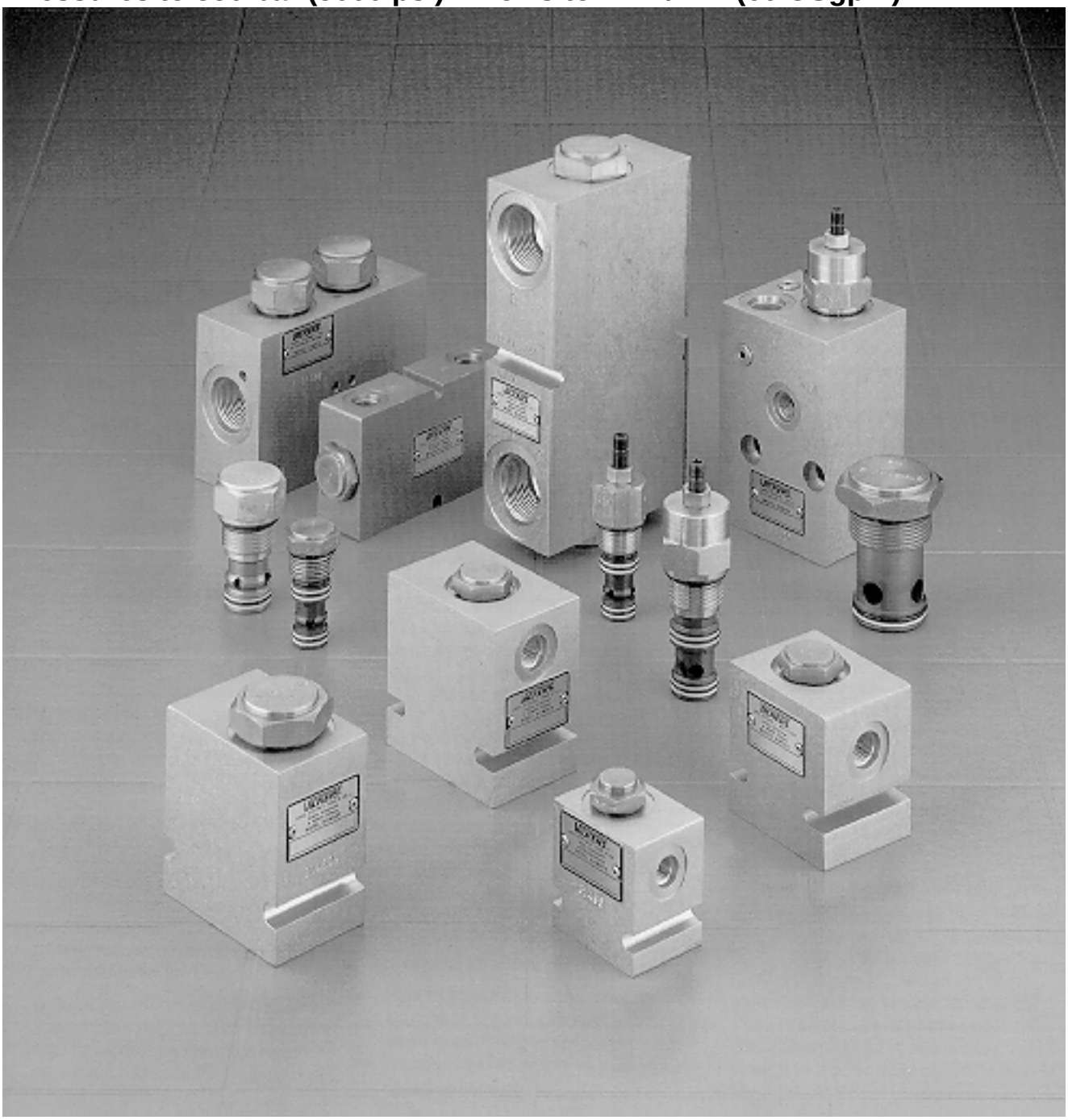
Check Valves

Screw In Cartridge Valves

Pressures to 350 bar (5000 psi) - Flows to 227 l/min (60 USgpm)



Introduction

For over 70 years, Vickers has provided its customers with quality products and innovative solutions for all their power and motion control needs. The products featured in this catalog represent the very best in screw-in cartridge check valve technology.

