



Cartridge Valves Technical Information
 Directional control valves
 Quick reference

Symbol	Model No.	Cavity	Description	Flow*	Pressure	Page
	CP620-1	SDC10-2	2w 2p rotary valve	75 l/min [20 US gal/min]	210 bar [3000 psi]	13.7

Symbol	Model No.	Cavity	Description	Flow*	Pressure	Page
	CP630-1	SDC10-3	3w 2p rotary valve	30 l/min [8 US gal/min]	210 bar [3000 psi]	13.8

Symbol	Model No.	Cavity	Description	Flow*	Pressure	Page
	CP640-1	SDC10-4	4w 3p rotary valve	10 l/min [3 US gal/min]	210 bar [3000 psi]	13.9

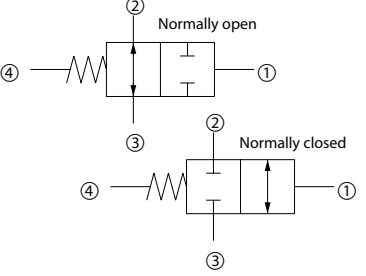
Symbol	Model No.	Cavity	Description	Flow*	Pressure	Page
	CP710-1	SDC10-3	2w 2p pilot operated spool w/atmospheric vent	40 l/min [11 US gal/min]	210 bar [3000 psi]	13.10
	CP712-1	SDC16-3		130 l/min [34 US gal/min]	210 bar [3000 psi]	13.11
	CP713-1	SDC20-3		265 l/min [70 US gal/min]	210 bar [3000 psi]	13.12

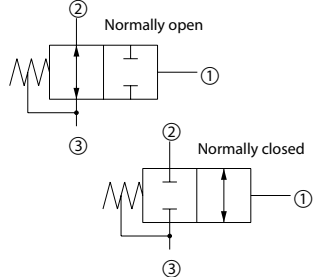
* Flow ratings are based on a pressure drop of 7 bar [100 psi] unless otherwise noted. They are for comparison purposes only.

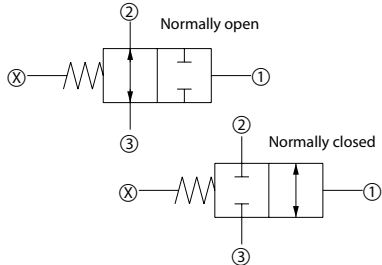
Cartridge Valves Technical Information

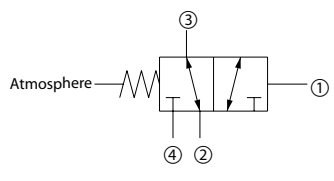
Directional control valves

Quick reference

Symbol	Model No.	Cavity	Description	Flow*	Pressure	Page
	CP710-8	SDC10-4	2w 2p pilot operated spool	40 l/min [11 US gal/min]	210 bar [3000 psi]	13.13
	CP712-8	CP16-4		130 l/min [34 US gal/min]	210 bar [3000 psi]	13.14
	CP712-11	CP16-4		130 l/min [34 US gal/min]	450 bar [6500 psi]	13.15

Symbol	Model No.	Cavity	Description	Flow*	Pressure	Page
	CP710-3	SDC10-3	2w 2p pilot operated spool	40 l/min [11 US gal/min]	210 bar [3000 psi]	13.16

Symbol	Model No.	Cavity	Description	Flow*	Pressure	Page
	CP710-2	SDC10-3	2w 2p double pilot operated spool	40 l/min [11 US gal/min]	210 bar [3000 psi]	13.17
	CP712-2	SDC16-3		130 l/min [34 US gal/min]	210 bar [3000 psi]	13.18
	CP713-2	SDC20-3		265 l/min [70 US gal/min]	210 bar [3000 psi]	13.19

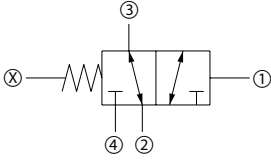
Symbol	Model No.	Cavity	Description	Flow*	Pressure	Page
	CP720-1	SDC10-4	3w 2p pilot operated spool w/atmospheric vent	30 l/min [8 US gal/min]	210 bar [3000 psi]	13.20
	CP722-1	CP16-4		130 l/min [34 US gal/min]	210 bar [3000 psi]	13.21
	CP723-1	SDC20-4		265 l/min [70 US gal/min]	210 bar [3000 psi]	13.22

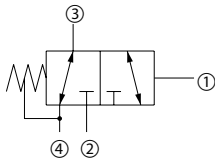
* Flow ratings are based on a pressure drop of 7 bar [100 psi] unless otherwise noted. They are for comparison purposes only.

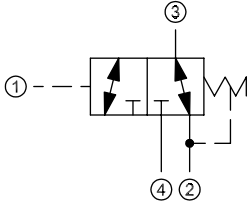
Cartridge Valves Technical Information

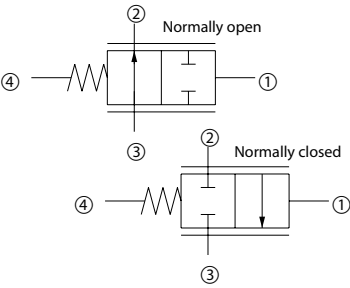
Directional control valves

Quick reference

Symbol	Model No.	Cavity	Description	Flow*	Pressure	Page
	CP720-2	SDC10-4	3w 2p double pilot operated spool	25 l/min [7 US gal/min]	210 bar [3000 psi]	13.23
	CP722-2	CP16-4		130 l/min [34 US gal/min]	210 bar [3000 psi]	13.24
	CP723-2	SDC20-4		265 l/min [70 US gal/min]	210 bar [3000 psi]	13.25

Symbol	Model No.	Cavity	Description	Flow*	Pressure	Page
	CP720-5	SDC10-4	3w 2p pilot operated spool	40 l/min [11 US gal/min]	210 bar [3000 psi]	13.26
	CP722-11	CP16-4		125 l/min [33 US gal/min]	450 bar [6500 psi]	13.27
	CP722-5	CP16-4		130 l/min [34 US gal/min]	210 bar [3000 psi]	13.28
	CP723-5	SDC20-4		265 l/min [70 US gal/min]	210 bar [3000 psi]	13.29

Symbol	Model No.	Cavity	Description	Flow*	Pressure	Page
	CP720-9	SDC10-4	3w 2p pilot operated spool	25 l/min [7 US gal/min]	210 bar [3000 psi]	13.30

Symbol	Model No.	Cavity	Description	Flow*	Pressure	Page
	CP712-7	CP16-4	Pilot operated proportional spool valve	220 l/min [58 US gal/min]	210 bar [3000 psi]	13.31

* Flow ratings are based on a pressure drop of 7 bar [100 psi] unless otherwise noted. They are for comparison purposes only.

Cartridge Valves Technical Information

Directional control valves

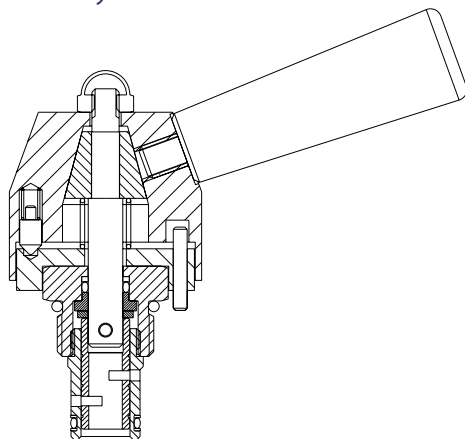
Application notes

TYPES OF DIRECTIONAL CONTROL VALVES

Directional valves are either manually or hydraulically actuated spools.

Manually-actuated valves are available as 2-way, 3-way, and 4-way valves, and are used either for flow or direction control.

Manually actuated valve



P103 086

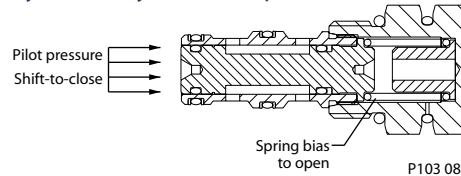
Hydraulically-actuated spool valves are available as 2-way (normally-open or normally-closed), 3-way, and 4-way valves, and are used for direction control. These are all 2-position valves that are spring-biased to a neutral position and use 3-10 bar [40-150 psi] hydraulic pressure to shift the spool.

Directional control valves



F102 007

Hydraulically actuated spool valve



P103 087

Cartridge Valves Technical Information

Directional control valves

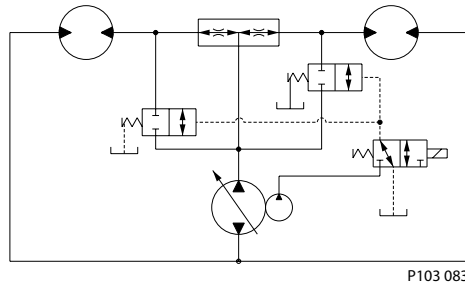
Application notes

APPLICATIONS

Common applications include:

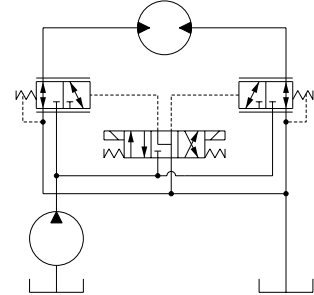
- Directional control valves for high flow with pilot pressure controlled by solenoid valves.
- Bypass valves for flow dividers in vehicle traction circuits.

Pilot-operated bypass valves for traction circuit

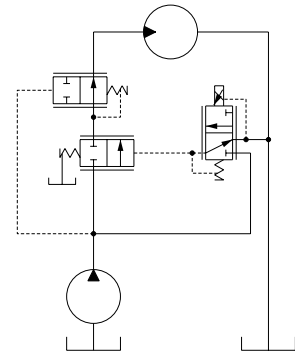


A hydraulically-actuated spool valve (CP712-7) is also available to create an infinitely variable orifice that is controlled by pilot pressure. This valve is typically used in a circuit with a proportional pressure reducing valve (e.g. CP558-24) and a pressure compensator (e.g. CP312-4). Such a circuit creates a pressure-compensated proportional flow control for flows too large for direct-acting proportional valves.

Pilot-operated directional valve circuit



Pilot-operated proportional flow control circuit





Cartridge Valves Technical Information

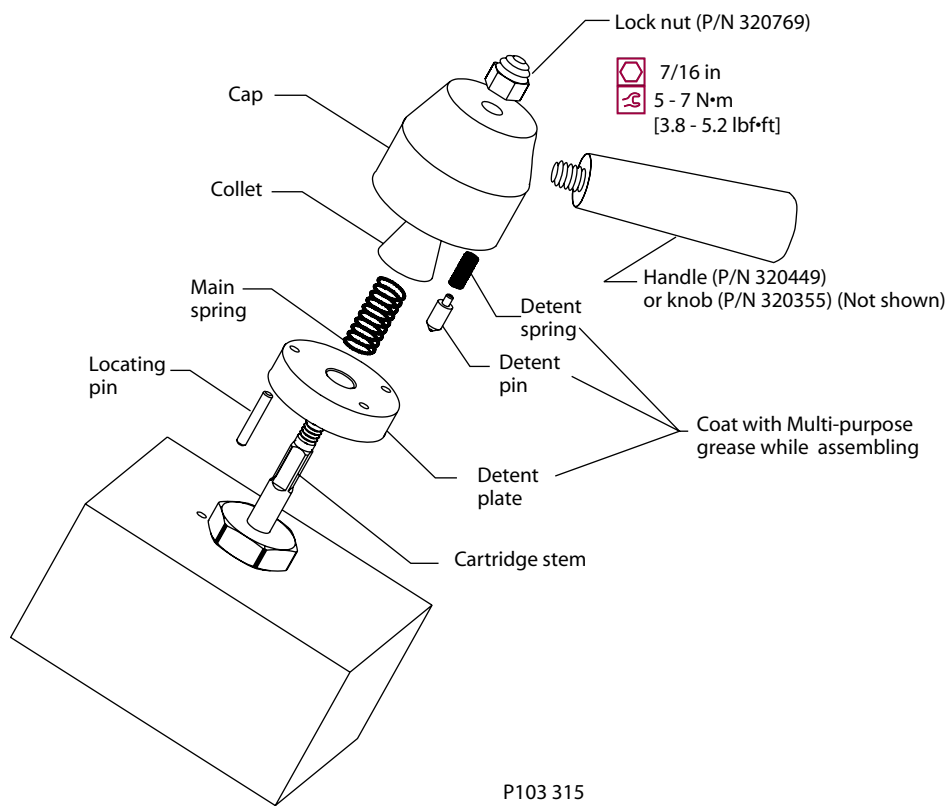
Directional control valves

Application notes

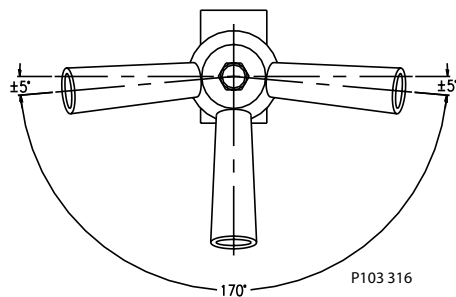
INSTALLATION

1. Install cartridge.
2. Place locating pin in the hole in the block.
3. Install detent plate over the cartridge stem and locating pin.
4. Place the main spring over the cartridge stem.
5. Install the collet into the cap.
6. Place the detent spring and detent pin into cap and install cap over the assembly as shown.
7. Place the lock nut and torque as shown.
8. Thread handle or knob into cap.

