

DC

# Directional Control Valves



*Danfoss*

# Directional Control Valves

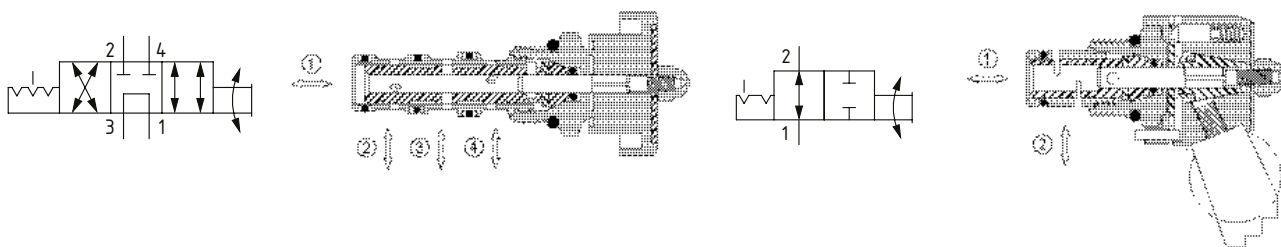
## Application Notes

### Basic Operation: Directional Control Valves

Directional Control Valves are manually actuated or hydraulically pilot operated, spool type valves. They are available as 2-way, 3-way or 4-way valves with various port configurations. Hydraulically pilot operated valves are generally 2-position, while the manually actuated valves can be 2 or 3-position. Manually operated valves can be rotary or linear with or without detent. They can be used to open or close flow lines, meter flow, or divert flow to various parts of a circuit.

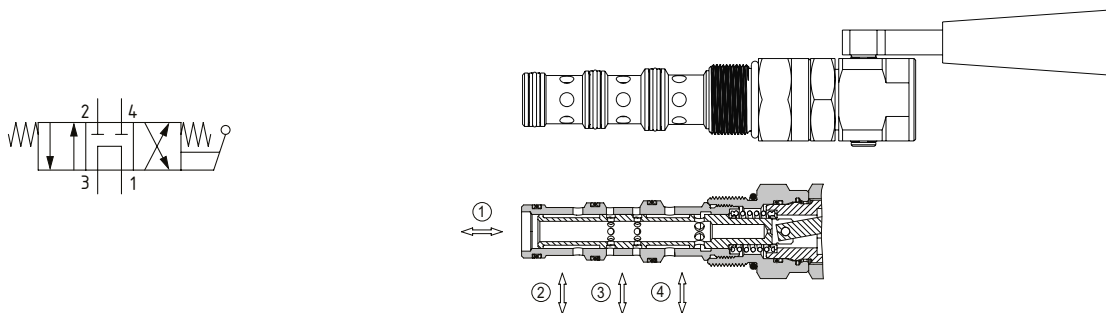
### Manual Rotary Valves

Manual rotary valves are available as 2, 3, or 4-way spools, 2 or 3-positions, with or without detent. The adjustment can be a hand knob or a lever, ideal for panel mounted applications where manual control or intervention is necessary.



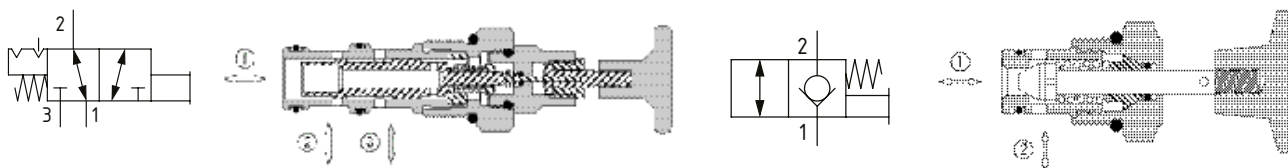
### Manual Lever Valves

Manual lever valves are 3-position, 4-way lever operated direct acting spool type directional valves. The lever can be positioned to suit in the manifold offering great flexibility in design. Inlet port is through port 3, ports 2 and 4 are the work ports, and port 1 the tank port.



### Manual Push or Pull Valves

Manual push and pull type valves are 2, 3 or 4-way, 2 position directional valves with a spool or poppet design. They are operated by pulling or pushing the spool from one position to another. Depending on the model, they will feature either spring return or position detent to lock the position in place. The poppet valves are ideal for emergency lowering while the spool designs act as diverter valves.

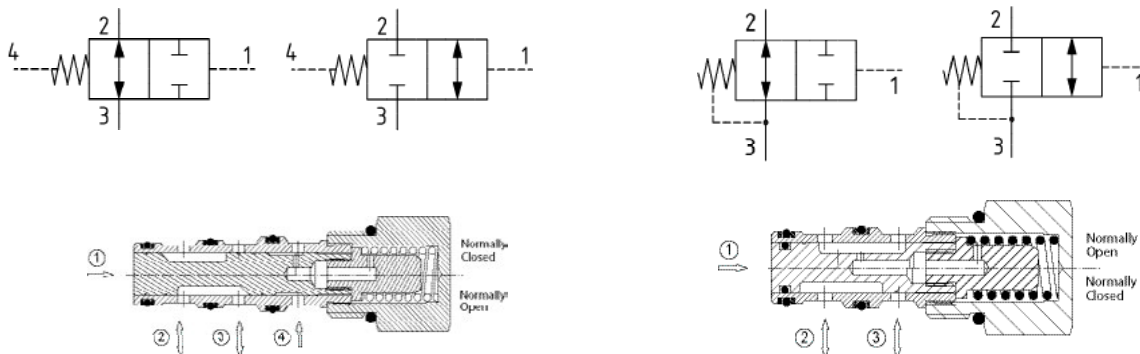


# Directional Control Valves

## Application Notes

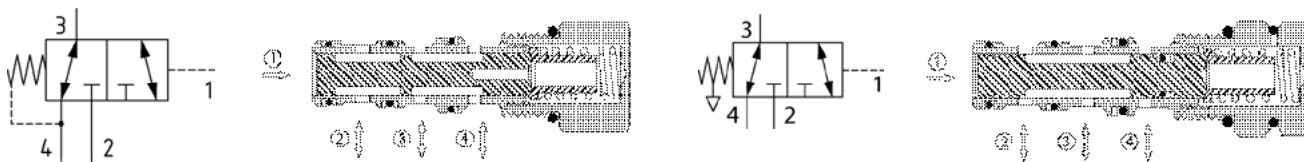
### Hydraulically Pilot Operated 2-way, 2-Position Valves

Hydraulically pilot operated, 2-way, 2-position valves are normally open or closed spool type valves. They are available with an internal or an external spring chamber drain, while some models have an atmospheric vent. Flow can pass in either direction provided the pilot pressure is higher than the vent pressure.



### Hydraulically Pilot Operated 3-way, 2 Position Valves

Hydraulically pilot operated 3-way, 2 position pilot operated spool type valves are available with internal or external spring chamber drain, while some models have an atmospheric vent. These valves can be used in a normally open, normally closed or as a diverter from one outlet port to the other. External or atmospheric drains allow for flow to pass in either direction through the spool without affecting the pilot switching pressure. Some of these valves can be used as compensators in conjunction with an adjustable orifice or as load sensing priority valves.



### Brake Release Hydraulically Pilot Operated Spool Valves

These hydraulically pilot operated spool type valves are designed to allow spring applied brakes to disengage, even when there is a residual pressure in the brake line. The pilot pressure is taken from the inlet port 1, opening port 1 to the outlet brake line in port 2. When the pressure applied to the brake falls below the setting of the valve, it opens the brake line port 2 to tank port 3, allowing the brake to engage.



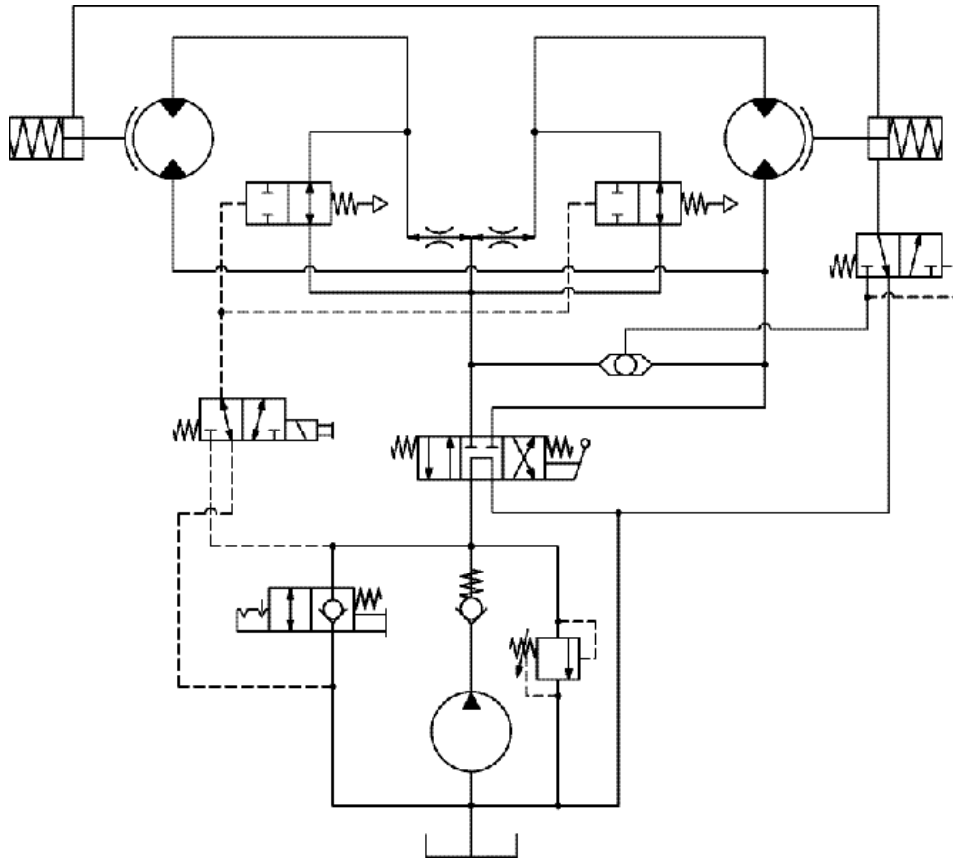
# Directional Control Valves

## Application Notes

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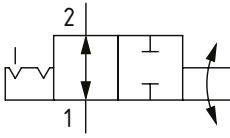
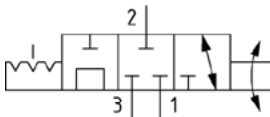
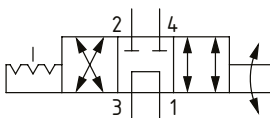
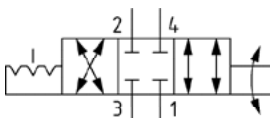
- Manual and hydraulically pilot operated directional valves have a multitude of applications. If questions arise, please contact your technical representative.
- Internally and externally vented valves are preferred over atmospheric vents because of the potential for external leakage as seals wear. Issues can arise quickly if the oil cleanliness is not within recommended specifications.

### Typical Applications



▲ Open Loop Transmission

## Directional Control Valves Quick Reference

Manual Rotary Valve	Model No.	Cavity	Description	Flow*	Pressure	Page
	<a href="#">MRV2-10</a>	<b>SDC10-2</b>	Manual Rotary Restrictor Valve, 2-Way, Spool Type	57 l/min [15 US gpm]	210 bar [3000 psi]	<b>12</b>
	<a href="#">MRV2-16</a>	<b>SDC16-2</b>	Manual Rotary Restrictor Valve, 2-Way, Spool Type	170 l/min [45 US gpm]	210 bar [3000 psi]	<b>13</b>
Manual Rotary Valve	Model No.	Cavity	Description	Flow*	Pressure	Page
	<a href="#">MRV3-10</a>	<b>SDC10-3</b>	Manual Rotary Valve, 3-Way, Spool Type	23 l/min [6 US gpm]	210 bar [3000 psi]	<b>14</b>
	<a href="#">MRV3-16</a>	<b>SDC16-3</b>	Manual Rotary Valve, 3-Way, Spool Type	65 l/min [17 US gpm]	210 bar [3000 psi]	<b>15</b>
Manual Rotary Valve	Model No.	Cavity	Description	Flow*	Pressure	Page
	<a href="#">MRV4-10</a>	<b>SDC10-4</b>	Manual Rotary Valve, 4-Way, Spool Type	11 l/min [3 US gpm]	210 bar [3000 psi]	<b>16</b>
	<a href="#">MRV4-16</a>	<b>SDC16-4</b>	Manual Rotary Valve, 4-Way, Spool Type	45 l/min [12 US gpm]	210 bar [3000 psi]	<b>17</b>
Manual Rotary Valve	Model No.	Cavity	Description	Flow*	Pressure	Page
	<a href="#">MRV5-10</a>	<b>SDC10-4</b>	Manual Rotary Valve, 4-Way, Spool Type	11 l/min [3 US gpm]	210 bar [3000 psi]	<b>18</b>

\*Flow ratings are for reference only. Refer to individual product page for performance information.

## Directional Control Valves Quick Reference

Manual Rotary Valve	Model No.	Cavity	Description	Flow*	Pressure	Page
	<b>MRV6-10</b>	<b>SDC10-4</b>	Manual Rotary Valve, 4-Way, Spool Type	11 l/min [3 US gpm]	210 bar [3000 psi]	<b>19</b>
	<b>MRV6-16</b>	<b>SDC16-4</b>	Manual Rotary Valve, 4-Way, Spool Type	45 l/min [12 US gpm]	210 bar [3000 psi]	<b>20</b>
Manual Rotary Valve	Model No.	Cavity	Description	Flow*	Pressure	Page
	<b>MRV7-10</b>	<b>SDC10-4</b>	Manual Rotary Valve, 4-Way, Spool Type	11 l/min [3 US gpm]	210 bar [3000 psi]	<b>21</b>
Manual Pull Valve	Model No.	Cavity	Description	Flow*	Pressure	Page
	<b>MPV1-10</b>	<b>SDC10-2</b>	Manual Pull Valve, 2-Way, Normally Closed, Poppet Type	45 l/min [12 US gpm]	210 bar [3000 psi]	<b>22</b>
Manual Pull Valve	Model No.	Cavity	Description	Flow*	Pressure	Page
	<b>MPV3-10</b>	<b>SDC10-2</b>	Manual Pull Valve with Detent, 2-Way, Normally Closed, Poppet Type	45 l/min [12 US gpm]	210 bar [3000 psi]	<b>23</b>
Manual Push Valve	Model No.	Cavity	Description	Flow*	Pressure	Page
	<b>3CP2</b>	<b>SDC08-2</b>	Manual Push Valve, 2-Way, Normally Closed, Poppet Type with Check	15 l/min [4 US gpm]	210 bar [3000 psi]	<b>24</b>
Manual Push Valve	Model No.	Cavity	Description	Flow*	Pressure	Page
	<b>CE 06</b>	<b>NCS06/2</b>	Manual Push Valve, 2-Way, Normally Closed, Poppet Type, Double Blocking	19 l/min [5 US gpm]	315 bar [4600 psi]	<b>25</b>

\*Flow ratings are for reference only. Refer to individual product page for performance information.

## Directional Control Valves Quick Reference

Manual Push Valve	Model No.	Cavity	Description	Flow*	Pressure	Page
	<a href="#">MSV11-10</a>	SDC10-3	Manual Push Valve with Detent, 3-Way, Spool Type	23 l/min [6 US gpm]	350 bar [5000 psi]	<b>26</b>
	<a href="#">MSV1-12</a>	C-12-3	Manual Push Valve with Detent, 3-Way, Spool Type	40 l/min [11 US gpm]	210 bar [3000 psi]	<b>27</b>
Manual Push Valve	Model No.	Cavity	Description	Flow*	Pressure	Page
	<a href="#">MSV2-12</a>	C-12-3	Manual Push Valve with Detent, 3-Way, Spool Type	38 l/min [10 US gpm]	210 bar [3000 psi]	<b>28</b>
Manual Push Valve	Model No.	Cavity	Description	Flow*	Pressure	Page
	<a href="#">MSV3-12</a>	C-12-4	Manual Push Valve with Detent, 4-Way, Spool Type	53 l/min [14 US gpm]	210 bar [3000 psi]	<b>29</b>
Manual Push Valve	Model No.	Cavity	Description	Flow*	Pressure	Page
	<a href="#">MSV4-12</a>	C-12-4	Manual Push Valve with Detent, 3-Way, Spool Type	53 l/min [14 US gpm]	210 bar [3000 psi]	<b>30</b>
Manual Push Valve	Model No.	Cavity	Description	Flow*	Pressure	Page
	<a href="#">MSV5-12</a>	C-12-3	Manual Push Valve with Detent, 4-Way, Spool Type	42 l/min [11 US gpm]	210 bar [3000 psi]	<b>31</b>
Manual Push Valve	Model No.	Cavity	Description	Flow*	Pressure	Page
	<a href="#">MSV6-12</a>	C-12-4	Manual Push Valve with Detent, 4-Way, Spool Type	53 l/min [14 US gpm]	210 bar [3000 psi]	<b>32</b>

\*Flow ratings are for reference only. Refer to individual product page for performance information.

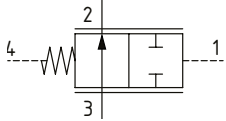
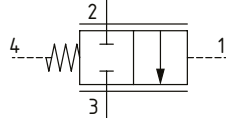
## Directional Control Valves Quick Reference

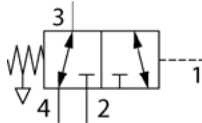
Manual Push Valve	Model No.	Cavity	Description	Flow*	Pressure	Page
	<a href="#">MSV17-10</a>	<b>SDC10-4</b>	Manual Push Valve with Detent, 4-Way, Spool Type	19 l/min [5 US gpm]	350 bar [5000 psi]	<b>33</b>
	<a href="#">MSV7-12</a>	<b>C-12-4</b>	Manual Push Valve with Detent, 4-Way, Spool Type	45 l/min [12 US gpm]	210 bar [3000 psi]	<b>34</b>
Hydraulically Piloted Valves	Model No.	Cavity	Description	Flow*	Pressure	Page
	<a href="#">CP710-1</a>	<b>SDC 10-3</b>	Directional Control Valve, 2-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent	40 l/min [11 US gpm]	210 bar [3000 psi]	<b>35</b>
Hydraulically Piloted Valves	Model No.	Cavity	Description	Flow*	Pressure	Page
	<a href="#">PTS17-10</a>	<b>SDC10-3</b>	Directional Control Valve, 2-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent	30 l/min [8 US gpm]	350 bar [5000 psi]	<b>36</b>
	<a href="#">PTS17-12</a>	<b>C-12-3</b>	Directional Control Valve, 2-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent	114 l/min [30 US gpm]	350 bar [5000 psi]	<b>37</b>
Hydraulically Piloted Valves	Model No.	Cavity	Description	Flow*	Pressure	Page
	<a href="#">CP710-3</a>	<b>SDC10-3</b>	Directional Control Valve, 2-Way, Spool Type, Hydraulic Pilot, Internal Drain	40 l/min [11 US gpm]	210 bar [3000 psi]	<b>38</b>
Hydraulically Piloted Valves	Model No.	Cavity	Description	Flow*	Pressure	Page
	<a href="#">CP710-8</a>	<b>SDC10-4</b>	Directional Control Valve, 2-Way, Spool Type, Hydraulic Pilot, External Drain	40 l/min [11 US gpm]	210 bar [3000 psi]	<b>39</b>
	<a href="#">CP712-8</a>	<b>SDC16-4</b>	Directional Control Valve, 2-Way, Spool Type, Hydraulic Pilot, External Drain	130 l/min [34 US gpm]	210 bar [3000 psi]	<b>40</b>
	<a href="#">CP712-11</a>	<b>SDC16-4</b>	Directional Control Valve, 2-Way, Spool Type, Hydraulic Pilot, External Drain	130 l/min [34 US gpm]	450 bar [6500 psi]	<b>41</b>

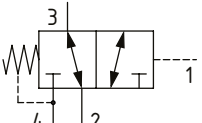
\*Flow ratings are for reference only. Refer to individual product page for performance information.

# Directional Control Valves

## Quick Reference

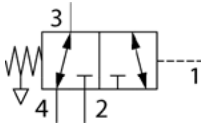
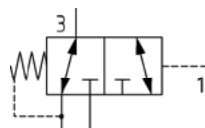
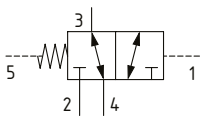
Hydraulically Piloted Valves	Model No.	Cavity	Description	Flow*	Pressure	Page
	<a href="#">CP712-7</a>	<b>SDC16-4</b>	Directional Control Valve, 2-Way, Spool Type, Hydraulic Pilot, External Drain, Proportional Flow Control	220 l/min [58 US gpm]	210 bar [3000 psi]	<b>42</b>
						

Hydraulically Piloted Valves	Model No.	Cavity	Description	Flow*	Pressure	Page
	<a href="#">PTS1-10</a>	<b>SDC10-4</b>	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent	30 l/min [8 US gpm]	210 bar [3000 psi]	<b>43</b>
	<a href="#">PTS11-10</a>	<b>SDC10-4</b>	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent	30 l/min [8 US gpm]	350 bar [5000 psi]	<b>44</b>
	<a href="#">PTS11-12</a>	<b>C-12-4</b>	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent	76 l/min [20 US gpm]	350 bar [5000 psi]	<b>45</b>
	<a href="#">PTS1-16</a>	<b>SDC16-4</b>	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent	132 l/min [35 US gpm]	210 bar [3000 psi]	<b>46</b>
	<a href="#">PTS11-16</a>	<b>SDC16-4</b>	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent	132 l/min [35 US gpm]	350 bar [5000 psi]	<b>47</b>
	<a href="#">PTS1-20</a>	<b>SDC20-4</b>	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent	265 l/min [70 US gpm]	210 bar [3000 psi]	<b>48</b>

Hydraulically Piloted Valves	Model No.	Cavity	Description	Flow*	Pressure	Page
	<a href="#">PTS12-10</a>	<b>SDC10-4</b>	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain	30 l/min [8 US gpm]	350 bar [5000 psi]	<b>49</b>
	<a href="#">PTS12-12</a>	<b>C-12-4</b>	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain	114 l/min [30 US gpm]	350 bar [5000 psi]	<b>50</b>
	<a href="#">PTS2-16</a>	<b>SDC16-4</b>	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain	132 l/min [35 US gpm]	210 bar [3000 psi]	<b>51</b>
	<a href="#">PTS12-16</a>	<b>SDC16-4</b>	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain	132 l/min [35 US gpm]	350 bar [5000 psi]	<b>52</b>
	<a href="#">PTS2-20</a>	<b>SDC20-4</b>	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain	265 l/min [70 US gpm]	210 bar [3000 psi]	<b>53</b>

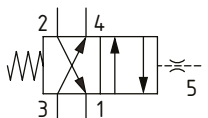
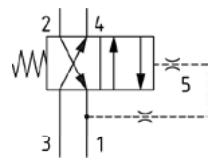
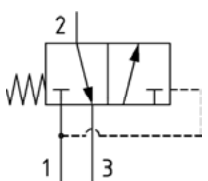
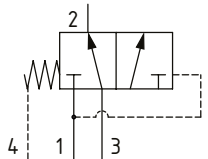
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## Directional Control Valves Quick Reference

Hydraulically Piloted Valves	Model No.	Cavity	Description	Flow*	Pressure	Page
	PTS14-12	C-12-4	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent	114 l/min [30 US gpm]	350 bar [5000 psi]	54
	PTS14-16	SDC16-4	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent	132 l/min [35 US gpm]	350 bar [5000 psi]	55
	PTS5-16	SDC16-4	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent	132 l/min [35 US gpm]	210 bar [3000 psi]	56
	PTS15-16	SDC16-4	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent	132 l/min [35 US gpm]	350 bar [5000 psi]	57
Hydraulically Piloted Valves	Model No.	Cavity	Description	Flow*	Pressure	Page
	PTS3-10	SDC10-4	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain	30 l/min [8 US gpm]	210 bar [3000 psi]	58
	PTS13-10	SDC10-4	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain	30 l/min [8 US gpm]	350 bar [5000 psi]	59
	PTS13-12	C-12-4	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain	114 l/min [30 US gpm]	350 bar [5000 psi]	60
	PTS3-16	SDC16-4	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain	132 l/min [35 US gpm]	210 bar [3000 psi]	61
	PTS6-16	SDC16-4	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain	132 l/min [35 US gpm]	210 bar [3000 psi]	62
	PTS13-16	SDC16-4	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain	132 l/min [35 US gpm]	350 bar [5000 psi]	63
	CP722-11	SDC16-4	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain	125 l/min [33 US gpm]	450 bar [6500 psi]	64
PTS3-20	SDC20-4	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain	265 l/min [70 US gpm]	210 bar [3000 psi]	65	
Hydraulically Piloted Valves	Model No.	Cavity	Description	Flow*	Pressure	Page
	PTS9-8	C-8-5S	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, External Drain	19 l/min [5 US gpm]	280 bar [4000 psi]	66
	PTS9-10	SDC10-5	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, External Drain	38 l/min [10 US gpm]	280 bar [4000 psi]	67
	PTS9-12	C-12-5S	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, External Drain	76 l/min [20 US gpm]	280 bar [4000 psi]	68
	PTS9-16	C-16-5S	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, External Drain	151 l/min [40 US gpm]	280 bar [4000 psi]	69
	PTS9-20	C-20-5S	Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, External Drain	230 l/min [60 US gpm]	280 bar [4000 psi]	70

\*Flow ratings are for reference only. Refer to individual product page for performance information.

## Directional Control Valves Quick Reference

Hydraulically Piloted Valves	Model No.	Cavity	Description	Flow*	Pressure	Page
	<b>DV15-P5-24-FD</b>	<b>NCS12/5</b>	Directional Control Valve, 4-Way, Spool Type, Hydraulic Pilot Internal Drain	70 l/min [18 US gpm]	230 bar [3300 psi]	<b>71</b>
						
Brake Release Valves	Model No.	Cavity	Description	Flow*	Pressure	Page
	<b>1SB10</b>	<b>A893</b>	Brake Sequence Directional Valve, 3-Way, Spool Type, Internal Pilot, Internal Drain	10 l/min [2.6 US gpm]	350 bar [5000 psi]	<b>72</b>
Brake Release Valves	Model No.	Cavity	Description	Flow*	Pressure	Page
	<b>1SB304</b>	<b>A5302</b>	Brake Sequence Directional Valve, 3-Way, Spool Type, Internal Pilot, External Drain	30 l/min [8 US gpm]	350 bar [5000 psi]	<b>73</b>

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## Directional Control Valves

### MRV2-10

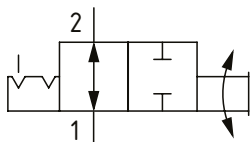
Manual Rotary Restrictor Valve, 2-Way, Spool Type

210 bar [3000 psi] • 57 l/min [15 US gpm]

#### DESCRIPTION AND OPERATION

This is a 2-way, spool type, manually operated semi-rotary restrictor valve. By rotating the manual actuator, a variable orifice is opened or closed linearly between ports 2 and 1. When used in conjunction with a compensator, the valve will increase the flow in proportion to the movement of the manual actuator.