Products in this catalog have been fatigue tested for one million cycles at 132% or 10 million cycles at 115% of rated pressure.

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

We are committed to maintaining this position by offering the most comprehensive range of cartridge valves for industrial and mobile equipment.

This catalog gives basic specifications for many of Vickers screw-in cartridge check valves. Its purpose is to provide a quick, convenient reference tool when choosing Vickers cartridge valves or designing a system using these components.

The Vickers range of direct and pilot operated check valves provides the hydraulic circuit designer with a wide selection of cartridge and in-line products.

All cartridges have hardened and ground poppets (other than CV1-10(V)-B models which utilize a chrome steel ball) 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.

Direct operated check valves

Cartridges fit into industry standard cavities and may be supplied for installation in manifolds, or be provided in standard housings having SAE or BSPP ports suitable for in-line mounting.

A wide selection of cracking pressures is available from 0,21 to 20,7 bar (3 to 300 psi). Thus the opportunity exists to use the valves not only as

conventional check but also as low pressure relief valves.

Pilot operated check valves

These valves are used for:

- Position load locking
- As an alternative to counterbalance valves where neither the overrunning loads or release speed are factors in the application.

The POC*-10 and POC*-12 series of pilot-to-open check valves compliment the CBV*-10 and CBV*-12 counterbalance cartridges and are physically interchangeable with them. The POC's provide a low cost alternative to load control when the dynamics of neither overrunning loads nor load release speed are factors to be considered in the design of the hydraulic circuit for the load to be controlled.

The pilot-to-open valves positively lock a load from port 1 to port 2 until pilot pressure applied to port 3 is sufficient to unseat the valve. This then permits flow from port 1 to port 2. The load can also be released through means of an optional screw type override.

The POC*-10 covers flow up to 60 l/min (15 USgpm). The POC*-12 covers flow up to 114 l/min (30 USgpm). With infinite life qualification to a fatigue pressure rating of 310 bar (4500 psi), these POC valves are suitable for use in a broad range of load control applications with typical system operating pressures up to 350 bar (5000 psi). Tailoring of the circuit to gain energy savings while minimizing shock is obtained through the use of several standard cracking pressure ranges from 2,0 bar (30 psi) to 7 bar (100 psi). When anti-cavitation protection is required, the 0,30 bar (5 psi) spring should be used. For those applications where pilot pressure may not always be available, the valve can be ordered with an optional adjustable override.

Features and benefits of pilot operated check valves:

- Simple load holding device. Low cost alternative to more complex solutions when overrunning loads are not present and / or control of load release speed is not required.
- Provides high operational efficiency and low spring settings.
- Valves are offered with a wide variety of standard housings with SAE and BSPP port options in the following configurations:
  - In-line single
  - In-line dual
  - SAE, 4-bolt
  - Close coupled, nipple mounted
  - Gasket mounted single
  - Gasket mounted dual

These valves can also be used in a C–10–3S or C–10–3S cavity.

- Four standard cracking pressures permit energy savings, while tailoring the hydraulic system requirements to minimize shock.
- Unique dual spring design provides high operational efficiency and a low pressure spring option for effective anti-cavitation protection.
- Unique design provides compact package and low pressure drops that match or exceed current market expectations and provide for excellent repeatability and stability
- 3:1 pilot ratio satisfies simple load holding application requirements, while providing smooth operation and longer operating life.
- Optional adjustable override releases the load for situations where pilot pressure is not always available.

Single pilot check

Also offered are SPC2-8 and SPC2-10 single pilot check valves with pressures to 240 bar (3500 psi) and flows to 23 l/min (6 gpm). These valves operate similar to the POC1 product but offer an opposite flow path which offers the designer a choice of pilot operated check valve when laying out a custom manifold for ease of design.

Supporting products

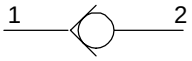
Vickers valves are available in a wide range of mounting configurations and porting options to provide flexibility in developing circuits. Housings are available in either aluminum 210 bar (3000 psi) or steel 350 bar (5000 psi) configurations. All are available with a choice of BSPP (ISO–0228/1) or SAE style ports.

