

Logic elements

Differential pressure sensing elements for applications up to 350 bar (5000 psi) and 400 L/min (100 USgpm)



Powering Business Worldwide

Logic elements

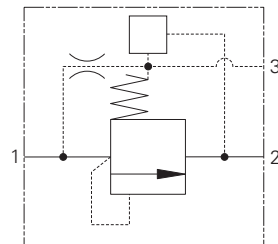
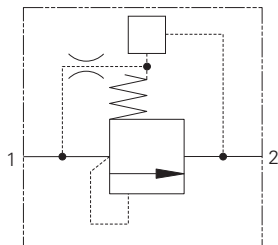
LOGIC ELEMENTS	I-4
APPLICATION EXAMPLES	I-6
DPS2-8 - LOGIC ELEMENT	I-14
DPS2-10 - LOGIC ELEMENT	I-16
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Logic elements

Valve locator

Functional symbol

Various



Model	Cavity	Flow rating	Typical pressure	Page
<i>Logic element spool</i>		L/min (USgpm)	bar (psi)	
DPS2-8	C-8-3S	30 (8)	350 (5000)	I-14
DPS2-10	C-10-3S	60 (15)	290 (4200)	I-16
DPS2-12	C-12-3S	114 (30)	350 (5000)	I-18
DPS2-16	C-16-3S	189 (50)	290 (4200)	I-20
DPS2-20	C-20-3S	303 (80)	290 (4200)	I-20

Model	Cavity	Rating	Pressure	Page
<i>Logic element Poppet</i>		L/min (USgpm)	bar (psi)	
DPS2-10	C-10-3S	60 (15)	350 (5000)	I-60
DPS2-12	C-12-3S	114 (30)	350 (5000)	I-18
DPS2-16	C-16-3S	189 (50)	350 (5000)	I-20
DPS2-20	C-20-3S	303 (80)	350 (5000)	I-22

Model	Cavity	Flow rating	Typical pressure	Page
<i>Logic element</i>		L/min (USgpm)	bar (psi)	
LE402	C-20-2	350 (95)	350 (5000)	I-26

Model	Cavity	Flow rating	Typical pressure	Page
<i>Logic element</i>		L/min (USgpm)	bar (psi)	
LEV402	A21773	400 (100)	250 (3500)	I-28

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

This section gives basic specifications for Eaton logic element threaded cartridge valves. Its purpose is to provide a quick, convenient reference tool when choosing these valves or designing a system using these components.

All cartridges have hardened and ground spools, and/or honed sleeves, poppets and sharp-edged ground steel seats. This provides an excellent product that is dirt-tolerant, has reliable seating, and is suitable for fast cycling with long life.

These cartridges provide the system designer with a versatile range of elements for use in HIC packages for controlling pressure, flow and direction of flow.

The range includes:

- Pressure compensators (Section H)
- Pressure compensators with priority and bypass outlets (Section H)
- Differential–pressure sensing elements

The correct selection of these products can enhance machine performance, shorten the design process and minimize manufacturing costs of manifold blocks.

Differential–pressure sensing elements – DPS2

For controlling pressure, flow or direction (including 3- and 4-way bridge circuits) the DPS2 is used with the aid of external pilot operators. The DPS2 elements are function building blocks which respond to pressure differential signals, providing the capacity to switch or modulate flows up to 303 L/min (80 USgpm) and pressure to 350 bar (5000 psi).

The choice of pilot arrangements related to DPS2 variants can minimize the number of construction holes in a manifold, simplifying design and reducing costs.

All poppet type DPS2 elements have recently been upgraded to 350 bar (5000 psi).

Flow compensators – PCS3 (Section H)

An essential component of a pressure compensated flow control which, with an external fixed or variable orifice, provides the required compensated flow characteristic. Excess flow is diverted at maximum system pressure. Excess fluid upstream must be diverted e.g. through a relief to tank.

Pressure compensator with priority and bypass outlets –PCS4.

Similar in function to the PCS3. The major difference is that excess flow is diverted at priority flow pressure, instead of at maximum system pressure, as is the case with PCS3 compensators. The excess flow can pass to a secondary circuit or to tank.

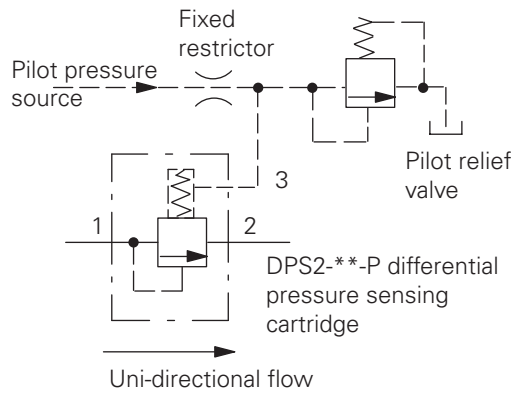
Application examples

DPS2 Logic elements for pressure control

Pressure control functions

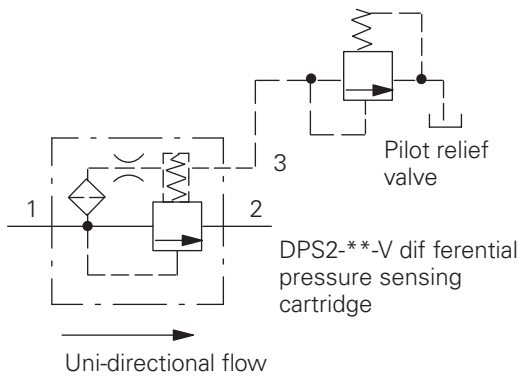
Pressure relief or sequence example

With external pilot supply and pilot relief



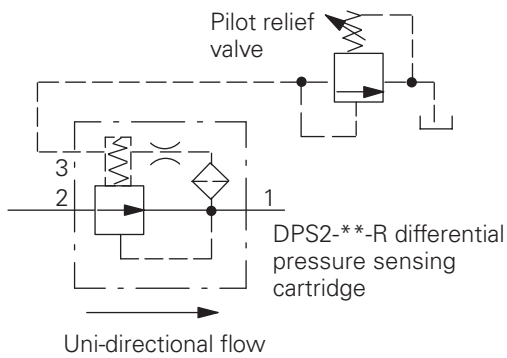
Pressure relief or sequence example

With internal pilot supply and pilot relief



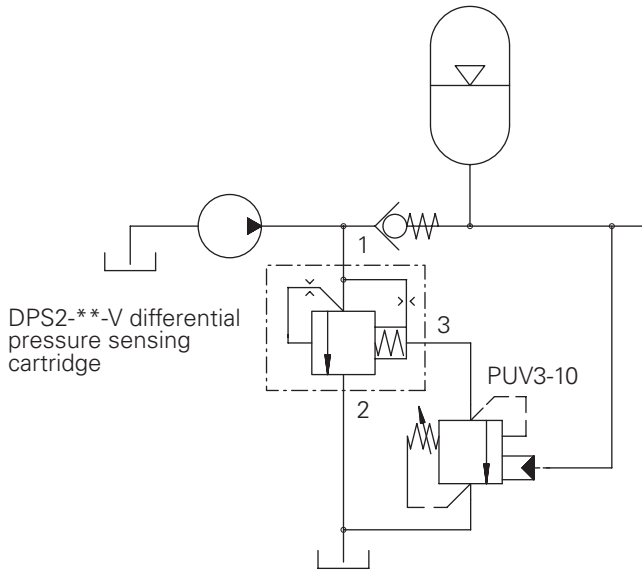
Pressure reducing example

Non-relieving type

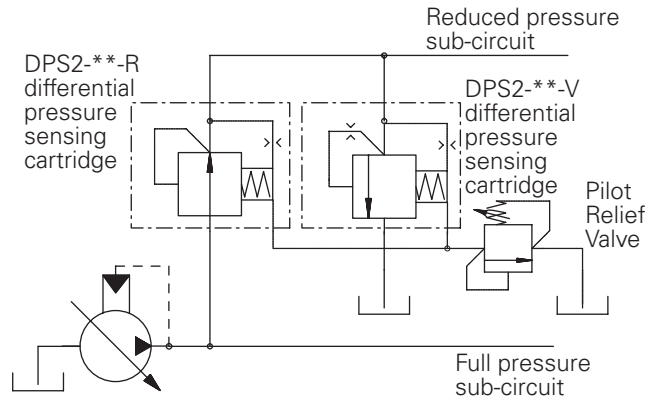


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

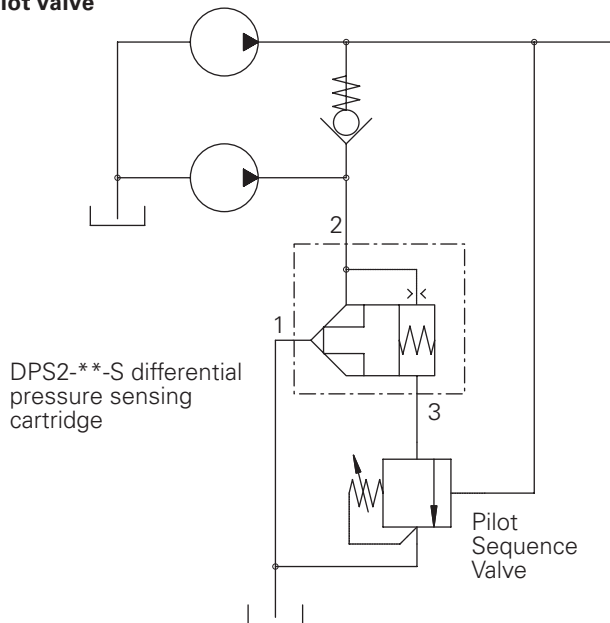
Accumulator charging with PUV3-10 pilot stage



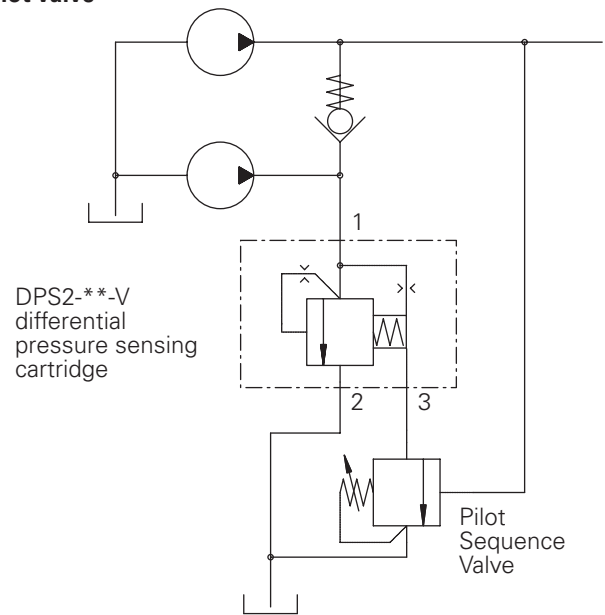
Pressure reducing and relieving



Hi/Low unloading circuit with externally piloted pressure sequence pilot valve



Hi/Low unloading circuit with externally piloted pressure sequence pilot valve



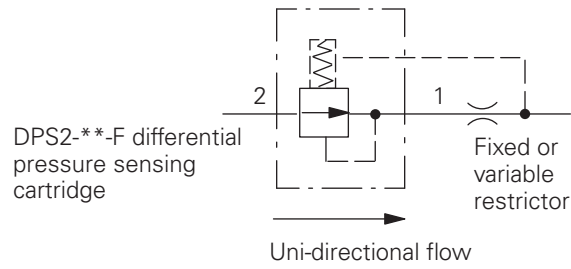
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Application examples