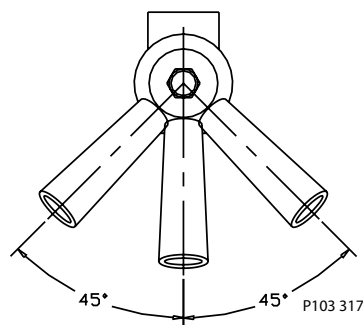
Assembly Drawing



Handle orientation for 2-way valve.



Handle orientation for 3-way and 4-way valves.



Directional control valves
Quick reference



Cartridge Valves Technical Information

Directional control valves

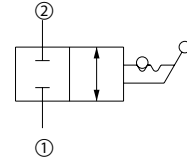
CP620-1

OPERATION

This valve is a non-compensated, adjustable flow control.

Refer to application notes for installation details.

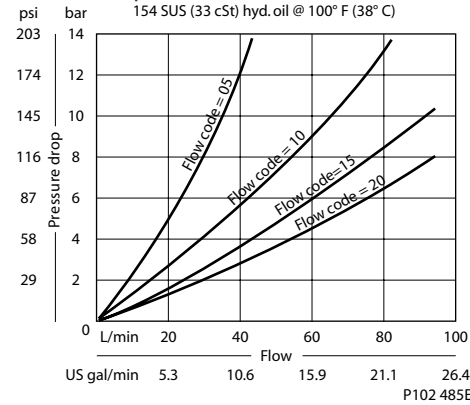
Schematic



P102 503E

SPECIFICATIONS

Theoretical performance



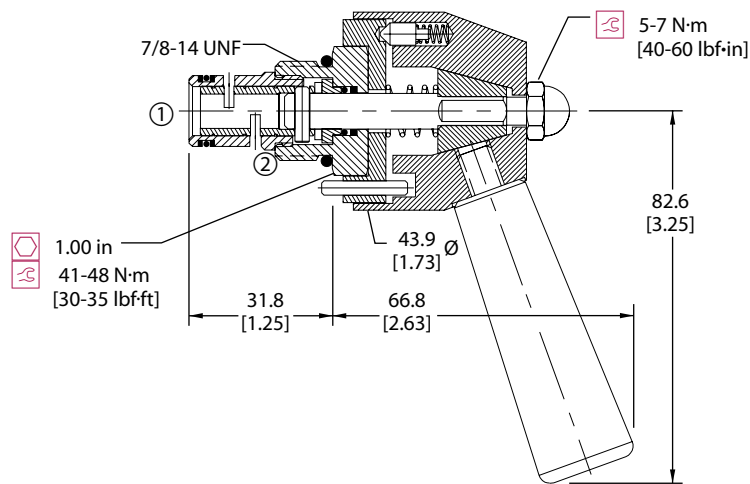
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	75 l/min [20 US gal/min]
Leakage	82 cm ³ /min [5 in ³ /min] @ Rated pressure
Weight	0.31 kg [0.69 lb]
Cavity	SDC10-2

DIMENSIONS

mm [in]

Cross-sectional view



P102 473E

ORDERING INFORMATION

CP620 - 1 - B - 8S - 20 - 2 - DR

Seals
 B - Buna-N
 V - Viton

Housing and ports
 0 = No Housing
 DG3B = AL, 3/8 BSP
 DG4B = AL, 1/2 BSP
 6S = AL, #6 SAE
 8S = AL, #8 SAE
 Other housings available

Seal kit
 120073
 120074

Housing P/N
 No Housing
 SDC10-2-DG-3B
 SDC10-2-DG-4B
 CP10-2-6S
 CP10-2-8S

Flow
 05 = 19 l/min [5 US gpm]
 10 = 38 l/min [10 US gpm]
 15 = 57 l/min [15 US gpm]
 20 = 77 l/min [20 US gpm]

Rotation to close
 R - Clockwise
 L - Counterclockwise

Detent
 D = Detent with handle
 K = Knob (not shown) knob is not detented

Position
 2 - 2 Position detent
 3 - 3 Position detent
 10 - 10 Position detent

P102 893E



Cartridge Valves Technical Information

Directional control valves

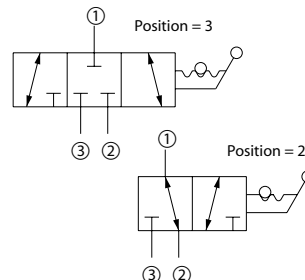
CP630-1

OPERATION

This valve is a 2 position 3 way manual directional control.

Refer to application notes for installation details.

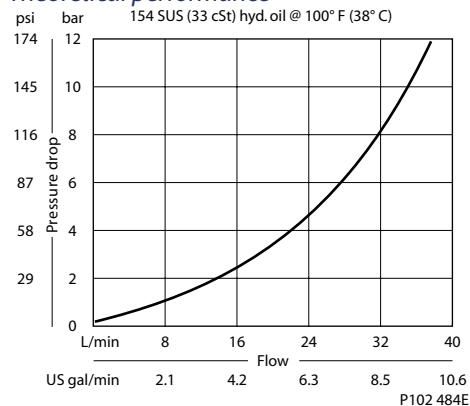
Schematic



P102 502E

SPECIFICATIONS

Theoretical performance



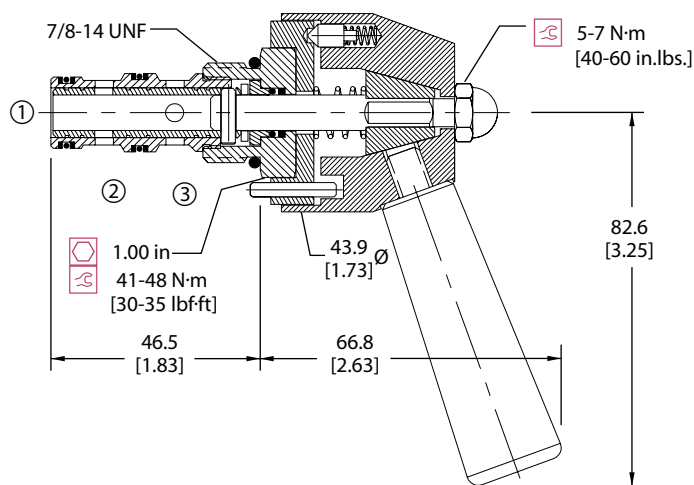
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	30 l/min [8 US gal/min]
Leakage	82 cm ³ /min [5 in ³ /min] @ Rated pressure
Weight	0.32 kg [0.71 lb]
Cavity	SDC10-3

DIMENSIONS

mm [in]

Cross-sectional view



P102 472E

ORDERING INFORMATION

CP630 - 1 - B - 8S - 3 - D

Seals

B = Buna-N
V = Viton

Seal kit
120009
120010

Housing and ports

0 = No Housing
SE3B = AL, 3/8 BSP
SE4B = AL, 1/2 BSP
6S = AL, #6 SAE
8S = AL, #8 SAE
Other housings available

Housing P/N

No Housing
SDC10-3-SE-3B
SDC10-3-SE-4B
CP10-3-6S
CP10-3-8S

Detent

D = Detent with handle
K = Knob (not shown)
knob is not detented

Position

2 = 2 Position detent
3 = 3 Position detent

P102 957E

Directional control valves
CP630-1



Cartridge Valves Technical Information

Directional control valves

CP640-1

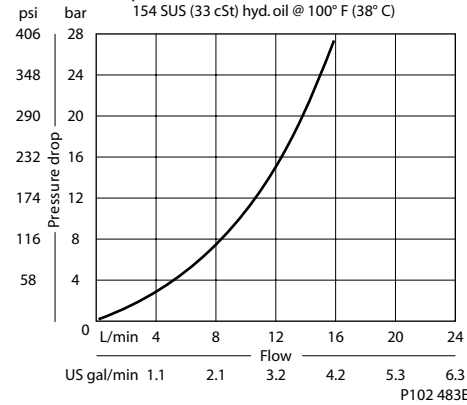
OPERATION

This valve is a 3 position 4 way manual directional control.

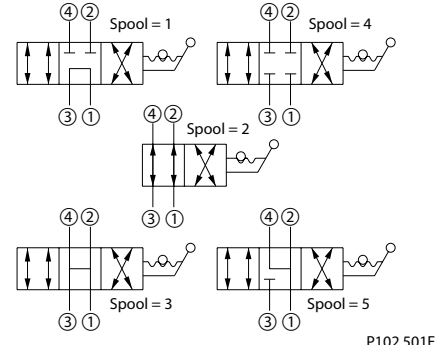
Refer to application notes for installation details.

SPECIFICATIONS

Theoretical performance



Schematic



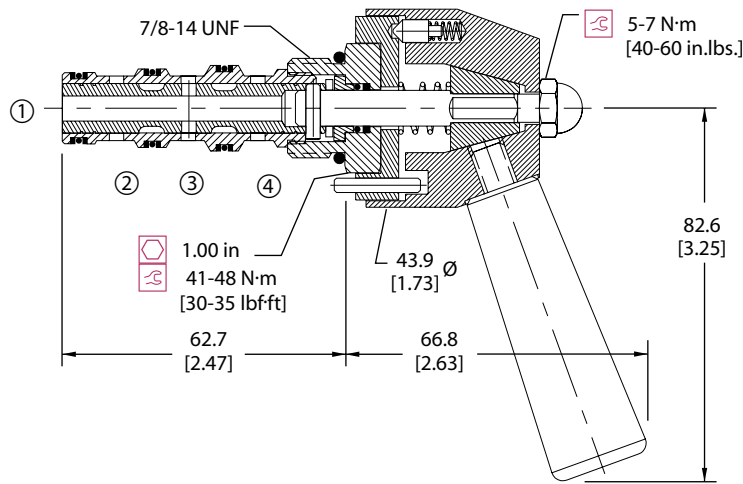
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	10 l/min [3 US gal/min]
Leakage	82 cm ³ /min [5 in ³ /min] @ Rated pressure
Weight	0.35 kg [0.77 lb]
Cavity	SDC10-4

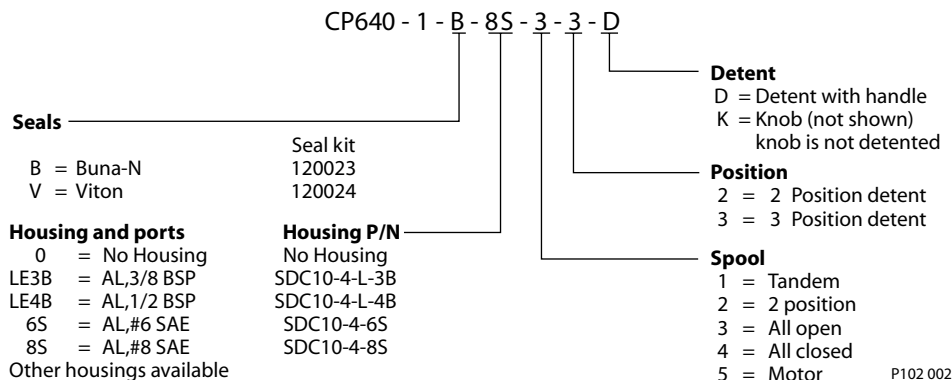
DIMENSIONS

mm [in]

Cross-sectional view



ORDERING INFORMATION



Directional control valves
CP640-1



Cartridge Valves Technical Information

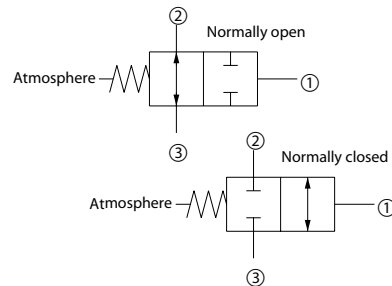
Directional control valves

CP710-1

OPERATION

This valve is a hydraulically operated spool with atmospheric vent.