#### SCHEMATIC

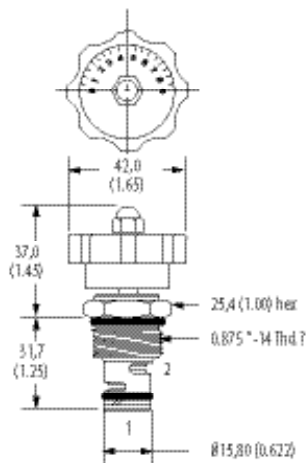


#### PERFORMANCE DATA

<b>Rated pressure</b>	<b>210 bar [3000 psi]</b>
<b>Rated flow</b>	<b>57 l/min [15 US gpm]</b>
<b>Leakage</b>	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
<b>Weight</b>	0.79 kg [1.74 lbs]
<b>Cavity</b>	SDC10-2

#### DIMENSIONS

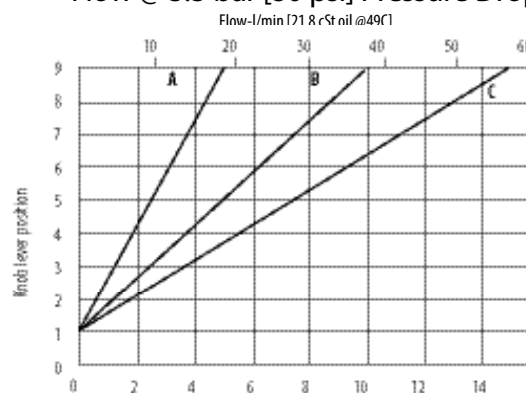
mm [in]



**Installation torque**  
47-54 Nm [35-40 ft lbs]

#### PERFORMANCE CURVES

Flow @ 5.5 bar [80 psi] Pressure Drop



A-05 • B-10 • C-15

#### MODEL CODE

**MRV2 - 10 - V - B - 3B - 05**

##### Seal Option

Code	Seal Kit
Omit-Buna-N	565803
V-Viton	566086

##### Actuator Option

**O** - Cartridge only (no actuator)  
**B** - Ball (friction lock)  
**E** - Ball (10 position detent)  
**D** - Lever (10 position detent)  
**L** - Lever (friction lock)  
**K** - Knob (non-locking)  
 Standard duty housings only

##### Flow Range

Code	l/min	[US gpm]
05	0-19	[0-5]
10	0-38	[0-10]
15	0-57	[0-15]

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty
0	No Housing		
3B	3/8" BSP	02-175462	
6T	#6 SAE	566151	
2G	1/4" BSP		876702
3G	3/8" BSP		876703
6H	#6 SAE		876700
8H	#8 SAE		876701

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### MRV2-16

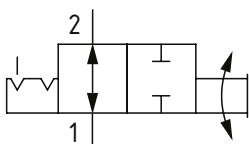
Manual Rotary Restrictor Valve, 2-Way, Spool Type

210 bar [3000 psi] • 170 l/min [45 US gpm]

#### DESCRIPTION AND OPERATION

This is a 2-way, spool type, manually operated semi-rotary restrictor valve. By rotating the manual actuator, a variable orifice is opened or closed linearly between ports 2 and 1. When used in conjunction with a compensator, the valve will increase the flow in proportion to the movement of the manual actuator.

#### SCHEMATIC

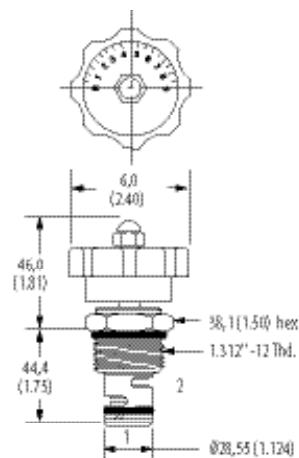


#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	170 l/min [45 US gpm]
Leakage	82 ml/min [5 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.79 kg [1.74 lb]
Cavity	SDC16-2

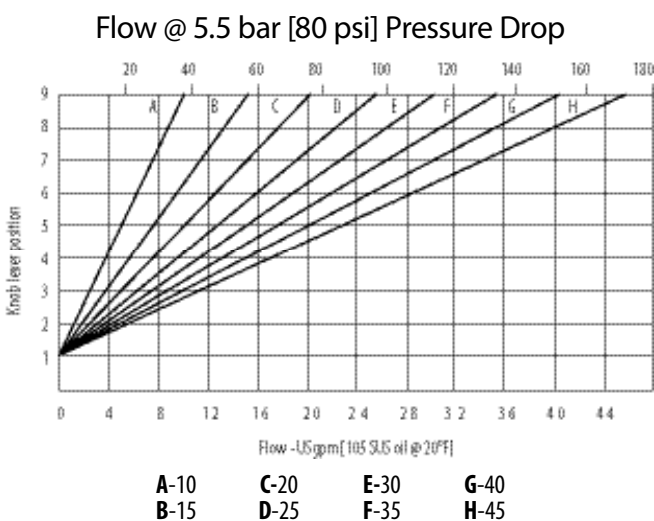
#### DIMENSIONS

mm [in]



Installation torque  
108-122 Nm [80-90 ft lbs]

#### PERFORMANCE CURVES



#### MODEL CODE

MRV2 - 16 - V - D - 6B - 10

##### Seal Option

Code	Seal Kit
Omit-Buna-N	565810
V-Viton	889609

##### Actuator Option

O - Cartridge only (no actuator)  
D - Lever (10 position detent)\*  
L - Lever (friction lock)\*  
K - Knob (non-locking)  
\*Standard duty housings only

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty
0	No Housing		
6B	3/4" BSP	02-175463	
12T	#12 SAE	566149	
4G	1/2" BSP		876716
6G	3/4" BSP		876718
10H	#10 SAE		876717
12H	#12 SAE		566113

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].  
\* Additional housings available

##### Flow Range

Code	l/min	US gpm
10	0-38	[0-10]
15	0-57	[0-15]
20	0-76	[0-20]
25	0-95	[0-25]
30	0-114	[0-30]
35	0-132	[0-35]
40	0-150	[0-40]
45	0-170	[0-45]

## Directional Control Valves

### MRV3-10

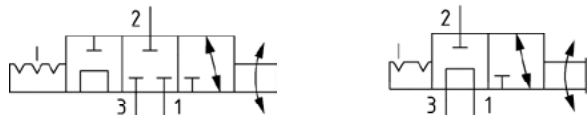
Manual Rotary Valve, 3-Way, Spool Type

210 bar [3000 psi] • 23 l/min [6 US gpm]

#### DESCRIPTION AND OPERATION

This is a 3-way, spool type, 2 or 3 position manually operated semi-rotary directional control valve. By rotating the manual actuator, the flow path will change from port 1 connected to port 3 (port 2 blocked) to port 1 connected to port 2 (port 3 blocked). Using the manual actuator and detent, the crossover condition can be used to create a third position with all ports blocked. This valve can be used as a diverter or as a dump valve.

#### SCHEMATIC



#### PERFORMANCE DATA

<b>Rated pressure</b>	<b>210 bar [3000 psi]</b>
<b>Rated flow</b>	<b>23 l/min [6 US gpm]</b>
<b>Weight</b>	0.22 kg [0.4 lb]
<b>Cavity</b>	SDC10-3

#### MODEL CODE

**MRV3 - 10 - V - 0 - A - 3B**

##### Seal Option

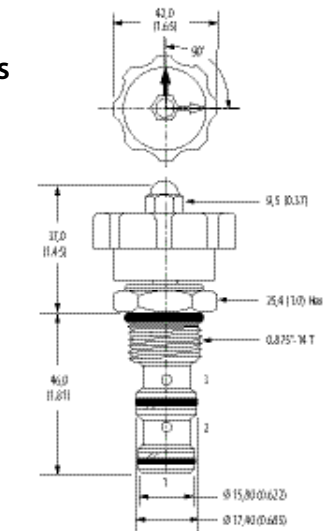
Code	Seal Kit
<b>O</b> mit-Buna-N	565804
<b>V</b> -Viton	889599

##### Actuator Option

**O** - Cartridge only (no actuator)  
**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)

##### Housing Material

**O**mit - No housing  
**A** - Aluminum  
**S** - Steel

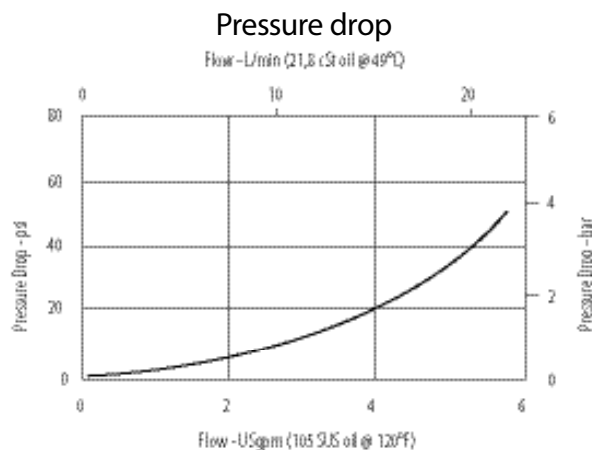


#### DIMENSIONS

mm [in]

**Installation torque**  
 47-54 Nm [35-40 ft. lbs]

#### PERFORMANCE CURVES



##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty	Steel
<b>O</b>	No Housing			
<b>3B</b>	3/8" BSP	02-173358		
<b>6T</b>	#6 SAE	566162		02-175124
<b>8T</b>	#8 SAE			02-175125
<b>2G</b>	1/4" BSP		876705	02-175127
<b>3G</b>	3/8" BSP		876714	02-175128
<b>6H</b>	#6 SAE		876704	
<b>8H</b>	#8 SAE		876711	

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].  
 \* Additional housings available

## Directional Control Valves

### MRV3-16

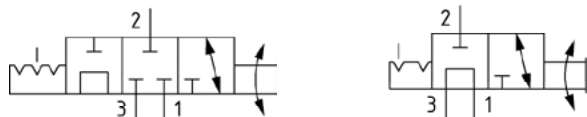
Manual Rotary Valve, 3-Way, Spool Type

210 bar [3000 psi] • 65 l/min [17 US gpm]

#### DESCRIPTION AND OPERATION

This is a 3-way, spool type, 2 or 3 position manually operated semi-rotary directional control valve. By rotating the manual actuator, the flow path will change from port 1 connected to port 3 (port 2 blocked) to port 1 connected to port 2 (port 3 blocked). Using the manual actuator and detent, the crossover condition can be used to create a third position with all ports blocked. This valve can be used as a diverter or as a dump valve.

#### SCHEMATIC



#### PERFORMANCE DATA

<b>Rated pressure</b>	<b>210 bar [3000 psi]</b>
<b>Rated flow</b>	<b>65 l/min [17 US gpm]</b>
<b>Weight</b>	0.53 kg [1.16 lb]
<b>Cavity</b>	SDC16-3

#### MODEL CODE

**MRV3 - 16 - V - 0 - A - 6B**

##### Seal Option

Code	Seal Kit
<b>O</b> mit-Buna-N	889632
<b>V</b> -Viton	889636

##### Actuator Option

**O** - Cartridge only (no actuator)  
**D** - Lever (3-position detent)  
**D2** - Lever (2-position detent)  
**K** - Knob (2 position, no detent)

##### Housing Material

**O**mit - No housing  
**A** - Aluminum  
**S** - Steel

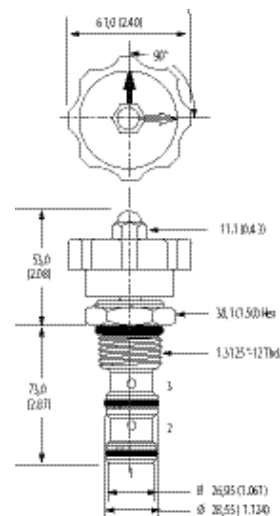
##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty	Steel
<b>0</b>	No Housing			
<b>6B</b>	3/4" BSP	02-175465		
<b>10H</b>	SAE10		876721	
<b>12H</b>	SAE12		876723	
<b>4G</b>	1/2" BSP		876720	02-175131
<b>6G</b>	3/4" BSP		876722	02-175132
<b>10T</b>	#10 SAE			02-175129
<b>12T</b>	#12 SAE	566152		02-175130

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].  
 \* Additional housings available

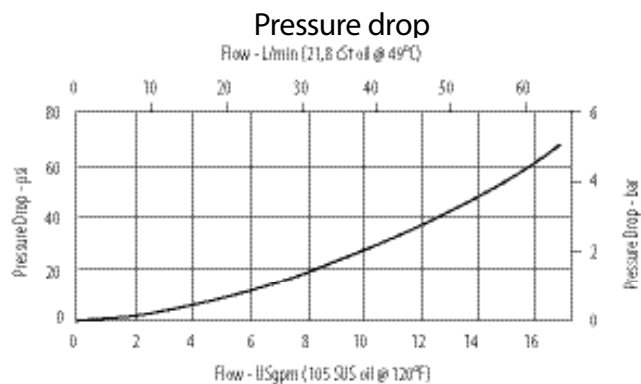
#### DIMENSIONS

mm [in]



**Installation torque**  
 108-122 Nm [80-90 ft. lbs]

#### PERFORMANCE CURVES



## Directional Control Valves

### MRV4-10

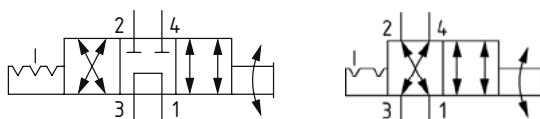
Manual Rotary Valve, 4-Way, Spool Type

210 bar [3000 psi] • 11 l/min [3 US gpm]

#### DESCRIPTION AND OPERATION

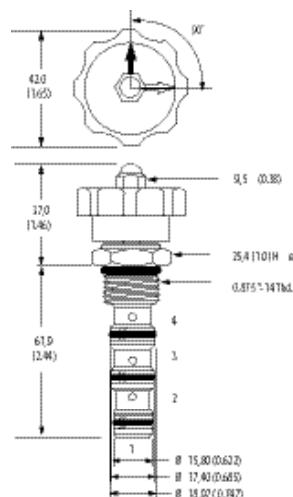
This is a 4-way, spool type, 2 or 3 position manually operated semi-rotary directional control valve. In the center position, port 1 is connected to port 3 and ports 2 and 4 are blocked. By rotating the manual actuator, the flow path will change from ports 3-2 and 1-4 to ports 3-4 and 1-2.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

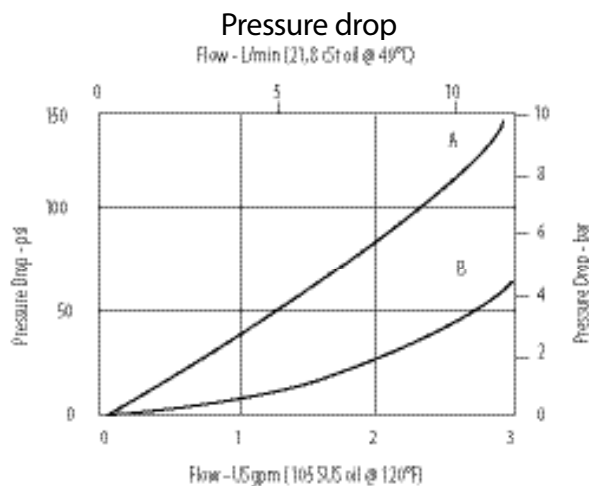


Installation torque  
47-54 Nm [35-40 ft. lbs]

#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	11 l/min [3 US gpm]
Weight	0.17 kg [0.38 lb]
Cavity	SDC10-4

#### PERFORMANCE CURVES



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

#### MODEL CODE

MRV4 - 10 - V - D - A - 3B

##### Seal Option

Code	Seal Kit
Omit-Buna-N	565805
V-Viton	889600

##### Actuator Option

O - Cartridge only (no actuator)  
 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)

##### Housing Material

Omit - No housing  
 A - Aluminum  
 S - Steel

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty	Steel
0	No housing			
3B	3/8" BSP	02-179705		
6T	#6 SAE	02-168235		02-175137
8T	#8 SAE			02-175138
2G	1/4" BSP		02-185804	02-175139
3G	3/8" BSP		02-185805	02-175140
6H	#6 SAE		02-185802	
8H	#8 SAE		02-185803	

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### MRV4-16

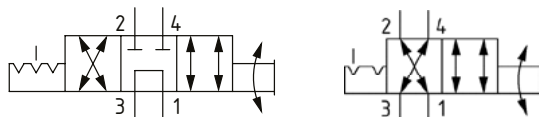
Manual Rotary Valve, 4-Way, Spool Type

210 bar [3000 psi] • 45 l/min [12 US gpm]

#### DESCRIPTION AND OPERATION

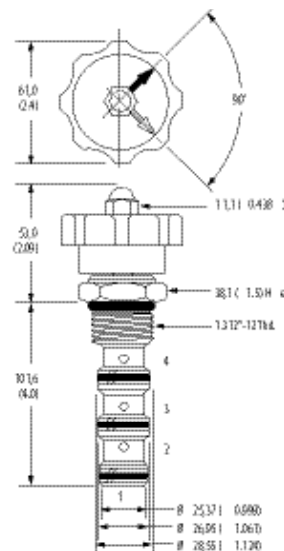
This is a 4-way, spool type, 2 or 3 position manually operated semi-rotary directional control valve. In the center position, port 1 is connected to port 3 and ports 2 and 4 are blocked. By rotating the manual actuator, the flow path will change from ports 3-2 and 1-4 to ports 3-4 and 1-2.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

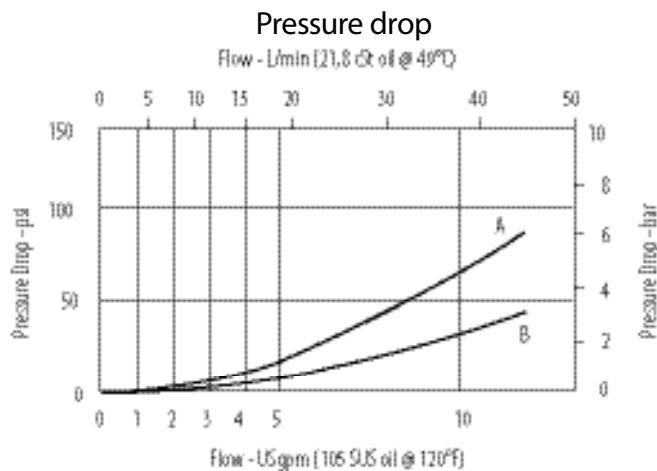


Installation torque  
108-122 Nm [80-90 ft lbs]

#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	45 l/min [12 US gpm]
Weight	0.65 kg [1.43 lb]
Cavity	SDC16-4

#### PERFORMANCE CURVES



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

#### MODEL CODE

MRV4 - 16 - V - D - A - 6B

##### Seal Option

Code	Seal Kit
Omit-Buna-N	889634
V-Viton	889638

##### Actuator Option

- O - Cartridge only (no actuator)
- D - Lever (3-position detent)
- D2 - Lever (2-position detent)
- K - Knob (2-position, no detent)

##### Housing Material

- Omit - No housing
- A - Aluminum
- S - Steel

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty	Steel
0	No housing			
10T	#10 SAE			02-175141
12T	#12 SAE	566411		02-175142
6B	3/4" BSP	02-175468		
10H	#10 SAE		876729	
12H	#12 SAE		876731	
4G	1/2" BSP		876728	02-175143
6G	3/4" BSP		876730	02-175144

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### MRV5-10

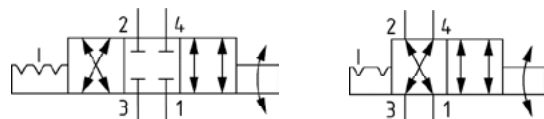
Manual Rotary Valve, 4-Way, Spool Type

210 bar [3000 psi] • 11 l/min [3 US gpm]

#### DESCRIPTION AND OPERATION

This is a 4-way, spool type, 2 or 3 position manually operated semi-rotary directional control valve. In the center position all ports are blocked. By rotating the manual actuator, the flow path will change from ports 3-2 and 1-4 to ports 3-4 and 1-2.

#### SCHEMATIC



#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	11 l/min [3 US gpm]
Weight	0.27 kg [0.59 lb]
Cavity	SDC10-4

#### MODEL CODE

**MRV5 - 10 - V - 0 - A - 3B**

##### Seal Option

Code	Seal Kit
Omit-Buna-N	889625
V-Viton	566080

##### Actuator Option

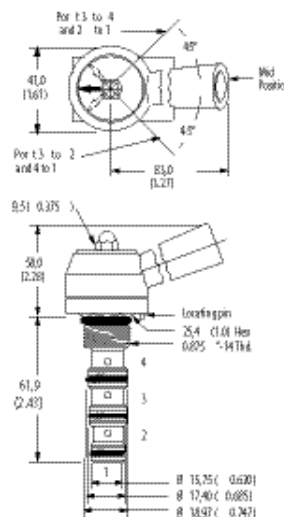
- O** - Cartridge only (no actuator)
- D** - Lever (3-position detent)
- D2** - Lever (2-position detent)
- E** - Ball (3-position detent)
- E2** - Ball (2-position detent)

##### Housing Material

- Omit** - No housing
- A** - Aluminum
- S** - Steel

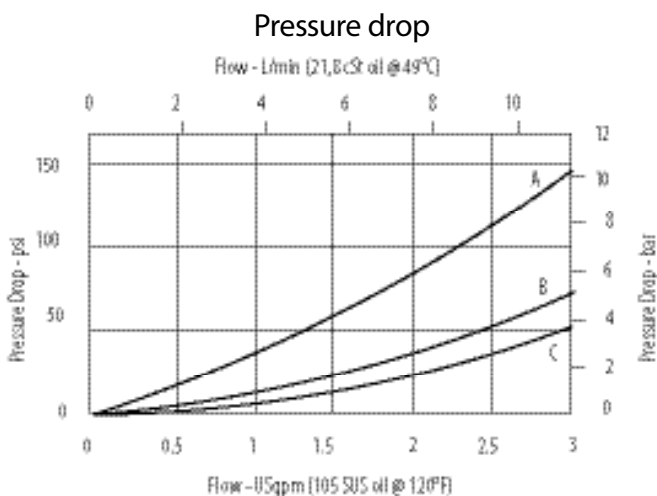
#### DIMENSIONS

mm [in]



Installation torque  
47-54 Nm [35-40 ft lbs]

#### PERFORMANCE CURVES



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

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty	Steel
<b>O</b>	No housing			
<b>3B</b>	3/8" BSP	02-179705		
<b>6T</b>	#6 SAE	02-168235		02-175137
<b>8T</b>	#8 SAE			02-175138
<b>2G</b>	1/4" BSP		02-185804	02-175139
<b>3G</b>	3/8" BSP		02-185805	02-175140
<b>6H</b>	#6 SAE		02-185802	
<b>8H</b>	#8 SAE		02-185803	

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### MRV6-10

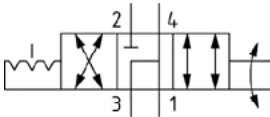
Manual Rotary Valve, 4-Way, Spool Type

210 bar [3000 psi] • 11 l/min [3 US gpm]

#### DESCRIPTION AND OPERATION

This is a 4-way, spool type, 3 position manually operated semi-rotary directional control valve. In the center position, ports 1, 3 and 4 are connected to each other and port 2 is blocked. By rotating the manual actuator, the flow path will change from ports 3-2 and 1-4 to ports 3-4 and 1-2.

#### SCHEMATIC

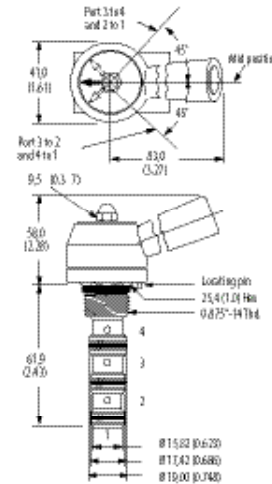


#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	11 l/min [3 US gpm]
Leakage	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.27 kg [0.59 lb]
Cavity	SDC10-4

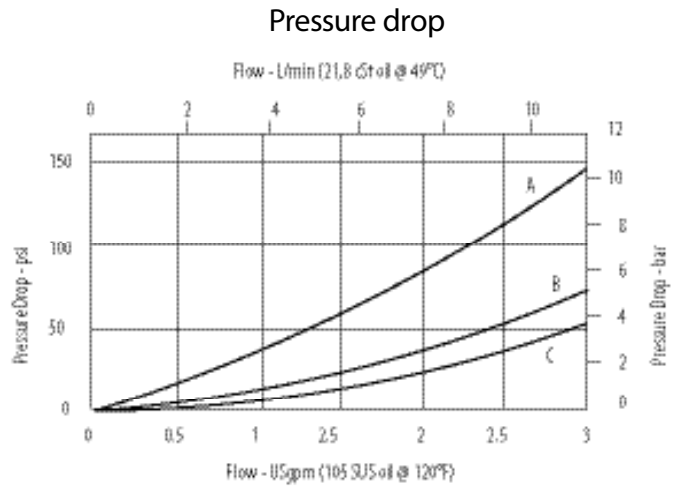
#### DIMENSIONS

mm [in]



Installation torque  
47-54 Nm [35-40 ft lbs]

#### PERFORMANCE CURVES



A-Port 3 to 4 and port 3 to 2 • B-Port 2 to 1 and port 4 to 1 • C-Port 4 to 1

#### MODEL CODE

MRV6 - 10 - V - D - A - 3B

##### Seal Option

Code	Seal Kit
Omit-Buna-N	889625
V-Viton	566080

##### Actuator Option

O-Cartridge only (no actuator)  
D-Lever (3-position detent)  
E-Ball (3-position detent)

##### Housing Material

Omit-No housing  
A-Aluminum  
S-Steel

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty	Steel
0	No housing			
3B	3/8" BSP	02-179705		
6T	#6 SAE	02-168235		02-175137
8T	#8 SAE			02-175138
2G	1/4" BSP		02-185804	02-175139
3G	3/8" BSP		02-185805	02-175140
6H	#6 SAE		02-185802	
8H	#8 SAE		02-185803	

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### MRV6-16

Manual Rotary Valve, 4-Way, Spool Type

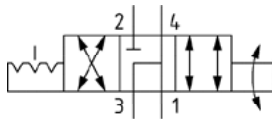
210 bar [3000 psi] • 45 l/min [12 US gpm]

#### DESCRIPTION AND OPERATION

This is a 4-way, spool type, 3 position manually operated semi-rotary directional control valve.

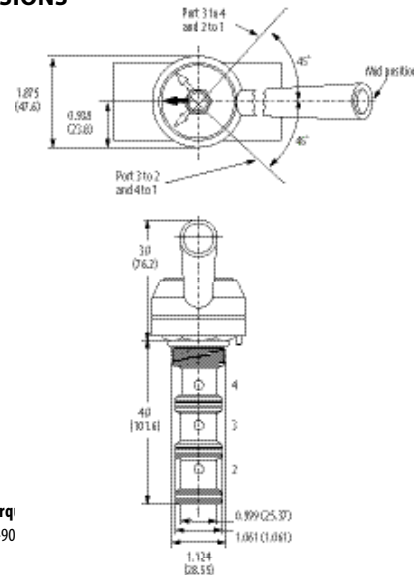
In the center position, ports 1, 3 and 4 are connected to each other and port 2 is blocked. By rotating the manual actuator, the flow path will change from ports 3-2 and 1-4 to ports 3-4 and 1-2.