DPS2 Elements for flow control

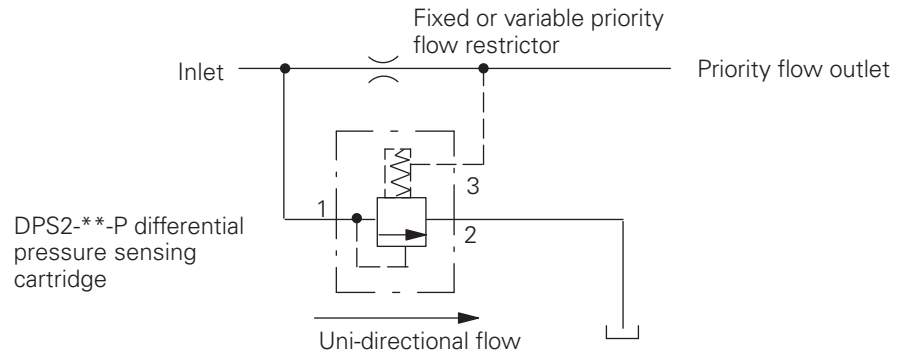
Pressure compensated flow control example

With downstream fixed or variable restrictor



Pressure compensated priority flow control example

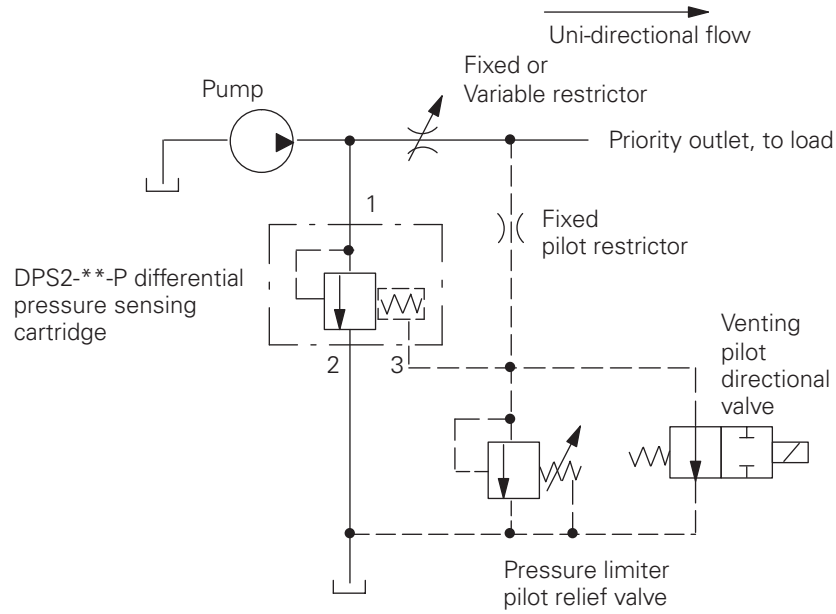
With fixed or variable priority flow control



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

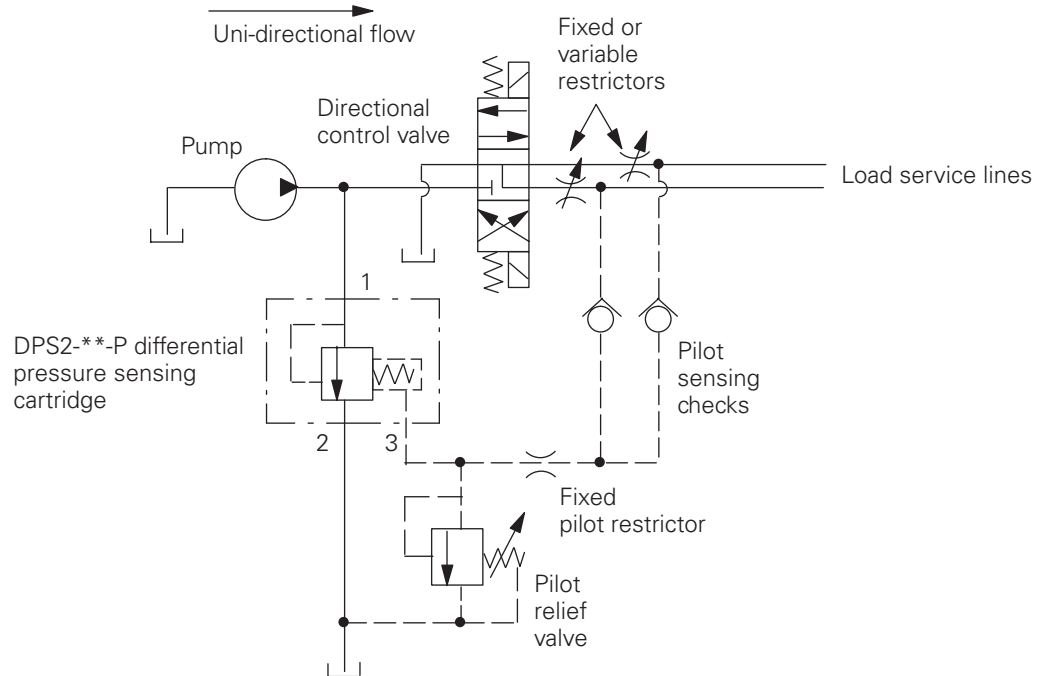
Load sensing priority flow control example

With pressure limiting and venting



Load sensing priority flow control example

Directional control version with pressure limiter



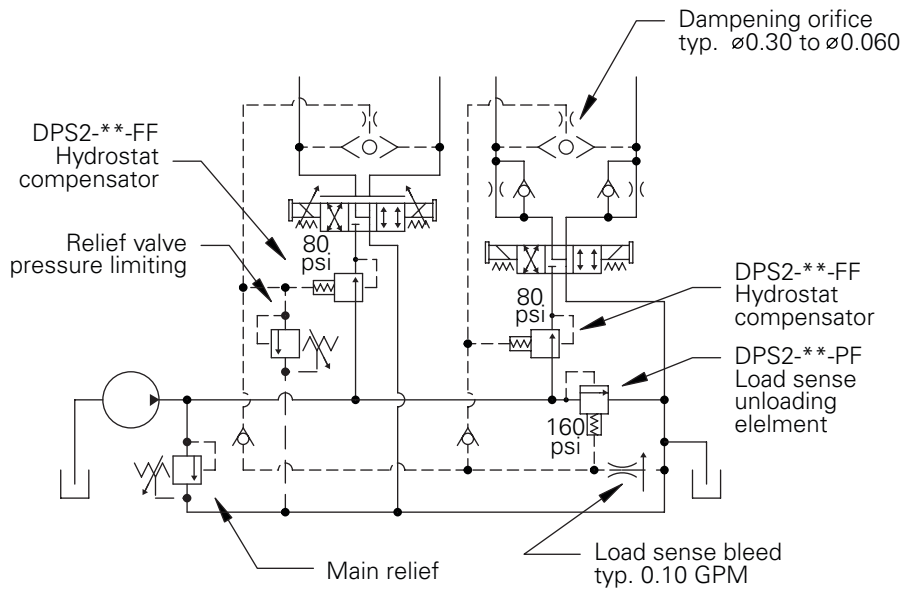
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Application examples

PPS2 Elements for flow control

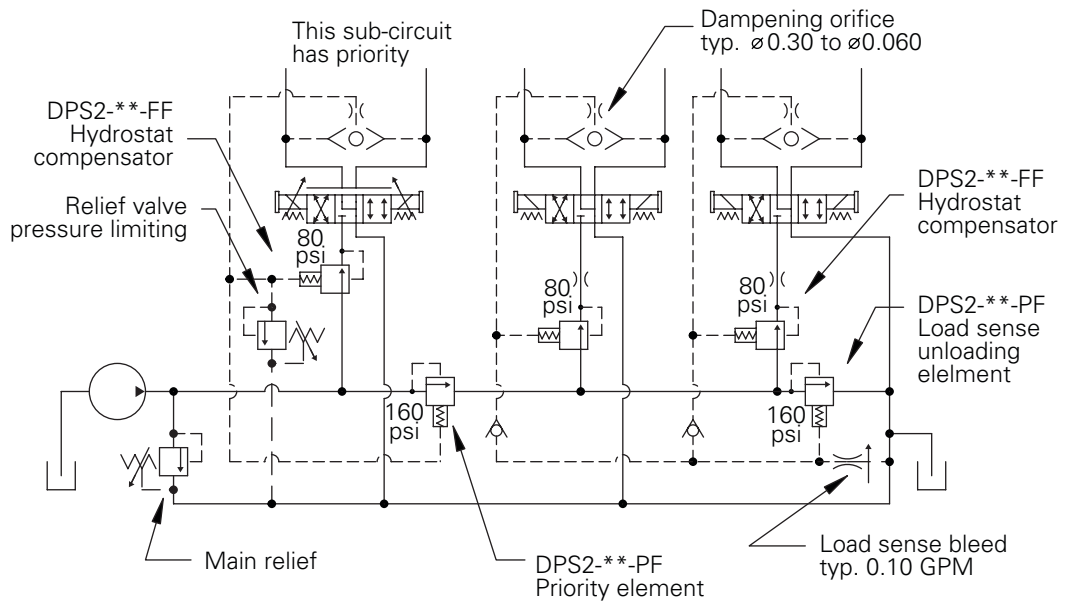
Load sense circuit example

For parallel operation



Load sense circuit example

For priority and parallel operation

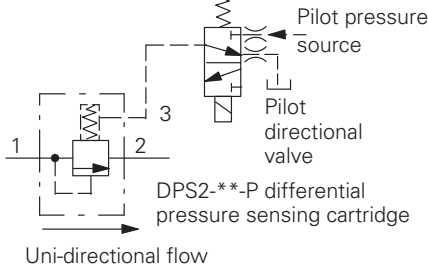


Note

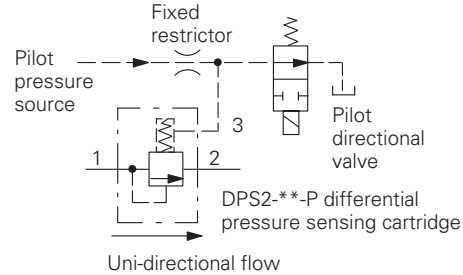
1. Pressure limiting relief must be < main relief setting.
2. If pre-ssure limiting is not used; port reliefs set < main relief are required.