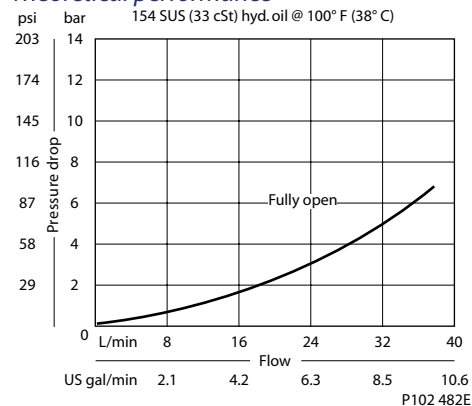
Schematic



P102 958E

SPECIFICATIONS

Theoretical performance



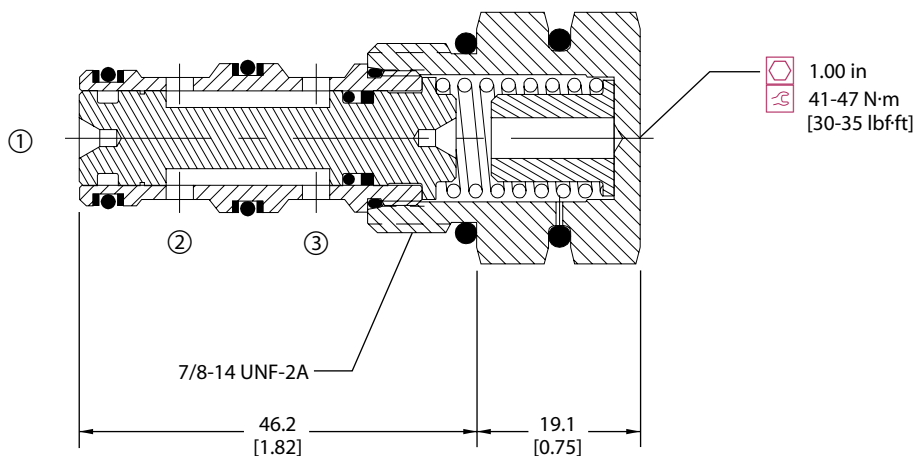
Specifications

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

DIMENSIONS

mm [in]

Cross-sectional view



P102 470E

ORDERING INFORMATION

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

Seals

B = Buna-N
V = Viton

Seal kit

120009
120010

Housing and ports

0 = No Housing
SE3B = AL, 3/8 BSP
SE4B = AL, 1/2 BSP
6S = AL, #6 SAE
8S = AL, #8 SAE
Other housings available

Housing P/N

No Housing
SDC10-3-SE-3B
SDC10-3-SE-4B
CP10-3-6S
CP10-3-8S

Spool seals

S1 = Seal at top of spool
S2 = Seals at top and bottom of spool

Shift pressure

	bar	[psi]
050	= 3.5	[50]
080	= 5.5	[80]
150	= 10.3	[150]

Configuration

O = Normally open
C = Normally closed

P102 004E



Cartridge Valves Technical Information

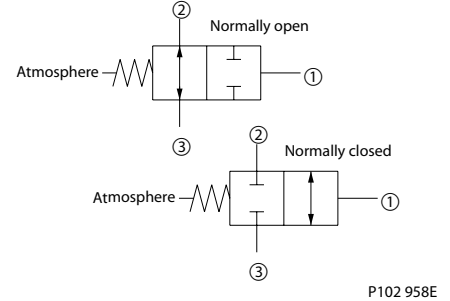
Directional control valves

CP712-1

OPERATION

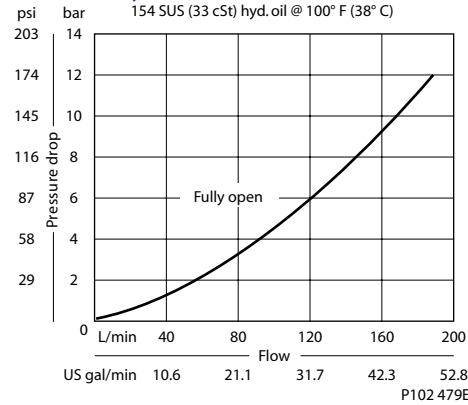
This valve is a hydraulically operated spool with atmospheric vent.

Schematic



SPECIFICATIONS

Theoretical performance



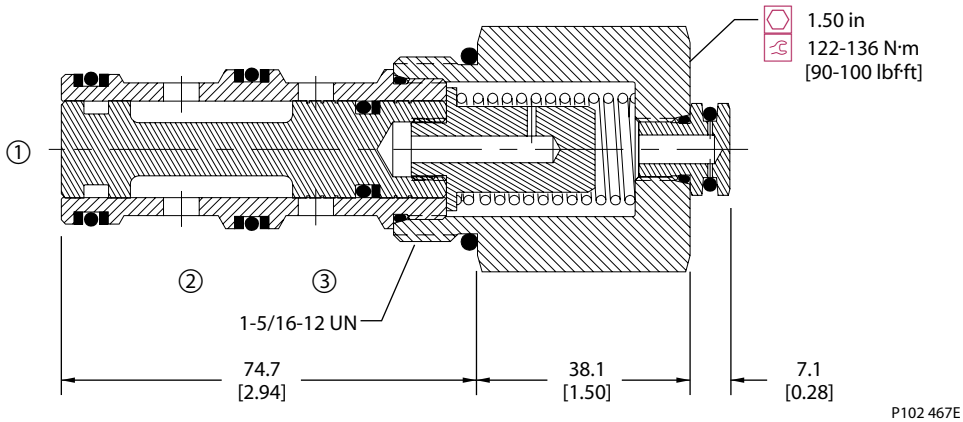
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	130 l/min [34 US gal/min]
Weight	0.57 kg [1.25 lb]
Cavity	SDC16-3

DIMENSIONS

mm [in]

Cross-sectional view



ORDERING INFORMATION

CP712 - 1 - B - 16S - C - 080 - S1

Seals		Seal kit		Spool seals	
B = Buna-N		120202		S1 = Seal at top of spool	
V = Viton		120203		S2 = Seals at top and bottom of spool	
Housing and ports		Housing P/N		Shift pressure	
0 = No Housing		No Housing		040 = 2.8 [40]	
SE6B = AL, 3/4 BSP		SDC16-3-SE-6B		080 = 5.5 [80]	
SE8B = AL, 1 BSP		SDC16-3-SE-8B		150 = 10.3 [150]	
12S = AL, #12 SAE		CP16-3-12S			
16S = AL, #16 SAE		CP16-3-16S			
Other housings available					
		Configuration			
		O = Normally open			
		C = Normally closed			

Directional control valves CP712-1



Cartridge Valves Technical Information

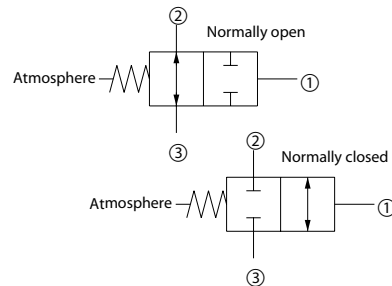
Directional control valves

CP713-1

OPERATION

This valve is a hydraulically operated spool with atmospheric vent.

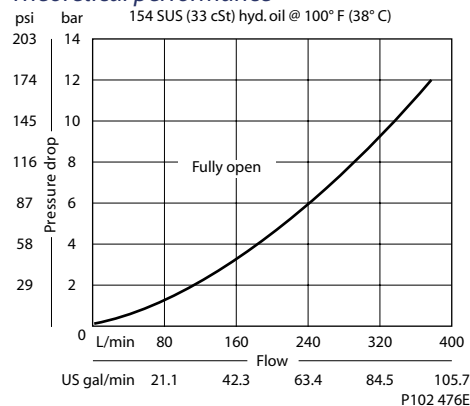
Schematic



P102 958E

SPECIFICATIONS

Theoretical performance



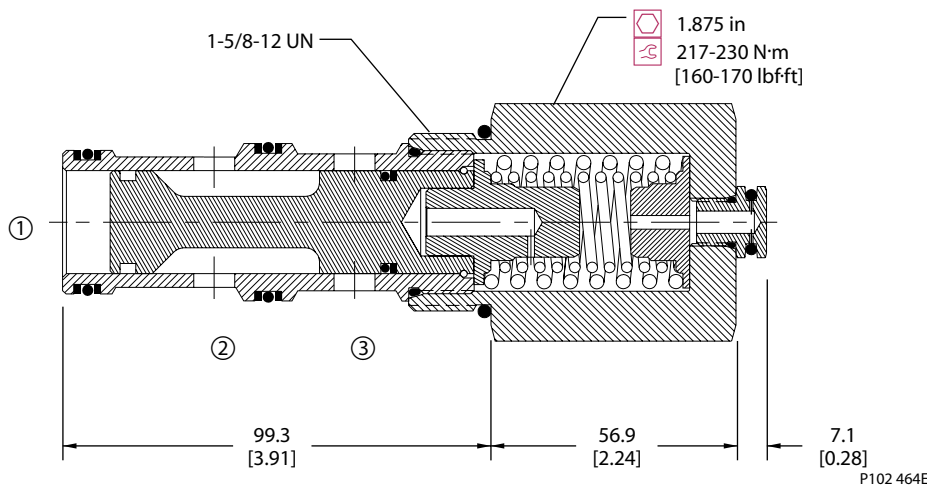
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	265 l/min [70 US gal/min]
Weight	1.26 kg [2.78 lb]
Cavity	SDC20-3

DIMENSIONS

mm [in]

Cross-sectional view



ORDERING INFORMATION

CP713 - 1 - B - 20S - C - 150 - S1

Seals

B = Buna-N
V = Viton

Seal kit
120200
120201

Housing and ports

0 = No Housing
8B = AL, 1 BSP
10B = AL, 1-1/4 BSP
16S = AL, #16 SAE
20S = AL, #20 SAE
Other housings available

Housing P/N

No Housing
CP20-3-8B
CP20-3-10B
CP20-3-16S
CP20-3-20S

Spool seals

S1 = Seal at top of spool
S2 = Seals at both ends of spool

Shift pressure

bar	[psi]
050	3.5 [50]
080	5.5 [80]
100	6.9 [100]
130	9.0 [130]
150	10.3 [150]

Configuration

O = Normally open
C = Normally closed

P102 954E



Cartridge Valves Technical Information

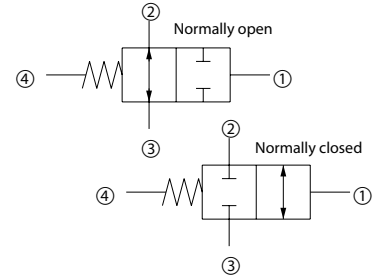
Directional control valves

CP710-8

OPERATION

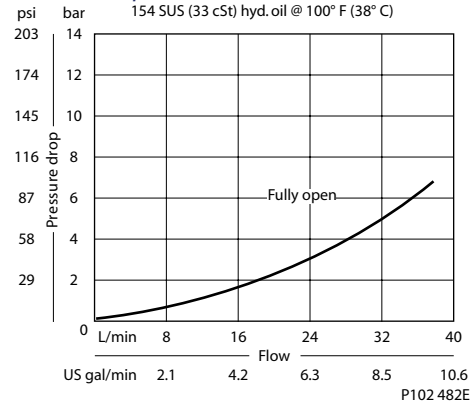
This valve is a 2-way double hydraulically piloted spool.

