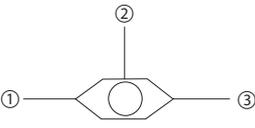
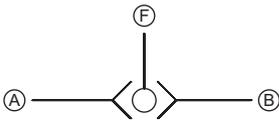


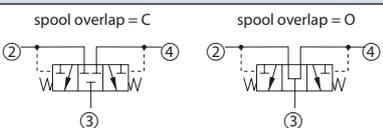
Cartridge Valves Technical Information

Shuttle Valves

Quick Reference

Cartridge	Model No.	Cavity	Description	Flow*	Pressure	Page
	CP124-1	CP04-3	Load Shuttle Valves, Normal direction	4 l/min [1 US gal/min]	210 bar [3000 psi]	03.4
	CP128-1	SDC08-3		10 l/min [3 US gal/min]	210 bar [3000 psi]	03.5
	SV 04	NCS04/3		15 l/min [4 US gal/min]	315 bar [4500 psi]	03.6
	CP120-4	SDC10-3		25 l/min [7 US gal/min]	330 bar [4800 psi]	03.7
	SV 06	NCS06/3		60 l/min [16 US gal/min]	315 bar [4500 psi]	03.8

In-line	Model No.	Cavity	Description	Flow*	Pressure	Page
	VS 06	none	Load shuttle Valve, In-line	35 l/min [9 US gal/min]	350 bar [5075 psi]	03.9
	VS 10	none		45 l/min [12 US gal/min]	350 bar [5075 psi]	03.10

Hot oil shuttle	Model No.	Cavity	Description	Flow*	Pressure	Page
	CP720-3	SDC10-4	Hot Oil Shuttle	25 l/min [7 US gal/min]	350 bar [5000 psi]	03.11
	CP721-3	CP12-3M		90 l/min [24 US gal/min]	350 bar [5000 psi]	03.12

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

OVERVIEW

There are two types of shuttle valves -- load shuttle valves and hot oil shuttle valves.

Shuttle valves

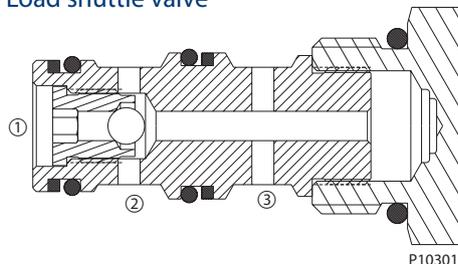


LOAD SHUTTLE VALVE

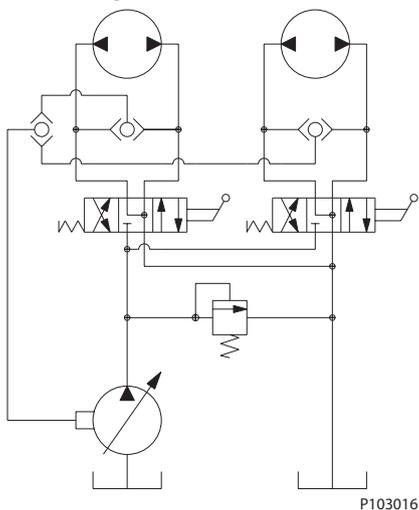
A load shuttle valve communicates the higher of two inlet pressures at 1 and 3 to the outlet at 2. A steel ball is used to seal the lower pressure. Load shuttles have several common applications including:

- Logic for load sensing circuits
- Bi-directional motor brake release valve

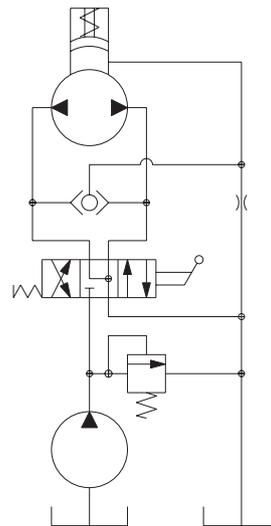
Load shuttle valve



Load sensing circuit



Bi-directional motor brake release valve



Cartridge Valves Technical Information

Shuttle Valves

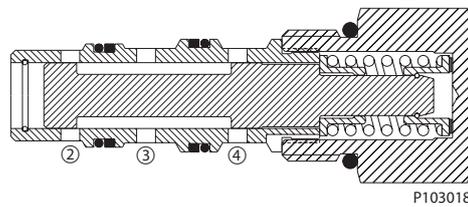
Application Notes

HOT OIL SHUTTLE VALVE

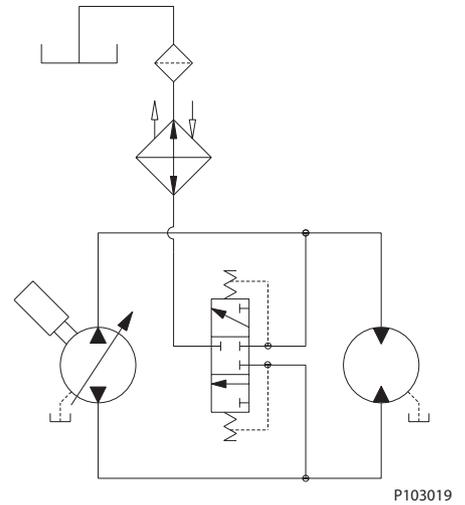
Hot oil shuttles are spool-type valves that use internal piloting at 2 and 4 to direct oil from the lower of the two input pressures to the outlet at 3.

A common application for a hot oil shuttle is diverting fluid from the low pressure side of a closed-circuit hydrostatic loop for cooling and/or filtering.

Hot oil shuttle valve



Closed-circuit hydrostatic loop





Cartridge Valves Technical Information

Shuttle Valves

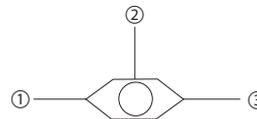
Cartridge

CP124-1

OPERATION

This valve senses the higher of the two input pressures at ports 1 and 3 and routes it to the output port 2.

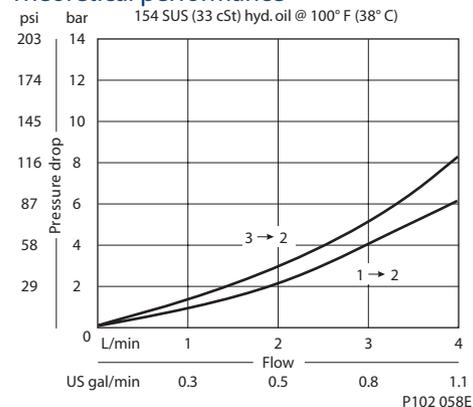
Schematic



P102 056E

SPECIFICATIONS

Theoretical performance



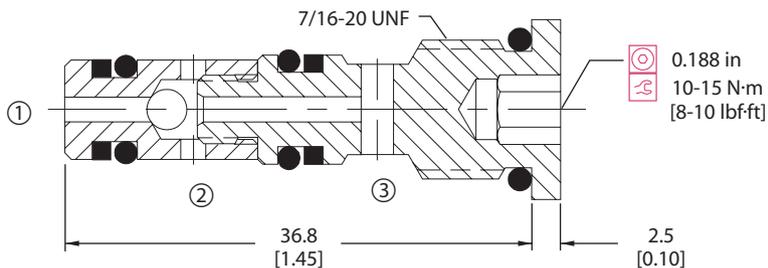
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	4 l/min [1 US gal/min]
Leakage	6 drops/min @ Rated pressure
Weight	0.02 kg [0.04 lb]
Cavity	CP04-3

DIMENSIONS

mm [in]

Cross-sectional view



ORDERING INFORMATION

CP124 - 1 - B - 4S

Seals

B = Buna-N
V = Viton

Seal kit

120111
120282

Housing and ports

0 = No Housing
2B = AL, 1/4 BSP
4S = AL, #4 SAE
Other housings available

Housing P/N

No Housing
CP04-3-2B
CP04-3-4S

P102 138E



Cartridge Valves Technical Information

Shuttle Valves

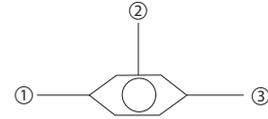
Cartridge

CP128-1

OPERATION

This valve senses the higher of the two input pressures at ports 1 and 3 and routes it to the output port 2.

