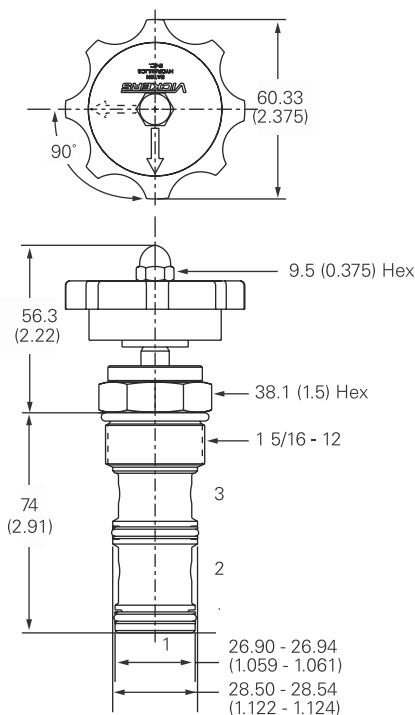
mm (inch)

Torque cartridge in housing

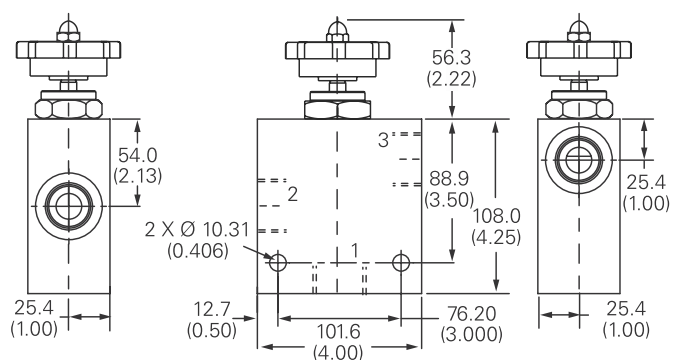
**A** - 108-122 Nm (80-90 ft. lbs)

**S** - 136-149 Nm (100-110 ft. lbs)

## Cartridge only



## Installation drawing (steel)



### Warning

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).

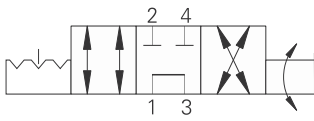
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV4-10 - Manual rotary valve

Manual semi-rotary directional control valve

11 L/min (3 USgpm) • 210 bar (3000 psi)

3 position models



## Operation

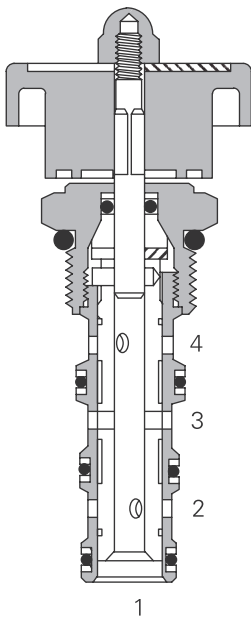
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position.

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.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Various levers and knobs available with and without detent.

## Sectional view



## Performance data

### 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 US gpm)
Temperature range	-40°C to 120°C (-40° to 248°F)
Manual operators	D - Lever (3-position detent)* D2 - Lever (2-position detent)* E - Ball (3-position detent)* E2 - Ball (2-position detent)* K - Knob (2-position, no detent)
Cavity	C-10-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing material	Aluminum or Steel
Weight cartridge only	0,17 kg (0.38 lbs)
Seal kit	565805 (Buna-N), 889600 (Viton®)

\* Light duty housing only.

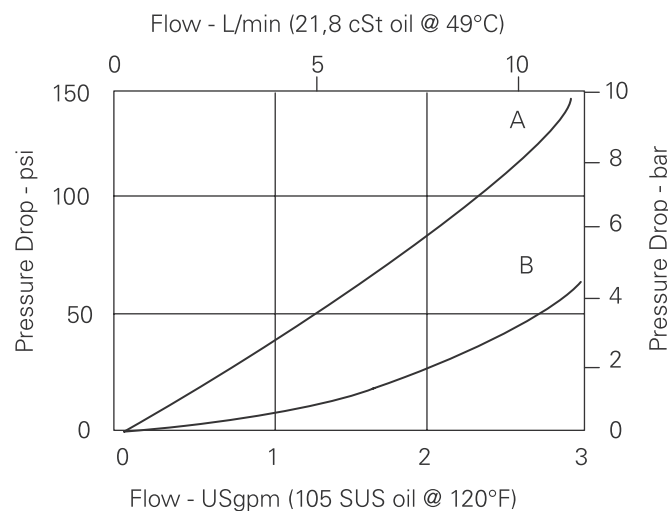
Viton is a registered trademark of E.I. DuPont

## Description

This is a 4 way 2 or 3 position manual semi-rotary directional control valve. In the center condition port 3 is open to port 1. Ports 4 and 2 are closed.

## Pressure drop curves

Cartridge only



**A** - Port 3 to port 4 or 3 to 2

**B** - Port 4 to port 1 or 2 to 1

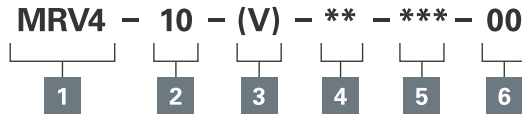
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# MRV4-10 - Manual rotary valve

Manual semi-rotary directional control valve  
11 L/min (3 USgpm) • 210 bar (3000 psi)

## Model code



### 1 Function

MRV4 - Manual rotary valve  
4-way

### 2 Size

10 - 10 size

### 3 Seal material

Blank - Buna-N  
V - Viton

### 4 Manual operator

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)

### 5 Port size

Code	Port size	Housing number		
		Aluminum Light duty	Aluminum Fatigue rated	Steel
0	Cartridge			
A3B	3/8" BSPP	02-179705		
A6T	SAE 6	566161		
A2G	1/4" BSPP		876709	
A3G	3/8" BSPP		876715	
A6H	SAE 6		876708	
A8H	SAE 8		876713	
S2G	1/4" BSPP			02-175139
S3G	3/8" BSPP			02-175140
S6T	SAE 6			02-175137
S8T	SAE 8			02-175138

See section J for housing details.

### 6 Special features

00 - None

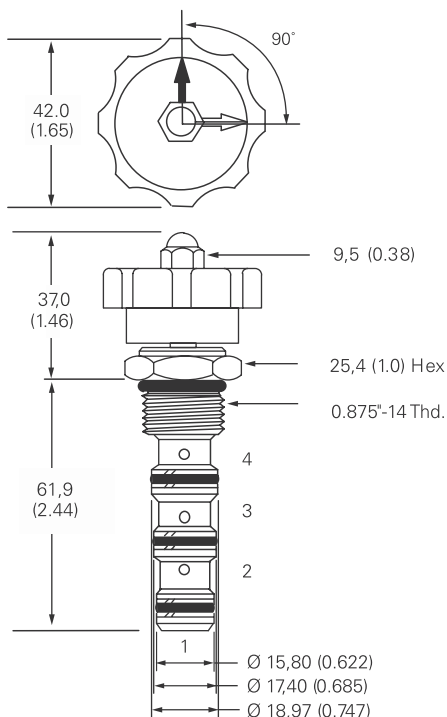
(Only required if valve has special features, omitted if "00".)

SS - 316 stainless steel external components (only available for "O" and "F" options).

## Dimensions

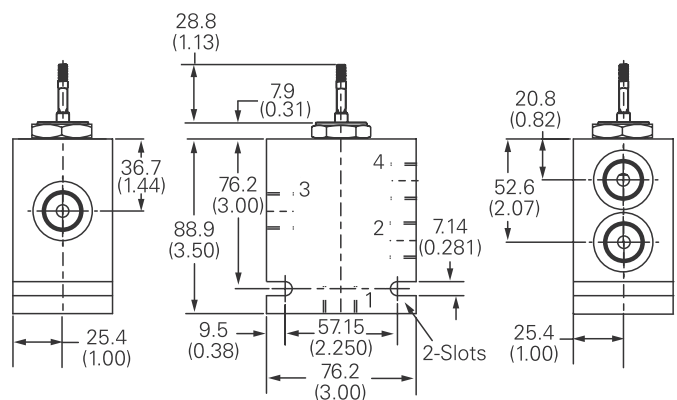
mm (inch)

### Cartridge only



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

### Installation drawing (aluminum)



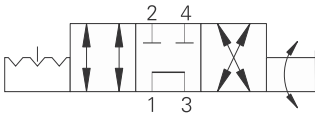
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV14-10 - Manual rotary valve

Manual semi-rotary directional control valve

11 L/min (3 USgpm) • 350 bar (5000 psi)

3 position models



## Operation

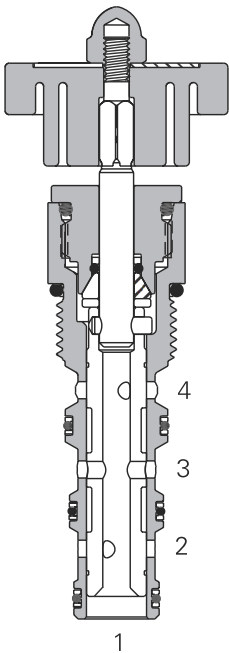
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position.

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.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Various levers and knobs available with and without detent. Working pressure 350 bar.

## Sectional view



## Performance data

### 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	11 L/min (3 USgpm)
Internal leakage	300 cc/min (18in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Manual operators	D - Lever (3-position detent)* D2 - Lever (2-position detent)* E - Ball (3-position detent)* E2 - Ball (2-position detent)* K - Knob (2-position, no detent)
Cavity	C-10-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum or Steel
Weight cartridge only	0.17 kg (0.38 lbs)
Seal kit	565805 (Buna-N), 889600 (Viton®)

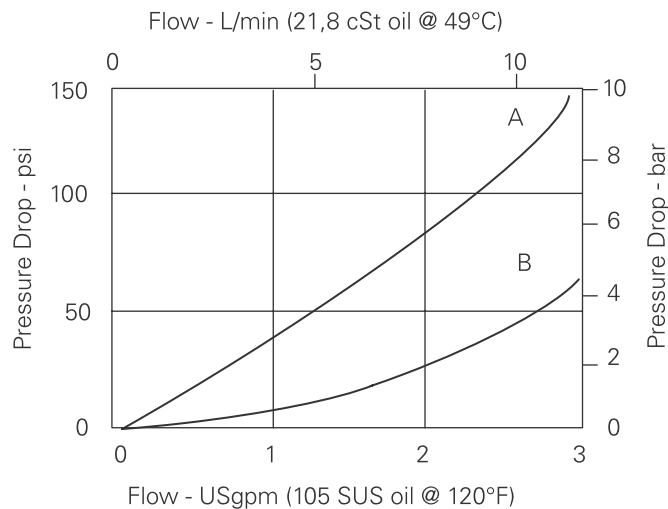
\* Light duty housing only.  
Viton is a registered trademark of E.I. DuPont

## Description

This is a high pressure 4 way 2 or 3 position manual semi-rotary directional control valve. In the center condition port 3 is open to port 1. Ports 4 and 2 are closed.

## Pressure drop curves

Cartridge only



**A** - Port 3 to port 4 or 3 to 2

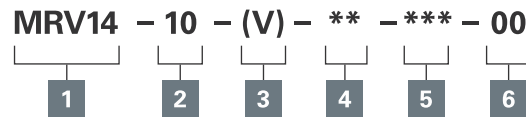
**B** - Port 4 to port 1 or 2 to 1

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV14-10 - Manual rotary valve

Manual semi-rotary directional control valve  
11 L/min (3 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

**MRV14** - Manual rotary valve  
4-way

### 2 Size

**10** - 10 size

### 3 Seals

**Blank** - Buna-N  
**V** - Viton®

### 4 Manual operator

**0** - 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)

### 5 Port size

**0** - Cartridge only

### 6 Special features

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

Code	Port size	Housing number		
		Aluminum light duty	Aluminum fatigue rated	Steel
<b>0</b>				
<b>A3B</b>	3/8" BSPP	02-179705		
<b>A6T</b>	SAE 6	566161		
<b>A2G</b>	1/4" BSPP		876709	
<b>A3G</b>	3/8" BSPP		876715	
<b>A6H</b>	SAE 6		876708	
<b>A8H</b>	SAE 8		876713	
<b>AZG</b>	1/4" BSPP			02-175139
<b>A3G</b>	3/8" BSPP			02-175140
<b>S6T</b>	SAE 6			02-175137
<b>S8T</b>	SAE 8			02-175138

See section J for housing details.

## Dimensions

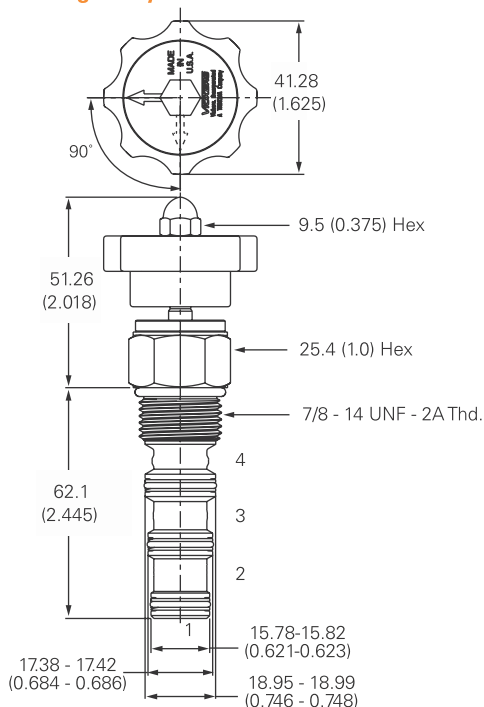
mm (inch)

Torque cartridge in housing

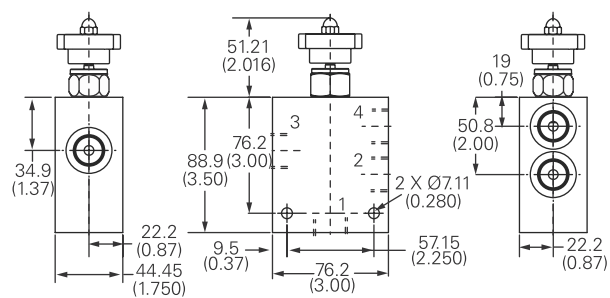
**A** - 47-54 Nm (35-40 ft. lbs)

**S** - 68-75 Nm (50-55 ft. lbs)

### Cartridge only



### Installation drawing (steel)



### Warning

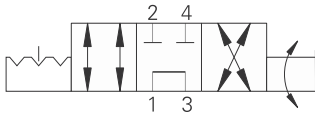
Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings must be used for operating pressures above 210 bar (3000 psi).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV14-12 - Manual rotary valve

Manual semi-rotary directional control valve  
 23 L/min (6 USgpm) • 350 bar (5000 psi)

3 position models



## Operation

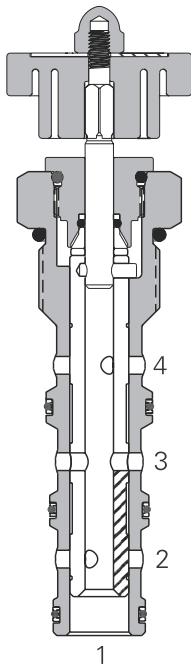
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position.

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.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Various levers and knobs available with and without detent. Working pressure 350 bar.

## Sectional view



## Performance data

### 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	23 L/min (6 USgpm)
Internal leakage	300 cc/min (18in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Manual operators	D - Lever (3-position detent)* D2 - Lever (2-position detent)* E - Ball (3-position detent)* E2 - Ball (2-position detent)* K - Knob (2-position, no detent)
Cavity	C-I2-4
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	0.45 kg (0.99 lbs)
Seal kit	02-160979 (Buna-N), 02-160980 (Viton®)

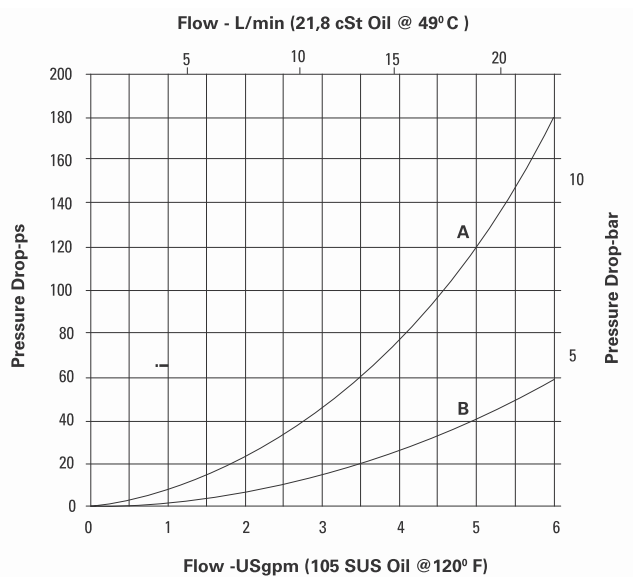
\* Light duty housing only.  
 Viton is a registered trademark of E.I. DuPont

## Description

This is a high pressure 4 way 2 or 3 position manual semi-rotary directional control valve. In the center condition port 3 is open to port 1. Ports 4 and 2 are closed.

## Pressure drop curves

Cartridge only



**A** - Port 3 to port 4 or 3 to 2

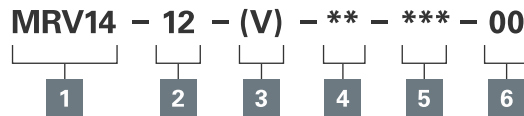
**B** - Port 4 to port 1 or 2 to 1

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV14-12 - Manual rotary valve

Manual semi-rotary directional control valve  
23 L/min (6 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

**MRV14** - Manual rotary valve  
4-way

### 2 Size

**12** - 12 size

### 3 Seals

**Blank** - Buna-N  
**V** - Viton®

### 4 Manual operator

**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)

### 5 Port size

**0** - Cartridge only

### 6 Special features

**00** - Non

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

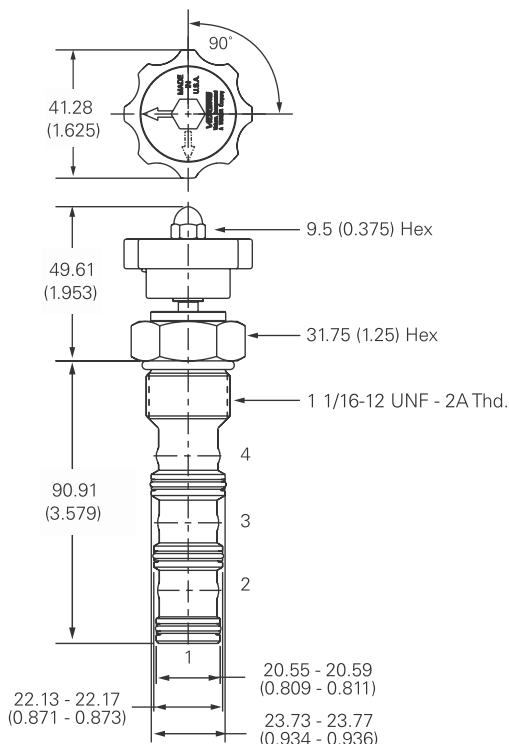
Code	Port size	Housing number	
		Aluminum Fatigue rated	Steel
<b>0</b>			
<b>A4G</b>	1/2" BSPP	5986431-001	
<b>A6G</b>	3/4" BSPP	5986432-001	
<b>A8H</b>	SAE 8	5986433-001	
<b>A10H</b>	3/8" BSPP	5986434-001	
<b>A12H</b>	SAE 12	5986436-001	
<b>S6G</b>	3/4" BSPP		5991073-001
<b>S10H</b>	SAE 10		5991074-001
<b>S12H</b>	SAE 12		5991075-001

See section J for housing details.

## Dimensions

mm (inch)

### Cartridge only

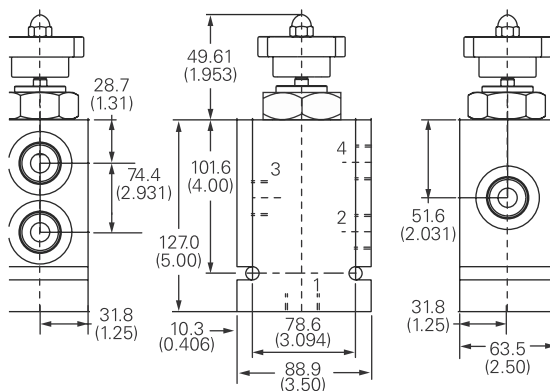


Torque cartridge in housing

**A** - 81-95 Nm (60-70 ft. lbs)

**B** - 102-115 Nm (75-85 ft. lbs)

### Installation drawing (steel)



### Warning

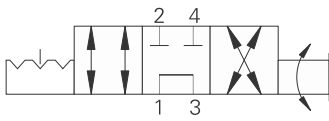
Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings must be used for operating pressures above 210 bar (3000 psi).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV4-16 - Manual rotary valve

Manual semi-rotary directional control valve  
 45 L/min (12 USgpm) • 210 bar (3000 psi)

3 position models



## Operation

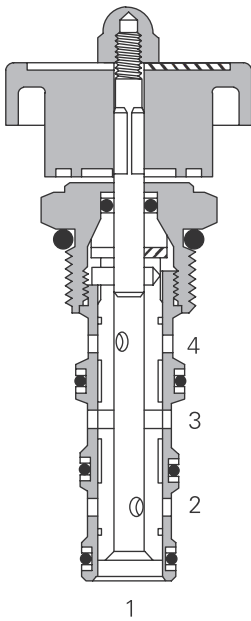
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position.

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.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Various levers and knobs available with and without detent.

## Sectional view



## Performance data

### 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)
Temperature range	-40°C 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/ <b>16/13</b>
Standard housing material	Aluminum or Steel
Weight cartridge only	0,65 kg (1.43 lbs)
Seal kit	889634 (Buna-N), 889638 (Viton®)

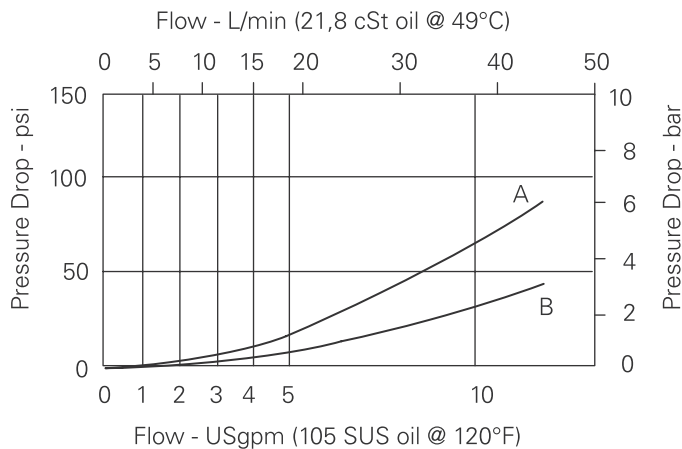
\* Light duty housing only.  
 Viton is a registered trademark of E.I. DuPont

## Description

This is a 4 way 2 or 3 position manual semi-rotary directional control valve. In the center condition all ports are closed.

## Pressure drop curves

Cartridge only



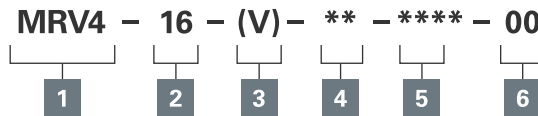
- A** - Port 3 to port 4 or 3 to 2
- B** - Port 4 to port 1 or 2 to 1

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV4-16 - Manual rotary valve

Manual semi-rotary directional control valve  
45 L/min (12 USgpm) • 210 bar (3000 psi)

## Model code



### 1 Function

MRV4 - Manual rotary valve  
4-way

### 2 Size

16 - 16 size

### 3 Seal material

Blank - Buna-N  
V - Viton

### 4 Manual operator

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

### 5 Port size

Code	Port size	Housing number		
		Aluminum light duty	Aluminum fatigue rated	Steel
0	Cartridge			
A12T	SAE 12	566411	-	-
A6B	3/4" BSPP	02-175468	-	-
A10H	SAE 10	-	876729	-
A12H	SAE 12	-	876731	-
A4G	1/2" BSPP	-	876728	-
A6G	3/4" BSPP	-	876730	-
S4G	1/2" BSPP	-	-	02-175143
S6G	3/4" BSPP	-	-	02-175144
S10T	SAE 10	-	-	02-175141
S12T	SAE 12	-	-	02-175142

See section J for housing details.

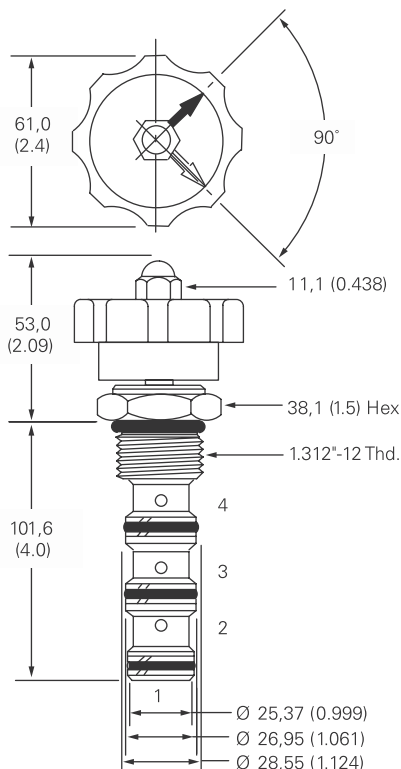
### 6 Special features

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

## Dimensions

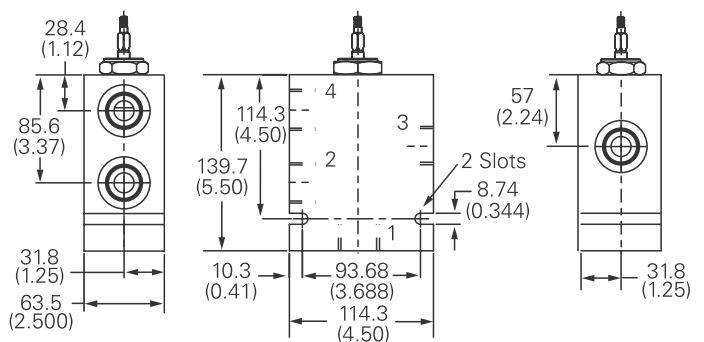
mm (inch)

### Cartridge only



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

### Installation drawing (aluminum)

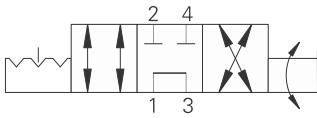


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV14-16 - Manual rotary valve

Manual semi-rotary directional control valve  
45 L/min (12 USgpm) • 350 bar (5000 psi)

3 position models



## Operation

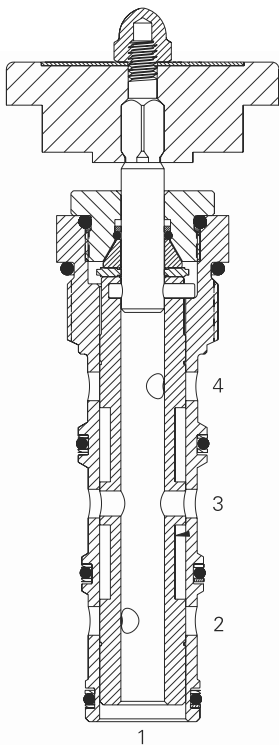
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position.

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.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Various levers and knobs available with and without detent. Working pressure 350 bar.

## Sectional view



## Performance data

### Ratings and specifications

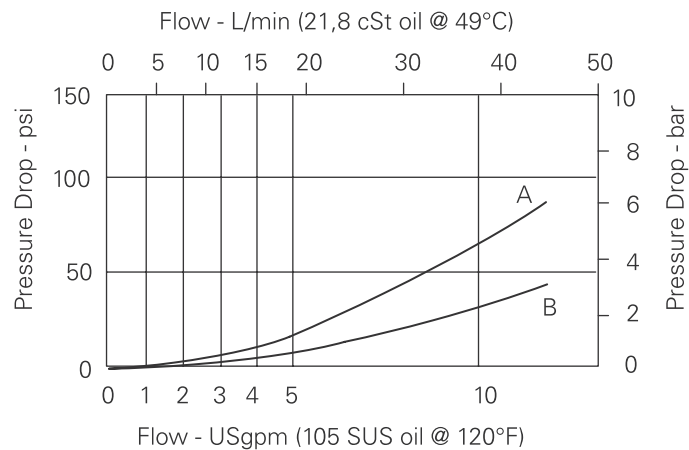
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	45 L/min (12 USgpm)
Internal leakage	300 cc/min (18in <sup>3</sup> /min) @ 350 bar (5000 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 or Steel
Weight cartridge only	0.65 kg (1.43 lbs)
Seal kit	889634 (Buna-N), 889638 (Viton®)

\* Light duty housing only.  
Viton is a registered trademark of E.I. DuPont

## Pressure drop curves

Cartridge only



**A** - Port 3 to port 4 or 3 to 2

**B** - Port 4 to port 1 or 2 to 1

## Description

This is a high pressure 4 way 2 or 3 position manual semi-rotary directional control valve. In the center condition all ports are closed.

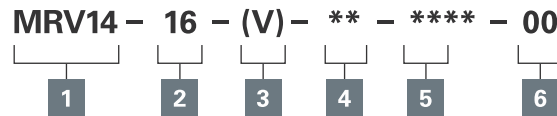
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# MRV14-16 - Manual rotary valve

Manual semi-rotary directional control valve  
45 L/min (12 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

MRV14 - Manual rotary valve  
4-way

### 2 Size

16 - 16 size

### 3 Seals

Blank - Buna-N  
V - Viton®

### 4 Manual operators

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

### 5 Port size

0 - Cartridge only

### 6 Special features

00 - Non

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

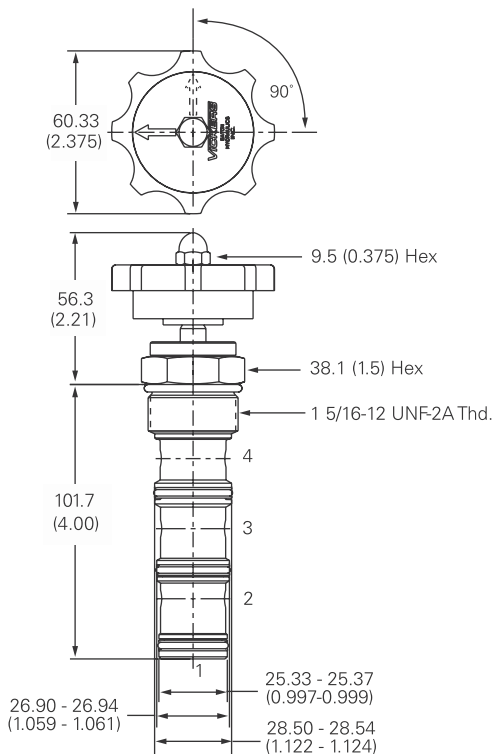
Code	Port size	Housing number		
0		Aluminum light duty	Aluminum fatigue rated	Steel
A12T	SAE 12	566411		
A6B	3/4" BSPP	02-175468		
A10H	SAE 10		876729	
A12H	SAE 12		876731	
A4G	1/2" BSPP		876728	
A6G	3/4" BSPP		876730	
S4G	1/2" SSPP			02-175143
S6G	3/4" BSPP			02-175144
S10T	SAE 10			02-175141
S12T	SAE 12			02-175142

See section J for housing details.

## Dimensions

mm (inch)

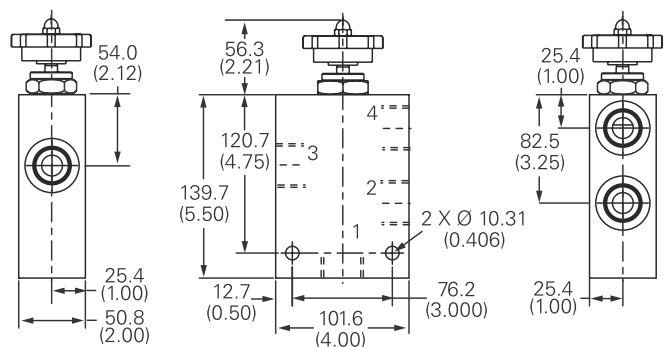
### Cartridge only



Torque cartridge in housing

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

### Installation drawing (steel)



### Warning

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).

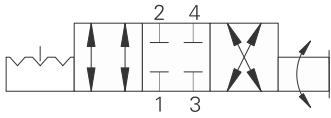
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV5-10 - Manual rotary valve

Manual semi-rotary directional control valve

11 L/min (3 USgpm) • 210 bar (3000 psi)

3 position models



## Operation

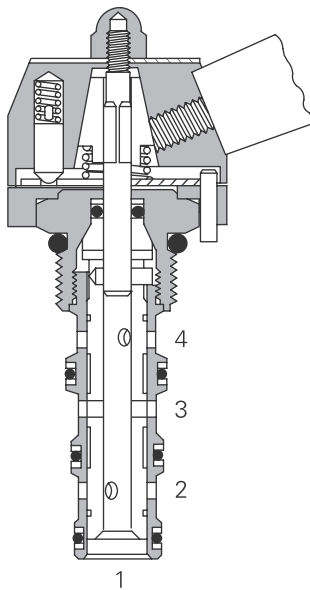
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position.

By turning the operator 90°, flow will be directed between ports 1 and 4 and port 3 and 2. During the cross-over transition, all ports are blocked.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Various levers and knobs available with and without detent.

## Sectional view



## Performance data

### Ratings and specifications

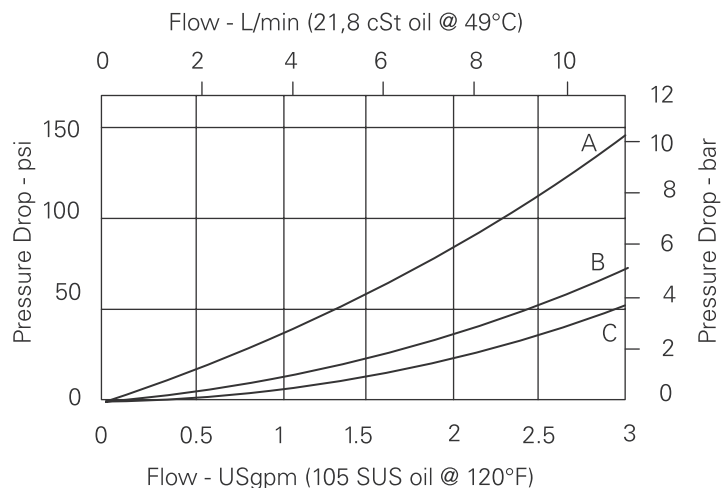
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

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)
Temperature range	-40°C to 120°C (-40° to 248°F)
Manual operators	D - Lever (3-position detent) E - Ball (3-position detent)
Cavity	C-10-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing material	Aluminum or Steel
Weight cartridge only	0,27 kg (0.59 lbs)
Seal kit	889625 (Buna-N), 566080 (Viton®)

\* Light duty housing only.  
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

## Description

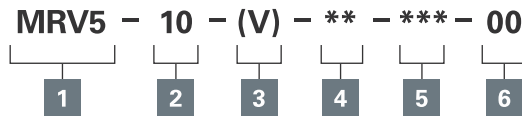
This is a 4 way 2 or 3 position manual semi-rotary directional control valve. In the center condition all ports closed.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV5-10 - Manual rotary valve

Manual semi-rotary directional control valve  
11 L/min (3 USgpm) • 210 bar (3000 psi)

## Model code



### 1 Function

**MRV5** - Manual rotary valve  
4-way

### 2 Size

**10** - 10 size

### 3 Seal material

**Blank** - Buna-N  
**V** - Viton

### 4 Manual operator

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

### 5 Port size

Code	Port size	Housing number		
		Aluminum light duty	Aluminum fatigue rated	Steel
<b>0</b>	Cartridge			
<b>A3B</b>	3/8" BSPP	02-179705	-	-
<b>A6T</b>	SAE 6	566161	-	-
<b>A2G</b>	1/4" BSPP	-	876709	-
<b>A3G</b>	3/8" BSPP	-	876715	-
<b>A6H</b>	SAE 6	-	876708	-
<b>A8H</b>	SAE 8	-	876713	-
<b>S2G</b>	1/4" BSPP	-	-	02-175139
<b>S3G</b>	3/8" BSPP	-	-	02-175140
<b>S6T</b>	SAE 6	-	-	02-175137
<b>S8T</b>	SAE 8	-	-	02-175138

See section J for housing details.

### 6 Special features

**00** - Non

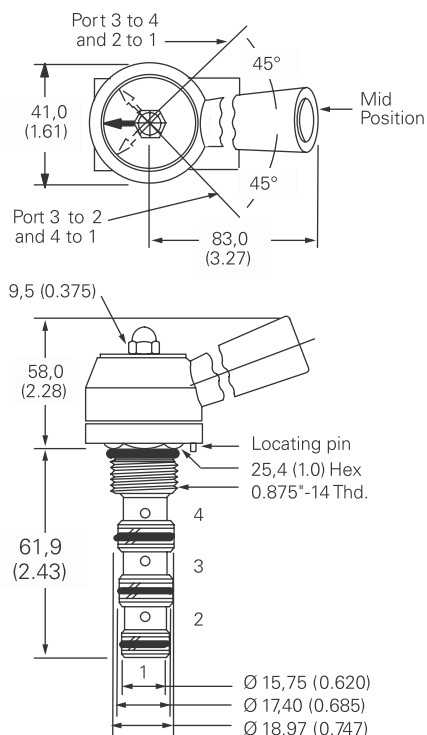
(Only required if valve has special features, omitted if "00").

## Dimensions

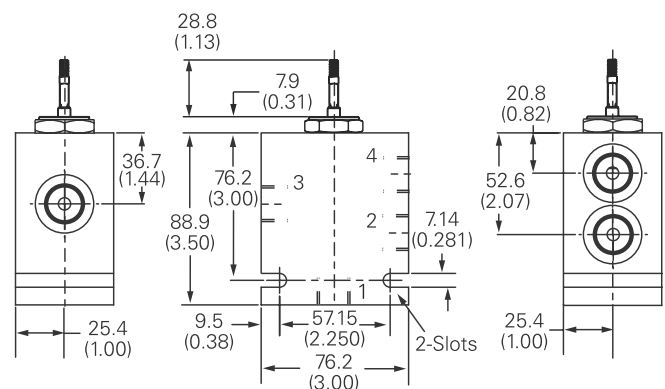
mm (inch)

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

### Cartridge only



### Installation drawing (aluminum)



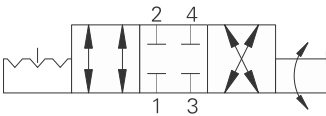
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV15-10 - Manual rotary valve

Manual semi-rotary directional control valve

11 L/min (3 USgpm) • 350 bar (5000 psi)

3 position models



## Operation

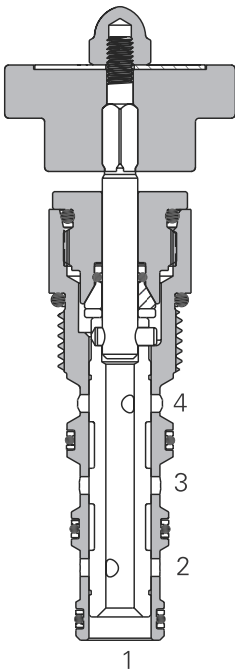
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position.

By turning the operator 90°, flow will be directed between ports 1 and 4 and port 3 and 2. During the cross-over transition, all ports are blocked.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Various levers and knobs available with and without detent. Working pressure 350 bar.

## Sectional view



## Performance data

### Ratings and specifications

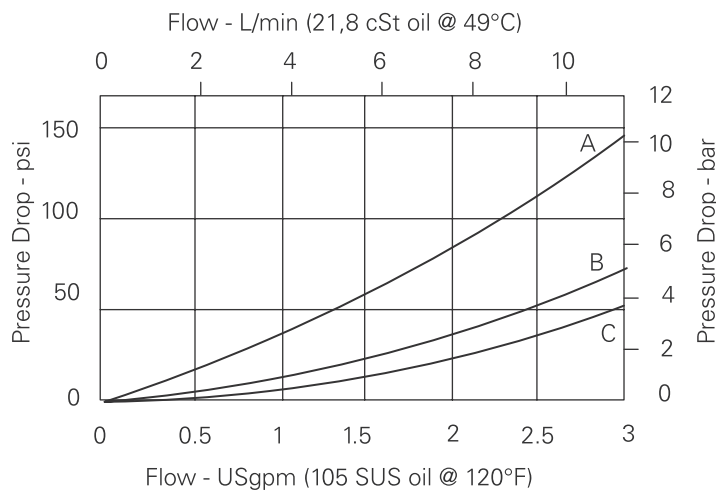
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	11 L/min (3 USgpm)
Internal leakage	300 cc/min (18in <sup>3</sup> /min) @ 350 bar (5000 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 (3-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 or Steel
Weight cartridge only	0.27 kg (0.59 lbs)
Seal kit	565805 (Buna-N), 889600 (Viton®)

\* Light duty housing only.  
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

## Description

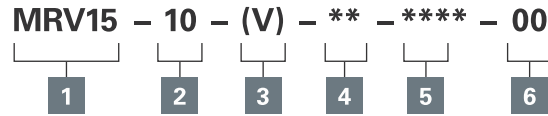
This is a high pressure 4 way 2 or 3 position manual semi-rotary directional control valve. In the center condition all ports are closed.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV15-10 - Manual rotary valve

Manual semi-rotary directional control valve  
11 L/min (3 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

**MRV15** - Manual rotary valve  
4-way

### 2 Size

**10** - 10 size

### 3 Seals

**Blank** - Buna-N  
**V** - Viton®

### 4 Manual operator

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

### 5 Port size

**0** - Cartridge only

### 6 Special features

**00** - Non

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

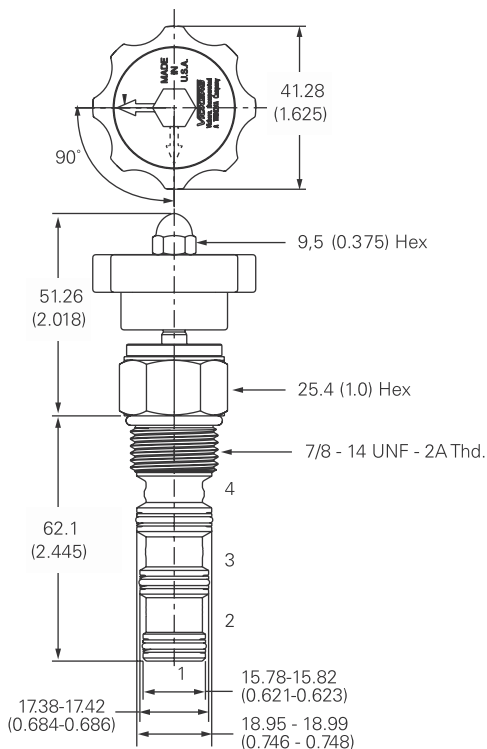
Code	Port size	Housing number		
		Aluminum light duty	Aluminum fatigue rated	Steel
<b>0</b>				
<b>A3B</b>	3/8" BSPP	02-179705		
<b>A6T</b>	SAE 6	566161		
<b>A2G</b>	1/4" BSPP		02-185804	
<b>A3G</b>	3/8" BSPP		02-185805	
<b>A6H</b>	SAE 6		02-185802	
<b>A8H</b>	SAE 8		02-185803	
<b>S2G</b>	1/4" SSPP			02-175139
<b>S3G</b>	3/8" BSPP			02-175140
<b>S6T</b>	SAE 6			02-175137
<b>S8T</b>	SAE 8			02-175138

See section J for housing details.

## Dimensions

mm (inch)

### Cartridge only

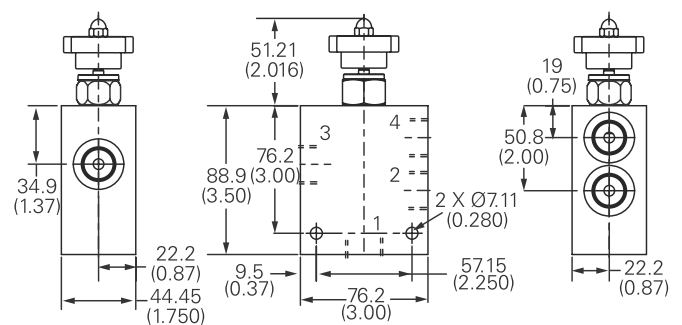


Torque cartridge in housing

**A** - 47-54 Nm (35-40 ft. lbs)

**S** - 68-75 Nm (50-55 ft. lbs)

### Installation drawing (steel)



### Warning

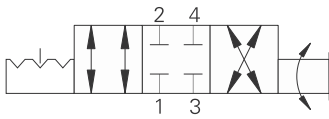
Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings must be used for operating pressures above 210 bar (3000 psi).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV15-12 - Manual rotary valve

Manual semi-rotary directional control valve  
 23 L/min (6 USgpm) • 350 bar (5000 psi)

3 position models



## Operation

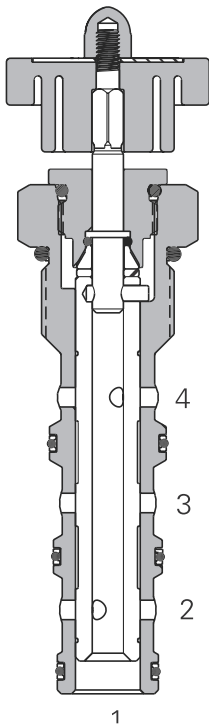
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position.

By turning the operator 90°, flow will be directed between ports 1 and 4 and port 3 and 2. During the cross-over transition, all ports are blocked.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Various levers and knobs available with and without detent. Working pressure 350 bar.

## Sectional view



## Performance data

### Ratings and specifications

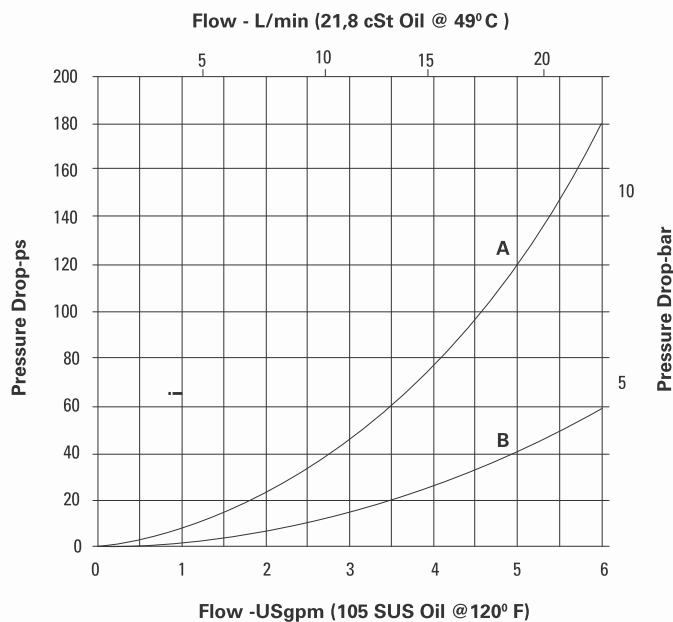
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	23 L/min (6 USgpm)
Internal leakage	300 cc/min (18in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Manual operators	D - Lever (3-position detent) E - Ball (3-position detent)
Cavity	C-I2-4
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	0.45 kg (0.99 lbs)
Seal kit	02-160979 (Buna-N), 02-160980 (Viton®)

\* Light duty housing only.  
 Viton is a registered trademark of E.I. DuPont

## Pressure drop curves

Cartridge only



**A** - Port 3-4 and port 3-2

**B** - Port 2-1 and port 4-1

## Description

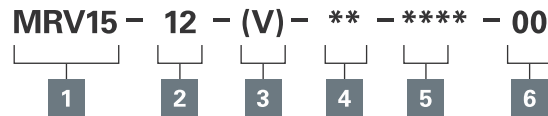
This is a 4 way 2 or 3 position manual semi-rotary directional control valve. In the center condition all ports are closed.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV15-12 - Manual rotary valve

Manual semi-rotary directional control valve  
23 L/min (6 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

**MRV15** - Manual rotary valve  
4-way

### 2 Size

**12** - 12 size

### 3 Seals

**Blank** - Buna-N  
**V** - Viton®

### 4 Manual operators

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

### 5 Port size

**0** - Cartridge only

### 6 Special features

**00** - Non  
(Only required if valve has special features, omitted if "00").

Code	Port size	Housing number	
		Aluminum light-duty	Steel
<b>0</b>			
<b>A4G</b>	1/2" BSPP	5986431-001	
<b>A6G</b>	3/4" BSPP	5986432-001	
<b>A8H</b>	SAE 8	5986433-001	
<b>A10H</b>	SAE 10	5986434-001	
<b>A12H</b>	SAE 12	5986436-001	
<b>S6G</b>	3/4" BSPP		5991073-001
<b>S10H</b>	SAE 10		5991074-001
<b>S12H</b>	SAE 12		5991075-001

See section J for housing details.

## Dimensions

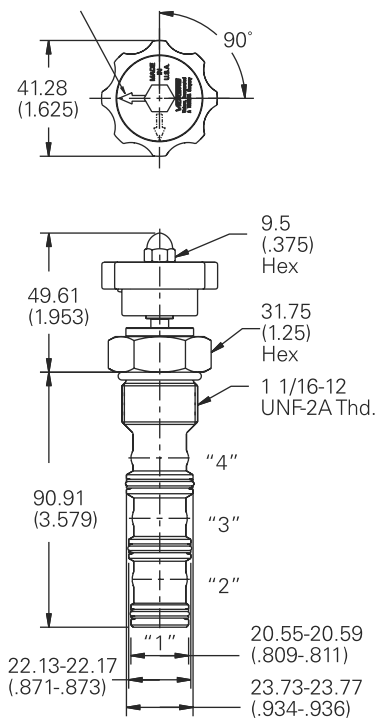
mm (inch)

Torque cartridge in housing

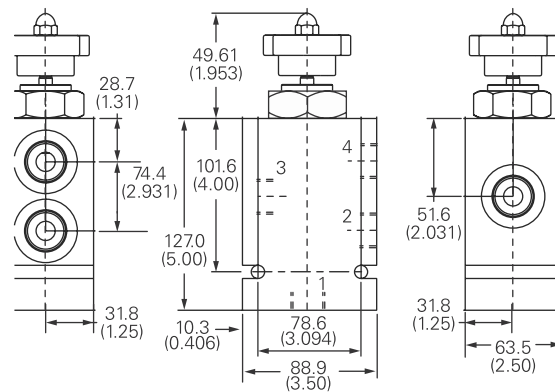
**A** - 81-95 Nm (60-70 ft. lbs)

**S** - 102-115 Nm (75-85 ft. lbs)

## Cartridge only



## Installation drawing (steel)



### Warning

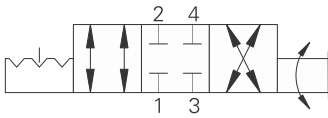
Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings must be used for operating pressures above 210 bar (3000 psi).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV5-16 - Manual rotary valve

Manual semi-rotary directional control valve  
45 L/min (12 USgpm) • 210 bar (3000 psi)

3 position models



## Operation

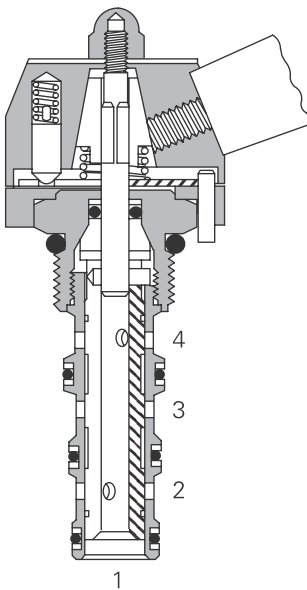
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position.

By turning the operator 90°, flow will be directed between ports 1 and 4 and port 3 and 2. During the cross-over transition, all ports are blocked.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Various levers and knobs available with and without detent.

## Sectional view



## Performance data

### 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	
Temperature range	-40°C to 120°C (-40° to 248°F)
Manual operators	D - Lever (3-position 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 material	Aluminum or Steel
Weight cartridge only	0,65 kg (1.43 lbs)
Seal kit	889634 (Buna-N), 889638 (Viton®)

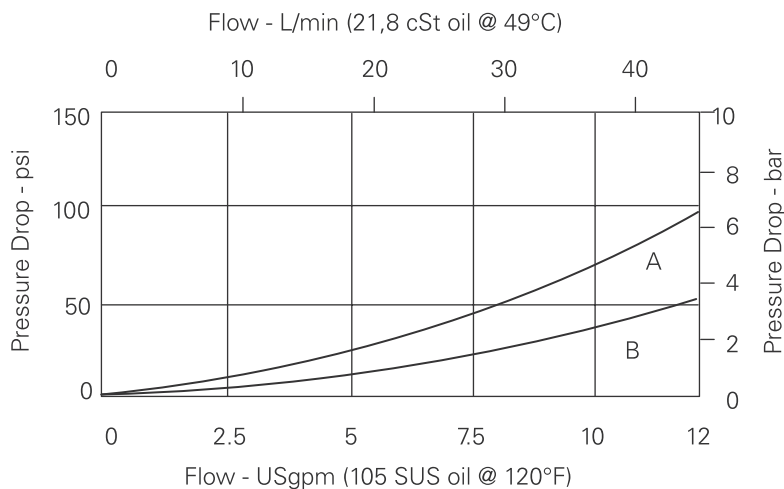
Viton is a registered trademark of E.I. DuPont  
\* Light duty housing only.

## Description

This is a 4 way 2 or 3 position manual semi-rotary directional control valve. In the center condition all ports are closed.

## Pressure drop curves

Cartridge only



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

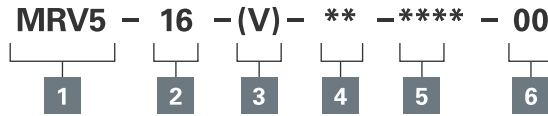
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# MRV5-16 - Manual rotary valve

Manual semi-rotary directional control valve  
45 L/min (12 USgpm) • 210 bar (3000 psi)

## Model code



### 1 Function

**MRV15** - Manual rotary valve  
4-way

### 2 Size

**16** - 16 size

### 3 Seal material

**Blank** - Buna-N  
**V** - Viton

### 4 Manual operator

**O** - No operator  
**D** - Level (3-position detent)

### 5 Port size

Code	Port size	Housing number	
		Aluminum	Aluminum light duty
<b>0</b>	Cartridge		
<b>A12T</b>	SAE 12	566411	-
<b>A6B</b>	3/4" BSPP	02-175468	-
<b>A10H</b> <b>876729</b>	SAE 10	-	
<b>A12H</b> <b>876731</b>	SAE 12	-	
<b>A4G</b>	1/2" BSPP	-	876728
<b>A6G</b>	3/4" BSPP	-	876730

See section J for housing details.

### 6 Special features

**00** - None

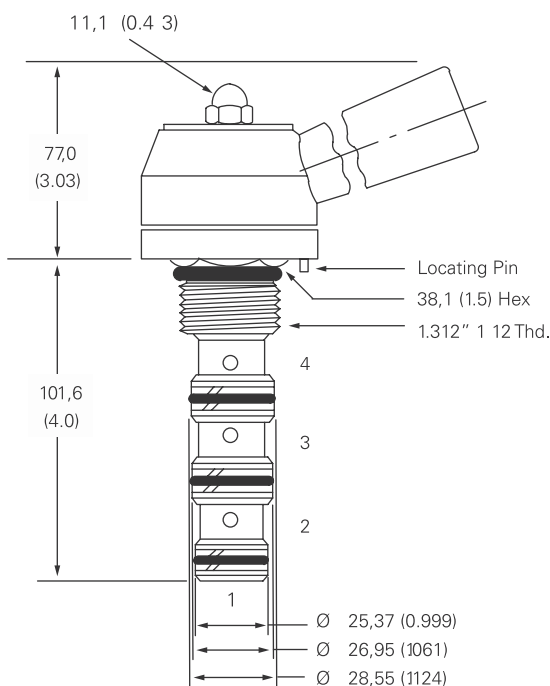
(Only required if valve has special features, omitted if "00".)

## Dimensions

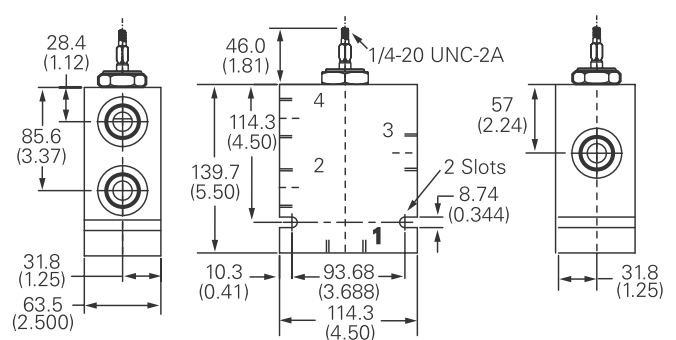
mm (inch)

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

## Cartridge only



## Installation drawing (aluminum)

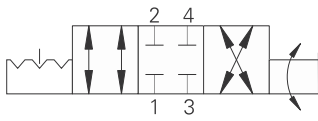


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV15-16 - Manual rotary valve

Manual semi-rotary directional control valve  
 45 L/min (12 USgpm) • 350 bar (5000 psi)

3 position models



### Operation

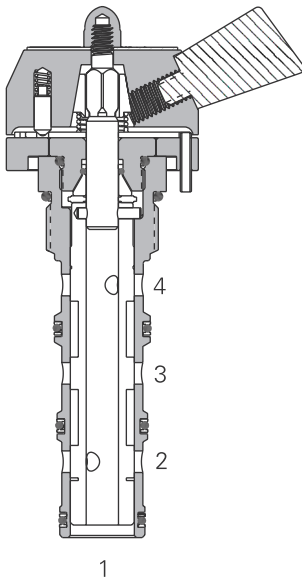
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position.