Schematic



SPECIFICATIONS

Theoretical performance



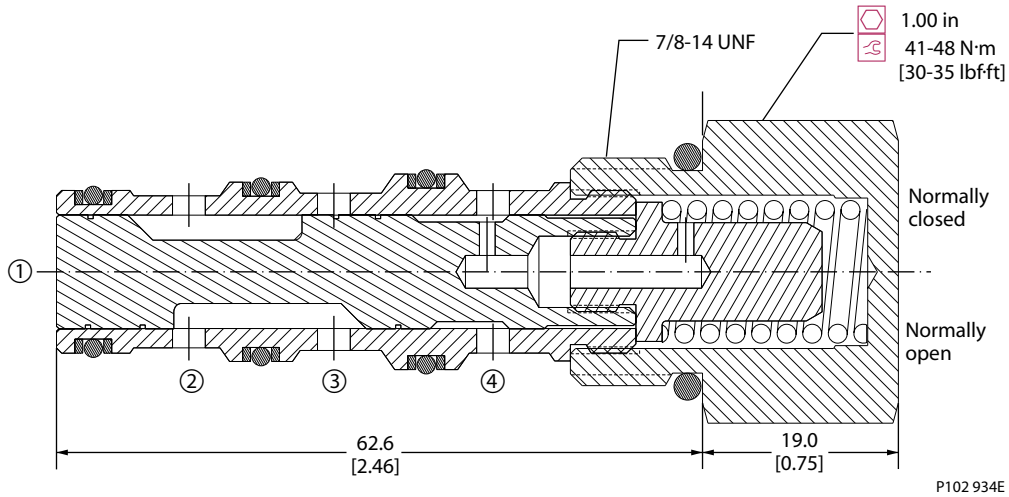
Specifications

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

DIMENSIONS

mm [in]

Cross-sectional view



ORDERING INFORMATION

CP710 - 8 - B - 16S - C - 080

Seals
 B = Buna-N
 V = Viton

Housing and ports
 0 = No Housing
 L3B = AL, 3/8 BSP
 L4B = AL, 1/2 BSP
 6S = AL, #6 SAE
 8S = AL, #8 SAE
 Other housings available

Housing P/N
 No Housing
 SDC10-4-L-3B
 SDC10-4-L-4B
 CP10-4-6S
 CP10-4-8S

Shift pressure
 040 = 2.8 bar [40 psi]
 080 = 5.5 bar [80 psi]
 150 = 10.3 bar [150 psi]

Configuration
 O = Normally open
 C = Normally closed

Seal kit
 120009
 120010

Directional control valves
CP710-8



Cartridge Valves Technical Information

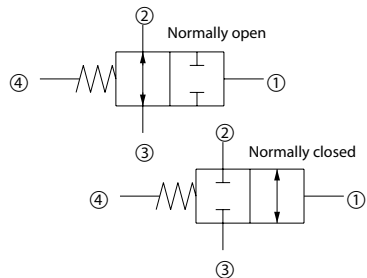
Directional control valves

CP712-8

OPERATION

This valve is a 2-way double hydraulically piloted spool.

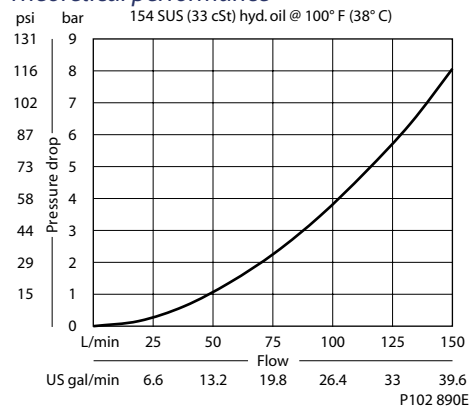
Schematic



P102 959

SPECIFICATIONS

Theoretical performance



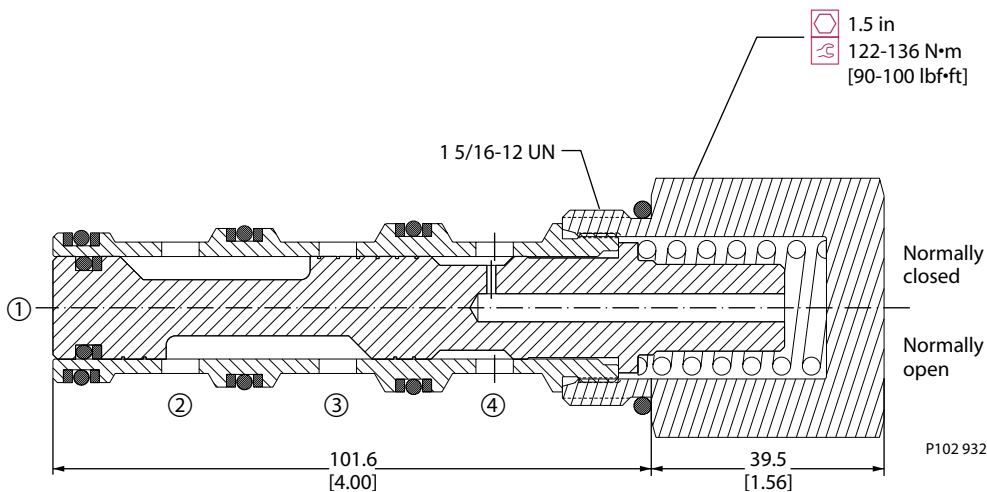
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	130 l/min [34 US gal/min]
Weight	0.61 kg [1.34 lb]
Cavity	CP16-4

DIMENSIONS

mm [in]

Cross-sectional view



ORDERING INFORMATION

CP712 - 8 - B - 16S - C - 080 - S1

- Seals**
 - B = Buna-N
 - V = Viton
- Housing and ports**
 - 0 = No Housing
 - 6B = AL, 3/4 BSP
 - 8B = AL, 1 BSP
 - 12S = AL, #12 SAE
 - 16S = AL, #16 SAE
 - Other housings available
- Housing P/N**
 - No Housing CP16-4-6B
 - CP16-4-8B
 - CP16-4-12S
 - CP16-4-16S
- Seal kit**
 - 120025
 - 120026
- Spool seal**
 - S3 = No seal
 - S4 = Seal included
- Shift pressure**
 - 040 = 2.8 bar [40 psi]
 - 080 = 5.5 bar [80 psi]
 - 150 = 10.3 bar [150 psi]
 - shift pressure assumes no seals
- Configuration**
 - O = Normally open
 - C = Normally closed

P102 933E



Cartridge Valves Technical Information

Directional control valves

CP712-11

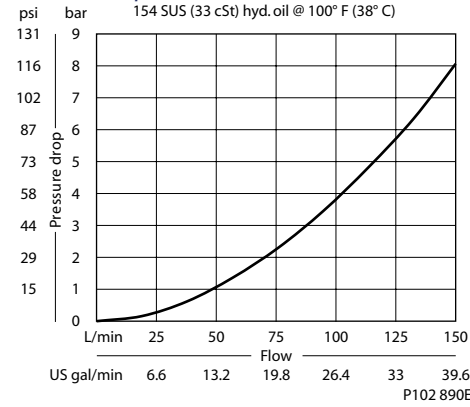
OPERATION

This valve is a 2-way double hydraulically piloted spool.

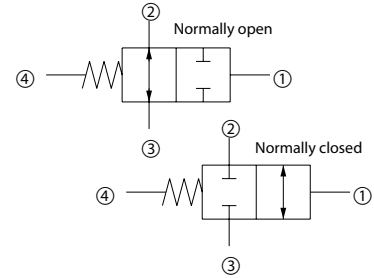
Note: Maximum pressure at port 4 is 207 bar [3000 psi].

SPECIFICATIONS

Theoretical performance



Schematic



P102 959

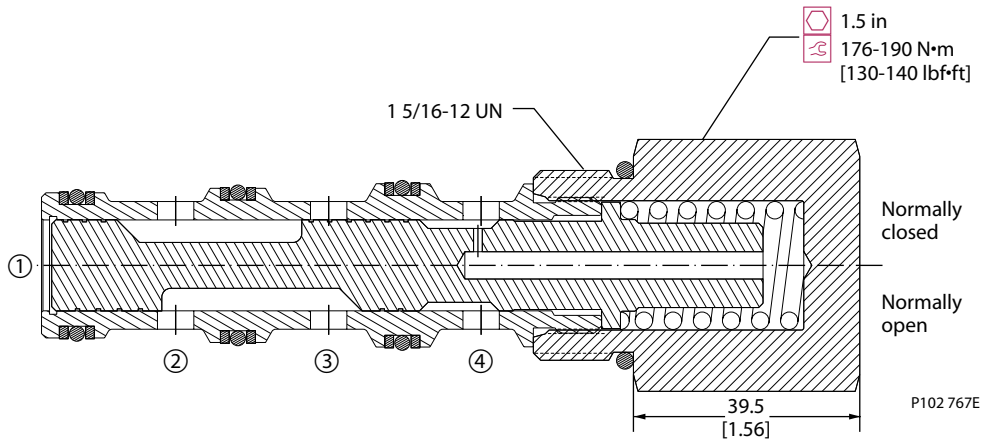
Specifications

Rated pressure	450 bar [6500 psi]
Rated flow at 7 bar [100 psi]	130 l/min [34 US gal/min]
Leakage	328 cm ³ /min [20 in ³ /min] @ 210 bar [3000 psi]
Weight	0.61 kg [1.34 lb]
Cavity	CP16-4

DIMENSIONS

mm [in]

Cross-sectional view



ORDERING INFORMATION

CP712-11-U-0-C-040

Shift pressure
 040 = 2.8 bar [40 psi]
 080 = 5.5 bar [80 psi]

Configuration
 O = Normally open
 C = Normally closed

Seals
 U = Urethane Seal kit 120677

Housing and ports
 0 = No Housing
 6B = AL, 3/4 BSP
 8B = AL, 1 BSP
 12S = AL, #12 SAE
 16S = AL, #16 SAE
 Other housings available

Housing P/N
 No Housing
 CP16-4-6B
 CP16-4-8B
 CP16-4-12S
 CP16-4-16S

Directional control valves CP712-11



Cartridge Valves Technical Information

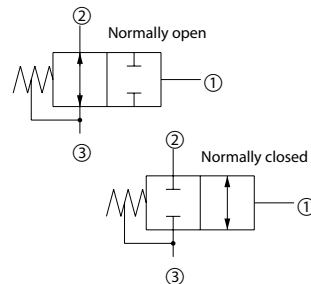
Directional control valves

CP710-3

OPERATION

This valve is a 2-way hydraulically piloted spool.

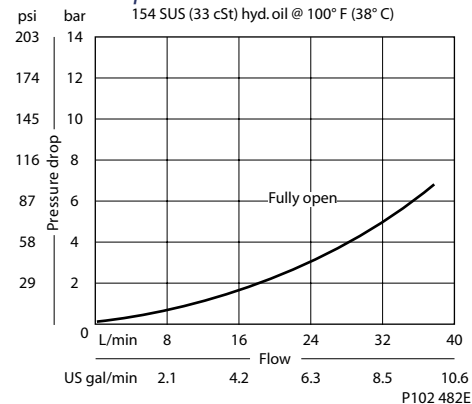
Schematic



P102 756

SPECIFICATIONS

Theoretical performance



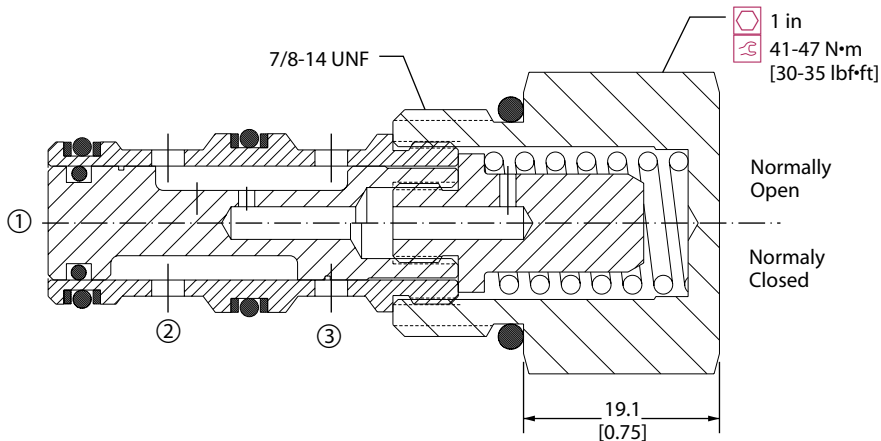
Specifications

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

DIMENSIONS

mm [in]

Cross-sectional view



P102 755

ORDERING INFORMATION

CP710 - 3 - B - 16S - C - 150 - S1

Seals

- B = Buna-N
- V = Viton

Seal kit

- 120009
- 120010

Housing and ports

- 0 = No Housing
- SE3B = AL, 3/8 BSP
- SE4B = AL, 1/2 BSP
- 6S = AL, #6 SAE
- 8S = AL, #8 SAE
- Other housings available

Housing P/N

- No Housing
- SDC10-3-SE-3B
- SDC10-3-SE-4B
- CP10-3S-6S
- CP10-3S-8S

Spool seal

- S3 = No seal
- S4 = With seal

Shift pressure

- bar [psi]
- 150 = 10.3 [150]
- shift pressure assumes no seal

Configuration

- O = Normally open
- C = Normally closed

P102 754E



Cartridge Valves Technical Information

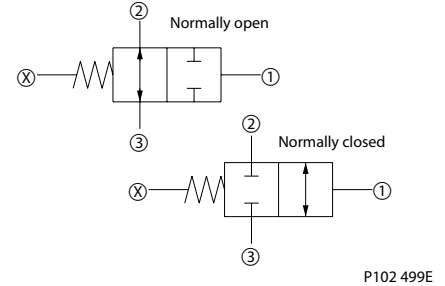
Directional control valves

CP710-2

OPERATION

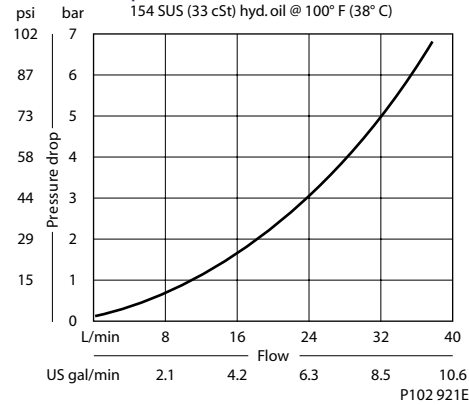
This valve is a 2-way double hydraulically piloted spool.