Two-way, two-position, normally open examples

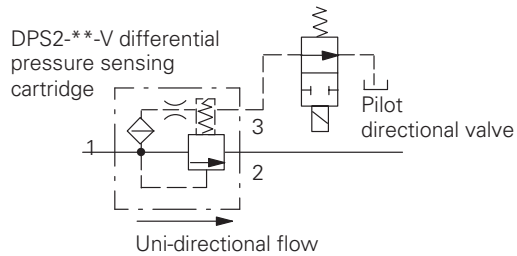
Switched by 3-way, 2-position pilot valve and external pilot pressure



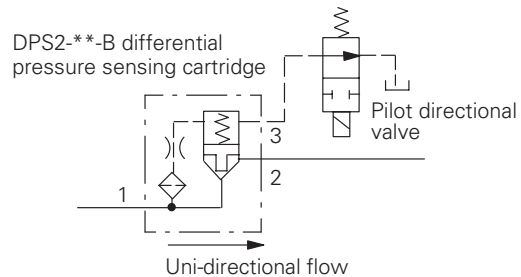
Switched by external pilot pressure and vented through 2-way, 2-position pilot valve



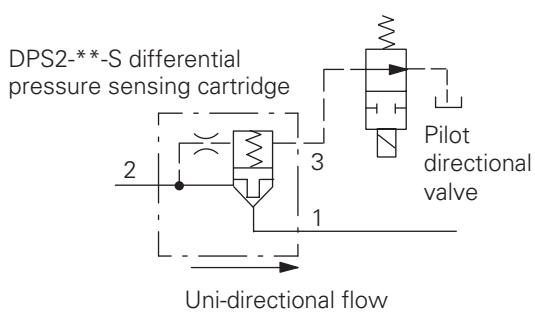
With DPS2-V cartridge and internal pilot supply & vented through 2-way, 2 position pilot valve



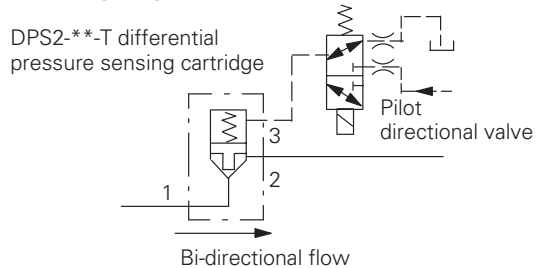
With DPS2-B cartridge and internal pilot supply & vented through 2-way, 2 position pilot valve



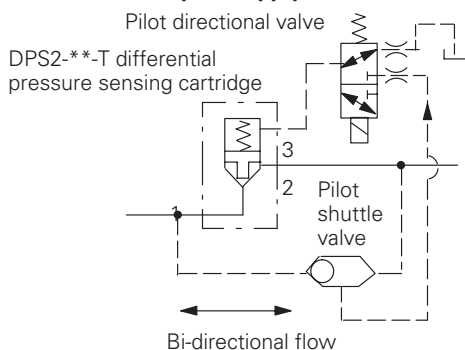
With DPS2-S cartridge and internal pilot supply & vented through 2-way, 2 position pilot valve



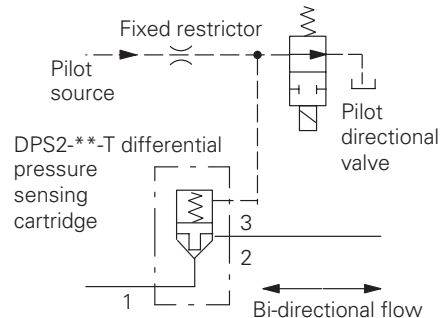
With DPS2-T cartridge and internal pilot supply & switched by 3-way, 2 position pilot valve and external pilot pressure



With DPS2-T cartridge and internal shuttle-selected pilot supply



With DPS2-T cartridge, external pilot supply and two-way two-position pilot valve

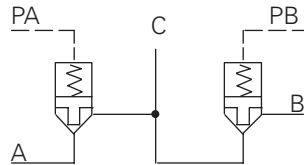


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

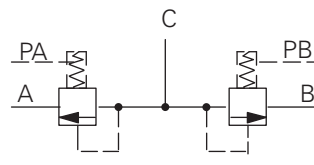
Application examples

DPS2 Elements for directional control

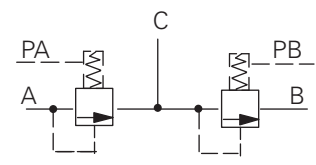
Three-way bridge circuits



Example 1, with DPS2--T**
Poppet type



Example 2, with DPS2--P**
Spool type



Example 3, with DPS2--P**
Spool type

Required flow path	Pilot pressure to		Available from form		
	PA	PB	1	2	3
	0	0	Yes	Yes	No
	1	0	Yes	Yes	Yes

Required flow path	Pilot pressure to		Available from form		
	PA	PB	1	2	3
	0	1	Yes	Yes	No
	1	1	Yes	Yes	Yes

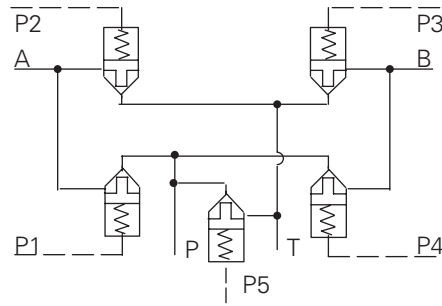
1- Pressure applied 0- Pressure vented

Note:

Pilot pressure, modified by valve area ratio (if any), must exceed load pressure at valve in order to close valve.

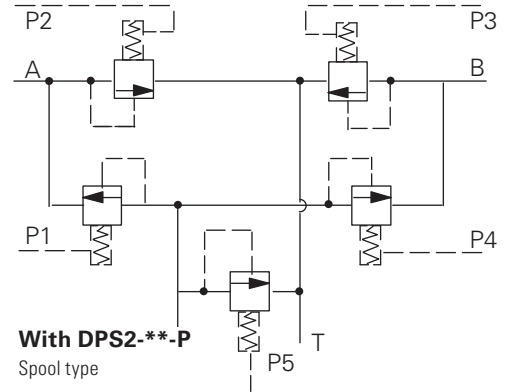
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Four-way bridge circuits



With DPS2--T**

Poppet type



With DPS2--P**

Spool type

Required flow path	Pilot pressure to					Required flow path	Pilot pressure to				
	P1	P2	P3	P4	P5		P1	P2	P3	P4	P5
	1	1	1	1	1		1	1	0	1	1
	0	0	0	0	0		0	1	1	1	1
	1	1	0	0	0		0	1	0	1	1
	0	0	1	1	0		1	0	1	0	1
	1	1	1	1	0		1	1	1	0	1
	1	0	0	1	1		1	0	1	1	1
	0	1	1	0	1						

1- Pressure applied 0- Pressure vented

Note:

Pilot pressure, modified by valve area ratio (if any), must exceed load pressure at valve in order to close valve.

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

DPS2-8 - Logic element

Differential pressure sense valves
30 L/min (8 USgpm) • 350 bar (5000 psi)

Description

These are normally open or closed logic elements with or without a control orifice. They can be used as main valves for the control of high flows using small pilot cartridges, as compensators or load sense elements.

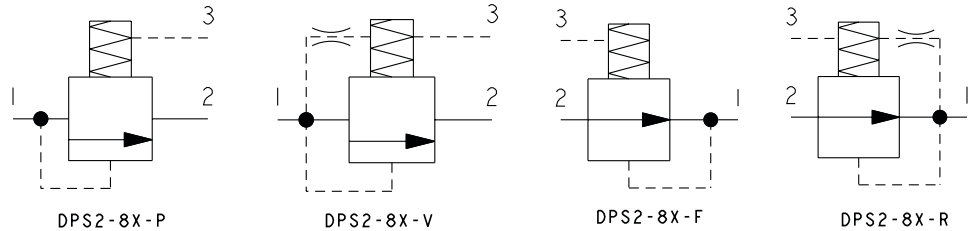
Operation

This valve is used as a main section of a pilot controlled valve assembly. This valve has multiple uses when used with either directional control, flow control or pressure control cartridges. Refer to application examples.

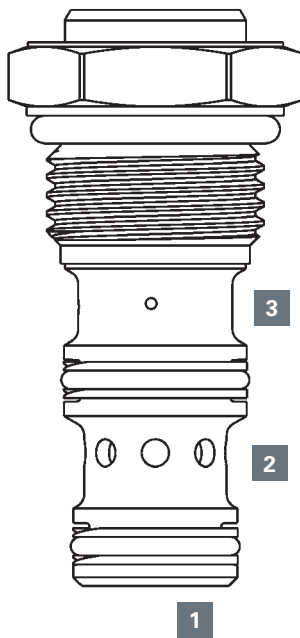
Features

Hardened and ground and honed working components. Cartridge construction for maximum mounting flexibility.

Functional symbols



Sectional view



Performance data

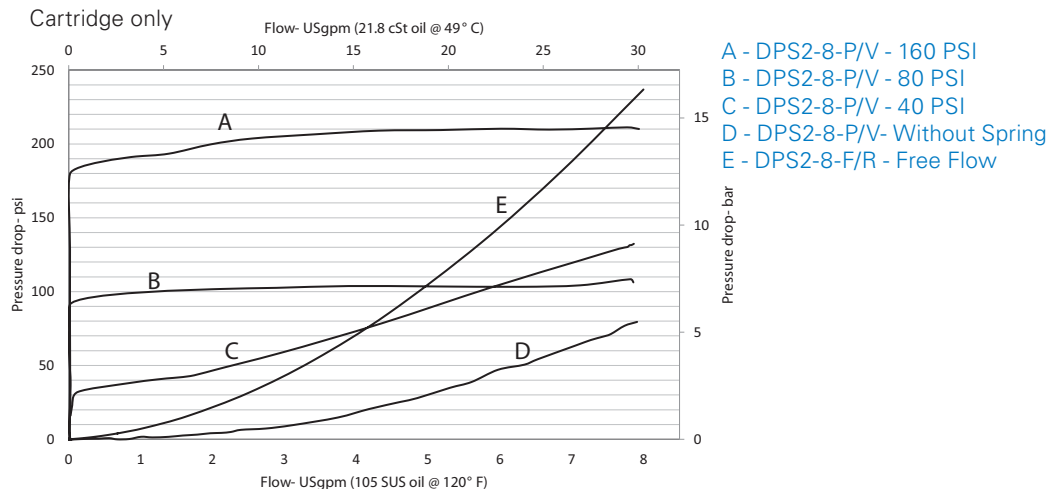
Ratings and specifications

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

Typical application pressure	Spool type: 350 bar (5000 psi)
Cartridge fatigue pressure	350 bar (5000 psi)
Rated flow	30 L/min (8 USgpm)
Pilot ratio	Spool type P, V, R, F: 1:1
Internal leakage	Spool type: 82 cm ³ /min. (5 in ³ /min) max @ 350 bar (5000 psi)
Temperature range	-40° to 120° C (-40° to 248° F)
Cavity	C-8-3
Standard housing materials	Aluminium or Steel
Fluids	All general purpose hydraulics fluids such as: MIL-H-5606, SAE 10, SAE 20 etc
Filtration	Cleanliness code 18/16/13
Weight cartridge only (Fixed/Adjustable)	0.07 kg (0.16 lbs) / 0.20 kg (0.43 lbs)
Seal kit	02-160755 (Buna-N), 02-160756 (Viton®)

Viton is a registered trademark of E.I. DuPont

Pressure drop curve

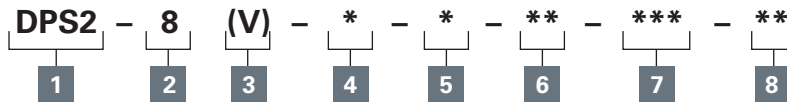


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

DPS2-8 - Logic element

Differential pressure sense valves
30 L/min (8 USgpm) • 350 bar (5000 psi)

Model code



1 Function

DPS2 - Differential pressure sensing

2 Size

8 - 8 size

3 Seal material

Blank - Buna-N

V - Viton®

4 Function

P - Spool, N/C (L/S element)

V - Spool, N/C

R - Spool, pressure reducing, N/O

F - Spool, flow control, N/O (hydrostat)

5 Port size

0 - Cartridge only

Code	Port size	Housing number
0	Cartridge only	
A4T	SAE 4	02-160741
A6T	SAE 6	02-160742
A2G	1/4" BSPP	02-160739
A3G	3/8" BSPP	02-160740
S4T	SAE 4	02-160745
S6T	SAE 6	02-160746
S2G	1/4" BSPP	02-160743
S3G	3/8" BSPP	02-160744

See section J for housing details.

6 Adjustment

F - None

P - Pressure adjustments

"P" adjustment is not available with F and R functions.