#### SCHEMATIC



#### DIMENSIONS

mm [in]



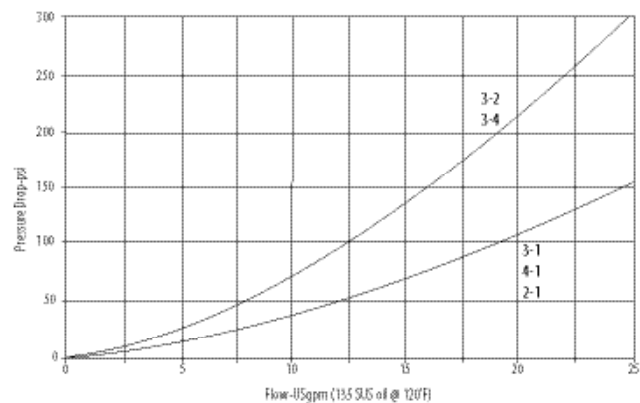
Installation torque  
108-122 Nm [80-90]

#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	45 l/min [12 US gpm]
Weight	0.27 kg [0.59 lb]
Cavity	SDC16-4

#### PERFORMANCE CURVES

Pressure drop



#### MODEL CODE

**MRV6 - 16 - V - D - 6B**

##### Seal Option

Code	Seal Kit
Omit-Buna-N	889625
V-Viton	566080

##### Actuator Option

O-Cartridge only (no actuator)  
D-Lever (3-position detent)

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty	Steel
0	No housing			
10T	#10 SAE			02-175141
12T	#12 SAE	566411		02-175142
6B	3/4" BSP	02-175468		
10H	#10 SAE		876729	
12H	#12 SAE		876731	
4G	1/2" BSP		876728	02-175143
6G	3/4" BSP		876730	02-175144

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### MRV7-10

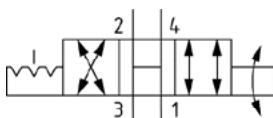
Manual Rotary Valve, 4-Way, Spool Type

210 bar [3000 psi] • 11 l/min [3 US gpm]

#### DESCRIPTION AND OPERATION

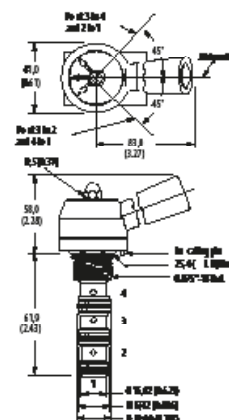
This is a 4-way, spool type, 3 position manually operated semi-rotary directional control valve. In the center position, all ports are connected. By rotating the manual actuator, the flow path will change from ports 3-2 and 1-4 to ports 3-4 and 1-2.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

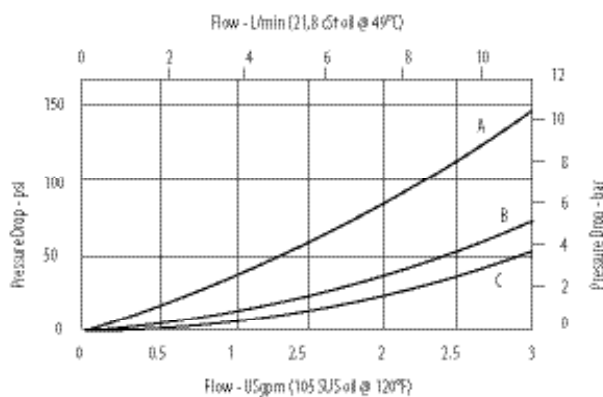


Installation torque  
47-54 Nm [35-40 ft lbs]

#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	11 l/min [3 US gpm]
Leakage	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.27 kg [0.59 lb]
Cavity	SDC10-4

#### PERFORMANCE CURVES



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

#### MODEL CODE

MRV7 - 10 - V - D - A - 3B

##### Seal Option

Code	Seal Kit
Omit-Buna-N	889625
V-Viton	566080

##### Actuator Option

O-Cartridge only (no actuator)  
D-Lever (3-position detent)  
E-Ball (3-position detent)

##### Housing Material

Omit-No housing  
A-Aluminum  
S-Steel

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty	Steel
0	No housing			
3B	3/8" BSP	02-179705		
6T	#6 SAE	02-168235		02-175137
8T	#8 SAE			02-175138
2G	1/4" BSP		02-185804	02-175139
3G	3/8" BSP		02-185805	02-175140
6H	#6 SAE		02-185802	
8H	#8 SAE		02-185803	

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### MPV1-10

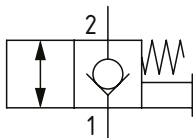
Manual Pull Valve, 2-Way, Normally Closed, Poppet Type

210 bar [3000 psi] • 45 l/min [12 US gpm]

#### DESCRIPTION AND OPERATION

This is a 2-way, normally closed, poppet type, pull to open directional control valve. In the normal position, flow is blocked from 2 to 1, while free reverse flow takes place from port 1 to 2 after overcoming the spring bias. When the knob is manually pulled upward, port 1 is connected to port 2 allowing free flow in both directions. This valve is ideal for emergency lowering applications.

#### SCHEMATIC

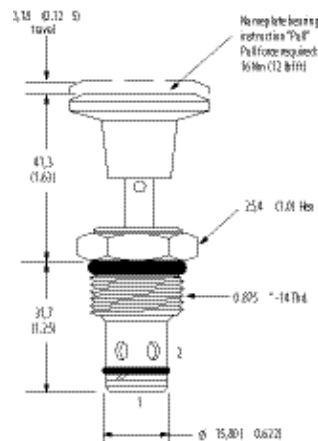


#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	45 l/min [12 US gpm]
Leakage	5 drops/min @ 210 bar [3000 psi]
Crack pressure	16 bar [230 psi]
Weight	0.11 kg [0.24 lb]
Cavity	SDC10-2

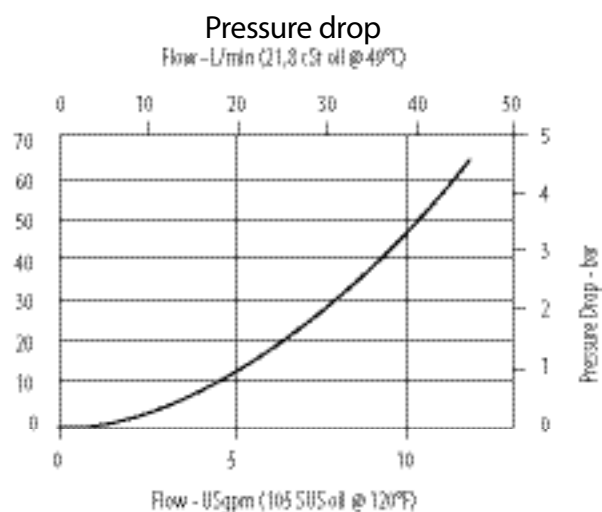
#### DIMENSIONS

mm [in]



Installation torque  
47-54 Nm [35-40 ft lbs]

#### PERFORMANCE CURVES



#### MODEL CODE

MPV1 - 10 - V - T - 0

##### Seal Option

Code	Seal Kit
Omit-Buna-N	565803
V-Viton	566086

##### Actuator Option

T-Stem only  
K-Knob

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty
0	No housing		
3B	3/8" BSP	02-175462	
6T	#6 SAE	566151	
2G	1/4" BSP		876702
3G	3/8" BSP		876703
6H	#6 SAE		876700
8H	#8 SAE		876701

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### MPV3-10

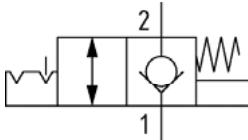
Manual Pull Valve with Detent, 2-Way, Normally Closed, Poppet Type

210 bar [3000 psi] • 45 l/min [12 US gpm]

#### DESCRIPTION AND OPERATION

This is a 2-way, normally closed, poppet type, pull to open directional control valve with a detent. In the normal position, flow is blocked from 2 to 1, while free reverse flow takes place from port 1 to 2 after overcoming the spring bias. When the knob is manually pulled upward, port 1 is connected to port 2 allowing free flow in both directions. The valve can be held open by twisting the knob to engage the detent. This is ideal for emergency lowering applications.

#### SCHEMATIC

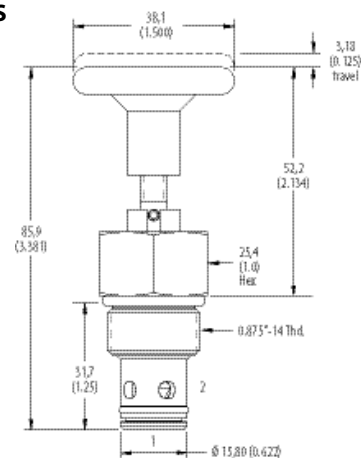


#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	45 l/min [12 US gpm]
Leakage	5 drops/min @ 210 bar [3000 psi]
Crack pressure	16 bar [230 psi]
Weight	0.11 kg [0.24 lb]
Cavity	SDC10-2

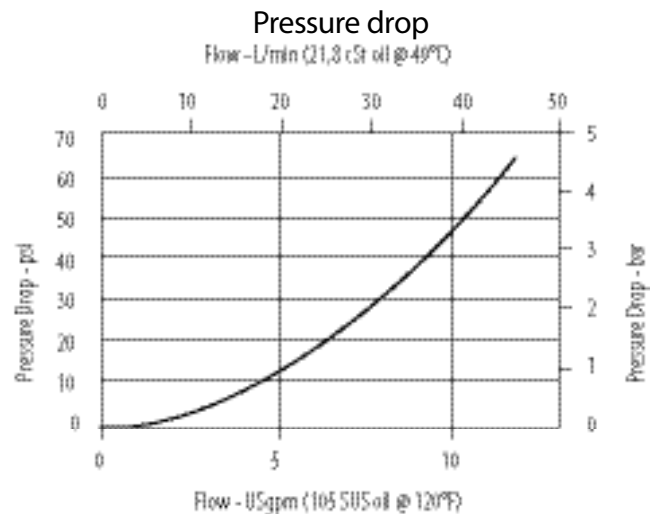
#### DIMENSIONS

mm [in]



Installation torque  
47-54 Nm [35-40 ft lbs]

#### PERFORMANCE CURVES



#### MODEL CODE

MPV3 - 10 - V - T - 0

##### Seal Option

Code	Seal Kit
Omit-Buna-N	565803
V-Viton	566086

##### Actuator Option

T-Stem only  
K-Knob

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty
0	No housing		
3B	3/8" BSP	02-175462	
6T	#6 SAE	566151	
2G	1/4" BSP		876702
3G	3/8" BSP		876703
6H	#6 SAE		876700
8H	#8 SAE		876701

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### 3CP2

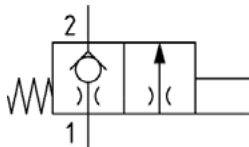
Manual Push Valve, 2-Way, Normally Closed, Poppet Type with Check

210 bar [3000 psi] • 15 l/min [4 US gpm]

#### DESCRIPTION AND OPERATION

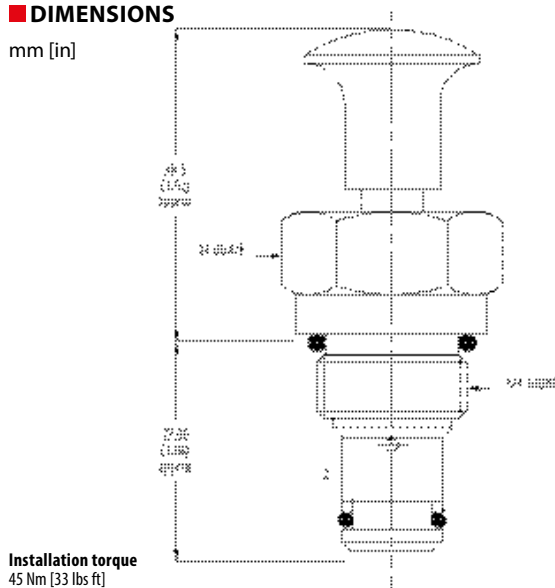
This is a 2-way, normally closed, restricted, poppet type, push to open directional control valve. In the normal position, flow is blocked from 1 to 2. When the knob is manually pushed downward, port 1 is connected to port 2 through a pre-determined orifice. This valve is ideal for emergency lowering applications. It is not recommended to flow from port 2 to port 1. If this is needed, please consult the factory.

#### SCHEMATIC



#### DIMENSIONS

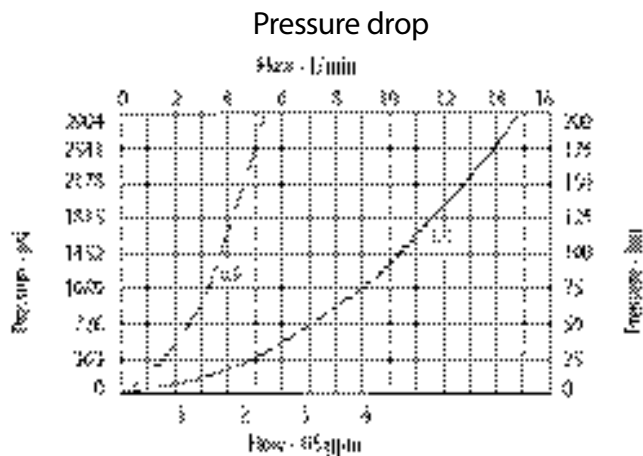
mm [in]



#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	15 l/min [4 US gpm]
Leakage	5 drops/min nominal
Weight	0.5 kg [0.11 lb]
Cavity	SDC08-2

#### PERFORMANCE CURVES



#### MODEL CODE

**3CP2 - 2W - 0.9 - S - 377**

##### Basic Code

3CP2 - No housing  
3CP25 - Cartridge and housing

##### Housing

Code	Ports	Aluminum	Steel
0	No housing		
2W	1/4" BSP	A1485	
3W	3/8" BSP	A1043	A18175
6T	3/8" SAE	A15676	A14843

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Housing Material

Omit - Aluminum/No housing  
377 - Steel

##### Seal Option

Code	Seal Kit
S-Buna-N	SK187
SV-Viton	SK187V

##### Orifice Size

0.9 - 0.9 mm  
1.5 - 1.5 mm

## Directional Control Valves

### CE 06

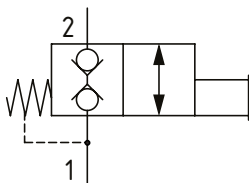
Manual Push Valve, 2-Way, Normally Closed, Poppet Type, Double Blocking

315 bar [4500 psi] • 19 l/min [5 US gpm]

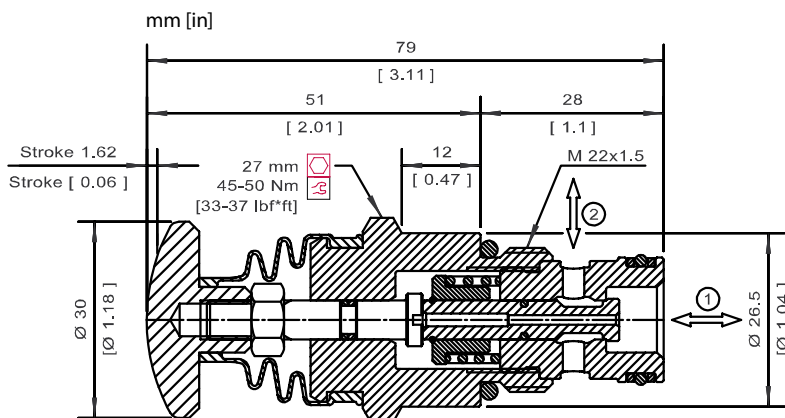
#### DESCRIPTION AND OPERATION

This is a 2-way, poppet type, 2 position valve. In the normal position, flow is blocked in both directions. Pushing down on the hand knob will open the valve and allow flow from port 1 to 2 and from 2 to 1. Pressure in port 1 will increase the force required to open the valve. For lowering applications where one port goes to tank, it is preferred that port 2 is connected to the actuator and port 1 to tank.

#### SCHEMATIC



#### DIMENSIONS

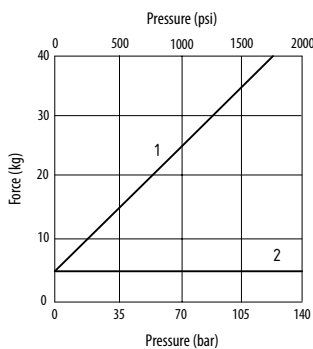


#### PERFORMANCE DATA

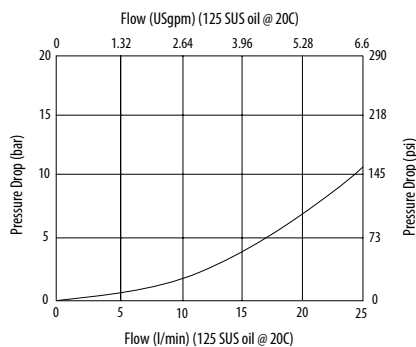
Rated pressure	315 bar [4600 psi]
Rated flow @ 7 bar [100 psi]	19 l/min [5 US gpm]
Weight	0.20 kg [0.44 lb]
Cavity	NCS06/2

#### PERFORMANCE CURVES

Manual Force to Activate



Pressure drop



#### MODEL CODE

CE06 - 00 - V

##### Housing

Code	Ports & Material	Housing Model Code
00	No housing	
DG3/8	AL, 3/8" BSP	NCS06/2-DG-3/8
DG1/2	AL, 1/2" BSP	NCS06/2-DG-1/2
DG6S	AL, #6 SAE	NCS06/2-DG-6S
DG8S	AL, #8 SAE	NCS06/2-DG-8S

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Seal Option

Code	Seal Kit
Omit-Buna-N	230000060
V-Viton	230000380

## Directional Control Valves

### MSV11-10

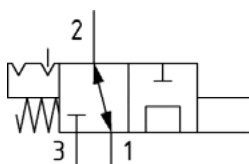
Manual Push Valve with Detent, 3-Way, Spool Type

350 bar [5000 psi] • 23 l/min [6 US gpm]

#### DESCRIPTION AND OPERATION

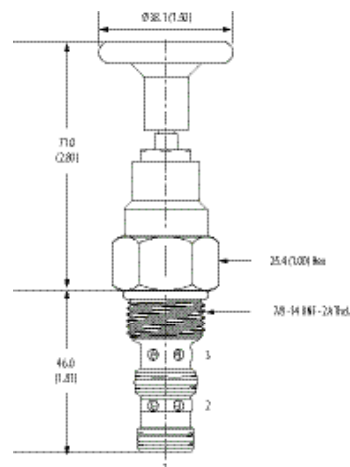
This is a 3-way, spool type, 2 position, push to open directional control valve with a push and twist detent. In the normal position, port 1 is connected to port 2 and port 3 is blocked. When the knob is manually pushed downward, port 2 is blocked and port 1 is connected to port 3. It can be held in this position by twisting the knob to engage the detent. This valve can be used to prevent flow to part of a system until manual intervention takes place.

#### SCHEMATIC



#### DIMENSIONS

mm [in]



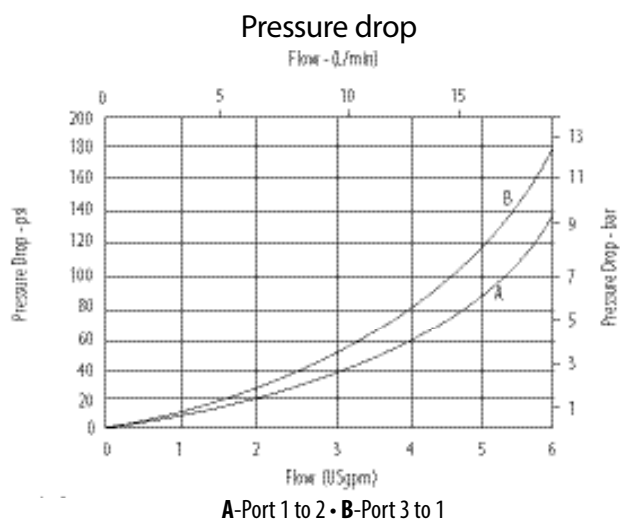
#### Installation torque

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

#### PERFORMANCE DATA

Rated pressure	350 bar [5000 psi]
Rated flow	23 l/min [6 US gpm]
Leakage	350 ml/min [21.5 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.25 kg [0.55 lb]
Cavity	SDC10-3

#### PERFORMANCE CURVES



#### MODEL CODE

MSV11 - 10 - V - L - A - 2G

#### Seal Option

Code	Seal Kit
Omit-Buna-N	889624
V-Viton	889628

#### Actuator Option

L-Push and Twist, with detent  
E-Push/Pull, with detent  
N-No detent, momentary actuation

#### Housing Material

Omit-No housing  
A-Aluminum  
S-Steel

#### Housing

Code	Ports	Aluminum	Steel
0	No housing		
2G	1/4" BSP	876705	02-175127
3G	3/8" BSP	876714	02-175128
6H	#6 SAE	876704	
8H	#8 SAE	876711	
6T	#6 SAE		02-175124
8T	#8 SAE		02-175125

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### MSV1-12

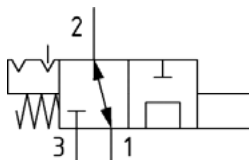
Manual Push Valve with Detent, 3-Way, Spool Type

210 bar [3000 psi] • 40 l/min [11 US gpm]

#### DESCRIPTION AND OPERATION

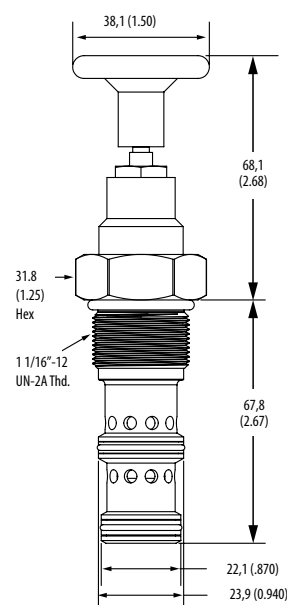
This is a 3-way, spool type, 2 position, push to open directional control valve with a push and twist detent. In the normal position, port 1 is connected to port 2 and port 3 is blocked. When the knob is manually pushed downward, port 2 is blocked and port 1 is connected to port 3. It can be held in this position by twisting the knob to engage the detent. This valve can be used to prevent flow to part of a system until manual intervention takes place.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

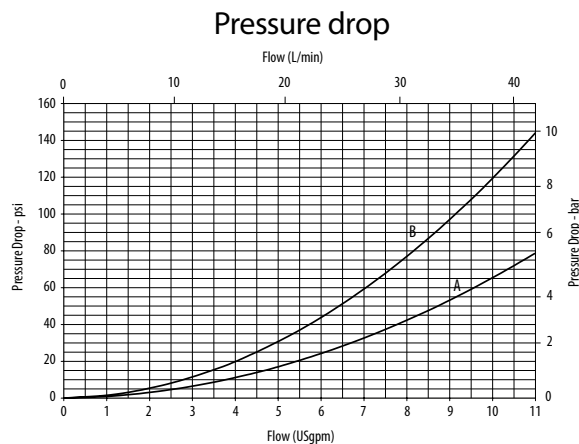


**Installation torque**  
81-95 Nm [60-70 ft lbs]

#### PERFORMANCE DATA

<b>Rated pressure</b>	<b>210 bar [3000 psi]</b>
<b>Rated flow</b>	<b>40 l/min [11 US gpm]</b>
<b>Leakage</b>	350 ml/min [21.5 in <sup>3</sup> /min] @ 210 bar [3000 psi]
<b>Weight</b>	0.29 kg [0.66 lb]
<b>Cavity</b>	C-12-3

#### PERFORMANCE CURVES



A-Port 1 to 2 • B-Port 3 to 1

#### MODEL CODE

**MSV1 - 12 - V - L - A - 12H**

##### Seal Option

Code	Seal Kit
<b>Omit</b> -Buna-N	9900171-000
<b>V</b> -Viton	9900172-000

##### Actuator Option

**L**-Push and Twist, with detent  
**E**-Push/Pull, with detent  
**N**-No detent, momentary actuation

##### Housing

Code	Ports	Aluminum
<b>0</b>	No housing	
<b>6G</b>	3/4" BSP	02-161816
<b>12H</b>	#12 SAE	02-160646

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].  
\* Additional housings available

##### Housing Material

**Omit** - No housing  
**A** - Aluminum

## Directional Control Valves

### MSV2-12

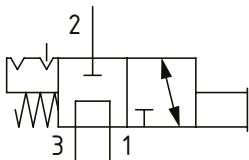
Manual Push Valve with Detent, 3-Way, Spool Type

210 bar [3000 psi] • 38 l/min [10 US gpm]

#### DESCRIPTION AND OPERATION

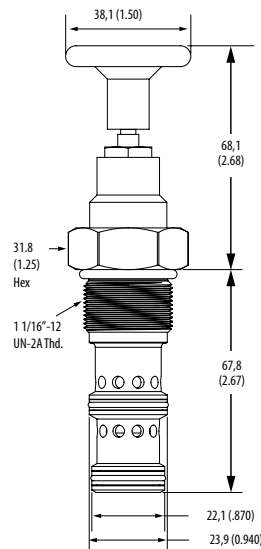
This is a 3-way, spool type, 2 position, push to open directional control valve with a push and twist detent. In the normal position, port 3 is connected to port 1 and port 2 is blocked. When the knob is manually pushed downward, port 3 is blocked and port 1 is connected to port 2. It can be held in this position by twisting the knob to engage the detent. This valve can be used to prevent flow to part of a system until manual intervention takes place.

#### SCHEMATIC



#### DIMENSIONS

mm [in]



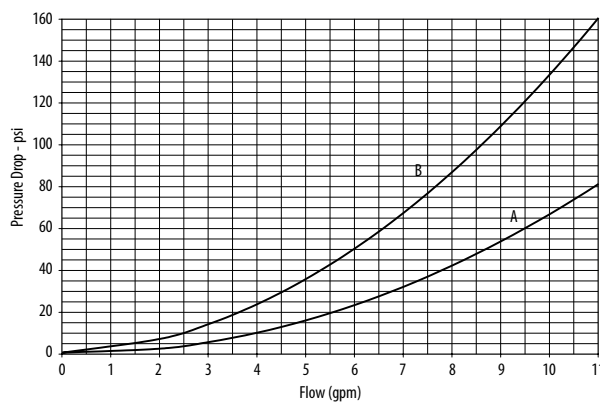
Installation torque  
81-95 Nm [60-70 ft lbs]

#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	38 l/min [10 US gpm]
Leakage	350 ml/min [21.5 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.29 kg [0.66 lb]
Cavity	C-12-3

#### PERFORMANCE CURVES

##### Pressure drop



A-Port 2 to 1 • B-Port 1 to 3

#### MODEL CODE

MSV2 - 12 - V - L - A - 12H

##### Seal Option

Code	Seal Kit
Omit-Buna-N	9900171-000
V-Viton	9900172-000

##### Actuator Option

L-Push and Twist, with detent  
E-Push/Pull, with detent  
N-No detent, momentary actuation

##### Housing Material

Omit - No housing  
A - Aluminum

##### Housing

Code	Ports	Aluminum
0	No housing	
4G	1/2" BSP	02-161817
6G	3/4" BSP	02-161816
10H	#10 SAE	02-160642
12H	#12 SAE	02-160646

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### MSV3-12

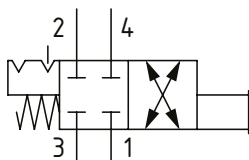
Manual Push Valve with Detent, 4-Way, Spool Type

210 bar [3000 psi] • 53 l/min [14 US gpm]

#### DESCRIPTION AND OPERATION

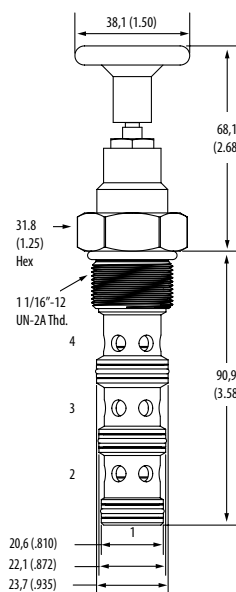
This is a 4-way, spool type, 2 position, push to open directional control valve with a push and twist detent. In the normal position all ports are blocked. When the knob is manually pushed downward, port 1 is connected to port 2 and port 3 is connected to port 4. It can be held in this position by twisting the knob to engage the detent. This valve can be used to isolate an actuator until manual intervention takes place.