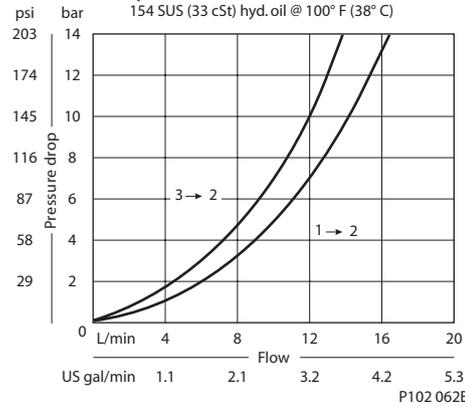
Schematic



P102 056E

SPECIFICATIONS

Theoretical performance



P102 062E

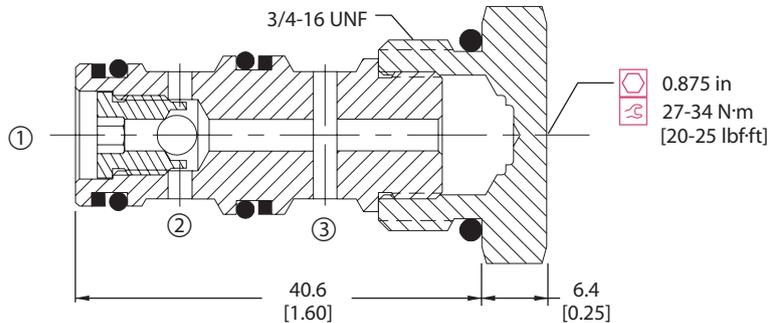
Specifications

Rated pressure	210 bar [3000 psi]
Rated flow at 7 bar [100 psi]	10 l/min [3 US gal/min]
Leakage	6 drops/min @ Rated pressure
Weight	0.06 kg [0.14 lb]
Cavity	SDC08-3

DIMENSIONS

mm [in]

Cross-sectional view



P102 061E

ORDERING INFORMATION

CP128 - 1 - B - 4S

Seals

B = Buna-N 120238
V = Viton 120239

Seal kit
120238
120239

Housing and ports

0 = No Housing
SE2B = AL, 1/4 BSP
SE3B = AL, 3/8 BSP
4S = AL, #4 SAE
6S = AL, #6 SAE
Other housings available

Housing P/N

No Housing
SDC08-3-SE-2B
SDC08-3-SE-3B
CP08-3-4S
CP08-3-6S

P102 109E

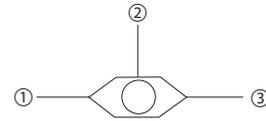
Shuttle valves
CP128-1

Cartridge Valves Technical Information
 Shuttle Valves
 Cartridge
 SV 04

OPERATION

This valve senses the higher of two input pressures at 1 and 3, and routes it to the output 2.