7 Differential pressure

Note: Code based on pressure in psi

040 - 2,80 bar (40 psi)

080 - 5,50 bar (80 psi)

160 - 11,0 bar (160 psi)

300 - 5.5-20.7 bar(80-300 psi)*

* Only for "P" Adjustment pressure setting, factory set at Max pressure.

8 Special features

00 - No special features

Dimensions

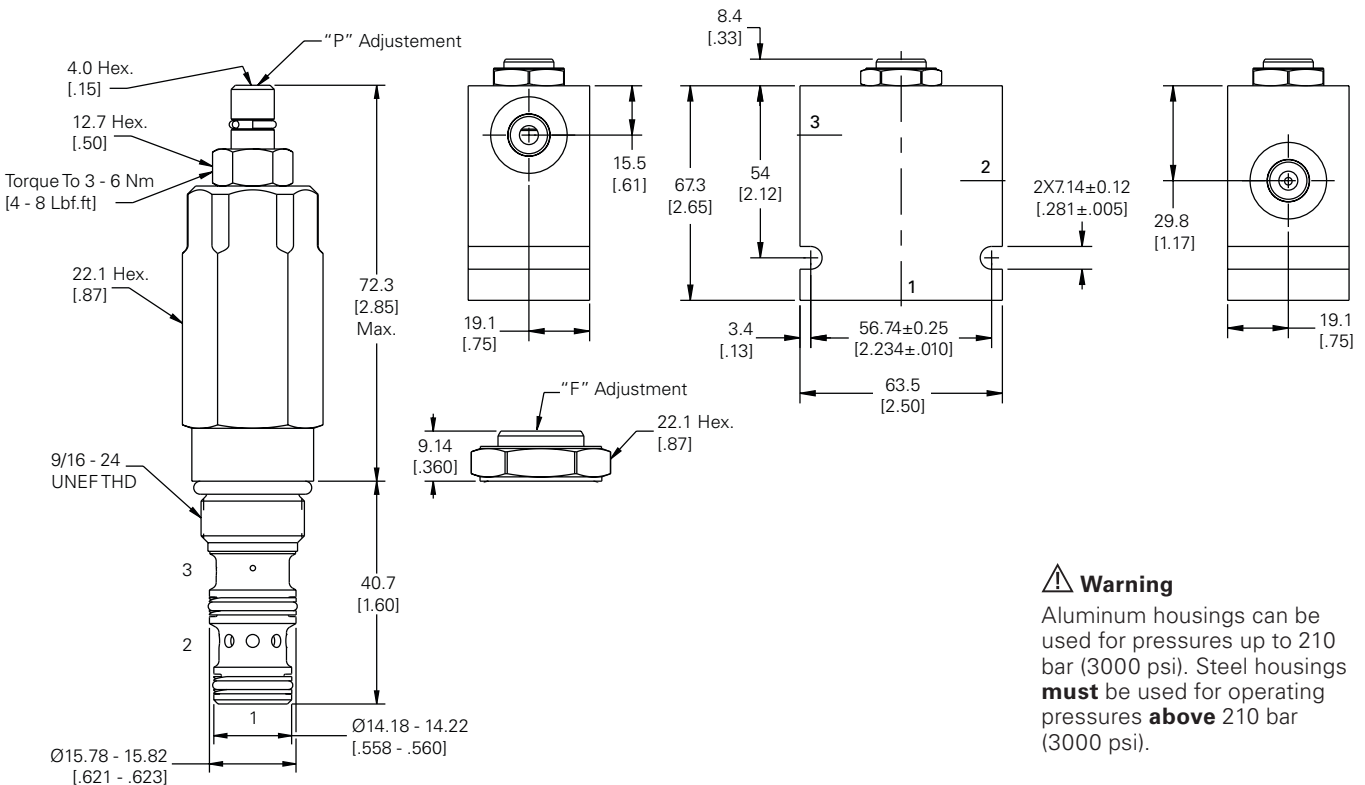
mm (inch)

Cartridge only

Torque cartridge in housing

Aluminum or Steel - 34-41 Nm (25-30 ft lbs)

Installation drawing



Warning

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

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

DPS2-10 - Logic element

Differential pressure sense valves
60 L/min (15 USgpm) • 290, 350 bar (4200, 5000 psi)

Functional symbols

See pages I-142 & I-143

Description

These are normally open or closed logic elements with or without a control orifice. They can be used as main valves for the control of high flows using small pilot cartridges, as compensators or load sense elements.

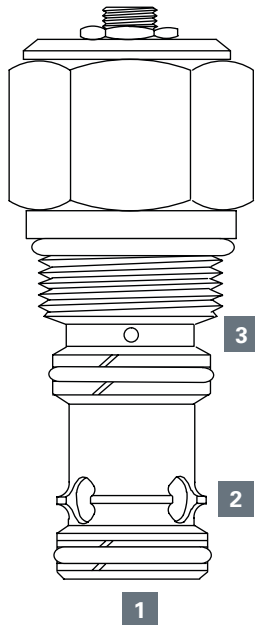
Operation

This valve is used as a main section of a pilot controlled valve assembly. This valve has multiple uses when used with either directional control, flow control or pressure control cartridges. Refer to application examples.

Features

Hardened and ground and honed working components. Cartridge construction for maximum mounting flexibility. Low leakage with poppet valves and 350 bar pressure rating

Sectional view



Performance data

Ratings and specifications

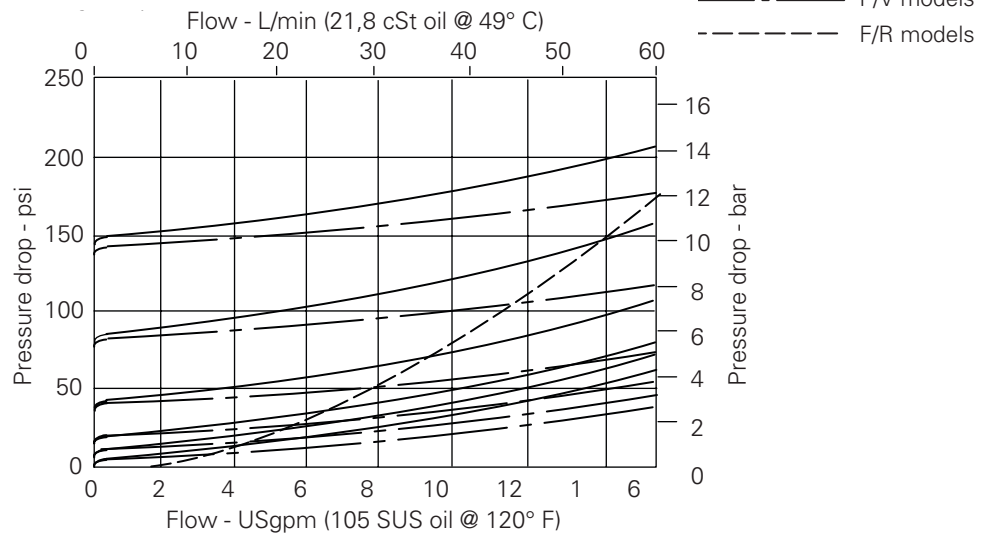
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49° C (120° F)

Typical application pressure	Spool type: 290 bar (4200 psi) Poppet type: 350 bar (5000 psi)
Rated flow	60 L/min (15 USgpm)
Pilot ratio	Spool type P, V, R, F: 1:1 Poppet type B, S, T: 2:1
Internal leakage	Spool type: 82 cm ³ /min. (5 in ³ /min) max @ 290 bar (4200 psi) Poppet type: Port 1 to 2: < 5 drops/min max @ 350 bar (5000 psi)
Temperature range	-40° to 120° C (-40° to 248° F)
Cavity	C-10-3S
Standard housing materials	Aluminium
Fluids	All general purpose hydraulics fluids such as: MIL-H-5606, SAE 10, SAE 20 etc
Filtration	Cleanliness code 18/16/13
Weight cartridge only	0,14 kg (0.30 lbs)
Seal kit	889650 (Buna-N), 889652 (Viton®)

Viton is a registered trademark of E.I. DuPont

Pressure drop curve

Cartridge only

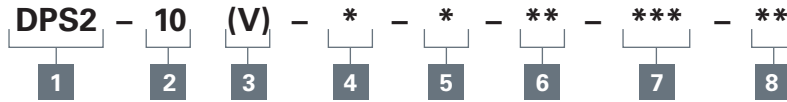


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

DPS2-10 - Logic element

Differential pressure sense valves
60 L/min (15 USgpm) • 290, 350 bar (4200, 5000 psi)

Model code



1 Function

DPS2 - Differential pressure sensing

2 Size

10 - 10 size

3 Seal material

Blank - Buna-N
V - Viton®

4 Function

B - Poppet, vent to open, N/C
S - Poppet, vent to open, N/C
T - Poppet, bi-directional, pilot to close, 2:1 ratio, N/C

P - Spool, N/C (L/S element)

V - Spool, N/C

R - Spool, pressure reducing, N/O

F - Spool, flow control, N/O (hydrostat)

5 Adjustment

F - None
P - Stroke adjustments

"S" adjustment is not available with F and R functions.

6 Port size

0 - Cartridge only

7 Differential pressure

Note: Code based on pressure in psi
005 - 0,35 bar (5 psi)+ *

010 - 0,7 bar (10 psi)+ *

020 - 1,40 bar (20 psi)+*

040 - 2,80 bar (40 psi)

080 - 5,50 bar (80 psi)

160 - 11,0 bar (160 psi)

+ Not available with the "B", "S" and "T" poppet.

* The operating back pressure at port 3 should never be less than 1.3 times the spring set pressure.

Code	Port size	Housing number
		Aluminium
3B	3/8" BSPP	02-175470*
6T	SAE 6	566413
6H	SAE 6	876706
8H	SAE 8	876712
2G	1/4" BSPP	876707
3G	3/8" BSPP	876710

* Light duty housing
See section J for housing details.

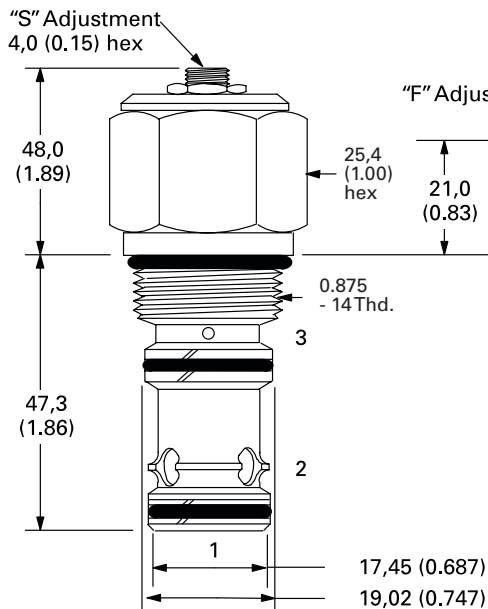
8 Special features

00 - No special features

Dimensions

mm (inch)

Cartridge only

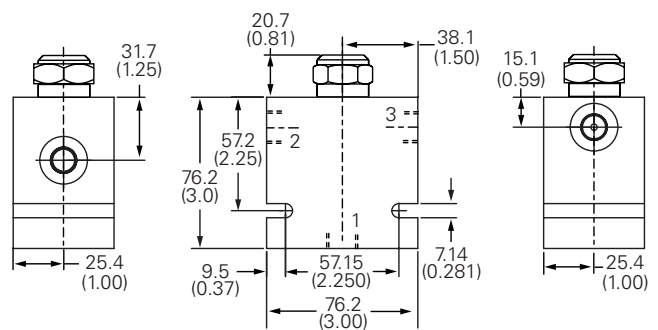


Torque cartridge in housing

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

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

Installation drawing



Warning

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

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

DPS2-12 - Logic element

Differential pressure sense valves
114 L/min (30 USgpm) • 350 bar (5000 psi)

Functional symbols

See pages I-142 & I-143

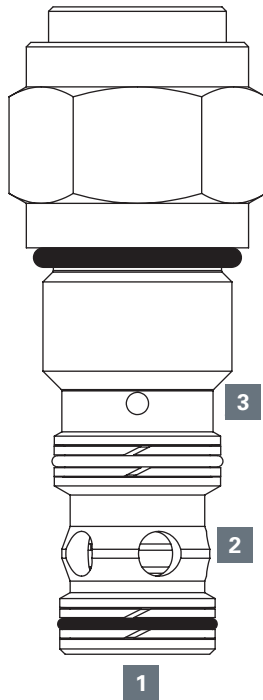
Operation

This valve is used as a main section of a pilot controlled valve assembly. This valve has multiple uses when used with either directional control, flow control or pressure control cartridges. Refer to application examples.