#### SCHEMATIC



#### DIMENSIONS

mm [in]



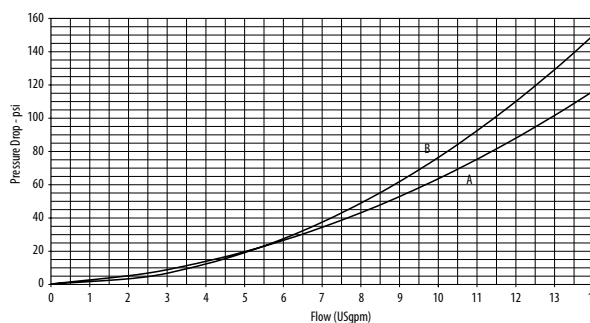
Installation torque  
81-95 Nm [60-70 ft lbs]

#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	53 l/min [14 US gpm]
Leakage	350 ml/min [21.5 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.32 kg [0.72 lb]
Cavity	C-12-4

#### PERFORMANCE CURVES

##### Pressure drop



A-Port 3 to 4 • B-Port 2 to 1

#### MODEL CODE

MSV3 - 12 - V - L - A - 6G

##### Seal Option

Code	Seal Kit
Omit-Buna-N	02-160979
V-Viton	02-160980

##### Actuator Option

L-Push and Twist, with detent  
E-Push/Pull, with detent  
N-No detent, momentary actuation

##### Housing

Code	Ports	Aluminum
0	No housing	
6G	3/4" BSP	5986432-001
10T	#10 SAE	6030517-001
12H	#12 SAE	5986436-001

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Housing Material

Omit - No housing  
A - Aluminum

## Directional Control Valves

### MSV4-12

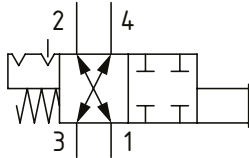
Manual Push Valve with Detent, 4-Way, Spool Type

210 bar [3000 psi] • 53 l/min [14 US gpm]

#### DESCRIPTION AND OPERATION

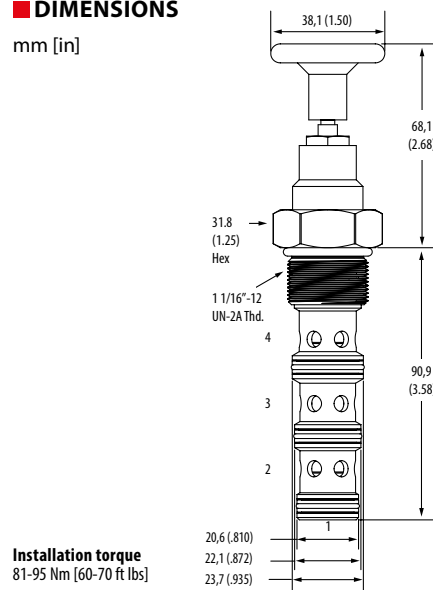
This is a 4-way, spool type, 2 position, push to open directional control valve with a push and twist detent. In the normal position, port 1 is connected to port 2 and port 3 is connected to port 4. When the knob is manually pushed downward, all ports are blocked. It can be held in this position by twisting the knob to engage the detent. This valve can be used to isolate an actuator when manual intervention takes place.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

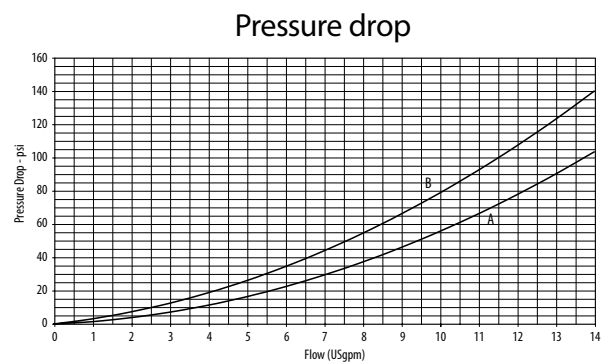


**Installation torque**  
81-95 Nm [60-70 ft lbs]

#### PERFORMANCE DATA

<b>Rated pressure</b>	<b>210 bar [3000 psi]</b>
<b>Rated flow</b>	<b>53 l/min [14 US gpm]</b>
<b>Leakage</b>	350 ml/min [21.5 in <sup>3</sup> /min] @ 210 bar [3000 psi]
<b>Weight</b>	0.32 kg [0.71 lb]
<b>Cavity</b>	C-12-4

#### PERFORMANCE CURVES



A-Port 3 to 4 • B-Port 2 to 1

#### MODEL CODE

**MSV4 - 12 - V - L - A - 10T**

##### Seal Option

Code	Seal Kit
<b>Omit</b> -Buna-N	02-160979
<b>V</b> -Viton	02-160980

##### Actuator Option

**L**-Push and Twist, with detent  
**E**-Push/Pull, with detent  
**N**-No detent, momentary actuation

##### Housing

Code	Ports	Aluminum
<b>0</b>	No housing	
<b>6G</b>	3/4" BSP	5986432-001
<b>10T</b>	#10 SAE	6030517-001
<b>12H</b>	#12 SAE	5986436-001

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Housing Material

**Omit** - No housing  
**A** - Aluminum

## Directional Control Valves

### MSV5-12

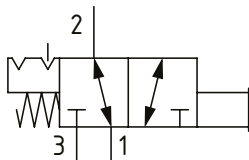
Manual Push Valve with Detent, 3-Way, Spool Type

210 bar [3000 psi] • 42 l/min [11 US gpm]

#### DESCRIPTION AND OPERATION

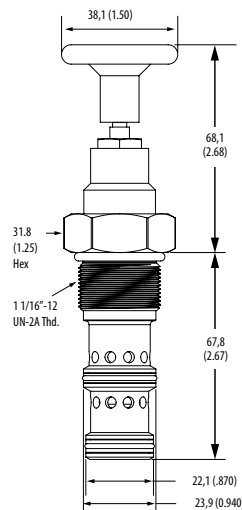
This is a 3-way, spool type, 2 position, push to open directional control valve with a push and twist detent. In the normal position, port 1 is connected to port 2 and port 3 is blocked. When the knob is manually pushed downward, port 1 is blocked and port 2 is connected to port 3. It can be held in this position by twisting the knob to engage the detent. This valve can be used to prevent flow to part of a system until manual intervention takes place.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

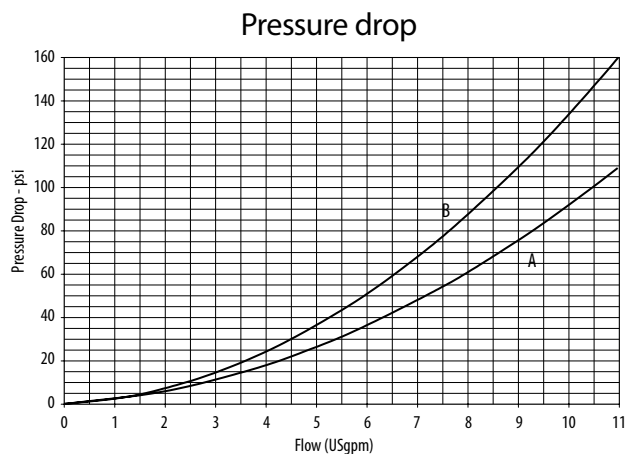


Installation torque  
81-95 Nm [60-70 ft lbs]

#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	42 l/min [11 US gpm]
Leakage	350 ml/min [21.5 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.29 kg [0.66 lb]
Cavity	C-12-3

#### PERFORMANCE CURVES



A-Port 2 to 1 • B-Port 3 to 2

#### MODEL CODE

MSV5 - 12 - V - L - A - 6G

##### Seal Option

Code	Seal Kit
Omit-Buna-N	9900171-000
V-Viton	9900172-000

##### Actuator Option

L-Push and Twist, with detent  
E-Push/Pull, with detent  
N-No detent, momentary actuation

##### Housing

Code	Ports	Aluminum
0	No housing	
6G	3/4" BSP	02-161816
12H	#12 SAE	02-160646

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Housing Material

Omit - No housing  
A - Aluminum

## Directional Control Valves

### MSV6-12

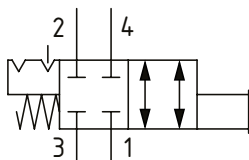
Manual Push Valve with Detent, 4-Way, Spool Type

210 bar [3000 psi] • 53 l/min [14 US gpm]

#### DESCRIPTION AND OPERATION

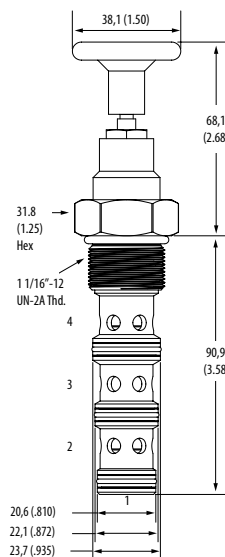
This is a 4-way, spool type, 2 position, push to open directional control valve with a push and twist detent. In the normal position, all ports are blocked. When the knob is manually pushed downward, port 1 is connected to port 4 and port 3 is connected to port 2. It can be held in this position by twisting the knob to engage the detent. This valve can be used to isolate an actuator until manual intervention takes place.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

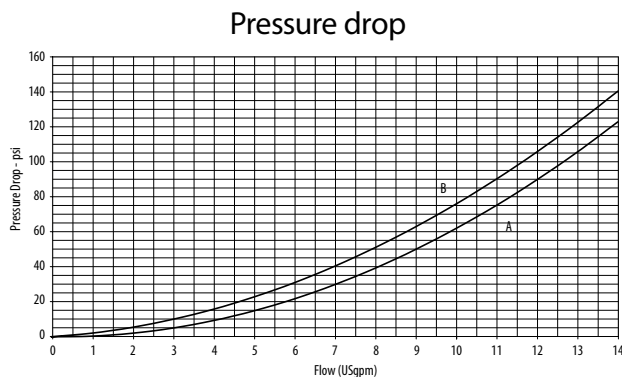


Installation torque  
81-95 Nm [60-70 ft lbs]

#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	53 l/min [14 US gpm]
Leakage	350 ml/min [21.5 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.32 kg [0.71 lb]
Cavity	C-12-4

#### PERFORMANCE CURVES



A-Port 4 to 1 • B-Port 3 to 2

#### MODEL CODE

MSV6 - 12 - V - L - A - 10T

##### Seal Option

Code	Seal Kit
Omit-Buna-N	02-160979
V-Viton	02-160980

##### Actuator Option

L-Push and Twist, with detent  
E-Push/Pull, with detent  
N-No detent, momentary actuation

##### Housing

Code	Ports	Aluminum
0	No housing	
6G	3/4" BSP	5986432-001
10T	#10 SAE	6030517-001
12H	#12 SAE	5986436-001

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Housing Material

Omit - No housing  
A - Aluminum

## Directional Control Valves

### MSV17-10

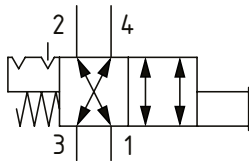
Manual Push Valve with Detent, 4-Way, Spool Type

350 bar [5000 psi] • 19 l/min [5 US gpm]

#### DESCRIPTION AND OPERATION

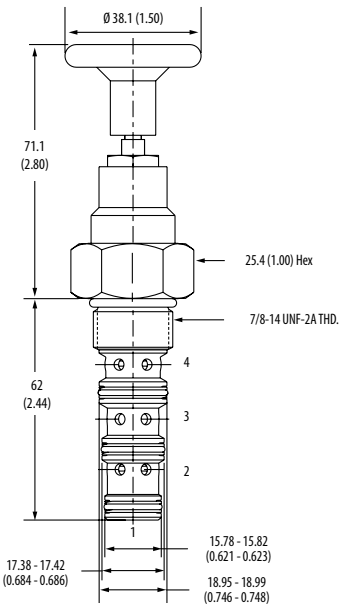
This is a 4-way, spool type, 2 position, push to open directional control valve with a push and twist detent. In the normal position port 1 is connected to port 2 and port 3 is connected to port 4. When the knob is manually pushed downward, port 1 is connected to port 4 and port 3 is connected to port 2. It can be held in this position by twisting the knob to engage the detent. The valve can be used to reverse an actuator until manual intervention takes place.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

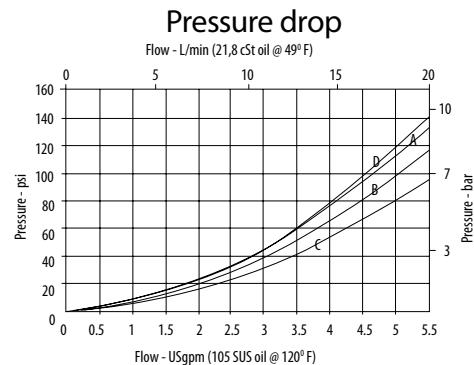


**Installation torque**  
**A** - 47-54 Nm [35-40 ft. lbs]  
**S** - 68-75 Nm [50-55 ft. lbs]

#### PERFORMANCE DATA

<b>Rated pressure</b>	<b>350 bar [5000 psi]</b>
<b>Rated flow</b>	<b>19 l/min [5 US gpm]</b>
<b>Leakage</b>	350 ml/min [21.5 in <sup>3</sup> /min] @ 210 bar [3000 psi]
<b>Weight</b>	0.28 kg [0.61 lb]
<b>Cavity</b>	SDC10-4

#### PERFORMANCE CURVES



**A**-Port 3 to 2 (actuated) • **B**-Port 3 to 4  
**C**-Port 2 to 1 • **D**-Port 4 to 1 (actuated)

#### MODEL CODE

**MSV17 - 10 - V - L - A - 6T**

##### Seal Option

Code	Seal Kit
<b>Omit</b> - Buna-N	889625
<b>V</b> - Viton	566080

##### Actuator Option

**L** - Push and Twist, with detent  
**E** - Push/Pull, with detent  
**N** - No detent, momentary actuation

##### Housing Material

**Omit** - No housing  
**A** - Aluminum  
**S** - Steel

##### Housing

Code	Ports	Aluminum	Steel
<b>0</b>	No housing		
<b>2G</b>	1/4" BSPP	02-185804	02-175139
<b>3G</b>	3/8" BSPP	02-185805	02-175140
<b>6H</b>	#6 SAE	02-185802	
<b>8H</b>	#8 SAE	02-185803	
<b>6T</b>	#6 SAE		02-175137
<b>8T</b>	#8 SAE		02-175138

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].  
 \* Additional housings available

## Directional Control Valves

### MSV7-12

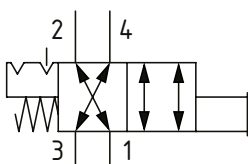
Manual Push Valve with Detent, 4-Way, Spool Type

210 bar [3000 psi] • 45 l/min [12 US gpm]

#### DESCRIPTION AND OPERATION

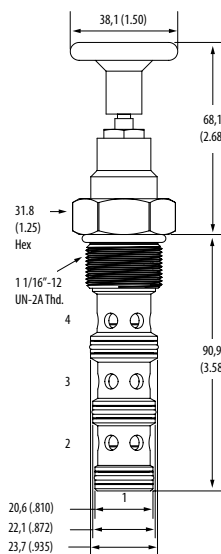
This is a 4-way, spool type, 2 position, push to open directional control valve with a push and twist detent. In the normal position port 1 is connected to port 2 and port 3 is connected to port 4. When the knob is manually pushed downward, port 1 is connected to port 4 and port 3 is connected to port 2. It can be held in this position by twisting the knob to engage the detent. The valve can be used to reverse an actuator until manual intervention takes place.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

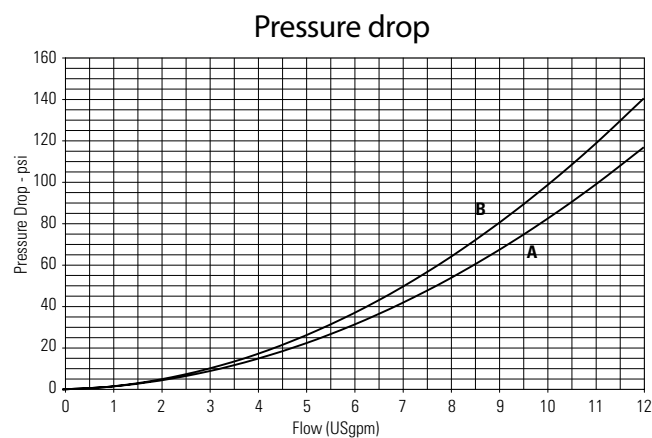


Installation torque  
81-95 Nm [60-70 ft. lbs]

#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	45 l/min [12 US gpm]
Leakage	350 ml/min [21.5 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.32 kg [0.71 lb]
Cavity	C-12-4

#### PERFORMANCE CURVES



A - Port 4 to 1, Port 3 to 2 • B - Port 2 to 1, Port 3 to 4

#### MODEL CODE

**MSV7 - 12 - V - L - A - 6G**

##### Seal Option

Code	Seal Kit
Omit-Buna-N	02-160979
V-Viton	02-160980

##### Actuator option

L-Push and Twist, with detent  
E-Push/Pull, with detent  
N-No detent, momentary actuation

##### Housing Material

Omit - No housing  
A - Aluminum

##### Housing

Code	Ports	Aluminum
0	No housing	
6G	3/4" BSP	5986432-001
10T	#10 SAE	6030517-001
12H	#12 SAE	5986436-001

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### CP710-1

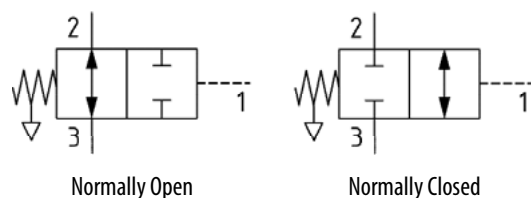
Directional Control Valve, 2-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent

210 bar [3000 psi] • 40 l/min [11 US gpm]

#### DESCRIPTION AND OPERATION

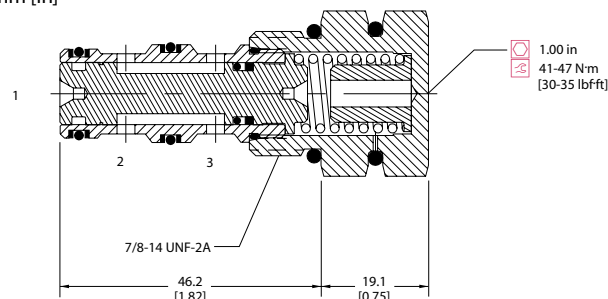
This is a 2-way, spool type, hydraulically piloted directional control valve with an atmospheric vent. It is available in normally open or normally closed configurations between ports 2 and 3, which shift when the pilot pressure at port 1 overcomes the opposing spring. Due to the atmospheric vent, the pilot pressure required to shift the valve is independent of the pressure in the line between port 2 and port 3.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

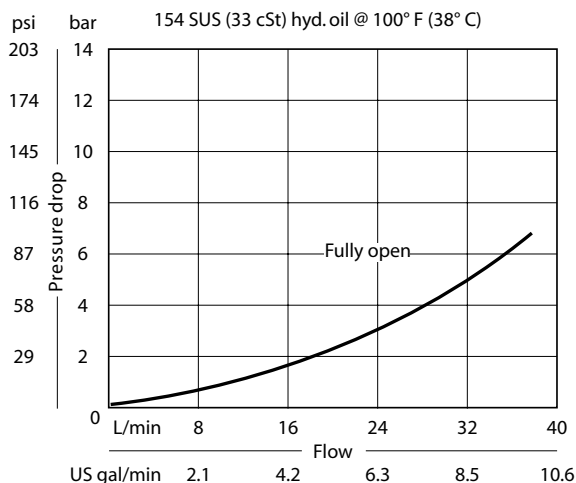


#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow @ 7 bar [100 psi]	40 l/min [11 US gpm]
Weight	0.13 kg [0.29 lb]
Cavity	SDC10-3

#### PERFORMANCE CURVES

##### Pressure drop



#### MODEL CODE

CP710 - 1 - B - 8S - C - 150 - S1

##### Seal Option

Code	Seal kit
B-Buna-N	120009
V-Viton	120010

##### Housing

Code	Ports & Material	Housing Model Code
0	No Housing	
SE3B	AL, 3/8 BSP	SDC10-3-SE-3B
SE4B	AL, 1/2 BSP	SDC10-3-SE-4B
6S	AL, #6 SAE	CP10-3-6S
8S	AL, #8 SAE	CP10-3-8S

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Spool Seal Option

S1 - Seal at top of spool  
S2 - Seal at top and bottom of spool

##### Shift Pressure

Code	Bar	[Psi]
050	3.5	[50]
080	5.5	[80]
150	10.3	[150]

##### Spool Configuration

0 - Normally open  
C - Normally closed

## Directional Control Valves

### PTS17-10

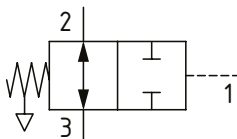
Directional Control Valve, 2-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent

350 bar [5000 psi] • 30 l/min [8 US gpm]

#### DESCRIPTION AND OPERATION

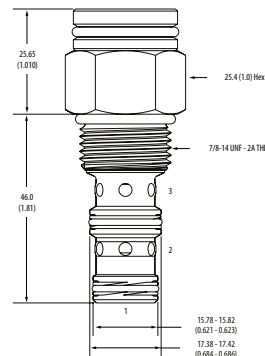
This is a 2-way, hydraulically piloted valve with an atmospheric vent. It is normally open between ports 2 and 3 that shift to the closed position when the pilot pressure at port 1 overcomes the opposing spring. Due to the atmospheric vent, the pilot pressure required to shift the valve is independent of the pressure in the line between port 2 and port 3.

#### SCHEMATIC



#### DIMENSIONS

mm [in]



#### Installation torque

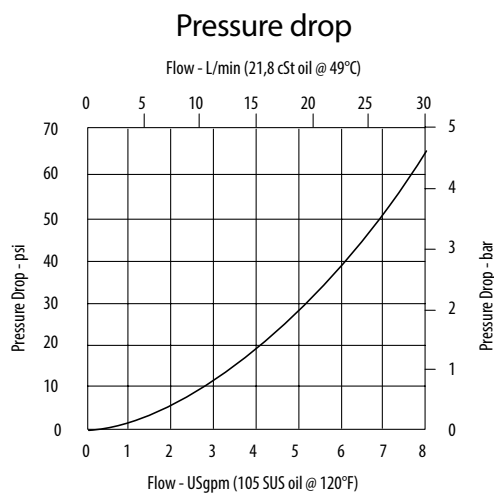
A-47-54 Nm [35-40 ft. lbs]

S-68-75 Nm [50-55 ft. lbs]

#### PERFORMANCE DATA

<b>Rated pressure</b>	<b>350 bar [5000 psi]</b>
<b>Rated flow</b>	<b>30 l/min [8 US gpm]</b>
<b>Leakage</b>	210 ml/min [13 in <sup>3</sup> /min] @ 350 bar [5000 psi]
<b>Weight</b>	0.10 kg [0.23 lbs]
<b>Cavity</b>	SDC10-3

#### PERFORMANCE CURVES



#### MODEL CODE

**PTS17 - 10 - V - A - 2G - 40**

#### Seal Option

Code	Seal kit
B-Buna-N	889624
V-Viton	889628

#### Housing Material

Omit-No housing  
A-Aluminum  
S-Steel

#### Shift Pressure

Code	Bar	Psi
40	2.75	[40]
80	5.5	[80]
160	11	[160]

#### Housing

Code	Port size	Aluminium Standard duty	Aluminium Heavy duty	Steel
0	No Housing			
3B	3/8" BSP	02-173358		
6T	#6 SAE	566162		02-175124
8T	#8 SAE			02-175125
2G	1/4" BSP		876705	02-175127
3G	3/8" BSP		876714	02-175128
6H	#6 SAE		876704	
8H	#8 SAE		876711	

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### PTS17-12

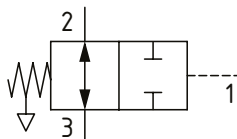
Directional Control Valve, 2-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent

350 bar [5000 psi] • 114 l/min [30 US gpm]

#### DESCRIPTION AND OPERATION

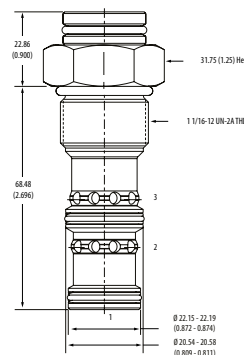
This is a 2-way, hydraulically piloted valve with an atmospheric vent. It is normally open between ports 2 and 3 that shift to the closed position when the pilot pressure at port 1 overcomes the opposing spring. Due to the atmospheric vent, the pilot pressure required to shift the valve is independent of the pressure in the line between port 2 and port 3.

#### SCHEMATIC



#### DIMENSIONS

mm [in]



#### Installation torque

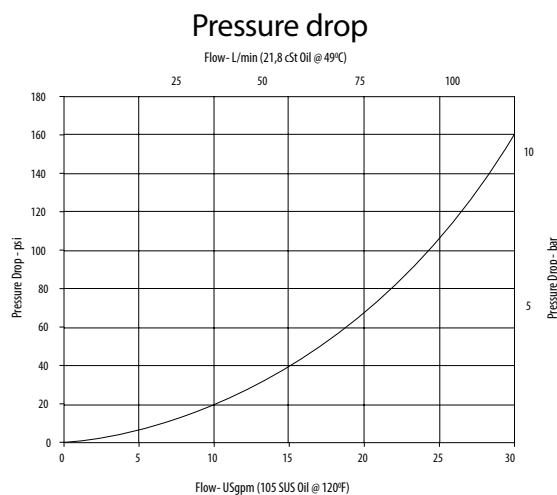
A-81-95 Nm [60-70 ft. lbs]

S-102-115 Nm [75-85 ft. lbs]

#### PERFORMANCE DATA

<b>Rated pressure</b>	<b>350 bar [5000 psi]</b>
<b>Rated flow</b>	<b>114 l/min [30 US gpm]</b>
<b>Leakage</b>	210 ml/min [13 in <sup>3</sup> /min] @ 350 bar [5000 psi]
<b>Weight</b>	0.25 kg [0.55 lbs]
<b>Cavity</b>	C-12-3

#### PERFORMANCE CURVES



#### MODEL CODE

**PTS17 - 12 - V - A - 4G - 80**

#### Seal Option

Code	Seal kit
<b>B</b> -Buna-N	9900171
<b>V</b> -Viton	9900172

#### Housing Material

**Omit**-No housing  
**A**-Aluminum  
**S**-Steel

#### Shift Pressure

Code	Bar	Psi
<b>80</b>	5.5	[80]
<b>120</b>	8.3	[120]
<b>160</b>	11.0	[160]

#### Housing

Code	Port size	Aluminium	Steel
<b>0</b>	No Housing		
<b>4G</b>	1/2" BSP	02-161817	02-169815
<b>6G</b>	3/4" BSP	02-161816	02-169814
<b>10H</b>	#10 SAE	02-160642	
<b>12H</b>	#12 SAE	02-160646	
<b>10T</b>	#10 SAE		02-161070
<b>12T</b>	#12 SAE		02-169816

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### CP710-3

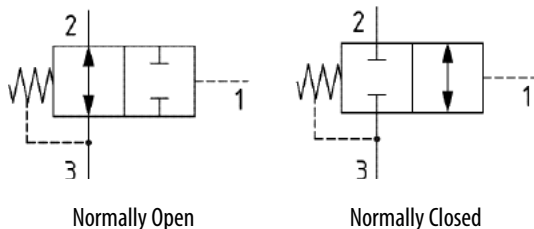
Directional Control Valve, 2-Way, Spool Type, Hydraulic Pilot, Internal Drain

210 bar [3000 psi] • 40 l/min [11 US gpm]

#### DESCRIPTION AND OPERATION

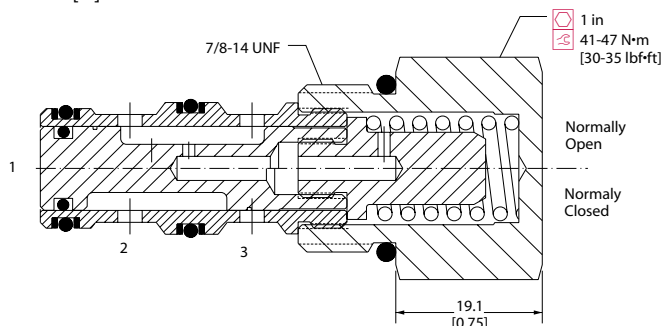
This is a 2-way, spool type, hydraulically piloted directional control valve with internal drain. It is available in normally open or normally closed configurations between ports 2 and 3 that shift when pilot pressure is applied to port 1. Due to the internal drain, the pilot pressure required to shift the valve is dependent on the pressure in the line between port 2 and port 3.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

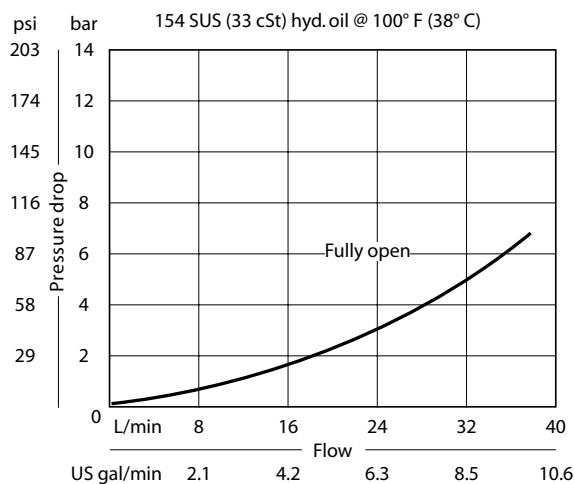


#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow @ 7 bar [100 psi]	40 l/min [11 US gpm]
Weight	0.13 kg [0.29 lb]
Cavity	SDC10-3

#### PERFORMANCE CURVES

##### Pressure drop



#### MODEL CODE

**CP710 - 3 - B - 6S - C - 150 - S3**

##### Seal Option

Code	Seal kit
B-Buna-N	120009
V-Viton	120010

##### Housing

Code	Ports & Material	Housing Model Code
0	No Housing	
SE3B	AL, 3/8 BSP	SDC10-3-SE-3B
SE4B	AL, 1/2 BSP	SDC10-3-SE-4B
6S	AL, #6 SAE	CP10-3
8S	AL, #8 SAE	CP10-3

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Spool Seal Option

S3 - No Seal  
S4 - Seal included

##### Shift Pressure

Code	Bar	[Psi]
150	10.3	[150]

Note: Shift pressure assumes no spool seal

##### Spool Configuration

0 - Normally Open  
C - Normally Closed

## Directional Control Valves

### CP710-8

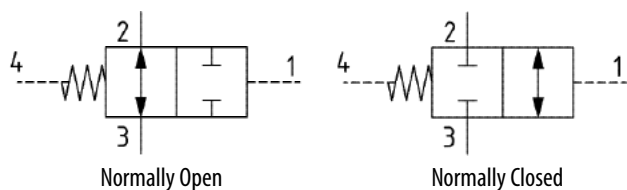
Directional Control Valve, 2-Way, Spool Type, Hydraulic Pilot, External Drain