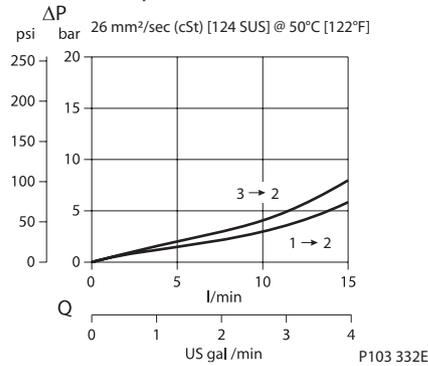
Schematic



P102 056E

SPECIFICATIONS

Theoretical performance

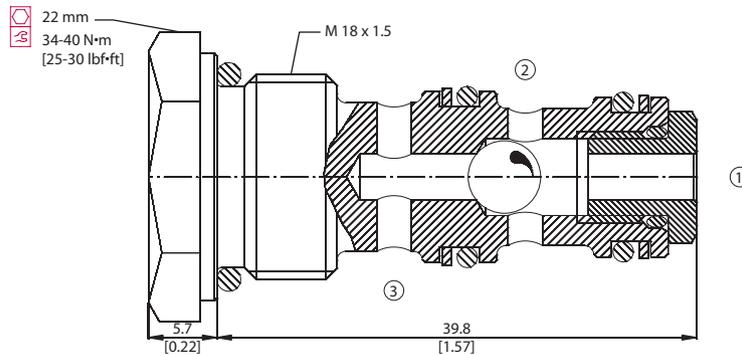


Specifications

Rated pressure	315 bar [4500 psi]
Rated flow at 7 bar [100 psi]	15 l/min [4 US gal/min]
Leakage	6 drops/min @ Rated pressure
Weight	0.07 kg [0.15 lb]
Cavity	NCS04/3

DIMENSIONS
 mm [in]

Cross-sectional view



P103 331

ORDERING INFORMATION

SV 04 - 00 - V

Housing and ports
 00 = No Housing
 SE1/4 = AL, 1/4 BSP
 SE4S = AL, #4 SAE
 SE6S = AL, #6 SAE
 Other housings available

Housing P/N
 No Housing
 NCS04/3-SE-1/4
 NCS04/3-SE-4S
 NCS04/3-SE-6S

Seals
 Omit = Buna-N
 V = Viton

Seal kit
 230000160
 230000450

P103333E

Shuttle valves
SV 04



Cartridge Valves Technical Information

Shuttle Valves

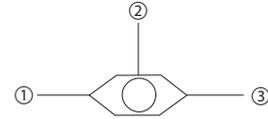
Cartridge

CP120-4

OPERATION

This valve senses the higher of two input pressures at 1 and 3, and routes it to the output 2.

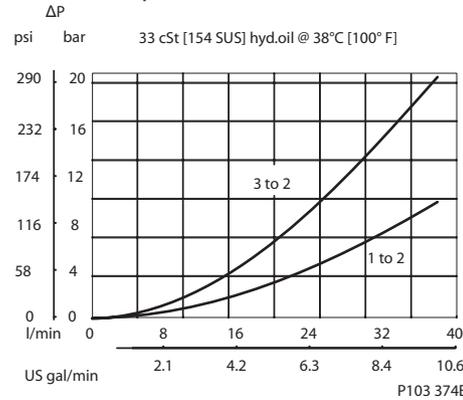
Schematic



P102 056E

SPECIFICATIONS

Theoretical performance



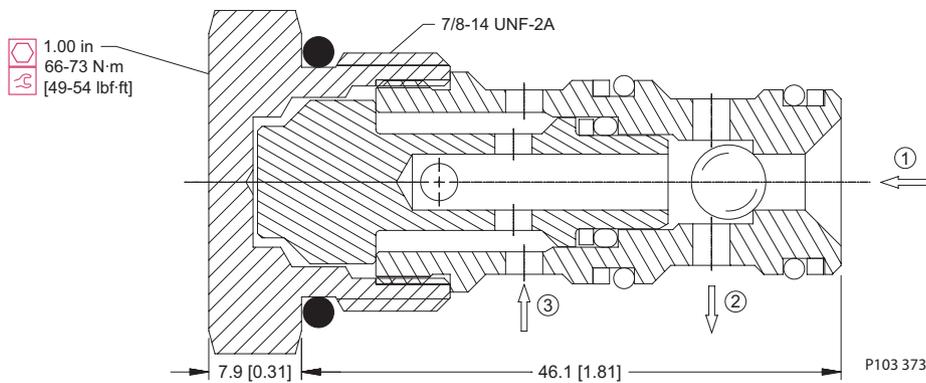
Specifications

Rated pressure	330 bar [4800 psi]
Rated flow at 7 bar [100 psi]	25 l/min [7 US gal/min]
Leakage	6 drops/min @
Weight	0.10 kg [0.22 lb]
Cavity	SDC10-3