Schematic



SPECIFICATIONS

Theoretical performance



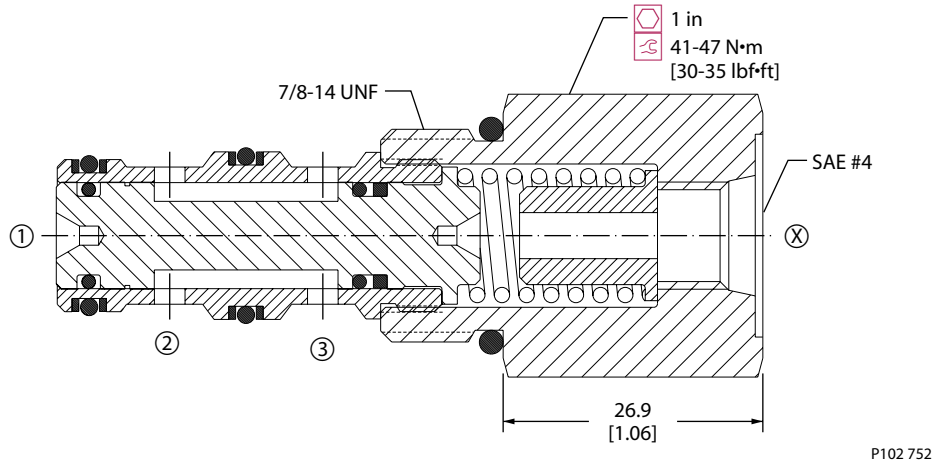
Specifications

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

DIMENSIONS

mm [in]

Cross-sectional view



ORDERING INFORMATION

CP710 - 2 - B - 16S - C - 080 - S1

- Seals**
 - B = Buna-N
 - V = Viton
- Housing and ports**
 - 0 = No Housing
 - SE3B = AL, 3/8 BSP
 - SE4B = AL, 1/2 BSP
 - 6S = AL, #6 SAE
 - 8S = AL, #8 SAE
 - Other housings available
- Housing P/N**
 - No Housing
 - SDC10-3-SE-3B
 - SDC10-3-SE-4B
 - CP10-3-6S
 - CP10-3-8S
- Configuration**
 - O = Normally open
 - C = Normally closed
- Spool seals**
 - S1 = Seal at top of spool
 - S2 = Seal at top and bottom of spool
 - S3 = No seals
 - S4 = Seal at bottom of spool
- Shift pressure**

	bar	[psi]
040	= 2.8	[40]
050	= 3.4	[50]
080	= 5.5	[80]
125	= 8.6	[125]
150	= 10.3	[150]

shift pressure assumes no seals

Directional control valves CP710-2



Cartridge Valves Technical Information

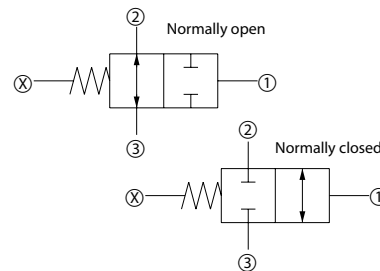
Directional control valves

CP712-2

OPERATION

This valve is a 2-way double hydraulically piloted spool.

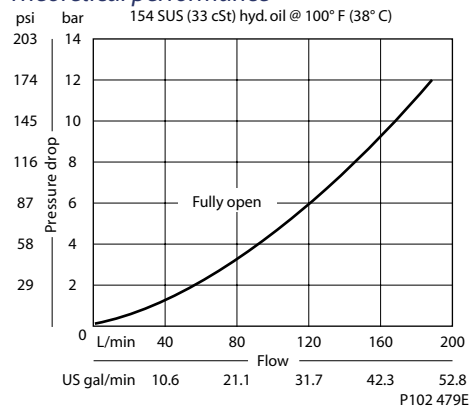
Schematic



P102 499E

SPECIFICATIONS

Theoretical performance



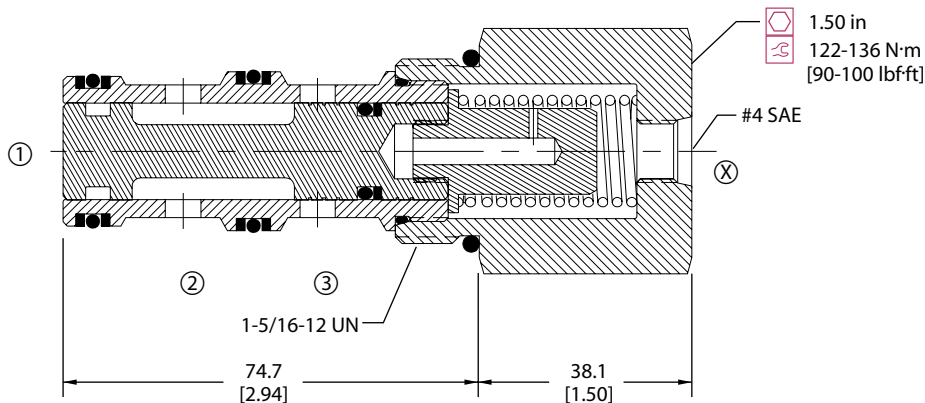
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	130 l/min [34 US gal/min]
Weight	0.57 kg [1.25 lb]
Cavity	SDC16-3

DIMENSIONS

mm [in]

Cross-sectional view



P102 949

ORDERING INFORMATION

CP712 - 2 - B - 16S - C - 080 - S1

Seals

B = Buna-N
V = Viton

Seal kit
120202
120203

Housing and ports

0 = No Housing
SE6B = AL, 3/4 BSP
SE8B = AL, 1BSP
12S = AL, #12 SAE
16S = AL, #16 SAE
Other housings available

Housing P/N

No Housing
SDC16-3-SE-6B
SDC16-3-SE-8B
CP16-3-12S
CP16-3-16S

Spool seals

S1 = Seal at top of spool
S2 = Seals at top and bottom of spool
S3 = No seals
S4 = Seal at bottom of spool

Shift pressure

bar [psi]

040 = 2.8 [40]
080 = 5.5 [80]
150 = 10.3 [150]
shift pressure assumes no seals

Configuration

O = Normally open
C = Normally closed

P102 007E



Cartridge Valves Technical Information

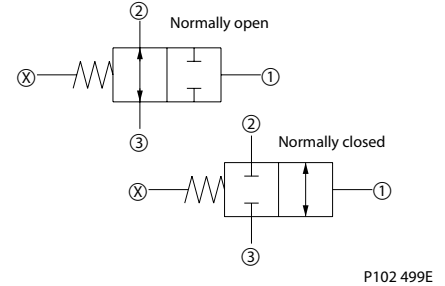
Directional control valves

CP713-2

OPERATION

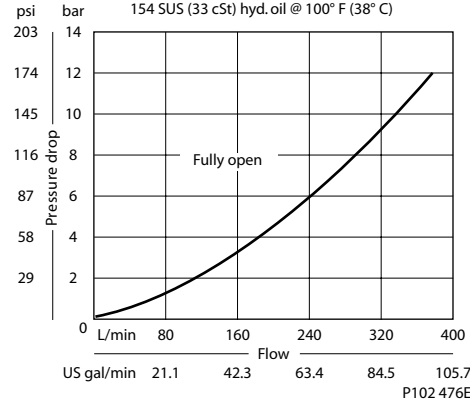
This valve is a 2-way double hydraulically piloted spool.

Schematic



SPECIFICATIONS

Theoretical performance



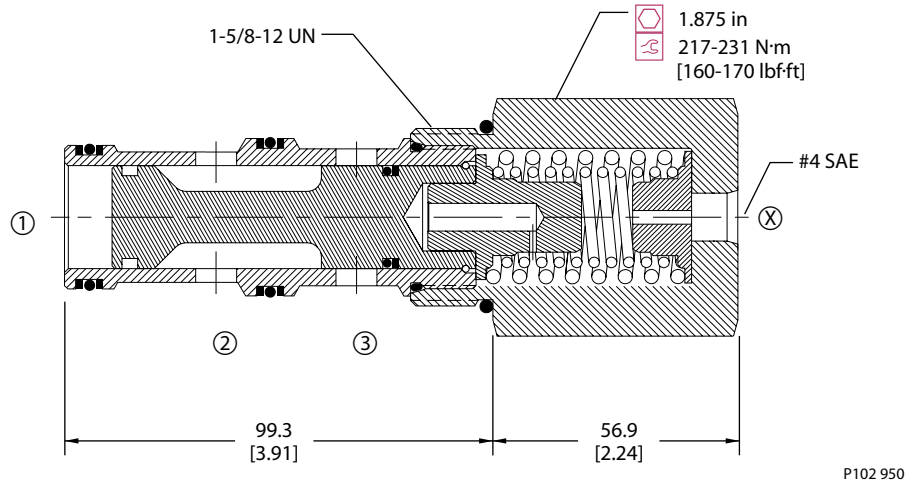
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	265 l/min [70 US gal/min]
Weight	1.26 kg [2.78 lb]
Cavity	SDC20-3

DIMENSIONS

mm [in]

Cross-sectional view



ORDERING INFORMATION

CP713 - 2 - B - 20S - C - 150 - S1

Seals

- B = Buna-N
- V = Viton

Housing and ports

- 0 = No Housing
- 8B = AL, 1 BSP
- 10B = AL, 1-1/4 BSP
- 16S = AL, #16 SAE
- 20S = AL, #20 SAE
- Other housings available

Configuration

- 0 = Normally open
- C = Normally closed

Seal kit

- 120200
- 120201

Housing P/N

- No Housing
- CP20-3-8B
- CP20-3-10B
- CP20-3-16S
- CP20-3-20S

Spool seals

- S1 = Seal at top of spool
- S2 = Seals at top and bottom of spool
- S3 = No seals
- S4 = Seal at bottom of spool

Shift pressure

bar	[psi]
050	3.5 [50]
080	5.5 [80]
100	6.9 [100]
130	9.0 [130]
150	10.3 [150]

shift pressure assumes no seals

Directional control valves CP713-2



Cartridge Valves Technical Information

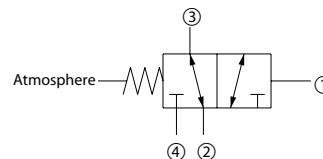
Directional control valves

CP720-1

OPERATION

This valve is a 3-way hydraulically piloted spool with atmospheric vent.