210 bar [3000 psi] • 40 l/min [11 US gpm]

#### DESCRIPTION AND OPERATION

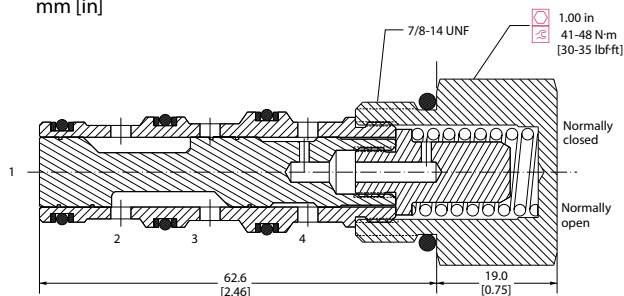
This is a 2-way, spool type, hydraulically piloted directional control valve with external drain. It is available in normally open or normally closed configurations between ports 2 and 3 that shift when pilot pressure is applied to port 1. Due to the external drain, the pilot pressure required shift the valve is dependent on the pressure in port 4, which would normally be connected to tank.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

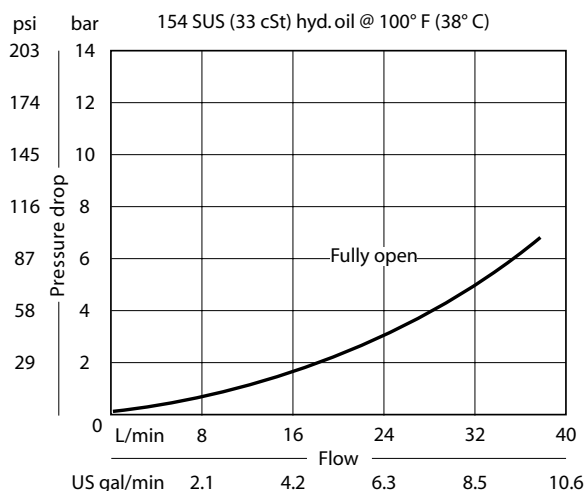


#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow @ 7 bar [100 psi]	40 l/min [11 US gpm]
Weight	0.15 kg [0.33 lb]
Cavity	SDC10-4

#### PERFORMANCE CURVES

##### Pressure drop



#### MODEL CODE

CP710 - 8 - B - 6S - C - 080

##### Seal Option

Code	Seal kit
B	Buna-N 120009
V	Viton 120010

##### Housing

Code	Ports & Material	Housing Model Code
0	No Housing	
L3B	AL, 3/8 BSP	SDC10-4-L-3B
L4B	AL, 1/2 BSP	SDC10-4-L-4B
6S	AL, #6 SAE	CP10-4-6S
8S	AL, #8 SAE	CP10-4-8S

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Shift Pressure

Code	Bar	[Psi]
040	2.8	[40]
080	5.5	[80]
150	10.3	[150]

##### Spool Configuration

0 - Normally Open  
C - Normally Closed

## Directional Control Valves

### CP712-8

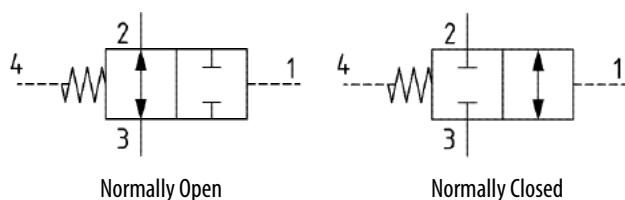
Directional Control Valve, 2-Way, Spool Type, Hydraulic Pilot, External Drain

210 bar [3000 psi] • 130 l/min [34 US gpm]

#### DESCRIPTION AND OPERATION

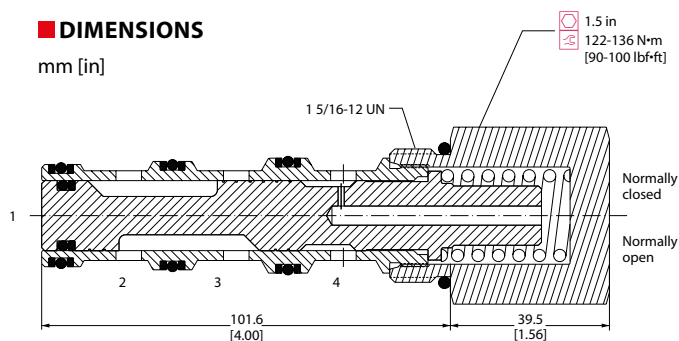
This is a 2-way, spool type, hydraulically piloted directional control valve with external drain. It is available in normally open or normally closed configurations between ports 2 and 3 that shift when pilot pressure is applied to port 1. Due to the external drain, the pilot pressure required shift the valve is dependent on the pressure in port 4, which would normally be connected to tank.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

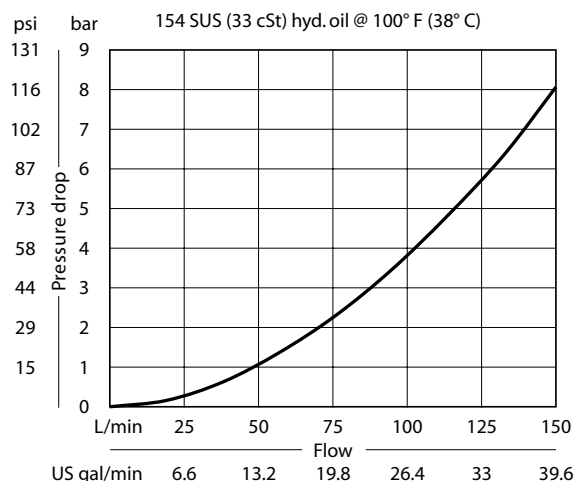


#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow @ 7 bar [100 psi]	130 l/min [34 US gpm]
Weight	0.61 kg [1.34 lb]
Cavity	SDC16-4

#### PERFORMANCE CURVES

##### Pressure drop



#### MODEL CODE

CP712 - 8 - B - 16S - C - 080 - S3

##### Seal Option

Code	Seal kit
B-Buna-N	120025
V-Viton	120026

##### Housing

Code	Ports & Material	Housing Model Code
0	No Housing	
6B	AL, 3/4 BSP	CP16-4-6B
8B	AL, 1 BSP	CP16-4-8B
12S	AL, #12 SAE	CP16-4-12S
16S	AL, #16 SAE	CP16-4-16S

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Spool Seal Option

S3-No seal  
S4-Seal included

##### Shift Pressure

Code	Bar	[Psi]
040	2.8	[40]
080	5.5	[80]
150	10.3	[150]

Note: Shift pressure assumes no spool seal

##### Spool Configuration

0 - Normally Open  
C - Normally Closed

## Directional Control Valves

### CP712-11

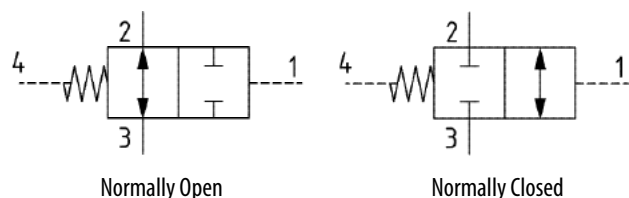
Directional Control Valve, 2-Way, Spool Type, Hydraulic Pilot, External Drain

450 bar [6500 psi] • 130 l/min [34 US gpm]

#### DESCRIPTION AND OPERATION

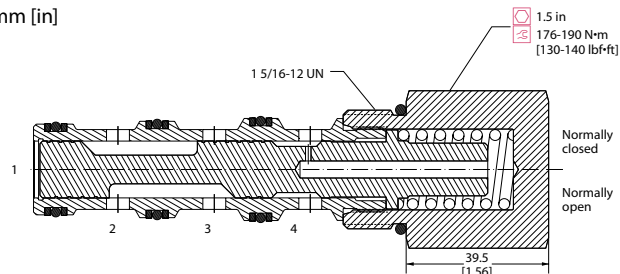
This is a 2-way, spool type, hydraulically piloted directional control valve with external drain. It is available in normally open or normally closed configurations between ports 2 and 3 that shift when pilot pressure is applied to port 1. Due to the external drain, the pilot pressure required shift the valve is dependent on the pressure in port 4, which would normally be connected to tank. Due to the high pressure rating, this valve is ideal for use in transmission circuits to by-pass flow dividers.

#### SCHEMATIC



#### DIMENSIONS

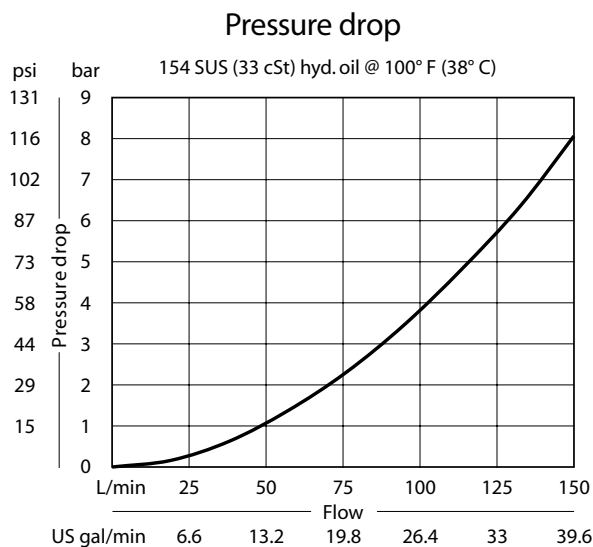
mm [in]



#### PERFORMANCE DATA

<b>Rated pressure</b>	<b>450 bar [6500 psi]</b>
<b>Rated flow @ 7 bar [100 psi]</b>	<b>130 l/min [34 US gpm]</b>
<b>Leakage</b>	328 ml/min [20 in <sup>3</sup> /min] @ 210 bar [3000 psi]
<b>Weight</b>	0.61 kg [1.34 lb]
<b>Cavity</b>	SDC16-4

#### PERFORMANCE CURVES



#### MODEL CODE

**CP712 - 11 - U - 0 - C - 040**

##### Seal Option

Code	Seal kit
U-Urethane	120677

##### Housing

Code	Ports & Material	Housing Model Code
0	No Housing	
6B	AL, 3/4 BSP	CP16-4-6B
8B	AL, 1 BSP	CP16-4-8B
12S	AL, #12 SAE	CP16-4-12S
16S	AL, #16 SAE	CP16-4-16S
S16S	Steel, #16SAE	CP16-4-S16S

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].  
\* Additional housings available

##### Shift Pressure

Code	Bar	[Psi]
040	2.8	[40]
080	5.5	[80]

##### Spool Configuration

0 - Normally Open  
C - Normally Closed

# Directional Control Valves

## CP712-7

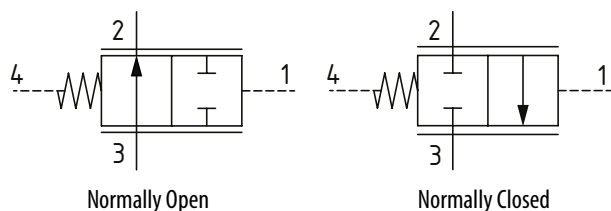
Directional Control Valve, 2-Way, Spool Type, Hydraulic Pilot, External Drain, Proportional Flow Control

210 bar [3000 psi] • 220 l/min [58 US gpm]

### DESCRIPTION AND OPERATION

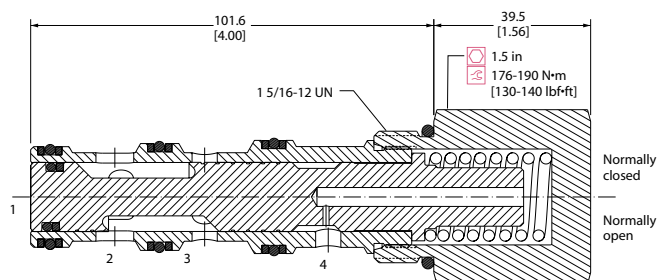
This is a 2-way, spool type, hydraulically piloted directional control valve with internal hydraulic vent. It is available in normally open or normally closed configurations between ports 2 and 3 that shift when pilot pressure is applied to port 1. Due to the external drain, the pilot pressure required shift the valve is dependent on the pressure in port 4, which would normally be connected to tank. This valve is ideal to use as a proportional flow control when combined with a proportional pressure reducing valve.

### SCHEMATIC



### DIMENSIONS

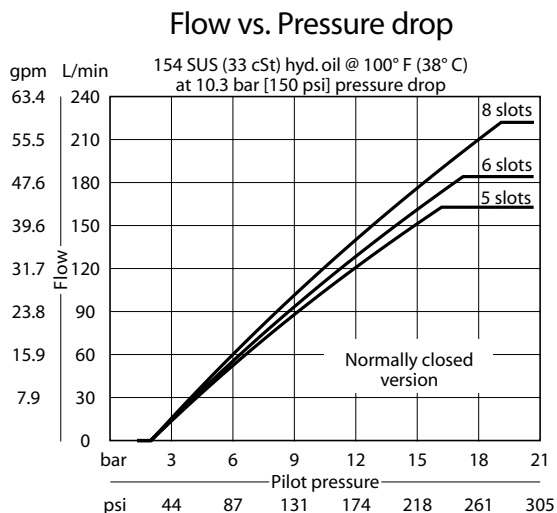
mm [in]



### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow @ 10 bar [150 psi]	220 l/min [58 US gpm]
Weight	0.61 kg [1.34 lb]
Cavity	SDC16-4

### PERFORMANCE CURVES



### MODEL CODE

CP712 - 7 - B - 12S - C - 5 - S4

#### Seal Option

Code	Seal kit
B-Buna-N	120025
V-Viton	120026

#### Housing

Code	Ports & Material	Housing Model Code
0	No Housing	
6B	AL, 3/4 BSP	CP16-4-6B
8B	AL, 1 BSP	CP16-4-8B
12S	AL, #12 SAE	CP16-4-12S
16S	AL, #16 SAE	CP16-4-16S

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

#### Spool Seal Option

S3 - No Seal  
S4 - Seal included

#### Sleeve Option

5 - 5 slots  
6 - 6 slots  
8 - 8 slots

#### Spool Configuration

O - Normally Open  
C - Normally Closed

## Directional Control Valves

### PTS1-10

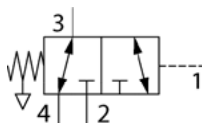
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent

210 bar [3000 psi] • 30 l/min [8 US gpm]

#### DESCRIPTION AND OPERATION

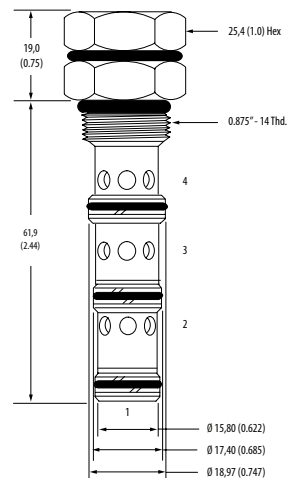
This is a 3-way, spool type, hydraulically piloted directional control valve with an atmospheric vent. In the normal condition, port 2 is connected to port 3 and port 4 is blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 4 with port 2 blocked. During the cross-over transition, all ports are blocked. This valve can be used as a selector valve when combined with a pilot solenoid valve.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

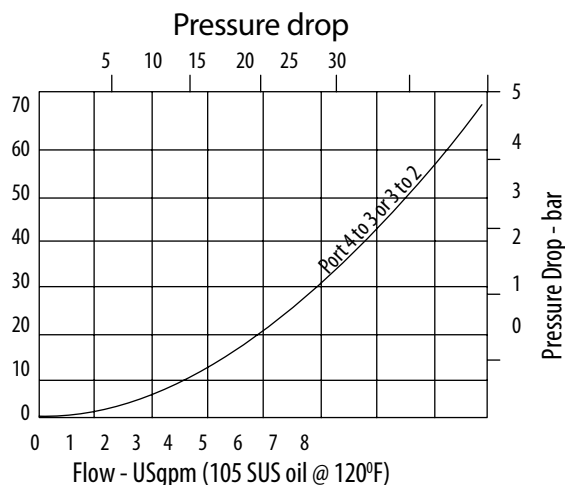


Installation torque  
47-54 Nm [35-40 ft lbs]

#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	30 l/min [8 US gpm]
Leakage	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.14 kg [0.32 lb]
Cavity	SDC10-4

#### PERFORMANCE CURVES



#### MODEL CODE

PTS1 - 10 - V - 0 - 40

##### Seal Option

Code	Seal Kit
Omit-Buna-N	889625
V-Viton	566080

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty
0	No housing		
3B	3/8" BSP	02-179705	
6T	#6 SAE	02-168235	
2G	1/4" BSP		876709
3G	3/8" BSP		876715
6H	#6 SAE		876708
8H	#8 SAE		876713

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Shift Pressure

Code	Bar	[Psi]
40	2.75	[40]
80	5.5	[80]
160	11.0	[160]

## Directional Control Valves

### PTS11-10

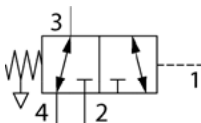
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent

350 bar [5000 psi] • 30 l/min [8 US gpm]

#### DESCRIPTION AND OPERATION

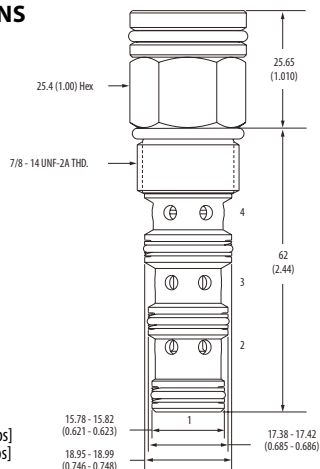
This is a 3-way, spool type, hydraulically piloted directional control valve with an atmospheric vent. In the normal condition, port 2 is connected to port 3 and port 4 is blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 4 with port 2 blocked. During the cross-over transition, all ports are blocked. This valve can be used as a selector valve when combined with a pilot solenoid valve.

#### SCHEMATIC



#### DIMENSIONS

mm [in]



#### Installation torque

A-47-54 Nm [35-40 ft. lbs]  
S-68-75 Nm [50-55 ft. lbs]

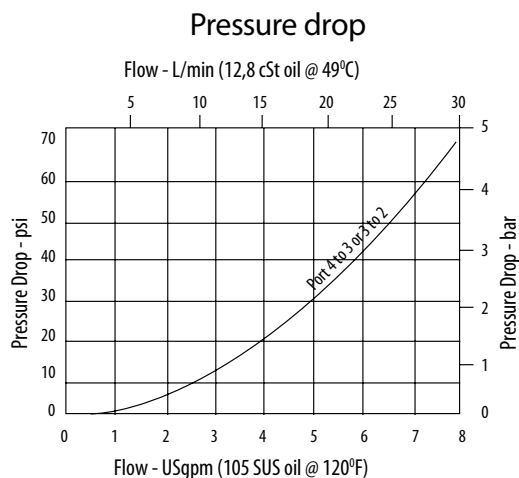
15.70 - 15.82  
(0.621 - 0.623)  
18.95 - 18.99  
(0.746 - 0.748)

17.38 - 17.42  
(0.685 - 0.686)

#### PERFORMANCE DATA

Rated pressure	350 bar [5000 psi]
Rated flow	30 l/min [8 US gpm]
Leakage	210 ml/min [13 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.14 kg [0.32 lb]
Cavity	SDC10-4

#### PERFORMANCE CURVES



#### MODEL CODE

PTS11 - 10 - V - A - 2G - 40

#### Seal Option

Code	Seal Kit
Omit-Buna-N	889625
V-Viton	566080

#### Housing Material

Omit-No housing  
A-Aluminum  
S-Steel

#### Shift Pressure

Code	Bar	[Psi]
40	2.75	[40]
80	5.5	[80]
160	11.0	[160]

#### Housing

Code	Ports	Aluminum Heavy duty	Steel
0	No housing		
2G	1/4" BSP	02-185804	02-175139
3G	3/8" BSP	02-185805	02-175140
6H	#6 SAE	02-185802	
8H	#8 SAE	02-185803	
6T	#6 SAE		02-175137
8T	#8 SAE		02-175138

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### PTS11-12

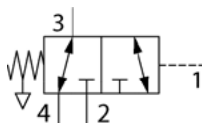
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent

350 bar [5000 psi] • 76 l/min [20 US gpm]

#### DESCRIPTION AND OPERATION

This is a 3-way, spool type, hydraulically piloted directional control valve with an atmospheric vent. In the normal condition, port 2 is connected to port 3 and port 4 is blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 4 with port 2 blocked. During the cross-over transition, all ports are blocked. This valve can be used as a selector valve when combined with a pilot solenoid valve.

#### SCHEMATIC

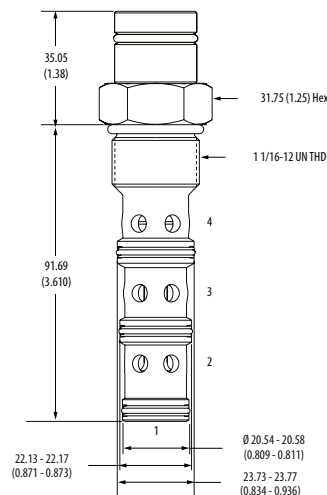


#### PERFORMANCE DATA

<b>Rated pressure</b>	<b>350 bar [5000 psi]</b>
<b>Rated flow</b>	<b>76 l/min [20 US gpm]</b>
<b>Leakage</b>	250 ml/min [15 in <sup>3</sup> /min] @ 350 bar [5000 psi]
<b>Weight</b>	0.32 kg [0.70 lb]
<b>Cavity</b>	C-12-4

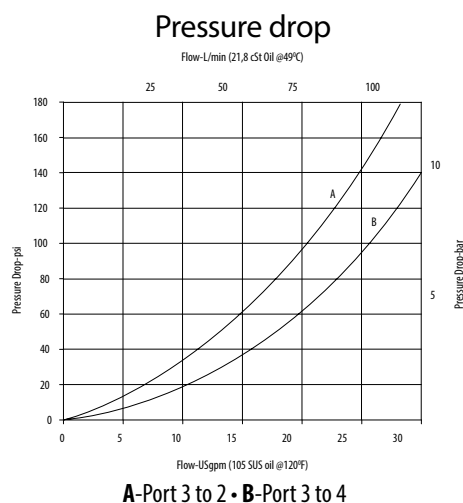
#### DIMENSIONS

mm [in]



**Installation torque**  
 A-81-95 Nm [60-70 ft. lbs]  
 S-102-115 Nm [75-85 ft. lbs]

#### PERFORMANCE CURVES



#### MODEL CODE

**PTS11 - 12 - V - A - 4G - 80**

##### Seal Option

Code	Seal Kit
Omit-Buna-N	02-160979
V-Viton	02-160980

##### Housing Material

Omit-No housing
A-Aluminum
S-Steel

##### Shift Pressure

Code	Bar	[Psi]
80	5.5	[80]
120	8.3	[120]

##### Housing

Code	Ports	Aluminum Heavy Duty	Steel
0	No housing		
4G	1/2" BSP	5986431-001	
6G	3/4" BSP	5986432-001	5991073-001
8H	#8 SAE	5986433-001	
10H	#10 SAE	5986434-001	5991074-001
12H	#12 SAE	5986436-001	5991075-001

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### PTS1-16

Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent

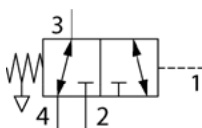
210 bar [3000 psi] • 132 l/min [35 US gpm]

#### DESCRIPTION AND OPERATION

This is a 3-way, spool type, hydraulically piloted directional control valve with an atmospheric vent.

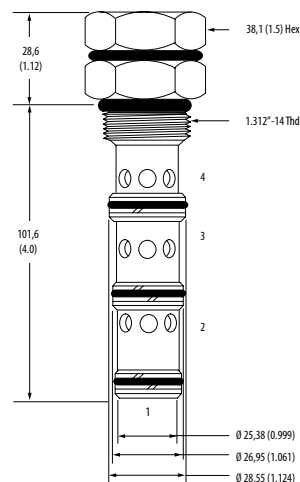
In the normal condition, port 2 is connected to port 3 and port 4 is blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 4 with port 2 blocked. During the cross-over transition, all ports are blocked. This valve can be used as a selector valve when combined with a pilot solenoid valve.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

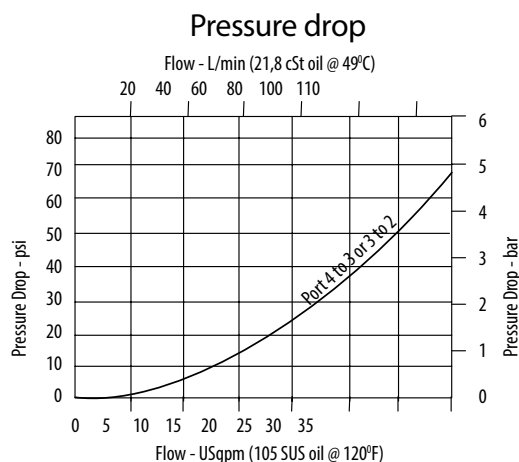


Installation torque  
108-122 Nm [80-90 ft. lbs]

#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	132 l/min [35 US gpm]
Leakage	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.5 kg [1.12 lb]
Cavity	SDC16-4

#### PERFORMANCE CURVES



#### MODEL CODE

PTS1 - 16 - V - 0 - 40 - 03

##### Seal Option

Code	Seal Kit
Omit	Buna-N 889634
V	Viton 889638

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty
0	No housing		
12T	#12 SAE	566411	
6B	3/4" BSP	02-175468	
10H	#10 SAE		876729
12H	#12 SAE		876731
4G	1/2" BSP		876728
6G	3/4" BSP		876730

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Spool Seal Option

Omit - No Seal  
03 - Seal included (between port 1 and 2)

##### Shift Pressure

Code	Bar	[Psi]
40	2.75	[40]
80	5.5	[80]
160	11.0	[160]

## Directional Control Valves

### PTS11-16

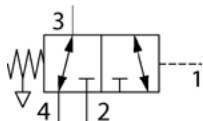
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent

350 bar [5000 psi] • 132 l/min [35 US gpm]

#### DESCRIPTION AND OPERATION

This is a 3-way, spool type, hydraulically piloted directional control valve with an atmospheric vent. In the normal condition, port 2 is connected to port 3 and port 4 is blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 4 with port 2 blocked. During the cross-over transition, all ports are blocked. This valve can be used as a selector valve when combined with a pilot solenoid valve.