DIMENSIONS

mm [in]

Cross-sectional view



Shuttle valves
CP120-4

ORDERING INFORMATION

CP120-4-B-8S

Seals	Seal kit	Housing and ports	Housing P/N
B = Buna-N	120240	00 = No Housing	No Housing
V = Viton	11043064	SE3B = AL, 3/8 BSP	SDC10-3-SE-3B
		SE4B = AL, 1/2 BSP	SDC10-3-SE-4B
		6S = AL, #6 SAE	CP10-3-6S
		8S = AL, #8 SAE	CP10-3-8S
		Other housings available	

P103 375E



Cartridge Valves Technical Information

Shuttle Valves

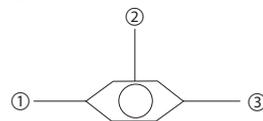
Cartridge

SV 06

OPERATION

This valve senses the higher of two input pressures at 1 and 3, and routes it to the output 2.

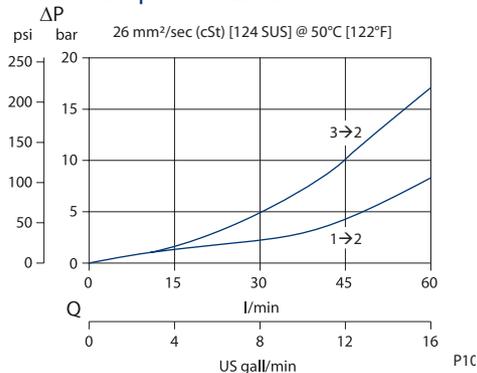
Schematic



P102 056E

SPECIFICATIONS

Theoretical performance



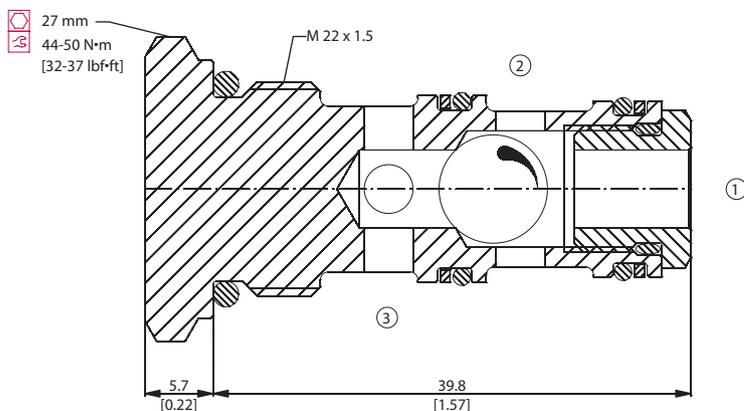
Specifications

Rated pressure	315 bar [4500 psi]
Rated flow at 7 bar [100 psi]	60 l/min [16 US gal/min]
Leakage	6 drops/min @ Rated pressure
Weight	0.11 kg [0.24 lb]
Cavity	NCS06/3

DIMENSIONS

mm [in]

Cross-sectional view



P103 366

ORDERING INFORMATION

SV 06 - SE3/8 - V

Housing and ports
 00 = No Housing
 SE3/8 = AL, 3/8 BSP
 SE1/2 = AL, 1/2 BSP
 SE6S = AL, #6 SAE
 SE8S = AL, #8 SAE
 Other housings available

Housing P/N
 No Housing
 NCS06/3-SE3/8
 NCS06/3-SE1/2
 NCS06/3-SE-6S
 NCS06/3-SE-8S

Seals Seal Kit
 V = Viton 230000110
 Omit = Buna-N 230000070

P103 368E

Shuttle valves SV 06



Cartridge Valves Technical Information

Shuttle Valves

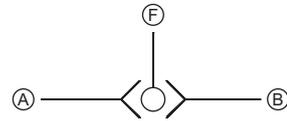
In-line

VS 06

OPERATION

This valve senses the higher of the two input pressures and routes it to the output port.