By turning the operator 90°, flow will be directed between ports 1 and 4 and port 3 and 2. During the cross-over transition, all ports are blocked.

### Features

Hardened, ground and honed working parts to limit leakage and prolong life. Various levers and knobs available with and without detent. Working pressure 350 bar.

### Sectional view



### Performance data

#### 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	45 L/min (12 USgpm)
Internal leakage	300 cc/min (18in <sup>3</sup> /min) @ 350 bar (5000 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 and Steel
Weight cartridge only	0.65 kg (1.43 lbs)
Seal kit	889634 (Buna-N), 889638 (Viton®)

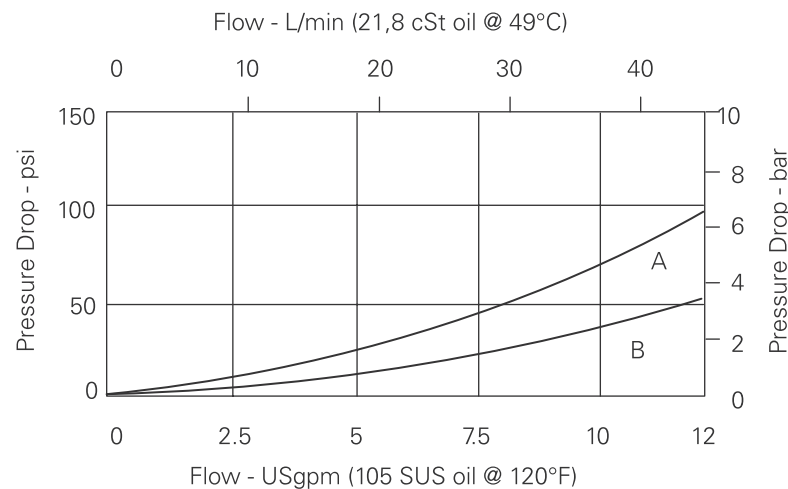
Viton is a registered trademark of E.I. DuPont

### Description

This is a high pressure 4 way 2 or 3 position manual semi-rotary directional control valve. In the center condition all ports are closed.

### Pressure drop curves

Cartridge only



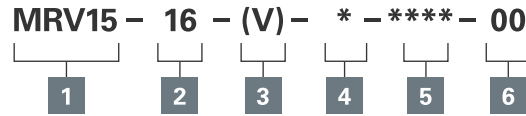
- A** - Port 3 to 4 or 3 to 2
- B** - Port 4 to 1 or 2 to 1

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV15-16 - Manual rotary valve

Manual semi-rotary directional control valve  
45 L/min (12 USgpm) • 350 bar (5000 psi)

## Model code



**1 Function**  
**MRV15** - Manual rotary valve  
4-way

**4 Manual operators**  
**0** - No operator  
**D** - Lever (3-position detent)

**5 Port size**  
**0** - Cartridge only

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

**2 Size**  
**16** - 16 size

**3 Seal**  
**Blank** - Buna-N  
**V** - Viton®

Code	Port size	Housing number		
		Aluminum light duty	Aluminum fatigue rated	Steel
<b>0</b>				
<b>A12T</b>	SAE 12	566411		
<b>A6B</b>	3/4" BSPP	02-175468		
<b>A10H</b>	SAE 10		876729	
<b>A12H</b>	SAE 12		876731	
<b>A4G</b>	1/2" BSPP		876728	
<b>A6G</b>	3/4" BSPP		876730	
<b>S4G</b>	1/2" SSPP			02-175143
<b>S6G</b>	3/4" BSPP			02-175144
<b>S10T</b>	SAE 10			02-175141
<b>S12T</b>	SAE 12			02-175142

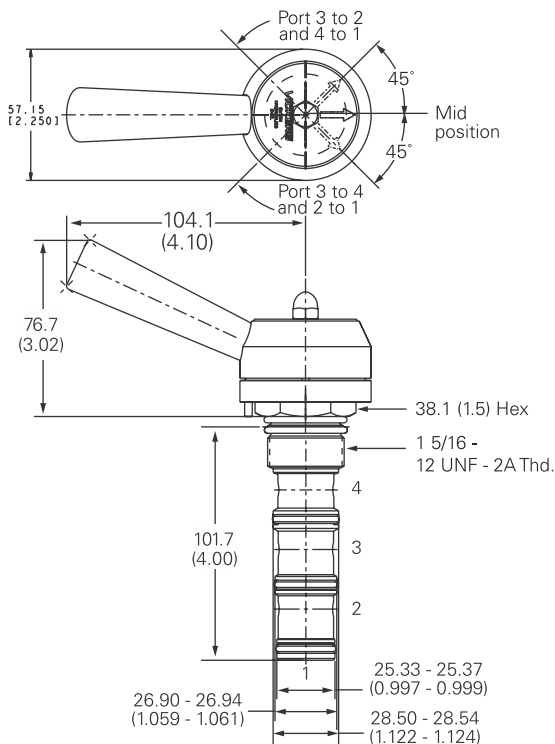
See section J for housing details.

## Dimensions

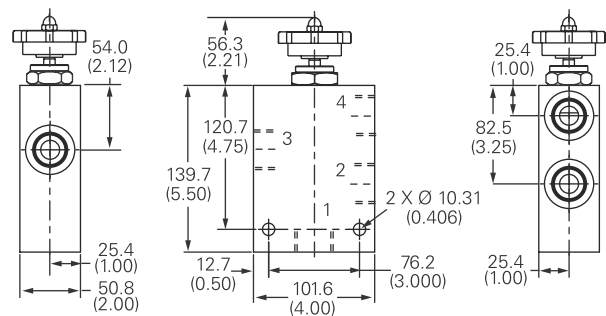
mm (inch)

Torque cartridge in housing  
**A** - 108-122 Nm (80-90 ft. lbs)  
**S** - 136-147 Nm (100-110 ft. lbs)

## Cartridge only



## Installation drawing (steel)



## Warning

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).

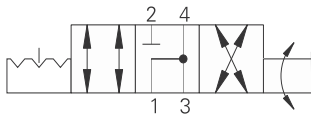
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV6-10 - Manual rotary valve

Manual semi-rotary directional control valve

11 L/min (3 USgpm) • 210 bar (3000 psi)

3 position models



## Operation

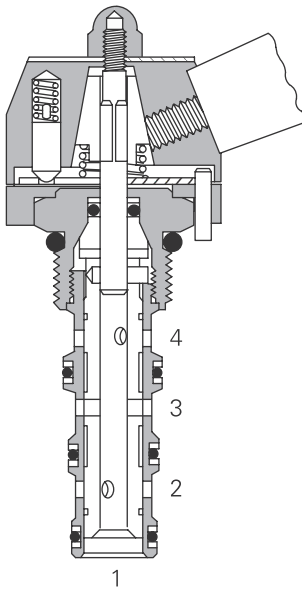
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position.

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.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Various levers and knobs available with and without detent.

## Sectional view



## Performance data

### 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 <sup>3</sup> /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Manual operators	<b>D</b> - Lever (3-position detent)* <b>E</b> - Ball (3-position detent)*
Cavity	C-10-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum and Steel
Weight cartridge only	0,27 kg (0.59 lbs)
Seal kit	889625 (Buna-N), 566080 (Viton®)

\* Light duty housing only.

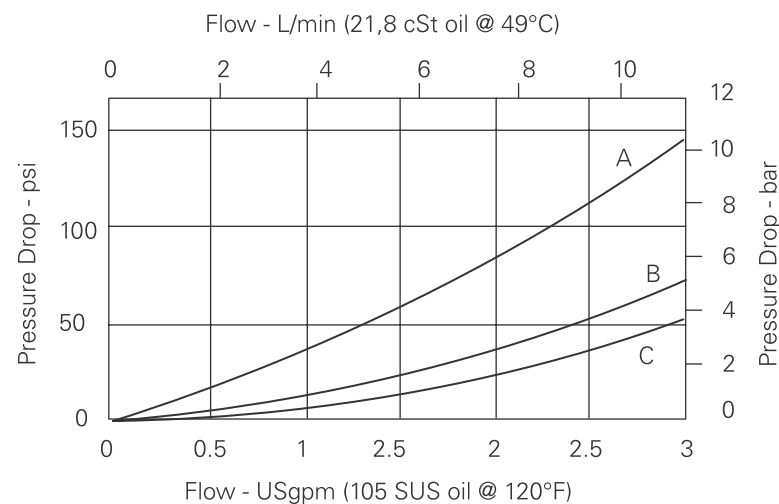
Viton is a registered trademark of E.I. DuPont

## Description

This is a 4 way 2 or 3 position manual semi-rotary directional control valve. In the center condition all port 2 is closed. All other ports are open.

## Pressure drop curves

Cartridge only



**A** - Port 3 to 4 or 3 to 2

**B** - Port 4 to 1

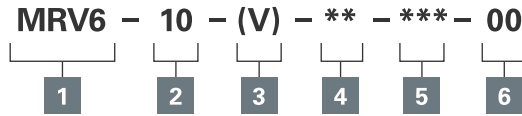
**C** - Port 2 to 1

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV6-10 - Manual rotary valve

Manual semi-rotary directional control valve  
11 L/min (3 USgpm) • 210 bar (3000 psi)

## Model code



### 1 Function

MRV6 - Manual rotary valve  
4-way

### 2 Size

10 - 10 size

### 3 Seal material

Blank - Buna-N  
V - Viton®

### 4 Manual operator

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

### 5 Port size

Code	Port size	Housing number		
		Aluminum Light duty	Aluminum Fatigue rated	Steel
0	Cartridge			
A3B	3/8" BSPP	02-179705	-	-
A6T	SAE 6	566161	-	-
A2G	1/4" BSPP	-	876709	-
A3G	3/8" BSPP	-	876715	-
A6H	SAE 6	-	876708	-
A8H	SAE 8	-	876713	-
S2G	1/4" BSPP	-	-	02-175139
S3G	3/8" BSPP	-	-	02-175140
S6T	SAE 6	-	-	02-175137
S8T	SAE 8	-	-	02-175138

See section J for housing details.

### 6 Special features

00 - None

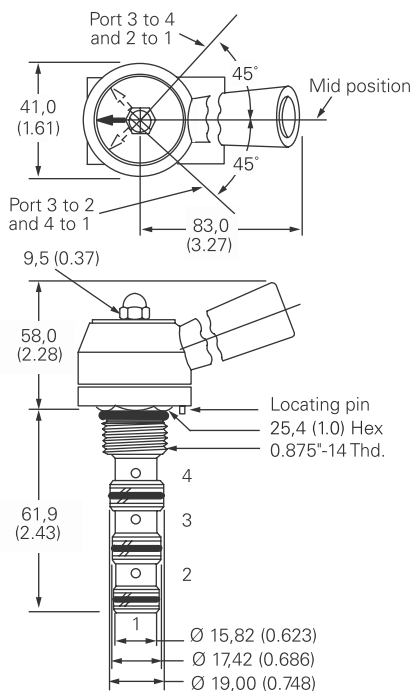
(Only required if valve has special features, omitted if "00".)

## Dimensions

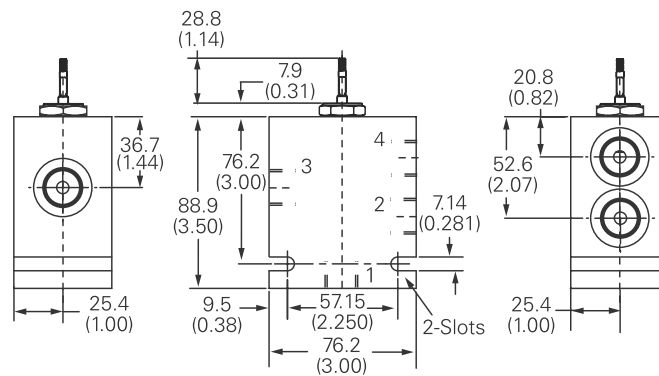
mm (inch)

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

## Cartridge only



## Installation drawing (Aluminum)



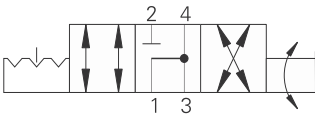
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV6-16 - Manual rotary valve

Manual semi-rotary directional control valve

11 L/min (3 USgpm) • 350 bar (3000 psi)

3 position models



## Operation

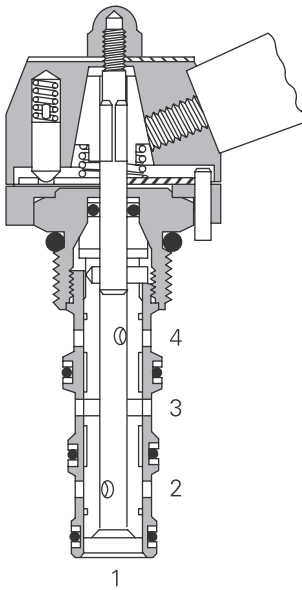
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position.

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.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Various levers and knobs available with and without detent.

## Sectional view



## Performance data

### 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	11 L/min (3 USgpm)
Temperature range	-40°C to 120°C (-40° to 248°F)
Manual operators	D - Lever (3-position detent) E - Ball (3-position 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 material	Aluminum and Steel
Weight cartridge only	0,27 kg (0.59 lbs)
Seal kit	889625 (Buna-N), 566080 (Viton®)

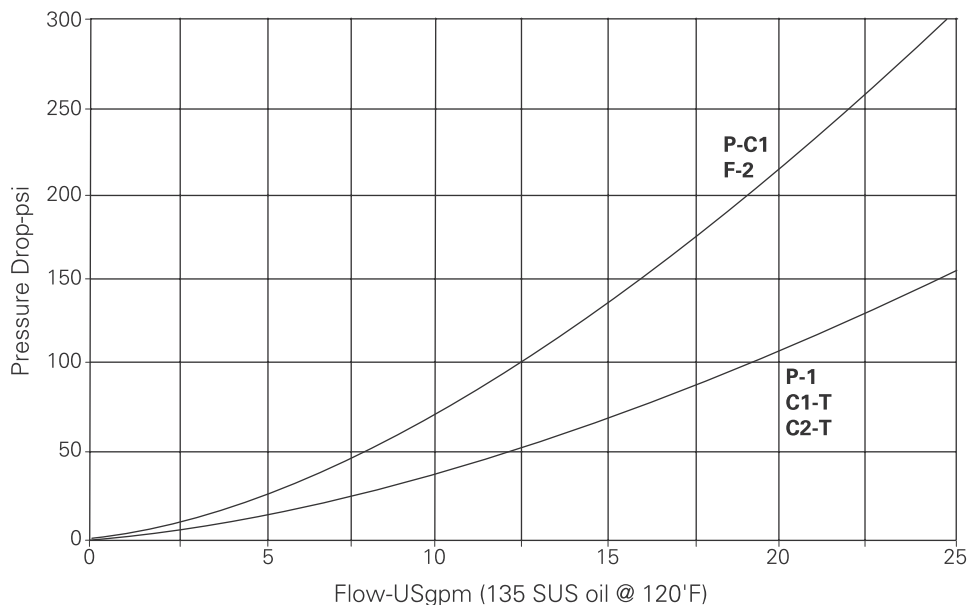
Viton is a registered trademark of E.I. DuPont

## Description

This is a 4 way 2 or 3 position manual semi-rotary directional control valve. In the center condition port 2 is closed. All other ports are open.

## Pressure drop curves

Cartridge only

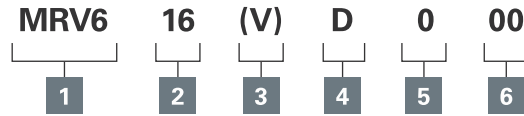


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV6-16 - Manual rotary valve

Manual semi-rotary directional control valve  
11 L/min (3 USgpm) • 350 bar (5000 psi)

## Model code

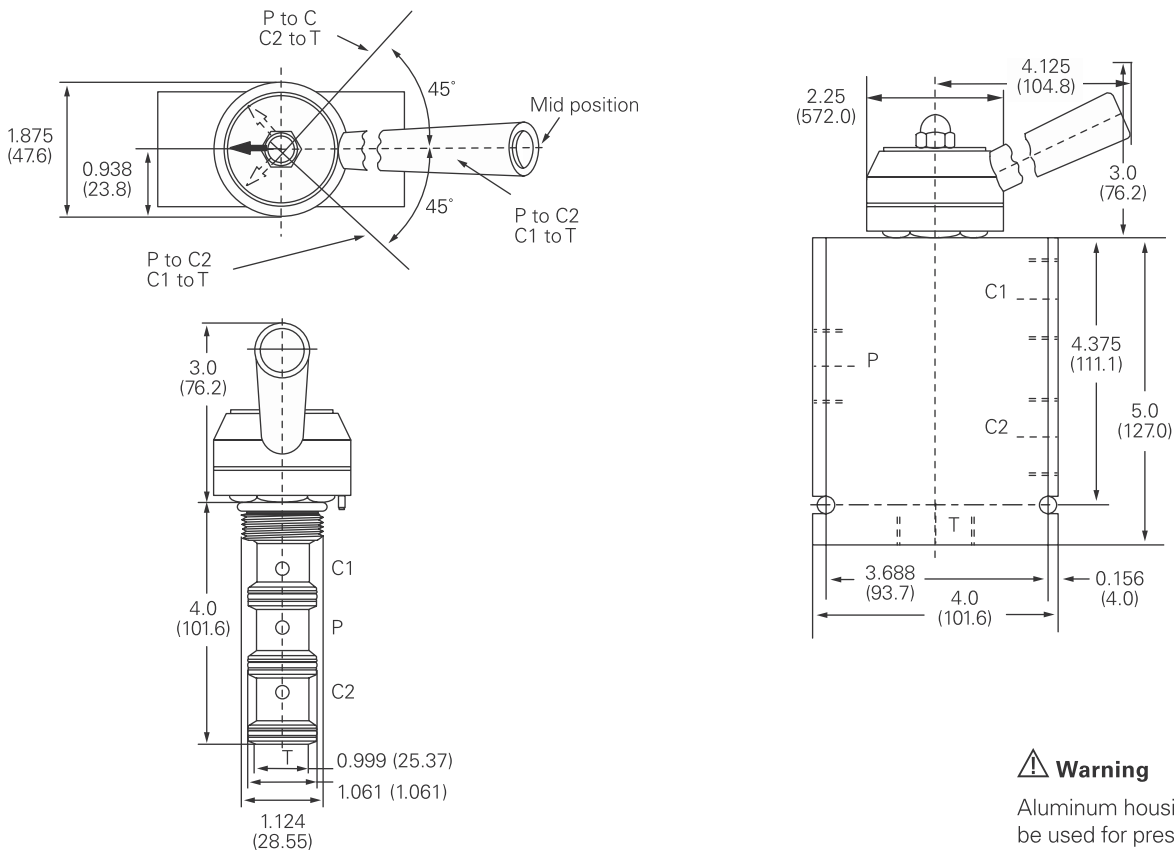


<b>1 Function</b> <b>MRV6</b> - Manual rotary valve 4-way	<b>3 Seal material</b> <b>Blank</b> - Buna-N <b>V</b> - Viton	<b>5 Port size</b> <b>0</b> - Cartridge Only <b>6</b> - 3/4" NPTF <b>8</b> - 1" NPTF <b>12T</b> - SAE 12 <b>16T</b> - SAE 16	<b>6 Special features</b> <b>00</b> - None (Only required if valve has special features, omitted if "00".)
<b>2 Size</b> <b>16</b> - 16 size	<b>4 Adjustment</b> <b>D</b> - 3-position detent		

## Dimensions

mm (inch)

## Cartridge and Installation drawing



### Warning

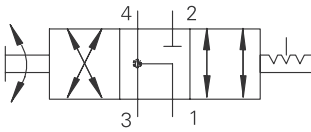
Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings must be used for operating pressures above 210 bar (3000 psi).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MRV7-10 - Manual rotary valve

Manual semi-rotary directional control valve  
 11 L/min (3 USgpm) • 210 bar (3000 psi)

3 position models



## Operation

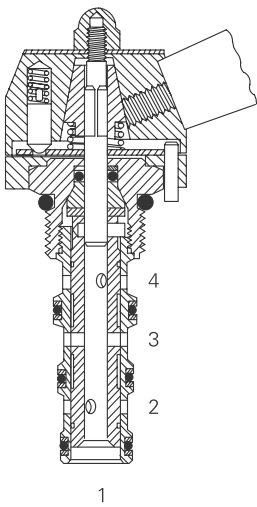
This valve will direct flow between ports 1 and 2 and ports 3 and 4 in one position.

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 open to each other.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Various levers and knobs available with and without detent.

## Sectional view



## Performance data

### 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 <sup>3</sup> /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Manual operators	<b>D</b> - Lever (3-position detent)* <b>E</b> - Ball (3-position detent)*
Cavity	C-10-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/ <b>16/13</b>
Standard housing materials	Aluminum and Steel
Weight cartridge only	0,27 kg (0.59 lbs)
Seal kit	889625 (Buna-N), 566080 (Viton®)

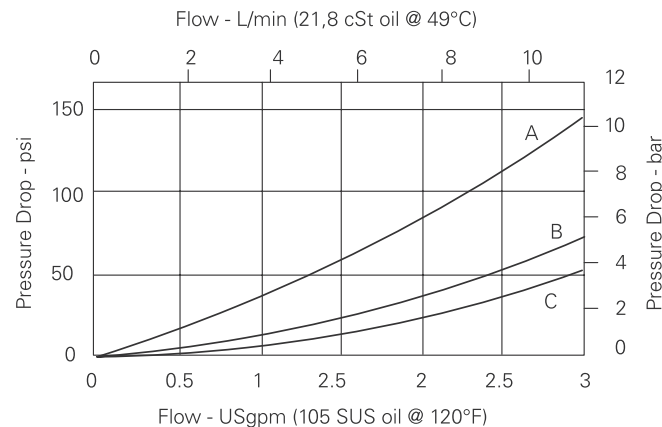
\* Light duty housing only.  
 Viton is a registered trademark of E.I. DuPont

## Description

This is a 4 way 2 or 3 position manual semi-rotary directional control valve. In the center condition all ports are open to each other.

## Pressure drop curves

Cartridge only



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

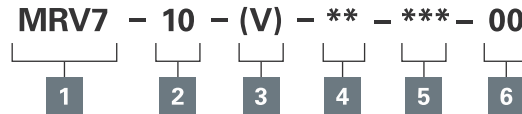
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# MRV7-10 - Manual rotary valve

Manual semi-rotary directional control valve  
11 L/min (3 USgpm) • 210 bar (3000 psi)

## Model code



### 1 Function

MRV7 - Manual rotary valve  
4-way

### 2 Size

10 - 10 size

### 3 Seal material

Blank - Buna-N  
V - Viton

### 4 Manual operator

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

### 5 Port size

Code	Port size	Housing number		
		Aluminum light duty	Aluminum fatigue rated	Steel
0	Cartridge			
A3B	3/8" BSPP	02-179705	-	-
A6T	SAE 6	566161	-	-
A2G	1/4" BSPP	-	876709	-
A3G	3/8" BSPP	-	876715	-
A6H	SAE 6	-	876708	-
A8H	SAE 8	-	876713	-
S2G	1/4" BSPP	-	-	02-175139
S3G	3/8" BSPP	-	-	02-175140
S6T	SAE 6	-	-	02-175137
S8T	SAE 8	-	-	02-175138

See section J for housing details.

### 6 Special features

00 - None

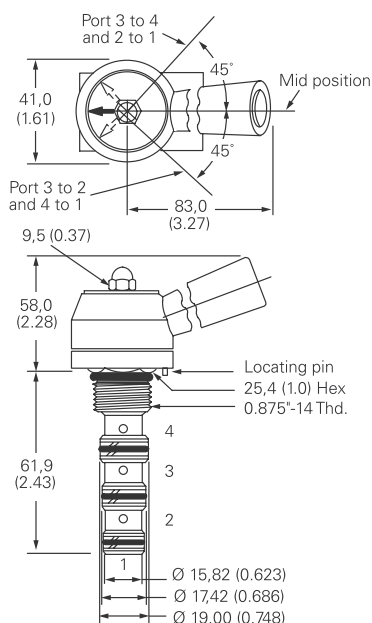
(Only required if valve has special features, omitted if "00").

## Dimensions

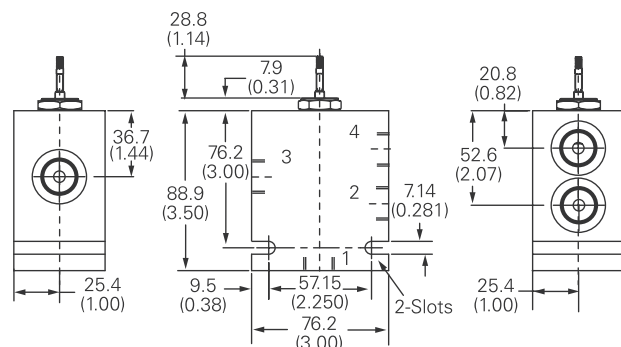
mm (inch)

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

## Cartridge only



## Installation drawing (Aluminum)

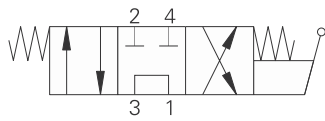


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MLV9-12-A - Directional valve

Manual lever valve, spool

60 L/min (15.9 USgpm) • 210 bar (3000 psi)



### Operation

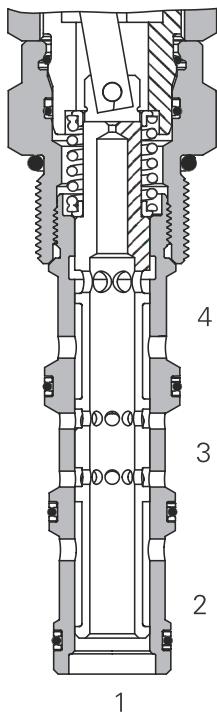
In the center position, this valve allows flow from port 3 to port 1 and blocks ports 2 and 4.

In position 1, flow is directed from port 3 to port 2 and from port 4 to port 1. In position 2, flow is directed from port 3 to port 4 and from port 2 to port 1.

### Features

Hardened, ground and honed working parts to limit leakage and prolong life. Compact design with a low Pressure drop. Handle position fully adjustable.

### Sectional view



### Performance data

#### Ratings and specifications

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

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Fatigue pressure	(210 bar) 3,000 psi per NFPA/T2-6-1 R2-2000
Rated burst pressure	(626 bar) 9090 psi per NFPA/T2-6-1 R2-2000
Max flow	60 L/min (15.9 USgpm)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight	.57 kg (1.25 lbs)
Seal kit	9900171-000 (Buna-N), 9900172 (Viton®)
Internal leakage	246 cm <sup>3</sup> /min (15 in <sup>3</sup> /min) max. @ 210 bar (3000 psi)

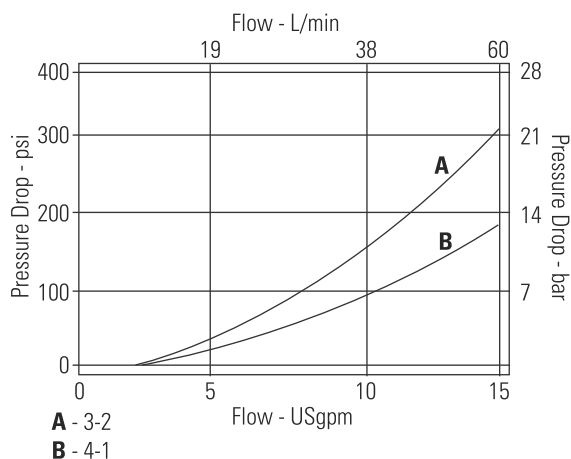
Endurance tested to 1 million cycles at full rated flow and pressure

Viton is a registered trademark of E.I. DuPont

### Description

This is a lever operated 4 way 3 position direct acting spool type directional valve. Spring centered with port 3 open to port 1 (Tank). Ports 2 and 4 blocked. This valve can easily be installed into a manifold simplifying the design and removing leak points.

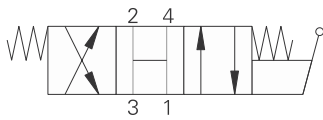
### Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MLV9-12-B - Directional valve

Manual lever valve, spool  
60 L/min (15.9 USgpm) • 210 bar (3000 psi)



## Operation

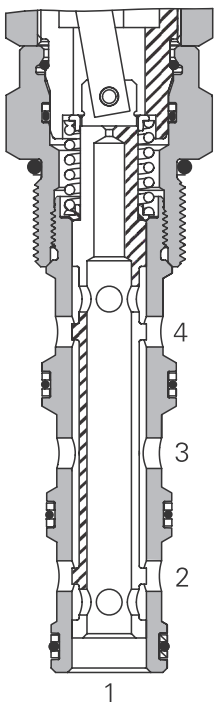
In the center position, all ports are open to each other. In position 1, flow is directed from port 3 to port 4 and from port 2 to port 1.

In position 2, flow is directed from port 3 to port 2 and from port 4 to port 1.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Compact design with a low Pressure drop. Handle position fully adjustable.

## Sectional view



## Performance data

### Ratings and specifications

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

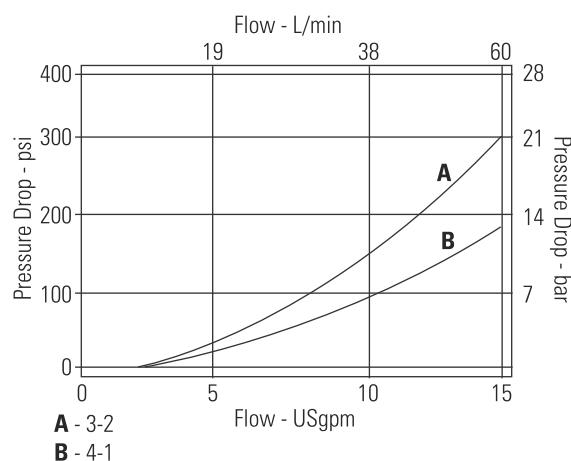
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Fatigue pressure	(210 bar) 3,000 psi per NFPA/T2-6-1 R2-2000
Rated burst pressure	(626 bar) 9090 psi per NFPA/T2-6-1 R2-2000
Max flow	60 L/min (15.9 USgpm)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight	.57 kg (1.25 lbs)
Seal kit	9900171-000 (Buna-N), 9900172 (Viton®)
Internal leakage	246 cm <sup>3</sup> /min (15 in <sup>3</sup> /min) max. @ 210 bar (3000 psi)
Endurance tested to 1 million cycles at full rated flow and pressure	

Viton is a registered trademark of E.I. DuPont

## Description

This is a lever operated 4 way 3 position direct acting spool type directional valve. Spring centered with all ports open. This valve can easily be installed into a manifold simplifying the design and removing leak points.

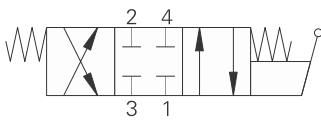
## Pressure drop curves



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MLV9-12-E - Directional valve

Manual lever valve, spool  
60 L/min (15.9 USgpm) • 210 bar (3000 psi)



### Operation

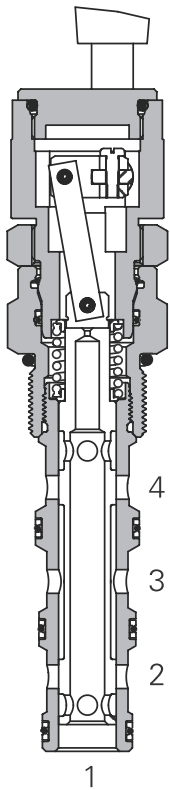
In the center position, all ports are blocked. In position 1, flow is directed from port 3 to port 2 and from port 4 to port 1.

In position 2, flow is directed from port 3 to port 2 and from port 4 to port 1.

### Features

Hardened, ground and honed working parts to limit leakage and prolong life. Compact design with a low Pressure drop. Handle position fully adjustable.

### Sectional view



### Performance data

#### Ratings and specifications

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

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Fatigue pressure	(210 bar) 3,000 psi per NFPA/T2-6-1 R2-2000
Rated burst pressure	(626 bar) 9090 psi per NFPA/T2-6-1 R2-2000
Max flow	60 L/min (15.9 USgpm)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight	.57 kg (1.25 lbs)
Seal kit	9900171-000 (Buna-N), 9900172 (Viton®)
Internal Leakage	246 cm <sup>3</sup> /min (15 in <sup>3</sup> /min) max. @ 210 bar (3000psi)

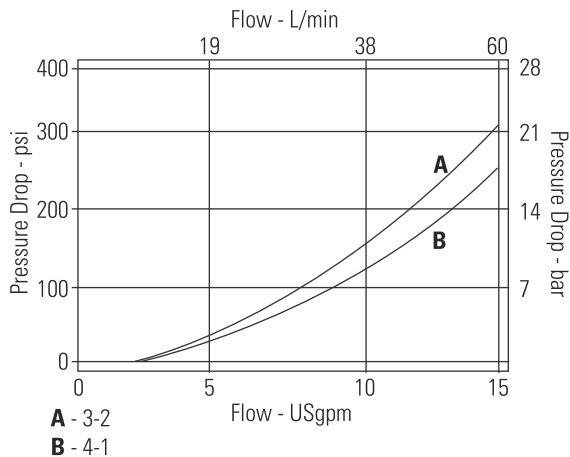
Endurance tested to 1 million cycles at full rated flow and pressure

Viton is a registered trademark of E.I. DuPont

### Description

This is a lever operated 4 way 3 position direct acting spool type directional valve. Spring centered with all ports closed. This valve can easily be installed into a manifold simplifying the design and removing leak points.

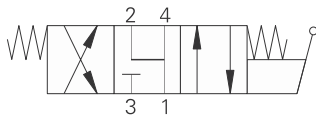
### Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MLV9-12-F - Directional valve

Manual lever valve, spool  
60 L/min (15.9 USgpm) • 210 bar (3000 psi)



## Operation

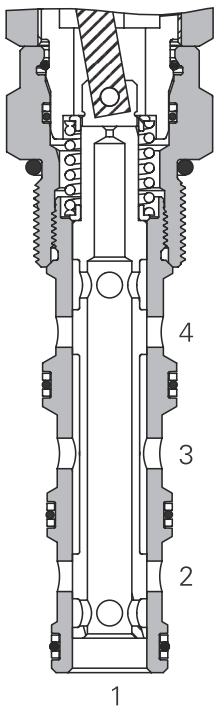
In the center position, port 1, port 2, and port 4 are open to each other while port 3 is blocked. In position 1, flow is directed from port 3 to port 4 and from port 2 to port 1.

In position 2, flow is directed from port 3 to port 2 and from port 4 to port 1.

## Features

Hardened, ground and honed working parts to limit leakage and prolong life. Compact design with a low Pressure drop. Handle position fully adjustable.

## Sectional view



## Performance data

### Ratings and specifications

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

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Fatigue pressure	(210 bar) 3,000 psi per NFPA/T2-6-1 R2-2000
Rated burst pressure	(626 bar) 9090 psi per NFPA/T2-6-1 R2-2000
Max flow	60 L/min (15.9 USgpm)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight	.57 kg (1.25 lbs)
Seal kit	9900171-000 (Buna-N), 9900172 (Viton®)
Internal Leakage	246 cm <sup>3</sup> /min (15 in <sup>3</sup> /min) max. @ 210 bar (3000psi)

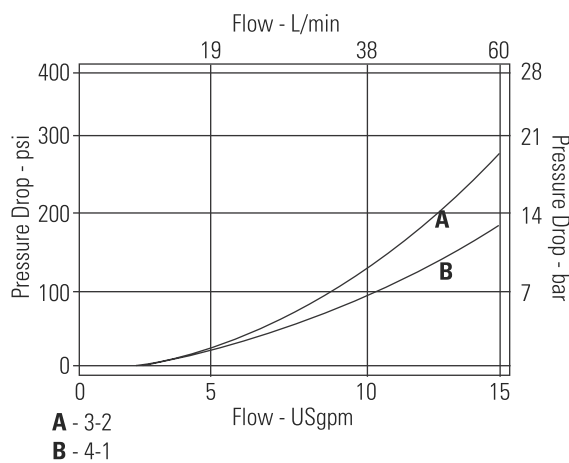
Endurance tested to 1 million cycles at full rated flow and pressure

Viton is a registered trademark of E.I. DuPont

## Description

This is a lever operated 4 way 3 position direct acting spool type directional valve. Spring centered with ports 2 and 4 to tank and port 2 blocked. This valve can easily be installed into a manifold simplifying the design and removing leak points.

## Pressure drop

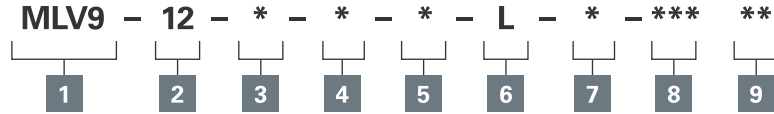


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MLV9-12 - Directional valve

Manual lever valve, spool  
60 L/min (15.9 USgpm) • 210 bar (3000 psi)

## Model code



### 1 Function

MLV9 - Manual lever valve

### 2 Size

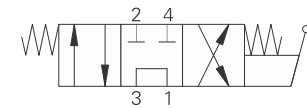
12 - 12 size

### 3 Seal material

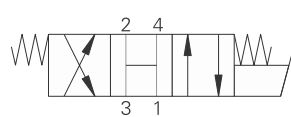
Blank - Buna-N  
V - Viton®

### 4 Spool center condition

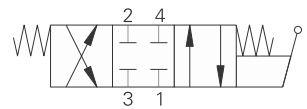
#### A



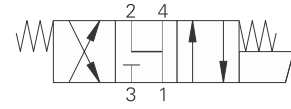
#### B



#### E



#### F



### 9 Lever position

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

See page D-297 for lever position

### 5 Detent option

- O - Spring return
- D - Detent, spring centered

### 6 Lever

L - Lever

### 7 Housing material

- Blank - Cartridge only
- A - Aluminum

### 8 Port size - bodied valve

Code	Port size	Housing number
		Aluminum
0	Cartridge only	
A4G	1/2" BSPP	5986431-001
A6G	3/4" BSPP	5986432-001
A8H	SAE 8	5986433-001
A10T	SAE 10	6030517-001
A12H	SAE 12	5986436-001

See section J for housing details.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MLV9-12 - Directional valve

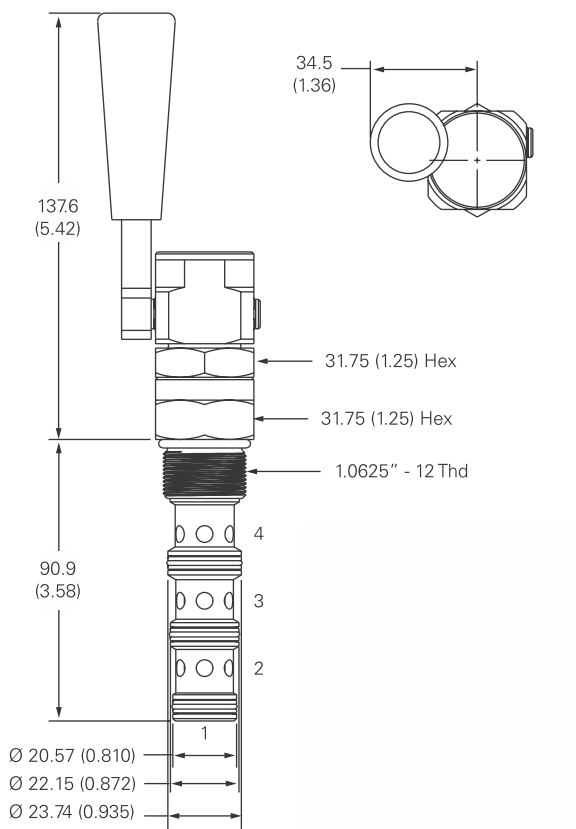
Manual lever valve, spool  
60 L/min (1.59 USgpm) • 210 bar (3000 psi)

## Dimensions

mm (inch)

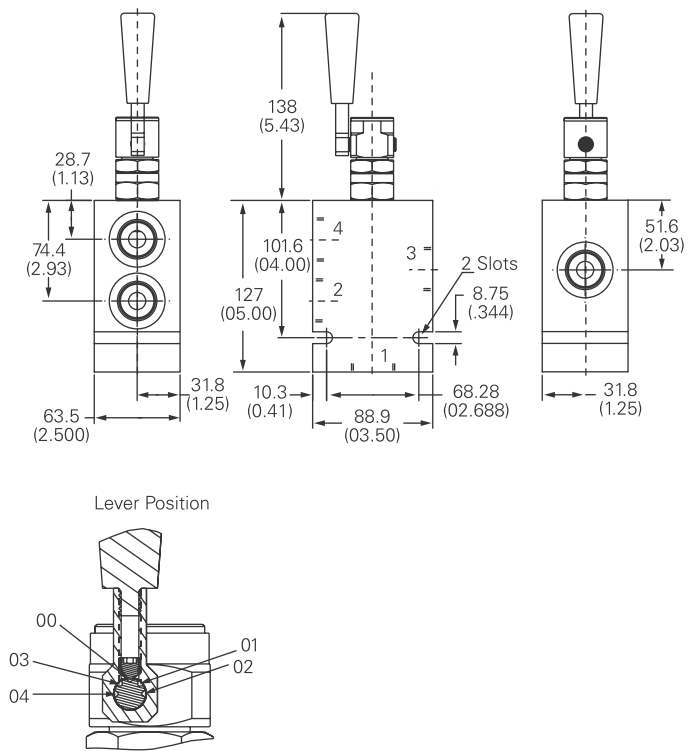
Torque cartridge in aluminum  
or steel housing  
34-41 Nm (25-30 ft lbs)

## Cartridge only



## Installation drawings (aluminum)

### MLV9-12-A/B/E/F



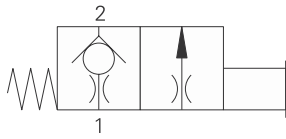
## Spare parts

Lever - 21113

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# 3CP2 - Series check valve

Check, manually operated  
 5.5-15 L/min (1.5-4 USgpm) • 210 bar (3000 psi)



### Operation

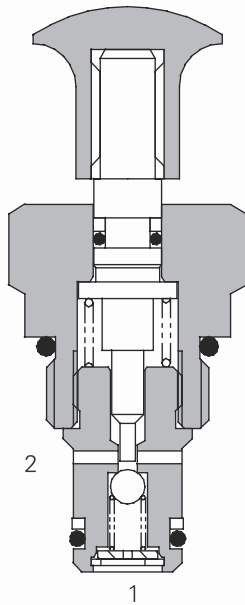
The poppet seals flow from ports 1 to 2, depressing the hand knob lifts the poppet from its seat permitting flow the flow rate is determined by the size of the orifice and the pressure in the system, various orifice sizes are available.

Flow from port 2 to 1 should be avoided - if required please consult our technical department.

### Features

Cartridge design with machined seats and precision ground balls gives excellent flow reseal characteristics.

### Sectional view



### Performance data

#### Ratings and specifications

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

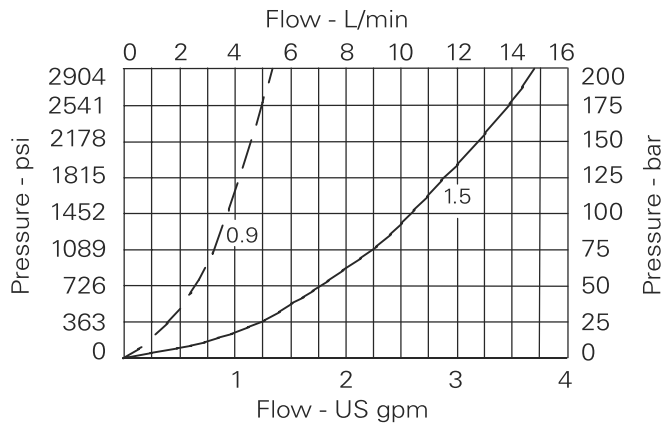
Max pressure	210 bar (3000 psi)
Rated flow	.9 mm orifice 5.5 L/min (1.4 US gpm), 1.5 mm orifice 15 L/min (4 US gpm)
Internal leakage	.3 ml/min nominal (5 dpm)
Temperature range	-30° to 90°C (-22° to 194°F)
Cavity	A879 (see Section M)
Torque cartridge into cavity	45 Nm (33 lbs ft)
Mounting position	Unrestricted
Filtration	BS5540/4 Class 18/13 (25 micron or better)
Nominal viscosity range	5 to 500 cSt
Cartridge material	All steel construction. External parts electroless zinc plated.
Standard housing materials	Aluminum
Weight	.05 kg (.11 lbs)
Seal kit	SK187 (Nitrile) SK187V (Viton®)

Viton is a registered trademark of E.I. DuPont

### Description

These cartridges permit a small regulated flow to pass when the hand knob is depressed. A typical application would be on an access platform to lower the boom in the event of a power failure.

### Pressure drop



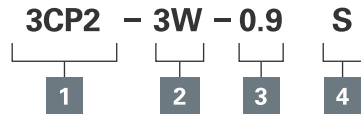
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# 3CP2 - Series check valve

Check, manually operated  
5.5-15 L/min (1.5-4 USgpm) • 210 bar (3000 psi)

## Model code



### 1 Function

**3CP2** - Cartridge only  
**3CP25** - Cartridge and body

### 2 Port size

Code	Port size	Housing number	
		Aluminum	Steel
<b>0</b>	Cartridge only		
<b>2W</b>	1/4" BSP	A1485	
<b>3W</b>	3/8" BSP	A1043	A18175
<b>6T</b>	3/8" SAE	A15676	A14843

See section J for housing details.

### 3 Orifice size

**0.9** - 0.9 mm  
**1.5** - 1.5 mm

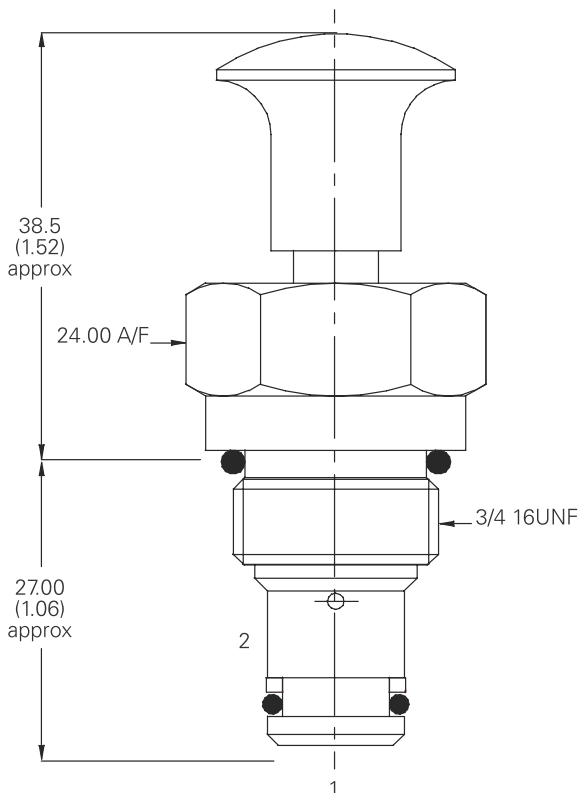
### 4 Seals

**S** - Nitrile  
**SV** - Viton

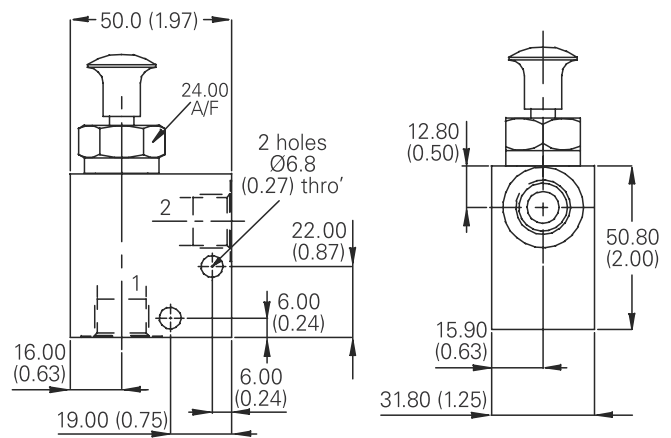
## Dimensions

mm (inch)

### Cartridge only



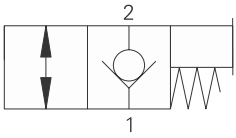
### Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MPV1-10 - Manual pull valve

Poppet type, normally closed valve  
 45 L/min (11.9 USgpm) • 210 bar (3000 psi)



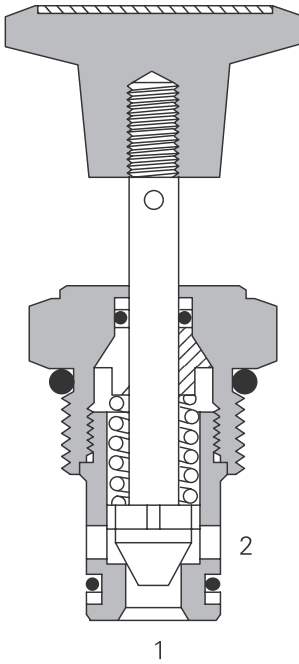
### Operation

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.

### Features

Hardened and ground poppet and seat with very low internal leakage

### Sectional view



### Performance data

#### Ratings and specifications

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

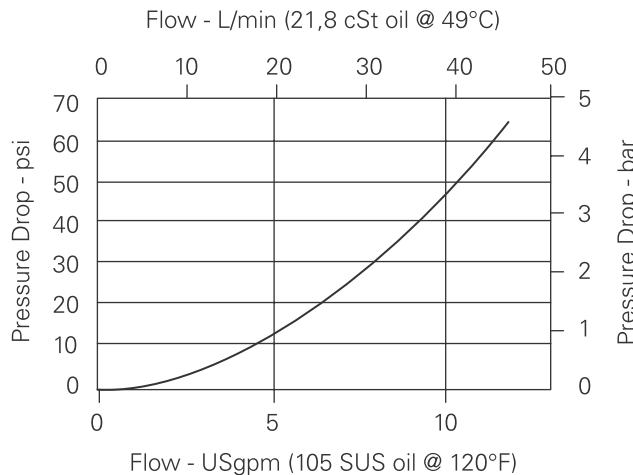
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	45 L/min (11.9 USgpm)
Internal leakage, port 2 to port 1	5 drops/min. maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-10-2
Fluids	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

### Description

This is a manually operated, pull to open normally closed none balanced poppet screw in cartridge valve. Ideal as an emergency lower valve.

### Pressure drop



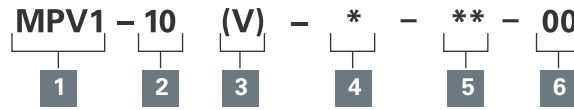
**Warning**  
 Back pressure of 16 bar (240 psi) will unseat the poppet.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MPV1-10 - Manual pull valve

Poppet type, normally closed valve  
45 L/min (1.9 USgpm) • 210 bar (3000 psi)

## Model code



### 1 Function

**MPV1** - Manual pull valve

### 2 Size

**10** - 10 size

### 3 Seal material

**Blank** - Buna-N

**V** - Viton®

### 4 Type

**T** - Stem only

**K** - Knob

### 5 Port size

**0** - Cartridge only

Code	Port size	Housing number	
		Aluminium light duty	Aluminium fatigue rated
<b>3B</b>	3/8" BSPP	02-175462	
<b>6T</b>	SAE 6	566151	
<b>2G</b>	1/4" BSPP	-	876702
<b>3G</b>	3/8" BSPP	-	876703
<b>6H</b>	SAE 6	-	876700
<b>8H</b>	SAE 8	-	876701

See section J for housing details.

### 6 Special features

**00** - None

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

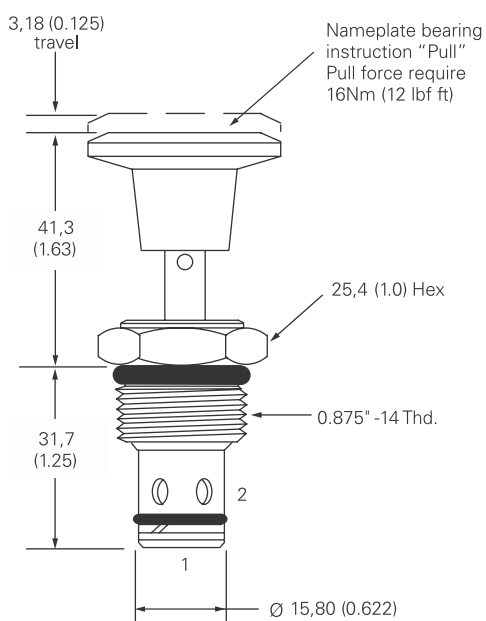
**SS** - 316 Stainless steel external components

## Dimensions

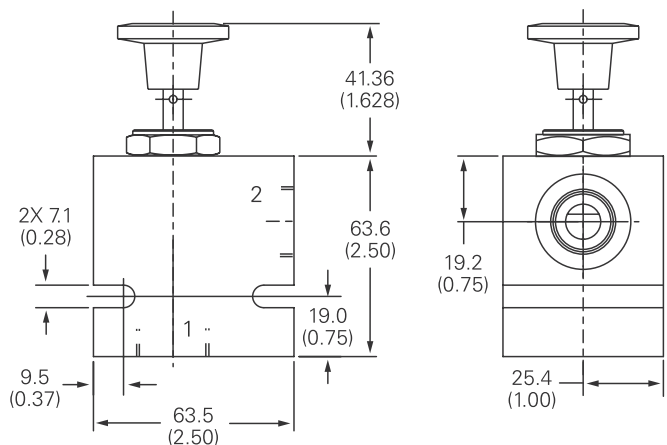
mm (inch)

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

### Cartridge only



### Installation drawing

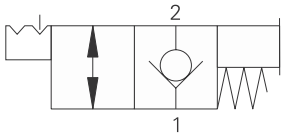


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MPV3-10 - Manual pull valve

Normally closed valve

45 L/min (11.9 USgpm) • 210 bar (3000 psi)



## Operation

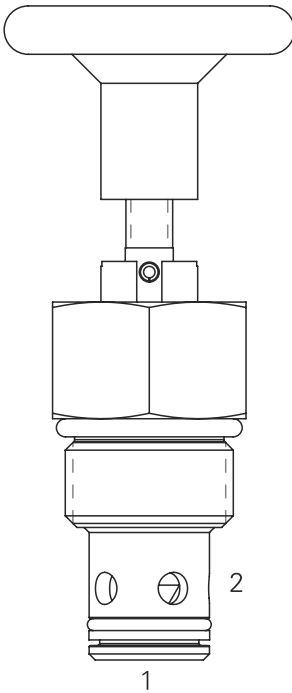
This valve blocks flow from port 2 to port 1 and will allow flow from port 1 to port 2 when the spring bias is overcome.

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

## Features

Hardened and ground poppet and seat with very low internal leakage

## Sectional view



## Performance data

### Ratings and specifications

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

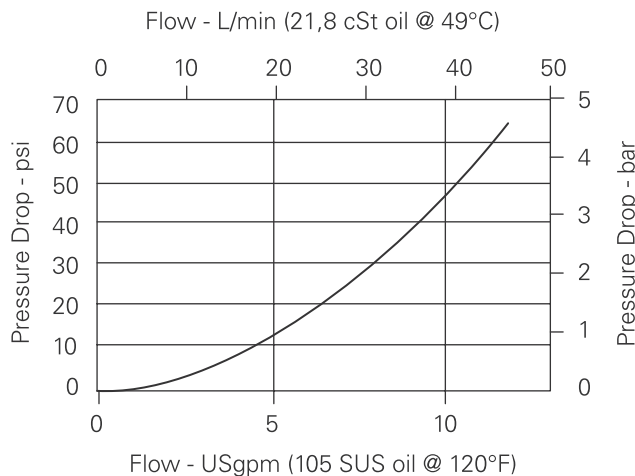
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	45 L/min (11.9 USgpm)
Internal leakage (port 2 to port 1)	5 drops/min. maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-10-2
Fluids	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

## Description

This is a manually operated, pull to open with detent normally closed non balanced poppet screw in cartridge valve. Ideal as an emergency lower valve.