#### SCHEMATIC



#### PERFORMANCE DATA

Rated pressure	350 bar [5000 psi]
Rated flow	132 l/min [35 US gpm]
Leakage	250 ml/min [15 in <sup>3</sup> /min] @ 350 bar [5000 psi]
Weight	0.5 kg [1.12 lb]
Cavity	SDC16-4

#### MODEL CODE

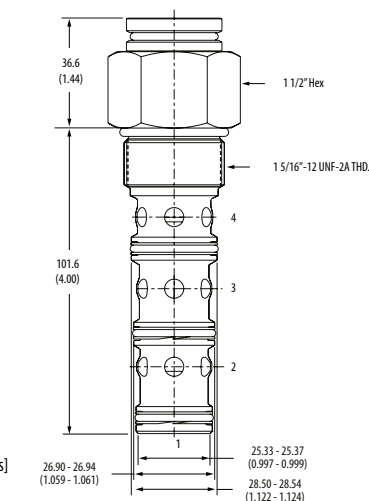
PTS11 - 16 - V - A - 6B - 80

##### Seal Option

Code	Seal Kit
Omit - Buna-N	889634
V - Viton	889638

##### Housing Material

Omit - No housing  
A - Aluminum  
S - Steel



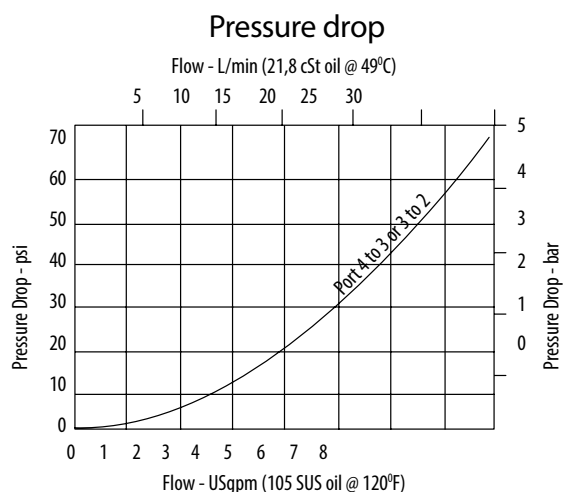
#### DIMENSIONS

mm [in]

##### Installation torque

A-108-122 Nm [80-90 ft. lbs]  
S-136-149 Nm [100-110 ft. lbs]

#### PERFORMANCE CURVES



##### Shift Pressure

Code	Bar	[Psi]
80	5.5	[80]
160	11.0	[160]

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty	Steel
0	No housing			
10T	#10 SAE			02-175141
12T	#12 SAE	566411		02-175142
6B	3/4" BSP	02-175468		
10H	#10 SAE		876729	
12H	#12 SAE		876731	
4G	1/2" BSP		876728	02-175143
6G	3/4" BSP		876730	02-175144

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### PTS1-20

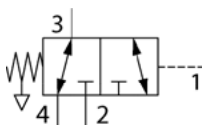
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent

210 bar [3000 psi] • 265 l/min [70 US gpm]

#### DESCRIPTION AND OPERATION

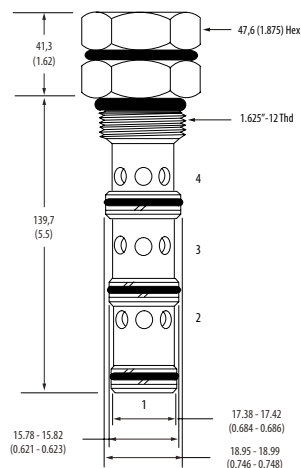
This is a 3-way, spool type, hydraulically piloted directional control valve with an atmospheric vent. In the normal condition, port 2 is connected to port 3 and port 4 is blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 4 with port 2 blocked. During the cross-over transition, all ports are blocked. This valve can be used as a selector valve when combined with a pilot solenoid valve.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

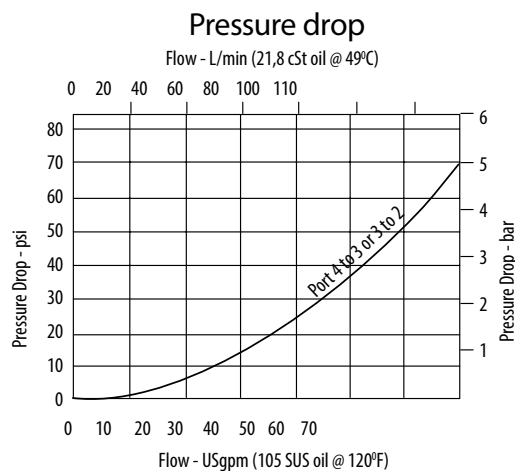


Installation torque  
128-155 Nm [95-115 ft. lbs]

#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	265 l/min [70 US gpm]
Leakage	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	1.1 kg [2.40 lb]
Cavity	SDC20-4

#### PERFORMANCE CURVES



#### MODEL CODE

PTS1 - 20 - V - 0 - 40

##### Seal Option

Code	Seal Kit
Omit-Buna-N	565916
V-Viton	889646

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty
0	No housing		
16T	#16 SAE	566412	
8B	1" BSP	02-175469	
12H	#12 SAE		876745
16H	#16 SAE		876747
6G	3/4" BSP		876744
8G	1" BSP		876746

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Shift Pressure

Code	Bar	[Psi]
40	2.75	[40]
80	5.5	[80]

## Directional Control Valves

### PTS12-10

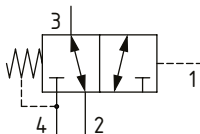
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain

350 bar [5000 psi] • 30 l/min [8 US gpm]

#### DESCRIPTION AND OPERATION

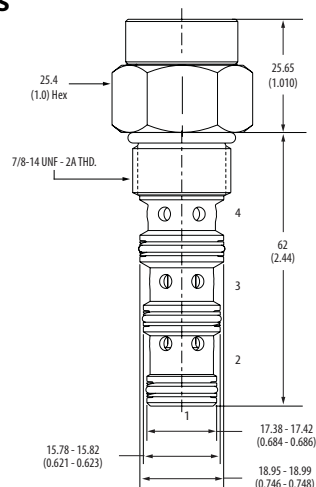
This is a 3-way, spool type, hydraulically piloted directional control valve with an internal drain. In the normal condition, port 2 is connected to port 3 with port 4 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 4 with port 2 blocked. During the cross-over transition all ports are blocked. Due to the internal hydraulic vent, the pilot pressure required shift the valve is dependent on the pressure in port 4, which would normally be connected to tank.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

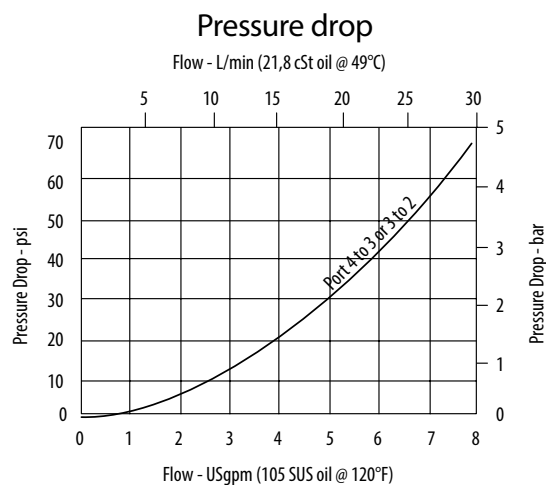


**Installation torque**  
 A-47-54 Nm [35-40 ft. lbs]  
 S-68-75 Nm [50-55 ft. lbs]

#### PERFORMANCE DATA

Rated pressure	350 bar [5000 psi]
Rated flow	30 l/min [8 US gpm]
Leakage	250 ml/min [15 in <sup>3</sup> /min] @ 350 bar [5000 psi]
Weight	0.14 kg [0.32 lb]
Cavity	SDC10-4

#### PERFORMANCE CURVES



#### MODEL CODE

PTS12 - 10 - V - A - 3G - 40

##### Seal Option

Code	Seal Kit
Omit-Buna-N	889625
V-Viton	566080

##### Housing Material

Omit - No housing  
 A - Aluminum  
 S - Steel

##### Shift Pressure

Code	Bar	[Psi]
40	2.75	[40]
80	5.5	[80]
160	11	[160]

##### Housing

Code	Ports	Aluminum heavy duty	Steel
0	No housing		
2G	1/4" BSP	02-185804	02-175139
3G	3/8" BSP	02-185805	02-175140
6H	#6 SAE	02-185802	
8H	#8 SAE	02-185803	
6T	#6 SAE		02-175137
8T	#8 SAE		02-175138

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### PTS12-12

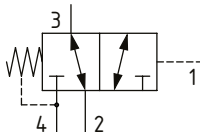
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain

350 bar [5000 psi] • 114 l/min [30 US gpm]

#### DESCRIPTION AND OPERATION

This is a 3-way, spool type, hydraulically piloted directional control valve with an internal drain. In the normal condition, port 2 is connected to port 3 with port 4 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 4 with port 2 blocked. During the cross-over transition all ports are blocked. Due to the internal hydraulic vent, the pilot pressure required shift the valve is dependent on the pressure in port 4, which would normally be connected to tank.

#### SCHEMATIC

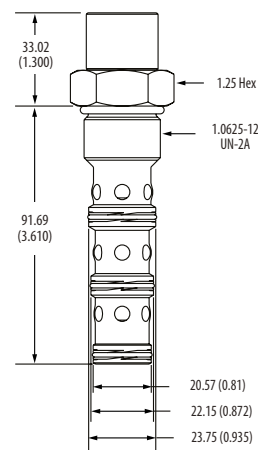


#### PERFORMANCE DATA

<b>Rated pressure</b>	<b>350 bar [5000 psi]</b>
<b>Rated flow</b>	<b>114 l/min [30 US gpm]</b>
<b>Leakage</b>	250 ml/min [15 in <sup>3</sup> /min] @ 350 bar [5000 psi]
<b>Weight</b>	0.32 kg [0.70 lb]
<b>Cavity</b>	C-12-4

#### DIMENSIONS

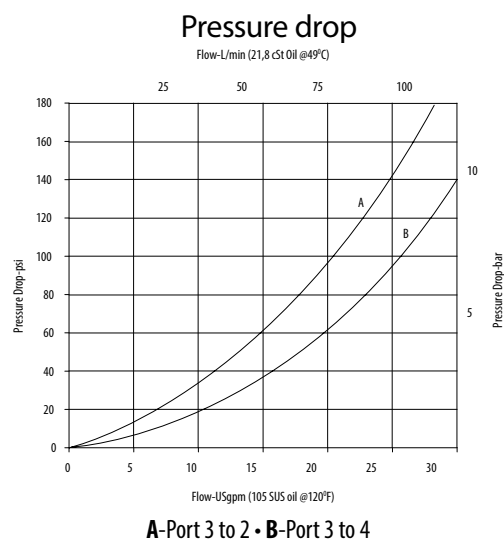
mm [in]



#### Installation torque

A- 81-95 Nm [60-70 ft. lbs]  
S- 102-115 Nm [75-85 ft. lbs]

#### PERFORMANCE CURVES



#### MODEL CODE

**PTS12 - 12 - V - A - 4G - 80 - 04**

#### Seal Option

Code	Seal Kit
Omit-Buna-N	02-160979
V-Viton	02-160980

#### Housing Material

Omit - No housing  
A - Aluminum  
S - Steel

#### Housing

Code	Ports	Aluminum Heavy duty	Steel
0	No housing		
4G	1/2" BSP	5986431-001	
6G	3/4" BSP	5986432-001	5991073-001
8H	#8 SAE	5986433-001	
10H	#10 SAE	5986434-001	5991074-001
12H	#12 SAE	5986436-001	5991075-001

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

#### Adjustment Option

04-"F" (Fixed)

#### Shift Pressure

Code	Bar	[Psi]
80	5.5	[80]
120	8.3	[120]
160*	8.3	[160]

\*Only for adjustable types

## Directional Control Valves

### PTS2-16

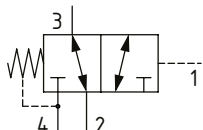
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain

210 bar [3000 psi] • 132 l/min [35 US gpm]

#### DESCRIPTION AND OPERATION

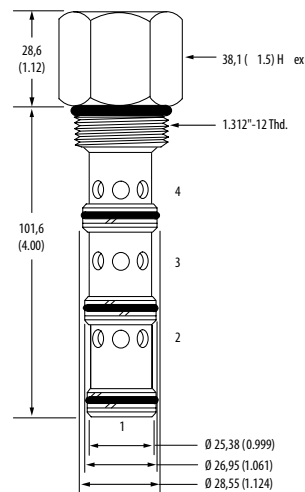
This is a 3-way, spool type, hydraulically piloted directional control valve with an internal drain. In the normal condition, port 2 is connected to port 3 with port 4 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 4 with port 2 blocked. During the cross-over transition all ports are blocked. Due to the internal hydraulic vent, the pilot pressure required shift the valve is dependent on the pressure in port 4, which would normally be connected to tank.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

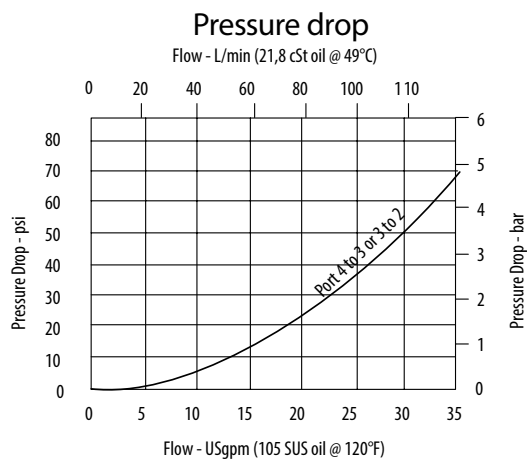


Installation torque  
 A-47-54 Nm [35-40 ft. lbs]  
 S-68-75 Nm [50-55 ft. lbs]

#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	132 l/min [35 US gpm]
Leakage	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.5 kg [1.12 lb]
Cavity	SDC16-4

#### PERFORMANCE CURVES



#### MODEL CODE

PTS2 - 16 - V - A - 6B - 40

##### Seal Option

Code	Seal Kit
Omit-Buna-N	889634
V-Viton	889638

##### Housing Material

Omit - No housing  
 A - Aluminum  
 S - Steel

##### Shift Pressure

Code	Bar	[Psi]
40	2.75	[40]
80	5.5	[80]
160	11.0	[160]

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty	Steel
0	No housing			
10T	#10 SAE			02-175141
12T	#12 SAE	566411		02-175142
6B	3/4" BSP	02-175468		
10H	#10 SAE		876729	
12H	#12 SAE		876731	
4G	1/2" BSP		876728	02-175143
6G	3/4" BSP		876730	02-175144

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### PTS12-16

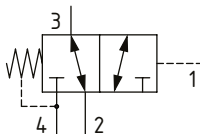
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain

350 bar [5000 psi] • 132 l/min [35 US gpm]

#### DESCRIPTION AND OPERATION

This is a 3-way, spool type, hydraulically piloted directional control valve with an internal drain. In the normal condition, port 2 is connected to port 3 with port 4 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 4 with port 2 blocked. During the cross-over transition all ports are blocked. Due to the internal hydraulic vent, the pilot pressure required shift the valve is dependent on the pressure in port 4, which would normally be connected to tank.

#### SCHEMATIC



#### PERFORMANCE DATA

<b>Rated pressure</b>	<b>350 bar [5000 psi]</b>
<b>Rated flow</b>	<b>132 l/min [35 US gpm]</b>
<b>Leakage</b>	550 ml/min [34 in <sup>3</sup> /min] @ 350 bar [5000 psi]
<b>Weight</b>	0.5 kg [1.12 lb]
<b>Cavity</b>	SDC16-4

#### MODEL CODE

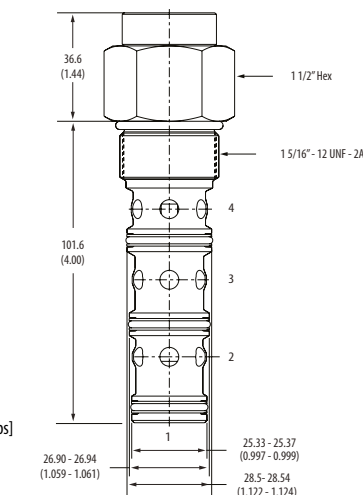
**PTS12 - 16 - V - A - 6B - 160**

##### Seal Option

Code	Seal Kit
Omit-Buna-N	889634
V-Viton	889638

##### Housing Material

Omit - No housing  
A - Aluminum  
S - Steel



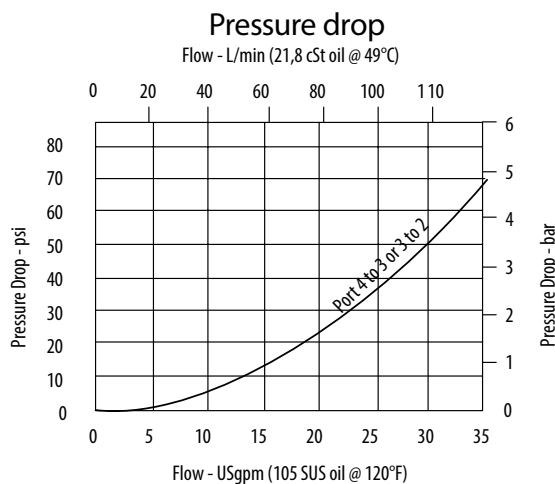
#### DIMENSIONS

mm [in]

##### Installation torque

A-108-122 Nm [80-90 ft. lbs]  
S-136-149 Nm [100-110 ft. lbs]

#### PERFORMANCE CURVES



##### Shift Pressure

Code	Bar	[Psi]
160	11.0	[160]

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty	Steel
0	No housing			
10T	#10 SAE			02-175141
12T	#12 SAE	566411		02-175142
6B	3/4" BSP	02-175468		
10H	#10 SAE		876729	
12H	#12 SAE		876731	
4G	1/2" BSP		876728	02-175143
6G	3/4" BSP		876730	02-175144

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### PTS2-20

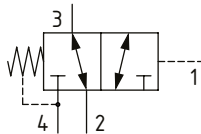
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain

210 bar [3000 psi] • 265 l/min [70 US gpm]

#### DESCRIPTION AND OPERATION

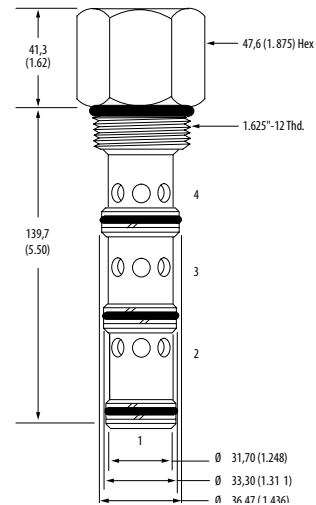
This is a 3-way, spool type, hydraulically piloted directional control valve with an internal drain. In the normal condition, port 2 is connected to port 3 with port 4 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 4 with port 2 blocked. During the cross-over transition all ports are blocked. Due to the internal hydraulic vent, the pilot pressure required shift the valve is dependent on the pressure in port 4, which would normally be connected to tank.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

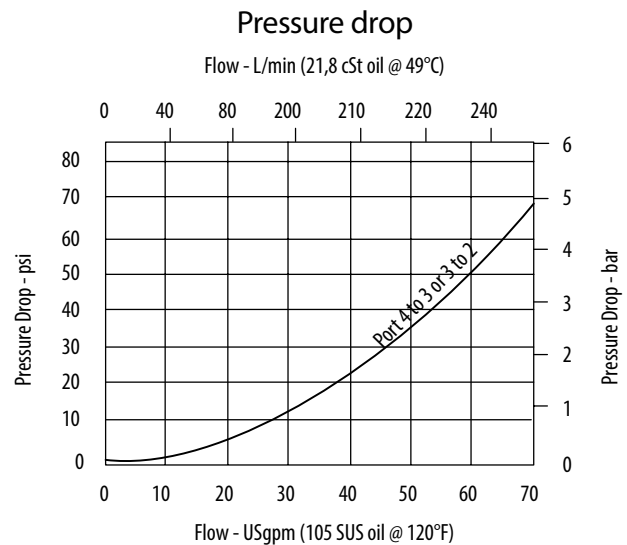


Installation torque  
128-155 Nm [95-115 ft lbs]

#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	265 l/min [70 US gpm]
Leakage	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.5 kg [1.12 lb]
Cavity	SDC20-4

#### PERFORMANCE CURVES



#### MODEL CODE

PTS2 - 20 - V - 0 - 40

##### Seal Option

Code	Seal Kit
Omit-Buna-N	565916
V-Viton	889646

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty
0	No housing		
16T	#16 SAE	566412	
8B	1" BSP	02-175469	
12H	#12 SAE		876745
16H	#16 SAE		876747
6G	3/4" BSP		876744
8G	1" BSP		876746

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Shift Pressure

Code	Bar	[Psi]
40	2.75	[40]
80	5.5	[80]

## Directional Control Valves

### PTS14-12

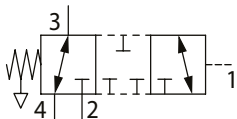
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent

350 bar [5000 psi] • 114 l/min [30 US gpm]

#### DESCRIPTION AND OPERATION

This is a 3-way, spool type, hydraulically piloted directional control valve with an atmospheric vent. In the normal condition, port 3 is connected to port 4 with port 2 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 2 with port 4 blocked. During the cross-over transition all ports are blocked. Due to the atmospheric vent, the pilot pressure required to keep the valve switched is independent of the pressure at the work ports.

#### SCHEMATIC

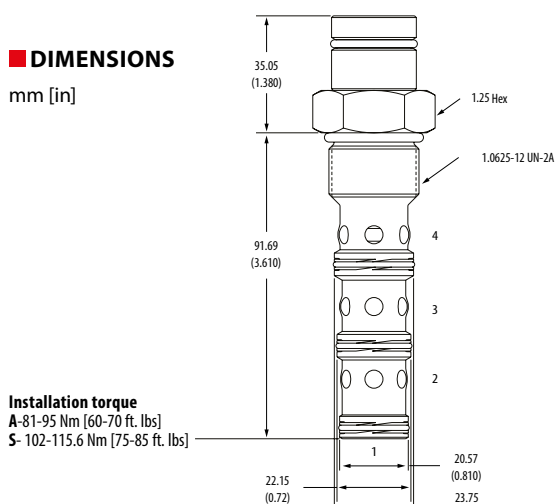


#### PERFORMANCE DATA

Rated pressure	350 bar [5000 psi]
Rated flow	114 l/min [30 US gpm]
Leakage	210 ml/min [13in <sup>3</sup> /min] @ 350 bar [5000 psi]
Weight	0.32 kg [0.70 lb]
Cavity	C-12-4

#### DIMENSIONS

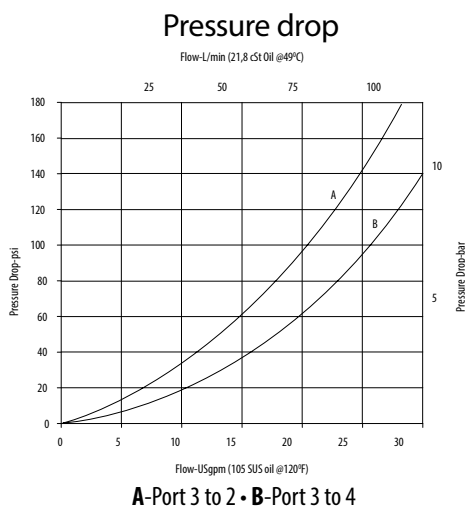
mm [in]



#### Installation torque

A-81-95 Nm [60-70 ft. lbs]  
S- 102-115.6 Nm [75-85 ft. lbs]

#### PERFORMANCE CURVES



#### MODEL CODE

PTS14 - 12 - V - A - 6G - 80

#### Seal Option

Code	Seal Kit
Omit - Buna-N	02-160979
V-Viton	02-160980

#### Housing Material

Omit - No housing  
A - Aluminum  
S - Steel

#### Shift Pressure

Code	Bar	[Psi]
80	5.5	[80]
120	8.3	[120]

#### Housing

Code	Ports	Aluminum Heavy duty	Steel
0	No housing		
4G	1/2" BSP	5986431-001	
6G	3/4" BSP	5986432-001	5991073-001
8H	#8 SAE	5986433-001	
10H	#10 SAE	5986434-001	5991074-001
12H	#12 SAE	5986436-001	5991075-001

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### PTS14-16

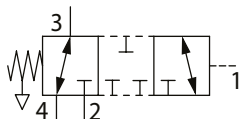
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent

350 bar [5000 psi] • 132 l/min [35 US gpm]

#### DESCRIPTION AND OPERATION

This is a 3-way, spool type, hydraulically piloted directional control valve with an atmospheric vent. In the normal condition, port 3 is connected to port 4 with port 2 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 2 with port 4 blocked. During the cross-over transition all ports are blocked. Due to the atmospheric vent, the pilot pressure required to keep the valve switched is independent of the pressure at the work ports.

#### SCHEMATIC



#### PERFORMANCE DATA

<b>Rated pressure</b>	<b>350 bar [5000 psi]</b>
<b>Rated flow</b>	<b>132 l/min [35 US gpm]</b>
<b>Leakage</b>	210 ml/min [13 in <sup>3</sup> /min] @ 350 bar [5000 psi]
<b>Weight</b>	0.5 kg [1.12 lb]
<b>Cavity</b>	SDC16-4

#### MODEL CODE

**PTS14 - 16 - V - A - 6B - 80**

##### Seal Option

Code	Seal Kit
Omit-Buna-N	889634
V-Viton	889638

##### Housing Material

Omit - No housing  
A - Aluminum  
S - Steel

##### Shift Pressure

Code	Bar	[Psi]
80	5.5	[80]
160	11.0	[160]

##### Housing

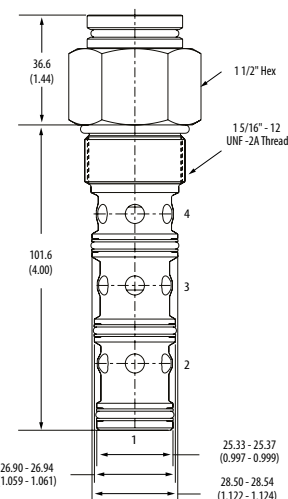
Code	Ports	Aluminum Standard duty	Aluminum Heavy duty	Steel
0	No housing			
10T	#10 SAE			02-175141
12T	#12 SAE	566411		02-175142
6B	3/4" BSP	02-175468		
10H	#10 SAE		876729	
12H	#12 SAE		876731	
4G	1/2" BSP		876728	02-175143
6G	3/4" BSP		876730	02-175144

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

#### DIMENSIONS

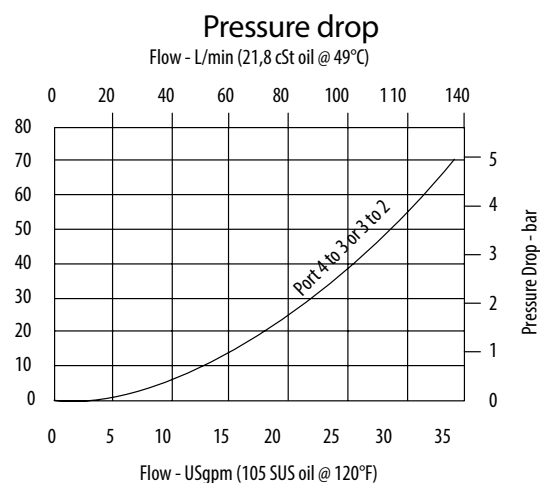
mm [in]



##### Installation torque

A-108-122 Nm [80-90 ft. lbs]  
S-136-149.6 Nm [100-110 ft. lbs]

#### PERFORMANCE CURVES



## Directional Control Valves

### PTS5-16

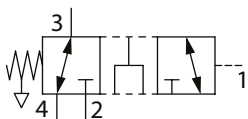
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent

210 bar [3000 psi] • 132 l/min [35 US gpm]

#### DESCRIPTION AND OPERATION

This is a 3-way, spool type, hydraulically piloted directional control valve with an atmospheric vent. In the normal condition, port 3 is connected to port 4 with port 2 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 2 with port 4 blocked. During the cross-over transition all ports are open. Due to the atmospheric vent, the pilot pressure required to keep the valve switched is independent of the pressure at the work ports.