Contents

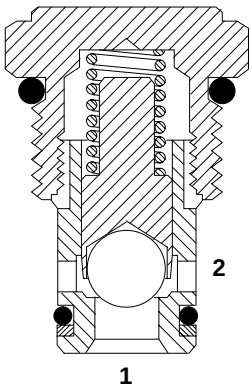
MODEL	DESCRIPTION	TYPICAL APPLICATION PRESSURE bar (psi)	RATED FLOW l/min (USgpm)	PAGE
Introduction				2
CV1–10–B	Ball Type Check Valve	210 (3000)	45 (12)	4
CV3–8–P	Poppet Type Check Valve	350 (5000)	30 (8)	6
CV1–10–P		210 (3000)	45 (12)	8
CV3–10–P		210 (3000)	76 (20)	10
CV16–10–P		350 (5000)	76 (20)	12
CV11–12–P		350 (5000)	114 (30)	14
CV1–16–P		210 (3000)	151 (40)	16
CV2–20–P		210 (3000)	227 (60)	18
SPC2–8–P	Single Pilot Check Valve Cartridge Type	240 (3500)	19 (5)	20
SPC2–10–P		210 (3000)	23 (6)	22
SPC1–10–P	Single Pilot Check Valve In-line Housing Type	210 (3000)	45 (12)	24
SPC1–16–P		210 (3000)	151 (40)	26
SPC1–20–P		210 (3000)	227 (60)	28
POC1-10	Pilot operated check valve	350 (5000)	57 (15)	30
POC1-12		350 (5000)	114 (30)	32
DPC1–10–P	Double Pilot Check Valve In-line Housing Type	210 (3000)	45 (12)	34
DPC1–16–P		210 (3000)	151 (40)	36
DPC1–20–P		210 (3000)	227 (60)	38
C-**-2(U)	Cavity Dimensions			40
C-**-3(S)				41
C-**-2 / C-**-3(S)	Aluminum Housings (Light Duty), Part Numbers, Dimensions & Weights			42
C-**-2(U) / C-**-3	Aluminum Housings (Fatigue Rated), Part Numbers, Dimensions & Weights			43
C-**-2(U) / C-**-3	Steel Housings (Fatigue Rated), Part Numbers, Dimensions & Weights			44
POC1-10 Housing Dimensions	I – Inline Steel & I – Inline Aluminum – NFPA fatigue rated			45
	I – Inline Aluminum – Light Duty & N – Close Coupled Nipple Mounting			46
	G – Gasket Mounted – Single / D – Dual Line Mounted			47
	P – Dual Gasket Mounted			48
POC1-12 Housing Dimensions	I – Inline / B – $^3/_4$" SAE 4-Bolt Pad Mounting			49
	N – Close Coupled Nipple Mounting & G – Gasket Mounted – Single			50
POC1-12 Housing Dimensions	D – Dual Line Mounted / P – Dual Gasket Mounted			51
Housing Part Numbers & Weights	POC1–10, POC1–12			52
Spare Parts				53
Form Tools	Roughing Finishing			54 54
Index				55

CV1-10-B
Check valve

Functional Symbol



Sectional View



Description

The CV1-10-B is a ball type, screw-in cartridge check valve.

Operation

This valve remains closed until the spring bias is reached at port 1 at which time the poppet lifts off the seat and allows flow from port 1 to port 2.

Ratings and specifications

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

Typical application pressure (all ports) . . . . . 210 bar (3000 psi)

Cartridge fatigue pressure (infinite life) . . . . . 210 bar (3000 psi)

Rated flow . . . . . 45 l/min (12 USgpm)

Free flow cracking pressure @1 l/min (0.25 USgpm) . . . . . 0,34 bar (5 psi)

Internal leakage . . . . . **Port 2 to 1** 5 drops / min. maximum @210 bar (3000 psi)

Temperature range . . . . . –40 to 120°C (–40° to 248°F)

Cavity . . . . . C–10–2 (See page 40)

Fluids . . . . . All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18/**16/13**