Schematic

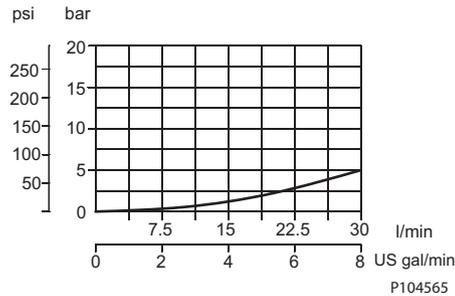


P104 559

SPECIFICATIONS

Theoretical performance

Pressure drop
26 cSt [121 SUS] hyd.oil at 50°C [122 °F]
Free flow from A⇒F or B⇒F



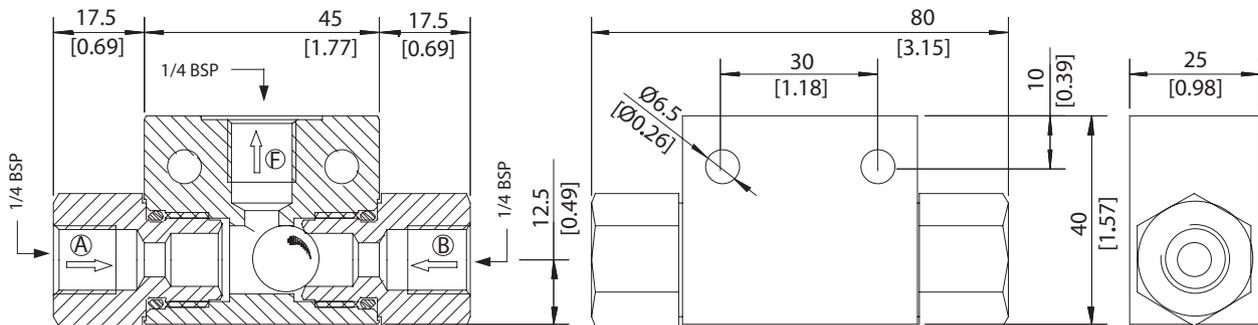
Specifications

Rated pressure	350 bar [5075 psi]
Rated flow at 7 bar [100 psi]	35 l/min [9 US gal/min]
Leakage	6 drops/min @ Rated pressure
Weight	0.22 kg [0.49 lb]
Cavity	none

DIMENSIONS

mm [in]

Cross-sectional view



P104 564

ORDERING INFORMATION

VS 06-G-V

SEALS
Omit = Buna
V = Viton

P104 560E

Shuttle valves
VS 06



Cartridge Valves Technical Information

Shuttle Valves

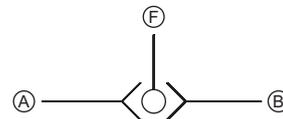
In-line

VS 10

OPERATION

This valve senses the higher of two input pressures and routes it to the output port.

Schematic

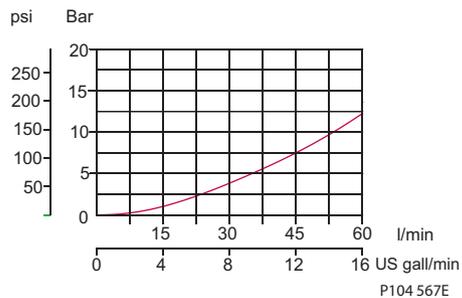


P104 559

SPECIFICATIONS

Theoretical performance

Pressure drop
26 cSt [121 SUS] hyd.oil at 50°C [122 °F]
Free flow from A⇒F or B⇒F