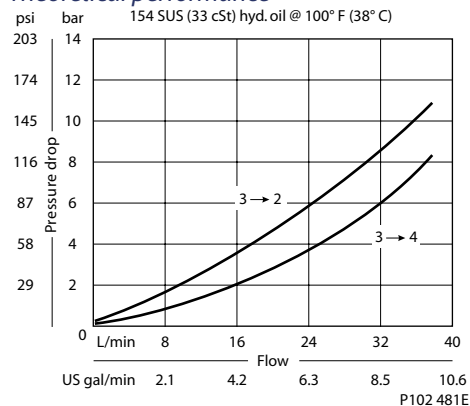
Schematic



P102 498E

SPECIFICATIONS

Theoretical performance



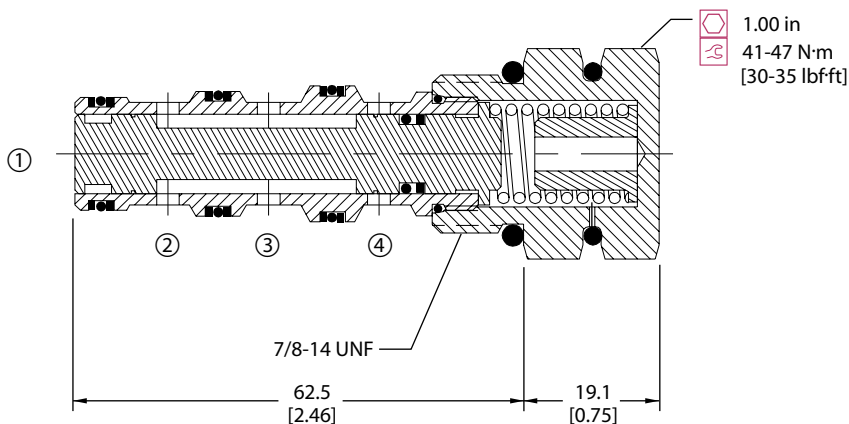
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	30 l/min [8 US gal/min]
Weight	0.15 kg [0.33 lb]
Cavity	SDC10-4

DIMENSIONS

mm [in]

Cross-sectional view



P102 469E

ORDERING INFORMATION

CP720 - 1 - B - 8S - 150 - S1

Seals

B = Buna-N
V = Viton

Seal kit
120023
120024

Spool seals

S1 = Seal at top of spool
S2 = Seals at both ends of spool

Housing and ports

0 = No Housing
L3B = AL, 3/8 BSP
L4B = AL, 1/2 BSP
6S = AL, #6 SAE
8S = AL, #8 SAE
Other housings available

Housing P/N

No Housing
SDC10-4-L-3B
SDC10-4-L-4B
CP10-4-6S
CP10-4-8S

Shift pressure

	bar	[psi]
040	= 2.8	[40]
050	= 3.5	[50]
080	= 5.5	[80]
125	= 8.6	[125]
150	= 10.3	[150]

P102 005E



Cartridge Valves Technical Information

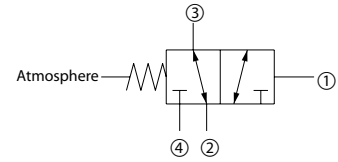
Directional control valves

CP722-1

OPERATION

This valve is a 3-way hydraulically piloted spool with atmospheric vent.

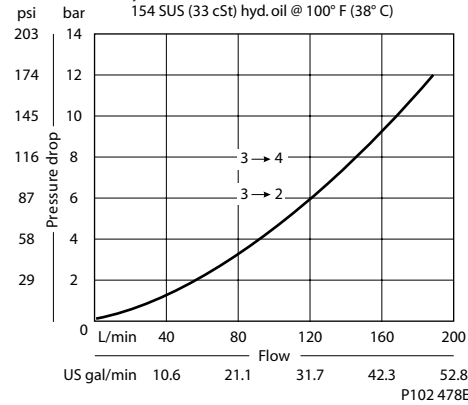
Schematic



P102 498E

SPECIFICATIONS

Theoretical performance



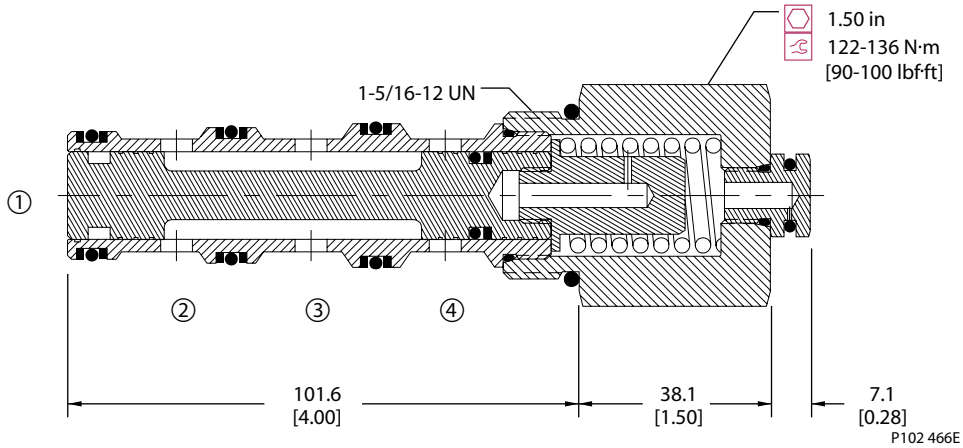
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	130 l/min [34 US gal/min]
Weight	0.61 kg [1.34 lb]
Cavity	CP16-4

DIMENSIONS

mm [in]

Cross-sectional view



ORDERING INFORMATION

CP722 - 1 - B - 16S - 150 - S1

Seals

B = Buna-N
V = Viton

Housing and ports

0 = No Housing
6B = AL, 3/4 BSP
8B = AL, 1 BSP
12S = AL, #12 SAE
16S = AL, #16 SAE
Other housings available

Seal kit

120025
120026

Housing P/N

No Housing
CP16-4-6B
CP16-4-8B
CP16-4-12S
CP16-4-16S

Spool seals

S1 = No seals
S2 = Seal at bottom of spool

Shift pressure

	bar	[psi]
040	2.8	[40]
080	5.5	[80]
150	10.3	[150]

shift pressure assumes no seals

P102 010E



Cartridge Valves Technical Information

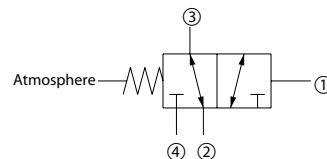
Directional control valves

CP723-1

OPERATION

This valve is a 3-way hydraulically piloted spool with atmospheric vent.

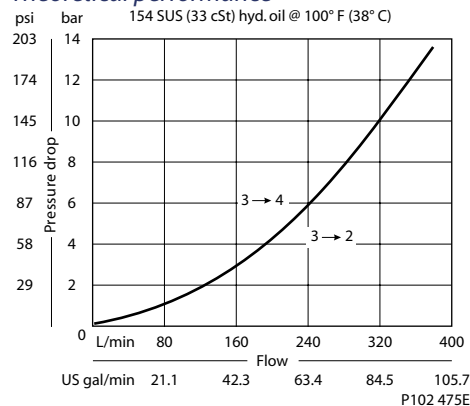
Schematic



P102 498E

SPECIFICATIONS

Theoretical performance



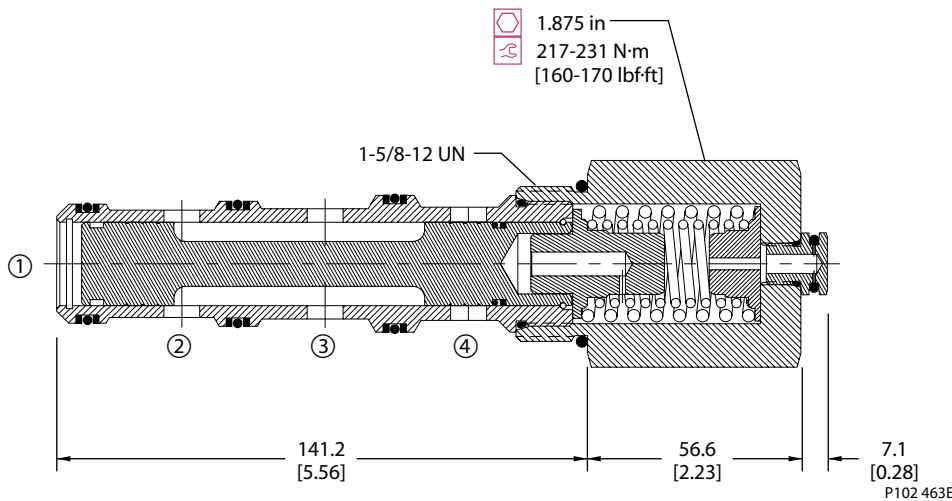
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	265 l/min [70 US gal/min]
Weight	1.22 kg [2.68 lb]
Cavity	SDC20-4

DIMENSIONS

mm [in]

Cross-sectional view



ORDERING INFORMATION

CP723 - 1 - B - 20S - 150 - S1

Seals

B = Buna-N
V = Viton

Housing and ports

0 = No Housing
8B = AL, 1 BSP
10B = AL, 1-1/4 BSP
16S = AL, #16 SAE
20S = AL, #20 SAE
Other housings available

Housing P/N

No Housing
CP20-4-8B
CP20-4-10B
CP20-4-16S
CP20-4-20S

Spool seals

S1 = Seal at top of spool (required)
S2 = Seals at both ends of spool

Shift pressure

	bar	[psi]
050	3.5	[50]
080	5.5	[80]
100	6.9	[100]
130	9.0	[130]
150	10.3	[150]

P102 015E



Cartridge Valves Technical Information

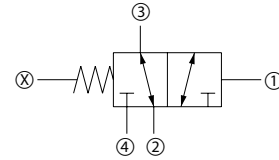
Directional control valves

CP720-2

OPERATION

This valve is a 3-way double hydraulically piloted spool.

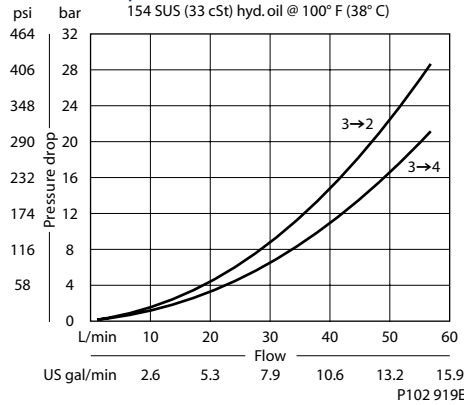
Schematic



P102 938E

SPECIFICATIONS

Theoretical performance



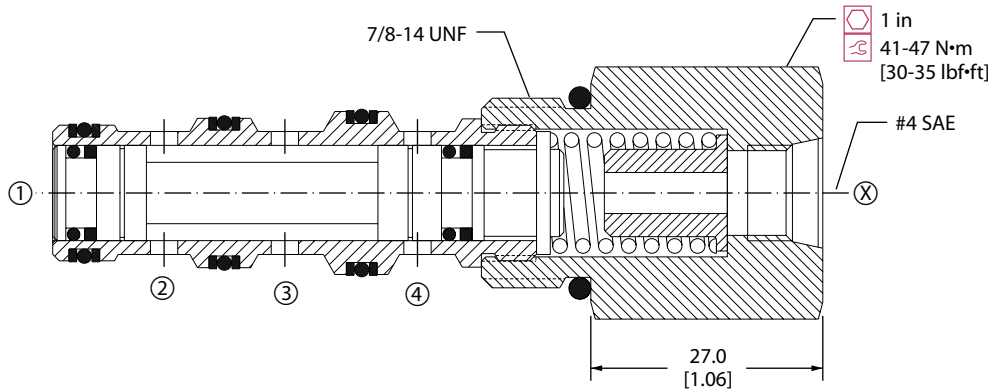
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	25 l/min [7 US gal/min]
Weight	0.15 kg [0.33 lb]
Cavity	SDC10-4

DIMENSIONS

mm [in]

Cross-sectional view



P102 758

ORDERING INFORMATION

CP720 - 2 - B - 4S - 150 - S1

Seals

B = Buna-N
V = Viton

Housing and ports

0 = No Housing
L3B = AL, 3/8 BSP
L4B = AL, 1/2 BSP
6S = AL, #6 SAE
8S = AL, #8 SAE
Other housings available

Housing P/N

No Housing
SDC10-4-L-3B
SDC10-4-L-4B
CP10-4-6S
CP10-4-8S

Spool seals

S1=Seal at top of spool
S2=Seals at both ends of spool
S3= No seal
S4= Seals at bottom of spool

Shift pressure

bar	[psi]
040	2.8 [40]
050	3.5 [50]
080	5.5 [80]
125	8.6 [125]
150	10.3 [150]

shift pressure assumes no seals

Directional control valves
CP720-2



Cartridge Valves Technical Information

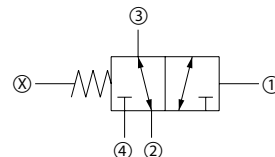
Directional control valves

CP722-2

OPERATION

This valve is a 3-way double hydraulically piloted spool.