Features

Hardened and ground and honed working components.
Cartridge construction for maximum mounting flexibility.
Low leakage with poppet valves and 350 bar pressure rating

Sectional view



Performance data

Ratings and specifications

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

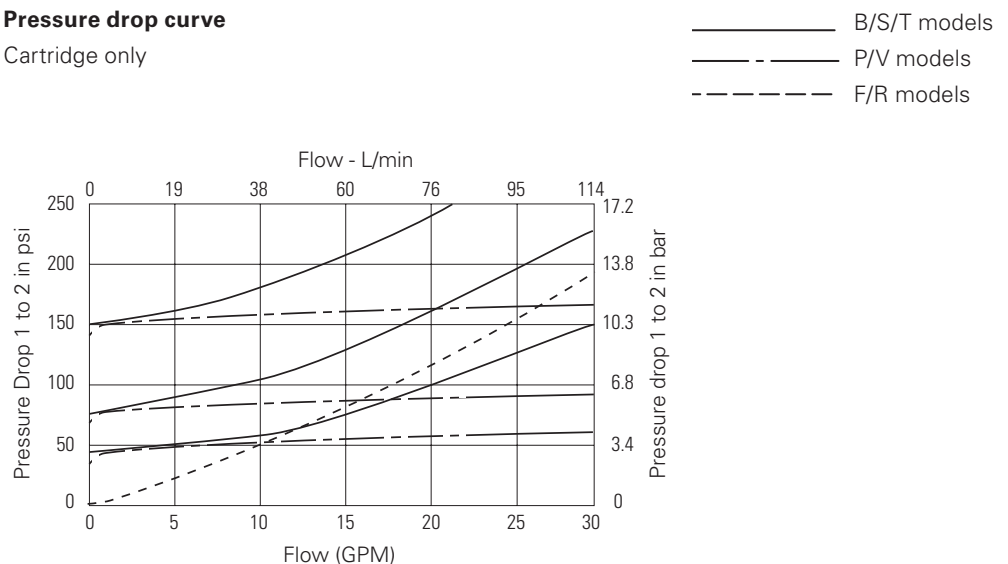
Typical application pressure	Spool and Poppet type: 350 bar (5000 psi)
Rated flow	114 L/min (30 USgpm)
Pilot ratio	Spool type P, V, R, F: 1:1 Poppet type B, S, T: 2:1
Internal leakage	Spool type: 82 cm ³ /min. (5 in ³ /min) max @ 350 bar (5000 psi) Poppet type: 5 drops/min @ 5000 psi
Temperature range	-40° to 120° C (-40° to 248° F)
Cavity	C-12-3S
Standard housing materials	Aluminium or steel
Fluids	All general purpose hydraulics fluids such as: MIL-H-5606, SAE 10, SAE 20 etc
Filtration	Cleanliness code 18/16/13
Weight cartridge only	0,31 kg (0.68 lbs)

Description

These are normally open or closed logic elements with or without a control orifice. They can be used as main valves for the control of high flows using small pilot cartridges, as compensators or load sense elements.

Pressure drop curve

Cartridge only

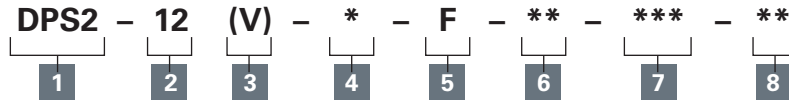


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

DPS2-12 - Logic element

Differential pressure sense valves
114 L/min (30 USgpm) • 350 bar (5000 psi)

Model code



1 Function

DPS2 - Differential pressure sensing

2 Size

12 - 12 size

3 Seal material

Blank - Buna-N
V - Viton®

4 Function

B - Poppet, vent to open, N/C
S - Poppet, vent to open, N/C
T - Poppet, bi-directional, pilot to close, 2:1 ratio, N/C
P - Spool, N/C (L/S element)
V - Spool, N/C
R - Spool, pressure reducing, N/O
F - Spool, flow control, N/O (hydrostat)

5 Adjustment

F - None

6 Port size

0 - Cartridge only

7 Differential pressure

Note: Code based on pressure in psi
040 - 2,80 bar (40 psi)
080 - 5,50 bar (80 psi)
160 - 11,0 bar (160 psi)

8 Special features

00 - No special features

Code	Housing number	Port 1 & 2	Port 3
(A)10T	02-178268	SAE 10	SAE 6
(A)12T	02-178269	SAE 12	SAE 6
(A)4G	02-178270	1/2" BSPP	3/8" BSPP
(A)6G	02-178271	3/4" BSPP	3/8" BSPP
(S)10T	02-160996	SAE 10	SAE 6
(S)12T	02-160997	SAE 12	SAE 6
(S)4G	02-160994	1/2" BSPP	3/8" BSPP
(S)6G	02-160995	3/4" BSPP	3/8" BSPP

See section J for housing details.

Dimensions

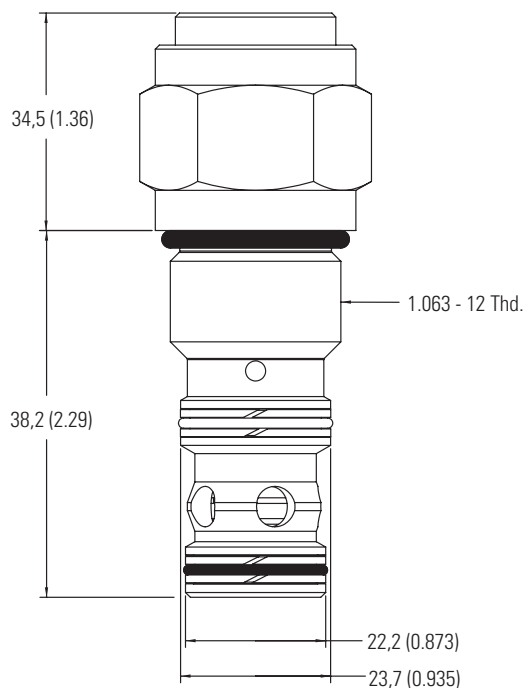
mm (inch)

Cartridge only

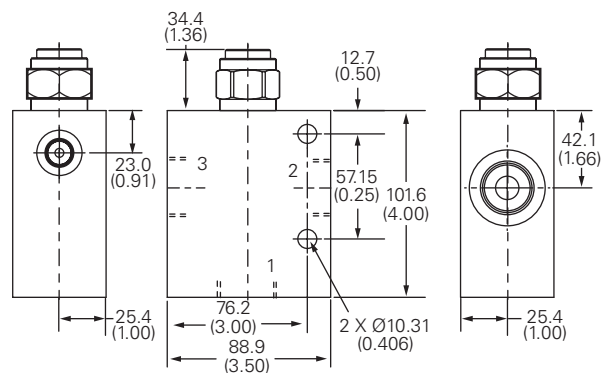
Torque cartridge in housing

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

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



Installation drawing (steel)



Warning

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

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

DPS2-16 - Logic element

Differential pressure sense valves
189 L/min (50 USgpm) • 210, 350 bar (3000, 5000 psi)

Functional symbols

See pages I-142 & I-143

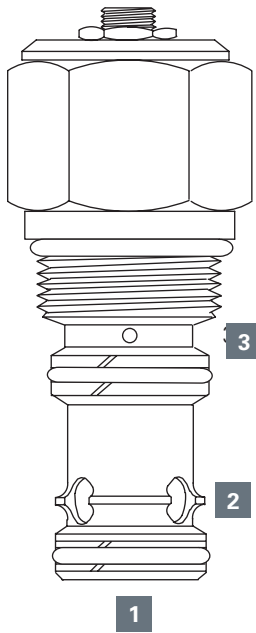
Operation

This valve is used as a main section of a pilot controlled valve assembly. This valve has multiple uses when used with either directional control, flow control or pressure control cartridges. Refer to application examples.

Features

Hardened and ground and honed working components.
Cartridge construction for maximum mounting flexibility.
Low leakage with poppet valves and 350 bar pressure rating

Sectional view



Performance data

Ratings and specifications

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

Typical application pressure	Spool type: 290 bar (4200 psi) Poppet type: 210 bar (3000 psi) or 350 bar (5000 psi)
Rated flow	189 L/min (50 USgpm)
Pilot ratio	Spool type P, V, R, F: 1:1
Internal leakage	Poppet type B, S, T: 2:1
Temperature range	spool type: 82 cm ³ /min. (5 in ³ /min) max @ 290 bar (4200 psi) poppet type: Port 1 to 2: < 5 drops/min max @ 350 bar (5000 psi)
Cavity	-40° to 120° C (-40° to 248° F)
Standard housing materials	C-16-3S
Fluids	Aluminium
Filtration	All general purpose hydraulics fluids such as: MIL-H-5606, SAE 10, SAE 20 etc
Weight cartridge only	Cleanliness code 18/16/13
Seal kit	0,35 kg (0.78 lbs) 889659 (Buna-N), 02-165871 (Viton®)

Viton is a registered trademark of E.I. DuPont

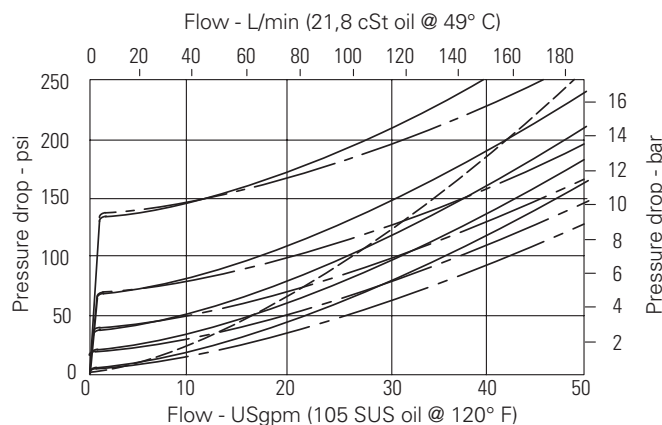
Description

These are normally open or closed logic elements with or without a control orifice. They can be used as main valves for the control of high flows using small pilot cartridges, as compensators or load sense elements.