## Pressure drop



## Warning

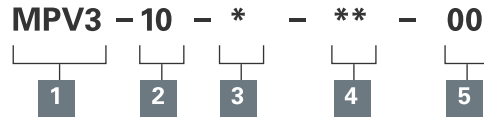
Back pressure of 16 bar (240 psi) will unseat the poppet.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MPV3-10 - Manual pull valve

Normally closed valve  
45 L/min (11.9 USgpm) • 210 bar (3000 psi)

## Model code



**1 Function**  
MPV1 - Manual pull valve with detent

**2 Size**  
10 - 10 size

**3 Seal material**  
Blank - 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	
		Aluminium light duty	Aluminium 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

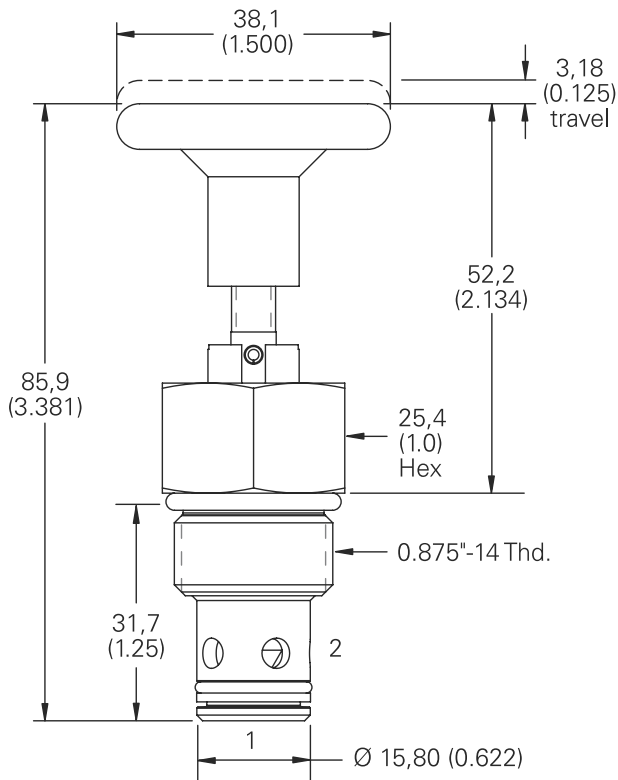
See section J for housing details.

## Dimensions

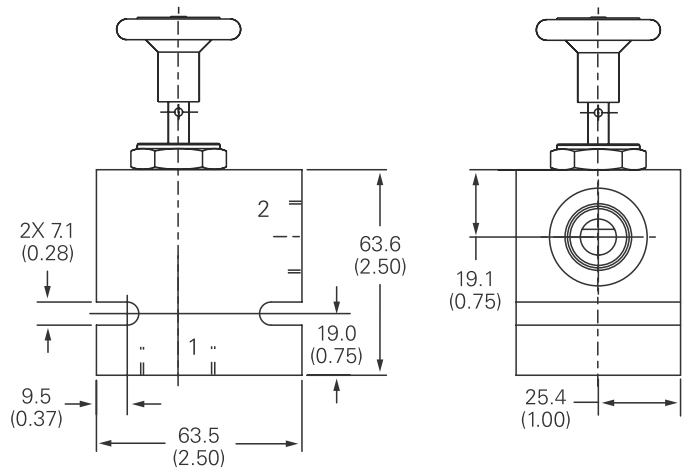
mm (inch)

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

## Cartridge only



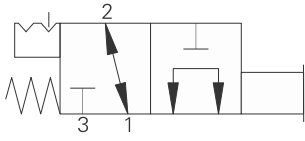
## Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV1-12 - Manual push valve

Push and twist directional control valve  
 41.8 L/min (11 USgpm) • 210 bar (3000 psi)



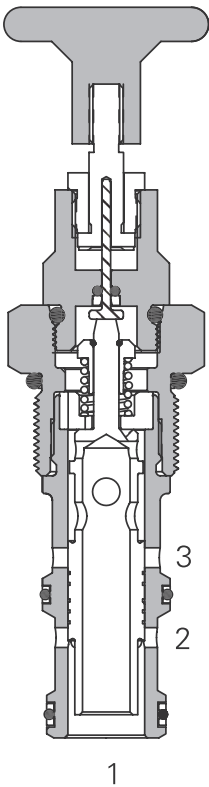
### Operation

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

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Detent allows valve to be fixed in position

### Sectional view



### Performance data

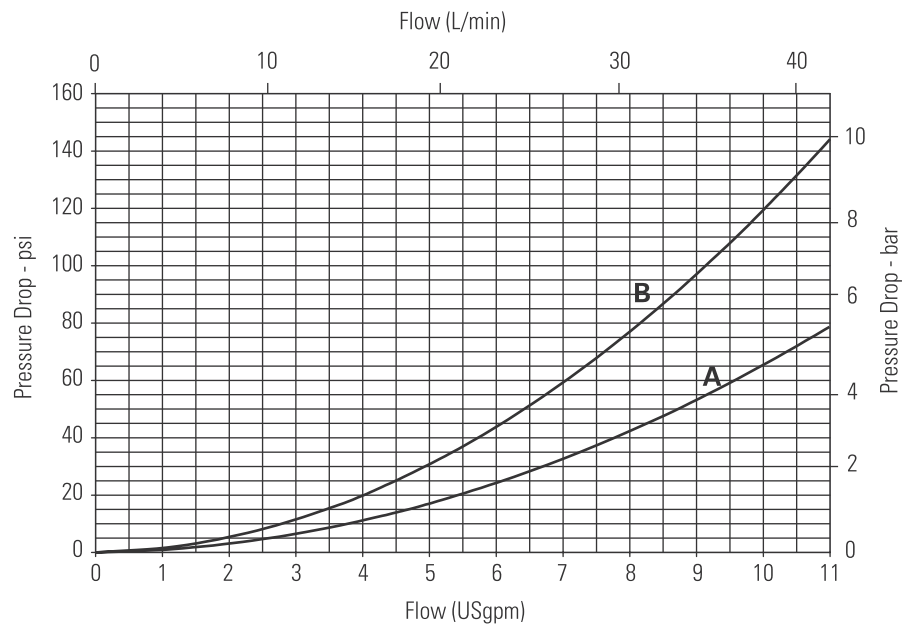
#### Ratings and specifications

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

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	41,8 L/min (11 USgpm)
Internal leakage	350 cc/min (21.5 in3/min)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-3
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,29 kg (0.66 lbs)
Seal kit	9900171-000 (Buna-N), 9900172-000 (Viton®)

Viton is a registered trademark of E.I. DuPont

### Pressure drop



**A** - P1 to P2  
**B** - P3 to P1

### Description

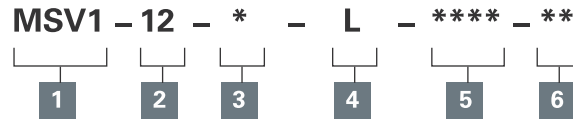
This is a manually operated push and twist type 2 position 3 ported directional control valve. Ideal for isolating a system until flow is required.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV1-12 - Manual push valve

Push and twist directional control valve  
41.8 L/min (11 USgpm) • 210 bar (3000 psi)

## Model code



**1 Function**  
**MSV1** - Manual push valve

**2 Size**  
**12** - 12 size

**3 Seal material**  
**Blank** - Buna-N  
**V** - Viton®

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

**5 Port size**  
**0** - Cartridge only

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

Code	Port size	Housing number
		Aluminium
<b>A6G</b>	3/4" BSPP	02-161816
<b>A12H</b>	SAE 12	02-160646

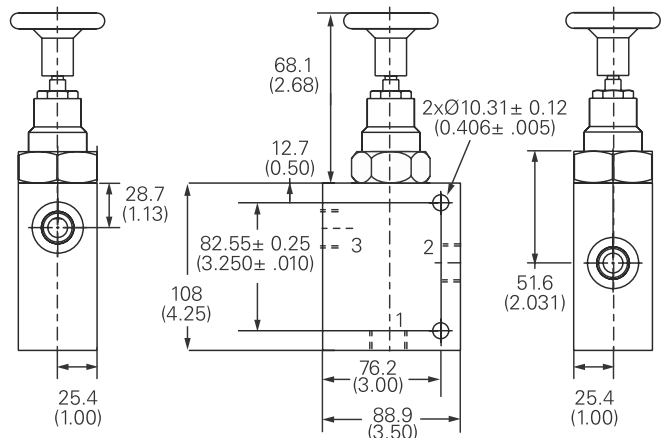
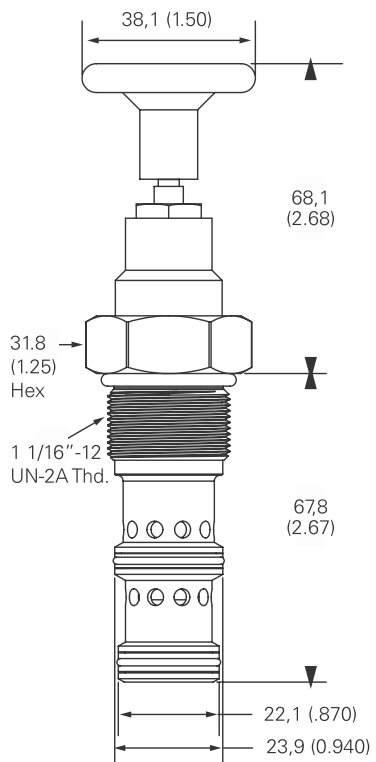
## Dimensions

mm (inch)

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

## Cartridge only

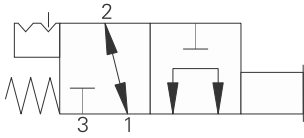
## Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV1 1-10 - Manual push valve

Push and twist directional control valve  
 23 L/min (6 USgpm) • 350 bar (5000 psi)



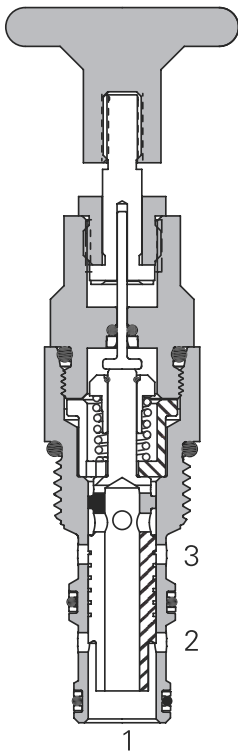
### Operation

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

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Detent allows valve to be fixed in position. Working Pressure 350 bar.

### Sectional view



### Performance data

#### Ratings and specifications

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

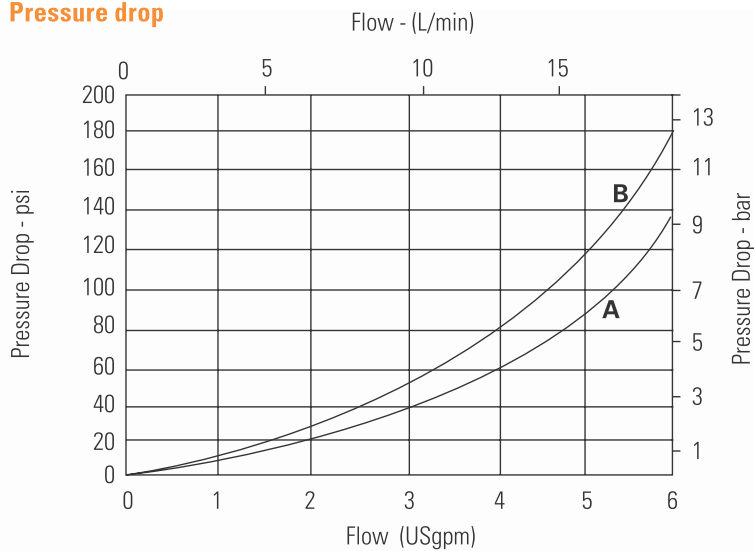
Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	23 L/min (6 USgpm)
Internal leakage	350 cc/min (21.5 in <sup>3</sup> /min) @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-10-3
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/ <b>16/13</b>
Standard housing materials	Aluminum and Steel
Weight cartridge only	0.25 kg (0.55 lbs)
Seal kit	889624 (Buna-N), 889628 (Viton®)

Viton is a registered trademark of E.I. DuPont

### Description

This is a manually operated high pressure push and twist type 2 position 3 ported directional control valve. Ideal for isolating a system until flow is required.

### Pressure drop



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

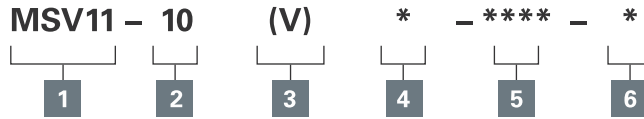
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# MSV1 1-10 - Manual push valve

Push and twist directional control valve  
23 L/min (6 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

**MSV11** - 3-way, 2 position manual push valve

### 2 Size

**10** - 10 size

### 3 Seals

**Blank** - Buna-N  
**V** - Viton®

### 4 Actuation option

**L** - 2 position 'push and twist' actuation, with detent  
**E** - Emergency stop actuation  
**N** - No detent, momentary actuation  
**K** - Push and twist

### 5 Port size

**0** - Cartridge only

Code	Port size	Housing number	
		Aluminum	Steel
<b>0</b>			
<b>A2G</b>	1/4" BSPP	876705	
<b>A3G</b>	3/8" BSPP	876714	
<b>A6H</b>	SAE 6	876704	
<b>A8H</b>	SAE 8	876711	
<b>S2G</b>	1/4" BSPP		02-175127
<b>S3G</b>	3/8" BSPP		02-175128
<b>S6T</b>	SAE 6		02-175124
<b>S8T</b>	SAE 8		02-175125

See section J for housing details.

### 6 Special features

**Blank** - No special features

## Dimensions

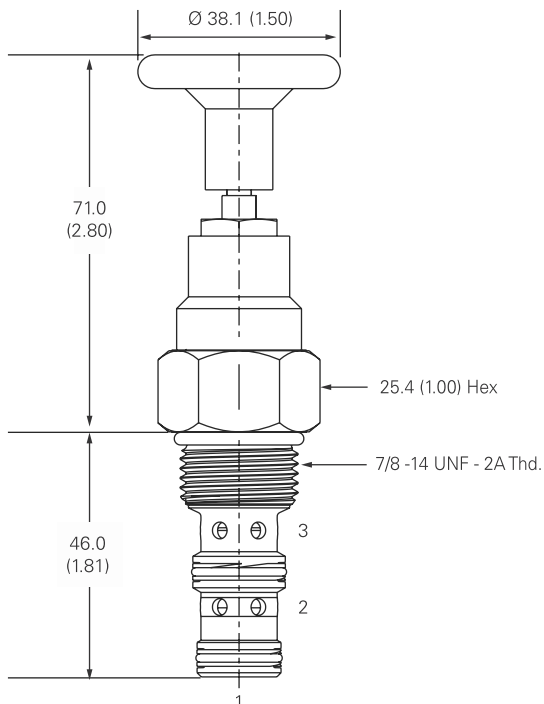
mm (inch)

Torque cartridge in housing

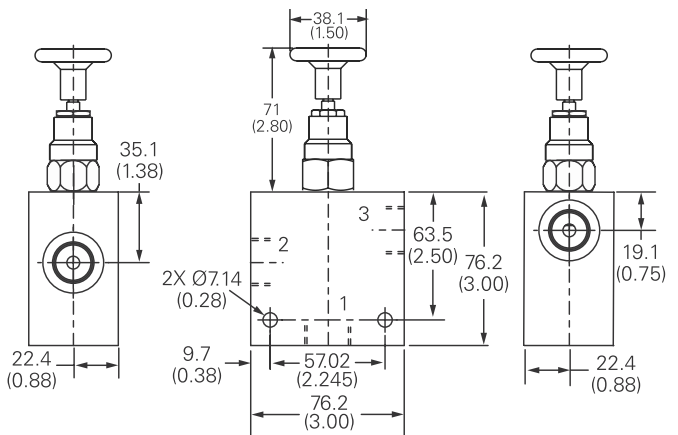
**A** - 47-54 Nm (35-40 ft. lbs)

**S** - 68-75 Nm (50-55 ft. lbs)

## Cartridge only



## Installation drawing (steel)



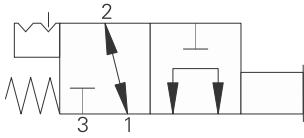
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV11-12 - Manual push valve

Push and twist directional control valve  
 30 L/min (8 USgpm) • 350 bar (5000 psi)



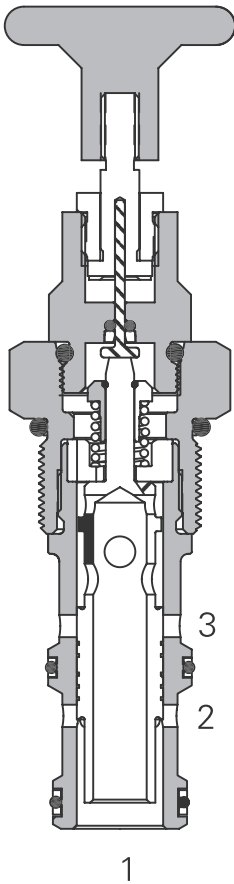
## Operation

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

## Features

Hardened, ground and honed sleeve and spool for low internal leakage. Detent allows valve to be fixed in position. Working Pressure 350 bar.

## Sectional view



## Description

This is a manually operated high pressure push and twist type 2 position 3 ported directional control valve. Ideal for isolating a system until flow is required.

## Performance data

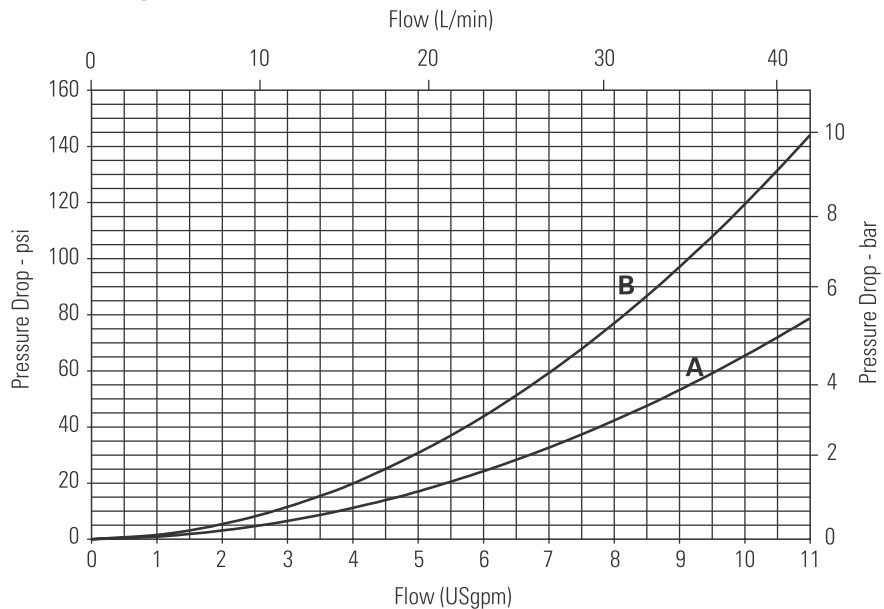
### Ratings and specifications

*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	30 L/min (8 USgpm)
Internal leakage	350 cc/min (21 in3/min) @ 350 bar (5000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-3
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum and Steel
Weight cartridge only	0,29 kg (0.66 lbs)
Seal kit	9900171-000 (Buna-N), 9900172-000 (Viton®)

Viton is a registered trademark of E.I. DuPont

## Pressure drop



**A** - P1 to P2

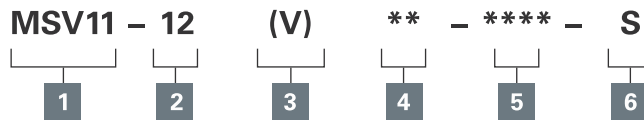
**B** - P3 to P1

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV1 1-12 - Manual push valve

Push and twist directional control valve  
30 L/min (8 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

**MSV11** - Manual push valve

### 2 Size

**12** - 12 size

### 3 Seals

**Blank** - Buna-N  
**V** - Viton®

### 4 Actuation option

**L** - 2 position, push & twist actuation, with detent.  
**E** - Emergency stop actuation  
**N** - No detent, momentary actuation  
**K** - Push and twist

### 5 Port size

**0** - Cartridge only

### 6 Valve housing material

**Blank** - Cartridge only  
**S** - Steel

Code	Port size	Housing number	
		Aluminum	Steel
<b>0</b>			
<b>A6G</b>	3/4" BSPP	02-161816	
<b>A12H</b>	SAE 12	02-160646	
<b>S4G</b>	1/2" BSPP		02-169815
<b>S6G</b>	3/4" BSPP		02-169814
<b>S10T</b>	SAE 10		02-161070
<b>S12T</b>	SAE 12		02-169816

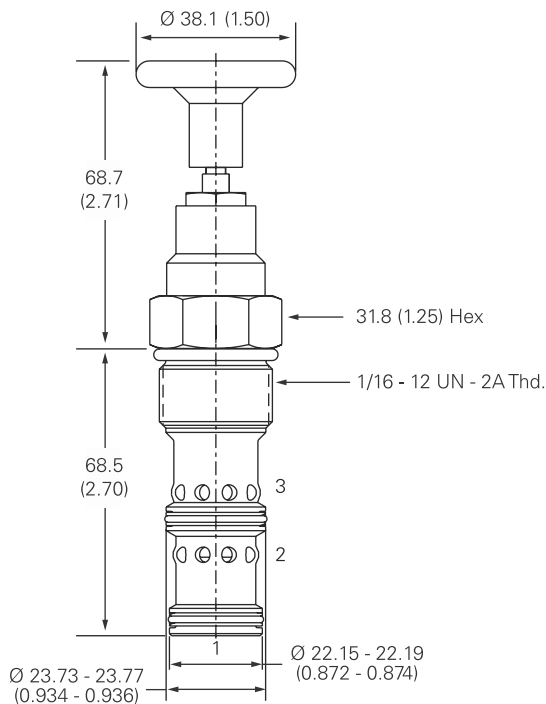
## Dimensions

mm (inch)

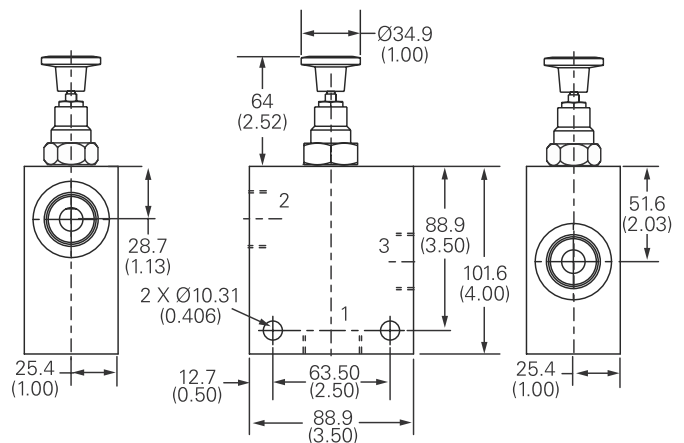
Torque cartridge in housing

**A** - 81-95 Nm (60-70 ft. lbs)  
**S** - 102-115 Nm (75-85 ft. lbs)

## Cartridge only



## Installation drawing (steel)



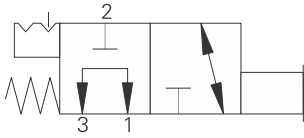
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV2-12 - Manual push valve

Push and twist directional control valve  
 38 L/min (10 USgpm) • 210 bar (3000 psi)



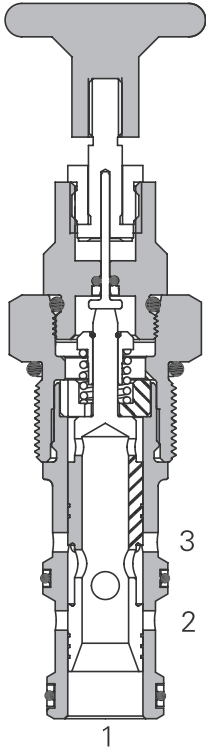
### Operation

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

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Detent allows valve to be fixed in position

### Sectional view



### Performance data

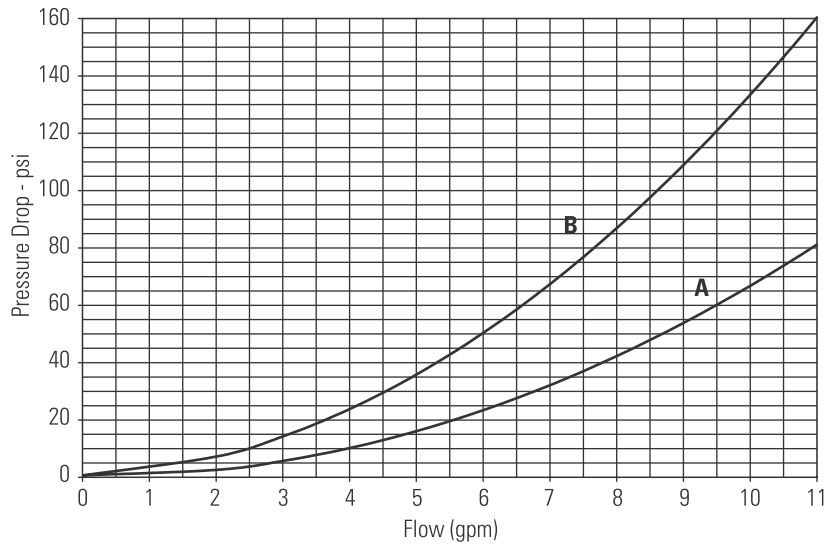
#### Ratings and specifications

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

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

Viton is a registered trademark of E.I. DuPont

### Pressure drop



**A** - P2 to P1  
**B** - P1 to P3

### Description

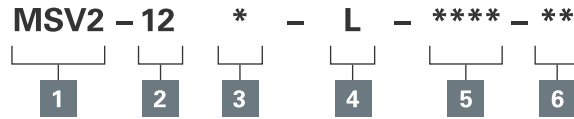
This is a manually operated push and twist type 2 position 3 ported directional control valve. Ideal for isolating a system until flow is required.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV2-12 - Manual push valve

Push and twist directional control valve  
38 L/min (10 USgpm) • 210 bar (3000 psi)

## Model code



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

**2 Size**  
12 - 12 size

**3 Seal material**  
Blank - Buna-N  
V - Viton®

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

**5 Port size**  
0 - Cartridge only

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

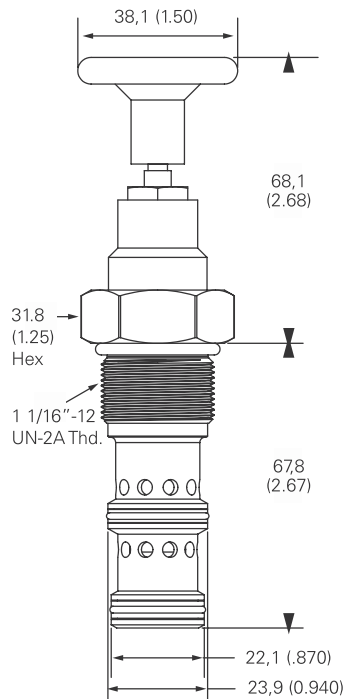
Code	Port size	Housing number
Aluminum		
A6G	3/4" BSPP	02-161816
A12H	SAE 12	02-160646

## Dimensions

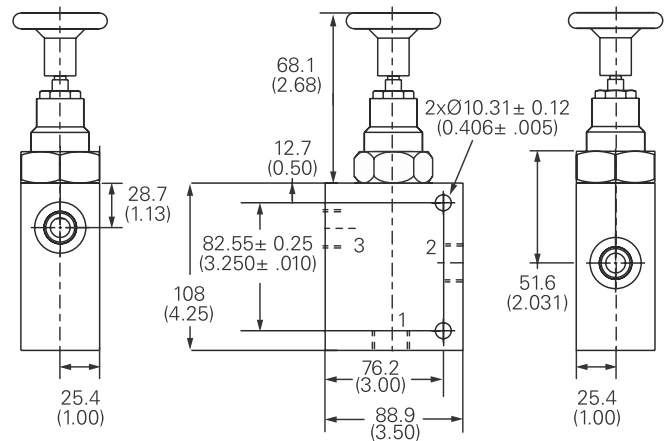
mm (inch)

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

### Cartridge only



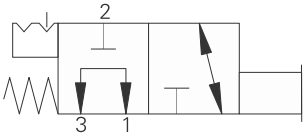
### Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV12-12 - Manual push valve

Push and twist directional control valve  
 38 L/min (10 USgpm) • 350 bar (5000 psi)



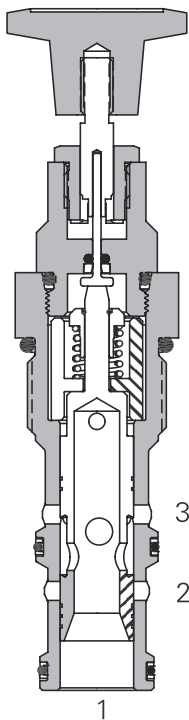
### Operation

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

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Detent allows valve to be fixed in position. Working Pressure 350 bar.

### Sectional view



### Performance data

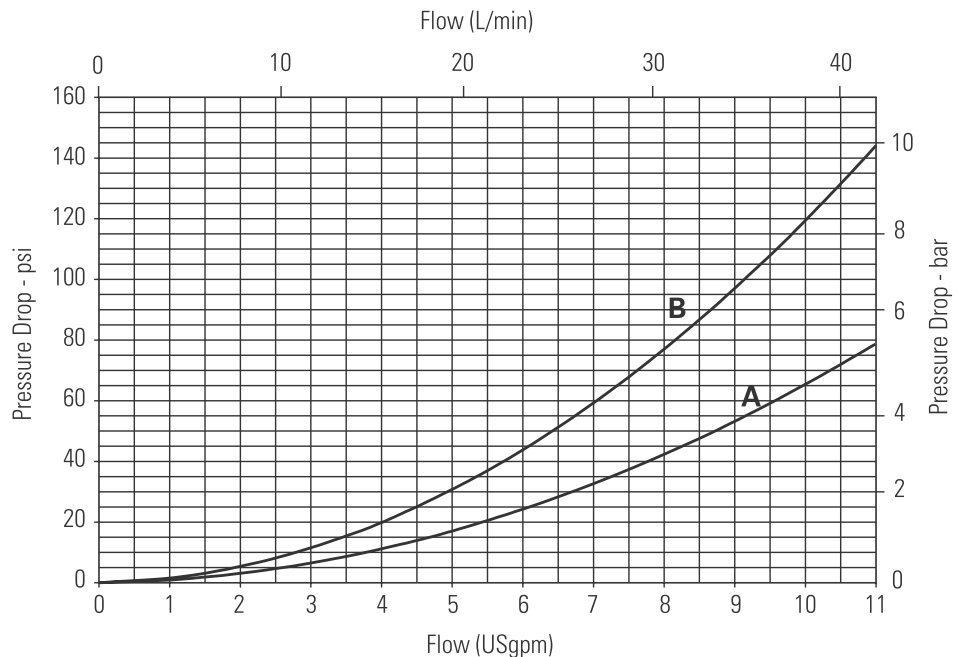
#### Ratings and specifications

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

Viton is a registered trademark of E.I. DuPont

### Pressure drop



**A** - P1 to P2

**B** - P3 to P1

### Description

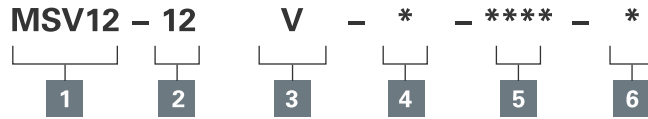
This is a manually operated high pressure push and twist type 2 position 3 ported directional control valve. Ideal for isolating a system until flow is required.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV12-12 - Manual push valve

Push and twist directional control valve  
38 L/min (10 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

**MSV12** - 3-way, 2 position manual push valve

### 2 Size

**12** - 12 size

### 3 Seals

**Blank** - Buna-N  
**V** - Viton®

### 4 Actuation option

**L** - 2 position 'push and twist' actuation, with detent  
**E** - Emergency stop actuation  
**N** - No detent, momentary actuation  
**K** - Push and twist

### 5 Port size

**0** - Cartridge only

### 6 Special features

**Blank** - No special features

Code	Port size	Housing number	
		Aluminum	Steel
<b>0</b>			
<b>A6G</b>	3/4" BSPP	02-161816	
<b>A12H</b>	SAE 12	02-160646	
<b>S4G</b>	1/2" BSPP	02-169815	
<b>S6G</b>	3/4" BSPP	02-169814	
<b>S10H</b>	SAE 10		02-161070
<b>S12H</b>	SAE 12		02-169816

See section J for housing details.

## Dimensions

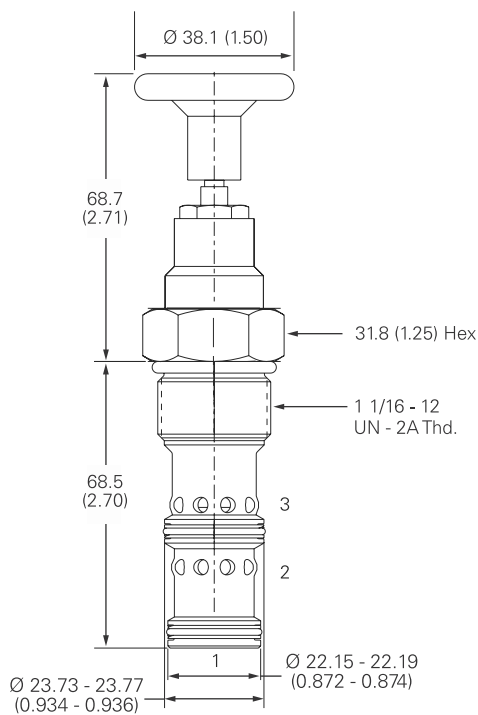
mm (inch)

Torque cartridge in housing

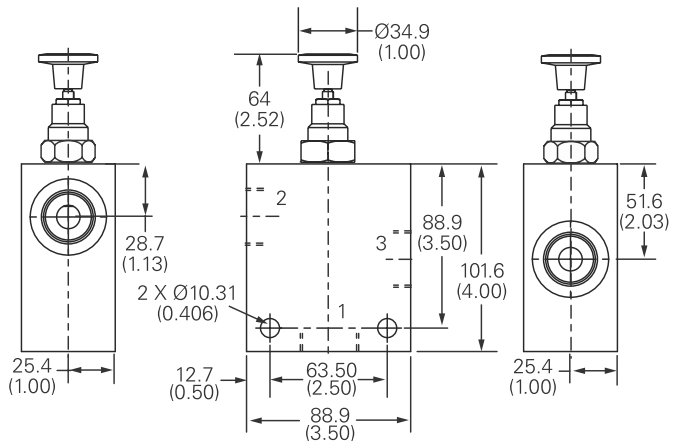
**A** - 81-95 Nm (60-70 ft. lbs)

**S** - 102-115 Nm (75-85 ft. lbs)

### Cartridge only



### Installation drawing (steel)



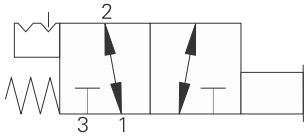
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV5-12 - Manual push valve

Push and twist directional control valve  
 41.8 L/min (11 USgpm) • 210 bar (3000 psi)



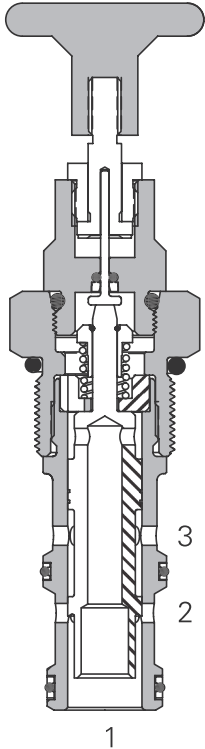
### Operation

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

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Detent allows valve to be fixed in position

### Sectional view



### Performance data

#### Ratings and specifications

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

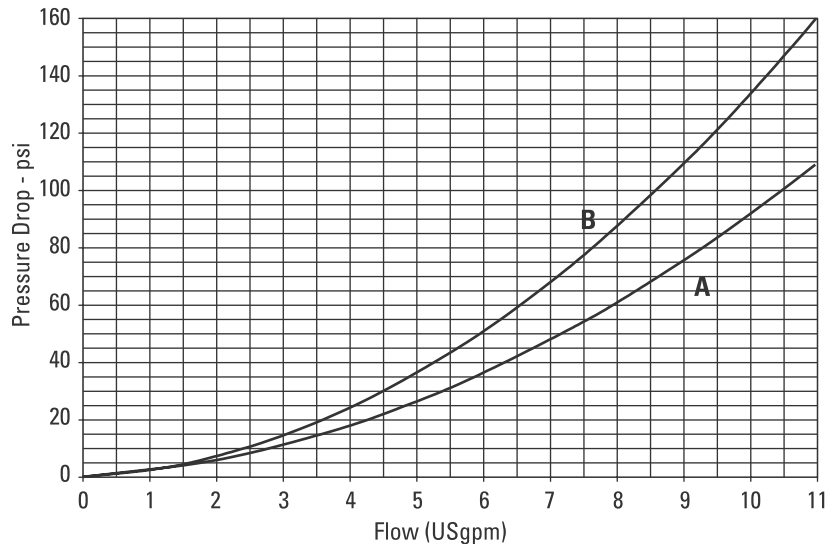
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	41.8 L/min (11 USgpm)
Internal leakage	350 cc/min (21.5 in3/min)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-3
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,29 kg (0.66 lbs)
Seal kit	9900171-000 (Buna-N), 9900172-000 (Viton®)

Viton is a registered trademark of E.I. DuPont

### Description

This is a manually operated push and twist type 2 position 3 ported directional control valve. Ideal for isolating a system until flow is required.

### Pressure drop



**A** - P2 to P1  
**B** - P3 to P2

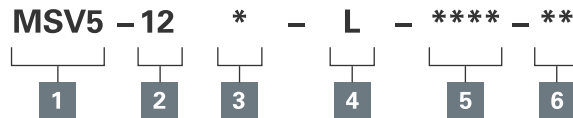
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# MSV5-12 - Manual push valve

Push and twist directional control valve  
41.8 L/min (11 USgpm) • 210 bar (3000 psi)

## Model code



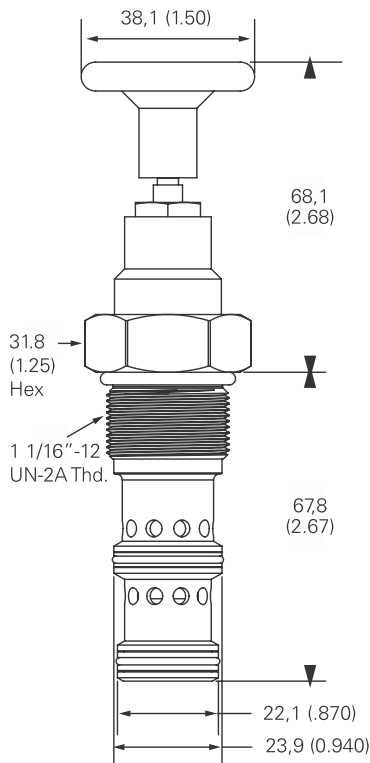
<b>1 Function</b> <b>MSV5</b> - 3 way, 2 position Manual push valve	<b>4 Actuation option</b> <b>L</b> - 2 position 'push and twist' actuation <b>E</b> - Emergency stop actuation <b>N</b> - No Detent	<b>6 Special features</b> <b>Blank</b> - No special features												
<b>2 Size</b> <b>12</b> - 12 size	<b>5 Port size</b> <b>0</b> - Cartridge only													
<b>3 Seal material</b> <b>Blank</b> - Buna-N <b>V</b> - Viton®	<table border="1"> <thead> <tr> <th>Code</th> <th>Port size</th> <th>Housing number</th> </tr> <tr> <th colspan="3">Aluminum</th> </tr> </thead> <tbody> <tr> <td><b>A6G</b></td> <td>3/4" BSPP</td> <td>02-161816</td> </tr> <tr> <td><b>A12H</b></td> <td>SAE 12</td> <td>02-160646</td> </tr> </tbody> </table>		Code	Port size	Housing number	Aluminum			<b>A6G</b>	3/4" BSPP	02-161816	<b>A12H</b>	SAE 12	02-160646
Code	Port size	Housing number												
Aluminum														
<b>A6G</b>	3/4" BSPP	02-161816												
<b>A12H</b>	SAE 12	02-160646												

## Dimensions

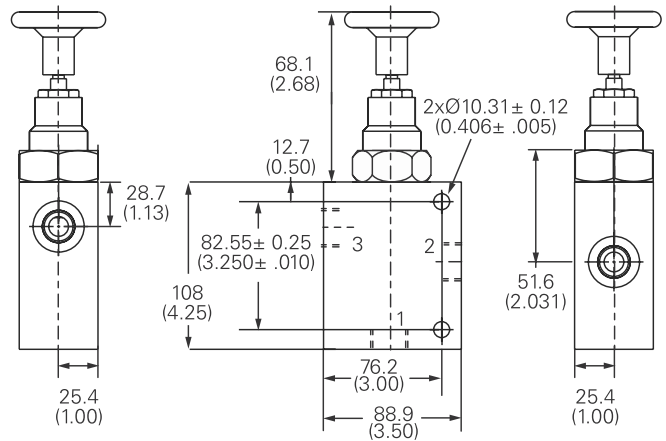
mm (inch)

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

## Cartridge only



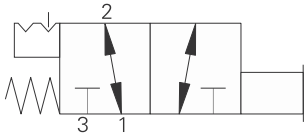
## Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV15-12 - Manual push valve

Push and twist directional control valve  
 41.8 L/min (11 USgpm) • 350 bar (5000 psi)



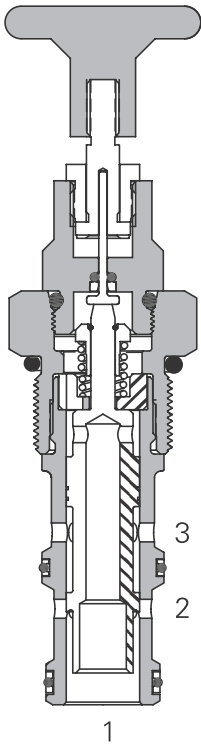
### Operation

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

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Detent allows valve to be fixed in position. Working Pressure 350 bar.

### Sectional view



### Performance data

#### Ratings and specifications

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

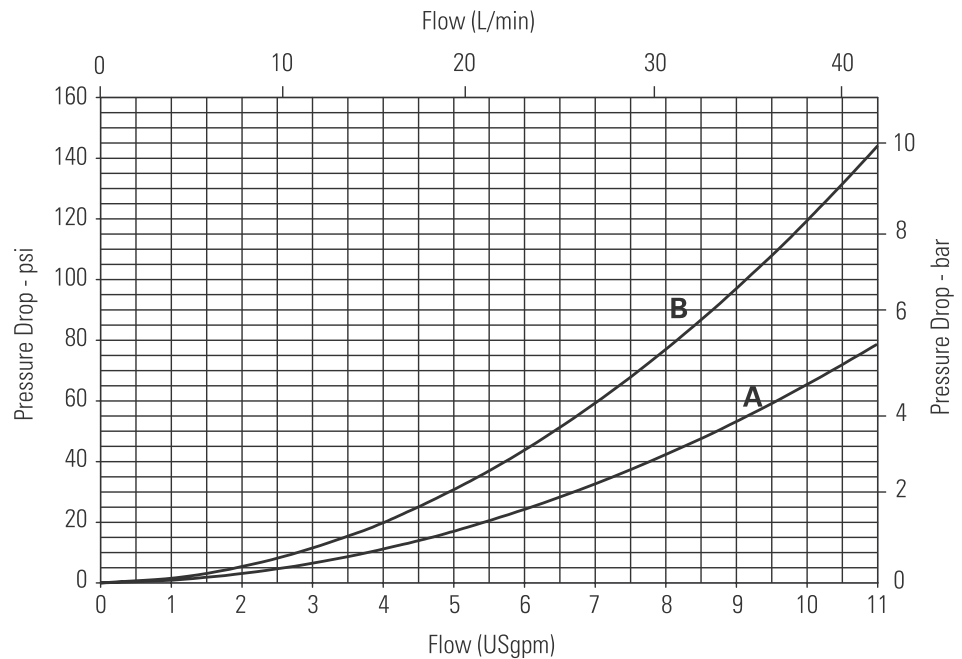
Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	41,8 L/min (11 USgpm)
Internal leakage	350 cc/min (21.5 in <sup>3</sup> /min)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-3
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Steel
Weight cartridge only	0,29 kg (0.66 lbs)
Seal kit	9900171-000 (Buna-N), 9900172-000 (Viton®)

Viton is a registered trademark of E.I. DuPont

### Description

This is a manually operated high pressure push and twist type 2 position 3 ported directional control valve. Ideal for isolating a system until flow is required.

### Pressure drop



**A** - P2 to P1

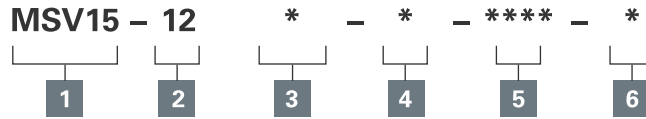
**B** - P3 to P2

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV15-12 - Manual push valve

Push and twist directional control valve  
41.8 L/min (11 USgpm) • 350 bar (5000 psi)

## Model code



- 1 Function**  
MSV15 - 3-way, 2 position manual push valve

---

- 2 Size**  
12 - 12 size

---

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

- 4 Actuation option**  
L - 2 position 'push and twist' actuation, with detent  
E - Emergency stop actuation  
N - No detent, momentary actuation  
K - Push and twist

- 5 Port size**  
0 - Cartridge only

- 6 Special features**  
Blank - No special features

Code	Port size	Housing number	
0		Aluminum	Steel
A6G	3/4" BSPP	02-161816	
A12H	SAE 12	02-160646	
S4G	1/2" BSPP		02-169815
S6G	3/4" BSPP		02-169814
S10T	SAE 10		02-161070
S12T	SAE 12		02-169816

See section J for housing details.

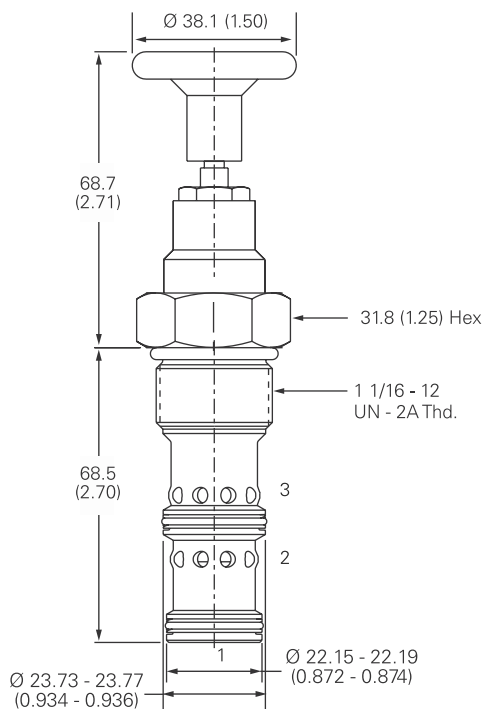
## Dimensions

mm (inch)

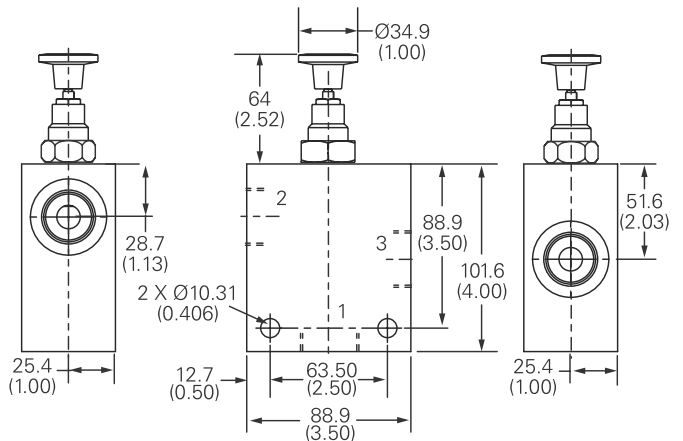
Torque cartridge in housing

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

### Cartridge only



### Installation drawing (steel)



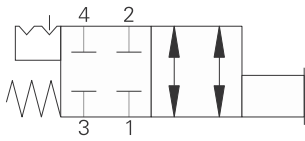
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV3-12 - Manual push valve

Push and twist, normally closed, directional control valve  
 53,2 L/min (14 USgpm) • 210 bar (3000 psi)



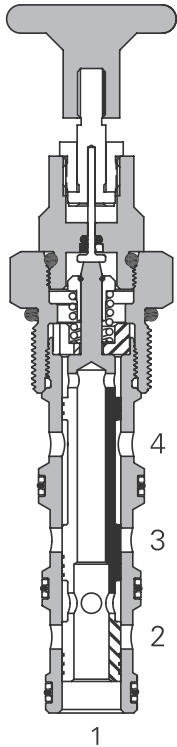
### Operation

In the normal position, all ports are blocked. In the actuated position, flow is allowed from port 3 to port 4 and from port 2 to port 1.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Detent allows valve to be fixed in position

### Sectional view



### Performance data

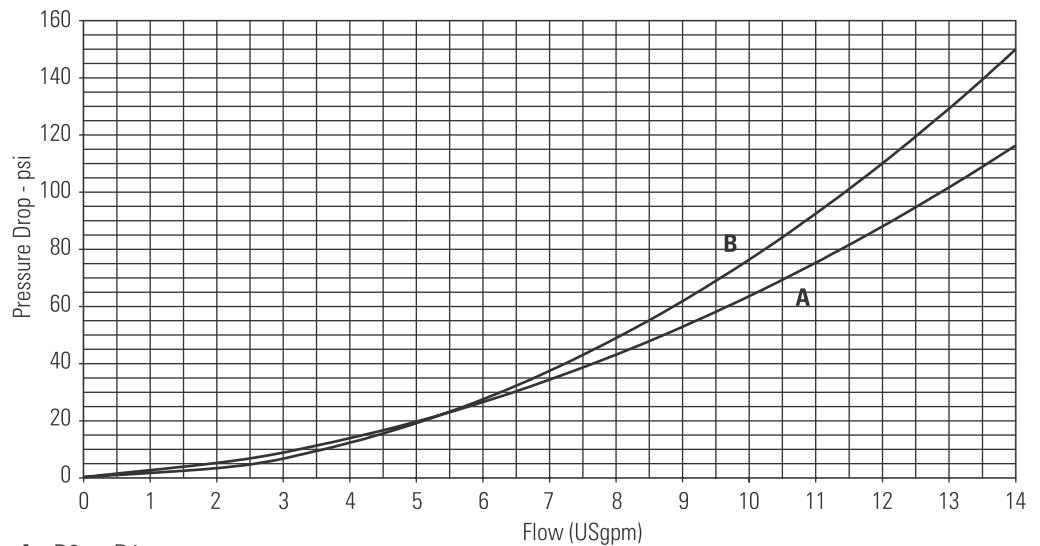
#### Ratings and specifications

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

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

Viton is a registered trademark of E.I. DuPont

### Pressure drop



**A** - P3 to P4

**B** - P2 to P1

### Description

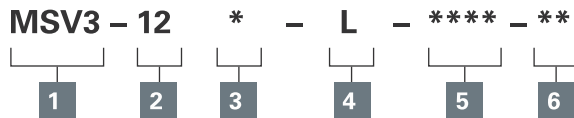
This valve is a manually operated push and twist to switch, normally closed 2 position 4 ported directional valve. This is ideal for isolating an actuator.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV3-12 - Manual push valve

Push and twist, normally closed, directional control valve  
53,2 L/min (14 USgpm) • 210 bar (3000 psi)

## Model code



### 1 Function

**MSV3** - 4 way, 2 position  
Manual push valve

### 2 Size

**12** - 12 size

### 3 Seal material

**Blank** - Buna-N  
**V** - Viton®

### 4 Actuation option

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

### 5 Port size

**0** - Cartridge only

### 6 Special features

**Blank** - No special features

Code	Port size	Housing number
<b>Aluminium</b>		
<b>A6G</b>	3/4" BSPP	5986432-001
<b>A10T</b>	SAE 10	6030517-001
<b>A12H</b>	SAE 12	5986436-001

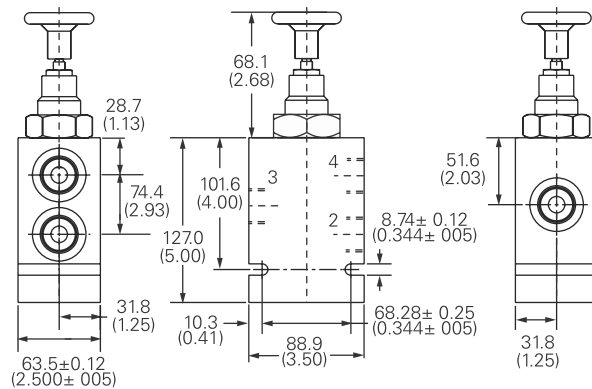
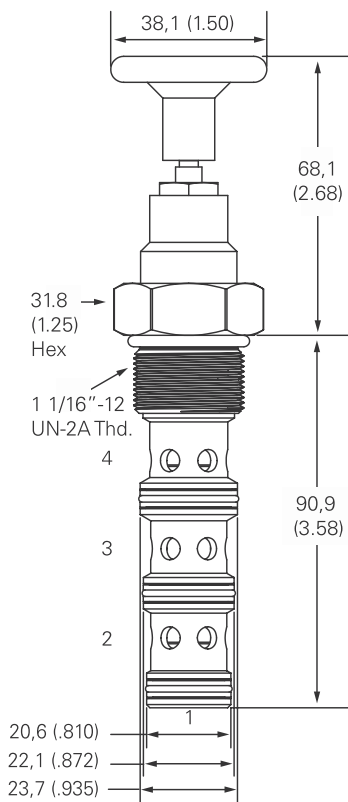
## Dimensions

mm (inch)

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

### Cartridge only

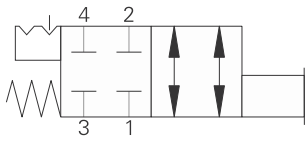
### Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV13-12 - Manual push valve

Push and twist, normally closed, directional control valve  
 53,2 L/min (14 USgpm) • 350 bar (5000 psi)



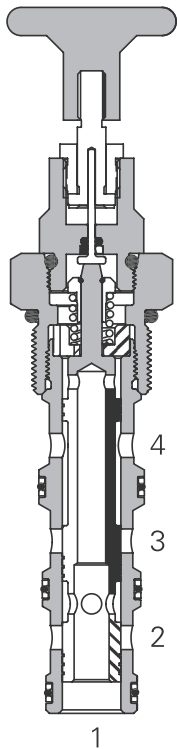
### Operation

In the normal position, all ports are blocked. In the actuated position, flow is allowed from port 3 to port 4 and from port 2 to port 1.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Detent allows valve to be fixed in position. Working Pressure 350 bar.

### Sectional view



### Performance data

#### Ratings and specifications

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

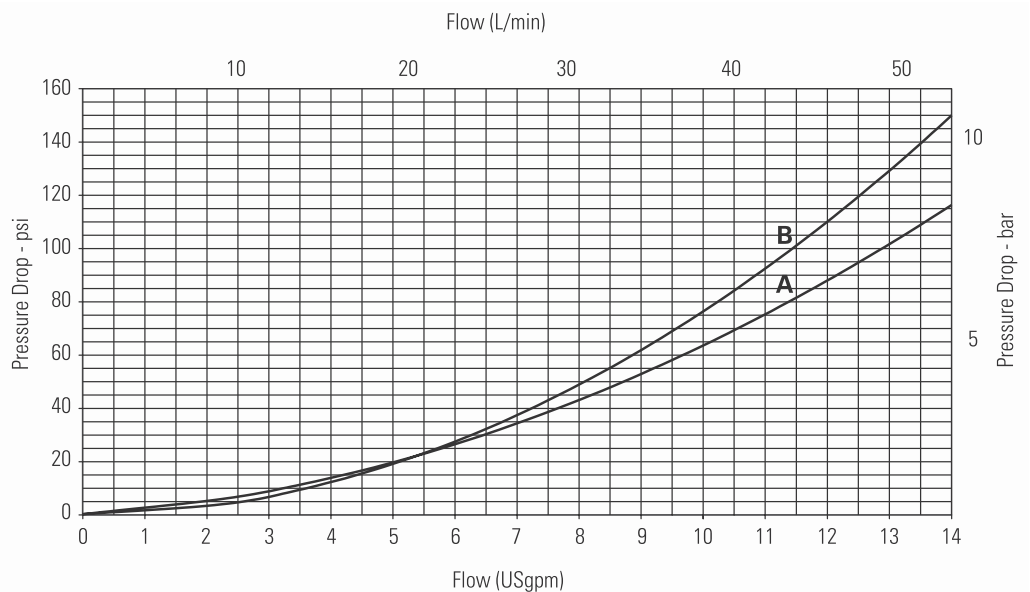
Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	53,2 L/min (14 USgpm)
Internal leakage	350 cc/min (21.5 in <sup>3</sup> /min) @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum or Steel
Weight cartridge only	0,32 kg (0.71 lbs)
Seal kit	02-160979 (Buna-N), 02-160980 (Viton®)

Viton is a registered trademark of E.I. DuPont

### Description

This valve is a manually operated high pressure push and twist to switch, normally closed 2 position 4 ported directional valve. This is ideal for isolating an actuator.

### Pressure drop



**A** - P3 to P4

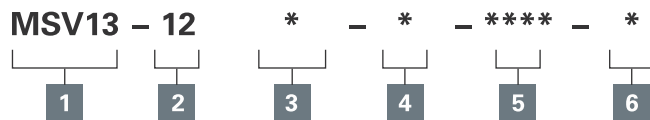
**B** - P2 to P1

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV13-12 - Manual push valve

Push and twist, normally closed, directional control valve  
53,2 L/min (14 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

**MSV13** - 4-way, 2 position manual push valve

### 2 Size

**12** - 12 size

### 3 Seals

**Blank** - Buna-N  
**V** - Viton®

### 4 Actuation option

**L** - 2 position 'push and twist' actuation, with detent  
**E** - Emergency stop actuation  
**N** - No detent, momentary actuation  
**K** - Push and twist

### 5 Port size

**0** - Cartridge only

### 6 Special features

**Blank** - No special features

Code	Port size	Housing number	
		Aluminum	Steel
<b>A6G</b>	3/4" BSPP	5986432-001	
<b>A10H</b>	SAE 10	5986434-001	
<b>A12H</b>	SAE 12	5986436-001	
<b>S6G</b>	3/4" BSPP		5991073-001
<b>S10T</b>	SAE 10		5991074-001
<b>S12T</b>	SAE 12		5991075-001

See section J for housing details.