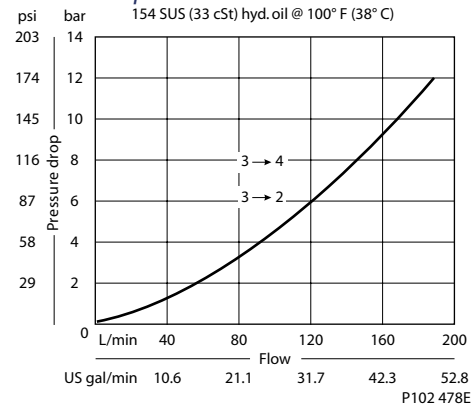
Schematic



P102 938E

SPECIFICATIONS

Theoretical performance



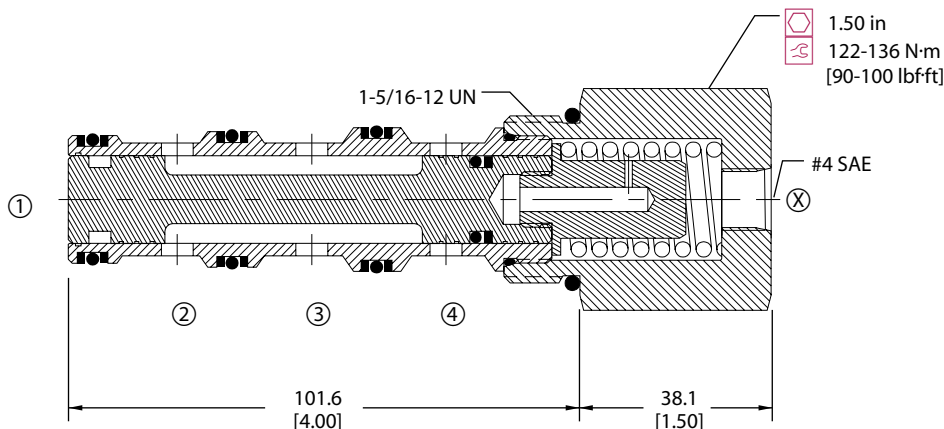
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	130 l/min [34 US gal/min]
Weight	0.61 kg [1.34 lb]
Cavity	CP16-4

DIMENSIONS

mm [in]

Cross-sectional view



P102 951

ORDERING INFORMATION

CP722 - 2 - B - 16S - 150 - S1

Seals

B = Buna-N
V = Viton

Seal kit
120025
120026

Housing and ports

0 = No Housing
6B = AL, 3/4 BSP
8B = AL, 1 BSP
12S = AL, #12 SAE
16S = AL, #16 SAE
Other housings available

Housing P/N

No Housing
CP16-4-6B
CP16-4-8B
CP16-4-12S
CP16-4-16S

Spool seals

S1 = Seal at top of spool
S2 = Seals at both ends of spool
S3 = No seals
S4 = Seal at bottom of spool

Shift pressure

bar [psi]

040 = 2.8 [40]
080 = 5.5 [80]
150 = 10.3 [150]

shift pressure assumes no seals



Cartridge Valves Technical Information

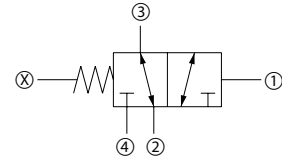
Directional control valves

CP723-2

OPERATION

This valve is a 3-way double hydraulically piloted spool.

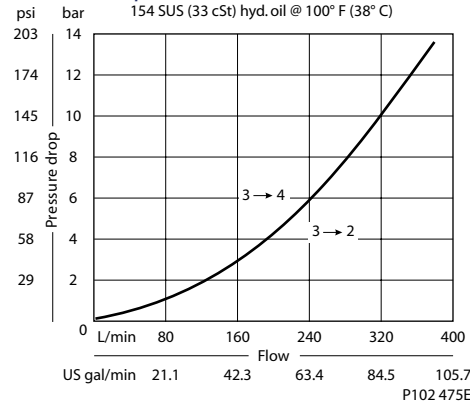
Schematic



P102 938E

SPECIFICATIONS

Theoretical performance



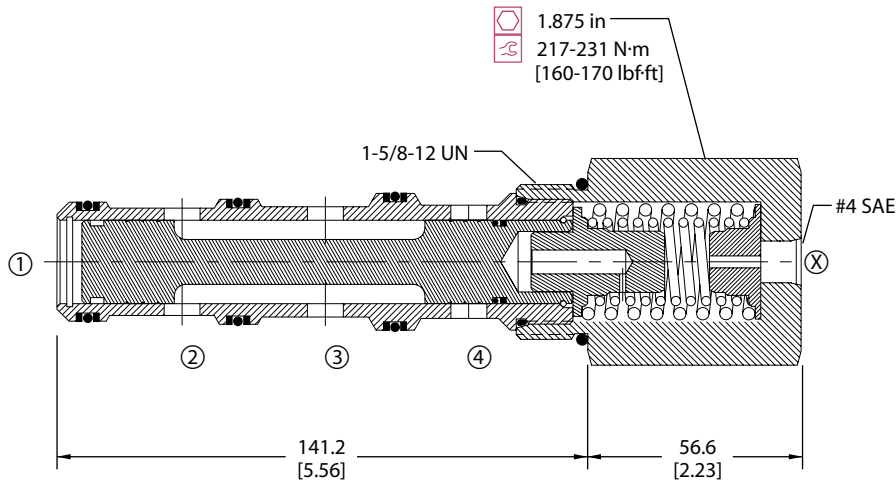
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	265 l/min [70 US gal/min]
Weight	1.22 kg [2.68 lb]
Cavity	SDC20-4

DIMENSIONS

mm [in]

Cross-sectional view



P102 952

ORDERING INFORMATION

CP723 - 2 - B - 20S - 150 - S1

Seals

B = Buna-N
V = Viton

Housing and ports

0 = No Housing
8B = AL, 1 BSP
10B = AL, 1-1/4 BSP
16S = AL, #16 SAE
20S = AL, #20 SAE
Other housings available

Seal kit
120181
120182

Housing P/N

No Housing
CP20-4-8B
CP20-4-10B
CP20-4-16S
CP20-4-20S

Spool seals

S1 = Seal at top of spool
S2 = Seal at top and bottom of spool
S3 = No seals
S4 = Seal at bottom of spool

Shift pressure

	bar	[psi]
050	3.5	[50]
080	5.5	[80]
100	6.9	[100]
130	9.0	[130]
150	10.3	[150]

shift pressure assumes no seals

P102 956E



Cartridge Valves Technical Information

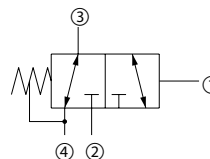
Directional control valves

CP720-5

OPERATION

This valve is a 3-way hydraulically piloted spool.

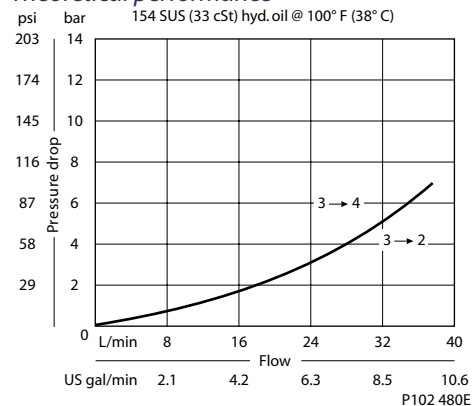
Schematic



P102 500E

SPECIFICATIONS

Theoretical performance



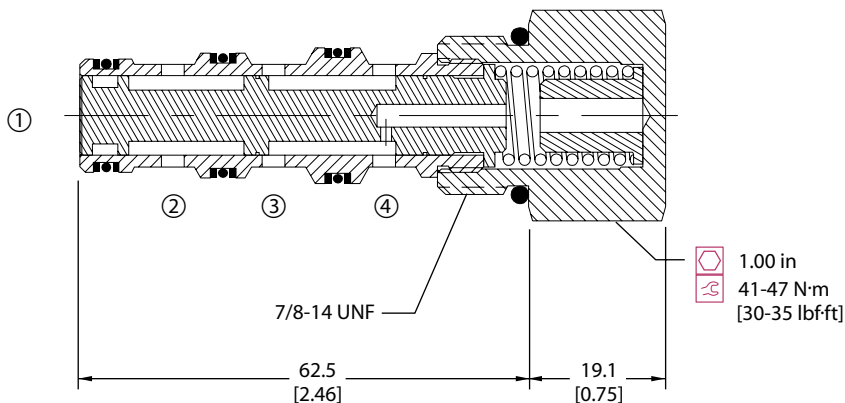
Specifications

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

DIMENSIONS

mm [in]

Cross-sectional view



P102 468E

ORDERING INFORMATION

CP720 - 5 - B - 8S - 150 - S3

Seals

B = Buna-N
V = Viton

Seal kit
120023
120024

Housing and ports

0 = No Housing
L3B = AL, 3/8 BSP
L4B = AL, 1/2 BSP
6S = AL, #6 SAE
8S = AL, #8 SAE
Other housings available

Housing P/N

No Housing
SDC10-4-L-3B
SDC10-4-L-4B
CP10-4-6S
CP10-4-8S

Spool seals

S3 = No seal
S4 = Seal at bottom of spool

Shift pressure

bar [psi]

050 = 3.5 [50]
080 = 5.5 [80]
125 = 8.6 [125]
150 = 10.3 [150]

shift pressure assumes no seals

P102 006E



Cartridge Valves Technical Information

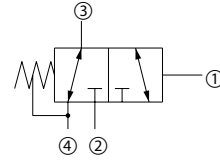
Directional control valves

CP722-11

OPERATION

This valve is a 3-way hydraulically-piloted spool.

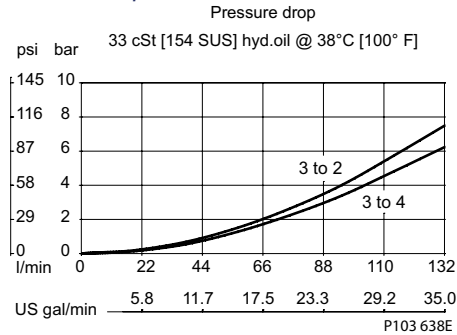
Schematic



P102 500E

SPECIFICATIONS

Theoretical performance



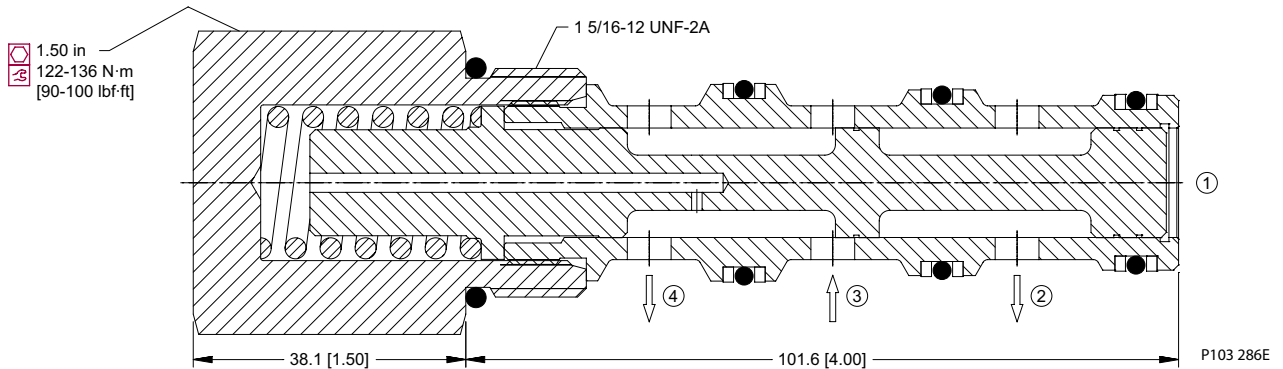
Specifications

Rated pressure	450 bar [6500 psi]
Rated flow at 7 bar [100 psi]	125 l/min [33 US gal/min]
Leakage	164 cm ³ /min [10 in ³ /min] @ Oil temperature range -20° to 80°C [-4° to 180°F]
Weight	0.61 kg [1.34 lb]
Cavity	CP16-4

DIMENSIONS

mm [in]

Cross-sectional view



ORDERING INFORMATION

CP722-11-U-6B-040

Seals	Seal kit	Shift pressure
U = Urethane	120677	bar [psi]
		040 = 2.8 40
		080 = 5.5 80
Housing and ports	Housing P/N	
0 = No Housing	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	
Other housings available		

P103 287E

Directional control valves
CP722-11



Cartridge Valves Technical Information

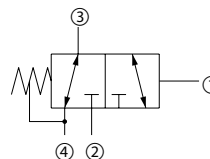
Directional control valves

CP722-5

OPERATION

This valve is a 3-way hydraulically piloted spool.