#### SCHEMATIC



#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	132 l/min [35 US gpm]
Leakage	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.5 kg [1.12 lb]
Cavity	SDC16-4

#### MODEL CODE

PTS5 - 16 - V - A - 6B - 40

##### Seal Option

Code	Seal Kit
Omit-Buna-N	889634
V-Viton	889638

##### Housing Material

Omit - No housing  
A - Aluminum  
S - Steel

##### Shift Pressure

Code	Bar	[Psi]
40	2.75	[40]
80	5.5	[80]
160	11.0	[160]

##### Housing

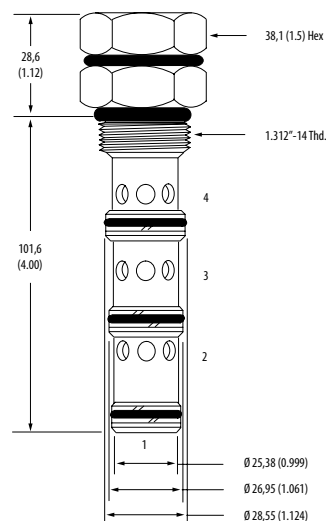
Code	Ports	Aluminum Standard duty	Aluminum Heavy duty
0	No housing		
12T	#12 SAE	566411	
6B	3/4" BSP	02-175468	
10H	#10 SAE		876729
12H	#12 SAE		876731
4G	1/2" BSP		876728
6G	3/4" BSP		876730

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

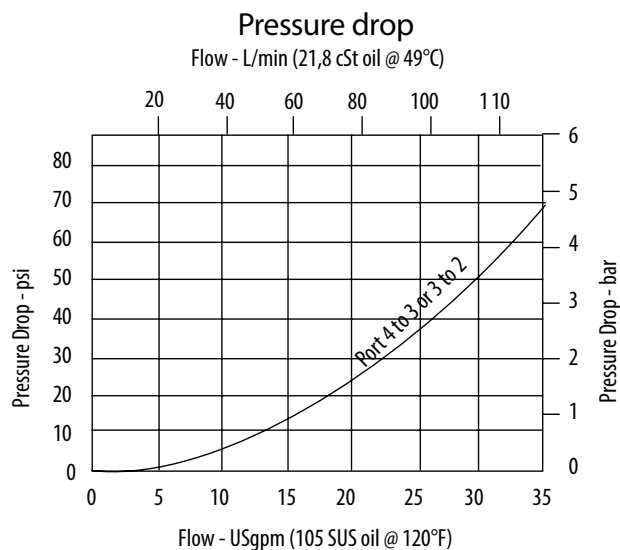
#### DIMENSIONS

mm [in]



Installation torque  
108-122 Nm [80-90 ft. lbs]

#### PERFORMANCE CURVES



## Directional Control Valves

### PTS15-16

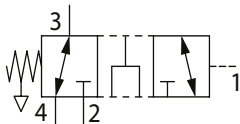
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Atmospheric Vent

350 bar [5000 psi] • 132 l/min [35 US gpm]

#### DESCRIPTION AND OPERATION

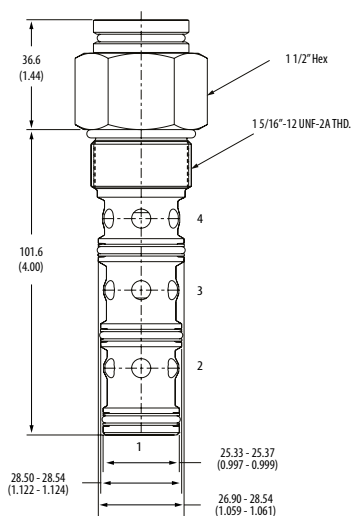
This is a 3-way, spool type, hydraulically piloted directional control valve with an atmospheric vent. In the normal condition, port 3 is connected to port 4 with port 2 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 2 with port 4 blocked. During the cross-over transition all ports are open. Due to the atmospheric vent, the pilot pressure required to keep the valve switched is independent of the pressure at the work ports.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

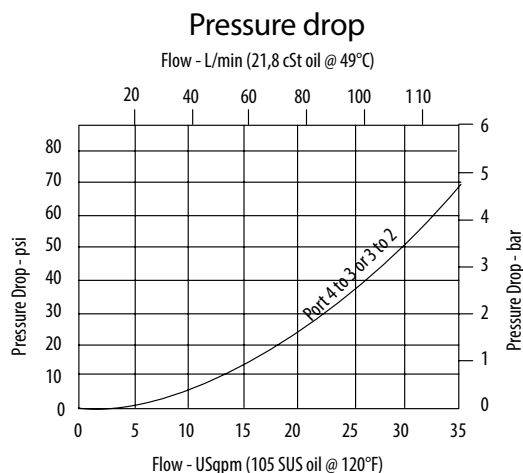


**Installation torque**  
**A**-108-122 Nm [80-90 ft. lbs]  
**B**-136-149.6 Nm [100-110 ft. lbs]

#### PERFORMANCE DATA

Rated pressure	350 bar [5000 psi]
Rated flow	132 l/min [35 US gpm]
Leakage	210 ml/min [13 in <sup>3</sup> /min] @ 350 bar [5000 psi]
Weight	0.5 kg [1.12 lb]
Cavity	SDC16-4

#### PERFORMANCE CURVES



#### MODEL CODE

PTS15 - 16 - V - A - 6B - 40

##### Seal Option

Code	Seal Kit
Omit-Buna-N	889634
V-Viton	889638

##### Housing Material

Omit - No housing  
 A - Aluminum  
 S - Steel

##### Shift Pressure

Code	Bar	[Psi]
40	2.75	[40]
80	5.5	[80]
160	11.0	[160]

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty	Steel
0	No Housing			
10T	#10 SAE			02-175141
12T	#12 SAE	566411		02-175142
6B	3/4" BSP	02-175468		
10H	#10 SAE		876729	
12H	#12 SAE		876731	
4G	1/2" BSP		876728	02-175143
6G	3/4" BSP		876730	02-175144

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### PTS3-10

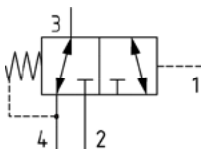
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain

210 bar [3000 psi] • 30 l/min [8 US gpm]

#### DESCRIPTION AND OPERATION

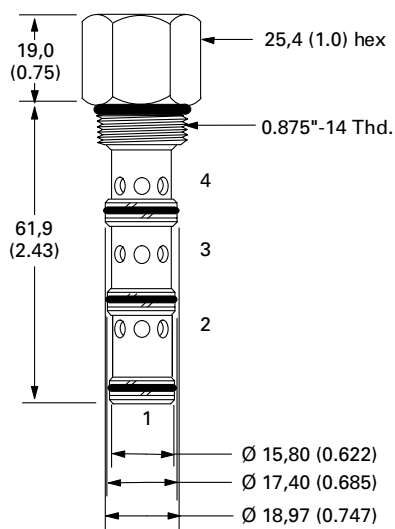
This is a 3-way, spool type, hydraulically piloted directional control valve with an internal drain. In the normal condition, port 3 is connected to port 4 with port 2 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 2 with port 4 blocked. During the cross-over transition all ports are blocked. Due to the internal hydraulic vent, the pilot pressure required shift the valve is dependent on the pressure in port 4, which would normally be connected to tank.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

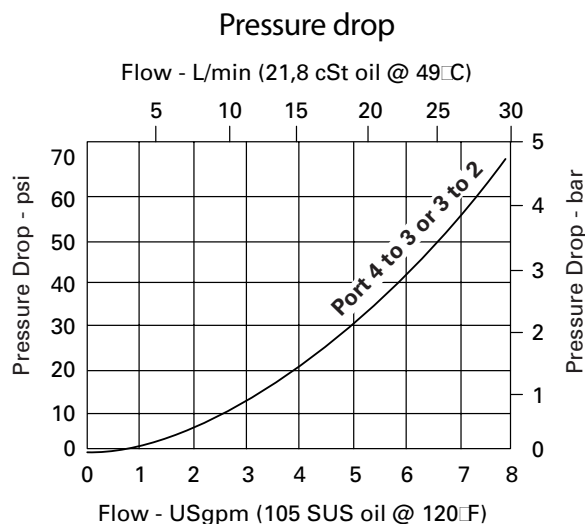


Installation torque  
47-54 Nm [35-40 ft. lbs]

#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	30 l/min [8 US gpm]
Leakage	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.5 kg [1.12 lb]
Cavity	SDC10-4

#### PERFORMANCE CURVES



#### MODEL CODE

PTS3 - 10 - V - 0 - 40

##### Seal Option

Code	Seal Kit
Omit-Buna-N	889625
V-Viton	566080

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty
0	No housing		
3B	3/8" BSP	02-179705	
6T	#6 SAE	02-168235	
2G	1/4" BSP		876709
3G	3/8" BSP		876715
6H	#6 SAE		876708
8H	#8 SAE		876713

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Shift Pressure

Code	Bar	Psi
40	2.75	[40]
80	5.5	[80]
160	11.0	[160]

## Directional Control Valves

### PTS13-10

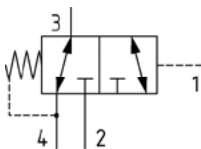
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain

350 bar [5000 psi] • 30 l/min [8 US gpm]

#### DESCRIPTION AND OPERATION

This is a 3-way, spool type, hydraulically piloted directional control valve with an internal drain. In the normal condition, port 3 is connected to port 4 with port 2 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 2 with port 4 blocked. During the cross-over transition all ports are blocked. Due to the internal hydraulic vent, the pilot pressure required shift the valve is dependent on the pressure in port 4, which would normally be connected to tank.

#### SCHEMATIC



#### PERFORMANCE DATA

<b>Rated pressure</b>	<b>350 bar [5000 psi]</b>
<b>Rated flow</b>	<b>30 l/min [8 US gpm]</b>
<b>Leakage</b>	210 ml/min [13 in <sup>3</sup> /min] @ 350 bar [5000 psi]
<b>Weight</b>	0.14 kg [0.32 lb]
<b>Cavity</b>	SDC10-4

#### MODEL CODE

**PTS13 - 10 - V - A - 3B - 40**

##### Seal Option

Code	Seal Kit
Omit-Buna-N	889625
V-Viton	566080

##### Housing Material

Omit - No housing  
A - Aluminum  
S - Steel

##### Shift Pressure

Code	Bar	[Psi]
40	2.75	[40]
80	5.5	[80]
160	11.0	[160]

##### Housing

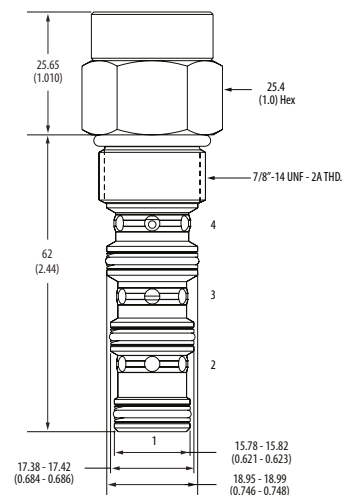
Code	Ports	Aluminum Standard duty	Aluminum Heavy duty	Steel
0	No housing			
3B	3/8" BSP	02-179705		
6T	#6 SAE	02-168235		02-175137
8T	#8 SAE			02-175138
2G	1/4" BSP		02-185804	02-175139
3G	3/8" BSP		02-185805	02-175140
6H	#6 SAE		02-185802	
8H	#8 SAE		02-185803	

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

#### DIMENSIONS

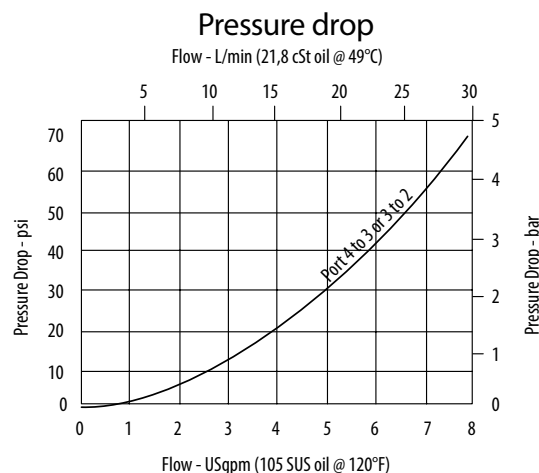
mm [in]



#### Installation torque

A-47-54 Nm [35-40 ft. lbs]  
S-68-75 Nm [50-55 ft. lbs]

#### PERFORMANCE CURVES



## Directional Control Valves

### PTS13-12

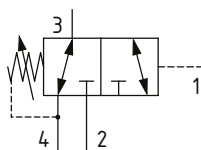
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain

350 bar [5000 psi] • 114 l/min [30 US gpm]

#### DESCRIPTION AND OPERATION

This is a 3-way, spool type, hydraulically piloted directional control valve with an internal drain. In the normal condition, port 3 is connected to port 4 with port 2 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 2 with port 4 blocked. During the cross-over transition all ports are blocked. Due to the internal hydraulic vent, the pilot pressure required shift the valve is dependent on the pressure in port 4, which would normally be connected to tank. It is available with a fixed or adjustable spring setting.

#### SCHEMATIC

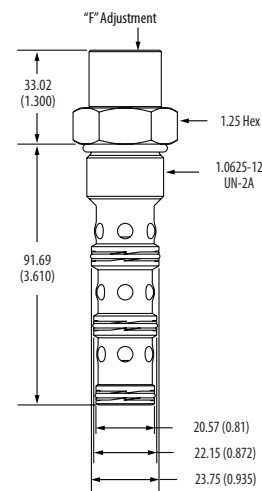


#### PERFORMANCE DATA

<b>Rated pressure</b>	<b>350 bar [5000 psi]</b>
<b>Rated flow</b>	<b>114 l/min [30 US gpm]</b>
<b>Leakage</b>	210 ml/min [13 in <sup>3</sup> /min] @ 350 bar [5000 psi]
<b>Weight</b>	0.32 kg [0.70 lb]
<b>Cavity</b>	C-12-4

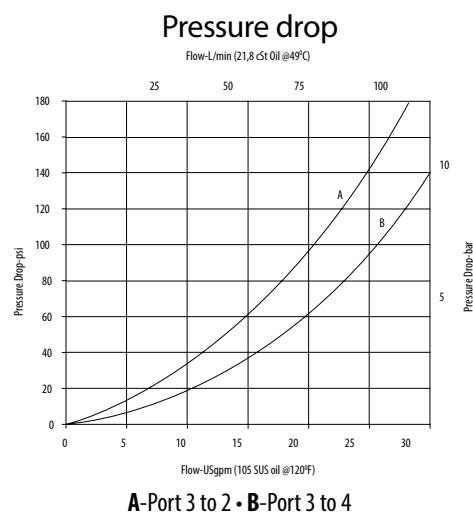
#### DIMENSIONS

mm [in]



**Installation torque**  
 A-81-95 Nm [60-70 ft. lbs]  
 S-102-115 Nm [75-85 ft. lbs]

#### PERFORMANCE CURVES



#### MODEL CODE

**PTS13 - 12 - V - A - 4G - 80 - 04**

##### Seal Option

Code	Seal Kit
Omit-Buna-N	02-160979
V-Viton	02-160980

##### Housing Material

Omit - No housing  
 A - Aluminum  
 S - Steel

##### Housing

Code	Ports	Aluminum	Steel
0	No housing		
4G	1/2" BSP	5986431-001	
6G	3/4" BSP	5986432-001	5991073-001
8H	#8 SAE	5986433-001	
10H	#10 SAE	5986434-001	5991074-001
12H	#12 SAE	5986436-001	5991075-001

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Adjustment/Transition Option

Code	Adjustment	Transition
04	F (Fixed)	Closed

##### Shift Pressure

Code	Bar	[Psi]
80	5.5	[80]
120	8.3	[120]
160	11.0	[160]

## Directional Control Valves

### PTS3-16

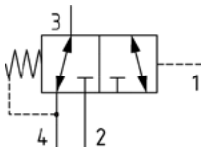
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain

210 bar [3000 psi] • 132 l/min [35 US gpm]

#### DESCRIPTION AND OPERATION

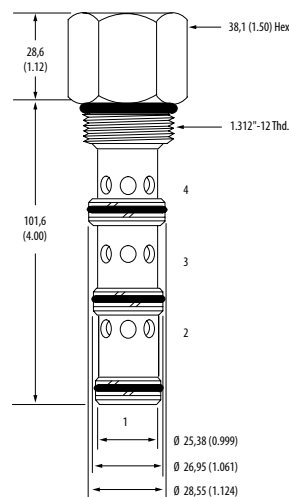
This is a 3-way, spool type, hydraulically piloted directional control valve with an internal drain. In the normal condition, port 3 is connected to port 4 with port 2 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 2 with port 4 blocked. During the cross-over transition all ports are blocked. Due to the internal hydraulic vent, the pilot pressure required shift the valve is dependent on the pressure in port 4, which would normally be connected to tank.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

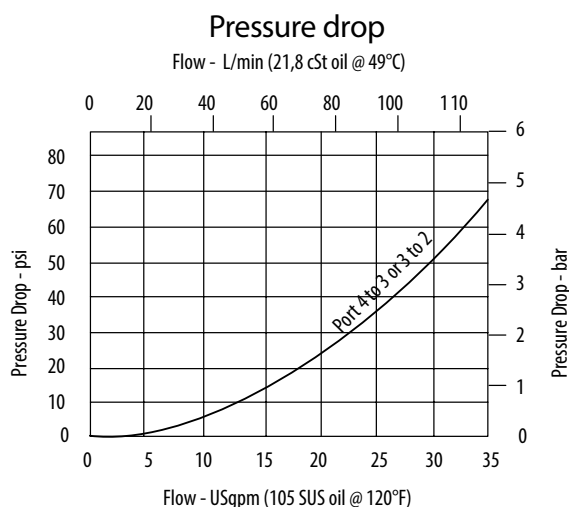


Installation torque  
108-122 Nm [80-90 ft. lbs]

#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	132 l/min [35 US gpm]
Leakage	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.5 kg [1.12 lb]
Cavity	SDC16-4

#### PERFORMANCE CURVES



#### MODEL CODE

PTS3 - 16 - V - 0 - 40

##### Seal Option

Code	Seal Kit
Omit-Buna-N	889634
V-Viton	889638

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty
0	No housing		
12T	#12 SAE	566411	
6B	3/4" BSP	02-175468	
10H	#10 SAE		876729
12H	#12 SAE		876731
4G	1/2" BSP		876728
6G	3/4" BSP		876730

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Shift Pressure

Code	Bar	[Psi]
40	2.75	[40]
80	5.5	[80]
160	11.0	[160]

## Directional Control Valves

### PTS6-16

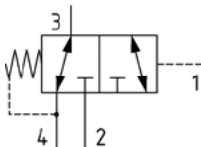
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain

210 bar [3000 psi] • 132 l/min [35 US gpm]

#### DESCRIPTION AND OPERATION

This is a 3-way, spool type, hydraulically piloted directional control valve with an internal drain. In the normal condition, port 3 is connected to port 4 with port 2 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 2 with port 4 open. During the cross-over transition all ports are open. Due to the internal hydraulic vent, the pilot pressure required shift the valve is dependent on the pressure in port 4, which would normally be connected to tank.

#### SCHEMATIC

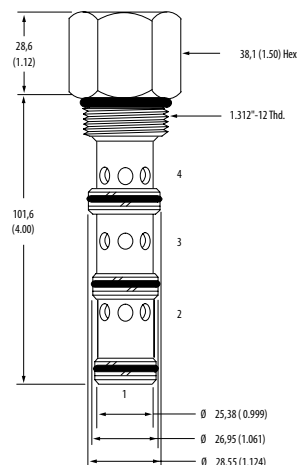


#### PERFORMANCE DATA

<b>Rated pressure</b>	<b>210 bar [3000 psi]</b>
<b>Rated flow</b>	<b>132 l/min [35 US gpm]</b>
<b>Leakage</b>	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
<b>Weight</b>	0.5 kg [1.12 lb]
<b>Cavity</b>	SDC16-4

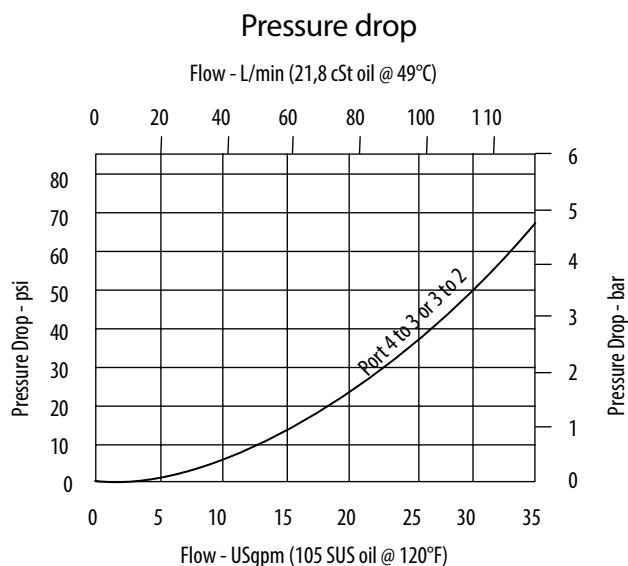
#### DIMENSIONS

mm [in]



**Installation torque**  
108-122 Nm [80-90 ft. lbs]

#### PERFORMANCE CURVES



#### MODEL CODE

**PTS6 - 16 - V - 0 - 40**

##### Seal Option

Code	Seal Kit
<b>Omit</b> -Buna-N	889634
<b>V</b> -Viton	889638

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty
<b>0</b>	No housing		
<b>12T</b>	#12 SAE	566411	
<b>6B</b>	3/4" BSP	02-175468	
<b>10H</b>	#10 SAE		876729
<b>12H</b>	#12 SAE		876731
<b>4G</b>	1/2" BSP		876728
<b>6G</b>	3/4" BSP		876730

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Shift Pressure

Code	Bar	[Psi]
<b>40</b>	2.75	[40]
<b>80</b>	5.5	[80]
<b>160</b>	11.0	[160]

## Directional Control Valves

### PTS13-16

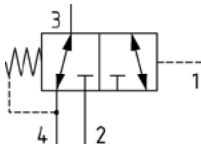
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain

350 bar [5000 psi] • 132 l/min [35 US gpm]

#### DESCRIPTION AND OPERATION

This is a 3-way, spool type, hydraulically piloted directional control valve with an internal drain. In the normal condition, port 3 is connected to port 4 with port 2 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 2 with port 4 blocked. During the cross-over transition all ports are blocked. Due to the internal hydraulic vent, the pilot pressure required shift the valve is dependent on the pressure in port 4, which would normally be connected to tank.

#### SCHEMATIC

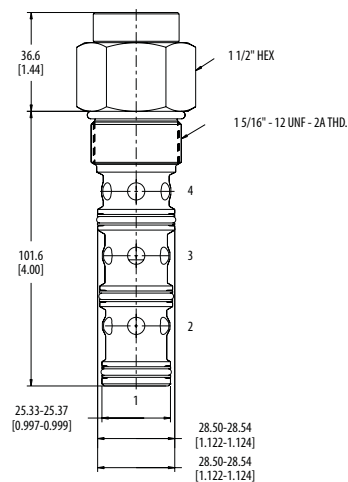


#### PERFORMANCE DATA

Rated pressure	350 bar [5000 psi]
Rated flow	132 l/min [35 US gpm]
Leakage	210 ml/min [13 in <sup>3</sup> /min] @ 350 bar [5000 psi]
Weight	0.5 kg [1.12 lb]
Cavity	SDC16-4

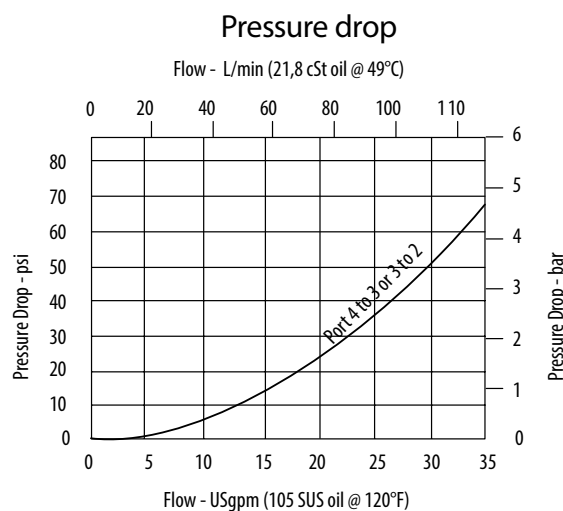
#### DIMENSIONS

mm [in]



**Installation torque**  
A-108-122 Nm [80-90 ft. lbs]  
S-136-149.6 Nm [100-110 ft. lbs]

#### PERFORMANCE CURVES



#### MODEL CODE

PTS13 - 16 - V - A - 6B - 80

##### Seal Option

Code	Seal Kit
Omit-Buna-N	889634
V-Viton	889638

##### Housing Material

Omit - No housing  
A - Aluminum  
S - Steel

##### Shift Pressure

Code	Bar	[Psi]
80	5.5	[80]
160	11.0	[160]

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty	Steel
0	No housing			
10T	#10 SAE			02-175141
12T	#12 SAE	566411		02-175142
6B	3/4" BSP		02-175468	
10H	#10 SAE		876729	
12H	#12 SAE		876731	
4G	1/2" BSP		876728	02-175143
6G	3/4" BSP		876730	02-175144

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### CP722-11

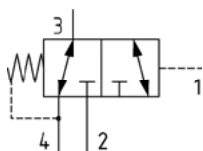
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain

450 bar [6500 psi] • 125 l/min [33 US gpm]

#### DESCRIPTION AND OPERATION

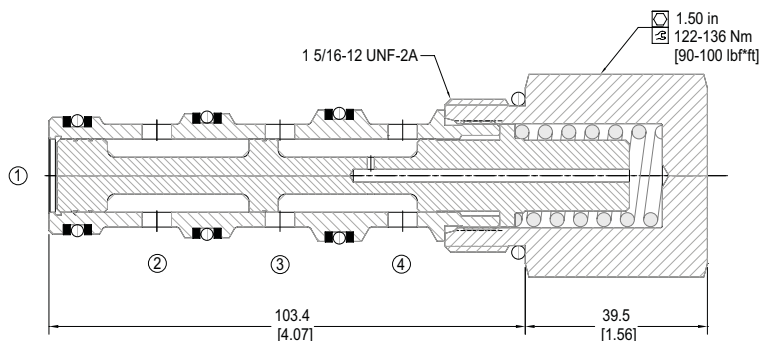
This is a 3-way, spool type, hydraulically piloted directional control valve with an internal drain. In the normal condition, port 3 is connected to port 4 with port 2 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 2 with port 4 blocked. During the cross-over transition all ports are blocked. Due to the internal hydraulic vent, the pilot pressure required shift the valve is dependent on the pressure in port 4, which would normally be connected to tank.

#### SCHEMATIC



#### DIMENSIONS

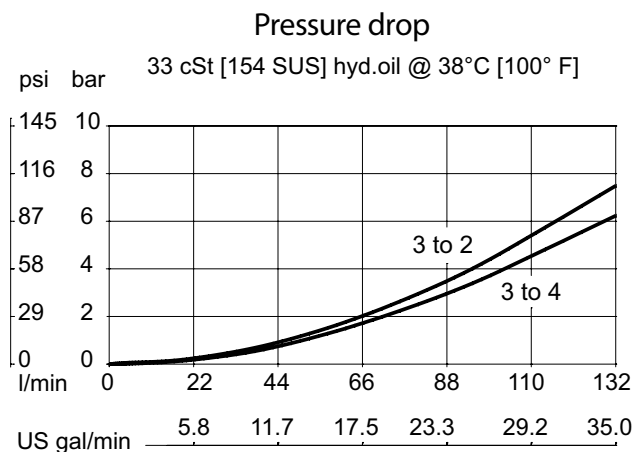
mm [in]



#### PERFORMANCE DATA

Rated pressure	450 bar [6500 psi]
Rated flow @ 7 bar [100 psi]	125 l/min [33 US gpm]
Leakage	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.61 kg [1.34 lb]
Cavity	SDC16-4

#### PERFORMANCE CURVES



#### MODEL CODE

CP722 - 11 - U - 12S - 040

##### Seal Option

Code	Seal kit
U-Urethane	120677

##### Housing

Code	Ports & Material	Housing Model Code
0	No Housing	
12S	Aluminium, #12 SAE	CP16-4-12S
16S	Aluminium, #16 SAE	CP16-4-16S
S12S	Steel, #12 SAE	223494
S16S	Steel, #16 SAE	11129057

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Shift Pressure

Code	Bar	[Psi]
040	2.8	[40]
080	5.5	[80]

## Directional Control Valves

### PTS3-20

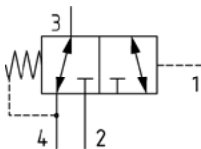
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, Internal Drain

210 bar [3000 psi] • 265 l/min [70 US gpm]

#### DESCRIPTION AND OPERATION

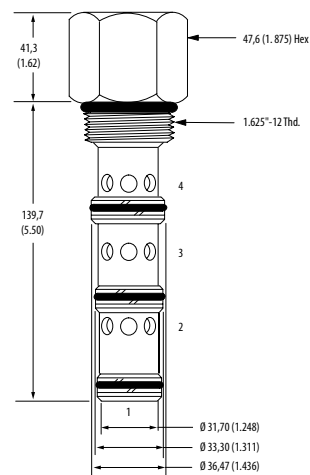
This is a 3-way, spool type, hydraulically piloted directional control valve with an internal drain. In the normal condition, port 3 is connected to port 4 with port 2 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 2 with port 4 blocked. During the cross-over transition all ports are blocked. Due to the internal hydraulic vent, the pilot pressure required shift the valve is dependent on the pressure in port 4, which would normally be connected to tank.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

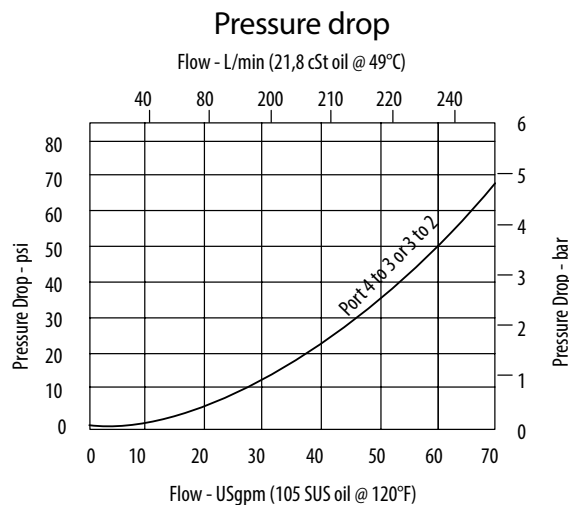


Installation torque  
129-155 Nm [95-115 ft lbs]

#### PERFORMANCE DATA

Rated pressure	210 bar [3000 psi]
Rated flow	265 l/min [70 US gpm]
Leakage	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.5 kg [1.12 lb]
Cavity	SDC20-4

#### PERFORMANCE CURVES



#### MODEL CODE

PTS3 - 20 - V - 0 - 40

##### Seal Option

Code	Seal Kit
Omit-Buna-N	565916
V-Viton	889646

##### Housing

Code	Ports	Aluminum Standard duty	Aluminum Heavy duty
0	No housing		
16T	#16 SAE	566412	
8B	1" BSP	02-175469	
12H	#12 SAE		876745
16H	#16 SAE		876747
6G	3/4" BSP		876744
8G	1" BSP		876746

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Shift Pressure

Code	Bar	[Psi]
40	2.75	[40]
80	5.5	[80]

## Directional Control Valves

### PTS9-8

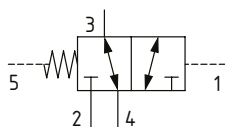
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, External Drain

280 bar [4000 psi] • 19 l/min [5 US gpm]

#### DESCRIPTION AND OPERATION

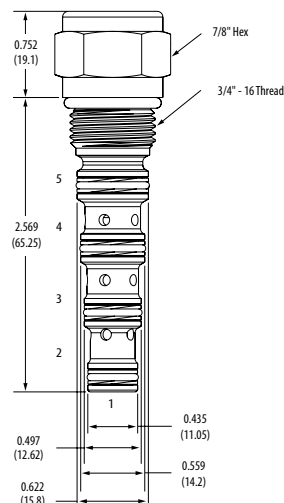
This is a 3-way, spool type, hydraulically piloted directional control valve with an external drain at port 5. In the normal condition, port 3 is connected to port 4 with port 2 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 2 with port 4 blocked. In the crossover transition all ports are open. Due to the external drain, the pilot pressure required shift the valve is dependent on the pressure in port 5, which would normally be connected to tank.