Pressure drop curve

Cartridge only

————— B/S/T models
- - - - - P/V models
- - - - - F/R models

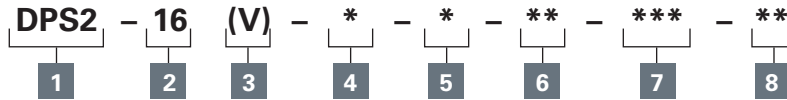


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

DPS2-16 - Logic element

Differential pressure sense valves
189 L/min (50 USgpm) • 210, 350 bar (3000, 5000 psi)

Model code



1 Function

DPS2 - Differential pressure sensing

2 Size

16 - 16 size

3 Seal material

Blank - Buna-N

V - Viton®

4 Function

B - Poppet, vent to open, N/C

S - Poppet, vent to open, N/C

T - Poppet, bi-directional, pilot to close, 2:1 ratio, N/C

P - Spool, N/C (L/S element)

V - Spool, N/C

R - Spool, pressure reducing, N/O

F - Spool, flow control, N/O (hydrostat)

5 Port size

0 - Cartridge only

Code	Port size	Housing number
Aluminium		
4B	3/4" BSPP	02-175471*
12T	SAE 12	566414*
10H	SAE 10	876725
12H	SAE 12	876727
4G	1/2" BSPP	02-160676
6G	3/4" BSPP	876726

* Light duty housing
See section J for housing details.

6 Stroke adjustment

F - None
S - Stroke adjustments

"S" adjustment is not available with F and R functions.

7 Differential pressure

Note: Code based on pressure in psi
005 - 0,35 bar (5 psi)+*

020 - 1,40 bar (20 psi)+*

040 - 2,80 bar (40 psi)

080 - 5,50 bar (80 psi)

160 - 11,0 bar (160 psi)

+ Not available with the "B", "S" and "T" poppet.

* The operating back pressure at port 3 should never be less than 1.3 times the spring set pressure.

8 Special features

00 - 210 bar (3000 psi) rated valve

AA - 350 bar (5000 psi) rated valve (poppet type only).

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

Dimensions

mm (inch)

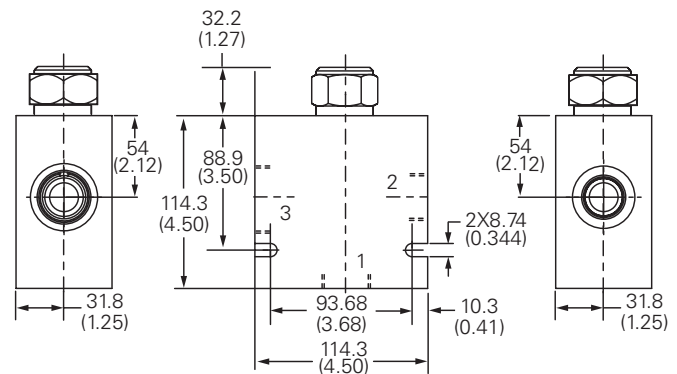
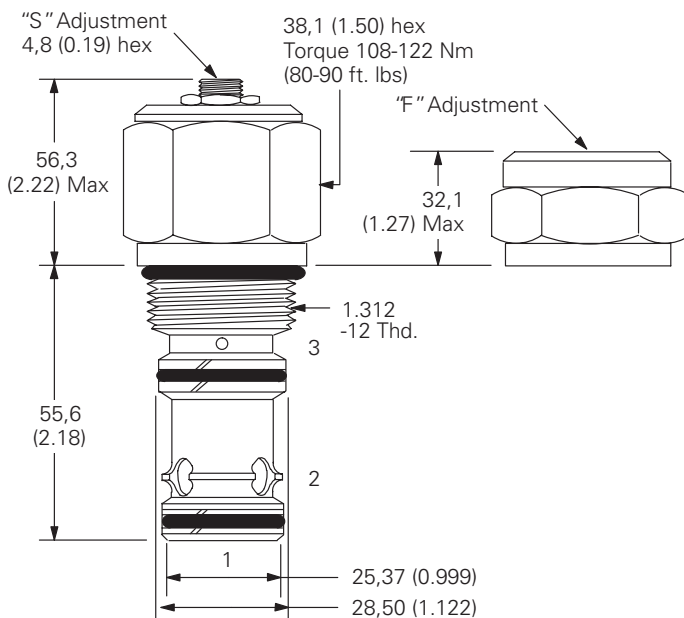
Cartridge only

Torque cartridge in housing

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

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

Installation drawing



Warning

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

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

DPS2-20 - Logic element

Differential pressure sense valves
303 L/min (80 USgpm) • 210, 350 bar (3000, 5000 psi)

Functional symbols

See pages I-142 & I-143

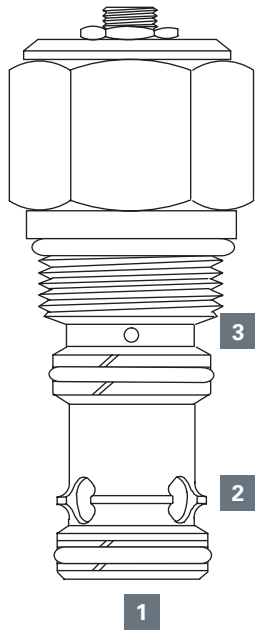
Operation

This valve is used as a main section of a pilot controlled valve assembly. This valve has multiple uses when used with either directional control, flow control or pressure control cartridges. Refer to application examples.

Features

Hardened and ground and honed working components. Cartridge construction for maximum mounting flexibility. Low leakage with poppet valves and 350 bar pressure rating.

Sectional view



Performance data

Ratings and specifications

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

Typical application pressure	Spool type: 290 bar (4200 psi) Poppet type: 210 bar (3000 psi) or 350 bar (5000 psi)
Rated flow	303 L/min (80 USgpm)
Pilot ratio	Spool type P, V, R, F: 1:1
Internal leakage	Poppet type B, S, T: 2:1
Temperature range	Spool type: 82 cm ³ /min. (5 in ³ /min) max @ 290 bar (4200 psi) Poppet type: Port 1 to 2: < 5 drops/min max @ 350 bar (5000 psi)
Cavity	-40° to 120° C (-40° to 248° F)
Standard housing materials	C-20-3S
Fluids	Aluminium
Filtration	All general purpose hydraulics fluids such as: MIL-H-5606, SAE 10, SAE 20 etc
Weight cartridge only	Cleanliness code 18/16/13
Seal kit	0,81 kg (1.78 lbs) 02-113153 (Buna-N), 02-112969 (Viton®)

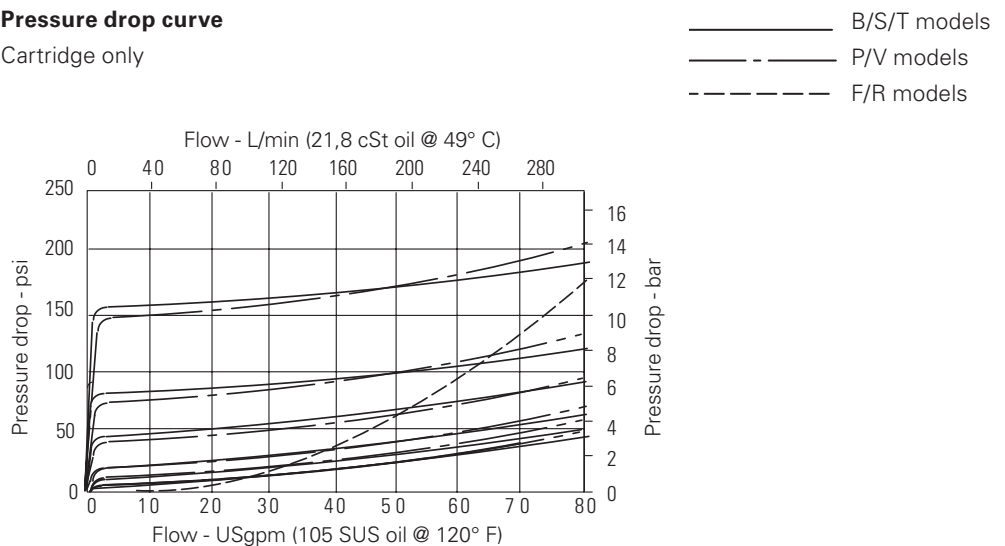
Viton is a registered trademark of E.I. DuPont

Description

These are normally open or closed logic elements with or without a control orifice. They can be used as main valves for the control of high flows using small pilot cartridges, as compensators or load sense elements.

Pressure drop curve

Cartridge only

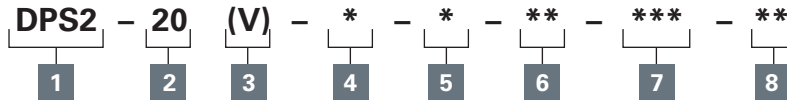


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

DPS2-20 - Logic element

Differential pressure sense valves
303 L/min (80 USgpm) • 210, 350 bar (3000, 5000 psi)

Model code



1 Function

DPS2 - Differential pressure sensing

Size

20 - 20 size

3 Seal material

Blank - Buna-N
V - Viton®

4 Function

B - Poppet, vent to open, N/C
S - Poppet, vent to open, N/C
T - Poppet, bi-directional, pilot to close, 2:1 ratio, N/C
P - Spool, N/C (L/S element)
V - Spool, N/C

R - Spool, pressure reducing, N/O

F - Spool, flow control, N/O (hydrostat)

5 Port size

0 - Cartridge only

Code	Port size	Housing number
		Aluminium
8B	1" BSPP	02-175472*
16T	SAE 16	566415*
12H	SAE 12	876741
16H	SAE 16	876743
6G	3/4" BSPP	876740
8G	1" BSPP	876742

* Light duty housing
See section J for housing details.

6 Stroke adjustment

F - None (Fixed stroke)
S - Screw adjustment

Screw adjustment is not available with F and R functions.

7 Differential pressure

Note: Code based on pressure in psi

005 - 0,35 bar (5 psi)+*

10 - 0,7 bar (10 psi)+*

20 - 1,40 bar (20 psi)+*

40 - 2,80 bar (40 psi)

80 - 5,50 bar (80 psi)

160 - 11,0 bar (160 psi)

+ Not available with the "B", "S" and "T" poppet.

* The operating back pressure at port 3 should never be less than 1.3 times the spring set pressure.

8 Special features

00 - 210 bar (3000 psi) rated valve

AA - 350 bar (5000 psi) rated valve (poppet type only).

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

Dimensions

mm (inch)

Cartridge only

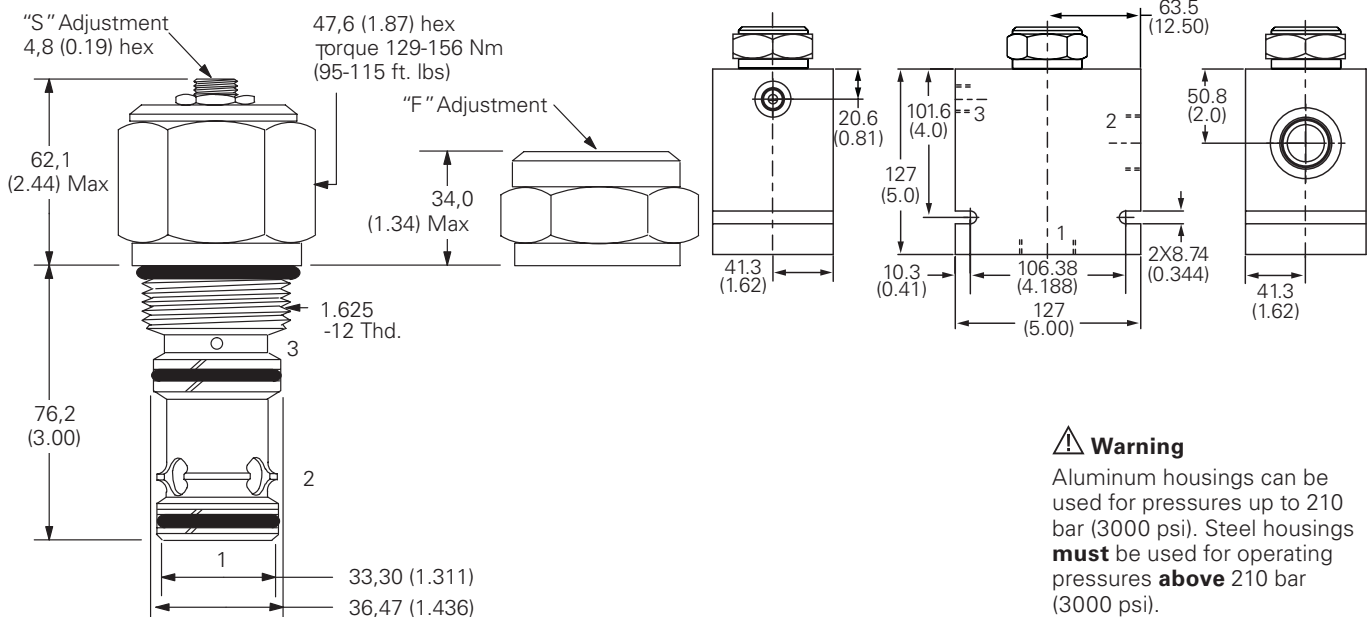
Torque cartridge in housing

A - 128-155 Nm (95-115 ft lbs)

S - 163-183 Nm (120-135 ft lbs)

Note: For application at 350 bar (5000 psi) torque into steel housing to 205-218 Nm (150-160 ft. lbs) (for valves with "AA" special feature only).