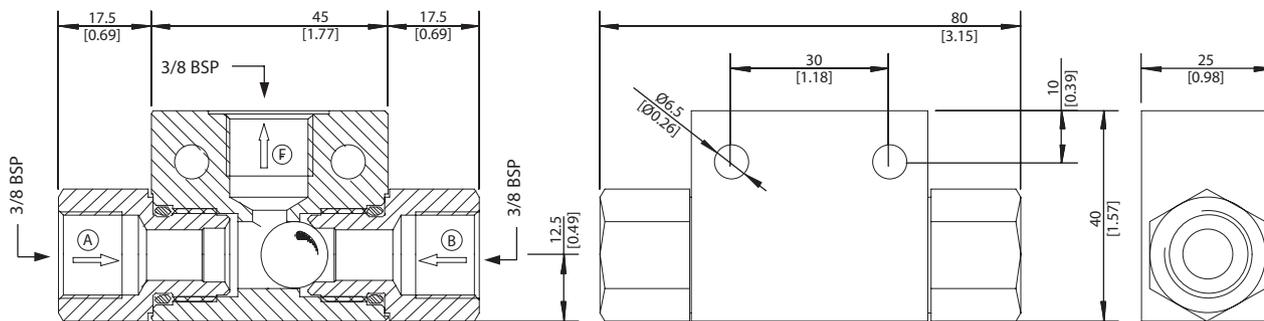
Specifications

Rated pressure	350 bar [5075 psi]
Rated flow at 7 bar [100 psi]	45 l/min [12 US gal/min]
Leakage	6 drops/min @ Rated pressure
Weight	0.19 kg [0.42 lb]
Cavity	none

DIMENSIONS

mm [in]

Cross-sectional view



P104 566

ORDERING INFORMATION

VS 10-G-V

SEALS
Omit = Buna
V = Viton

P104 562E

Shuttle valves VS 10



Cartridge Valves Technical Information

Shuttle Valves

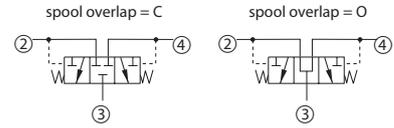
Hot Oil Shuttle

CP720-3

OPERATION

This valve has an internally piloted spool that directs flow from the lower pressure inlet, 2 or 4, to the output at 3.

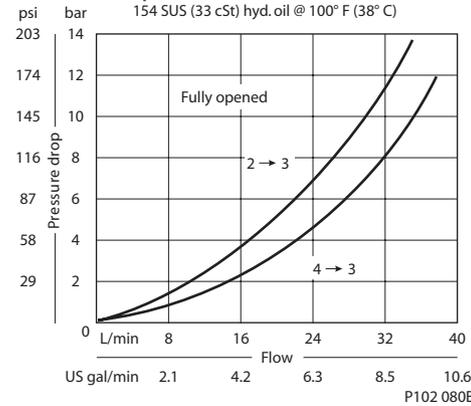
Schematic



P102 078E

SPECIFICATIONS

Theoretical performance



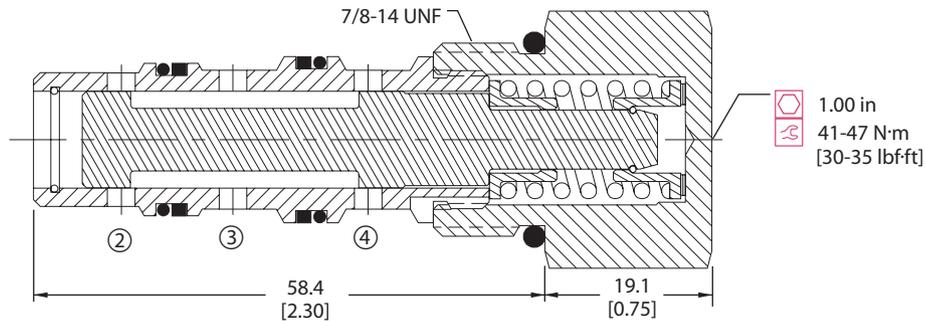
Specifications

Rated pressure	350 bar [5000 psi]
Rated flow at 7 bar [100 psi]	25 l/min [7 US gal/min]
Leakage	82 cm ³ /min [5 in ³ /min] @ 207 bar [3000 psi]
Weight	0.15 kg [0.34 lb]
Cavity	SDC10-4