## Dimensions

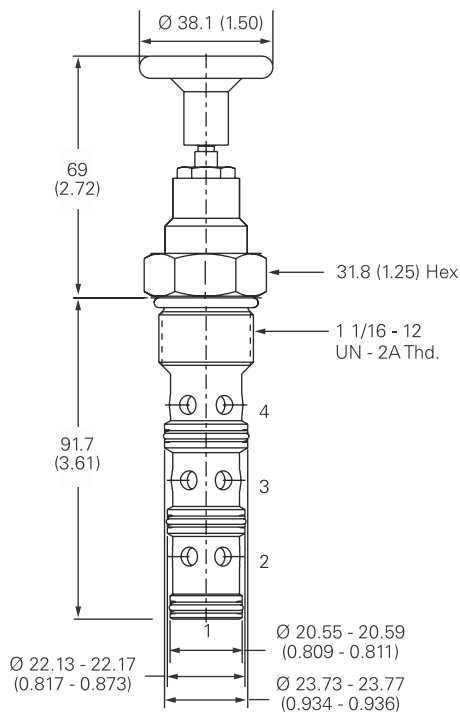
mm (inch)

Torque cartridge in housing

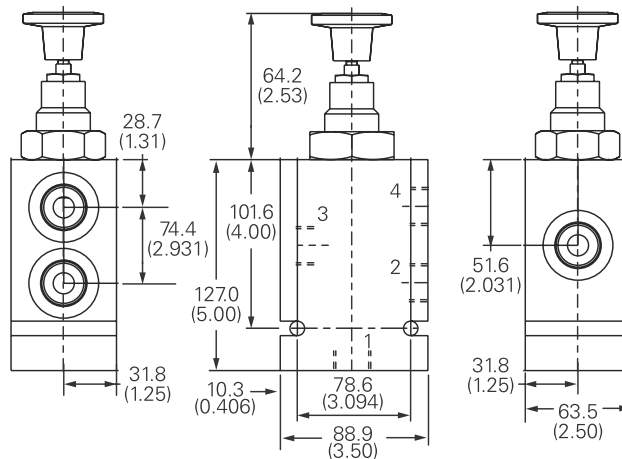
**A** - 81-95 Nm (60-70 ft. lbs)

**S** - 102-115 Nm (75-85 ft. lbs)

## Cartridge only



## Installation drawing



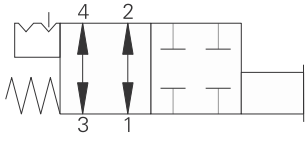
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV4-12 - Manual push valve

Push and twist, normally open, directional control valve  
 53,2 L/min (14 USgpm) • 210 bar (3000 psi)



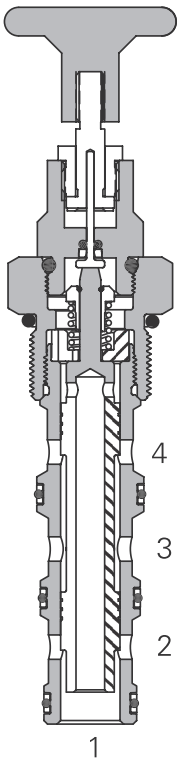
### Operation

In the normal position, flow is allowed from port 3 to port 4 and from port 2 to port 1. In the actuated position, all ports are blocked.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Detent allows valve to be fixed in position

### Sectional view



### Description

This valve is a manually operated push and twist to switch, normally open 2 position 4 ported directional valve. This is ideal for isolating an actuator.

### Performance data

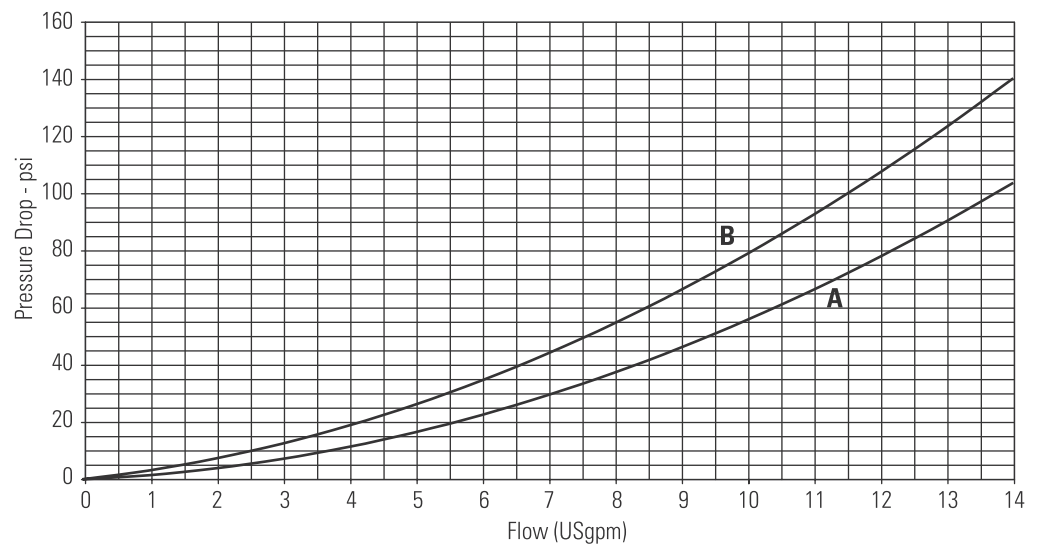
#### Ratings and specifications

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

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	53,2 L/min (14 USgpm)
Internal leakage	350 cc/min (21.5 in3/min)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,32 kg (0.71 lbs)
Seal kit	02-160979 (Buna-N), 02-160980 (Viton®)

Viton is a registered trademark of E.I. DuPont

### Pressure drop



**A** - P3 to P4

**B** - P2 to P1

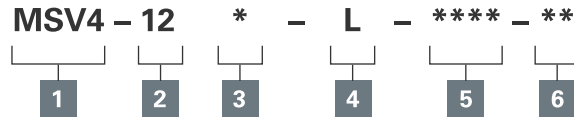
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# MSV4-12 - Manual push valve

Push and twist, normally open, directional control valve  
53,2 L/min (1.4 USgpm) • 210 bar (3000 psi)

## Model code



### 1 Function

**MSV4** -4-way, 2 position,  
Manual push valve

### 4 Actuation option

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

### 6 Special features

**Blank** - No special features

### 2 Size

**12** - 12 size

### 5 Port size

**0** -Cartridge only

### 3 Seal material

**Blank** - Buna-N  
**V** - Viton®

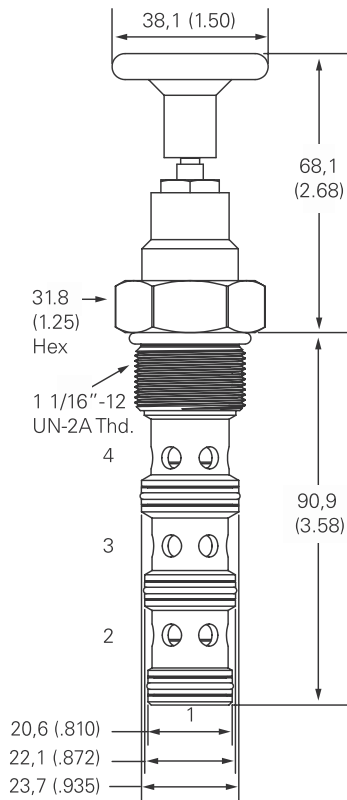
Code	Port size	Housing number
<b>Aluminium</b>		
<b>A6G</b>	3/4" BSPP	5986432-001
<b>A10T</b>	SAE 10	6030517-001
<b>A12H</b>	SAE 12	5986436-001

## Dimensions

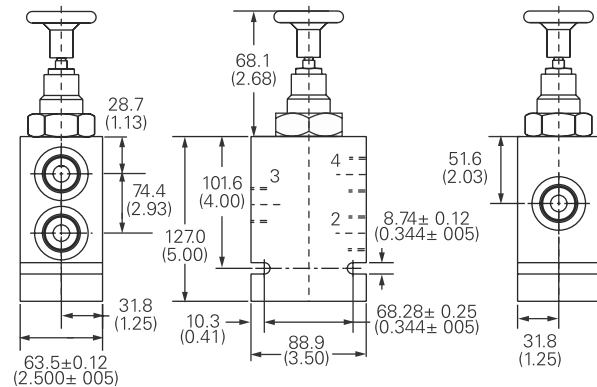
mm (inch)

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

## Cartridge only



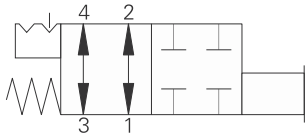
## Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV14-12 - Manual push valve

Push and twist, normally open, directional control valve  
 53,2 L/min (14 USgpm) • 350 bar (5000 psi)



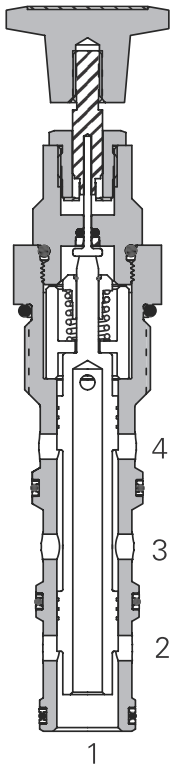
### Operation

In the normal position, flow is allowed from port 3 to port 4 and from port 2 to port 1. In the actuated position, all ports are blocked.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Detent allows valve to be fixed in position. Working Pressure 350 bar.

### Sectional view



### Description

This valve is a manually operated high pressure push and twist to switch, normally open 2 position 4 ported directional valve. This is ideal for isolating an actuator.

### Performance data

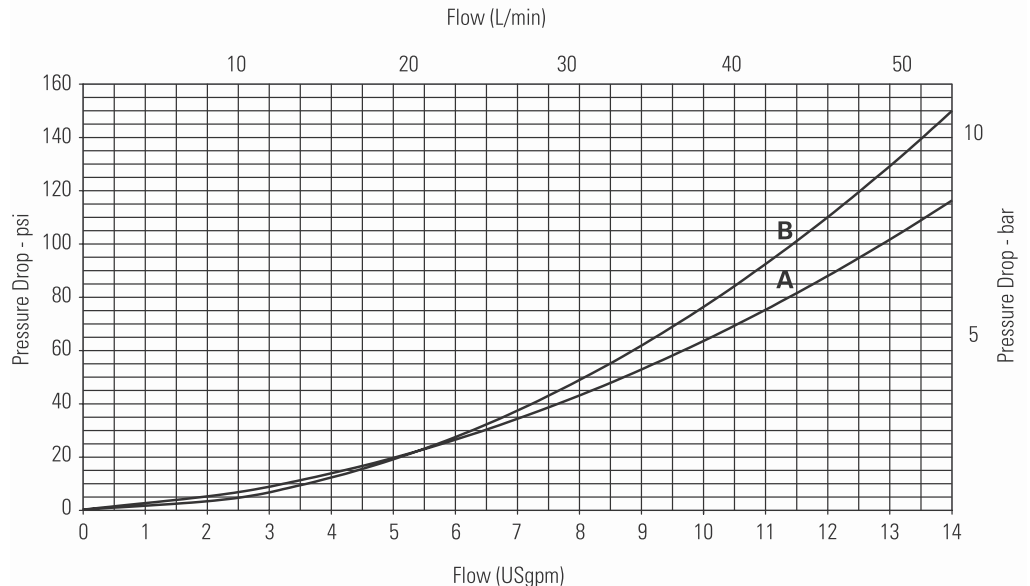
#### Ratings and specifications

*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	53,2 L/min (14 USgpm)
Internal leakage	350 cc/min (21 in <sup>3</sup> /min) @ 219 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum and Steel
Weight cartridge only	0,32 kg (0.71 lbs)
Seal kit	02-160979 (Buna-N), 02160981(Viton)

Viton is a registered trademark of E.I. DuPont

### Pressure drop



**A** - P3 to P4

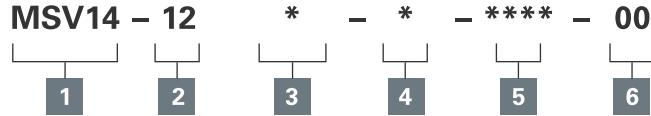
**B** - P2 to P1

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV14-12 - Manual push valve

Push and twist, normally open, directional control valve  
53,2 L/min (14 USgpm) • 350 bar (5000 psi)

## Model code



- 1 Function**  
MSV14 - 4-Way 2 position manual push valve

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- 2 Size**  
12 - 12 size

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

- 4 Actuation Option**  
L - 2 position 'push and twist' actuation, with detent  
E - Emergency stop actuation  
N - No detent, momentary actuation  
K - Push and twist

- 5 Port size**  
0 - Cartridge only

- 6 Special features**  
00 - Non (Only required if valve has special features, omitted if "00")

Code	Port size	Housing number	
		Aluminum	Steel
<b>0</b>			
<b>A6G</b>	3/4" BSPP	5986432-001	
<b>A10H</b>	3/4" BSP	5986434-001	
<b>A12H</b>	SAE 12	5986436-001	
<b>S6G</b>	3/4" BSPP		5991073-001
<b>S10H</b>	SAE 10		5981074-001
<b>S12H</b>	SAE 12		5981075-001

See section J for housing details.

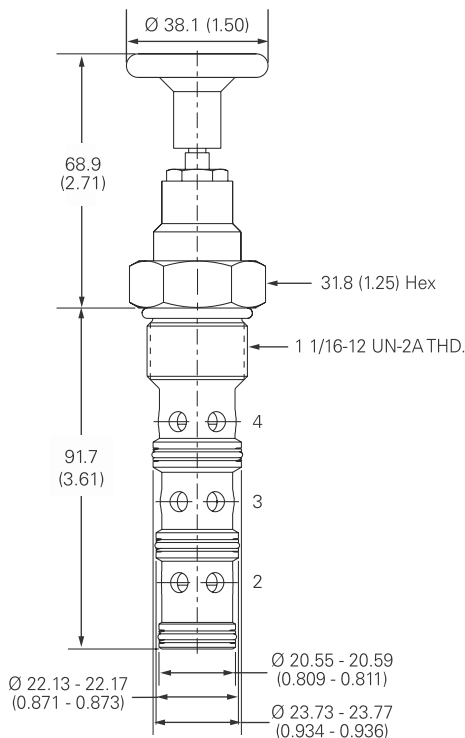
## Dimensions

mm (inch)

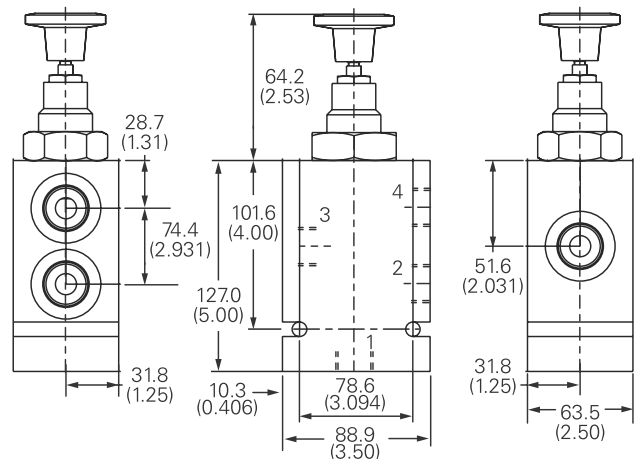
Torque cartridge in aluminum housing 81-95 Nm (60-70 ft. lbs)

Torque cartridge in steel housing 102-115 Nm (75-85 ft. lbs)

## Cartridge only



## Installation drawing (steel)



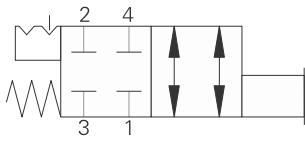
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV6-12 - Manual push valve

Push and twist, normally closed, directional control valve  
 53,2 L/min (14 USgpm) • 210 bar (3000 psi)



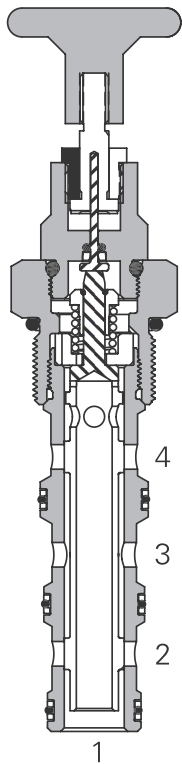
### Operation

In the normal position, all ports are blocked. In the actuated position, flow is allowed from port 3 to port 2 and from port 4 to port 1.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Detent allows valve to be fixed in position

### Sectional view



### Performance data

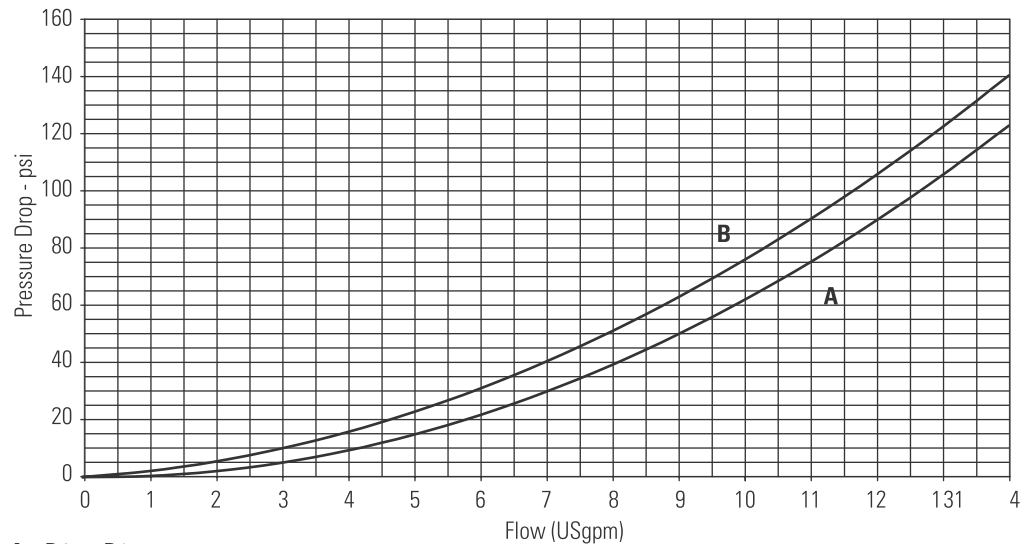
#### Ratings and specifications

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

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	53,2 L/min (14 USgpm)
Internal leakage	350 cc/min (21.5 in3/min)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,32 kg (0.71 lbs)
Seal kit	02-160979 (Buna-N), 02-160980 (Viton®)

Viton is a registered trademark of E.I. DuPont

### Pressure drop



**A** - P4 to P1  
**B** - P3 to P2

### Description

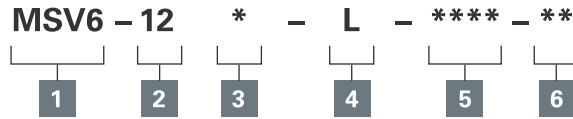
This valve is a manually operated push and twist to switch, normally closed 2 position 4 ported directional valve. This is ideal for isolating an actuator.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV6-12 - Manual push valve

Push and twist, normally closed, directional control valve  
53,2 L/min (14 USgpm) • 210 bar (3000 psi)

## Model code



**1 Function**  
MSV6 - 4 way, 2 position  
Manual push valve

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

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

**2 Size**  
12 - 12 size

**5 Port size**  
0 - Cartridge only

**3 Seal material**  
Blank - Buna-N  
V - Viton®

Code	Port size	Housing number
<b>Aluminium</b>		
A6G	3/4" BSPP	5986432-001
A10T	SAE 10	6030517-001
A12H	SAE 12	5986436-001

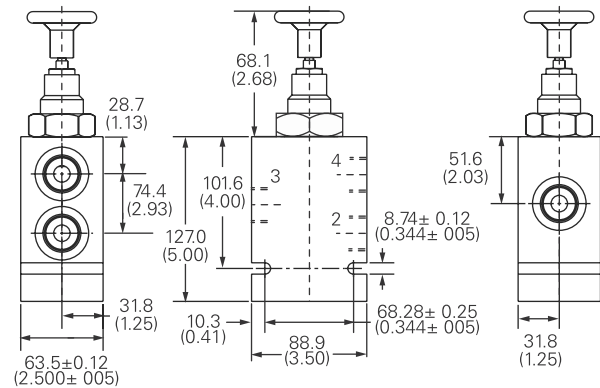
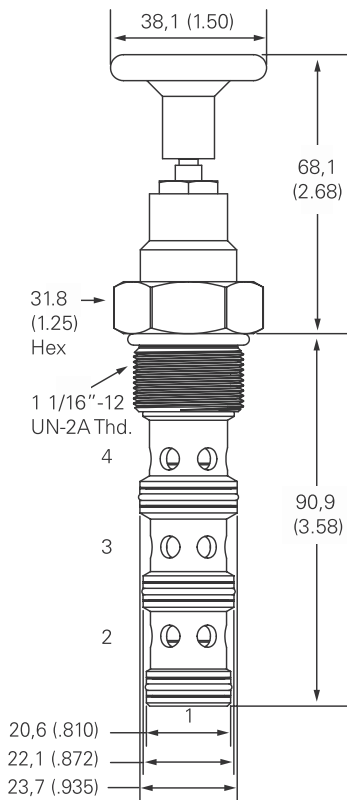
## Dimensions

mm (inch)

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

## Cartridge only

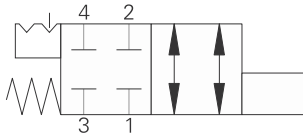
## Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV16-12 - Manual push valve

Push and twist, normally closed, directional control valve  
 53.2 L/min (14 USgpm) • 350 bar (5000 psi)



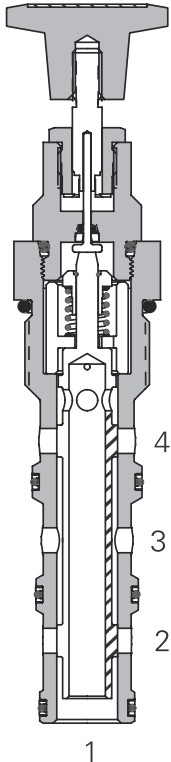
### Operation

In the normal position, all ports are blocked. In the actuated position, flow is allowed from port 3 to port 4 and from port 1 to port 2.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Detent allows valve to be fixed in position. Working Pressure 350 bar.

### Sectional view



### Performance data

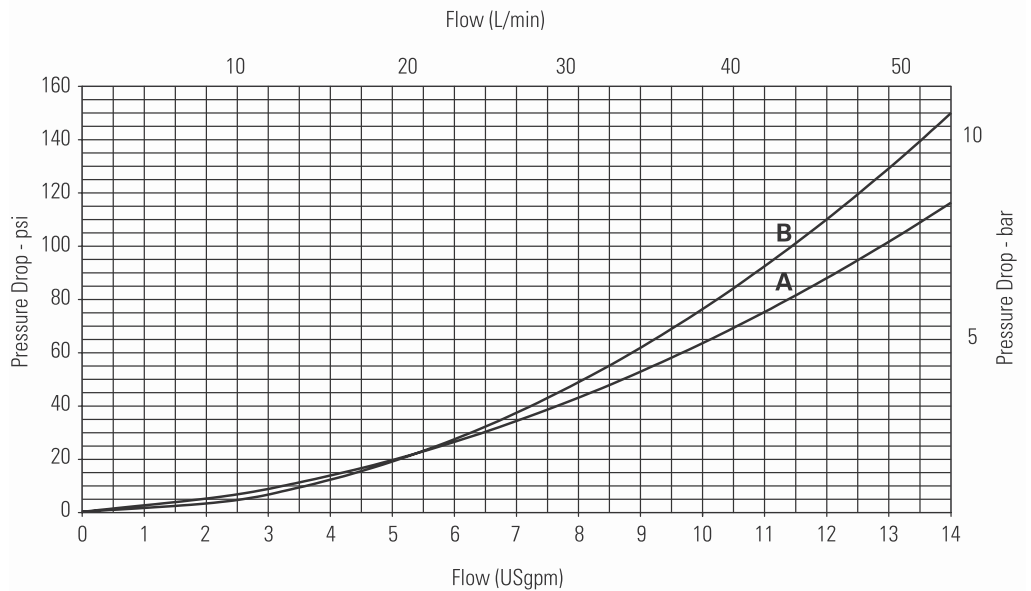
#### Ratings and specifications

*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	53.2 L/min (14 USgpm)
Internal leakage	350 cc/min (21.5 in <sup>3</sup> /min) @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum and Steel
Weight cartridge only	0,32 kg (0.71 lbs)
Seal kit	02-160979 (Buna-N), 02-160980 (Viton®)

Viton is a registered trademark of E.I. DuPont

### Pressure drop



**A** - P4 to P1

**B** - P3 to P2

### Description

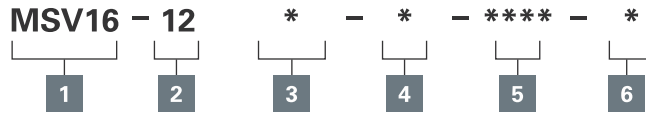
This valve is a manually operated high pressure push and twist to switch, normally closed 2 position 4 ported directional valve. This is ideal for isolating an actuator.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV16-12 - Manual push valve

Push and twist, normally closed, directional control valve  
53.2 L/min (14 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

**MSV16** - 4-way, 2 position manual push valve

### 2 Size

**12** - 12 size

### 3 Seals

**Blank** - Buna-N  
**V** - Viton®

### 4 Actuation option

**L** - 2 position 'push and twist' actuation, with detent  
**E** - Emergency stop actuation  
**N** - No detent, momentary actuation  
**K** - Push and twist

### 5 Port size

**0** - Cartridge only

### 6 Special features

**Blank** - No special features

Code	Port size	Housing number	
		Aluminum	Steel
<b>A6G</b>	3/4" BSPP	5986432-001	
<b>A10H</b>	SAE 10	5986434-001	
<b>S12H</b>	SAE 12	5986436-001	
<b>S6G</b>	3/4" BSPP		5991073-001
<b>S10T</b>	SAE 10		5991074-001
<b>S12T</b>	SAE 12		5991075-001

See section J for housing details.

## Dimensions

mm (inch)

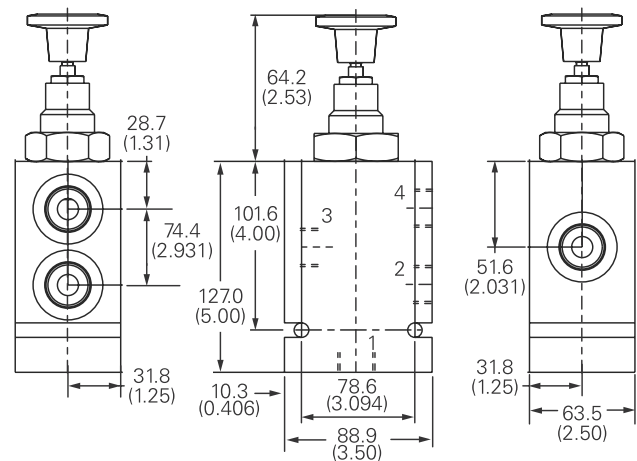
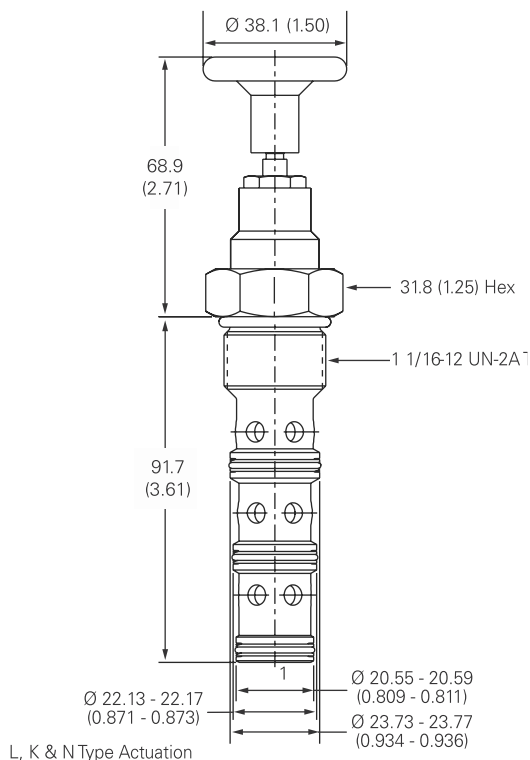
Torque cartridge in housing

**A** - 81-95 Nm (60-70 ft. lbs)

**S** - 102-115 Nm (75-85 ft. lbs)

### Cartridge only

### Installation drawing (steel)



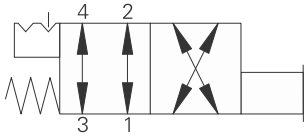
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV17-10 - Manual push valve

Push and twist directional control valve  
 20 L/min (5.3 USgpm) • 350 bar (5000 psi)



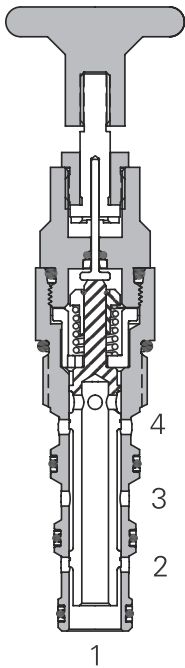
### Operation

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

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Detent allows valve to be fixed in position. Working Pressure 350 bar.

### Sectional view



1  
 "L" Detent style

### Description

This valve is a manually operated high pressure push and twist to switch, 2 position 4 ported directional valve. This is ideal for reversing the direction of an actuator.

### Performance data

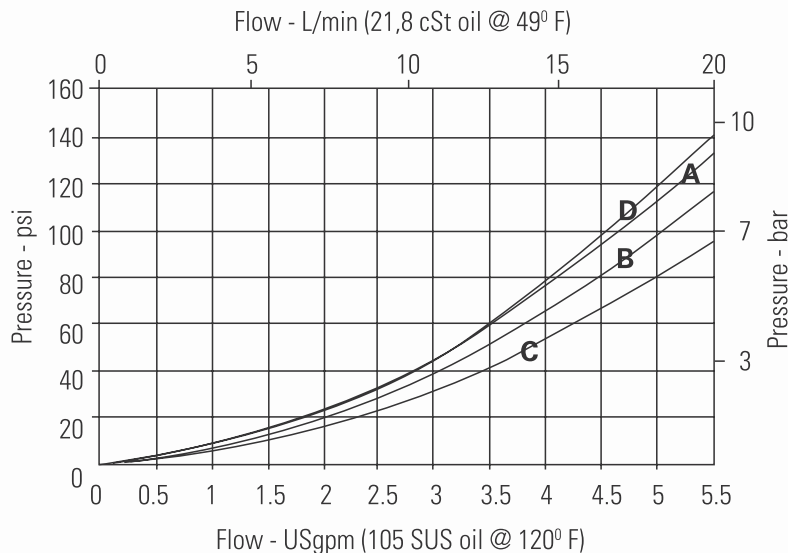
#### Ratings and specifications

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	20 L/min (5.3 USgpm)
Internal leakage	350 cc/min (21.5 in <sup>3</sup> /min) @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
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 and Steel
Weight cartridge only	0.28 kg (0.61 lbs)
Seal kit	(Buna-N), (Viton®)

Viton is a registered trademark of E.I. DuPont

### Pressure drop



- A** - Port 3 to port 2 energized
- B** - Port 3 to port 4 de-energized
- C** - Port 2 to port 1 de-energized
- D** - Port 4 to port 1 energized

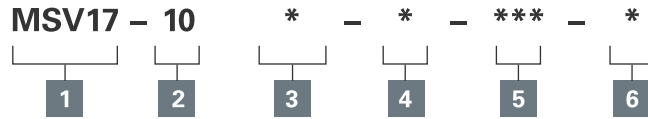
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# MSV17-10 - Manual push valve

Push and twist directional control valve  
20 L/min (5.3 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

**MSV17** - 4-way, 2 position manual push valve

### 2 Size

**10** - 10 size

### 3 Seals

**Blank** - Buna-N  
**V** - Viton®

### 4 Actuation option

**L** - 2 position 'push and twist' actuation, with detent  
**E** - Emergency stop actuation  
**N** - No detent, momentary actuation  
**K** - Push and twist

### 5 Port size

**0** - Cartridge only

### 6 Special features

**Blank** - No special features

Code	Port size	Housing number	
		Aluminum	Steel
<b>A2G</b>	1/4" BSPP	02-185804	
<b>A3G</b>	3/8" BSPP	02-185805	
<b>A6H</b>	SAE 6	02-185802	
<b>A8H</b>	SAE 8	02-185803	
<b>S2G</b>	1/4" BSPP		02-175139
<b>S3G</b>	3/8" BSPP		02-175140
<b>S6T</b>	SAE 6		02-175137
<b>S8T</b>	SAE 8		02-175138

See section J for housing details.

## Dimensions

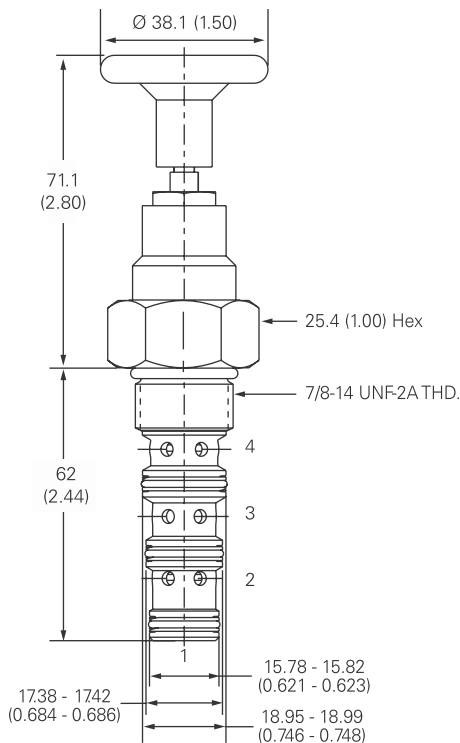
mm (inch)

Torque cartridge in housing

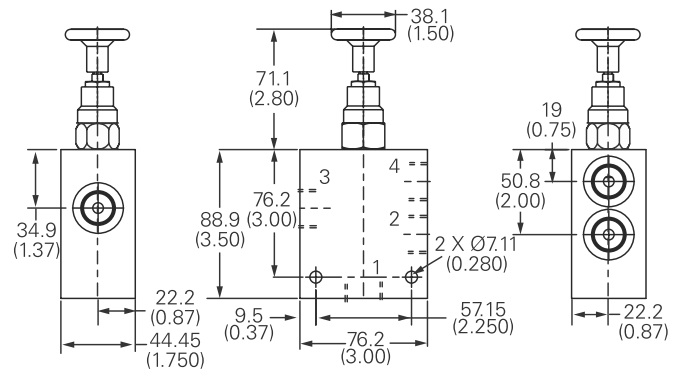
**A** - 47-54 Nm (35-40 ft. lbs)

**S** - 68-75 Nm (50-55 ft. lbs)

## Cartridge only



## Installation drawing (steel)



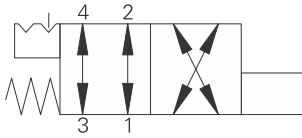
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV7-12 - Manual push valve

Push and twist directional control valve  
 45 L/min (11.9 USgpm) • 210 bar (3000 psi)



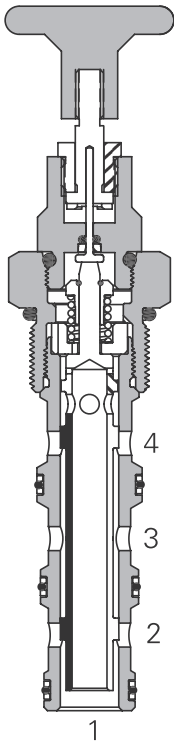
### Operation

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

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Detent allows valve to be fixed in position

### Sectional view



### Description

This valve is a manually operated push and twist to switch, 2 position 4 ported directional valve. This is ideal for reversing the direction of an actuator.

### Performance data

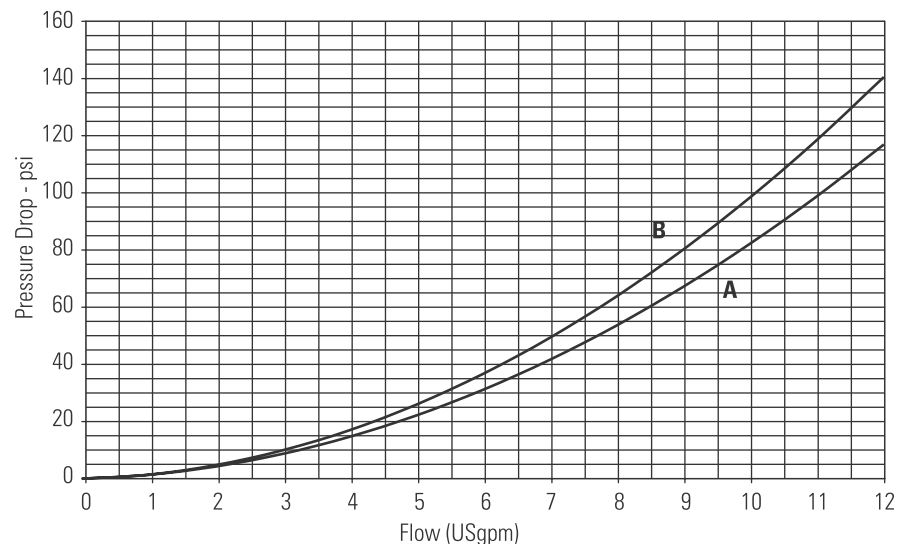
#### Ratings and specifications

*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 (11.9 USgpm)
Internal leakage	350 cc/min (21.5 in <sup>3</sup> /min) @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Weight cartridge only	0,32 kg (0.71 lbs)
Seal kit	02-160979 (Buna-N), 02-160980 (Viton®)

Viton is a registered trademark of E.I. DuPont

### Pressure drop



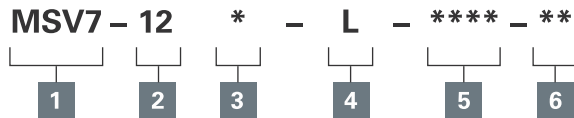
**A** - P4 to P1, P3 to P2  
**B** - P2 to P1, P3 to P4

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV7-12 - Manual push valve

Push and twist directional control valve  
45 L/min (1.9 USgpm) • 210 bar (3000 psi)

## Model code



### 1 Function

**MSV7** - 4 way, 2 position manual push valve

### 2 Size

**12** - 12 size

### 3 Seal material

**Blank** - Buna-N  
**V** - Viton®

### 4 Actuation option

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

### 5 Port size

**0** - Cartridge only

### 6 Special features

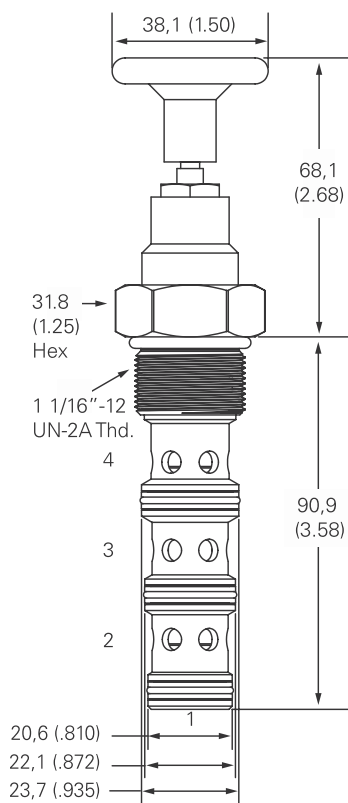
**Blank** - No special features

Code	Port size	Housing number
<b>Aluminium</b>		
<b>A6G</b>	3/4" BSPP	5986432-001
<b>A10T</b>	SAE 10	6030517-001
<b>A12H</b>	SAE 12	5986436-001

## Dimensions

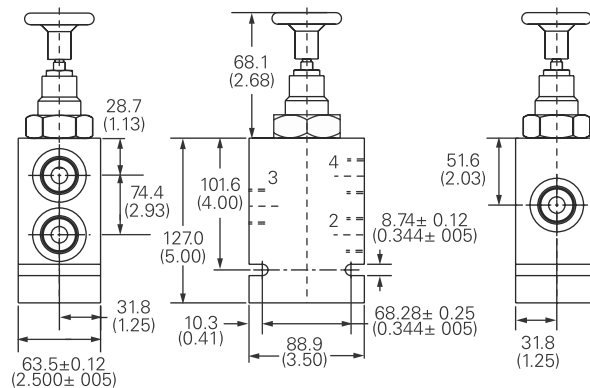
mm (inch)

### Cartridge only



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

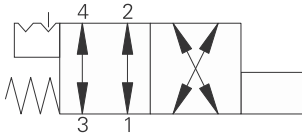
### Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV17-12 - Manual push valve

Push and twist directional control valve  
 20 L/min (5.3 USgpm) • 350 bar (5000 psi)



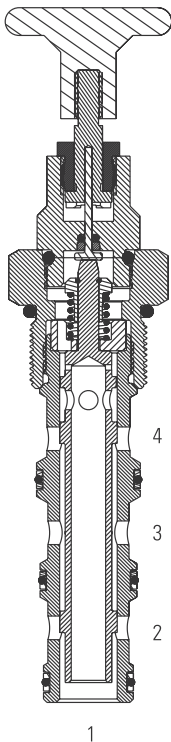
### Operation

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

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Detent allows valve to be fixed in position. Working Pressure 350 bar.

### Sectional view



### Performance data

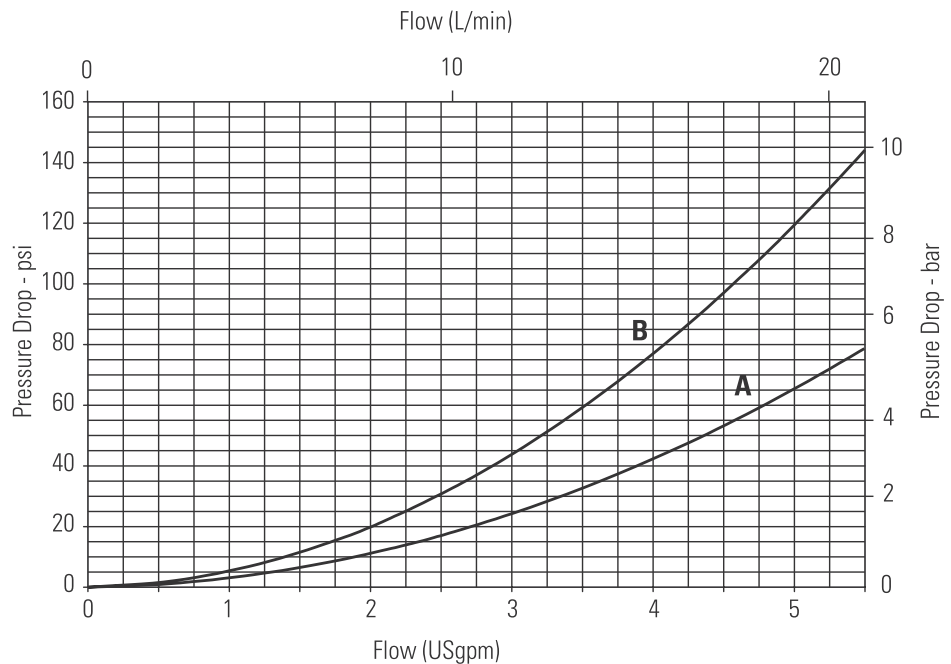
#### Ratings and specifications

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	20 L/min (5 USgpm)
Internal leakage	350 cc/min (21.5 in <sup>3</sup> /min) @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum and Steel
Weight cartridge only	0,32 kg (0.71 lbs)
Seal kit	02-160979 (Buna-N), 02-160980 (Viton®)

Viton is a registered trademark of E.I. DuPont

### Pressure drop



**A** - P4 to P1 and P3 to P2

**B** - P2 to P1 and P3 to P4

### Description

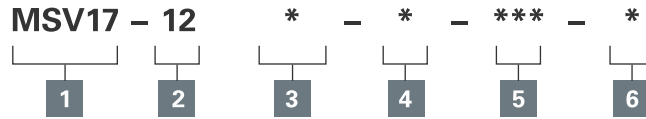
This valve is a manually operated high pressure push and twist to switch, 2 position 4 ported directional valve. This is ideal for reversing the direction of an actuator.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# MSV17-12 - Manual push valve

Push and twist directional control valve  
20 L/min (5.3 USgpm) • 350 bar (5000 psi)

## Model code



**1 Function**  
MSV17 - 4-way, 2 position manual push valve

**2 Size**  
12 - 12 size

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

**4 Actuation option**  
L - 2 position 'push and twist' actuation, with detent  
E - Emergency stop actuation  
N - No detent, momentary actuation  
K - Push and twist

**5 Port size**  
0 - Cartridge only

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

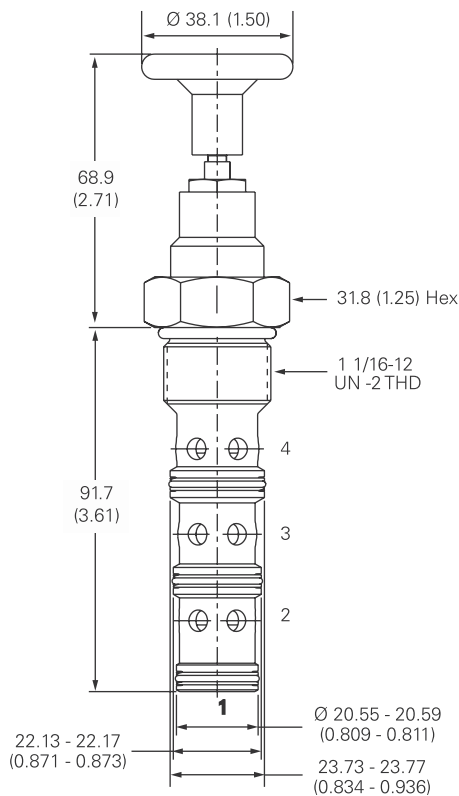
Code	Port size	Housing number	
		Aluminium	Steel
A6G	3/4" BSPP	5986432-001	
A10H	SAE 10	5986434-001	
A12H	SAE 12	5986436-001	
S6G	3/4" BSPP		5991073-001
S3G	3/8" BSPP		5991074-001
S6T	SAE 6		5991075-001

See section J for housing details.

## Dimensions

mm (inch)

### Cartridge only

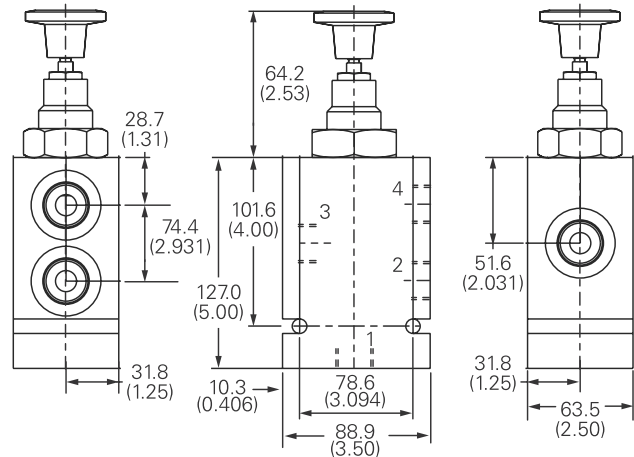


L, K & N Type Actuation

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

Torque cartridge in steel housing 102-115 Nm (75-85 ft. lbs)

### Installation drawing (steel)



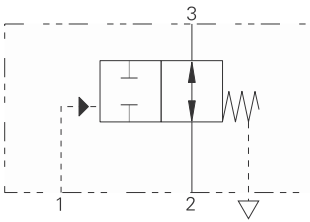
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS7-10 - Pilot to shift valve

2/2, pilot operated directional control valve  
 30 L/min (8 USgpm) • 210 bar (3000 psi)



### Operation

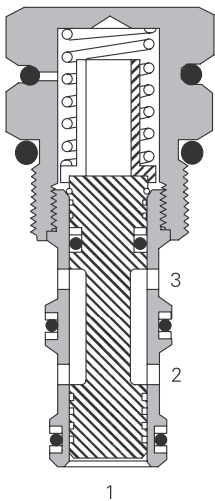
This valve allows flow between ports 2 and 3 until sufficient pressure at port 1 overcomes the spring bias, which closes both ports.

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

### Features

Hardened, ground and honed internal sleeve and spool for low internal leakage.

### Sectional view



### Performance data

#### 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 <sup>3</sup> /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	<b>40</b> - 2,75 bar (40 psi) <b>80</b> - 5,5 bar (80 psi) <b>160</b> - 11,0 bar (160 psi)
Pilot displacement volume	0,49 cm <sup>3</sup> (0.02 in <sup>3</sup> )
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®)

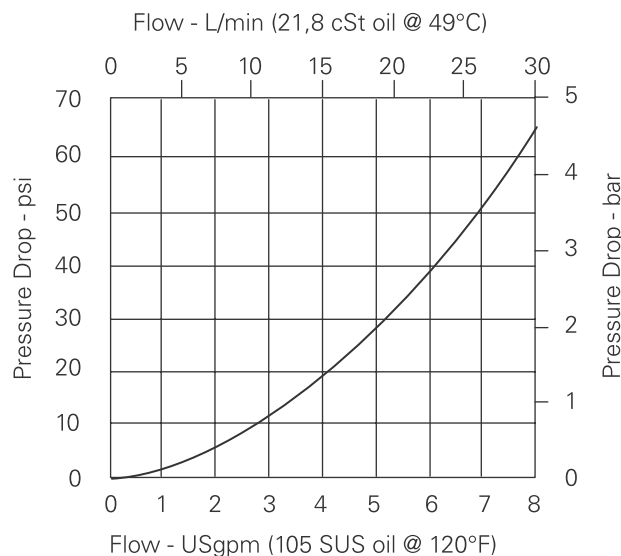
Viton is a registered trademark of E.I. DuPont

### Description

This is a 2-way 2 position, pilot operated directional control valve ideal for isolating a function when the pilot pressure is applied or removed.

### Pressure drop curves

Cartridge only

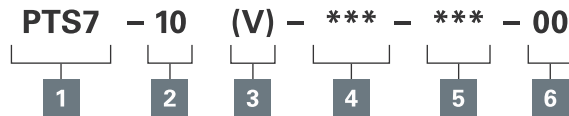


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS7-10 - Pilot to shift valve

2/2, pilot operated directional control valve  
30 L/min (8 USgpm) • 210 bar (3000 psi)

## Model code



**1 Function**  
PTS7 - Pilot to shift valve

**2 Size**  
10 - 10 size

**3 Seal material**  
Blank - Buna-N  
V - Viton

## 4 Port size

Code	Port size	Housing number		
		Aluminium light duty	Aluminium fatigue rated	Steel
0	Cartridge			
A3B	3/8" BSPP	02-173358	-	-
A6T	SAE 6	566162	-	-
A2G	1/4" BSPP	-	876705	-
A3G	3/8" BSPP	-	876714	-
A6H	SAE 6	-	876704	-
A8H	SAE 8	-	876711	-

See section J for housing details.

## 5 Pilot to shift (nominal)

**Note:** Code based on pressure in psi.

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

## 6 Special features

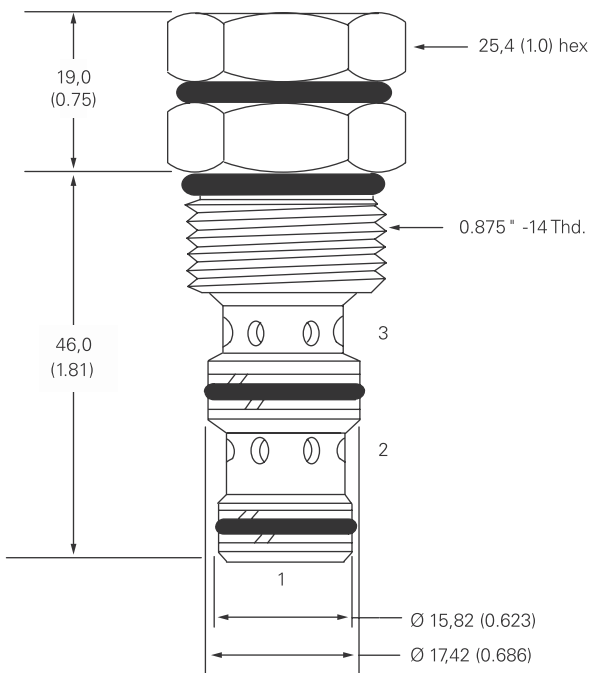
00 - None  
(Only required if valve has special features, omitted if "00".)

## Dimensions

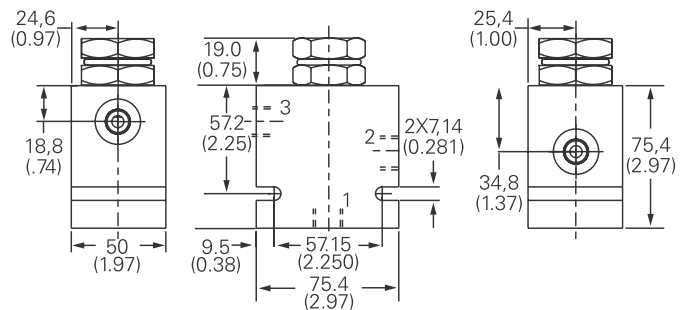
mm (inch)

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

### Cartridge only



### Installation drawing (aluminum)



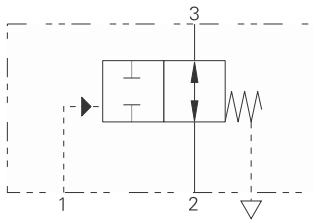
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS17-10 - Pilot to shift valve

2/2, pilot operated directional control valve  
 30 L/min (8 USgpm) • 350 bar (5000 psi)



### Operation

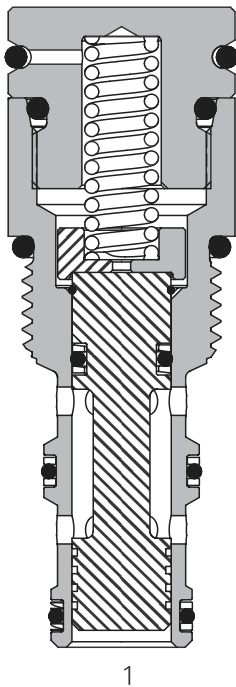
This valve allows flow between ports 2 and 3 until sufficient pressure at port 1 overcomes the spring bias, which closes both ports.

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

### Features

Hardened, ground and honed internal sleeve and spool for low internal leakage. Working pressure 350 bar.

### Sectional view



### Performance data

#### Ratings and specifications

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

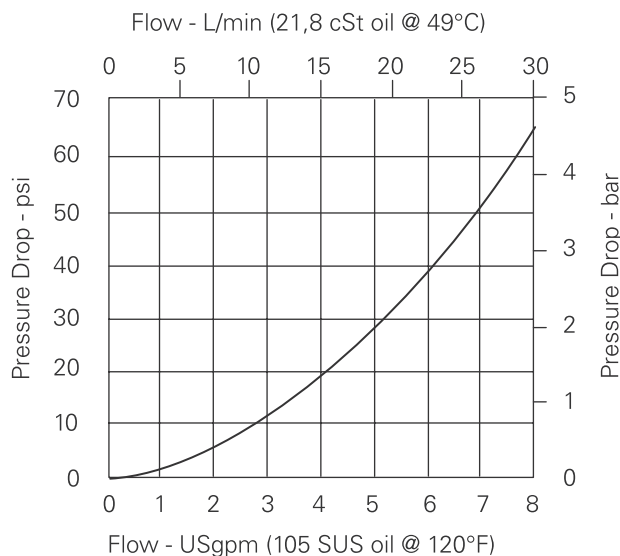
Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	30 L/min (8 USgpm)
Internal leakage	210 cc/min (13in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	40 - 2,75 bar (40 psi) 80 - 5,5 bar (80 psi) 160 - 11,0 bar (160 psi)
Pilot displacement volume	0,49 cm <sup>3</sup> (0.02 in <sup>3</sup> )
Cavity	C-10-3
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/ <b>16/13</b>
Standard housing materials	Aluminum and Steel
Weight cartridge only	0,10 kg (0.23 lbs)
Seal kit	889624 (Buna-N), 889628 (Viton®)

3  
2  
1

Viton is a registered trademark of E.I. DuPont

### Pressure drop curves

Cartridge only



### Description

This is a 2-way 2 position, high pressure, pilot operated directional control valve ideal for isolating a function when the pilot pressure is applied or removed.