Installation drawing



Warning

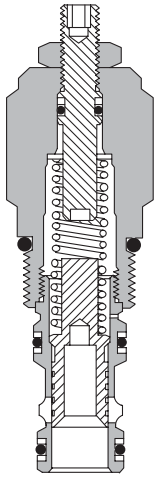
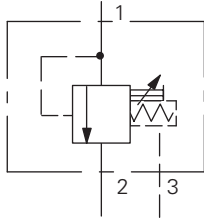
Aluminum housings can be used for pressures up to 210 bar (3000 psi). Steel housings **must** be used for operating pressures **above** 210 bar (3000 psi).

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

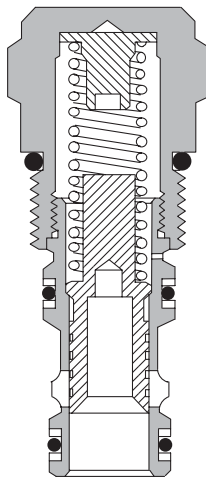
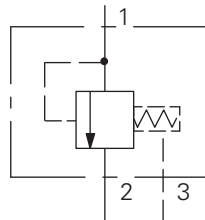
DPS2

Spool type functional symbols

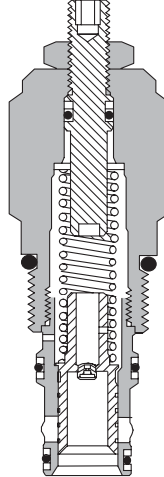
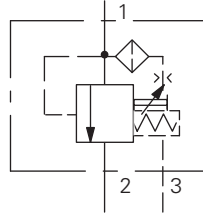
DPS2-**-P-S



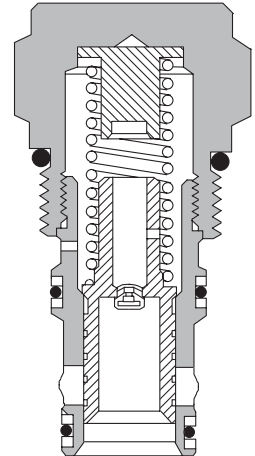
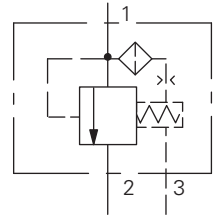
DPS2-**-P-F



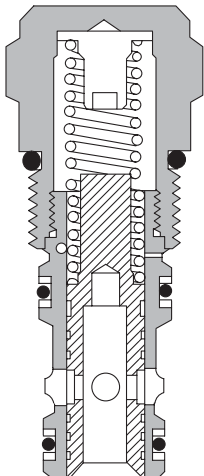
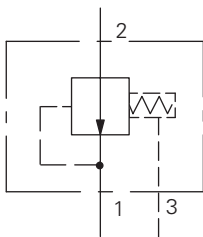
DPS2-**-V-S



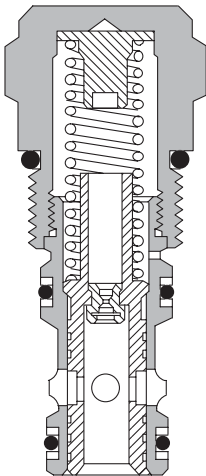
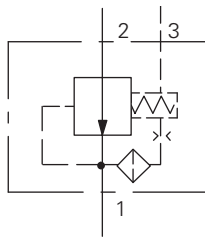
DPS2-**-V-F



DPS2-**-F-F

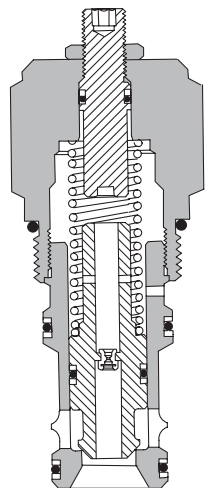
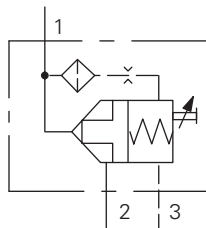


DPS2-**-R-F

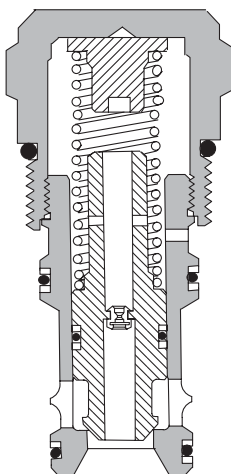
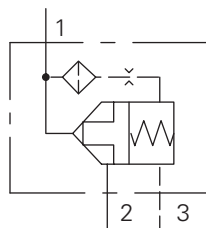


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

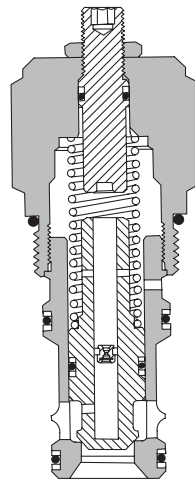
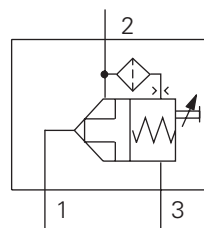
DPS2-**-B-S



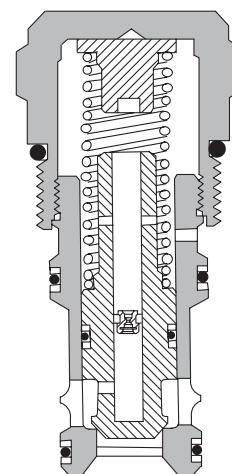
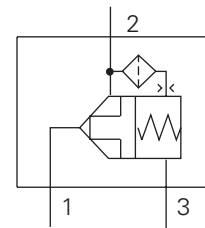
DPS2-**-B-F



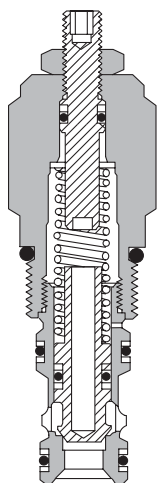
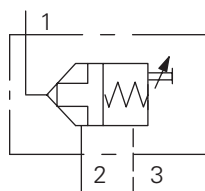
DPS2-**-S-S



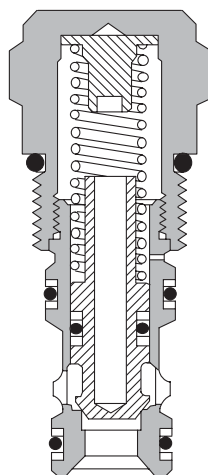
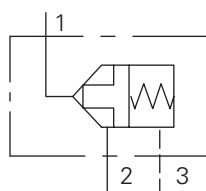
DPS2-**-S-F



DPS2-**-T-S



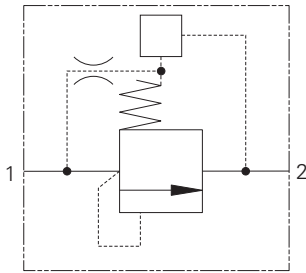
DPS2-**-T-F



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

LE402 - Logic element

Spool type with control cartridge cavity
 350 L/min (95 USgpm) • 350 bar (5000 psi)



Operation

With a pilot valve fitted the valve will only open when flow is allowed across the orifice in the middle of the spool. Flow passing across this orifice will cause there to be a pressure difference that acts over the

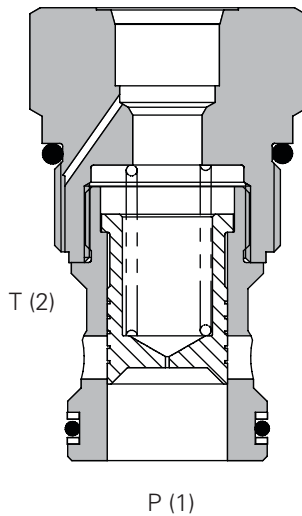
full area of the spool to move it back against the spring that biases it closed. By controlling the pressure in the spring chamber you can control the pressure at which the valve opens.

Features

Very versatile in its application using hardened and ground spool and sleeve giving minimal internal leakage and long life.

High flow and pressure rating increases the variety of applications into which it can fit.

Sectional view



Performance data

Ratings and specifications

Performance data is typical with fluid at 32,0 cSt (150 SUS)

Figures based on oil temperature of 40° C and viscosity of 40 cSt

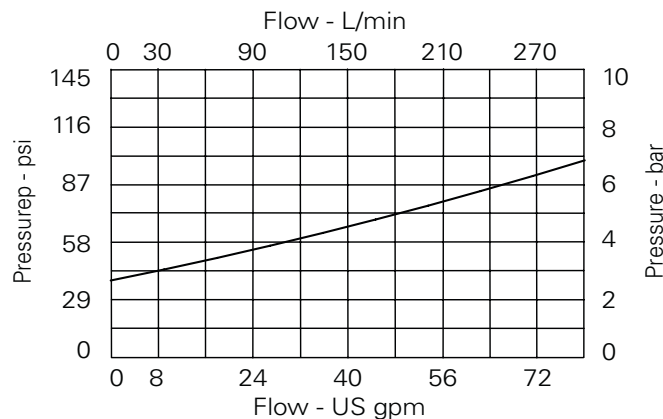
Rated Flow	350 liters/min (95 USgpm)
Maximum load induced pressure	P1: 350 bar (5000 psi), P2: 210 bar (3000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated
Body material	Standard aluminum (up to 210 bar*). Add suffix '377' for steel option
Mounting position	Unrestricted
Cavity number	C-20-2 (see Section M)
Torque cartridge into cavity	60 Nm (44 lbs. ft.)
Weight	LE402: 0.29 kg (0.63 lbs), LE452: 1.35 kg (2.97 lbs)
Seal kit number	SK633 (Nitrile), SK633V (Viton®) Viton is a registered trademark of E. I. DuPont
Recommended Filtration Level	BS5540/4 Class 18/16/13 (25 micron nominal)
Operating temperature	-30° to +90° C (-22° to 194° F)
Leakage	Up to 350 ml/min nominal
Nominal viscosity range	5 to 500 cSt

Description

For use in conjunction with pilot valves to allow control of larger flows. When used with a 2/2 solenoid valve the combination allows control of flows to 350 lts/min (95 US gpm). With a pilot relief valve or a proportional relief valve the element becomes a high flow pilot style relief. With a needle valve an on/off function is achieved. The outlet flow would normally go to tank because back pressure will act on the pilot cartridge to increase the switching pressure.