DIMENSIONS

mm [in]

Cross-sectional view



ORDERING INFORMATION

CP720 - 3 - B - 8S - 080 - C

Seals

B = Buna-N
V = Viton

Seal kit
11032943
11032944

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-X1
CP10-4-8S-X1

Spool overlap

O = Open
C = Closed

Shift pressure

bar [psi]

050 = 3.4 [50]
080 = 5.5 [80]

P102 126E

Shuttle valves
CP720-3



Cartridge Valves Technical Information

Shuttle Valves

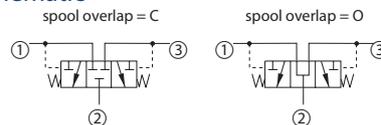
Hot Oil Shuttle

CP721-3

OPERATION

This valve has an internally piloted spool that directs flow from the lower pressure inlet, 1 or 3, to the output at 2.

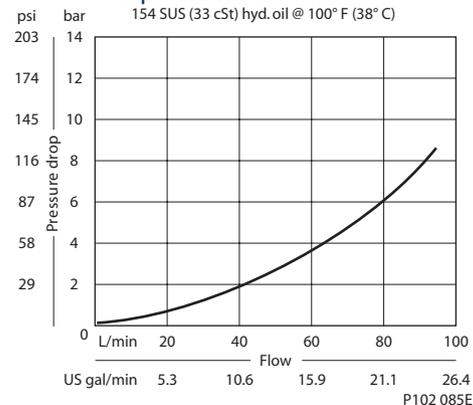
Schematic



P102 083E

SPECIFICATIONS

Theoretical performance



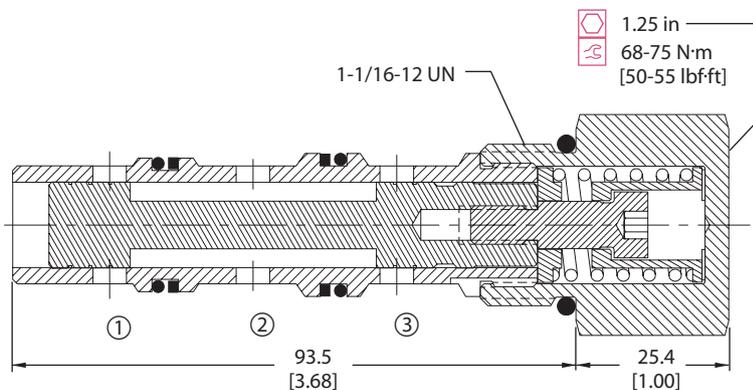
Specifications

Rated pressure	350 bar [5000 psi]
Rated flow at 7 bar [100 psi]	90 l/min [24 US gal/min]
Leakage	82 cm ³ /min [5 in ³ /min] @ 207 bar [3000 psi]
Weight	0.34 kg [0.75 lb]
Cavity	CP12-3M

DIMENSIONS

mm [in]

Cross-sectional view



P102 084E

ORDERING INFORMATION

CP721 - 3 - B - 12S - 100 - C

Seals	Seal kit	Spool overlap
B = Buna-N	120098	O = Open
V = Viton	120099	C = Closed
Housing and ports	Housing P/N	Shift pressure
0 = No Housing	No Housing	bar [psi]
4B = AL, 1/2 BSP	CP12-3M-4B	025 = 1.6 [25]
6B = AL, 3/4 BSP	CP12-3M-6B	050 = 3.4 [50]
10S = AL, #10 SAE	CP12-3M-10S	100 = 6.9 [100]
12S = AL, #12 SAE	CP12-3M-12S	
Other housings available		

P102 106E