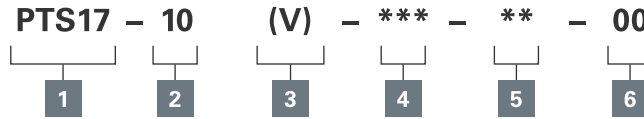
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# PTS17-10 - Pilot to shift valve

2/2, pilot operated directional control valve  
30 L/min (8 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

PTS17 - Pilot to shift valve

### 2 Size

10 - 10 Size

### 3 Seals

Blank - Buna-N  
V - Viton®

### 4 Port size

0 - Cartridge only

Code	Port size	Housing number		
		Aluminium light duty	Aluminium fatigue rated	Steel
A3B	3/8" BSPP	02-173358		
A6T	SAE 6	566162		
A2G	1/4" BSPP		876705	
A3G	3/8" BSPP		876714	
A6H	SAE 6		876704	
A8H	SAE 8		876711	
S2G	1/4" BSPP			02-175127
S3G	3/8" BSPP			02-175128
S6T	SAE 6			02-175124
S8T	SAE 8			02-175125

See section J for housing details.

### 5 Pilot to shift (nominal)

Note: Code based on pressure in psi.

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")

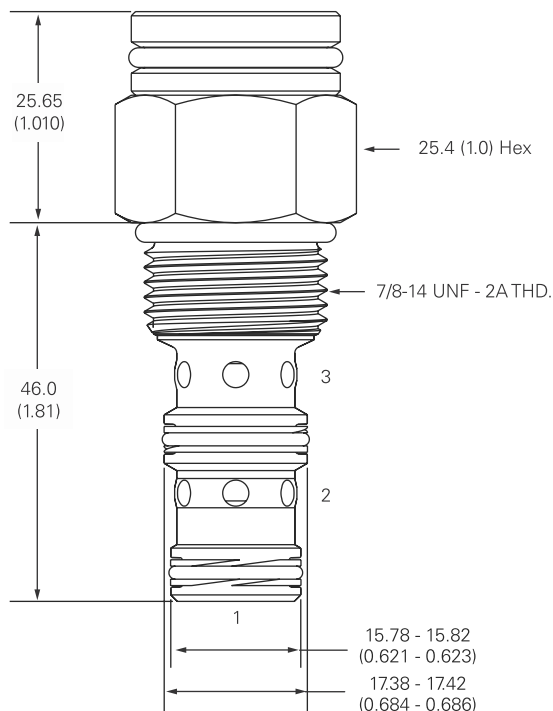
## Dimensions

mm (inch)

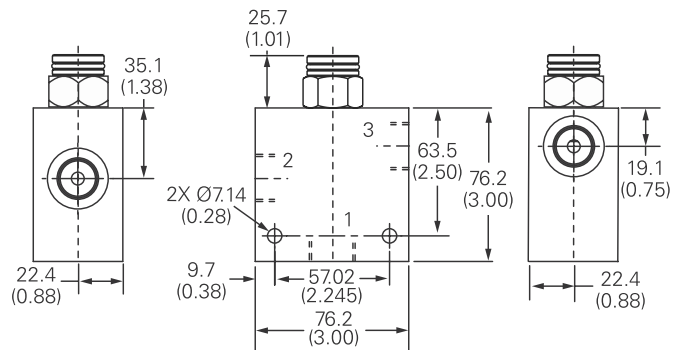
Torque cartridge in aluminum housing 47-54 Nm (35-40 ft. lbs)

Torque cartridge in steel housing 68-75 Nm (50-55 ft. lbs)

### Cartridge only



### Installation drawing (steel)



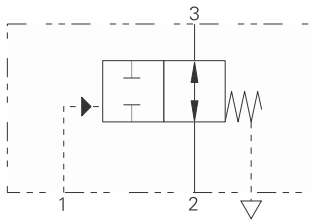
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS17-12 - Pilot to shift valve

2/2, pilot operated directional control valve  
 114 L/min (30 USgpm) • 350 bar (5000 psi)



### Operation

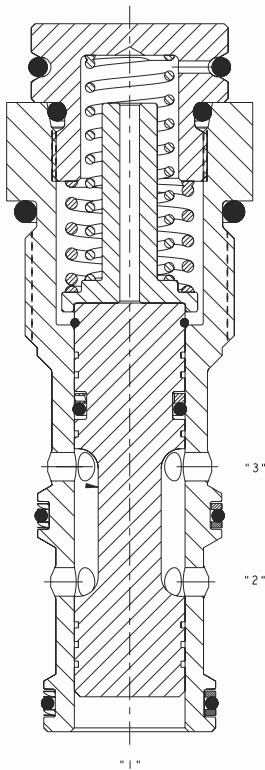
This valve allows flow between ports 2 and 3 until sufficient pressure at port 1 overcomes the spring bias, which closes both ports.

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

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Working pressure 350 bar.

### Sectional view



### Performance data

#### Ratings and specifications

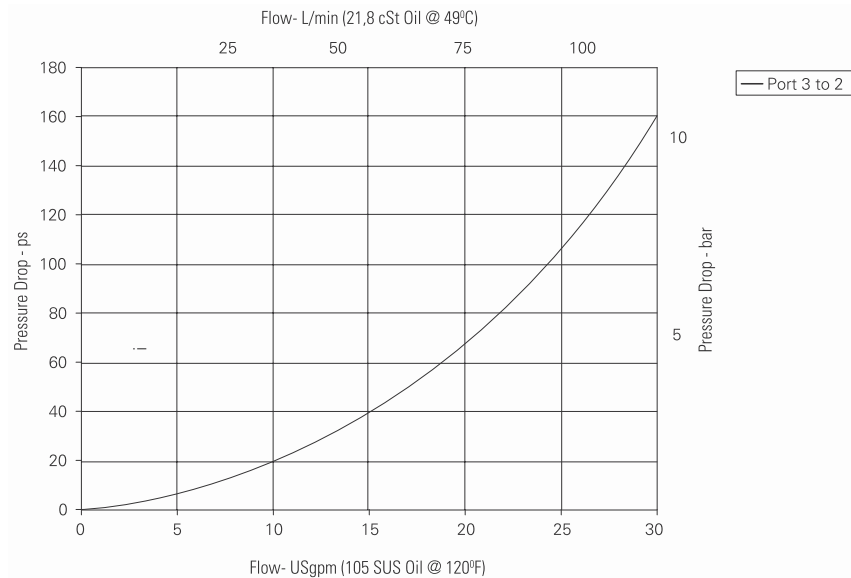
Performance data is typical with fluid at 21,8 cST (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	114 L/min (30 USgpm)
Internal leakage	210 cc/min (13in <sup>3</sup> /min) @ 350 bar (5000 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) 120 - 8,3 bar (120 psi) 160 - 11,0 bar (160 psi)
Pilot displacement volume	0,49 cm <sup>3</sup> (0.02 in <sup>3</sup> )
Cavity	C-12-3
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum and Steel
Weight cartridge only	0.25 kg (0.55 lbs)
Seal kit	9900171 (Buna-N), 9900172 (Viton®)

Viton is a registered trademark of E.I. DuPont

### Pressure drop curves

Cartridge only



### Description

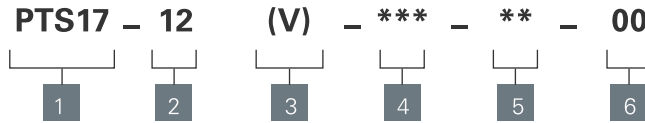
This is a 2-way 2 position, high pressure, pilot operated directional control valve ideal for isolating a function when the pilot pressure is applied or removed.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS17-12 - Pilot to shift valve

2/2, pilot operated directional control valve  
114 L/min (30 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

PTS17 - Pilot to shift valve

### 2 Size

12 - 12 Size

### 3 Seals

Blank - Buna-N  
V - Viton®

### 4 Port size

0 - Cartridge only

Code	Port size	Housing number	
		Aluminium	Steel
A4G	1/2" BSPP	02-161817	
A6G	3/4" BSPP	02-161816	
A10H	SAE 10	02-160642	
A12H	SAE 12	02-160646	
S4G	1/2" BSPP		02-169815
S6G	3/4" BSPP		02-169814
S10T	SAE 10		02-161070
S12T	SAE 12		02-169816

See section J for housing details.

### 5 Pilot to shift (nominal)

**Note:** Code based on pressure in psi.

- 80 - 5,5 bar (80 psi)
- 120 - 8,3 bar (120 psi)
- 160 - 11,0 bar (160 psi)

### 6 Special features

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

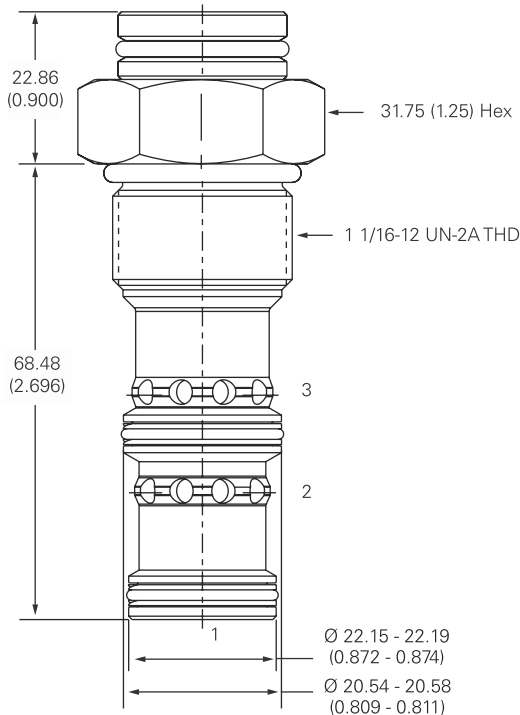
## Dimensions

mm (inch)

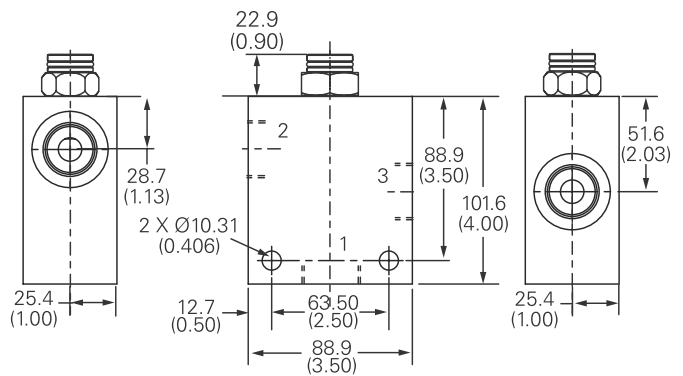
Torque cartridge in aluminum housing 81-95 Nm (60-70 ft. lbs)

Torque cartridge in steel housing 102-115 Nm (75-85 ft. lbs)

### Cartridge only



### Installation drawing (steel)



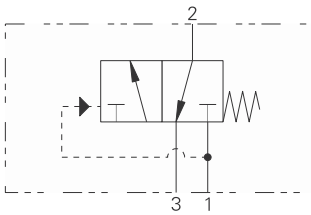
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# 1SB10 - Brake sequence valve

Brake sequence directional valve  
 10 L/min (2.5 USgpm) • 350 bar (5000 psi)



### Operation

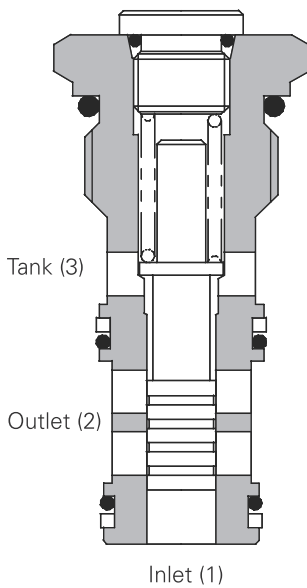
When the pressure in the inlet line is below the switching pressure (15 bar), the outlet will be connected to the tank, the spool being held in place by the spring force.

When the pressure in the inlet line exceeds the switching pressure, the spool will slide back, opening inlet to outlet.

### Features

Cartridge design enabling speedy servicing when mounted in a body or in a composite manifold.

### Sectional view



### Performance data

#### Ratings and specifications

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

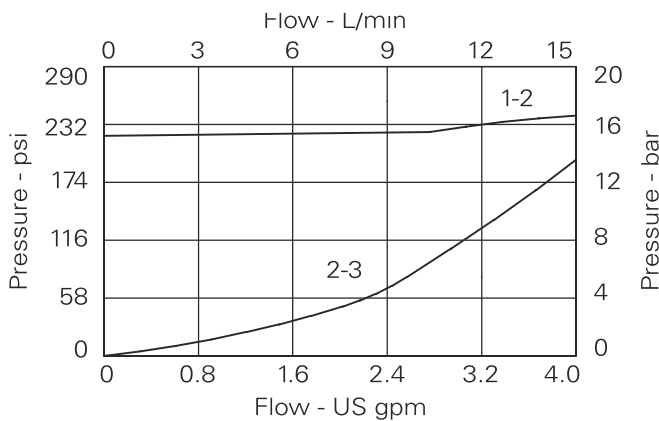
Max working pressure	350 bar (5000 psi)
Rated flow	10 L/min (2.5 US gpm)
Internal leakage	50 ml/min nominal
Temperature range	-30° to 90°C (22° to 194°F)
Cavity	A893 (see Section M)
Torque cartridge into cavity	60 Nm (44 lbs ft)
Mounting position	Unrestricted
Filtration	BS5540/4 Class 18/ <b>13</b> (25 micron or better)
Nominal viscosity range	5 to 500 cSt
Cartridge material	All working parts hardened and ground steel. External surfaces zinc plated.
Standard housing materials	Aluminum and Steel
Weight	1SB10 .12 kg (.26 lbs), 1SB15 1.0 kg (2.2 lbs)
Seal kit	SK182 (Nitrile) SK182V (Viton®)

Viton is a registered trademark of E.I. DuPont

### Description

This valve provides a bias so that a predetermined pressure (15 bar) has to be reached before the valve will switch. In a typical brake circuit the brake will be held on until system pressure reaches the bias pressure. Once this pressure has been reached the valve will switch and supply pressure to the brake to hold it off. If the pressure then falls below the bias pressure the valve will again switch, applying the brake in a controlled manner.

### Pressure drop curves

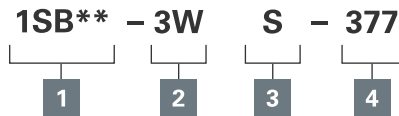


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# 1SB10 - Brake sequence valve

Brake sequence directional valve  
10 L/min (2.5 USgpm) • 350 bar (5000 psi)

## Model code



**1 Function**  
1SB10 - Cartridge only

### 2 Port size

Code	Port size	Housing number	
		Aluminum single	Steel
0	Cartridge only		
2W	1/4" BSP		A1882
3W	3/8" BSP		A1883
6T	3/8" SAE	A10715	A7371

### 3 Seals

S - Nitrile  
SV - Viton

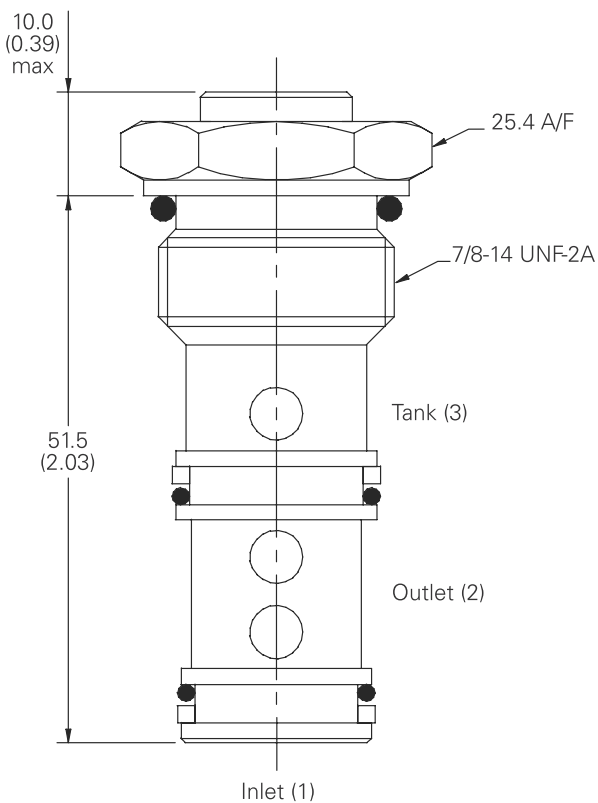
### 4 Body material

377 - Steel  
(Omit for aluminum (up to 210 bar)).

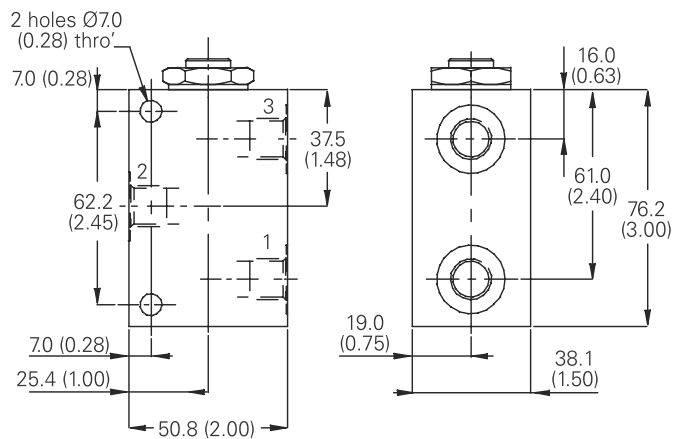
## Dimensions

mm (inch)

### Cartridge only



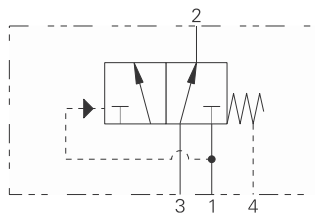
### Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# 1SB304 - Brake release shuttle valve

Brake release shuttle directional valve  
30 L/min (8 USgpm) • 350 bar (5000 psi)



## Operation

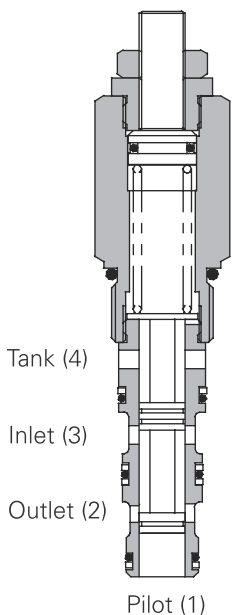
When pressure in the inlet exceeds the set pressure, flow is allowed from inlet to outlet closing off the tank line.

When the inlet pressure is removed, the spool returns to its normal position, opening the outlet port to tank and closing the inlet port.

## Features

Cartridge design enabling speedy servicing when mounted in a body or in a composite manifold.

## Sectional view



## Performance data

### Ratings and specifications

*Performance data is typical with fluid at 32 cSt (150 SUS)*

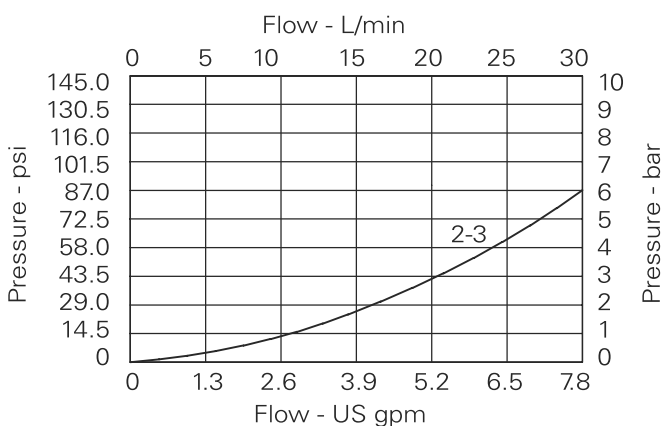
Max working pressure	350 bar (5000 psi)
Rated flow	30 L/min (8 US gpm)
Pilot pressure	10 to 100 bar (145 to 1450 psi) max pilot pressure 210 bar
Internal leakage	50 ml/min nominal
Temperature range	-30° to 90°C (-22° to 194°F)
Cavity	A5302 (see Section M)
Torque cartridge into cavity	60 Nm (44 lbs ft)
Mounting position	Unrestricted
Filtration	BS5540/4 Class 18/ <b>13</b> (25 micron or better)
Nominal viscosity range	5 to 500 cSt
Cartridge material	All working parts hardened and ground steel. External surfaces zinc plated.
Standard housing materials	Aluminum and Steel
Weight	.24 kg (.53 lbs)
Seal kit	SK645 (Nitrile) SK645V (Viton®)

Viton is a registered trademark of E.I. DuPont

## Description

This valve provides a means of supplying oil to the outlet from the inlet when a pre-set pressure is reached. On removal of this pressure, inlet closes opening outlet to tank. Ideal for use in braking systems where a pressure is required in the main system before the brake is removed.

## Pressure drop curves

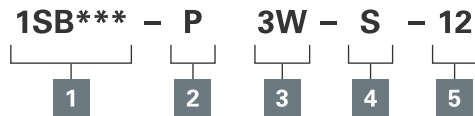


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# 1SB304 - Brake release shuttle valve

Brake release shuttle directional valve  
30 L/min (8 USgpm) • 350 bar (5000 psi)

## Model code

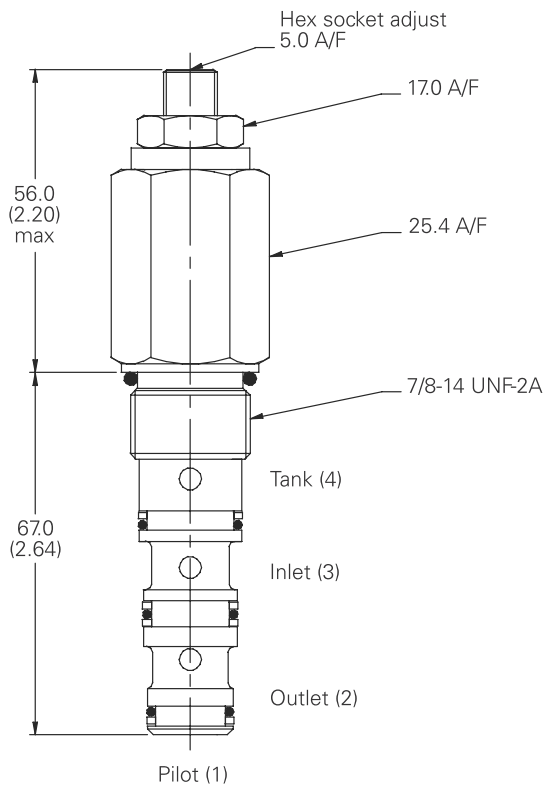


1 Function	3 Port size	4 Seals																				
1SB304 - Cartridge only	<table border="1"> <thead> <tr> <th>Code</th> <th>Port size</th> <th colspan="2">Housing number</th> </tr> <tr> <th></th> <th></th> <th>Aluminum</th> <th>Steel</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Cartridge only</td> <td></td> <td></td> </tr> <tr> <td>3W</td> <td>3/8" BSP</td> <td>B13602</td> <td>B13603</td> </tr> <tr> <td>6T</td> <td>3/8" SAE</td> <td>B21661</td> <td>B21660</td> </tr> </tbody> </table>	Code	Port size	Housing number				Aluminum	Steel	0	Cartridge only			3W	3/8" BSP	B13602	B13603	6T	3/8" SAE	B21661	B21660	<b>S</b> - Nitrile <b>SV</b> - Viton
Code	Port size	Housing number																				
		Aluminum	Steel																			
0	Cartridge only																					
3W	3/8" BSP	B13602	B13603																			
6T	3/8" SAE	B21661	B21660																			
2 Adjustment means		5 Pressure range																				
P - Leakproof screw adjustment		<b>Note:</b> Code based on pressure in bar. <b>6</b> - 10-60 bar. Std setting 30 bar <b>12</b> - 20-100 bar. Std setting 60 bar Std setting made at 14 L/min (3.8 USgpm).																				

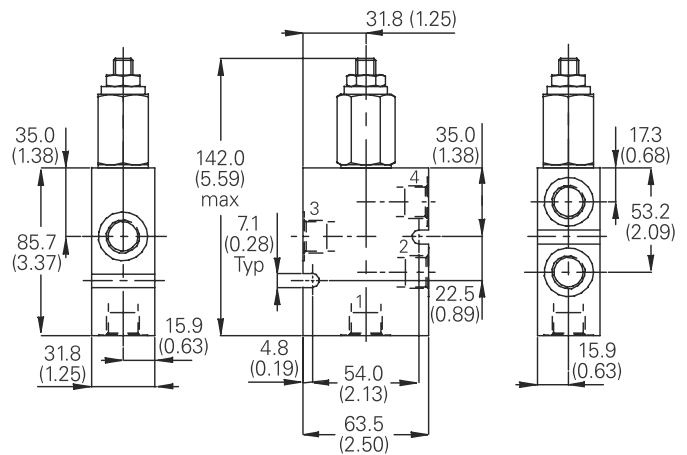
## Dimensions

mm (inch)

### Cartridge only



### Installation drawing

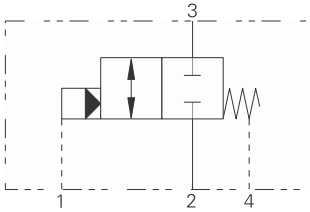


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# 1RDS702 - Pilot to shift valve

Pilot to shift directional valve

80 L/min (20 USgpm) • 420 bar (6090 psi)



## Operation

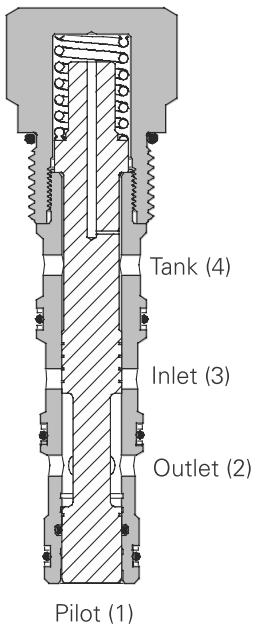
When a pre-set pilot pressure is reached the spool moves back against the spring either opening or closing the line between inlet and outlet.

When the pilot pressure falls the valve will return to its normal position.

## Features

Cartridge design enabling speedy servicing when mounted in a body or in a composite manifold.

## Sectional view



## Performance data

### Ratings and specifications

*Performance data is typical with fluid at 32 cST (150 SUS)*

Max working pressure	420 bar (6090 psi)
Rated flow	80 L/min (20 USgpm)
Internal leakage	90 ml/min nominal per land
Temperature range	-30° to 90°C (-22° to 194°F)
Cavity	A21145 (see Section M)
Torque cartridge into cavity	67 Nm (50 lbs ft)
Mounting position	Unrestricted
Filtration	BS5540/4 Class 18/13 (25 micron or better)
Nominal viscosity range	5 to 500 cSt
Pilot pressure	7 or 10 bar (101.5 or 145 psi)
Cartridge material	All working parts hardened and ground steel. External surfaces zinc plated.
Standard housing materials	Aluminum and Steel
Weight	1RDS702 .37 kg (.8 lbs), 1RDS752 1.97 kg (4.3 lbs)
Seal kit	SK1227 (Nitrile) SK1227V (Viton®)

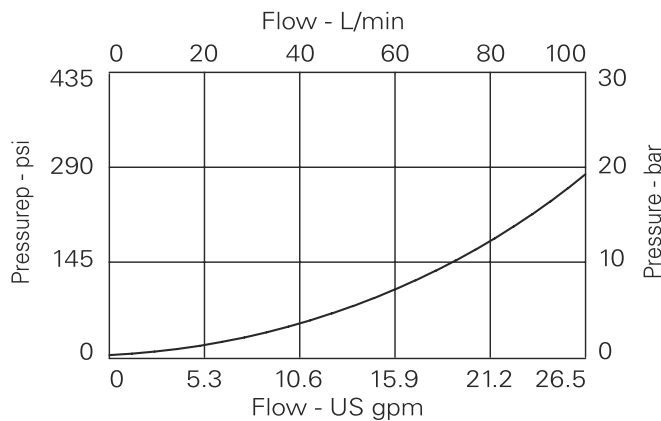
Viton is a registered trademark of E.I. DuPont

## Description

This valve provides a means of interrupting a pressure line when a predetermined pilot pressure is reached in a normally open or normally closed form.

The valve can be used in any pilot or small flow system as a remotely operated sequence valve.

## Pressure drop curves



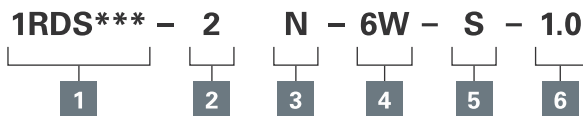
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# 1RDS702 - Pilot to shift valve

Pilot to shift directional valve  
80 L/min (20 USgpm) • 420 bar (6090 psi)

## Model code



### 1 Function

1RDS702 - Cartridge only  
1RDS752 - Cartridge and body

### 2 Options

2 - Normally closed

### 3 Adjustment means

N - Fixed

### 4 Port size

Code	Port size	Housing number	
		Aluminum	Steel
Omit	Cartridge only		
6W	3/4" BSP	B21818	B21819
12T	3/4" SAE	B21822	B21823

### 5 Seals

S - Nitrile  
SV - Viton

### 6 Pilot pressure.

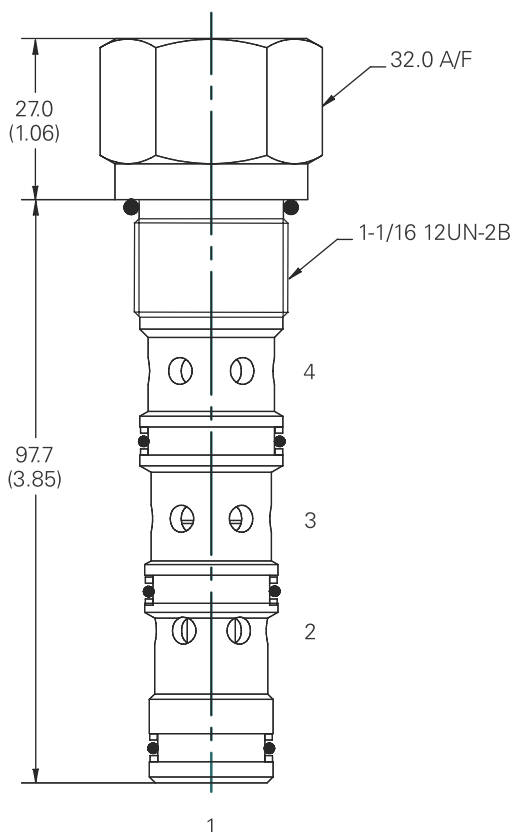
.7 - 7 bar  
1.0 - 10 bar

## Dimensions

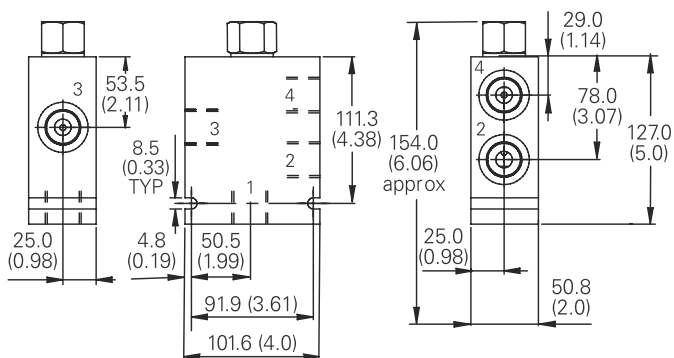
mm (inch)

**Note:** For applications above 210 bar (3000 psi), please consult our technical department or use the steel body option.

### Cartridge only



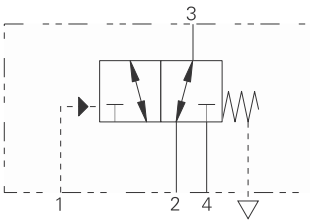
### Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS1-10 - Pilot to shift valve

Pilot operated, directional control valve  
30 L/min (7.9 USgpm) • 210 bar (3000 psi)



## Operation

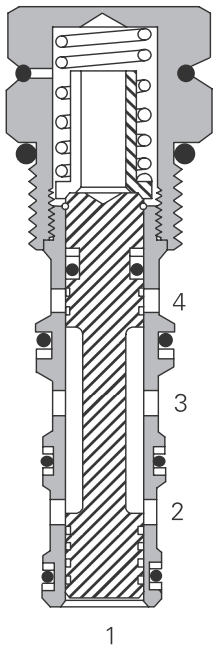
This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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.

## Features

Hardened, ground and honed sleeve and spool for low internal leakage.

## Sectional view



## Performance data

### 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 <sup>3</sup> /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 <sup>3</sup> (0.02 in <sup>3</sup> )
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®)

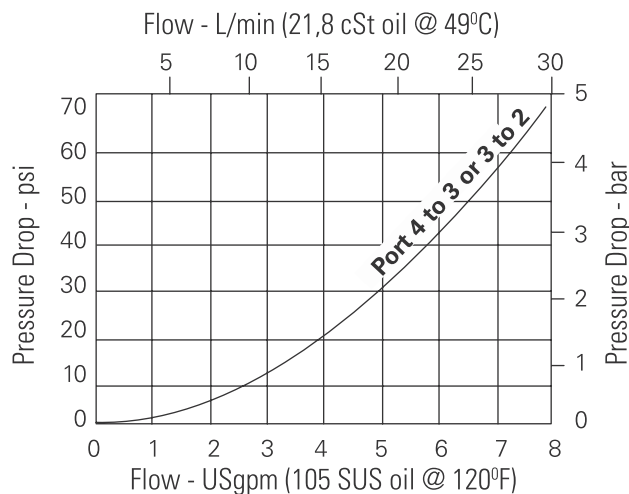
Viton is a registered trademark of E.I. DuPont

## Description

This is a 3-way 2 position, pilot operated directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

## Pressure drop curves

Cartridge only

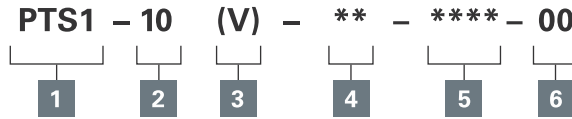


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS1-10 - Pilot to shift valve

Pilot operated, directional control valve  
30 L/min (7.9 USgpm) • 210 bar (3000 psi)

## Model code



**1 Function**  
PTS1 - Pilot to shift valve

**4 Port size**  
0 - Cartridge only

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

**2 Size**  
10 - 10 size

Code	Port size	Housing number	
		Aluminium light duty	Aluminium fatigue rated
3B	3/8" BSPP	02-179705	
6T	SAE 6	566161	
2G	1/4" BSPP	-	876709
3G	3/8" BSPP	-	876715
6H	SAE 6	-	876708
8H	SAE 8	-	876713

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

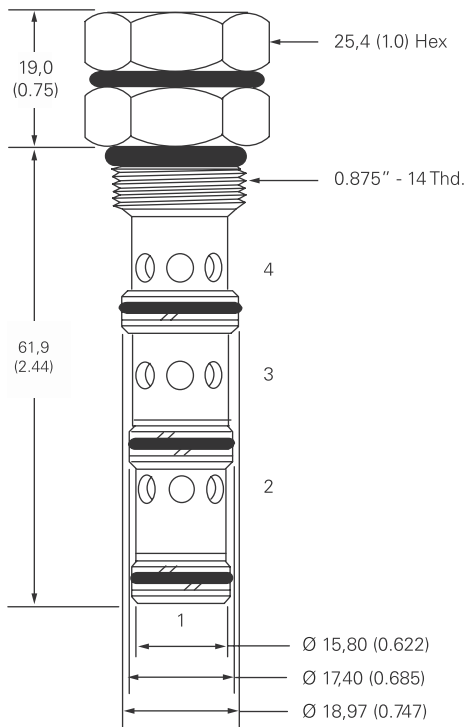
**3 Seal material**  
Blank - Buna-N  
V - Viton®

See section J for housing details.

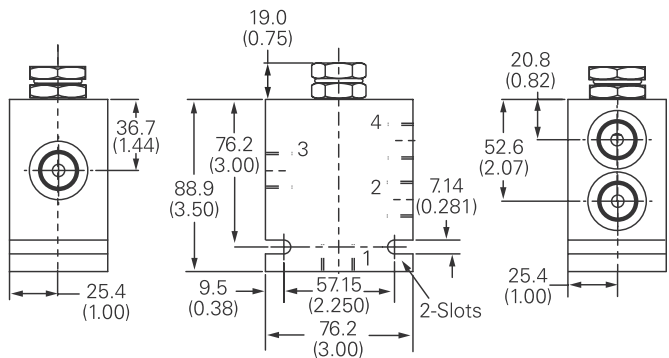
## Dimensions

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

## Cartridge only



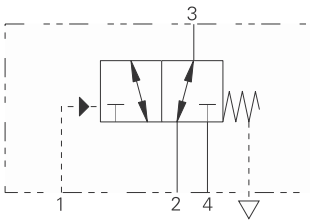
## Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS1 1-12 - Pilot to shift valve

Pilot operated, directional control valve  
76 L/min (20 USgpm) • 350 bar (5000 psi)



## Operation

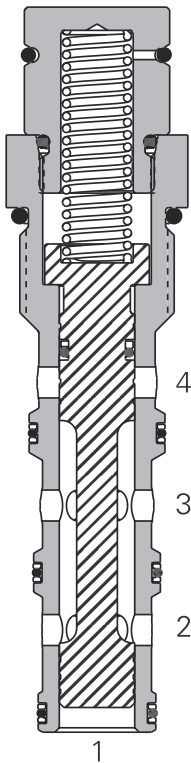
This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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.

## Features

Hardened, ground and honed internal sleeve and spool for low internal leakage. Working pressure 350 bar.

## Sectional view



## Performance data

### Ratings and specifications

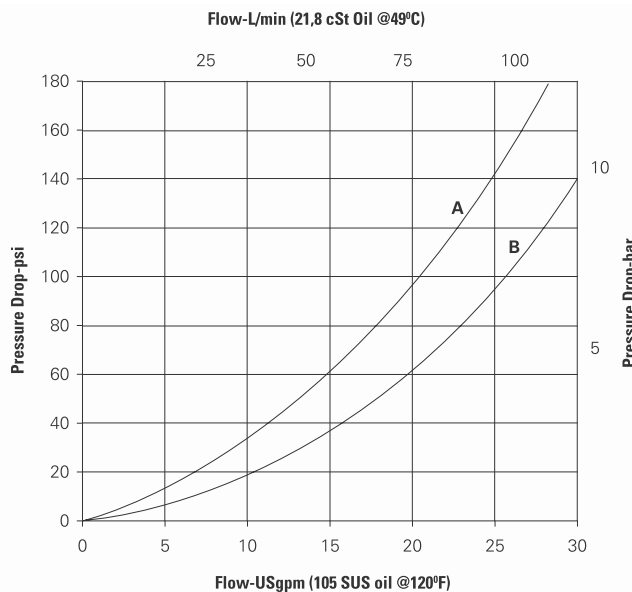
Performance data is typical with fluid at 21,8 cST (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	76 L/min (20 USgpm)
Internal leakage	250 cc/min (15in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	<b>80-5,5 bar (80 psi)</b> <b>120-8,3 bar (120 psi)</b>
Pilot displacement volume	0,49 cm <sup>3</sup> (0.02 in <sup>3</sup> )
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum, Steel
Weight cartridge only	0.32 kg (0.70 lbs)
Seal kit	02-160979 (Buna-N), 02-160980 (Viton®)

Viton is a registered trademark of E.I. DuPont

## Pressure drop curves

Cartridge only



A - P3 to P2

B - P3 to P4

## Description

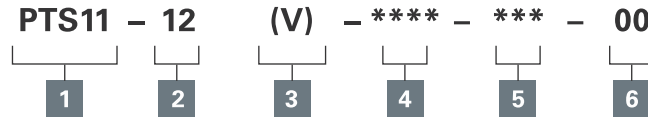
This is a 3-way 2 position, high pressure pilot operated, directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS1 1-12 - Pilot to shift valve

Pilot operated, directional control valve  
76 L/min (20 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

PTS11 - Pilot to shift valve

### 2 Size

12 - 12 size

### 3 Seals

Blank - Buna-N  
V - Viton®

### 4 Port size

0 - Cartridge only

Code	Port size	Housing number	
		Aluminum fatigue rated	Steel
A4G	1/2" BSPP	5986431-001	
A6G	3/4" BSPP	5986432-001	
A8H	SAE 8	5986433-001	
A10H	SAE 10	5986434-001	
A12H	SAE 12	5986436-001	
S6G	3/4" BSPP		5991073-001
S10H	SAE 10		5981074-001
S12H	SAE 12		5981075-001

See section J for housing details.

### 5 Pilot to shift (nominal)

80 - 5,5 bar (80 psi)

120 - 8,3 bar (120 psi)

### 6 Special features

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

01 - External vent port with vent port option (SAE-4)

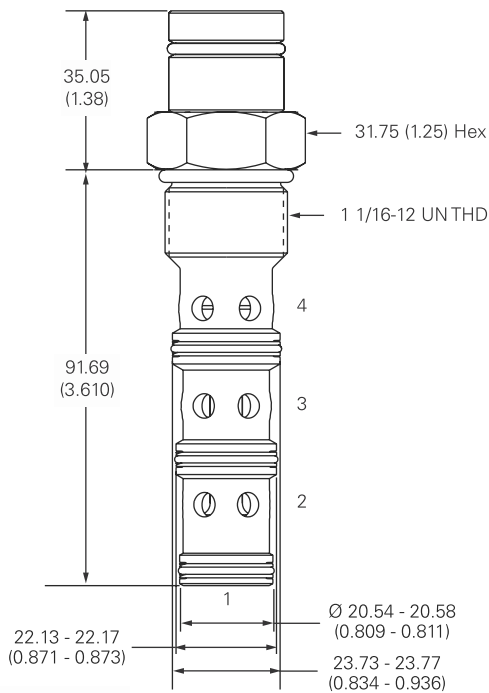
## Dimensions

mm (inch)

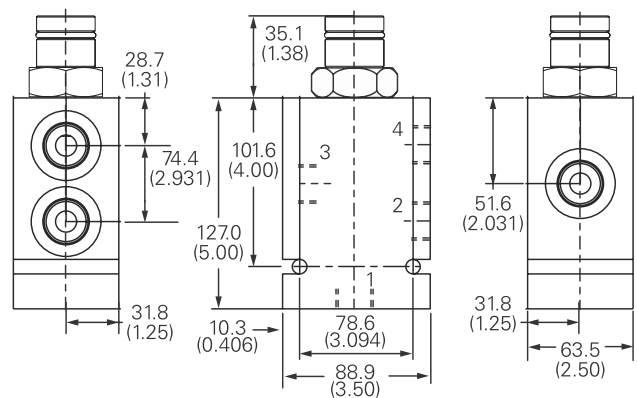
Torque cartridge in aluminum housing 47-54 Nm (35-40 ft. lbs)

Torque cartridge in steel housing 68-75 Nm (50-55 ft. lbs)

### Cartridge only



### Installation drawing (steel)



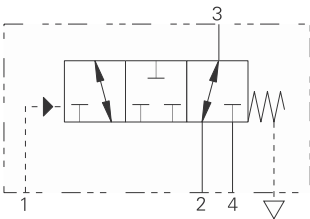
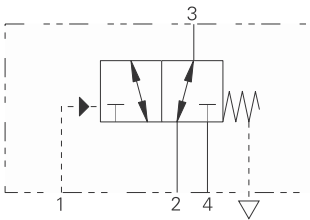
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS1 1-10 - Pilot to shift valve

Pilot operated, directional control valve  
 30 L/min (8 USgpm) • 350 bar (5000 psi)



### 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.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Working pressure 350 bar.

### Performance data

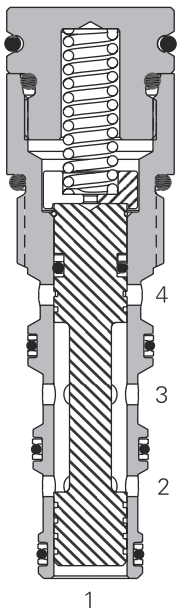
#### Ratings and specifications

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	30 L/min (8 USgpm)
Internal leakage	210 cc/min (13 in <sup>3</sup> /min) @ 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 <sup>3</sup> (0.02 in <sup>3</sup> )
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, Steel (5000 PSI)
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

### Sectional view

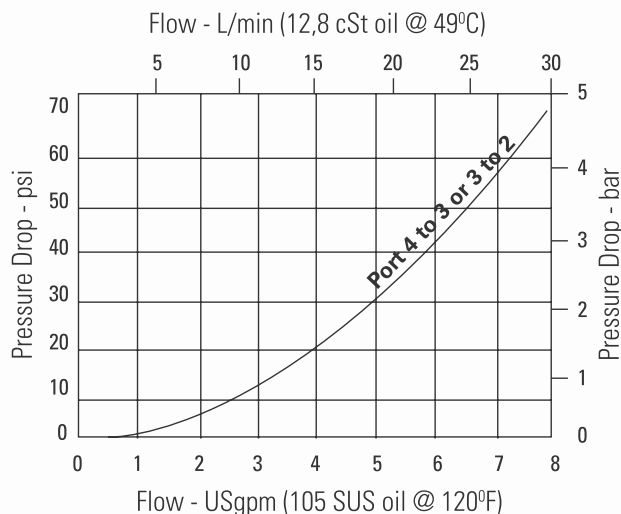


### Description

This is a 3-way 2 position, high pressure pilot operated, directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

### Pressure drop curves

Cartridge only

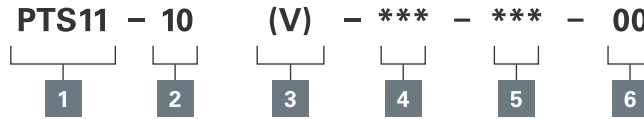


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS1 1-10 - Pilot to shift valve

Pilot operated, directional control valve  
30 L/min (8 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

PTS11 - Pilot to shift valve

### 2 Size

10 - 10 Size

### 3 Seals

Blank - Buna-N  
V - Viton®

### 4 Port size

0 - Cartridge only

Code	Port size	Housing number	
		Aluminum fatigue rated	Steel
O			
A2G	1/4" BSPP	02-185804	
A3G	3/8" BSPP	02-185805	
A6H	SAE 6	02-185802	
A8H	SAE 8	02-185803	
S2G	1/4" BSPP		02-175127
S3G	1/3" BSPP		02-175128
S6T	SAE 6		02-175124
S8T	SAE 8		02-175125

### 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")

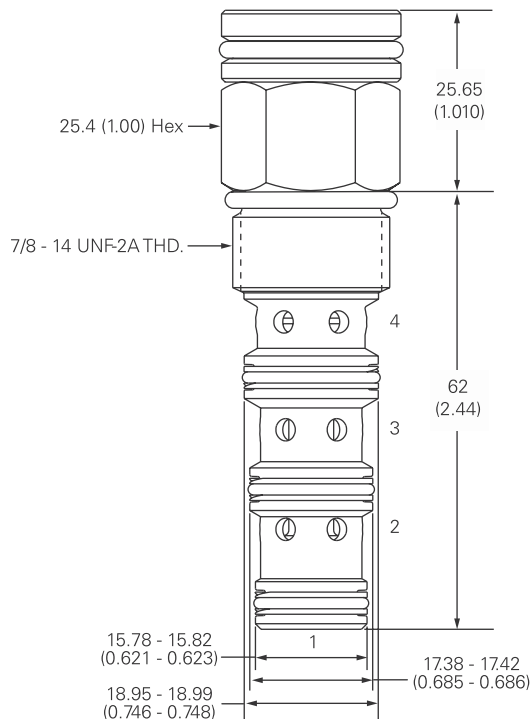
## Dimensions

mm (inch)

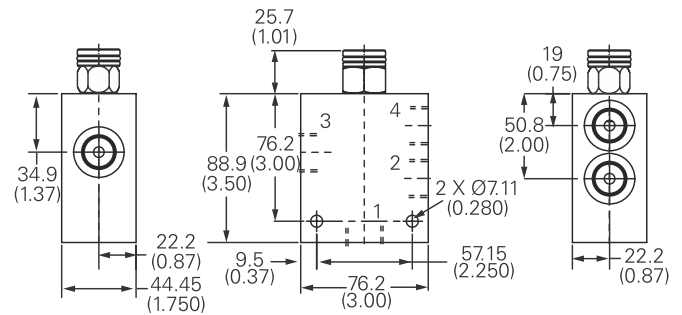
Torque cartridge in housing

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

### Cartridge only



### Installation drawing (steel)



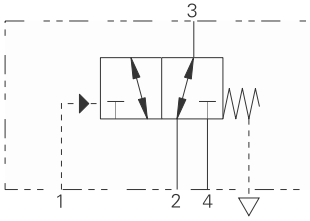
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS1-16 - Pilot to shift valve

Pilot operated, directional control valve  
 132 L/min (35 USgpm) • 210 bar (3000 psi)



### Operation

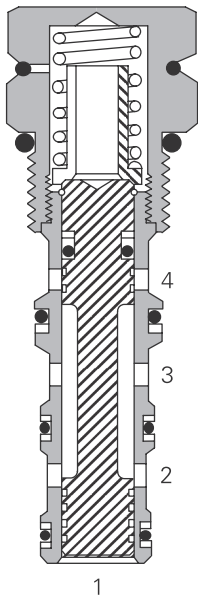
This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage.

### Sectional view



### Performance data

#### 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 <sup>3</sup> /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 <sup>3</sup> (0.12 in <sup>3</sup> )
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®)

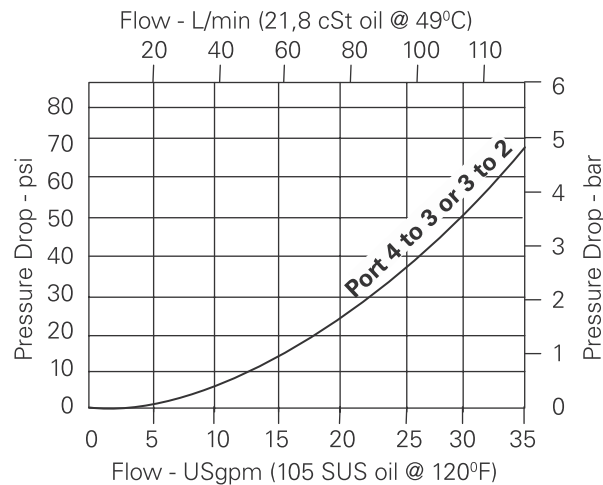
Viton is a registered trademark of E.I. DuPont

### Description

This is a 3-way 2 position, pilot operated directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

### Pressure drop curves

Cartridge only



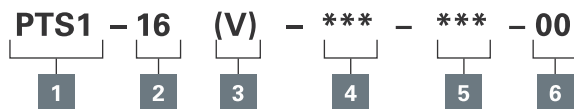
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# PTS1-16 - Pilot to shift valve

Pilot operated, directional control valve  
132 L/min (35 USgpm) • 210 bar (3000 psi)

## Model code



### 1 Function

PTS1 - Pilot to shift valve

### 2 Size

16 - 16 size

### 3 Seal material

Blank - Buna-N  
V - Viton®

### 4 Port size

0 - Cartridge only

Code	Port size	Housing number	
		Aluminium light duty	Aluminium 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.

### 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

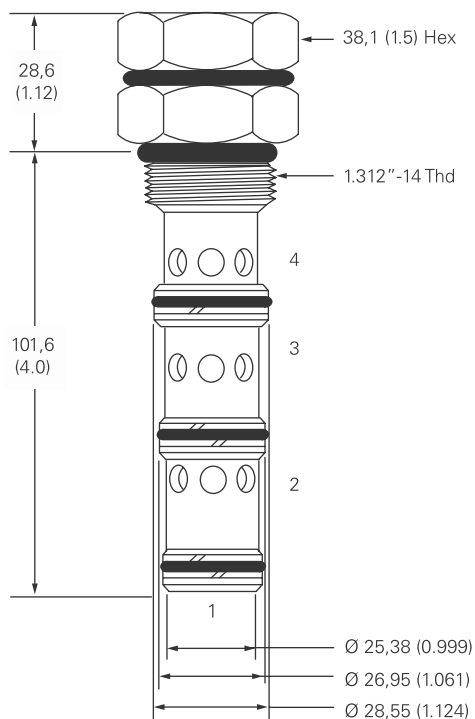
00 - None  
(Only required if valve has special features, omitted if "00.")

## Dimensions

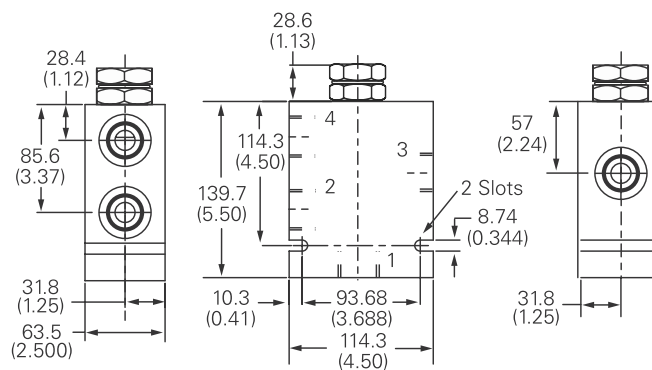
mm (inch)

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

### Cartridge only



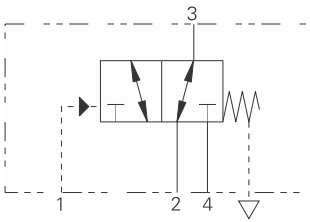
### Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS1 1-16 - Pilot to shift valve

Pilot operated, directional control valve  
 132 L/min (35 USgpm) • 350 bar (5000 psi)



### Operation

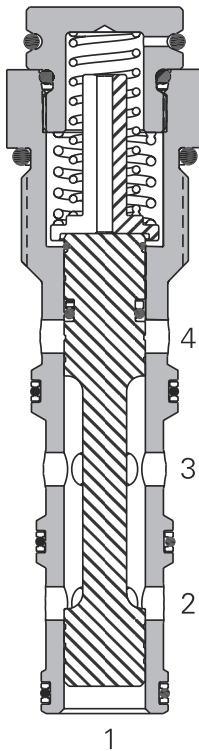
This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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.

### Features

Hardened, ground and honed internal sleeve and spool for low internal leakage. Working pressure 350 bar.

### Sectional view



### Performance data

#### Ratings and specifications

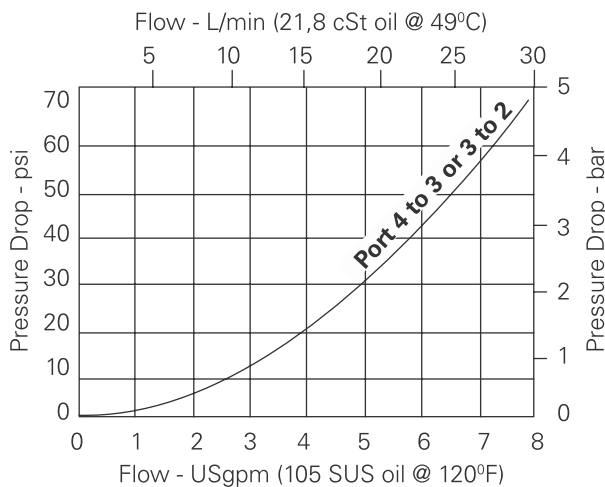
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	132 L/min (35 USgpm)
Internal leakage	250 cc/min (15 in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	<b>80</b> - 5,5 bar (80 psi) <b>160</b> - 11,0 bar (160 psi)
Pilot displacement volume	1,97 cm <sup>3</sup> (0.12 in <sup>3</sup> )
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, Steel
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 curves

Cartridge only



### Description

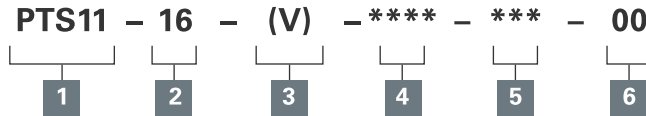
This is a 3-way 2 position, high pressure pilot operated, directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS1 1-16 Pilot to shift valve

Pilot operated, directional control valve  
132 L/min (35 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

**PTS11** - Pilot to shift valve

### 2 Size

**16** - 16 size

### 3 Seals

**Blank** - Buna-N  
**V** - Viton®

### 4 Port size

**0** - Cartridge only

Code	Port size	Housing number		
		Aluminum light duty	Aluminum fatigue rated	Steel
<b>0</b>				
<b>A12T</b>	SAE 12	566411		
<b>A6B</b>	3/4" BSPP	02-175468		
<b>A10H</b>	SAE 10		876729	
<b>A12H</b>	SAE 12		876731	
<b>A4G</b>	1/2" BSPP		876728	
<b>A6G</b>	3/4" BSPP		876730	
<b>S4G</b>	1/2" BSPP			02-175143
<b>S6G</b>	3/4" BSPP			02-175144
<b>S10T</b>	SAE 10			02-175141
<b>S12T</b>	SAE 12			02-175142

### 5 Pilot to shift (nominal)

**80** - 5,5 bar (80 psi)  
**160** - 11 bar (160 psi)

### 6 Special features

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

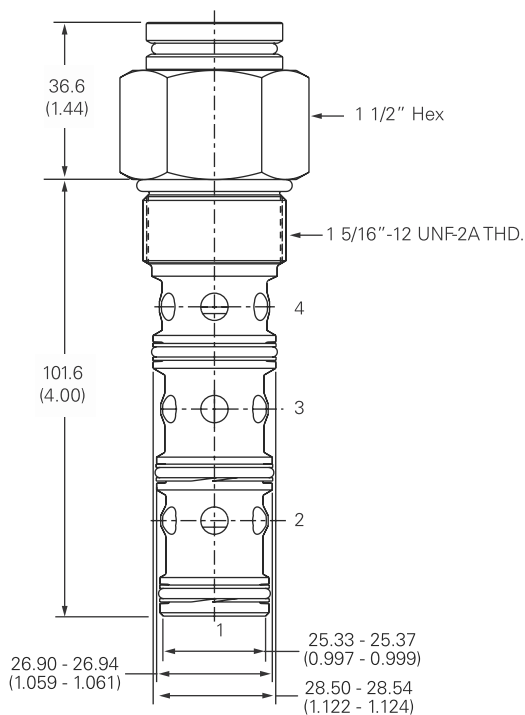
## Dimensions

mm (inch)

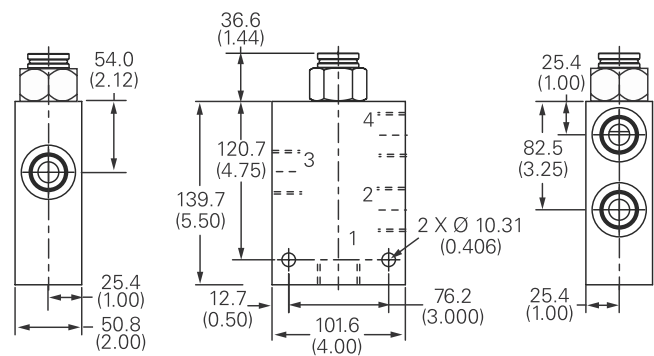
Torque cartridge in aluminum housing 108-122 Nm (80-90 ft. lbs)

Torque cartridge in steel housing 136-149 Nm (100-110 ft. lbs)

### Cartridge only



### Installation drawing (steel)



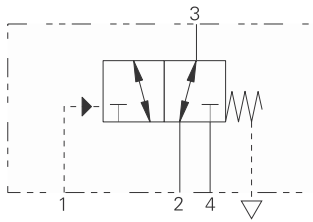
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS1 1-20 - Pilot to shift valve

Pilot operated, directional control valve  
265 L/min (70 USgpm) • 210 bar (3000 psi)



### Operation

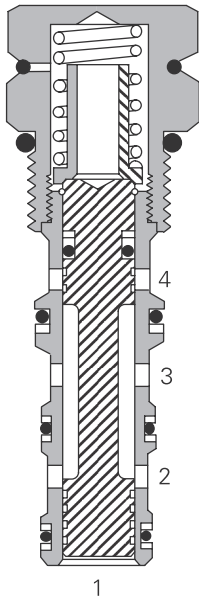
This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage.