Pressure drop curve

Free flow 1-2



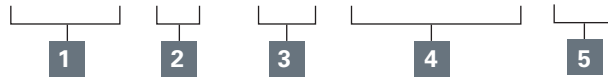
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

LE402 - Logic element

Spool type with control cartridge cavity
350 L/min (95 USgpm) • 350 bar (5000 psi)

Model code

LE4 - N - 0.2 - 1DR2-P-40S - 10W**



1 Basic code

LE402 - Cartridge (logic Element)

LE452 - Cartridge (Logic Element) and body

2 Seals

N - Nitrile (for use with most industrial hydraulic oils)

V - Viton® (for high temperature & most special fluid applications)

3 Spring

0.2 - 1.75

4 Pilot cartridge

Blank - None

1DR2-P-40S - See pg E-100

PDR21AN*6** - See pg B-270

S207N - See pg A-280

5 Port size

Omit - Cartridge only

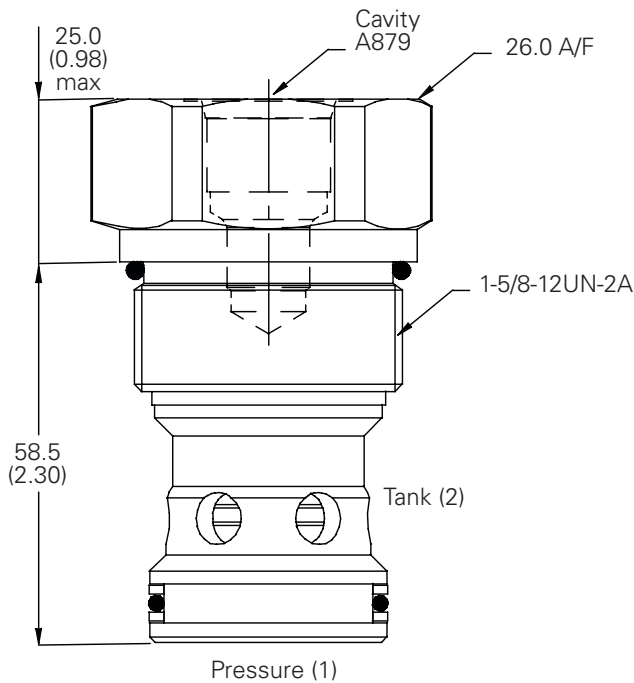
Code	Port size	Aluminum	Steel
10W	1-1/4" BSPP	C24005	C24006
12W	1-1/2" BSPP	C24007	C24008
20T	1-1/4" SAE	C24011	C24012
24T	1-1/2" SAE	C24013	C24014

Dimensions

mm (inch)

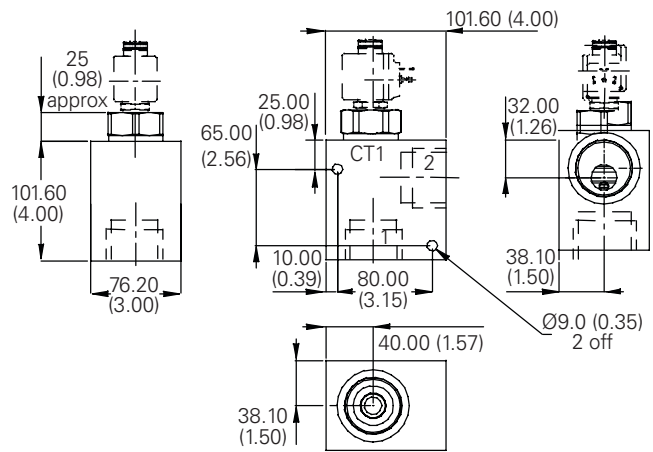
Cartridge only

Basic Code: LE402



Installation drawing

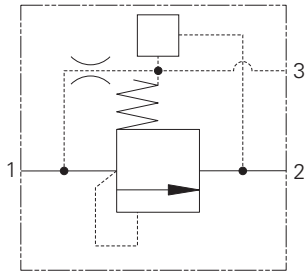
Basic Code: LE452 1 1/4" 1/2" Ports



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

LEV402 - Logic element

Spool type with control cartridge cavity
Up to 400 L/min (100 USgpm) • 250 bar (3500 psi)



Operation

With a pilot valve fitted the valve will only open when flow is allowed across the orifice in the middle of the spool. Flow passing across this orifice will cause there to be a pressure difference that acts over the full area of the spool to move it back against the spring that biases it closed.

By controlling the pressure in the spring chamber you can control the pressure at which the valve opens.

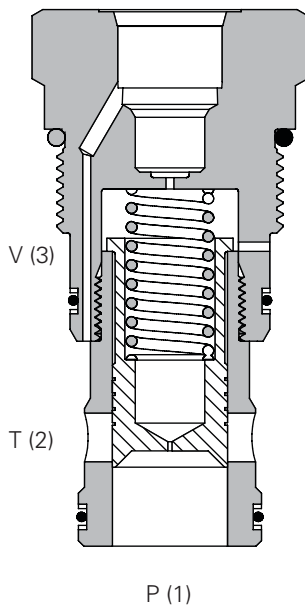
The vent port can be used as a remote control port to provide two pressure operation or a dump facility.

Features

Very versatile in its application using hardened and ground spool and sleeve giving minimal internal leakage and long life. High flow and pressure rating increases the variety of applications into which it can fit.

With small modifications to the spool the valve can be used in load sensing circuits or as a compensator for by-pass pressure compensated flow controls.

Sectional view



Performance data

Ratings and specifications

Performance data is typical with fluid at 32,0 cSt (150 SUS)

Figures based on oil temperature of 40° C and viscosity of 40 cSt

Rated Flow	400 liters/min (100 USgpm)
Maximum working pressure	P1 and P2: 250 bar (3500 psi), P3: 210 bar (3000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated
Body material	Standard aluminum (up to 210 bar*). Add suffix '377' for steel option
Mounting position	Unrestricted
Cavity number	A21773 (see Section M)
Torque cartridge into cavity	150 Nm (110 lbs. ft.)
Weight	LEV402: 0.70 kg (1.54 lbs), LEV452: 2.54 kg (5.6 lbs)
Seal kit number	SK1232 (Nitrile), SK1232V (Viton®) Viton is a registered trademark of E. I. DuPont
Recommended Filtration Level	BS5540/4 Class 18/16/13 (25 micron nominal)
Operating temperature	-30° to +90° C (-22° to 194° F)
Leakage	Up to 350 ml/min
Nominal viscosity range	32 cSt

For applications above 210 bar, please consult our technical department or use the steel body option

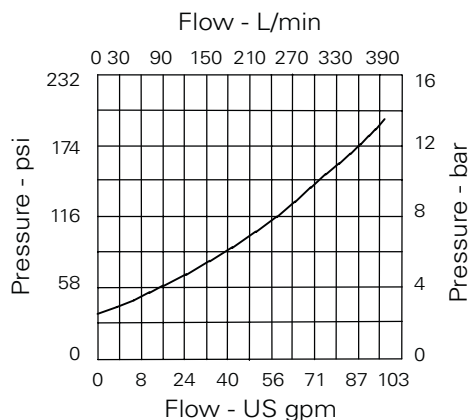
Description

For use in conjunction with pilot valves to allow control of larger flows. When used with a 2/2 solenoid valve the combination allows control of flows to 400 lts/min (100 US gpm). With a pilot relief valve or a proportional relief valve the element becomes a high flow pilot style ventable relief. With a needle valve an on/off function is achieved.

The outlet flow would normally go to tank because back pressure will act on the pilot cartridge to increase the switching pressure.

Pressure drop curve

Vented pressure drop



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LEV402 - Logic element

Spool type with control cartridge cavity
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Model code

LEV4 - N - 0.2 - 1DR2-P-40S - 10W**

1
 2
 3
 4
 5

1 Basic code

1LEV402 - Cartridge only (Logic Element)
1LEV452 - Cartridge (Logic Element) and body

2 Seals

N - Nitrile (for use with most industrial hydraulic oils)
V - Viton® (for high temperature & most special fluid applications)

3 Spring

0.2 - 2 bar

4 Pilot cartridge

Blank - None
1DR2-P-40S - See pg E-100
PDR21AN*6** - See pg B-270
S207N - See pg A-280

5 Port size

Omit - Cartridge only

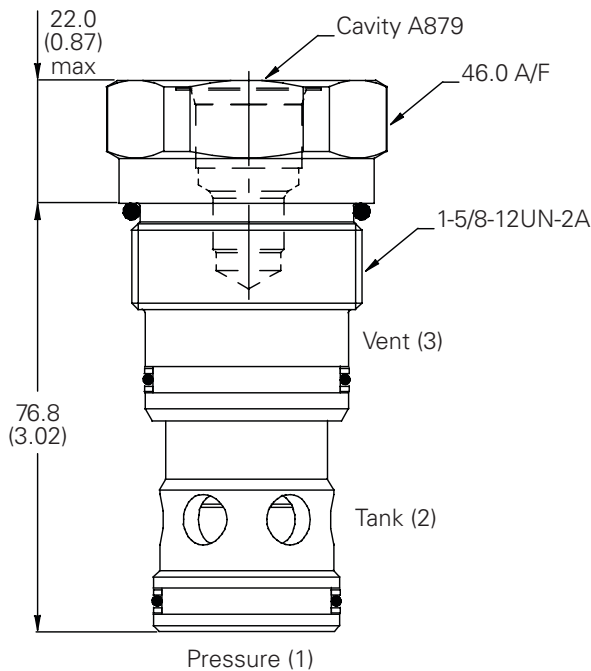
Code	Port size	Aluminum	Steel
10W	1-1/4" BSPP, 1/4" BSPP vent	C24005	C24006
12W	1-1/2" BSPP, 1/4" BSPP vent	C24007	C24008
20T	1-1/4" SAE, 1/4" SAE vent	C24011	C24012
24T	1-1/2" SAE, 1/4" SAE vent	C24013	C24014

Dimensions

mm (inch)

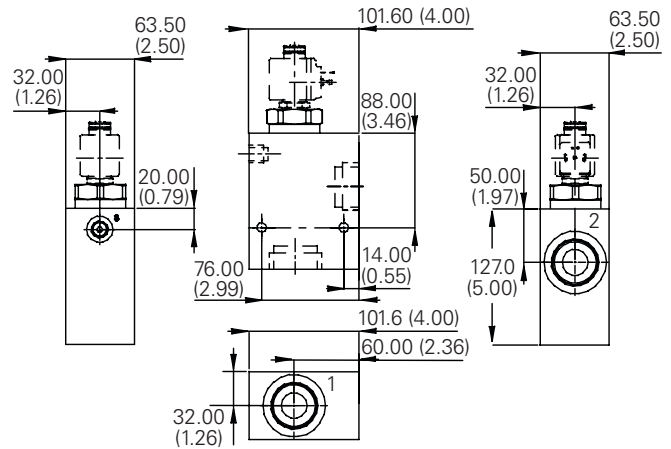
Cartridge only

Basic Code: LEV402



Installation drawing

Basic Code: LEV452 1 1/4" 1/2" Ports

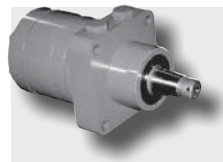
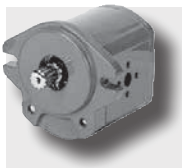
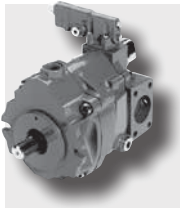


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