#### SCHEMATIC



#### DIMENSIONS

mm [in]



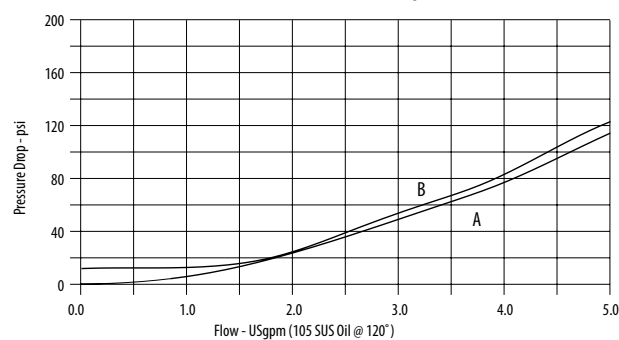
Installation torque  
34-41 Nm [25-30 ft lbs]

#### PERFORMANCE DATA

Rated pressure	280 bar [4000 psi]
Rated flow	19 l/min [5 US gpm]
Leakage	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.10 kg [0.23 lbs]
Cavity	C-8-5S

#### PERFORMANCE CURVES

##### Pressure drop



A-Port 3 to 4 • B-Port 3 to 2

#### MODEL CODE

PTS9 - 8 - V - 0 - 000 - 080

##### Seal Option

Code	Seal kit
Omit-Buna-N	9900310-001
V-Viton	9900310-002

##### Housing Material

0 - No housing  
A - Aluminum  
S - Steel

##### Shift Pressure

Code	Bar	[Psi]
080	5.5	[80]
160	11.0	[160]

##### Housing

Code	Ports 2,3,4	Ports 1,5	Aluminum	Steel
000	No housing			
04T	#4 SAE	#4 SAE	4999357-001	4999358-001
06T	#6 SAE	#6 SAE	4999357-002	4999358-002
02G	1/4" BSP	1/4" BSP	4999357-003	4999358-003
03G	3/8" BSP	1/4" BSP	4999357-004	4999358-004

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### PTS9-10

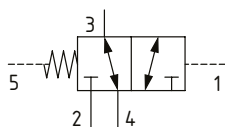
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, External Drain

280 bar [4000 psi] • 38 l/min [10 US gpm]

#### DESCRIPTION AND OPERATION

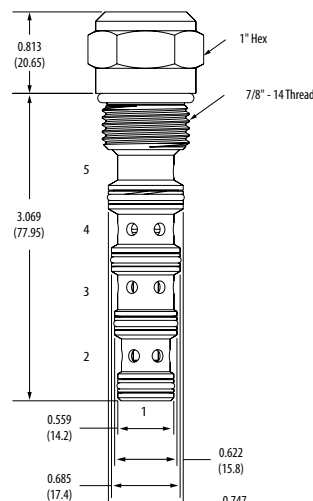
This is a 3-way, spool type, hydraulically piloted directional control valve with an external drain at port 5. In the normal condition, port 3 is connected to port 4 with port 2 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 2 with port 4 blocked. In the crossover transition all ports are open. Due to the external drain, the pilot pressure required shift the valve is dependent on the pressure in port 5, which would normally be connected to tank.

#### SCHEMATIC



#### DIMENSIONS

mm [in]



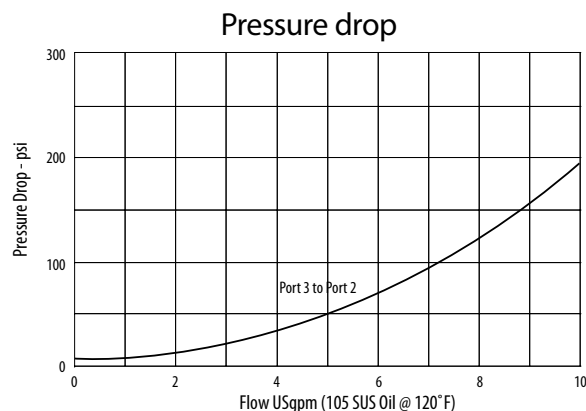
#### Installation torque

47-54 nm [35-40 ft lbs]

#### PERFORMANCE DATA

<b>Rated pressure</b>	<b>280 bar [4000 psi]</b>
<b>Rated flow</b>	<b>38 l/min [10 US gpm]</b>
<b>Leakage</b>	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
<b>Weight</b>	0.10 kg [0.23 lbs]
<b>Cavity</b>	SDC10-5

#### PERFORMANCE CURVES



#### MODEL CODE

**PTS9 - 10 - V - 0 - 000 - 080**

#### Seal Option

Code	Seal kit
<b>O</b> mit-Buna-N	9901261-000
<b>V</b> -Viton	9901262-000

#### Housing Material

**O** - No housing  
**A** - Aluminum  
**S** - Steel

#### Shift Pressure

Code	Bar	[Psi]
<b>080</b>	5.5	[80]
<b>100</b>	6.9	[100]
<b>160</b>	11.0	[160]

#### Housing

Code	Port 1, 2 & 4	Port 1 & 5	Aluminum	Steel
<b>000</b>	No housing			
<b>06T</b>	#6 SAE	#4 SAE	5994133-001	5994134-001
<b>08T</b>	#8 SAE	#4 SAE	5994133-002	5994134-002
<b>04G</b>	1/2" BSP	1/4" BSP	5994133-003	5994134-003

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

## Directional Control Valves

### PTS9-12

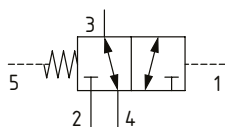
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, External Drain

**280 bar [4000 psi] • 76 l/min [20 US gpm]**

#### DESCRIPTION AND OPERATION

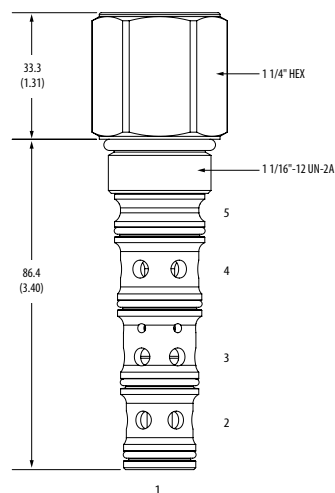
This is a 3-way, spool type, hydraulically piloted directional control valve with an external drain at port 5. In the normal condition, port 3 is connected to port 4 with port 2 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 2 with port 4 blocked. In the crossover transition all ports are open. Due to the external drain, the pilot pressure required shift the valve is dependent on the pressure in port 5, which would normally be connected to tank.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

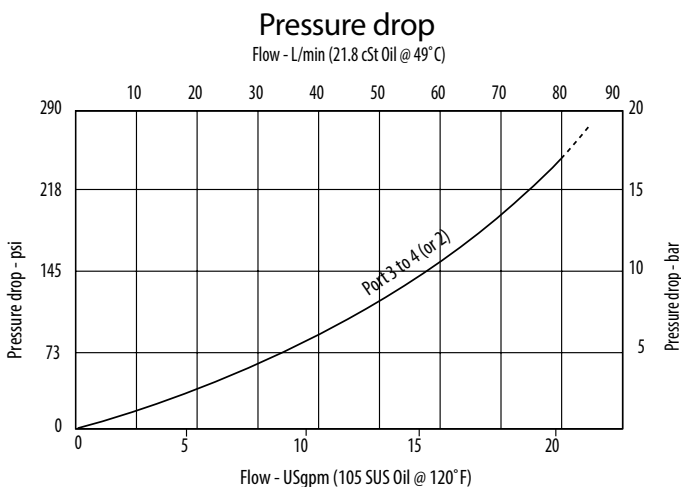


**Installation torque**  
 A-81-95 Nm [60-70 ft lbs]  
 S-102-115 Nm [75-85 ft lbs]

#### PERFORMANCE DATA

<b>Rated pressure</b>	<b>280 bar [4000 psi]</b>
<b>Rated flow</b>	<b>76 l/min [20 US gpm]</b>
<b>Leakage</b>	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
<b>Weight</b>	0.36 kg [0.79 lb]
<b>Cavity</b>	C-12-5S

#### PERFORMANCE CURVES



#### MODEL CODE

**PTS9 - 12 - U - A - 12T - 075**

##### Seal Option

Code	Seal Kit
U-Urethane	202914-921

##### Housing Material

**O** - No housing  
**A** - Aluminum  
**S** - Steel

##### Housing

Code	Port 2, 3 & 4	Port 1 & 5	Aluminum	Steel
000	No Housing			
12T	#12 SAE	#4 SAE	4998820-002	4998821-002
06G	3/4" BSP	1/4" BSP	4998820-004	4998821-004

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Shift Pressure

Code	Bar	[Psi]
075	5.2	[75]
110	7.6	[110]

## Directional Control Valves

### PTS9-16

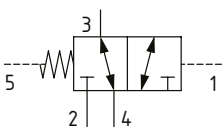
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, External Drain

280 bar [4000 psi] • 150 l/min [40 US gpm]

#### DESCRIPTION AND OPERATION

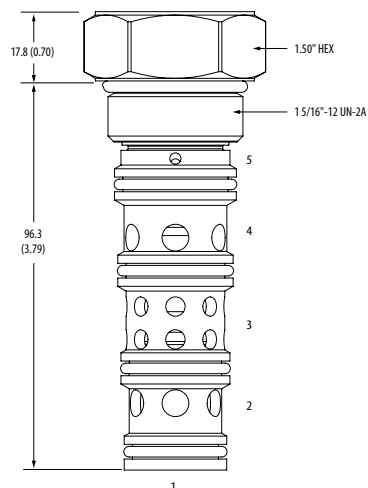
This is a 3-way, spool type, hydraulically piloted directional control valve with an external drain at port 5. In the normal condition, port 3 is connected to port 4 with port 2 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 2 with port 4 blocked. In the crossover transition all ports are open. Due to the external drain, the pilot pressure required shift the valve is dependent on the pressure in port 5, which would normally be connected to tank.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

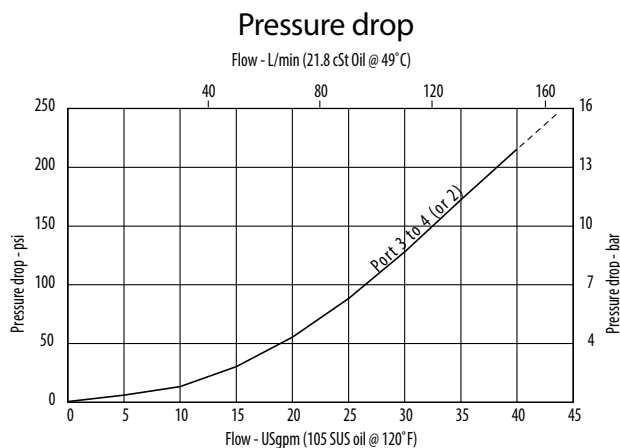


**Installation torque**  
 A-108-122 Nm (80-90 ft lbs)  
 S-136-149 Nm (100-110 ft lbs)

#### PERFORMANCE DATA

Rated pressure	280 bar [4000 psi]
Rated flow	150 l/min [40 US gpm]
Leakage	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.47 kg [1.05 lb]
Cavity	C-16-5S

#### PERFORMANCE CURVES



#### MODEL CODE

**PTS9 - 16 - U - A - 16T - 030**

##### Seal Option

Code	Seal Kit
U-Urethane	202915-922

##### Housing Material

0 - No housing  
 A - Aluminum  
 S - Steel

##### Housing

Code	Port 2, 3 & 4	Port 1 & 5	Aluminum	Steel
000	No Housing			
16T	#16 SAE	#4 SAE	4994880-002	4994881-002
08G	1" BSP	1/4" BSP	4994880-004	4994881-004

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Shift Pressure

Code	Bar	[Psi]
030	2	[30]
050	3.5	[50]
070	4.8	[70]

## Directional Control Valves

### PTS9-20

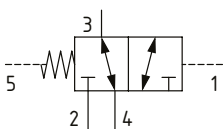
Directional Control Valve, 3-Way, Spool Type, Hydraulic Pilot, External Drain

280 bar [4000 psi] • 230 l/min [60 US gpm]

#### DESCRIPTION AND OPERATION

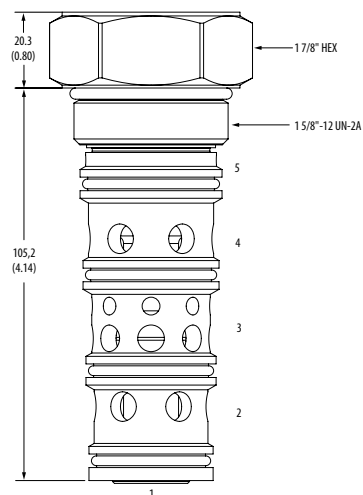
This is a 3-way, spool type, hydraulically piloted directional control valve with an external drain at port 5. In the normal condition, port 3 is connected to port 4 with port 2 blocked. Pilot pressure at port 1 will cause the valve to shift, connecting port 3 to port 2 with port 4 blocked. In the crossover transition all ports are open. Due to the external drain, the pilot pressure required shift the valve is dependent on the pressure in port 5, which would normally be connected to tank.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

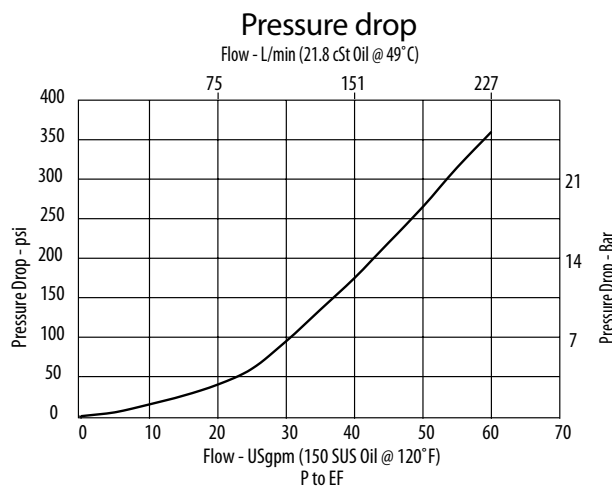


Installation torque  
160-180 Nm [120-135 ft. lbs]

#### PERFORMANCE DATA

Rated pressure	280 bar [4000 psi]
Rated flow	230 l/min [60 US gpm]
Leakage	164 ml/min [10 in <sup>3</sup> /min] @ 210 bar [3000 psi]
Weight	0.86 kg [1.9 lb]
Cavity	C-20-5S

#### PERFORMANCE CURVES



#### MODEL CODE

PTS9 - 20 - U - A - 16T - 040

##### Seal Option

Code	Seal Kit
U-Urethane	02-187543

##### Housing Material

0 - No housing  
A - Aluminum  
S - Steel

##### Housing

Code	Port 2, 3 & 4	Port 1 & 5	Aluminum	Steel
000	No Housing			
16T	#16 SAE	#4 SAE	4998822-002	4998823-002
08G	1" BSP	1/4" BSP	4998822-004	4998823-004

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Shift Pressure

Code	Bar	[Psi]
040	2.75	[40]
080	5.5	[80]

## Directional Control Valves

### DV15-P5-24-FD

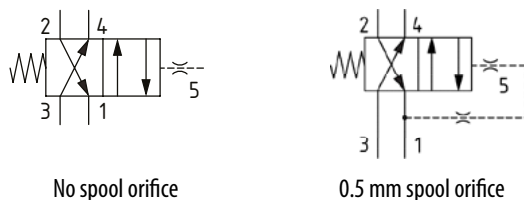
Directional Control Valve, 4-Way, Spool Type, Hydraulic Pilot, Internal Drain

230 bar [3300 psi] • 70 l/min [18 US gpm]

#### DESCRIPTION AND OPERATION

This is a 4-way, spool type, hydraulically piloted directional control valve with an internal drain. In the normal position, ports 3-4 and 1-2 are connected. In the crossover transition all ports are open. When shifted by pilot pressure at port 5, ports 3-2 and 1-4 are connected. This valve is primarily used for reversing fan drive circuits where the open-transition design is important for smooth shifting and minimal pressure spikes during reversing.

#### SCHEMATIC

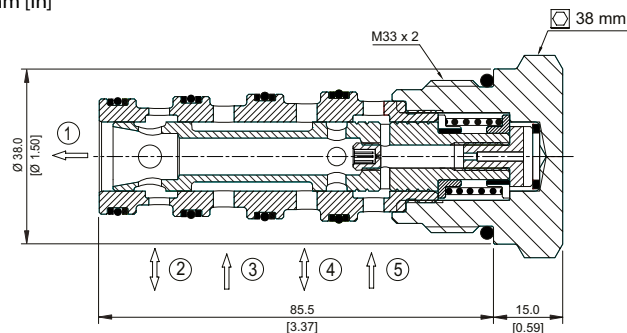


#### PERFORMANCE DATA

Rated pressure	230 bar [3300 psi]
Rated flow at 7 bar [100 psi]	70 l/min [18 US gpm]
Maximum Flow	80 l/min [21 US gpm]
Minimum Pilot Pressure	2 bar [29 psi]
Weight	0.44 kg [0.95 lb]
Cavity	NCS12/5

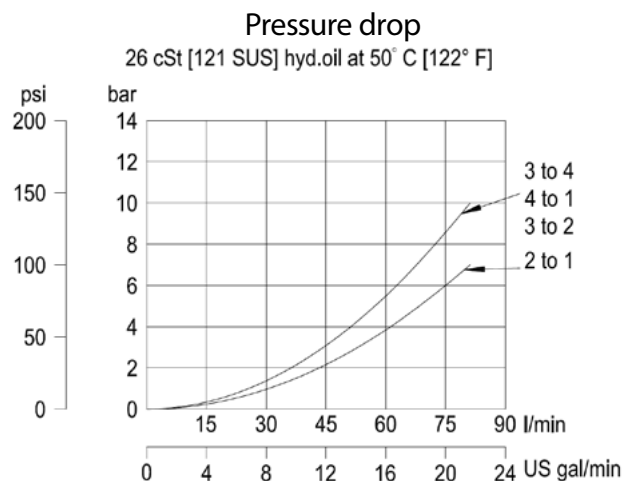
#### DIMENSIONS

mm [in]



Installation torque  
68-75 Nm [50-55 ft. lbs.]

#### PERFORMANCE CURVES



#### MODEL CODE

DV15 - P5 - 24 - FD - 0.5 - B - 2 - 12S

##### Spool Orifice Option

Code	Orifice/Plug for Pilot Drain
00	Plug
0.5	0.5 mm orifice

##### Seal Option

Code	Seal kit
B-Buna-N	11182670
V-Viton	11182671

##### Housing

Code	Ports & Material	Housing Model Code
00	No housing	
6B	3/4 BSP, AL [P5-3/8 BSP]	NCS 12/5-6B/3B
12S	#12 SAE, AL [P5-#6 SAE]	NCS 12/5-12S/6S

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Shift Pressure

Code	Bar	[Psi]
2	2	[29]

## Directional Control Valves

### 1SB10

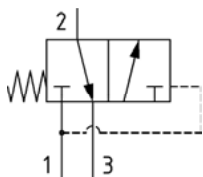
Brake Sequence Directional Valve, 3-Way, Spool Type, Internal Pilot, Internal Drain

350 bar [5000 psi] • 10 l/min [2.6 US gpm]

#### DESCRIPTION AND OPERATION

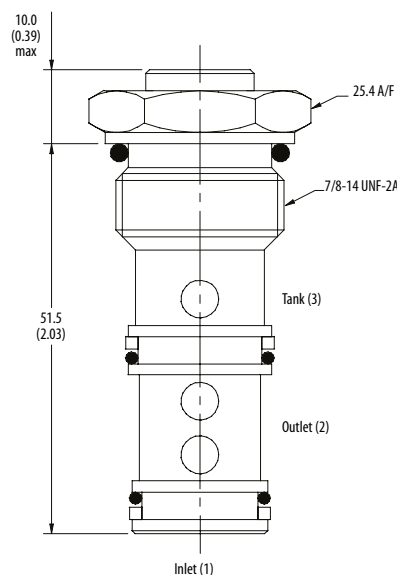
This is a 3-way, spool type, internally piloted directional control valve. Pressure at port 1 will connect port 1 to port 2 and block port 3. When this pressure falls below the spring setting, the valve connects port 2 to port 3 and blocks port 1. This is ideal for brake circuits and allows the brake to automatically dis-engage when the machine is in operation.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

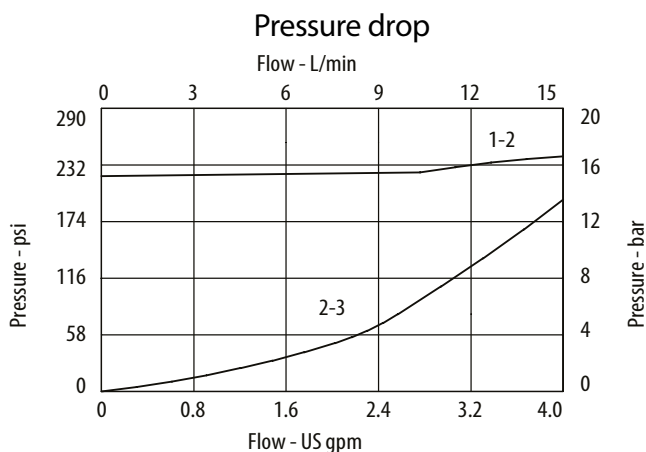


Installation torque  
60 Nm [44 ft. lbs]

#### PERFORMANCE DATA

Rated pressure	350 bar [5000 psi]
Rated flow	10 l/min [2.6 US gpm]
Leakage	50 ml/min nominal
Weight	0.12 kg [0.26 lbs]
Cavity	A893

#### PERFORMANCE CURVES



#### MODEL CODE

### 1SB15 - 3W - S - 377

#### Basic Code

1SB10 - Cartridge Only  
1SB15 - Cartridge and Housing

#### Housing

Code	Ports	Aluminum single	Steel
0	No housing		
2W	1/4" BSP		A1882
3W	3/8" BSP		A1883
6T	3/8" SAE	A10715	A7371

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

#### Housing Material

Omit - No housing/Aluminum  
377 - Steel

#### Seal Option

Code	Seal Kit
S-Buna-N	SK182
SV-Viton	SK182V

## Directional Control Valves

### 1SB304

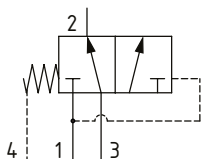
Brake Sequence Directional Valve, 3-Way, Spool Type, Internal Pilot, External Drain

350 bar [5000 psi] • 30 l/min [8 US gpm]

#### DESCRIPTION AND OPERATION

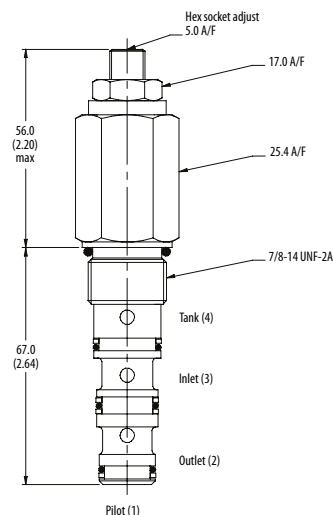
This is a 3-way, spool type, internally piloted directional control valve with external drain. Pressure at port 1 will connect port 1 to port 2 and block port 3. When this pressure falls below the spring setting, the valve connects port 2 to port 3 and blocks port 1. Due to the external drain, the pilot pressure required shift the valve is dependent on the pressure in port 4, which would normally be connected to tank. This is ideal for brake circuits and allows the brake to automatically dis-engage when the machine is in operation.

#### SCHEMATIC



#### DIMENSIONS

mm [in]

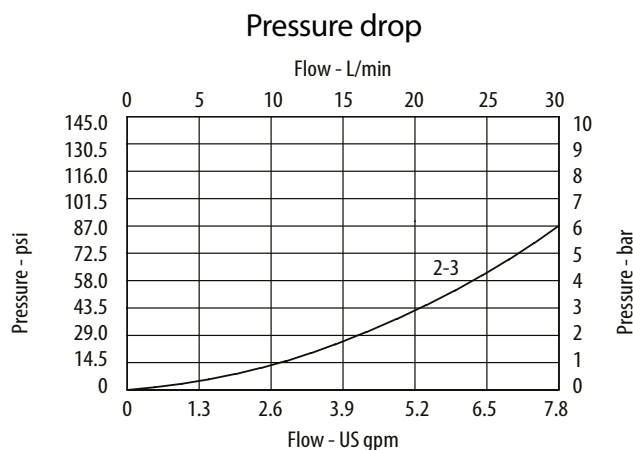


Installation torque  
60 Nm [44 ft. lbs]

#### PERFORMANCE DATA

Rated pressure	350 bar [5000 psi]
Rated flow	30 l/min [8 US gpm]
Max pilot pressure	210 bar [3000 psi]
Leakage	50 ml/min nominal
Weight	0.24 kg [0.53 lb]
Cavity	A5302

#### PERFORMANCE CURVES



#### MODEL CODE

**1SB354 - P - 3W - S - 12 - 377 - 60**

##### Basic Code

1SB304 - Cartridge Only  
1SB354 - Cartridge and Housing

##### Adjustment Option

P - External

##### Housing

Code	Ports	Aluminum	Steel
0	No housing		
3W	3/8" BSP	B13602	B13603
6T	3/8" SAE	B21661	B21660

\* Aluminum bodies are to be used for pressures less than 210 bar [3000 psi].

\* Additional housings available

##### Seal Option

Code	Seal Kit
S-Buna-N	SK645
SV-Viton	SK645V

##### Pressure Setting

Code-Pressure setting in bar  
(5 bar increments within specified Pressure Range)  
XXX-Standard setting  
(see Pressure Range for value)  
Example:

Code	Bar	Psi
60	60	[870]

##### Housing Material

Omit - No housing/Aluminum  
377 - Steel

##### Pressure Range

Code	Bar	[Psi]
6	10-60	[145-870]
Standard Setting	30	[435]
12	20-100	[290-1450]
Standard Setting	60	[870]

Standard setting made at 14 l/min [3.8 US gpm]

*Danfoss*