### Sectional view



### Performance data

#### 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 <sup>3</sup> /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 <sup>3</sup> (0.41 in <sup>3</sup> )
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®)

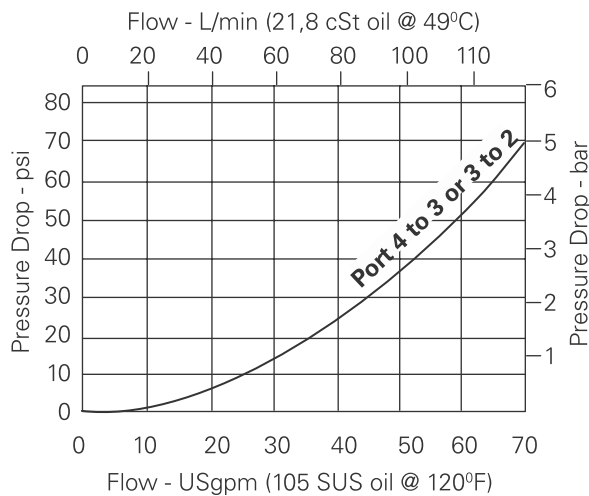
Viton is a registered trademark of E.I. DuPont

### Description

This is a 3-way 2 position, pilot operated directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

### Pressure drop curves

Cartridge only

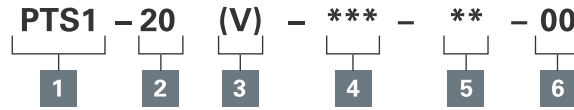


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS1-20 - Pilot to shift valve

Pilot operated, directional control valve  
265 L/min (70 USgpm) • 210 bar (3000 psi)

## Model code



### 1 Function

**PTS1** - Pilot to shift valve

### 2 Size

**20** - 20 size

### 3 Seal material

**Blank** - Buna-N  
**V** - Viton®

### 4 Port size

**0** - Cartridge only

Code	Port size	Housing number	
		Aluminium light duty	Aluminium fatigue rated
<b>16T</b>	SAE 16	566412	–
<b>8B</b>	1" BSPP	02-175469	–
<b>12H</b>	SAE 12	–	876745
<b>16H</b>	SAE 16	–	876747
<b>6G</b>	3/4" BSPP	–	876744
<b>8G</b>	1" BSPP	–	876746

See section J for housing details.

### 5 Pilot to Shift (Nominal)

**40** - 2,75 bar (40 psi)  
**80** - 5,5 bar (80 psi)

### 6 Special features

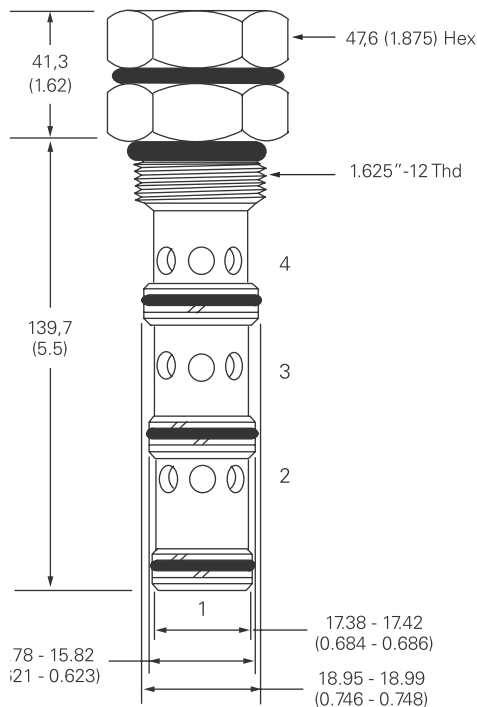
**00** - None  
(Only required if valve has special features, omitted if "00.")

## Dimensions

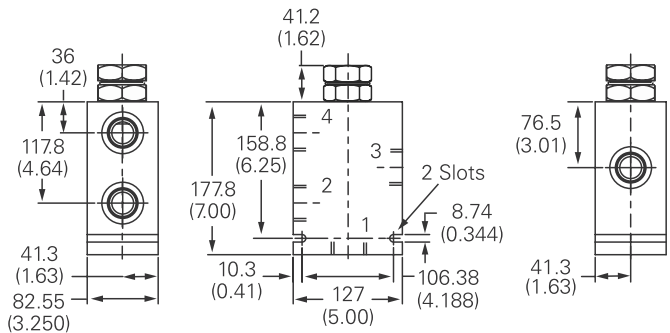
mm (inch)

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

## Cartridge only



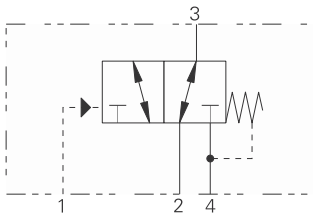
## Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS1 2-10 - Pilot to shift valve

Pilot operated, directional control valve  
 30 L/min (8 USgpm) • 350 bar (5000 psi)



### Operation

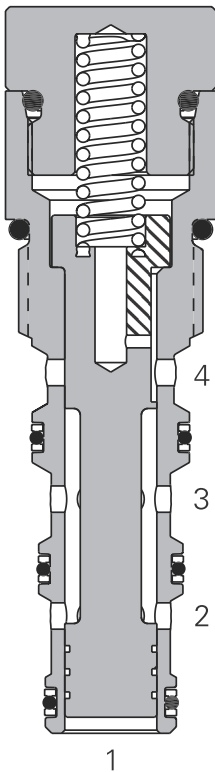
This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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 port 4.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Working pressure 350 bar.

### Sectional view



### Performance data

#### Ratings and specifications

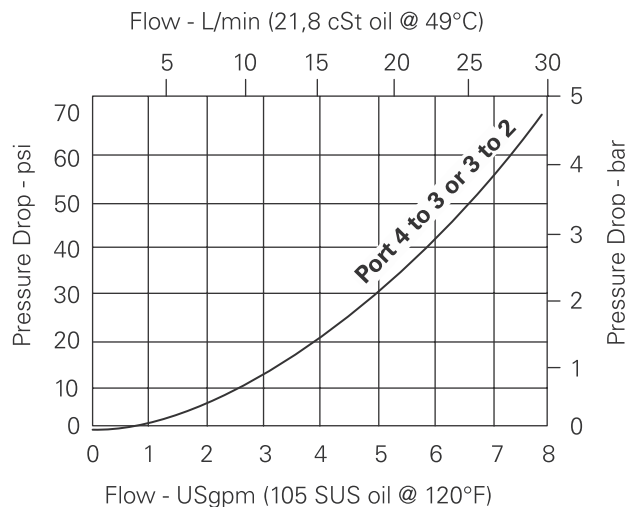
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	30 L/min (8 USgpm)
Internal leakage	250 cc/min (15in <sup>3</sup> /min) @ 350 bar (5000 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 <sup>3</sup> (0.02 in <sup>3</sup> )
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, Steel
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 curves

Cartridge only



### Description

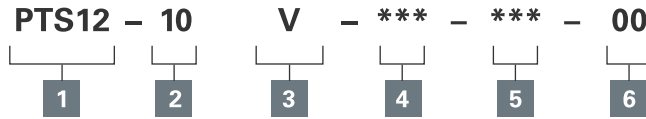
This is a 3-way 2 position, high pressure pilot operated, directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS12-10 - Pilot to shift valve

Pilot operated, directional control valve  
30 L/min (8 USgpm) • 350 bar (5000 psi)

## Model code



**1 Function**  
PTS12 - Pilot to shift valve

**2 Size**  
10 - 10 size

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

**4 Port size**  
0 - Cartridge only

Code	Port size	Housing number	
<b>0</b>	<b>Fatigue rated</b>	<b>Aluminum</b>	<b>Steel</b>
A2G	1/4" BSPP	02-185804	
A3G	3/8" BSPP	02-185805	
A6H	SAE 6	02-185802	
A8H	SAE 8	02-185803	
S2G	1/4" BSPP		02-175139
S3G	3/8" BSPP		02-175140
S6T	SAE 6		02-175137
S8T	SAE 8		02-175138

See section J for housing details.

**5 Pilot to shift (nominal)**  
40 - 2,75 bar (40 psi)  
80 - 5,5 bar (80 psi)  
120 - 8,3 bar (120 psi)

**6 Special features**  
00 - Non (Only required if valve has special features, omitted if "00")

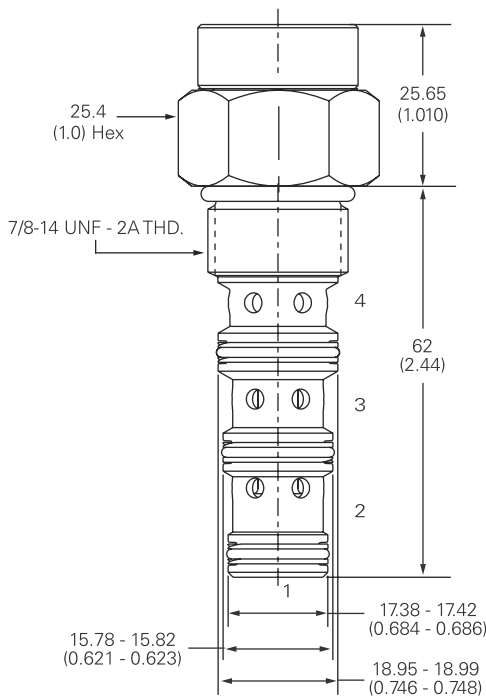
## Dimensions

mm (inch)

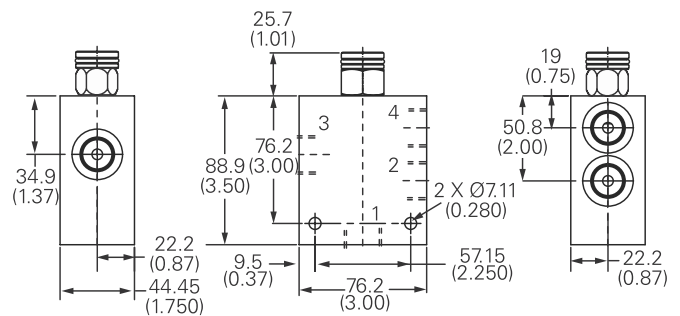
Torque cartridge in aluminum housing 47-54 Nm (35-40 ft. lbs)

Torque cartridge in steel housing 68-75 Nm (100-110 ft. lbs)

## Cartridge only



## Installation drawing (steel)



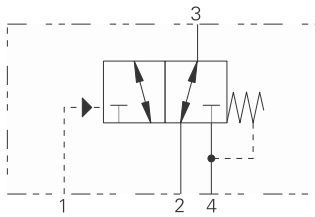
## Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS1 2-12 - Pilot to shift valve

Pilot operated, directional control valve  
 114 L/min (30 USgpm) • 350 bar (5000 psi)



## Operation

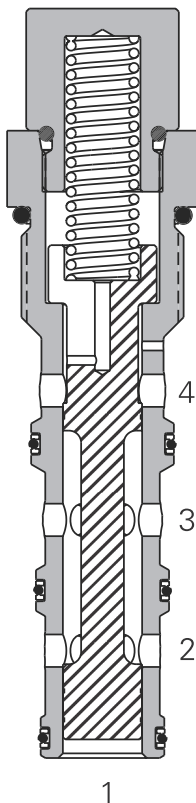
This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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 vented to port 4.

## Features

Hardened, ground and honed sleeve and spool for low internal leakage. Working pressure 350 bar.

## Sectional view



## Performance data

### 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	114 L/min (30 USgpm)
Internal leakage	250 cc/min (15in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	<b>80</b> - 5,5 bar (80 psi) <b>120</b> - 8,3 bar (120 psi) <b>160</b> - 11,0 bar (160 psi)*
*Only for adjustable types	
Pilot displacement volume	0,49 cm <sup>3</sup> (0.02 in <sup>3</sup> )
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/ <b>16/13</b>
Standard housing materials	Aluminum, Steel
Weight cartridge only	0.32 kg (0.70 lbs)
Seal kit	02-160979 (Buna-N), 02-160980 (Viton®)

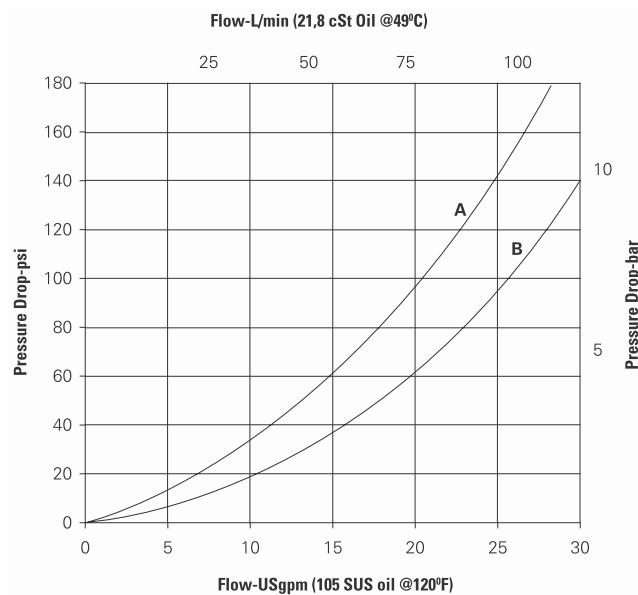
Viton is a registered trademark of E.I. DuPont

## Pressure drop curves

Cartridge only

**A** - P3 to P2

**B** - P3 to P4



## Description

This is a 3-way 2 position, high pressure pilot operated, directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

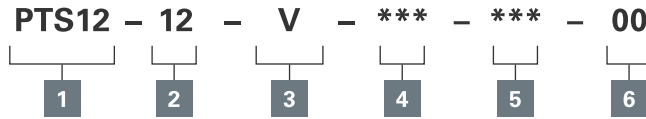
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# PTS12-12 - Pilot to shift valve

Pilot operated, directional control valve  
114 L/min (30 USgpm) • 350 bar (5000 psi)

## Model code



- 1 Function**  
PTS12 - Pilot to shift valve
- 2 Size**  
12 - 12 size
- 3 Seals**  
Blank - Buna-N  
V - Viton®

**4 Port size**  
0 - Cartridge only

Code	Port size	Housing number
0		Aluminum fatigue rated      Steel
A4G	1/2" BSPP	5986431-001
A6G	3/4" BSPP	5986432-001
A8H	SAE 8	5986433-001
A10H	SAE 10	5986434-001
A12H	SAE 12	5986436-001
S6G	3/4" BSPP	5991073-001
S10H	SAE 10	5981074-001
S12H	SAE 12	5981075-001

- 5 Pilot to shift (nominal)**  
80 - 5,5 bar (80 psi)  
120 - 8,3 bar (120 psi)  
160 - 8,3 bar (160 psi)\*  
\*Only for adjustable types
- 6 Special features**  
04 - "F Type" fixed type  
03 - "C Type" cap adjustable type  
05 - "K Type" knob adjustable type  
06 - "S Type" screw adjustable type

## Dimensions

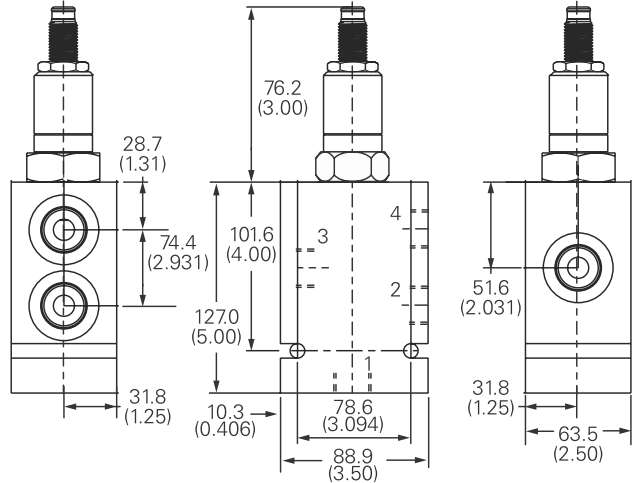
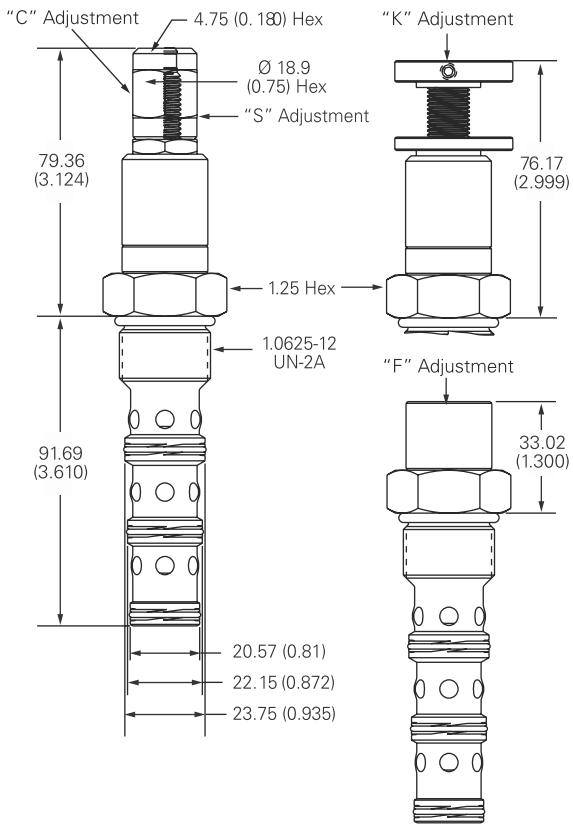
mm (inch)

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

Torque cartridge in steel housing 102-115 Nm (75-85 ft. lbs)

### Cartridge only

### Installation drawing (steel)

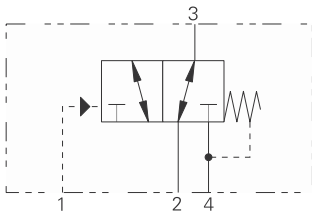


**Warning**  
Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings must be used for operating pressures above 210 bar (3000 psi).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS2-16 - Pilot to shift valve

Pilot operated, directional control valve  
 132 L/min (35 USgpm) • 210 bar (3000 psi)



### Operation

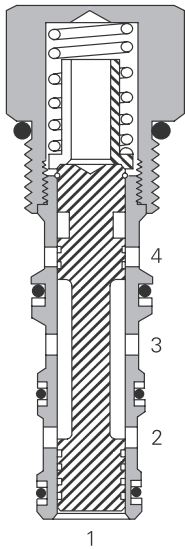
This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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 vented to port 4.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage.

### Sectional view



### Performance data

#### 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 <sup>3</sup> /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	<b>40</b> - 2,75 bar (40 psi) <b>80</b> - 5,5 bar (80 psi) <b>160</b> - 11,0 bar (160 psi)
Pilot displacement volume	1,97 cm <sup>3</sup> (0.12 in <sup>3</sup> )
Cavity	C-16-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/ <b>16/13</b>
Standard housing materials	Aluminum, Steel
Weight cartridge only	0,5 kg (1.12 lbs)
Seal kit	889634 (Buna-N), 889638 (Viton®)

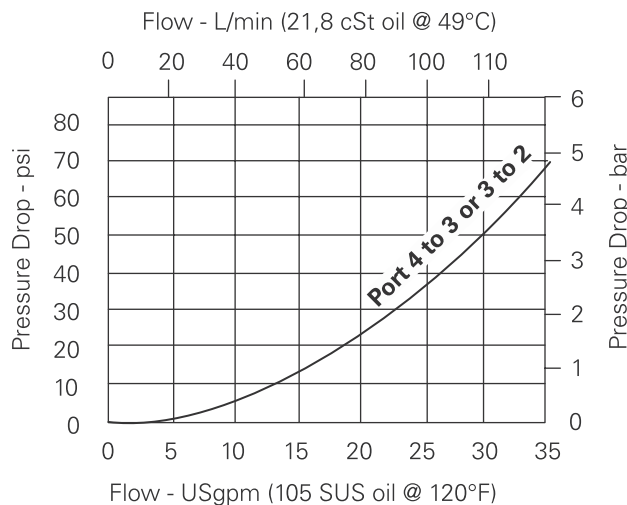
Viton is a registered trademark of E.I. DuPont

### Description

This is a 3-way 2 position, pilot operated directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

### Pressure drop curves

Cartridge only

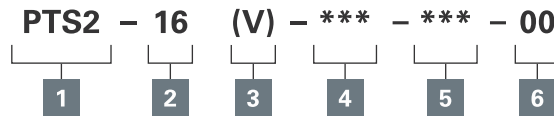


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS2-16 - Pilot to shift valve

Pilot operated, directional control valve  
132 L/min (35 USgpm) • 210 bar (3000 psi)

## Model code



**1 Function**  
PTS2 - Pilot to shift valve

**2 Size**  
16 - 16 size

**3 Seal material**  
Blank - Buna-N  
V - Viton

## 4 Port size

Code	Port size	Housing number		
		Aluminum light duty	Aluminum fatigue rated	Steel
0	Cartridge			
A12T	SAE 12	566411	-	-
A6B	3/4" BSPP	02-175468	-	-
A10H	SAE 10	-	876729	-
A12H	SAE 12	-	876731	-
A4G	1/2" BSPP	-	876728	-
A6G	3/4" BSPP	-	876730	-
S4G	1/2" BSPP	-	-	02-175143
S6G	3/4" BSPP	-	-	02-175144
S10T	SAE 10	-	-	02-175141
S12T	SAE 12	-	-	02-175142

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

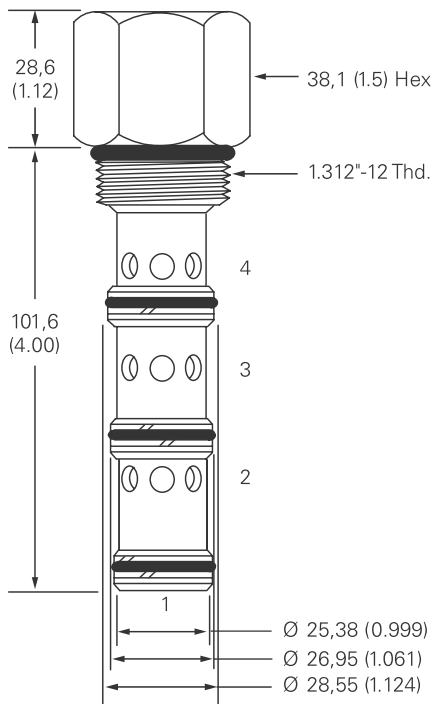
00 - None  
(Only required if valve has special features, omitted if "00".)

## Dimensions

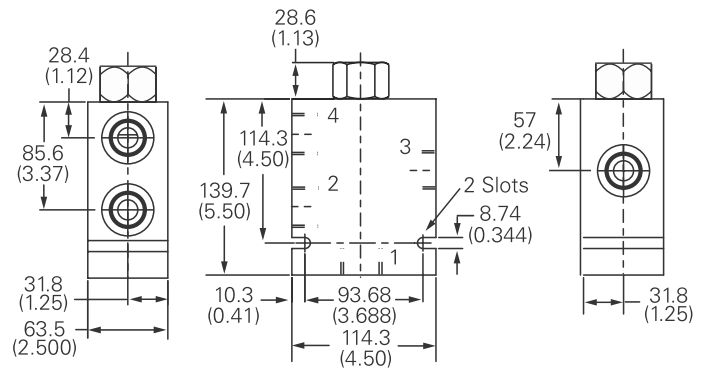
mm (inch)

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

## Cartridge only



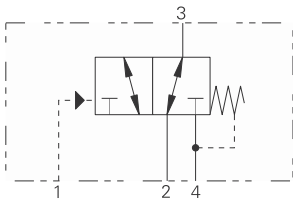
## Installation drawing (aluminum)



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS1 2-16 - Pilot to shift valve

Pilot operated, directional control valve  
 132 L/min (35 USgpm) • 350 bar (5000 psi)



## Operation

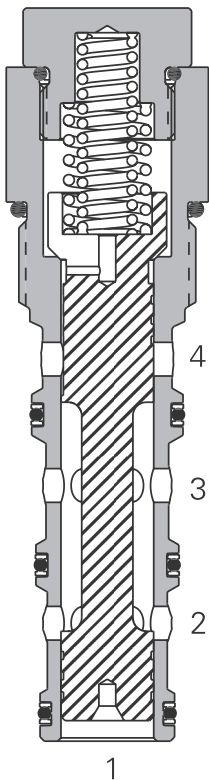
This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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 vented to port 4.

## Features

Hardened, ground and honed sleeve and spool for low internal leakage. Working pressure 350 bar.

## Sectional view



## Performance data

### Ratings and specifications

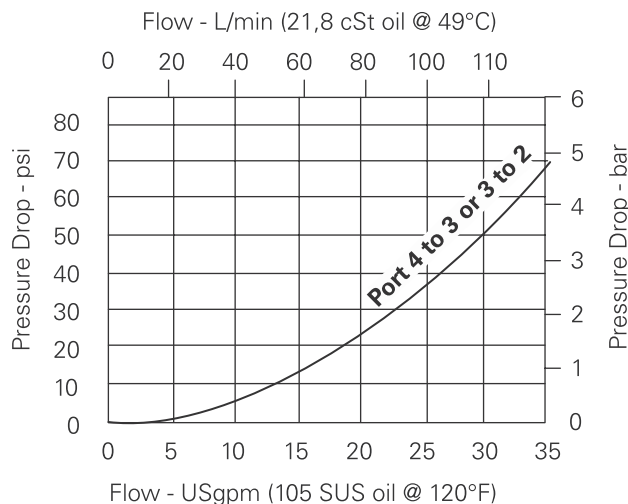
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	132 L/min (35 USgpm)
Internal leakage	550 cc/min (34 in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120° C (-40° to 248°F)
Pilot pressures	<b>80</b> - 5,5 bar (80 psi) <b>160</b> - 11,0 bar (160 psi)
Pilot displacement volume	1,97 cm <sup>3</sup> (0.12 in <sup>3</sup> )
Cavity	C-16-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/ <b>16/13</b>
Standard housing materials	Aluminum, Steel
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 curves

Cartridge only



## Description

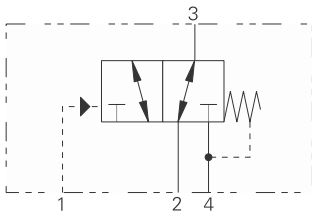
This is a 3-way 2 position, high pressure pilot operated, directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# PTS2-20 - Pilot to shift valve

Pilot operated, directional control valve  
265 L/min (70 USgpm) • 210 bar (3000 psi)



### Operation

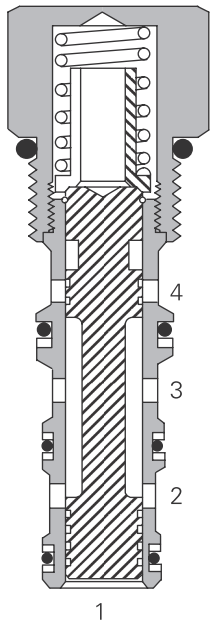
This valve allows flow between ports 2 and 3 while blocking port 4 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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 vented to port 4.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage.

### Sectional view



### Performance data

#### 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 <sup>3</sup> /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	<b>40</b> - 2,75 bar (40 psi) <b>80</b> - 5,5 bar (80 psi)
Pilot displacement volume	6,72 cm <sup>3</sup> (0.41 in <sup>3</sup> )
Cavity	C-20-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/ <b>16/13</b>
Standard housing material	Aluminum
Weight cartridge only	0,5 kg (1.12 lbs)
Seal kit	565916 (Buna-N), 889646 (Viton®)

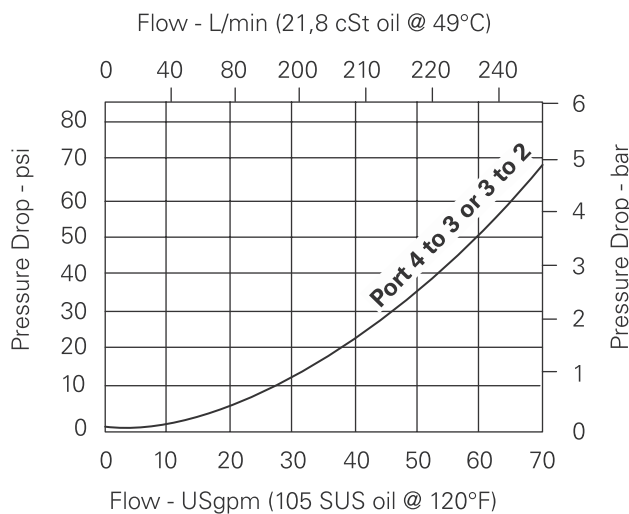
Viton is a registered trademark of E.I. DuPont.

### Description

This is a 3-way 2 position, pilot operated directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

### Pressure drop curves

Cartridge only

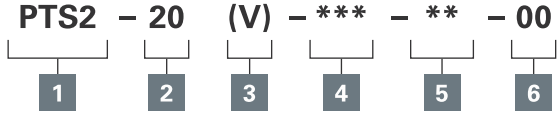


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS2-20 - Pilot to shift valve

Pilot operated, directional control valve  
265 L/min (70 USgpm) • 210 bar (3000 psi)

### Model code



### 1 Function

PTS2 - Pilot to shift valve

### 2 Size

20 - 20 size

### 3 Seal material

Blank - Buna-N  
V - Viton

### 4 Port size

Code	Port size	Housing number	
		Aluminum light duty	Aluminium fatigue rated
0	Cartridge		
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.

### 5 Pilot to shift (nominal)

40 - 2,75 bar (40 psi)  
80 - 5,5 bar (80 psi)

### 6 Special features

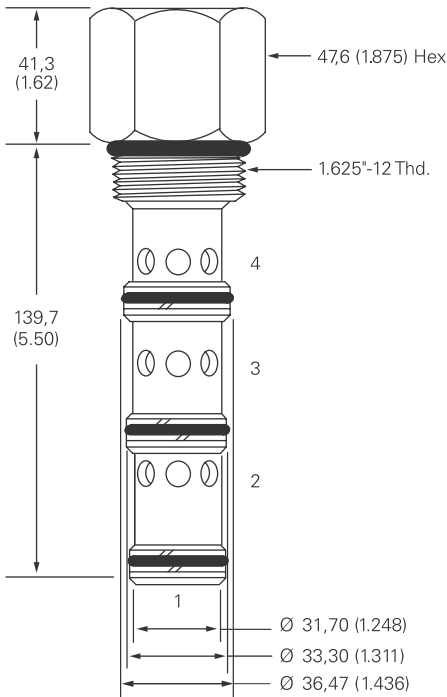
00 - None  
(Only required if valve has special features, omitted if "00".)

### Dimensions

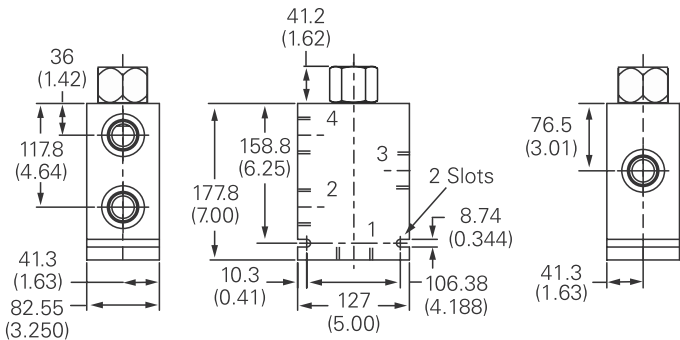
mm (inch)

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

### Cartridge only



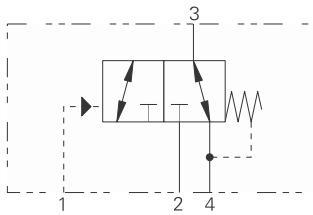
### Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS13-10 - Pilot to shift valve

Pilot operated, directional control valve  
 30 L/min (8 USgpm) • 350 bar (5000 psi)



### Operation

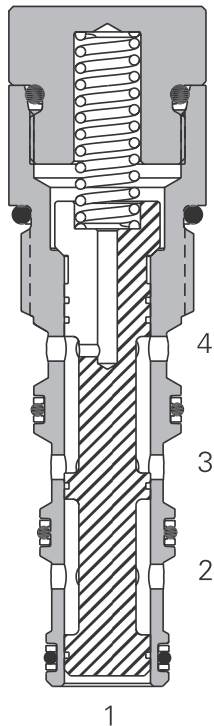
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Working pressure 350 bar.

### Sectional view



### Performance data

#### Ratings and specifications

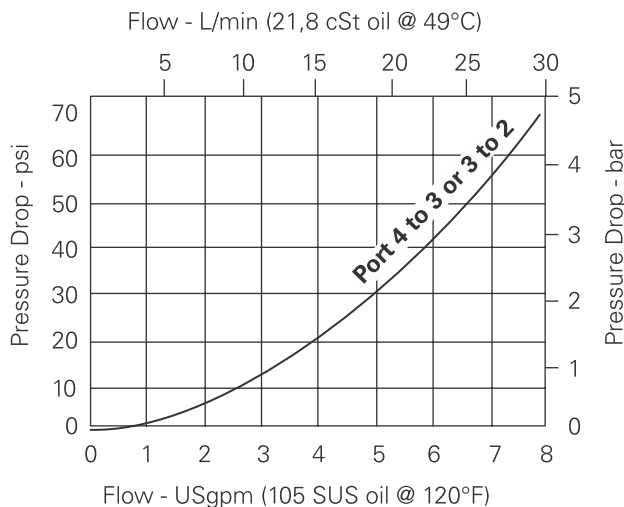
*Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)*

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	30 L/min (8 USgpm)
Internal leakage	210 cc/min (13in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120° C (-40° to 248°F)
Pilot pressures	<b>40</b> - 2,75 bar (40 psi) <b>80</b> - 5,5 bar (80 psi) <b>160</b> - 11,0 bar (160 psi)
Pilot displacement volume	0,49 cm <sup>3</sup> (0.02 in <sup>3</sup> )
Cavity	C-10-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/ <b>16/13</b>
Standard housing materials	Aluminum or Steel
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 curves

Cartridge only



### Description

This is a 3-way 2 position, high pressure pilot operated, directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

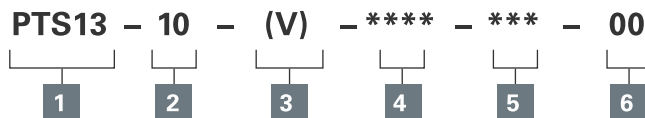
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# PTS13-10 - Pilot to shift valve

Pilot operated, directional control valve  
30 L/min (8 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

PTS13 - Pilot to shift valve

### 2 Size

10 - 10 size

### 3 Seals

Blank - Buna-N  
V - Viton®

### 4 Port size

0 - Cartridge only

Code	Port size	Housing number		
		Aluminum light duty	Aluminum fatigue rated	Steel
A3B	3/8" BSPP	02-179705		
A6T	SAE 6	566161		
A2G	1/4" BSPP		02-185804	
A3G	3/8" BSPP		02-185805	
A6H	SAE 6		02-185802	
A8H	SAE 8		02-185803	
S2G	1/4" BSPP			02-175139
S3G	3/8" BSPP			02-175140
S6T	SAE 6			02-175137
S8T	SAE 8			02-175138

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")

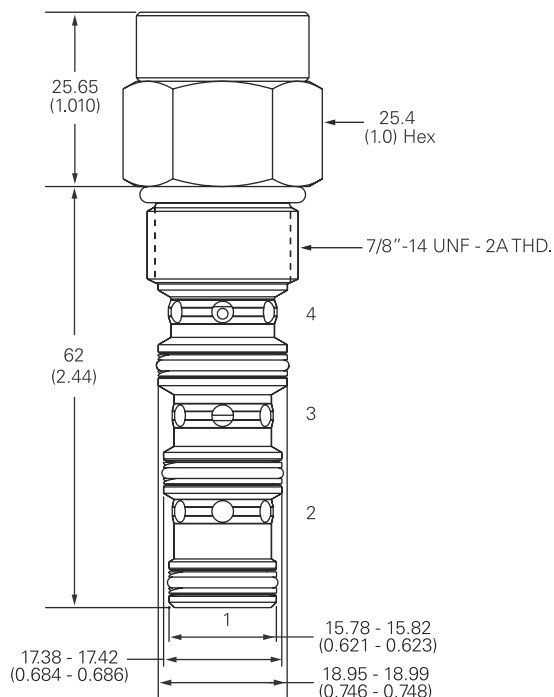
## Dimensions

mm (inch)

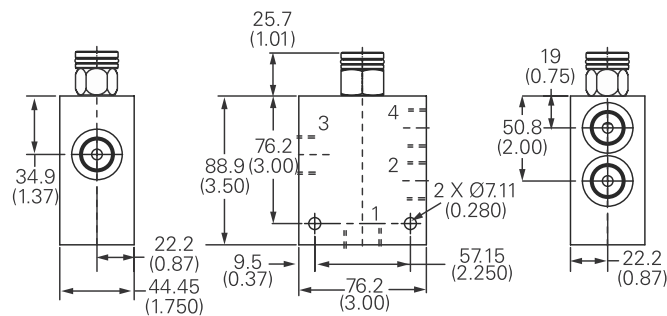
Torque cartridge in aluminum housing 47-54 Nm (35-40 ft. lbs)

Torque cartridge in steel housing 136-149 Nm (100-110 ft. lbs)

### Cartridge only



### Installation drawing (Steel)



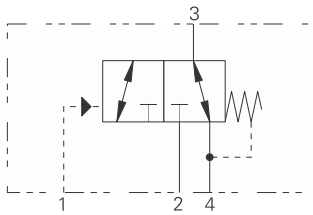
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS13-12 - Pilot to shift valve

Pilot operated, directional control valve  
 114 L/min (30 USgpm) • 350 bar (5000 psi)



### Operation

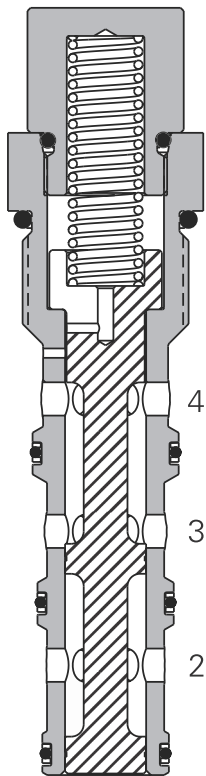
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Working pressure 350 bar.

### Sectional view



### Performance data

#### Ratings and specifications

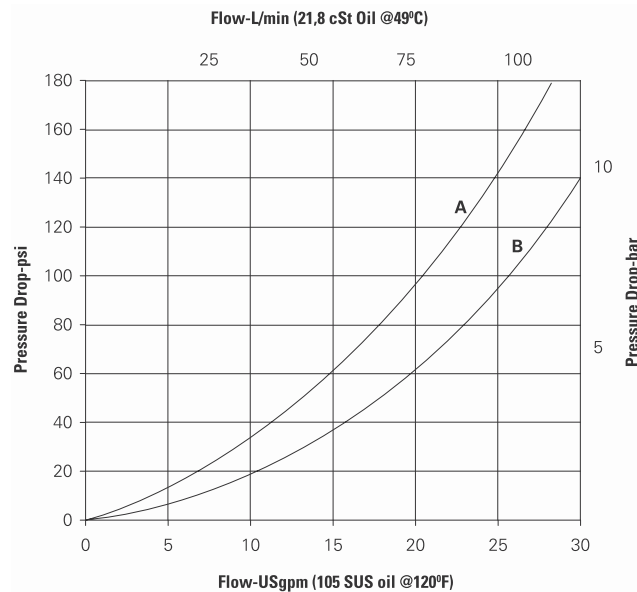
*Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)*

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	113 L/min (30 USgpm)
Internal leakage	210 cc/min (13 in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120° C (-40° to 248°F)
Pilot pressures	<b>80</b> - 5,5 bar (80 psi) <b>120</b> - 8,3 bar (120 psi) <b>160</b> - 11,0 bar (160 psi)
Pilot displacement volume	0,49 cm <sup>3</sup> (0.02 in <sup>3</sup> )
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum or Steel
Weight cartridge only	0.32 kg (0.70 lbs)
Seal kit	02-160979 (Buna-N), 02-160980 (Viton®)

Viton is a registered trademark of E.I. DuPont.

### Pressure drop curves

Cartridge only



### Description

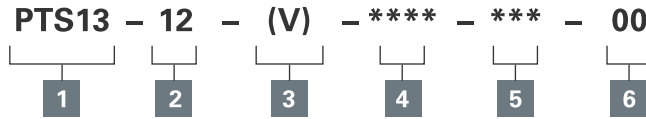
This is a 3-way 2 position, high pressure pilot operated, directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS13-12 - Pilot to shift valve

Pilot operated, directional control valve  
114 L/min (30 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

PTS13 - Pilot to shift valve

### 2 Size

12 - 12 size

### 3 Seals

Blank - Buna-N  
V - Viton®

### 4 Port size

0 - Cartridge only

Code	Port size	Housing number	
		Aluminum	Steel
A4G	1/2" BSPP	5986431-001	
A6G	3/4" BSPP	5986432-001	
A8H	SAE 8	5986433-001	
A10H	SAE 10	5986434-001	
A12H	SAE 12	5986436-001	
S6G	3/4" BSPP		5991073-001
S10T	SAE 10		5991074-001
S12T	SAE 12		5991075-001

See section J for housing details.

### 5 Pilot to shift (nominal)

80 - 5,5 bar (80 psi)  
120 - 8,3 bar (120 psi)  
160 - 11,0 bar (160 psi)

### 6 Special features

- 04 - 'F Type' fixed type w/closed transition
- 03 - 'C Type' cap adjustable type w/closed transition
- 05 - 'K Type' knob adjustable type w/closed transition
- 06 - 'S Type' screw adjustable type w/closed transition
- 09 - 'F Type' fixed type w/open transition

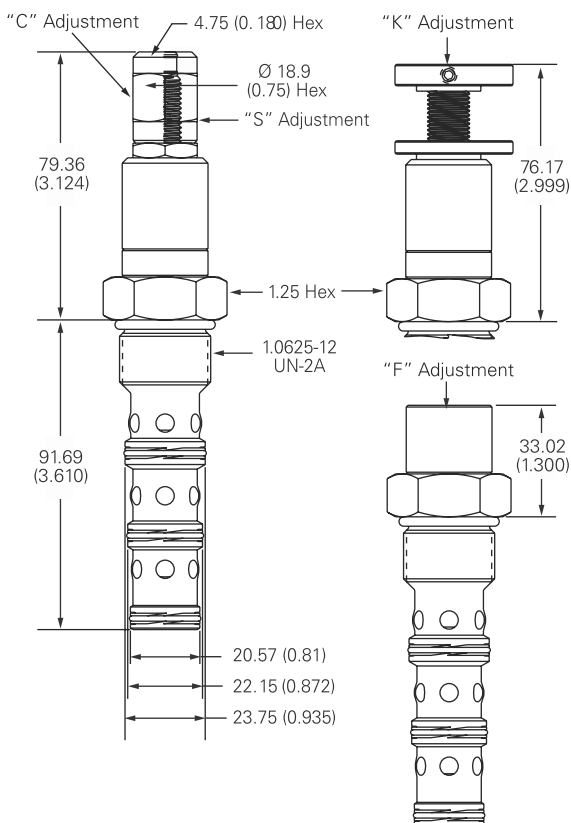
## Dimensions

mm (inch)

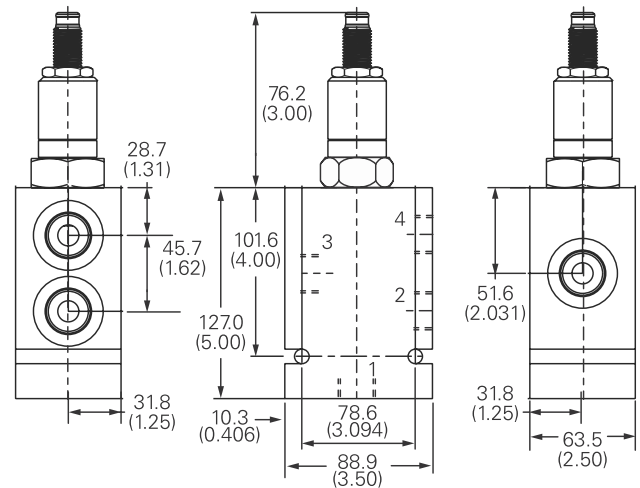
Torque cartridge in aluminum housing 81-95 Nm (60-70 ft. lbs)

Torque cartridge in steel housing 102-115 Nm (75-85 ft. lbs)

## Cartridge only



## Installation drawing (steel)



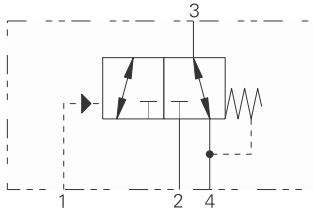
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS3-16 - Pilot to shift valve

Pilot operated, directional control valve  
 132 L/min (35 USgpm) • 210 bar (3000 psi)



### Operation

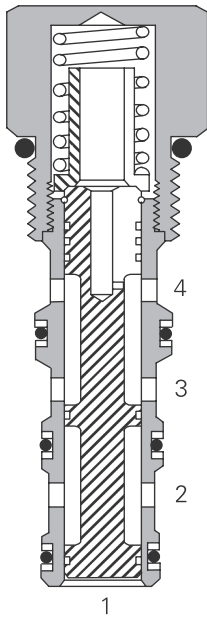
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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

### Features

Hardened, ground and honed sleeve and spool for low internal leakage.

### Sectional view



### Performance data

#### 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 <sup>3</sup> /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	<b>40</b> - 2,75 bar (40 psi) <b>80</b> - 5,5 bar (80 psi) <b>160</b> - 11,0 bar (160 psi)
Pilot displacement volume	1,97 cm <sup>3</sup> (0.12 in <sup>3</sup> )
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®)

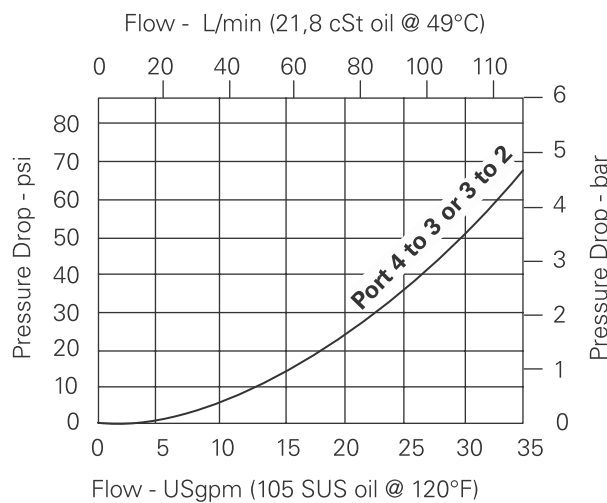
Viton is a registered trademark of E.I. DuPont

### Description

This is a 3-way 2 position, pilot operated directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

### Pressure drop curves

Cartridge only

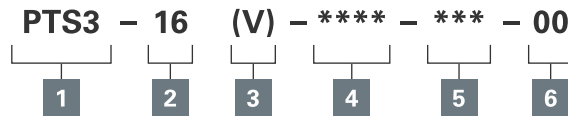


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS3-16 - Pilot to shift valve

Pilot operated, directional control valve  
132 L/min (35 USgpm) • 210 bar (3000 psi)

## Model code



**1 Function**  
PTS3 - Pilot to shift valve

**2 Size**  
16 - 16 size

**3 Seal material**  
Blank - Buna-N  
V - Viton®

## 4 Port size

Code	Port size	Housing number		
		Aluminum light duty	Aluminum fatigue rated	Steel
0	Cartridge			
A12T	SAE 12	566411	-	-
A6B	3/4" BSPP	02-175468	-	-
A10H	SAE 10	-	876729	-
A12H	SAE 12	-	876731	-
A4G	1/2" BSPP	-	876728	-
A6G	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

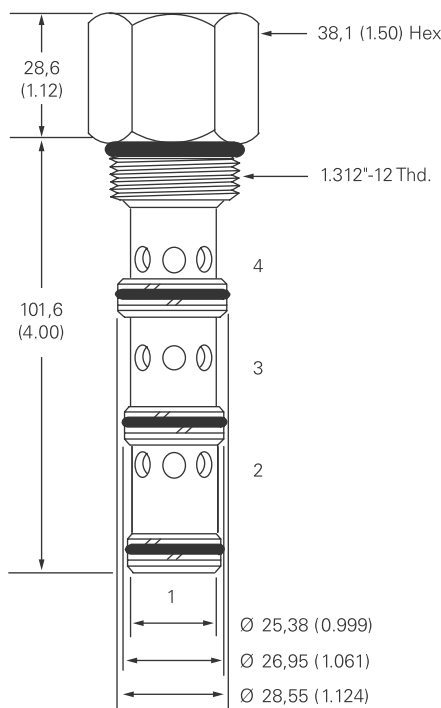
00 - None  
(Only required if valve has special features, omitted if "00".)

## Dimensions

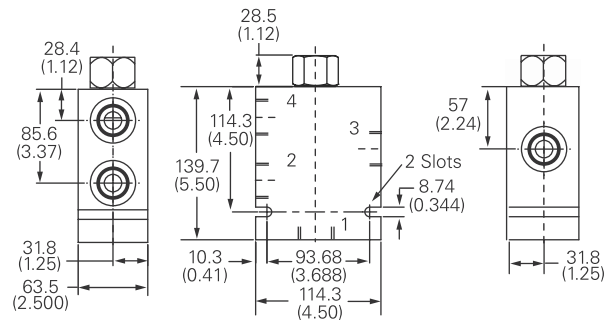
mm (inch)

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

## Cartridge only



## Installation drawing (Aluminum)



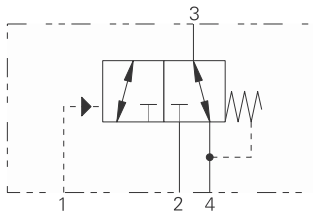
## Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS13-16 - Pilot to shift valve

Pilot operated, directional control valve  
 132 L/min (35 USgpm) • 350 bar (5000 psi)



### Operation

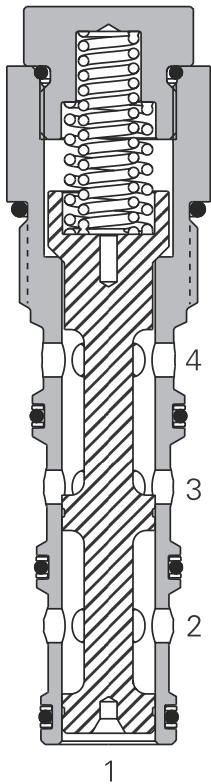
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Working pressure 350 bar.

### Sectional view



### Performance data

#### Ratings and specifications

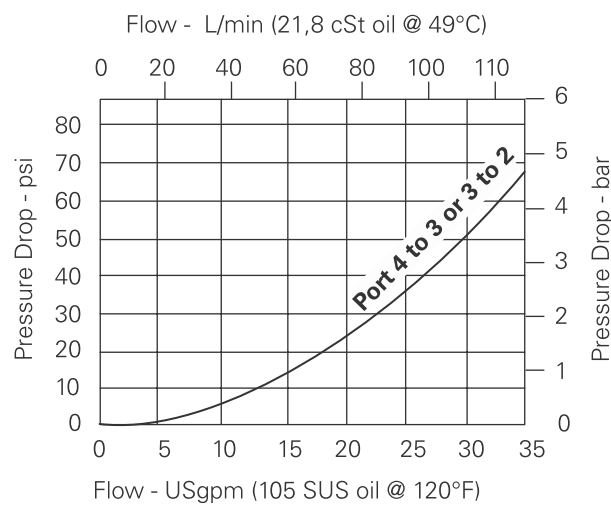
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	132 L/min (35 USgpm)
Internal leakage	210 cc/min (13in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	<b>80</b> - 5,5 bar (80 psi) <b>160</b> - 11,0 bar (160 psi)
Pilot displacement volume	1,97 cm <sup>3</sup> (0.12 in <sup>3</sup> )
Cavity	C-16-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/ <b>16/13</b>
Standard housing materials	Aluminum or Steel
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 curves

Cartridge only



### Description

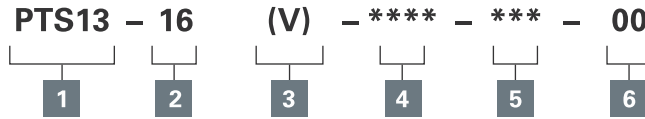
This is a 3-way 2 position, high pressure pilot operated, directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS13-16 - Pilot to shift valve

Pilot operated, directional control valve  
132 L/min (35 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

PTS13 - Pilot to shift valve

### 2 Size

16 - 16 size

### 3 Seals

Blank - Buna-N  
V - Viton®

### 4 Port size

0 - Cartridge only

Code	Port size	Housing number		
		Aluminum light duty	Aluminum fatigue rated	Steel
A12T	SAE 12	566411		
A6B	3/4" BSPP		02-175468	
A10H	SAE 10		876729	
A12H	SAE 12		876731	
A4G	1/2" BSPP		876728	
A6G	3/4" BSPP		876730	
S4G	1/2" BSPP			02-175143
S6G	1/4" BSPP			02-175144
S10T	SAE 10			02-175141
S12T	SAE 12			02-175142

See section J for housing details.

### 5 Pilot to shift (nominal)

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")

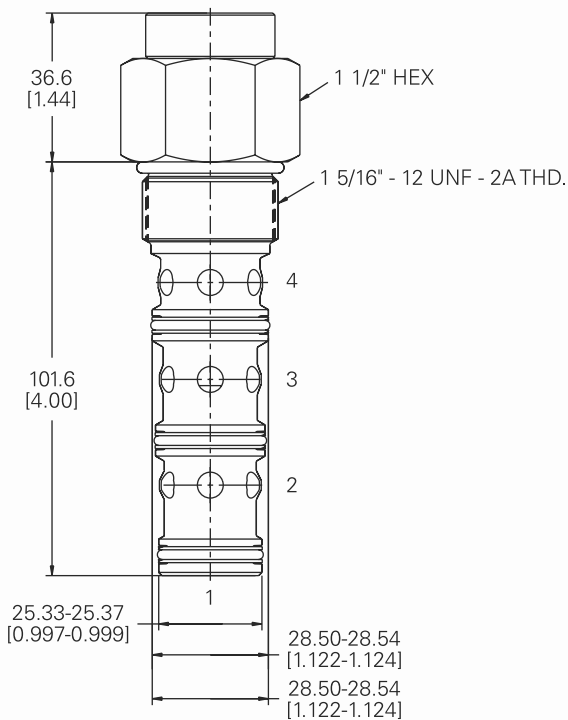
## Dimensions

mm (inch)

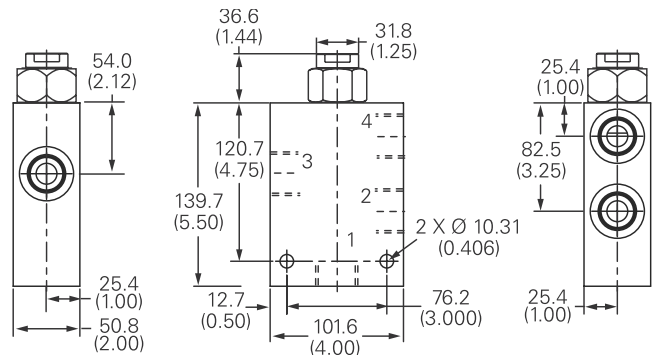
Torque cartridge in aluminum housing 108-122 Nm (80-90 ft. lbs)

Torque cartridge in steel housing 136-149.6 Nm (100-110 ft. lbs)

### Cartridge only



### Installation drawing (Steel)



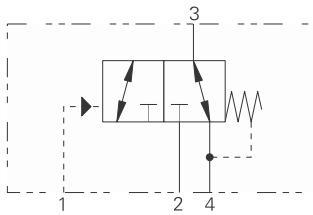
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS3-20 - Pilot to shift valve

Pilot operated, directional control valve  
265 L/min (70 USgpm) • 210 bar (3000 psi)



### Operation

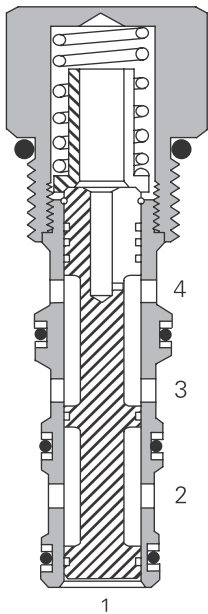
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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

### Features

Hardened, ground and honed sleeve and spool for low internal leakage.