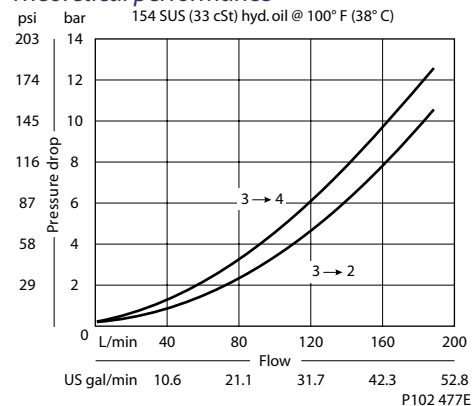
Schematic



P102 500E

SPECIFICATIONS

Theoretical performance



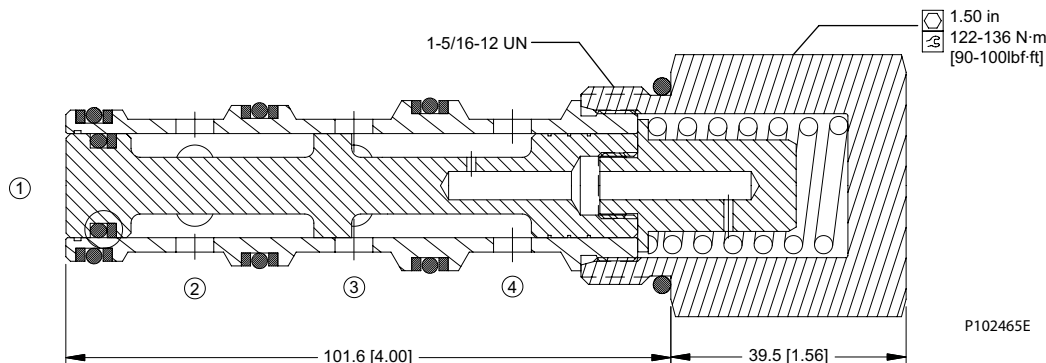
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	130 l/min [34 US gal/min]
Weight	0.61 kg [1.34 lb]
Cavity	CP16-4

DIMENSIONS

mm [in]

Cross-sectional view



ORDERING INFORMATION

CP722 - 5 - B - 16S - 150 - S3

Seals

B = Buna-N
V = Viton

Seal kit
120025
120026

Housing and ports

0 = No Housing
6B = AL, 3/4 BSP
8B = AL, 1 BSP
12S = AL, #12 SAE
16S = AL, #16 SAE
Other housings available

Housing P/N

No Housing
CP16-4-6B
CP16-4-8B
CP16-4-12S
CP16-4-16S

Spool seals

S3 = No seal
S4 = Seal at bottom of spool

Shift pressure

bar	[psi]
040	2.8 [40]
080	5.5 [80]
150	10.3 [150]

shift pressure assumes no seals

P102 013E



Cartridge Valves Technical Information

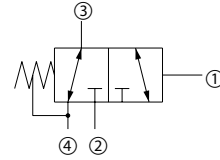
Directional control valves

CP723-5

OPERATION

This valve is a 3-way hydraulically piloted spool.

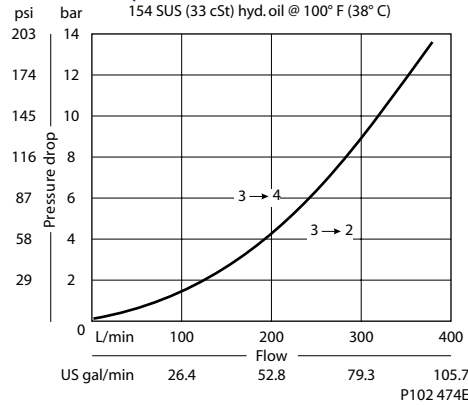
Schematic



P102 500E

SPECIFICATIONS

Theoretical performance



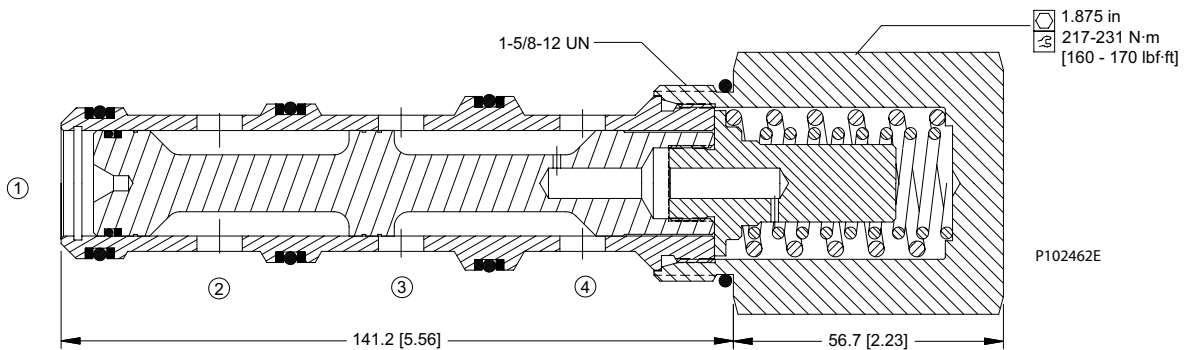
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	265 l/min [70 US gal/min]
Weight	1.22 kg [2.68 lb]
Cavity	SDC20-4

DIMENSIONS

mm [in]

Cross-sectional view



Directional control valves
CP723-5

ORDERING INFORMATION

CP723 - 5 - B - 20S - 150 - S3

Seals

B = Buna-N
V = Viton

Housing and ports

00 = No Housing
8B = AL, 1 BSP
10B = AL, 1-1/4 BSP
16S = AL, #16 SAE
20S = AL, #20 SAE
Other housings available

Seal kit
120181
120182

Housing P/N

No Housing
CP20-4-8B
CP20-4-10B
CP20-4-16S
CP20-4-20S

Spool seals

S3 = No seal
S4 = Seal at bottom of spool

Shift pressure

Shift pressure (bar)	Shift pressure (psi)
050	3.5 [50]
080	5.5 [80]
100	6.9 [100]
130	9.0 [130]
150	10.3 [150]

shift pressure assumes no seals

P101 018E



Cartridge Valves Technical Information

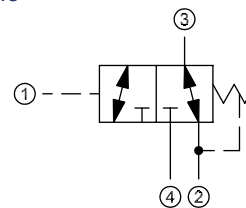
Directional control valves

CP720-9

OPERATION

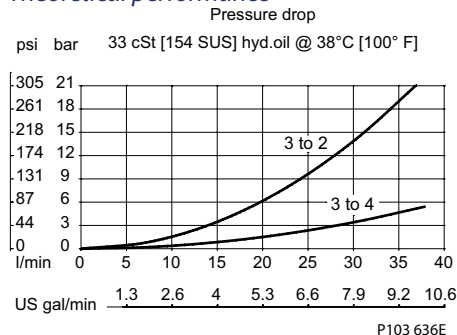
This valve is a 3-way hydraulically-piloted spool.

Schematic



SPECIFICATIONS

Theoretical performance



P103 506

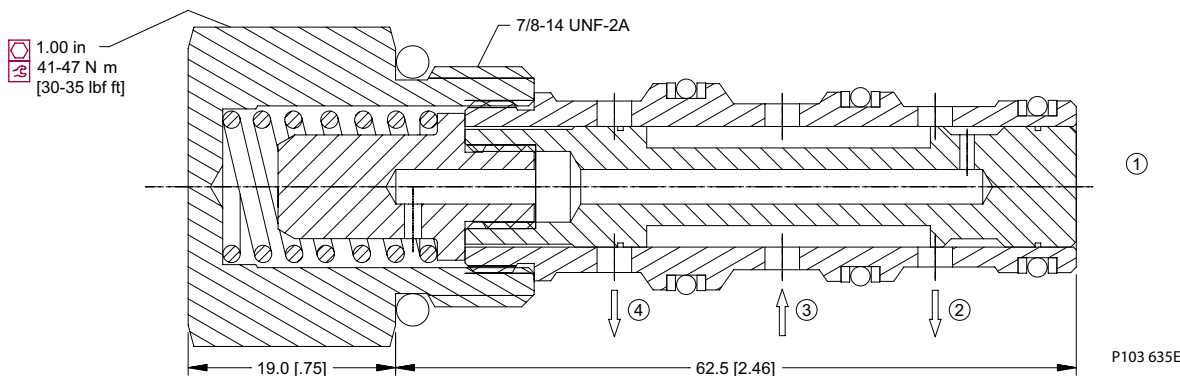
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	25 l/min [7 US gal/min]
Leakage	164 cm ³ /min [10 in ³ /min] @
Weight	0.16 kg [0.35 lb]
Cavity	SDC10-4

DIMENSIONS

mm [in]

Cross-sectional view



ORDERING INFORMATION

CP720-9-B-6S-040

Seals		Shift pressure
B = Buna-N	Seal kit 120023	bar [psi]
V = Viton	120024	040 = 2.8 40
		050 = 3.5 50
Housing and ports	Housing P/N	080 = 5.5 80
0 = No Housing	No Housing	125 = 8.6 125
L3B = AL, 3/8 BSP	SDC10-4-L-3B	150 = 10.3 150
L4B = AL, 1/2 BSP	SDC10-4-L-4B	
6S = AL, #6 SAE	CP10-4-6S	
8S = AL, #8 SAE	CP10-4-8S	
Other housings available		

P103 637E



Cartridge Valves Technical Information

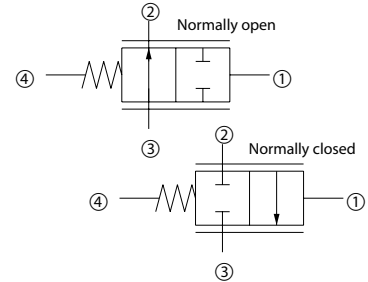
Directional control valves

CP712-7

OPERATION

This valve is a hydraulically piloted proportional flow control.

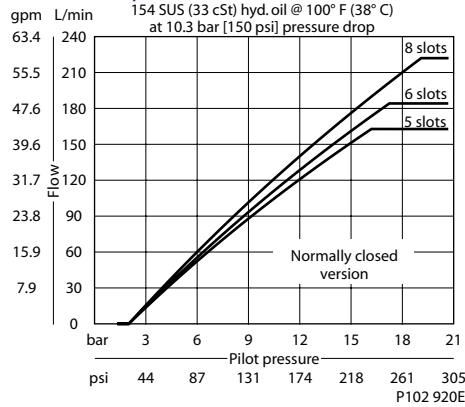
Schematic



P102 937E

SPECIFICATIONS

Theoretical performance



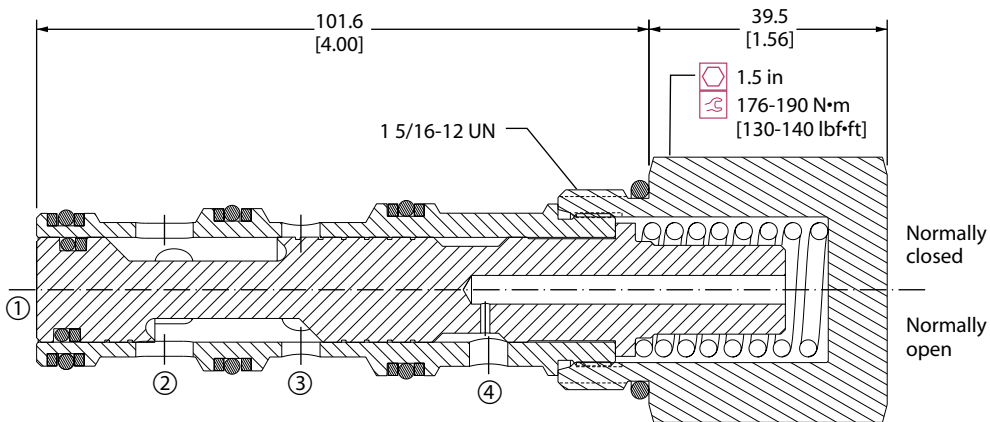
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 10 bar [150 psi]	220 l/min [58 US gal/min]
Weight	0.61 kg [1.34 lb]
Cavity	CP16-4

DIMENSIONS

mm [in]

Cross-sectional view



P102 936E

ORDERING INFORMATION

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

Spool seal

S3 = No spool seal
S4 = With spool seal

Sleeve option

5 = 5 slots
6 = 6 slots
8 = 8 slots

Spool configuration
C = Normally closed
O = Normally open

Seals

B = Buna-N
V = Viton

Seal kit
120025
120026

Housing and ports

0 = No Housing
6B = AL, 3/4 BSP
8B = AL, 1 BSP
12S = AL, #12 SAE
16S = AL, #16 SAE
Other housings available

Housing P/N

No Housing
CP16-4-6B
CP16-4-8B
CP16-4-12S
CP16-4-16S

P102 894E



Cartridge Valves Technical Information
Directional control valves
Notes