### Sectional view



### Performance data

#### 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 <sup>3</sup> /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	<b>40</b> - 2,75 bar (40 psi) <b>80</b> - 5,5 bar (80 psi)
Pilot displacement volume	6,72 cm <sup>3</sup> (0.41 in <sup>3</sup> )
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 material	Aluminum
Weight cartridge only	0,5 kg (1.12 lbs)
Seal kit	565916 (Buna-N), 889646 (Viton®)

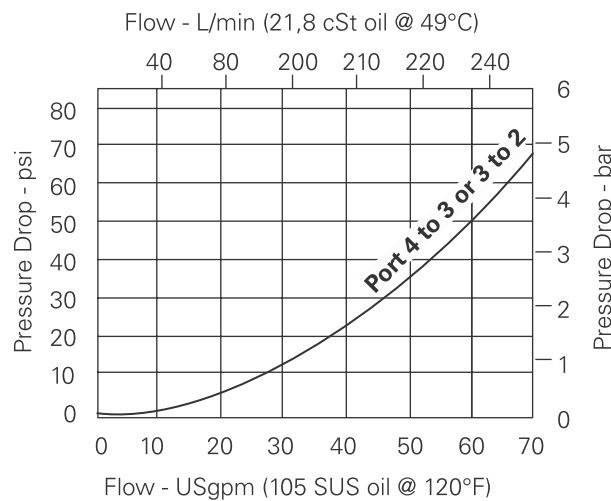
Viton is a registered trademark of E.I. DuPont

### Description

This is a 3-way 2 position, pilot operated directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

### Pressure drop curves

Cartridge only



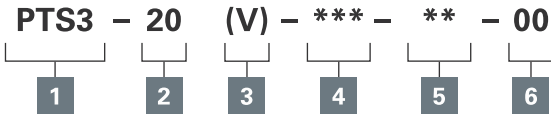
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# PTS3-20 - Pilot to shift valve

Pilot operated, directional control valve  
265 L/min (70 USgpm) • 210 bar (3000 psi)

### Model code



**1 Function**  
PTS3 - Pilot to shift valve

**2 Size**  
20 - 20 size

**3 Seal material**  
Blank - Buna-N  
V - Viton®

### 4 Port size

Code	Port size	Housing number	
		Aluminum light duty	Aluminum fatigue rated
0	Cartridge only		
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.

### 5 Pilot to shift (nominal)

- 40 - 2,75 bar (40 psi)
- 80 - 5,5 bar (80 psi)

### 6 Special features

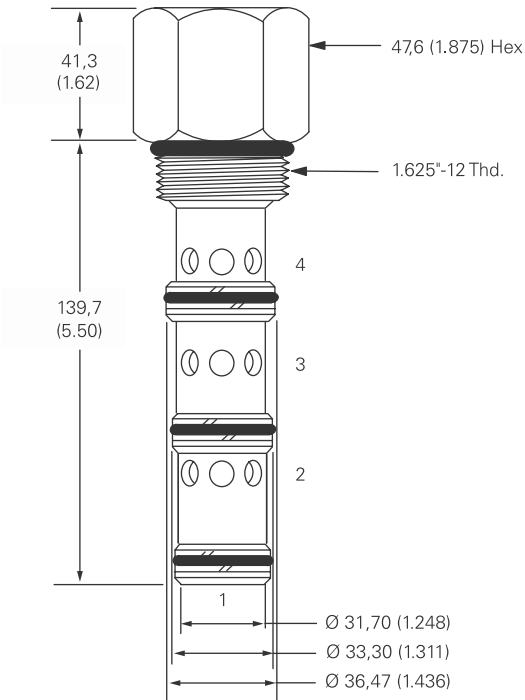
00 - None  
(Only required if valve has special features, omitted if "00".)

### Dimensions

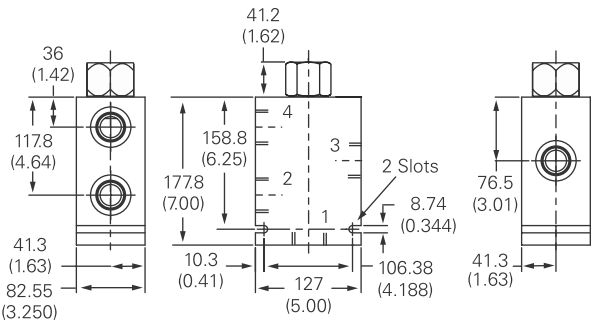
mm (inch)

Torque cartridge in aluminum housing  
129-155 Nm (95-115 ft lbs)

### Cartridge only



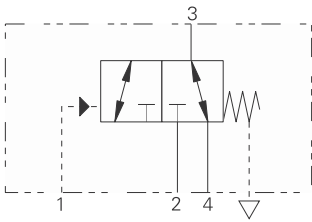
### Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS14-12 - Pilot to shift valve

Pilot operated, directional control valve  
 114 L/min (30 USgpm) • 350 bar (5000 psi)



## Operation

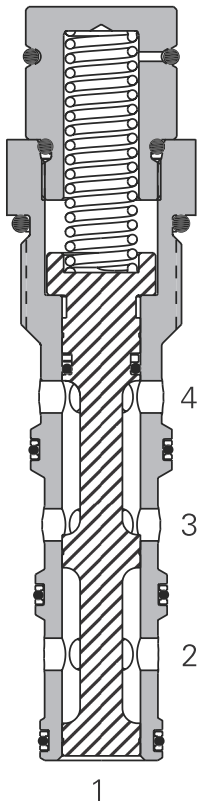
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

At this time, flow is directed between port 2 and port 3 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome. During the cross-over transition, all ports are blocked. The spring chamber for this valve is externally vented to atmosphere.

## Features

Hardened, ground and honed sleeve and spool for low internal leakage. Working pressure 350 bar.

## Sectional view



## Performance data

### Ratings and specifications

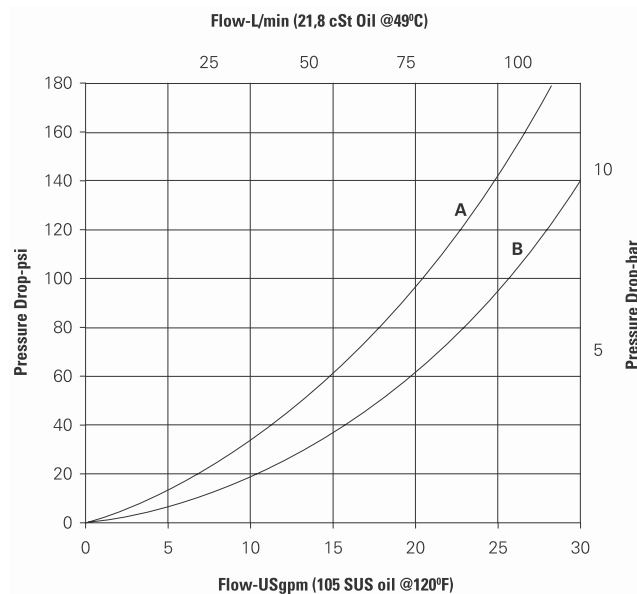
*Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)*

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	114 L/min (30 USgpm)
Internal leakage	210 cc/min (13in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	<b>80</b> - 5,5 bar (80 psi) <b>120</b> - 8,3 bar (120 psi)
Pilot displacement volume	1,97 cm <sup>3</sup> (0.12 in <sup>3</sup> )
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum or Steel
Weight cartridge only	0.32 kg (0.70 lbs)
Seal kit	02-160979 (Buna-N), 02-160980 (Viton®)

Viton is a registered trademark of E.I. DuPont

## Pressure drop curves

Cartridge only



## Description

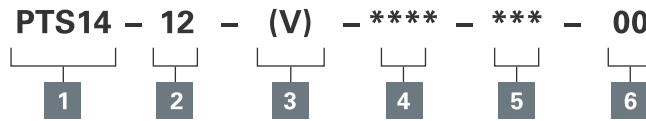
This is a 3-way 2 position, high pressure pilot operated, directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS14-12 - Pilot to shift valve

Pilot operated, directional control valve  
114 L/min (30 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

PTS14 - Pilot to shift valve

### 2 Size

12 - 12 size

### 3 Seals

Blank - Buna-N  
V - Viton®

### 4 Port size

0 - Cartridge only

Code	Port size	Housing number	
		Aluminium fatigue rated	Steel
A4G	1/2" BSPP	5986431-001	
A6G	3/4" BSPP	5986432-001	
A8H	SAE 8	5986433-001	
A10H	SAE 10	5986434-001	
A12H	SAE 12	5986436-001	
A6G	3/4" BSPP		5991073-001
S10H	SAE 10		5991074-001
S12H	SAE 12		5991074-001

See section J for housing details.

### 5 Pilot to shift (nominal)

80 - 5,5 bar (80 psi)  
120 - 8,3 bar (120 psi)

### 6 Special features

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

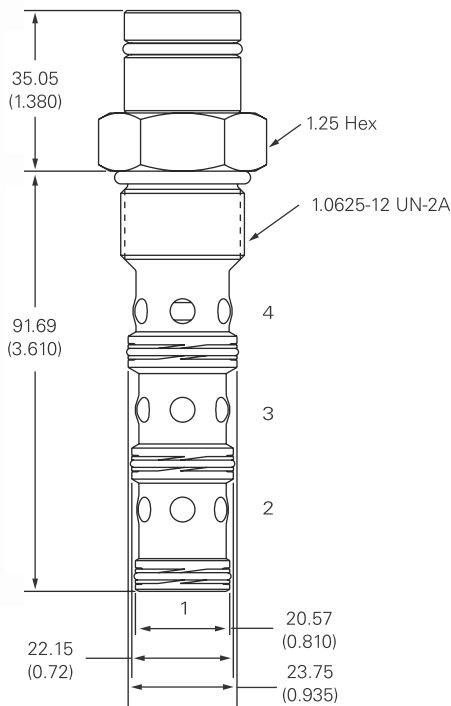
## Dimensions

mm (inch)

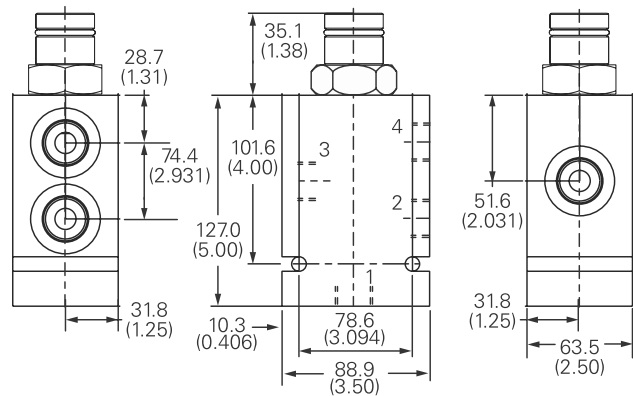
Torque cartridge in aluminum housing 81-95 Nm (60-70 ft. lbs)

Torque cartridge in steel housing 102-115.6 Nm (75-85 ft. lbs)

### Cartridge only



### Installation drawing (steel)



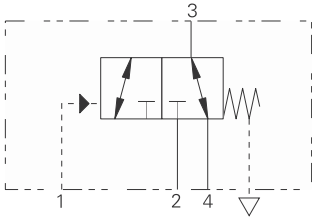
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS14-16 - Pilot to shift valve

Pilot operated, directional control valve  
 132 L/min (35 USgpm) • 350 bar (5000 psi)



### Operation

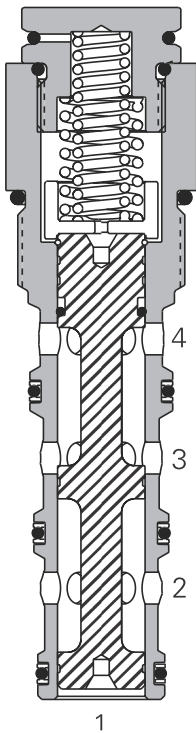
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

At this time, flow is directed between port 2 and port 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.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Working pressure 350 bar.

### Sectional view



### Performance data

#### Ratings and specifications

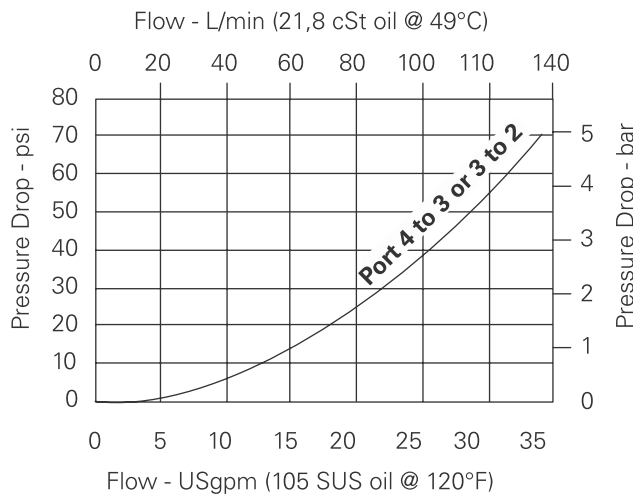
*Performance data is typical with fluid at 21,8 cST (105 SUS) and 49°C (120°F)*

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	132 L/min (35 USgpm)
Internal leakage	210 cc/min (13in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	<b>80</b> - 5,5 bar (80 psi) <b>160</b> - 11,0 bar (160 psi)
Pilot displacement volume	1,97 cm <sup>3</sup> (0.12 in <sup>3</sup> )
Cavity	C-16-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/ <b>16/13</b>
Standard housing materials	Aluminum or Steel
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 curves

Cartridge only



### Description

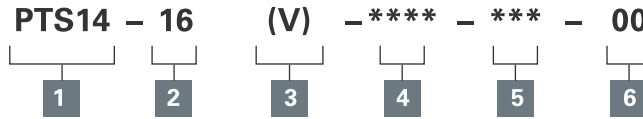
This is a 3-way 2 position, high pressure pilot operated, directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS14-16 - Pilot to Shift Valve

Pilot operated, directional control valve  
132 L/min (35 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

PTS14 - Pilot to shift valve

### 2 Size

16 - 16 Size

### 3 Seals

Blank - Buna-N  
V - Viton®

### 4 Port size

0 - Cartridge only

Code	Port size	Housing number		
		Aluminum light duty	Aluminium fatigue rated	Steel
A12T	SAE 12	566411		
A6B	3/4" BSPP	02-175468		
A10H	SAE 10		876729	
A12H	SAE 12		876731	
A4G	1/2" BSPP		876728	
A6G	3/4" BSPP		876730	
S4G	1/2" BSPP			02-175143
S6G	3/4" BSPP			02-175144
S10T	SAE 10			02-175141
S12T	SAE 12			02-175142

See section J for housing details.

### 5 Pilot to shift (nominal)

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")

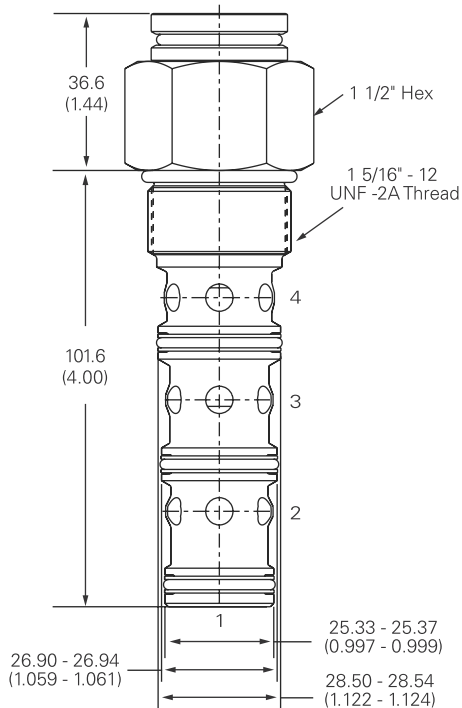
## Dimensions

mm (inch)

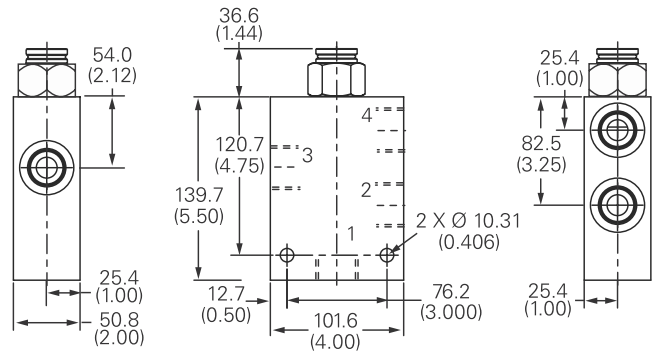
Torque cartridge in aluminum housing 108-122 Nm (80-90 ft. lbs)

Torque cartridge in steel housing 136-149.6 Nm (100-110 ft. lbs)

### Cartridge only



### Installation drawing (steel)



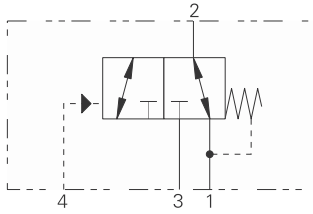
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS5-10 - Pilot to shift valve

Pilot operated, directional control valve  
 11 L/min (3 USgpm) • 210 bar (3000 psi)



### Operation

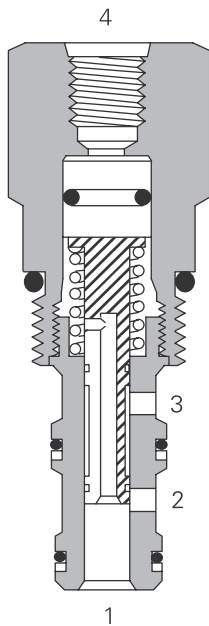
This valve allows flow between ports 1 and 2 while blocking port 3 until sufficient pressure has been applied to port 4 and the spring bias is overcome.

At this time, flow is directed between port 2 and port 3 while blocking port 1. During the cross-over transition, all ports are blocked. The spring chamber for this valve is vented to port 1.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage.

### Sectional view



### Performance data

#### 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 <sup>3</sup> /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 <sup>3</sup> (0.02 in <sup>3</sup> )
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®)

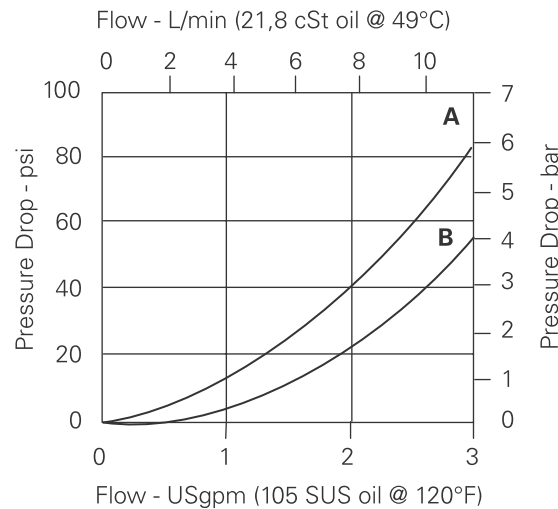
Viton is a registered trademark of E.I. DuPont.

### Description

This is a 3-way 2 position, remotely pilot operated directional control valve ideal for selecting a function when the pilot pressure is applied or lost.

### Pressure drop curves

Cartridge only



**A** - Port 3 to 2

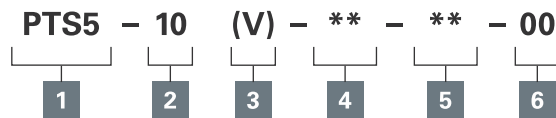
**B** - Port 2 to 1

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS5-10 - Pilot to shift valve

Pilot operated, directional control valve  
11 L/min (3 USgpm) • 210 bar (3000 psi)

## Model code



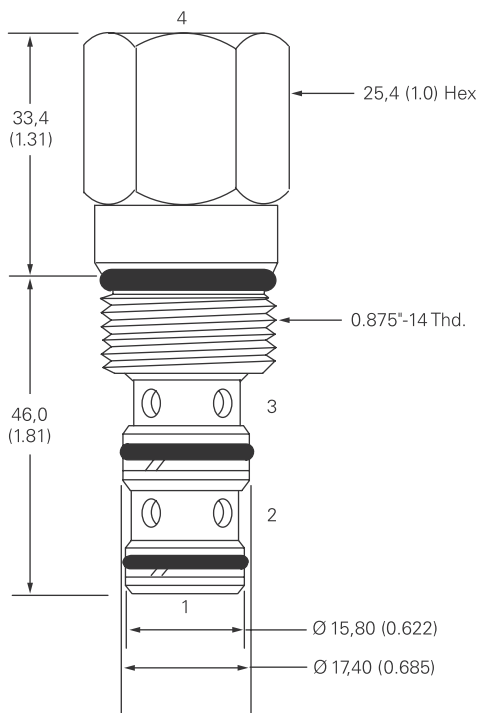
<b>1 Function</b> PTS5 - Pilot to shift valve	<b>4 Port size</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Code</th> <th style="text-align: left;">Port size</th> <th style="text-align: left;">Housing number</th> </tr> </thead> <tbody> <tr> <td><b>0</b></td> <td>Cartridge only</td> <td></td> </tr> <tr> <td><b>3B</b></td> <td>3/8" BSPP</td> <td>02-173358</td> </tr> <tr> <td><b>6T</b></td> <td>SAE 6</td> <td>566162</td> </tr> <tr> <td><b>2G</b></td> <td>1/4" BSPP</td> <td>-</td> <td>876705</td> </tr> <tr> <td><b>3G</b></td> <td>3/8" BSPP</td> <td>-</td> <td>876714</td> </tr> <tr> <td><b>6H</b></td> <td>SAE 6</td> <td>-</td> <td>876704</td> </tr> <tr> <td><b>8H</b></td> <td>SAE 8</td> <td>-</td> <td>876711</td> </tr> </tbody> </table> See section J for housing details.	Code	Port size	Housing number	<b>0</b>	Cartridge only		<b>3B</b>	3/8" BSPP	02-173358	<b>6T</b>	SAE 6	566162	<b>2G</b>	1/4" BSPP	-	876705	<b>3G</b>	3/8" BSPP	-	876714	<b>6H</b>	SAE 6	-	876704	<b>8H</b>	SAE 8	-	876711	<b>5 Pilot to shift (nominal)</b> 50 - 3,45 bar (50 psi)
Code	Port size	Housing number																												
<b>0</b>	Cartridge only																													
<b>3B</b>	3/8" BSPP	02-173358																												
<b>6T</b>	SAE 6	566162																												
<b>2G</b>	1/4" BSPP	-	876705																											
<b>3G</b>	3/8" BSPP	-	876714																											
<b>6H</b>	SAE 6	-	876704																											
<b>8H</b>	SAE 8	-	876711																											
<b>2 Size</b> 10 - 10 size	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Code</th> <th style="text-align: left;">Port size</th> <th style="text-align: left;">Aluminum light duty</th> <th style="text-align: left;">Aluminum fatigue rated</th> </tr> </thead> <tbody> <tr> <td><b>0</b></td> <td>Cartridge only</td> <td></td> <td></td> </tr> </tbody> </table>	Code	Port size	Aluminum light duty	Aluminum fatigue rated	<b>0</b>	Cartridge only			<b>6 Special features</b> 00 - None (Only required if valve has special features, omitted if "00".)																				
Code	Port size	Aluminum light duty	Aluminum fatigue rated																											
<b>0</b>	Cartridge only																													
<b>3 Seal material</b> Blank - Buna-N V - Viton®																														

## Dimensions

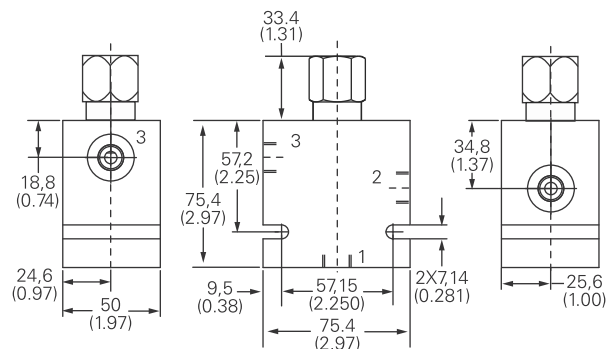
mm (inch)

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

### Cartridge only



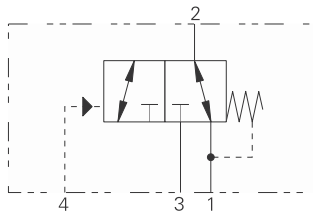
### Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS15-12 - Pilot to shift valve

Pilot operated, directional control valve  
 105 L/min (27.7 USgpm) • 350 bar (5000 psi)



## Operation

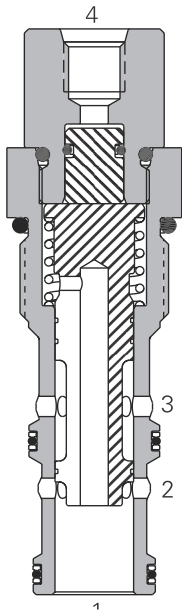
This valve allows flow between ports 1 and 2 while blocking port 3 until sufficient pressure has been applied to port 4 and the spring bias is overcome.

At this time, flow is directed between port 2 and port 3 while blocking port 1. During the cross-over transition, all ports are blocked. The spring chamber for this valve is vented to port 1.

## Features

Hardened, ground and honed internal sleeve and spool for low internal leakage. Working pressure 350 bar.

## Sectional view



## Performance data

### 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	105 L/min (28 USgpm)
Internal leakage	210 cc/min (13 in <sup>3</sup> /min) maximum @ 350 bar (5000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	2.76 bar (40 psi)
Pilot displacement volume	0,49 cm <sup>3</sup> (0.02 in <sup>3</sup> )
Cavity	C-12-3
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing material	Aluminum, Steel
Weight cartridge only	0,21 kg (0.55 lbs)
Seal kit	9900171 (Buna-N), 9900172 (Viton®)

Viton is a registered trademark of E.I. DuPont

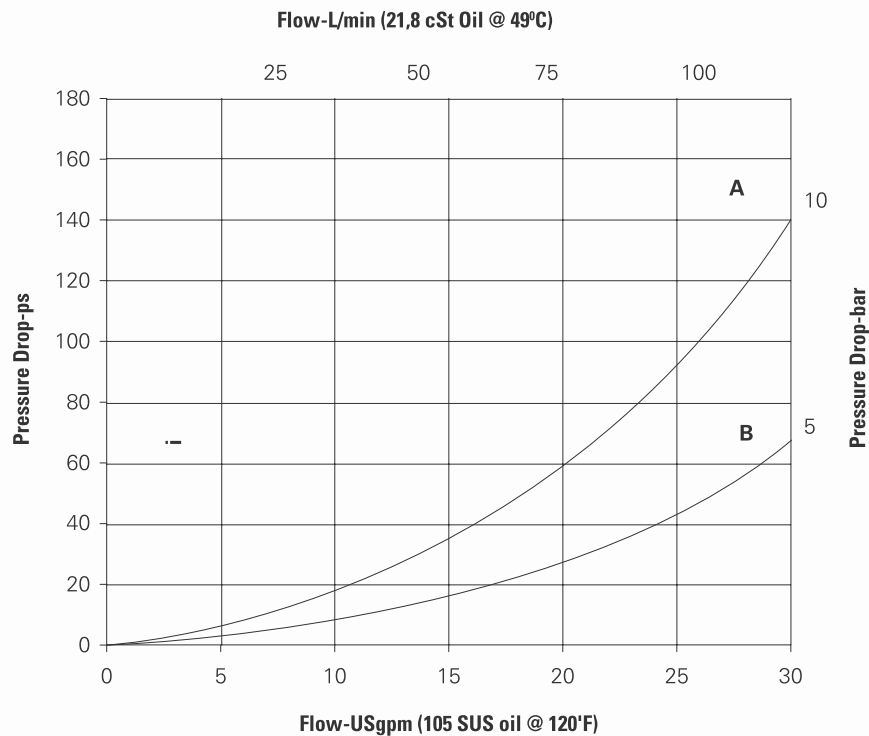
## Description

This is a 3-way 2 position, high pressure, remotely pilot operated directional control valve ideal for selecting a function when the pilot pressure is applied or lost.

## Pressure drop curves

Cartridge only

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



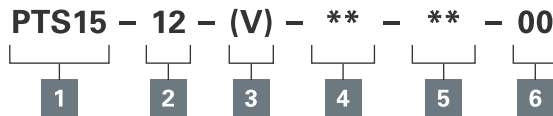
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# PTS15-12 - Pilot to Shift Valve

Pilot operated, directional control valve  
105 L/min (27.7 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

**PTS15** - Pilot to shift valve

### 2 Size

**12** - 12 size

### 3 Seal material

**Blank** - Buna-N  
**V** - Viton®

### 4 Port size

Code	Port size	Housing number	
		Aluminum	Steel
<b>0</b>	Cartridge		
<b>A4G</b>	1/2" BSPP	02-161817	
<b>A6G</b>	3/4" BSPP	02-161816	
<b>A10H</b>	SAE 10	02-160642	
<b>A12H</b>	SAE 12	02-160646	
<b>S8G</b>	1/2" BSPP		02-169814
<b>S10T</b>	SAE 10		02-161070
<b>S12T</b>	SAE 12		02-169816

See section J for housing details.

### 5 Pilot to shift (nominal)

**40** - 2,76 bar (40 psi)

### 6 Special features

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

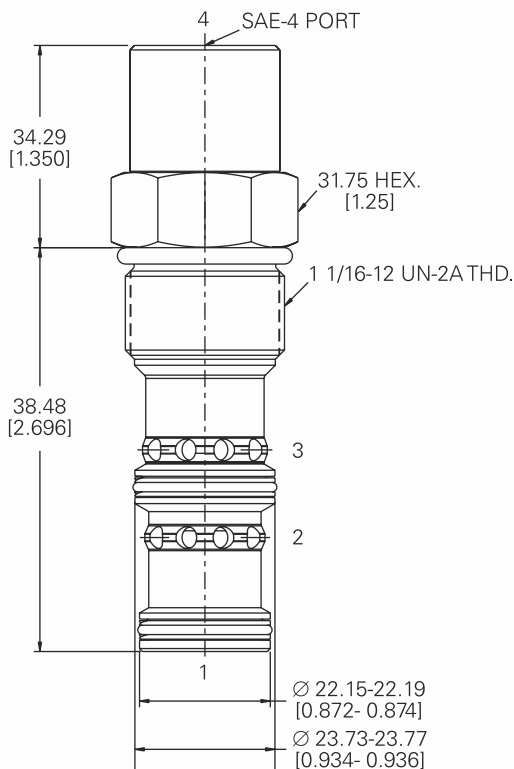
## Dimensions

mm (inch)

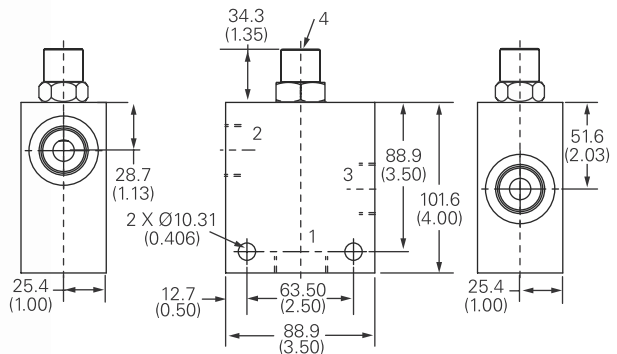
Torque cartridge in  
aluminum housing  
81-93 Nm (60-70 ft lbs)

Torque cartridge in  
steel housing  
102-115 Nm (75-85 ft lbs)

### Cartridge only



### Installation drawing (steel)



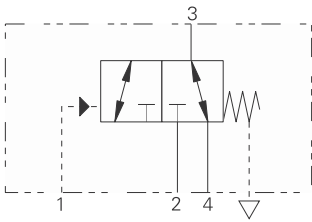
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS5-16 - Pilot to shift valve

Pilot operated, directional control valve  
 132 L/min (35 USgpm) • 210 bar (3000 psi)



### Operation

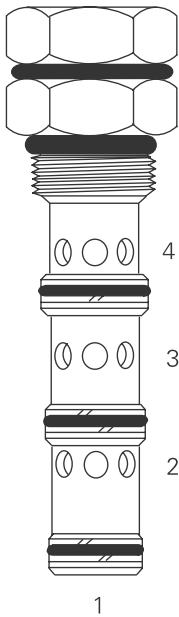
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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

### Features

Hardened, ground and honed sleeve and spool for low internal leakage.

### Sectional view



### Performance data

#### 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 <sup>3</sup> /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	<b>40</b> - 2,75 bar (40 psi) <b>80</b> - 5,5 bar (80 psi) <b>160</b> - 11,0 bar (160 psi)
Pilot displacement volume	1,97 cm <sup>3</sup> (0.12 in <sup>3</sup> )
Cavity	C-16-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/ <b>16/13</b>
Standard housing materials	Aluminum
Weight cartridge only	0,5 kg (1.12 lbs)
Seal kit	889634 (Buna-N), 889638 (Viton®)

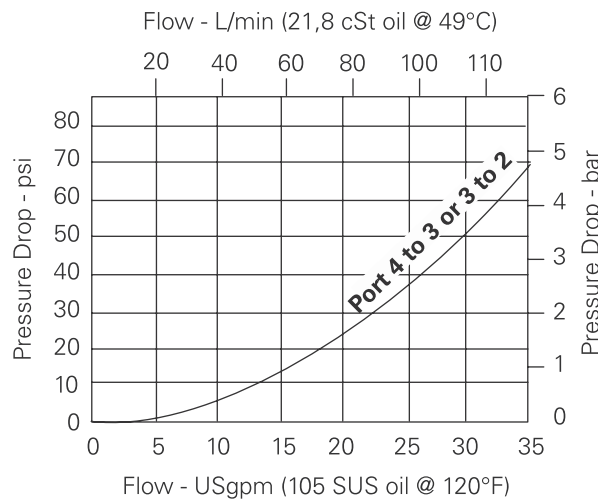
Viton is a registered trademark of E.I. DuPont.

### Description

This is a 3-way 2 position, pilot operated directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

### Pressure drop curves

Cartridge only

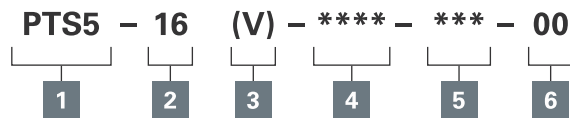


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS5-16 - Pilot to shift valve

Pilot operated, directional control valve  
132 L/min (35 USgpm) • 210 bar (3000 psi)

## Model code



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

**2 Size**  
16 - 16 size

**3 Seal material**  
Blank - Buna-N  
V - Viton®

## 4 Port size

Code	Port size	Housing number		
		Aluminum light duty	Aluminum fatigue rated	Steel
0	Cartridge			
A12T	SAE 12	566411	-	-
A6B	3/4" BSPP	02-175468	-	-
A10H	SAE 10	-	876729	-
A12H	SAE 12	-	876731	-
A4G	1/2" BSPP	-	876728	-
A6G	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

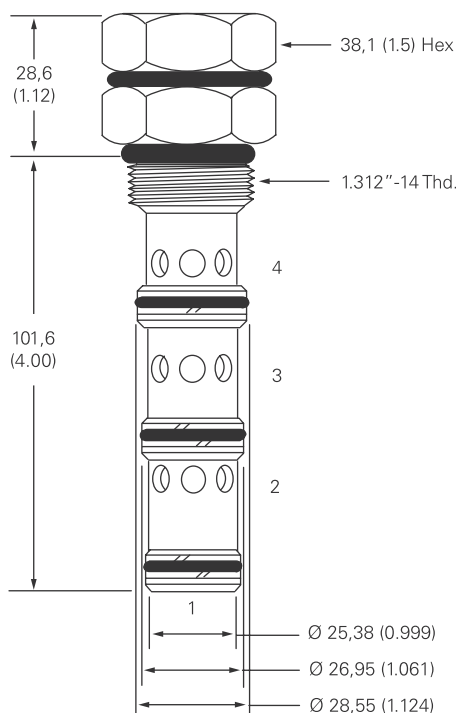
00 - None  
(Only required if valve has special features, omitted if "00".)

## Dimensions

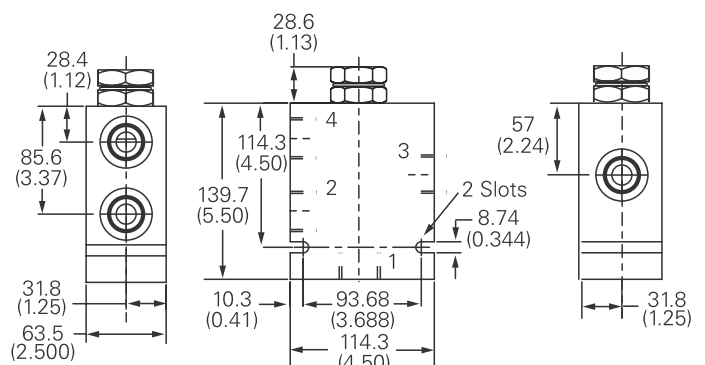
mm (inch)

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

### Cartridge only



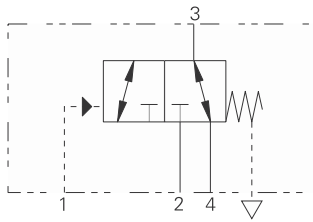
### Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS15-16 - Pilot to shift valve

Pilot operated, directional control valve  
 132 L/min (35 USgpm) • 350 bar (5000 psi)



### Operation

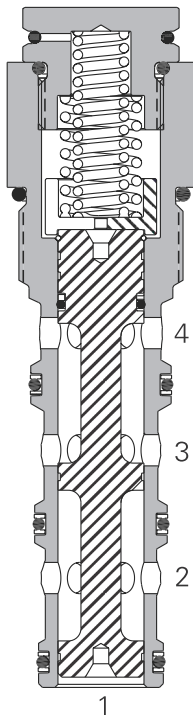
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Working pressure 350 bar.

### Sectional view



### Performance data

#### Ratings and specifications

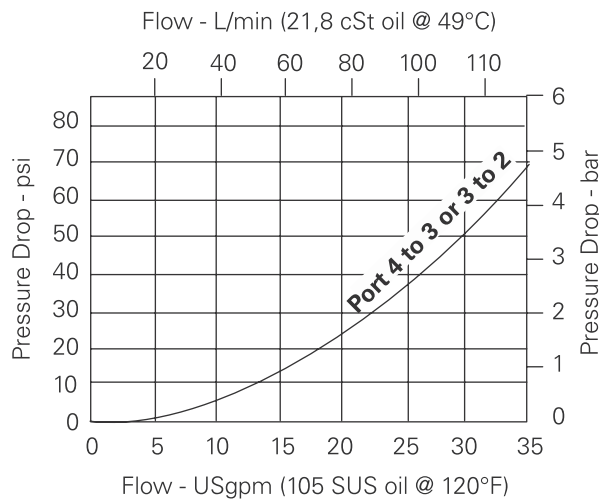
Performance data is typical with fluid at 21,8 cST (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	132 L/min (35 USgpm)
Internal leakage	210 cc/min (13in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	<b>80</b> - 5,5 bar (80 psi) <b>160</b> - 11,0 bar (160 psi)
Pilot displacement volume	1,97 cm <sup>3</sup> (0.12 in <sup>3</sup> )
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), 889638 (Viton®)

Viton is a registered trademark of E.I. DuPont.

### Pressure drop curves

Cartridge only



### Description

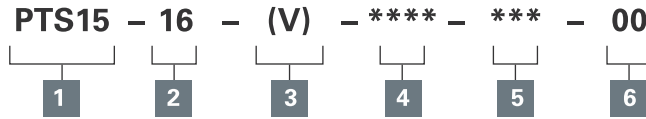
This is a 3-way 2 position, high pressure pilot operated, directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS15-16 - Pilot to shift valve

Pilot operated, directional control valve  
132 L/min (35 USgpm) • 350 bar (5000 psi)

## Model code



**1 Function**  
PTS15 - Pilot to shift valve

**2 Size**  
16 - 16 Size

**3 Seals**  
Blank - Buna-N

**4 Port size**  
0 - Cartridge only

Code	Port size	Housing number		
		Aluminum light duty	Aluminum fatigue rated	Steel
A12T	SAE 12	566411		
A6B	3/4" BSPP	02-175468		
A10H	SAE 10		876729	
A12H	SAE 12		876731	
A4G	1/2" BSPP		876728	
A6G	3/4" BSPP		876730	
S4G	1/2" BSPP			02-175143
S6G	3/4" BSPP			02-175144
S10T	SAE 10			02-175141
S12T	SAE 12			02-175142

See section J for housing details.

**5 Pilot to shift (nominal)**  
40 - 2,76 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")

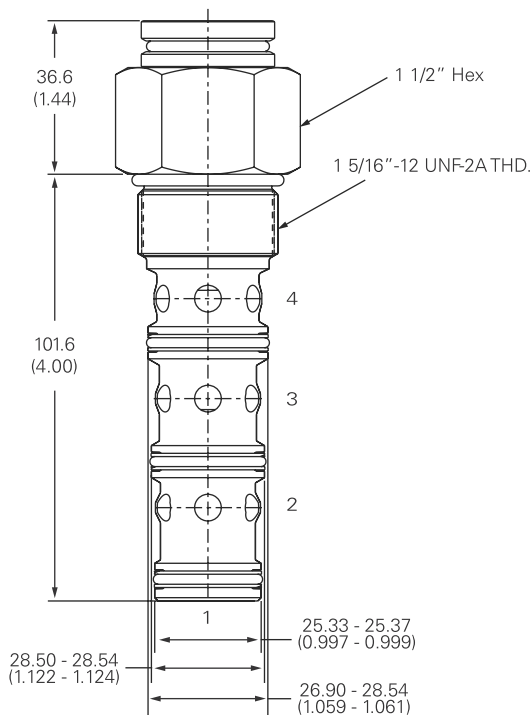
## Dimensions

mm (inch)

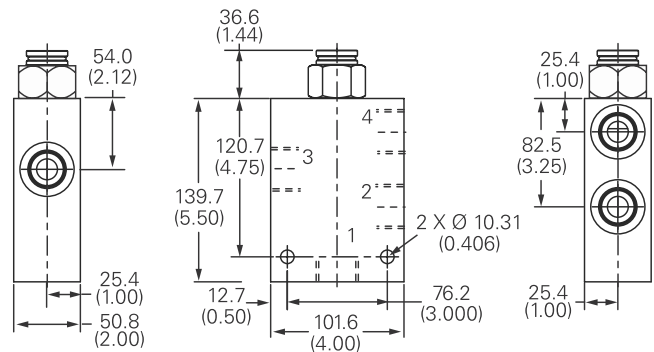
Torque cartridge in aluminum housing 108-122 Nm (80-90 ft. lbs)

Torque cartridge in steel housing 136-149.6 Nm (100-110 ft. lbs)

### Cartridge only



### Installation drawing (steel)



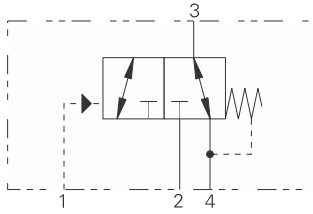
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS6-16 - Pilot to shift valve

Pilot operated, directional control valve  
 132 L/min (35 USgpm) • 210 bar (3000 psi)



### Operation

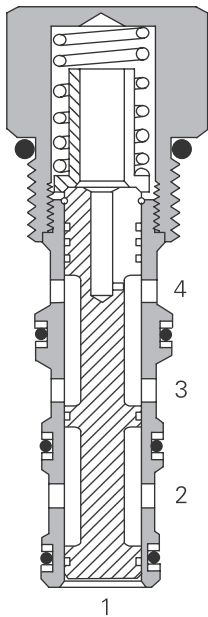
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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

### Features

Hardened, ground and honed sleeve and spool for low internal leakage.

### Sectional view



### Performance data

#### 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 <sup>3</sup> /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	<b>40</b> - 2,75 bar (40 psi) <b>80</b> - 5,5 bar (80 psi) <b>160</b> - 11,0 bar (160 psi)
Pilot displacement volume	1,97 cm <sup>3</sup> (0.12 in <sup>3</sup> )
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®)

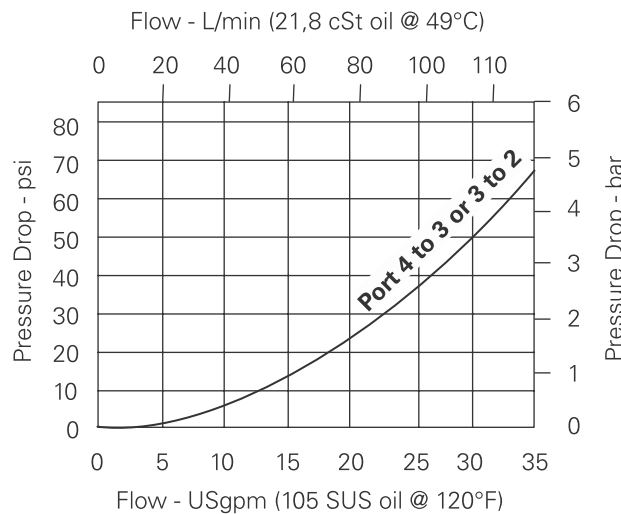
Viton is a registered trademark of E.I. DuPont

### Description

This is a 3-way 2 position, pilot operated directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

### Pressure drop curves

Cartridge only

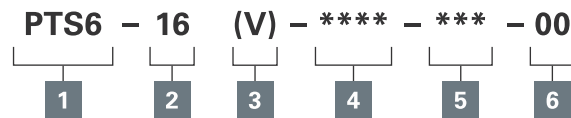


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS6-16 - Pilot to shift valve

Pilot operated, directional control valve  
132 L/min (35 USgpm) • 210 bar (3000 psi)

## Model code



### 1 Function

PTS6 - Pilot to shift valve

### 2 Size

16 - 16 size

### 3 Seal material

Blank - Buna-N  
V - Viton®

### 4 Port size

Code	Port size	Housing number		
		Aluminum light duty	Aluminum fatigue rated	Steel
0	Cartridge			
A12T	SAE 12	566411	-	-
A6B	3/4" BSPP	02-175468	-	-
A10H	SAE 10	-	876729	-
A12H	SAE 12	-	876731	-
A4G	1/2" BSPP	-	876728	-
A6G	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

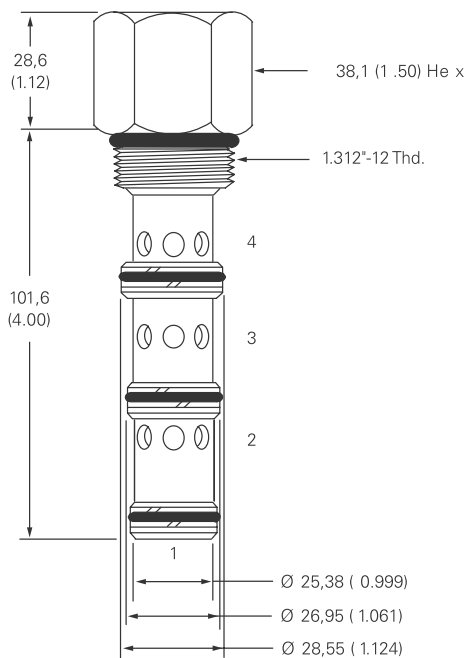
00 - None  
(Only required if valve has special features, omitted if "00".)

## Dimensions

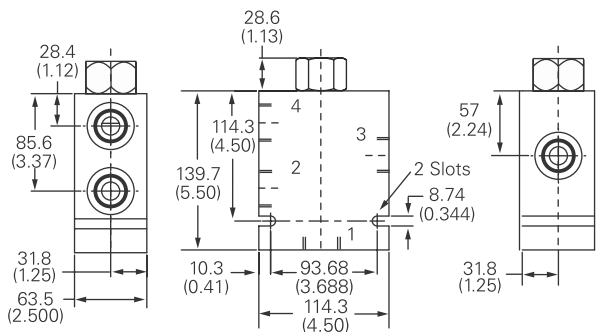
mm (inch)

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

## Cartridge only



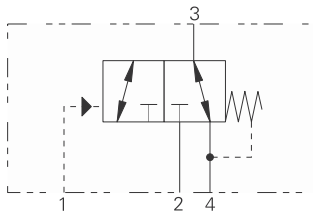
## Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS16-16 - Pilot to shift valve

Pilot operated, directional control valve  
 132 L/min (35 USgpm) • 350 bar (5000 psi)



## Operation

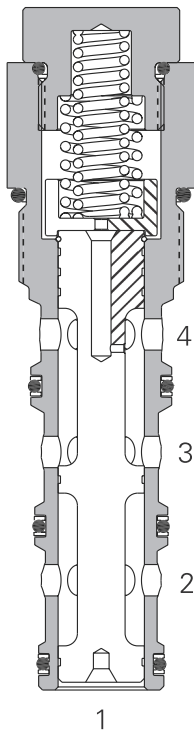
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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

## Features

Hardened, ground and honed sleeve and spool for low internal leakage. Working pressure 350 bar.

## Sectional view



## Performance data

### Ratings and specifications

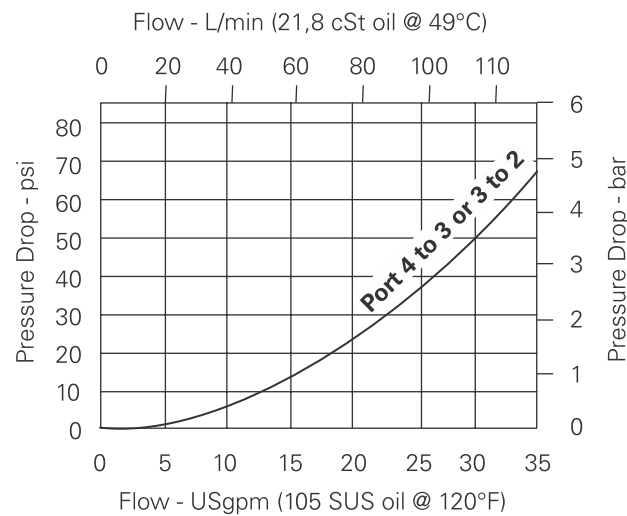
Performance data is typical with fluid at 21,8 cST (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	132 L/min (35 USgpm)
Internal leakage	210 cc/min (13in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	<b>80</b> - 5,5 bar (80 psi) <b>160</b> - 11,0 bar (160 psi)
Pilot displacement volume	1,97 cm <sup>3</sup> (0.12 in <sup>3</sup> )
Cavity	C-16-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/ <b>16/13</b>
Standard housing materials	Aluminum or Steel
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 curves

Cartridge only



## Description

This is a 3-way 2 position, high pressure pilot operated, directional control valve ideal for selecting a function when the pilot pressure is applied or removed.

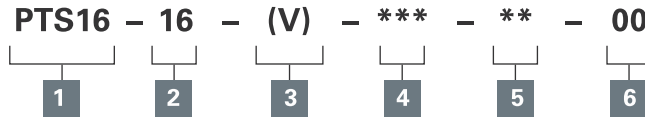
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# PTS16-16 - Pilot to shift valve

Pilot operated, directional control valve  
132 L/min (35 USgpm) • 350 bar (5000 psi)

## Model code



**1 Function**  
PTS16 - Pilot to shift valve

**2 Size**  
16 - 16 Size

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

**4 Port size**  
0 - Cartridge only

Code	Port size	Housing number		
		Aluminum light duty	Aluminum fatigue rated	Steel
A12T	SAE 12	566411		
A6B	3/4" BSPP	02-175468		
A10H	SAE 10		876729	
A12H	SAE 12		876731	
A4G	1/2" BSPP		876728	
A6G	3/4" BSPP		876730	
S4G	1/2" BSPP			02-175143
S6G	3/4" BSPP			02-175144
S10T	SAE 10			02-175141
S12T	SAE 12			02-175142

See section J for housing details.

**5 Pilot to shift (nominal)**  
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")

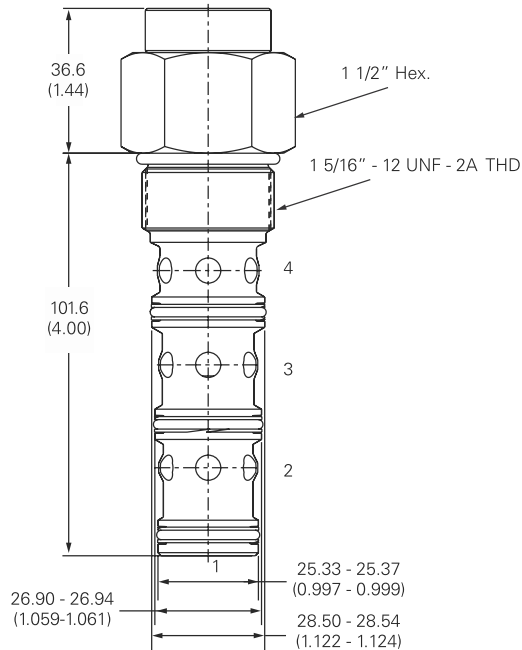
## Dimensions

mm (inch)

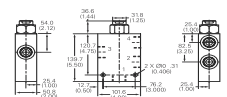
Torque cartridge in aluminum housing 81-95 Nm (60-70 ft. lbs)

Torque cartridge in steel housing 102-115 Nm (75-85 ft. lbs)

## Cartridge only



## Installation drawing (steel)



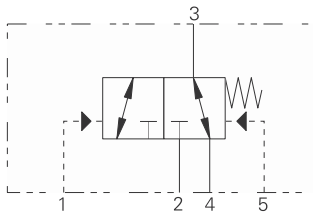
## Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS9-8 - Pilot to shift valve

Pilot operated, directional control valve  
 19 L/min (5 USgpm) • 280 bar (4000 psi)



### Operation

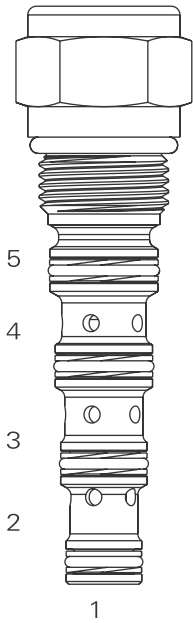
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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.

### Features

Hardened, ground and honed internal sleeve and spool for low internal leakage.

### Sectional view



### Performance data

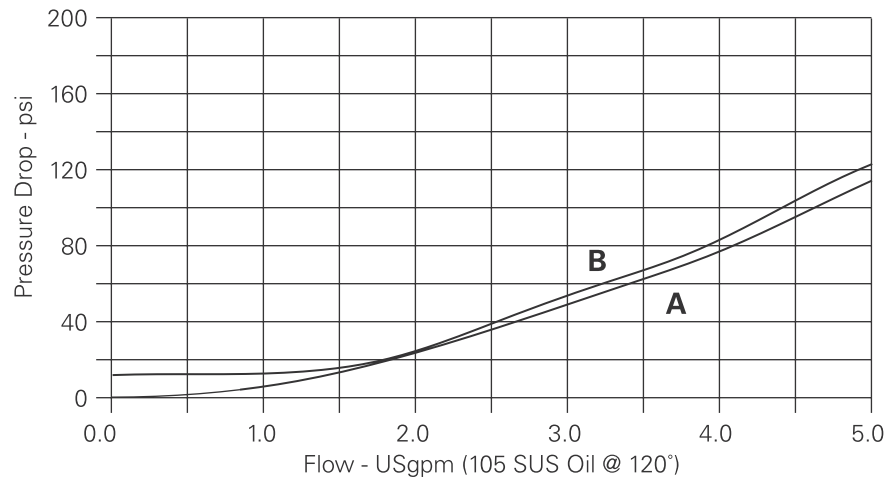
#### Ratings and specifications

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

Typical application pressure (all ports)	280 bar (4000 psi)
Cartridge fatigue pressure (infinite life)	280 bar (4000 psi)
Rated flow	19 L/min (5 USgpm)
Transition	All ports open
Internal leakage, port 2 to port 1	164 cc/min (10 in <sup>3</sup> /min) @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-8-5S
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13

### Performance characteristics

Cartridge only



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

### Description

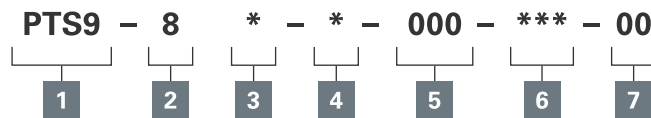
This is a 3-way 2 position, pilot operated directional control valve ideal for selecting a function when the pilot pressure is applied or lost or as a pilot operated shuttle valve.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

## PTS9-8 - Pilot to shift valve

Pilot operated, directional control valve  
19 L/min (5 USgpm) • 280 bar (4000 psi)

### Model code



#### 1 Function

**PTS9** - Pilot to shift valve

#### 2 Size

**8** - C-8-5S cavity

#### 3 Seal material

**Blank** - Buna-N  
**V** - Viton®

#### 4 Body

**0** - Cartridge only

#### 5 Port size

**000** - Cartridge only

#### 6 Pilot to shift (nominal)

**080** - 5,5 bar (80 psi)  
**160** - 11,0 bar (160 psi)

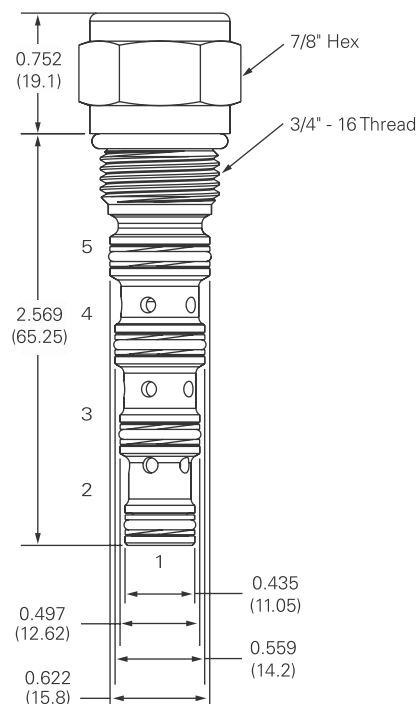
#### 7 Special features

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

### Dimensions

mm (inch)

#### Cartridge only



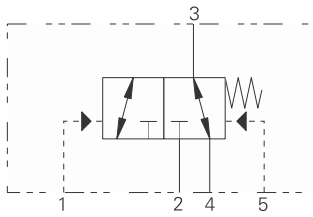
#### ⚠ Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS9-10 - Pilot to shift valve

Pilot operated, directional control valve  
38 L/min (10 USgpm) • 280 bar (4000 psi)



### Operation

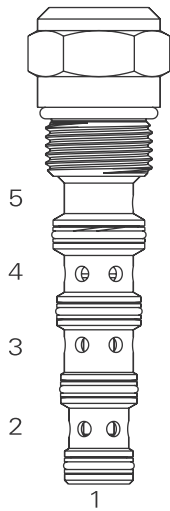
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage.

### Sectional view



### Performance data

#### Ratings and specifications

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

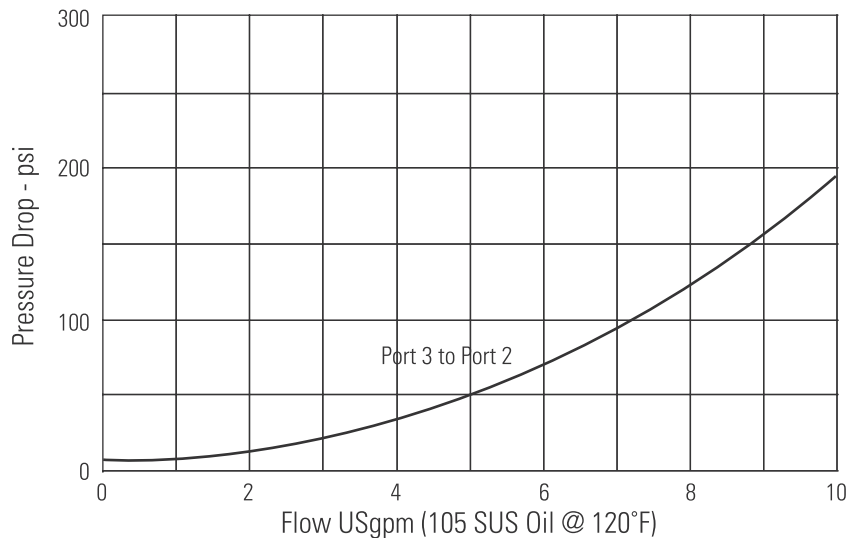
Typical application pressure (all ports)	280 bar (4000 psi)
Cartridge fatigue pressure (infinite life)	280 bar (4000 psi)
Rated flow	38 L/min (10 USgpm)
Transition	All ports open
Internal leakage, port 2 to port 1	164 cc/min (10 in <sup>3</sup> /min) @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-10-5S
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13

### Description

This is a 3-way 2 position, pilot operated directional control valve ideal for selecting a function when the pilot pressure is applied or lost or as a pilot operated shuttle valve.

### Performance characteristics

Cartridge only

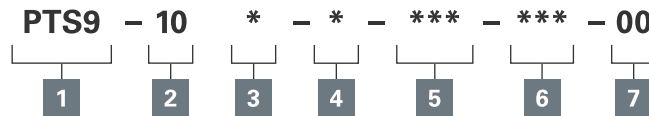


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS9-10 - Pilot to Shift Valve

Pilot operated, directional control valve  
38 L/min (10 USgpm) • 280 bar (4000 psi)

## Model code



- 1 Function**  
PTS9 - Pilot to shift valve

---

- 2 Size**  
8 - C-10-5S cavity

---

- 3 Seal material**  
Blank - Buna-N  
V -Viton®

---

- 4 Body**  
0 - Cartridge only

- 5 Port size**  
000- Cartridge only

Code	Port size		Housing number	
	Port 1, 2 & 4	Port 1 & 5	Aluminum	Steel
6T	SAE 6	SAE 4	5994133-001	5994134-001
8T	SAE 8	SAE 4	5994133-002	5994134-002
4G	1/2" BSPP	1/4" BSPP	5994133-003	5994134-003

See section J for housing details.

- 6 Shift pressure**  
80 - 5,5 bar (80 psi)  
100 - 6,9 bar (100 psi)  
160 - 11,0 bar (160 psi)

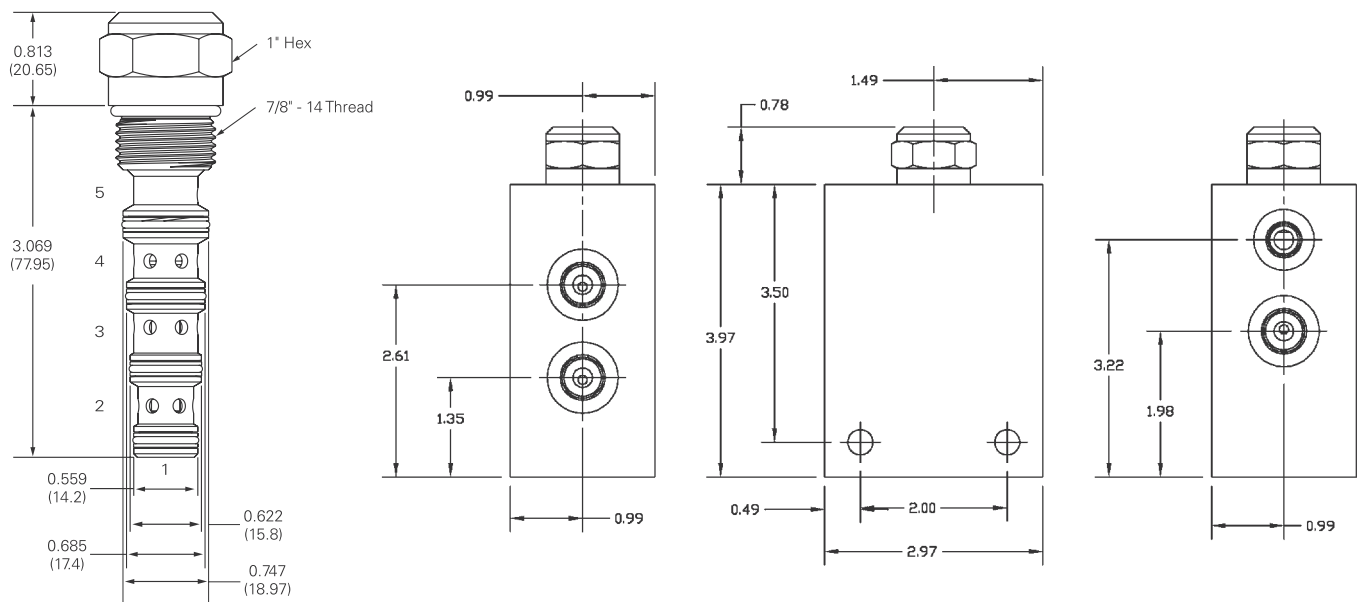
---

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

## Dimensions

mm (inch)

### Cartridge only

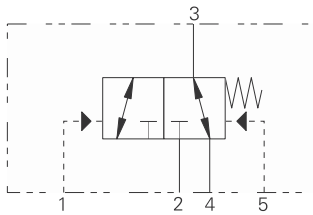


**Warning**  
Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings must be used for operating pressures above 210 bar (3000 psi).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS9-12 - Pilot to shift valve

Pilot operated, directional control valve  
76 L/min (20 USgpm) • 280 bar (4000 psi)



## Operation

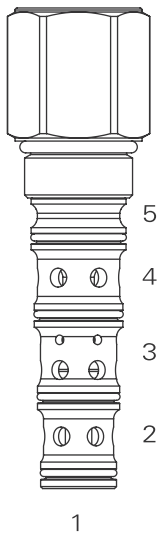
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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.

## Features

Hardened, ground and honed sleeve and spool for low internal leakage.

## Sectional view



## Performance data

### Ratings and specifications

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

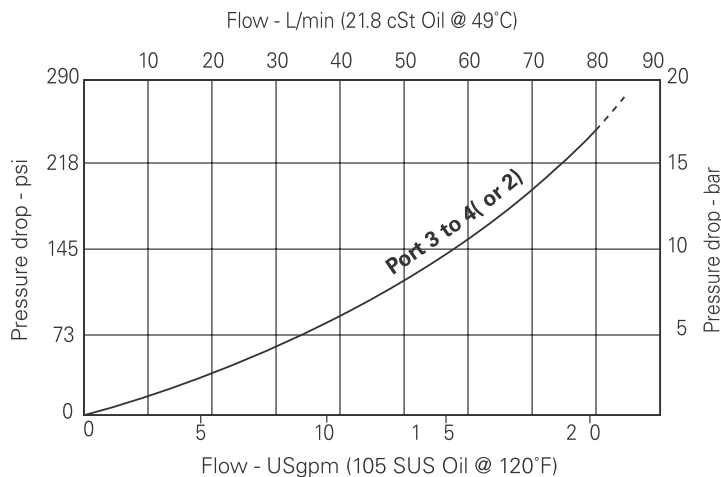
Typical application pressure (all ports)	280 bar (4000 psi)
Cartridge fatigue pressure (infinite life)	280 bar (4000 psi)
Rated flow	76 L/min (20 USgpm)
Transition	All ports open
Internal leakage, port 2 to port 1	164 cc/min (10 in <sup>3</sup> /min) @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°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/ <b>16/13</b>
Standard housing material	Aluminum or steel
Weight cartridge only	0,36 kg (0.79 lbs)
Seal kit	(Urethane) 202914-921

## Description

This is a 3-way 2 position, pilot operated directional control valve ideal for selecting a function when the pilot pressure is applied or lost or as a pilot operated shuttle valve.

## Performance characteristics

Cartridge only

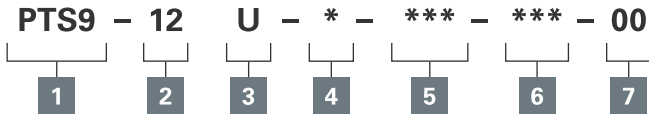


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS9-12 - Pilot to shift valve

Pilot operated, directional control valve  
76 L/min (20 USgpm) • 280 bar (4000 psi)

### Model code



- 1 Function**  
PTS9 - Pilot to shift valve

---

- 2 Size**  
8 - C-12-5S cavity

---

- 3 Seal material**  
U - Urethane (standard)

---

- 4 Body**  
0 - Cartridge only  
A - Aluminum  
S - Steel

**5 Port size**

Code	Port size		Housing number	
	Port 2, 3 & 4	Port 1 & 5	Aluminum	Steel
000	No Body	-	-	-
12T	SAE 12	SAE 4	4998820-002	4998821-002
06G	3/4" BSPP	1/4" BSPP	4998820-004	4998821-004

See section J for housing details.

- 6 Shift pressure**  
075 - 5,2 bar (75 psi)  
110 - 7,6 bar (110 psi)

---

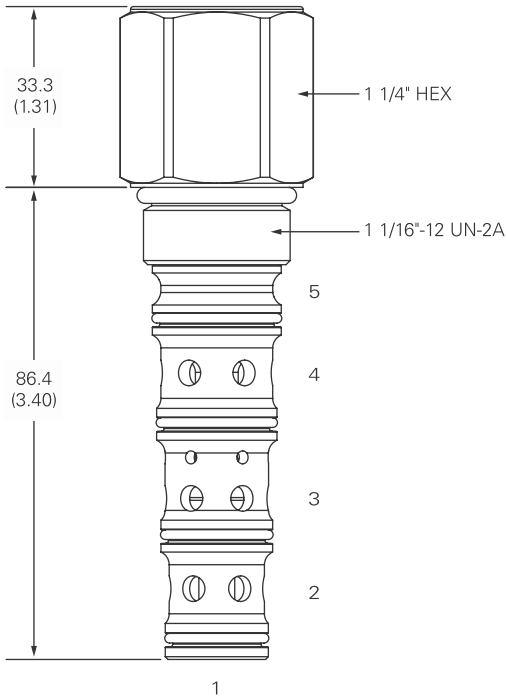
- 7 Special features**  
00 - None  
(Only required if valve has special features, omitted if "00".)

### Dimensions

mm (inch)

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

### Cartridge only

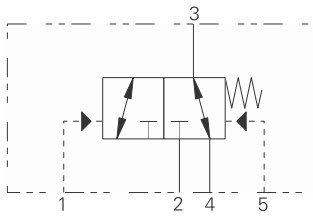


**Warning**  
 Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings must be used for operating pressures above 210 bar (3000 psi).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS9-16 - Pilot to shift valve

Pilot operated, directional control valve  
 151 L/min (40 USgpm) • 280 bar (4000 psi)



### Operation

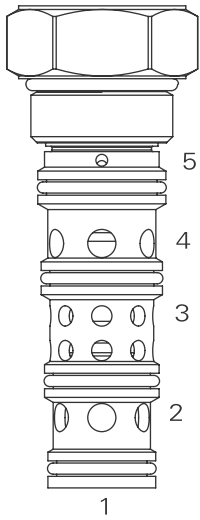
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage.

### Sectional view



### Performance data

#### Ratings and specifications

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

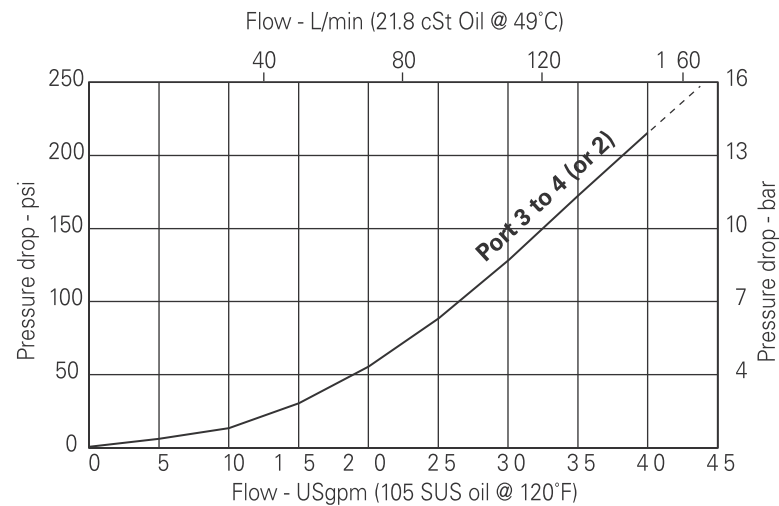
Typical application pressure (all ports)	280 bar (4000 psi)
Cartridge fatigue pressure (infinite life)	280 bar (4000 psi)
Rated flow	151 L/min (40 gpm)
Transition	All ports open
Internal leakage, port 2 to port 1	164 cc/min (10 in <sup>3</sup> /min) @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°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/ <b>16/13</b>
Standard housing material	Aluminum or steel
Weight cartridge only	0,47 kg (1.05 lbs)
Seal kit	(Urethane) 202915-922

### Description

This is a 3-way 2 position, pilot operated directional control valve ideal for selecting a function when the pilot pressure is applied or lost or as a pilot operated shuttle valve.

### Performance characteristics

Cartridge only



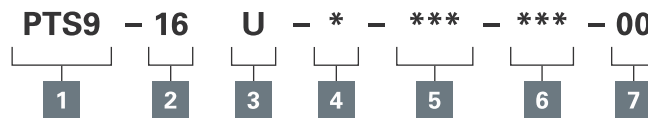
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# PTS9-16 - Pilot to shift valve

Pilot operated, directional control valve  
151 L/min (40 USgpm) • 280 bar (4000 psi)

## Model code



### 1 Function

**PTS9** - Pilot to shift valve

### 2 Size

**16** - C-16-5S cavity

### 3 Seal material

**U** - Urethane (standard)

### 4 Body

**0** - Cartridge only  
**A** - Aluminum  
**S** - Steel

### 5 Port size

Code	Port size		Housing number	
	Port 2, 3 & 4	Port 1 & 5	Aluminum	Steel
<b>000</b>	No Body	-	-	-
<b>16T</b>	SAE 16	SAE 4	4994880-002	4994881-002
<b>08G</b>	1" BSPP	1/4" BSPP	4994880-004	4994881-004

See section J for housing details.

### 6 Shift pressure

**030** - 2 bar (30 psi)  
**050** - 3,5 bar (50 psi)  
**070** - 4,8 bar (70 psi)

### 7 Special features

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

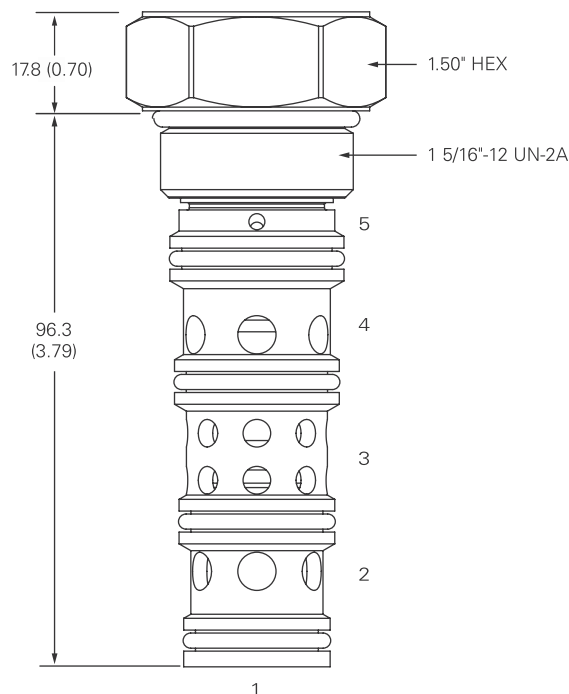
## Dimensions

mm (inch)

Torque cartridge in housing:

**A** - 108-122 Nm (80-90 ft lbs)  
**S** - 136-149 Nm (100-110 ft lbs)

## Cartridge only



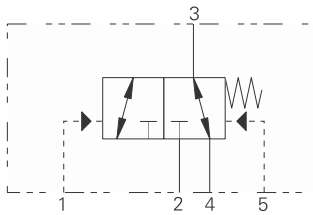
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS9-20 - Pilot to shift valve

Pilot operated, directional control valve  
230 L/min (60 USgpm) • 280 bar (4000 psi)



### Operation

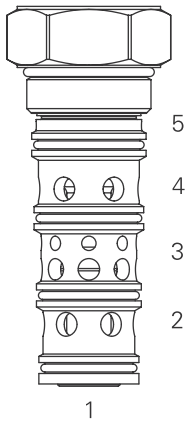
This valve allows flow between ports 3 and 4 while blocking port 2 until sufficient pressure has been applied to port 1 and the spring bias is overcome.

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.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage.

### Sectional view



### Performance data

#### Ratings and specifications

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

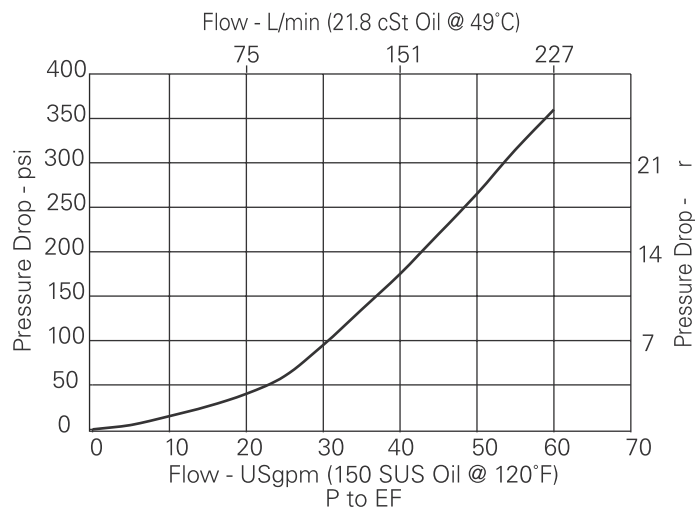
Typical application pressure (all ports)	280 bar (4000 psi)
Cartridge fatigue pressure (infinite life)	280 bar (4000 psi)
Rated flow	230 L/min (60 USgpm)
Transition	All ports open
Internal leakage, port 2 to port 1	164 cc/min (10 in <sup>3</sup> /min) @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°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	Aluminum or Steel
Weight cartridge only	0,86 kg (1.9 lbs)
Seal kit	(Urethane) 02-187543

### Description

This is a 3-way 2 position, pilot operated directional control valve ideal for selecting a function when the pilot pressure is applied or lost or as a pilot operated shuttle valve.

### Performance characteristics

Cartridge only

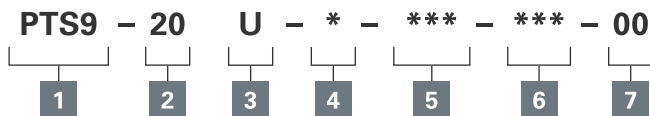


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS9-20 Pilot to shift valve

Pilot operated, directional control valve  
230 L/min (60 USgpm) • 280 bar (4000 psi)

## Model code



- 1 Function**  
PTS9 - Pilot to shift valve

---

- 2 Size**  
20 - C-20-5S cavity

---

- 3 Seal material**  
U - Urethane (standard)

---

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

**5 Port size**

Code	Port size		Housing number	
	Port 2, 3 & 4	Port 1 & 5	Aluminum	Steel
000	No Body	-	-	-
16T	SAE 16	SAE 4	4998822-002	4998823-002
08G	1" BSPP	1/4" BSPP	4998822-004	4998823-004

See section J for housing details.

- 6 Shift pressure**  
40 - 2,75 bar (40 psi)  
80 - 5,5 bar (80 psi)

---

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

## Dimensions

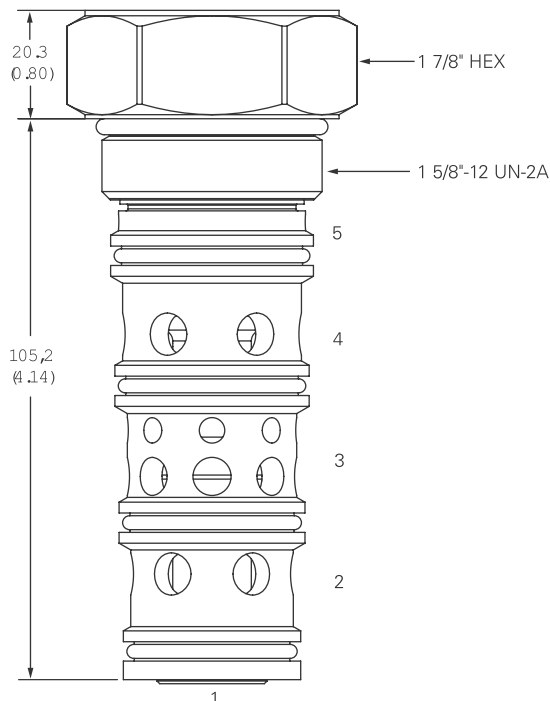
mm (inch)

Torque cartridge in housing:

**Note: A** - 108-122 Nm  
(80-90 ft lbs)

**S** - 136-149 Nm (100-110 ft lbs)

## Cartridge only



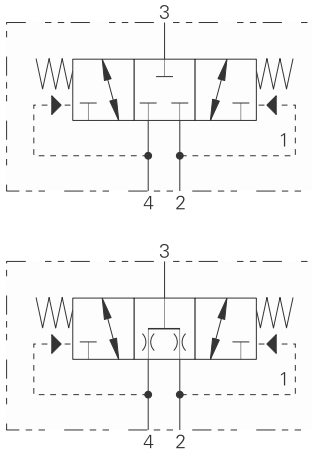
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# DSV4-10 - Shuttle valve

Spring centered, open or closed center spool type shuttle valve  
 26 L/min (6.9 USgpm) • 350 bar (5000 psi)



### 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.

### Features

Hardened, ground and honed working parts to limit leakage and prolong life. The valve should be fitted into a blind C-10-4 cavity or a standard body with port 1 plugged. Several switching pressures available. Compact design with a low Pressure drop.

### Performance data

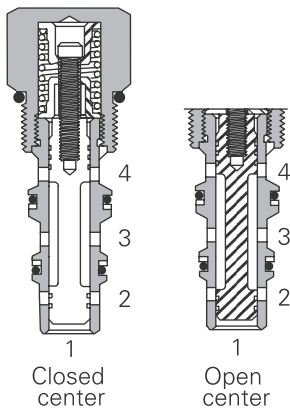
#### Ratings and specifications

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 (6.9 USgpm)
Internal leakage	164 cc/min (10 in <sup>3</sup> /min) maximum @ 210 bar (3000 psi)
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 <sup>3</sup> (0.02 in <sup>3</sup> )
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-10-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/ <b>16/13</b>
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.

### Sectional view

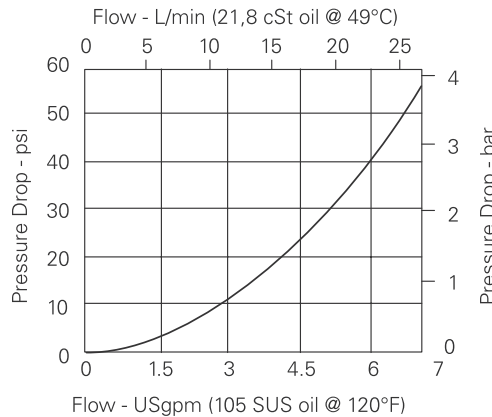


### Description

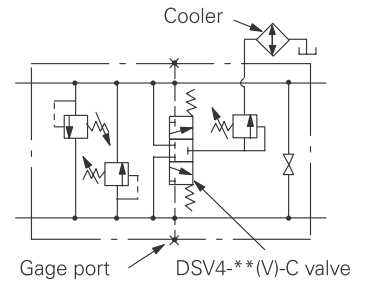
This is a 3-way 3-position, Spring centered, open or closed center spool type hot oil shuttle valve for transmission applications. This is usually built into manifolds containing other transmission components such as cross line relief valves and purge reliefs.

### Pressure drop curves

Cartridge only



### Typical application

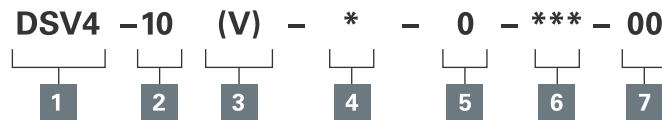


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# DSV4-10 - Shuttle valve

Spring centered, open or closed center spool type shuttle valve  
26 L/min (6.9 USgpm) • 350 bar (5000 psi)

## Model code



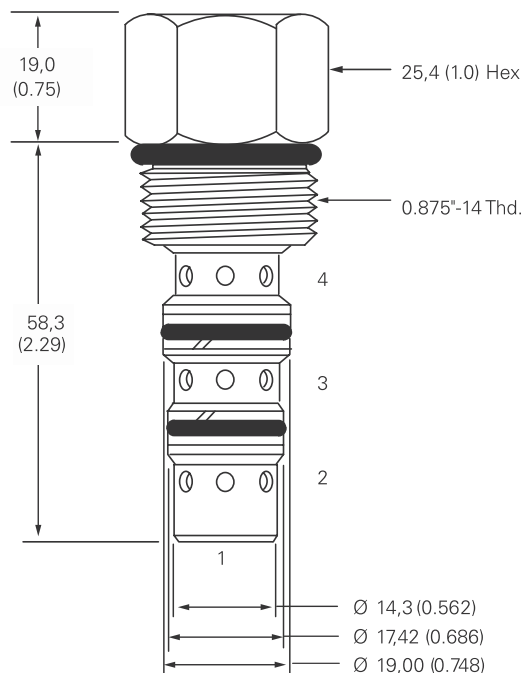
<b>1 Function</b> <b>DSV4</b> - Directional shuttle valve	<b>4 Spool configuration</b> <b>C</b> - Normally closed <b>O</b> - Open center	<b>6 Pilot to shift (nominal)</b> <b>Note:</b> Code based on pressure in psi. <b>40</b> - 2,75 bar (40 psi) <b>80</b> - 5,5 bar (80 psi) <b>160</b> -11,0 bar (160 psi)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

## Dimensions

mm (inch)

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

## Cartridge only



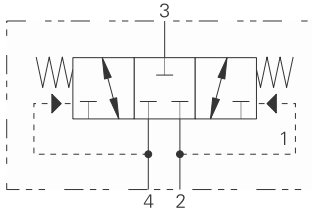
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# DSV4-12 - Shuttle valve

Spring centered, open or closed center spool type shuttle valve  
 113 L/min (29.9 USgpm) • 350 bar (5000 psi)



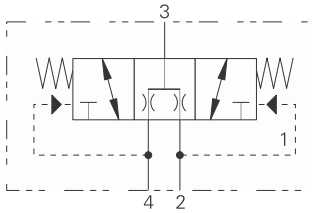
### Operation

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.

### Features

Hardened, ground and honed working parts to limit leakage and prolong life. The valve should be fitted into a blind C-12-4 cavity or a standard body with port 1 plugged. Several switching pressures available. Compact design with a low Pressure drop.



### Performance data

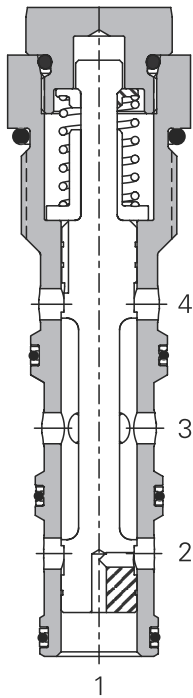
#### Ratings and specifications

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	113 L/min (29.9 USgpm)
Temperature range	-40° to 120°C (-40° to 248°F)
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20 etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum
Seal kit	(Buna-N), Viton®

Endurance tested to 1 million cycles at full rated flow and pressure.  
 Viton is a registered trademark of E.I. DuPont.

### Sectional view



### Description

This is a 3-way 3-position, Spring centered, open or closed center spool type hot oil shuttle valve for transmission applications. This is usually built into manifolds containing other transmission components such as cross line relief valves and purge reliefs.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# DSV4-12 - Shuttle valve

Spring centered, open or closed center spool type shuttle valve  
113 L/min (29.9 USgpm) • 350 bar (5000 psi)

## Model code



- 1 Function**  
DSV4 - Directional shuttle valve

---

- 2 Size**  
12 - 12 size

---

- 3 Seal material**  
Blank - Buna-N  
V - Viton®

---

- 4 Spool configuration**  
C - Normally closed  
O - Open center

**5 Port size**

Code	Port size	Housing number
<b>Aluminium</b>		
A4G	3/8" BSPP	02-173358
A6G	SAE 6	566162
A10H	3/8" BSPP	876714
A12H	SAE 6	876704

See section J for housing details.

- 6 Pilot to shift (nominal)**  
**Note:** Code based on pressure in psi.  
40 - 2,75 bar (40 psi)  
80 - 5,5 bar (80 psi)  
160 - 11,0 bar (160 psi)

---

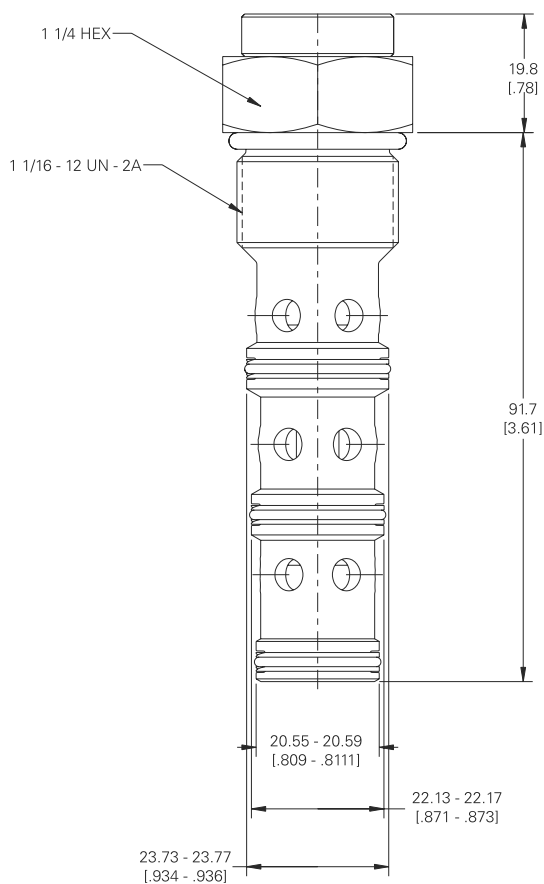
- 7 Special features**  
00 - None  
(Only required if valve has special features, omitted if "00.")

## Dimensions

mm (inch)

## Cartridge only

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



### Warning

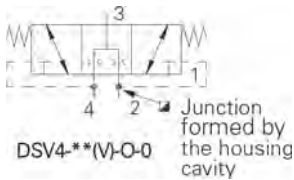
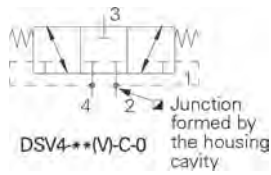
Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings must be used for operating pressures above 210 bar (3000 psi).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# DSV4-16 - Shuttle valve

Spring centered, open or closed center spool type shuttle valve  
 190 L/min (50 USgpm) • 350 bar (5000 psi)

### Functional symbols



### 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.

### Performance data

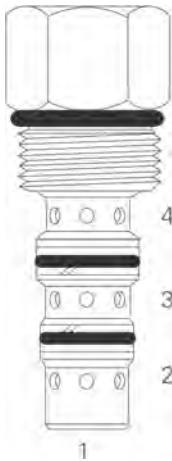
#### Ratings and specifications

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

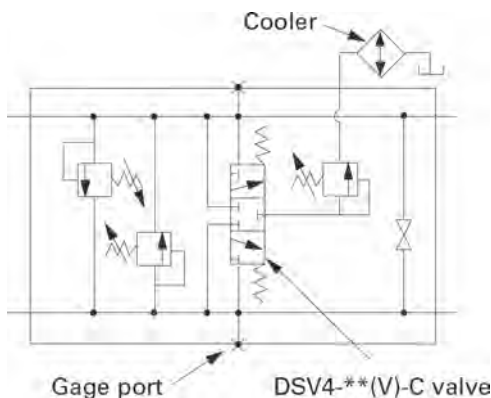
Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	190 L/min (50 USgpm)
Internal leakage	164 cc/min (10 in <sup>3</sup> /min) maximum @ 210 bar (3000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	<b>40</b> - 2,75 bar (40 psi) <b>80</b> - 5,5 bar (80 psi) <b>160</b> - 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/ <b>16/13</b>
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.

### Profile Views

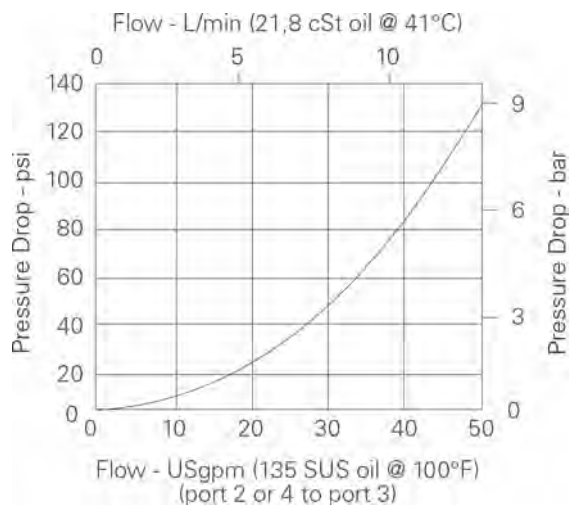


### Typical application



### Pressure drop curve

Cartridge only

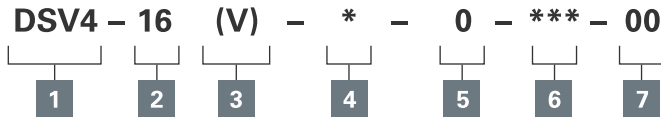


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.



# DSV4-16 - Shuttle valve

Spring centered, open or closed center spool type shuttle valve  
 190 L/min (50 USgpm) • 350 bar (5000 psi)

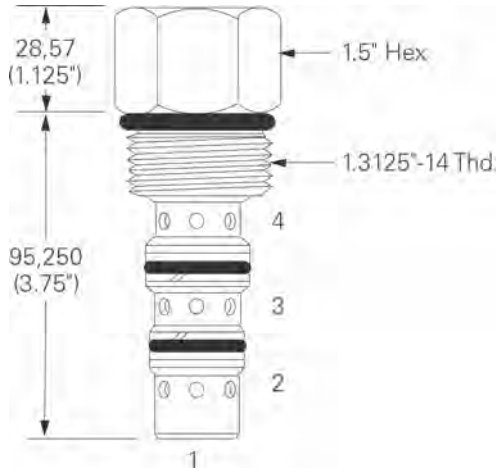


<b>1 Function</b> DSV4 - Directional shuttle valve	<b>3 Seal</b> Blank - Buna-N V - Viton®	<b>5 Port size</b> O - Cartridge only (Not available with standard housing)	<b>7 Special features</b> 00 - None (Only required if valve has special features, omitted if "00.")
<b>2 Size</b> 16 - 16 size	<b>4 Spool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

## Dimensions

mm (inch)

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

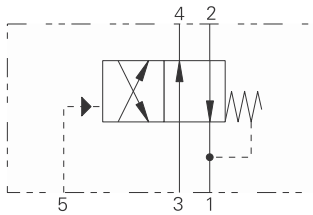


**Warning**  
 Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings **must** be used for operating pressures **above** 210 bar (3000 psi).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS6-10 - Pilot to shift valve

Remote pilot operated, directional control valve  
 23 L/min (6 USgpm) • 210 bar (3000 psi)



### Operation

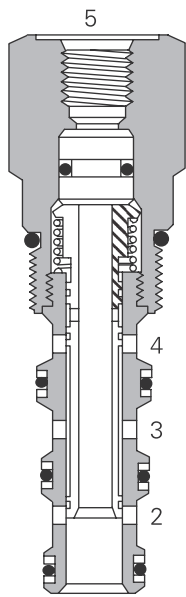
This valve allows flow between ports 1 and 2 and ports 3 and 4 until sufficient pressure has been applied at port 5 and the spring bias is overcome.

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.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage.

### Sectional view



### Performance data

#### 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 <sup>3</sup> /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 <sup>3</sup> (0.02 in <sup>3</sup> )
Cavity	C-10-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/ <b>16/13</b>
Standard housing materials	Aluminum
Weight cartridge only	0,15 kg (0.33 lbs)
Seal kit	889625 (Buna-N), 566080 (Viton®)

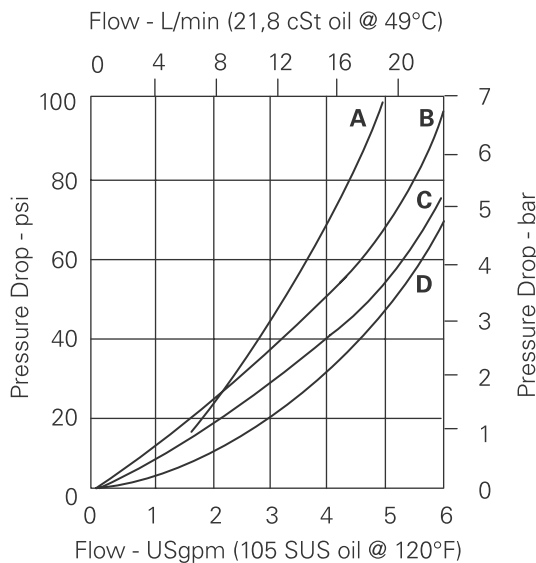
Viton is a registered trademark of E.I. DuPont.

### Description

This is a 4-way 2 position, remotely pilot operated directional control valve ideal for reversing a function when the pilot pressure is applied or lost.

### Pressure drop curves

Cartridge only

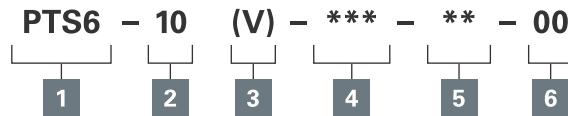


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS6-10 - Pilot to shift valve

Remote pilot operated, directional control valve  
23 L/min (6 USgpm) • 210 bar (3000 psi)

## Model code



1 Function	4 Port size	5 Pilot to shift (nominal)		
PTS6 - Pilot to shift valve		60 - 4,2 bar (60 psi)		
2 Size		6 Special features		
10 - 10 size		00 - None (Only required if valve has special features, omitted if "00".)		
3 Seal material				
Blank - Buna-N V - Viton®				
	Code	Port size	Housing number	
			Aluminium light duty	Aluminium fatigue rated
	0	Cartridge		
	A3B	3/8" BSPP	02-179705	-
	A6T	SAE 6	566161	-
	A2G	1/4" BSPP	-	876709
	A3G	3/8" BSPP	-	876715
	A6H	SAE 6	-	876708
	A8H	SAE 8	-	876713

See section J for housing details.

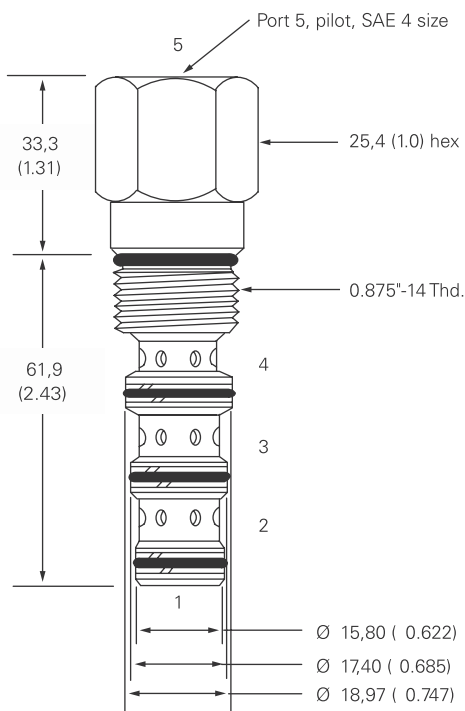
## Dimensions

mm (inch)

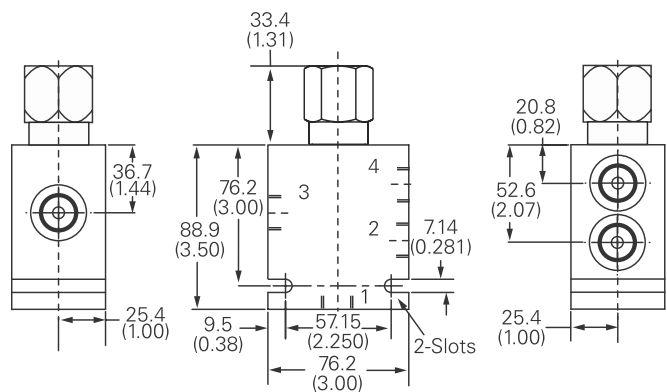
Torque cartridge in aluminum housing  
47-75 Nm (35-40 ft lbs)

Torque cartridge in steel housing 68-75 Nm  
(50-55 ft lbs)

## Cartridge only



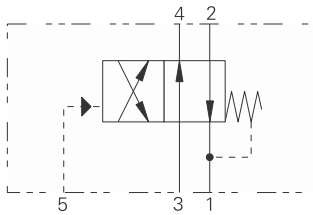
## Installation drawing



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS16-10 - Pilot to shift valve

Remote pilot operated, directional control valve  
 23 L/min (6 USgpm) • 350 bar (5000 psi)



### Operation

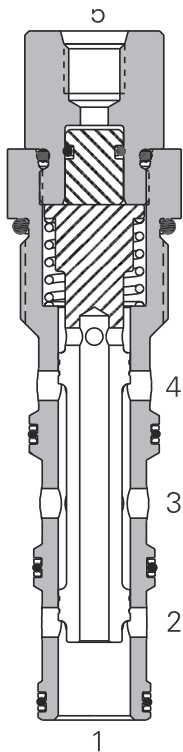
This valve allows flow between ports 1 and 2 and ports 3 and 4 until sufficient pressure has been applied at port 5 and the spring bias is overcome.

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.

### Features

Hardened, ground and honed sleeve and spool for low internal leakage. Working pressure 350 bar.

### Sectional view



### Performance data

#### Ratings and specifications

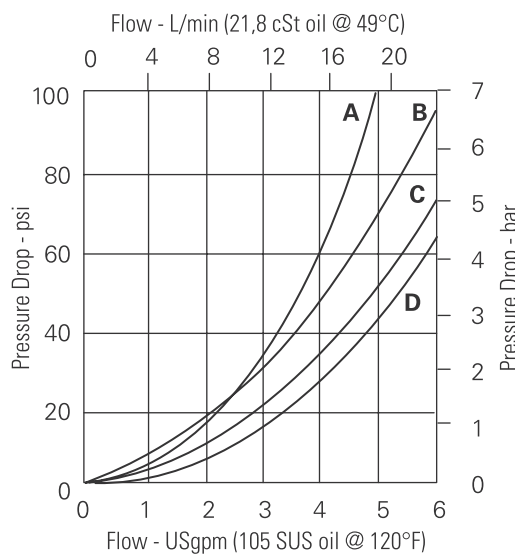
*Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)*

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	23 L/min (6 USgpm)
Internal leakage	210 cc/min (13in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	4,2 bar (60 psi)
Pilot displacement volume	0,49 cm <sup>3</sup> (0.02 in <sup>3</sup> )
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	0,5 kg (0.55 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

### Description

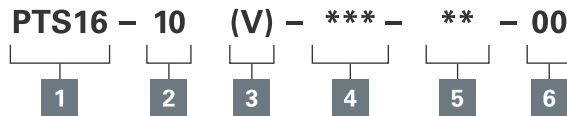
This is a 4-way 2 position, high pressure, remotely pilot operated directional control valve ideal for reversing a function when the pilot pressure is applied or lost.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS16-10 - Pilot to shift valve

Remote pilot operated, directional control valve  
23 L/min (6 USgpm) • 350 bar (5000 psi)

## Model code



### 1 Function

PTS16 - Pilot to shift valve

### 2 Size

10 - 10 size

### 3 Seal material

Blank - Buna-N  
V - Viton®

### 4 Port size

Code	Port size	Housing number		
		Aluminium light duty	Aluminium fatigue rated	Steel
0	Cartridge			
A3B	3/8" BSPP	02-179705	-	-
A6T	SAE 6	566161	-	-
A2G	1/4" BSPP	-	876709	-
A3G	3/8" BSPP	-	876715	-
A6H	SAE 6	-	876708	-
A8H	SAE 8	-	876713	-
S2G	1/4" BSPP	-	-	02-175139
S3G	3/8" BSPP	-	-	02-175140
S6T	SAE 6	-	-	02-175137
S8T	SAE 8	-	-	02-175138

See section J for housing details.

### 5 Pilot to shift (nominal)

60 - 4,2 bar (60 psi)

### 6 Special features

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

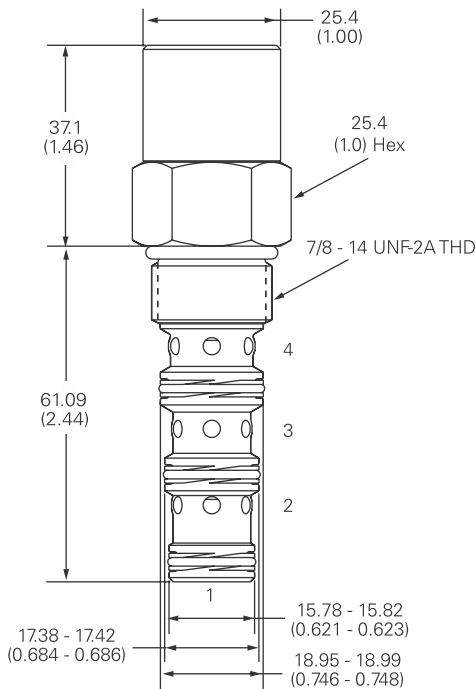
## Dimensions

mm (inch)

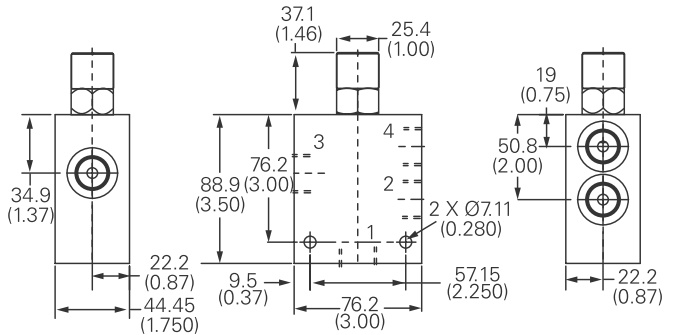
Torque cartridge in aluminum housing  
47-75 Nm (35-40 ft lbs)

Torque cartridge in steel housing  
68-75 Nm (50-55 ft lbs)

## Cartridge only



## Installation drawing Steel



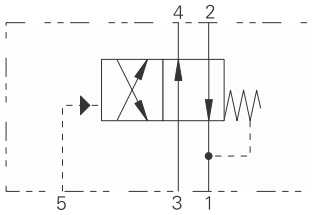
### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS16-12 - Pilot to shift valve

Pilot operated, directional control valve  
76 L/min (20 USgpm) • 350 bar (5000 psi)



## Operation

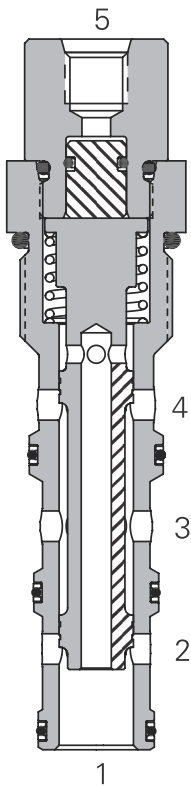
This valve allows flow between ports 1 and 2 and ports 3 and 4 until sufficient pressure has been applied at port 5 and the spring bias is overcome. At that time, flow is

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.

## Features

Hardened, ground and honed sleeve and spool for low internal leakage. Working pressure 350 bar.

## Sectional view



## Performance data

### Ratings and specifications

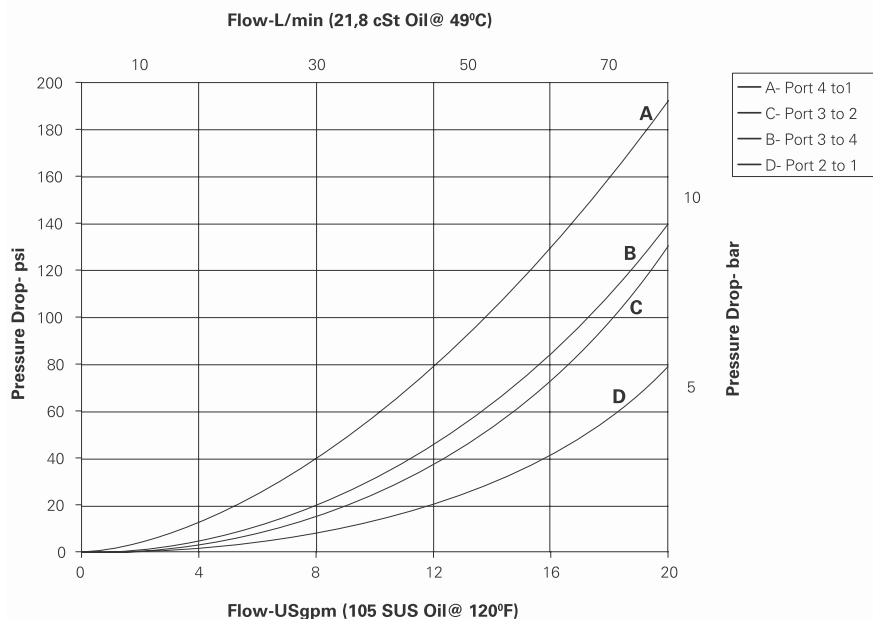
Performance data is typical with fluid at 21,8 cST (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated flow	76 L/min (20 USgpm)
Internal leakage	210 cc/min (13in <sup>3</sup> /min) @ 350 bar (5000 psi)
Temperature range	-40° to 120°C (-40° to 248°F)
Pilot pressures	3,4 bar (50 psi)
Pilot displacement volume	1,97 cm <sup>3</sup> (0.12 in <sup>3</sup> )
Cavity	C-12-4
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/16/13
Standard housing materials	Aluminum or Steel
Weight cartridge only	0,32 kg (0.70 lbs)
Seal kit	02-160979 (Buna-N), 02-160980 (Viton®)

Viton is a registered trademark of E.I. DuPont

## Pressure drop curves

Cartridge only



## Description

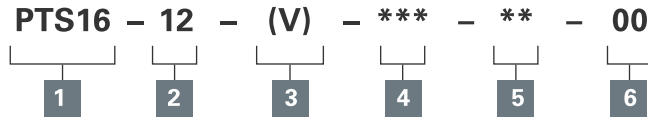
This is a 4-way, 2 position, remotely pilot operated directional control valve ideal for reversing a function when the pilot pressure is applied or lost.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

# PTS16-12 - Pilot to shift valve

Pilot operated, directional control valve  
76 L/min (20 USgpm) • 350 bar (5000 psi)

## Model code



**1 Function**  
PTS16 - Pilot to shift valve

**2 Size**  
12 - 12 Size

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

**4 Port size**  
0 - Cartridge only

Code	Port size	Housing number	
		Aluminium	Steel
A4G	1/2" BSPP	5986431-001	
A6G	3/4" BSPP	5986432-001	
A8H	SAE 8	5986433-001	
A10H	SAE 10	5986434-001	
A12H	SAE 12	5986436-001	
S6G	3/4" BSPP		5991073-001
S10T	SAE 10		5991074-001
S12T	SAE 12		5991075-001

See section J for housing details.

**5 Pilot to shift (nominal)**  
50 - 3,4 bar (50 psi)

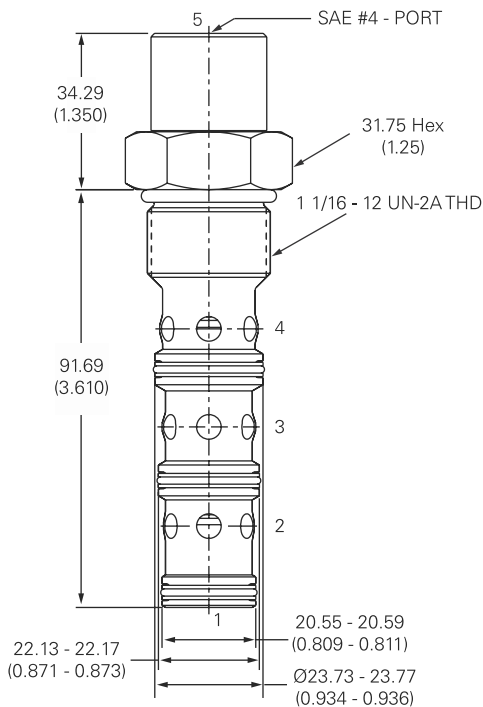
**6 Special features**  
00 - None  
(Only required if valve has special features, omitted if "00")

**Dimensions**  
mm (inch)

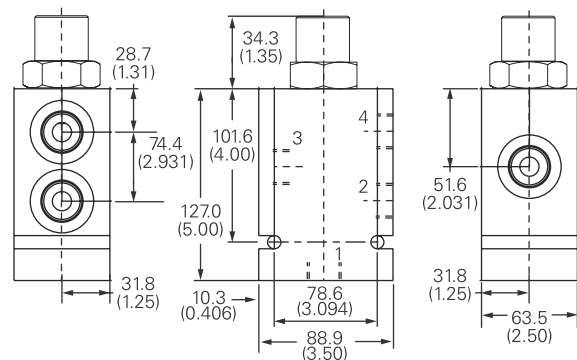
Torque cartridge in aluminum housing 81-95 Nm (60-70 ft. lbs)

Torque cartridge in steel housing 102-115 Nm (75-85 ft. lbs)

## Cartridge only



## Installation drawing (Steel)



### Warning

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).

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

For enquiries please contact our  
Technical Sales Team directly;

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