Standard housing materials . . . . . Aluminum

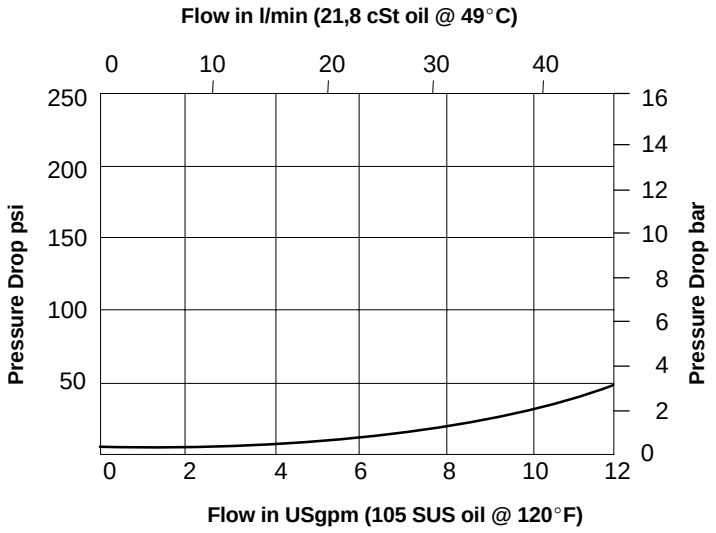
Weight cartridge only . . . . . 0,08 kg (0.17 lb.)

Seal kit . . . . . 565803 Buna–N
566086 Viton®

Viton is a registered trademark of E.I.DuPont

Pressure Drop Curve

Cartridge only



Model Code CV1–10–B

CV 1 - 10 (V) – B – ** – 5

1 2 3 4 5 6

1 Function

CV1– Check valve

2 Size

10 – 10 Size

3 Seals

Blank– Buna-N
V – Viton

4 Seating type

B – Ball

5 Port size

O – Cartridge only

Code	Port size	Housing number	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8” BSPP	02–175462	———
6T	SAE 6	566151	
2G	1/4” BSPP	———	876702
3G	3/8” BSPP		876703
6H	SAE 6		876700
8H	SAE 8		876701

(See pages 42 & 43 for housing details.)

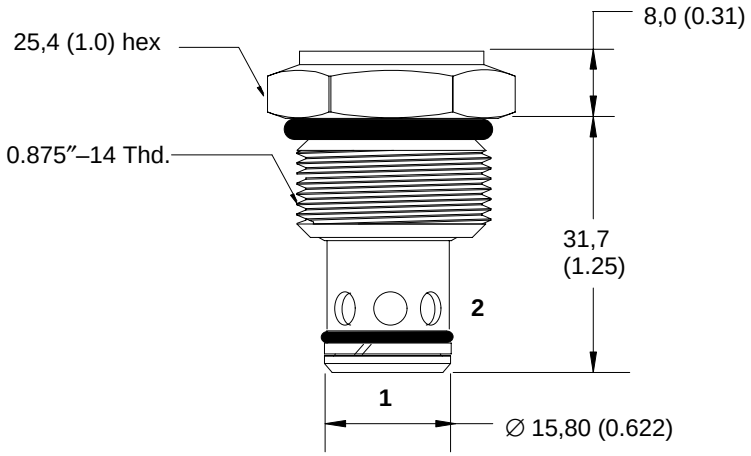
6 Free flow cracking pressure

5 – 0,34 bar (5 psi) (Anti-cavitation)

Dimensions

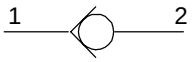
mm (inch)

Torque cartridge in housing
47–54 Nm (35–40 lbf ft)

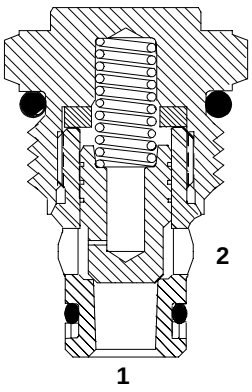


CV3-8-P
Check valve

Functional Symbol



Sectional View



Description

The CV3–8–P is a direct acting, poppet type check valve.

Operation

This valve remains closed until the spring bias is reached at port 1. The poppet then lifts off the seat and allows flow from port 1 to port 2,

Ratings and specifications

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

Typical application pressure (all ports) . . . . . 350 bar (5000 psi)

Cartridge fatigue pressure (infinite life) . . . . . 280 bar (4000 psi)

Rated flow . . . . . 30 l/min (8 USgpm)

Cracking pressures @ 1.0 l/min (0.25 USgpm) . . . . . **4** – 0,28 bar (4 psi)
10 – 0,7 bar (10 psi)
25 – 1,7 bar (25 psi)
60 – 4,0 bar (60 psi)

Internal leakage . . . . . 5 drops/min. maximum @ 350 bar (5000 psi)

Cavity . . . . . C-8-2 (See page 40)

Standard housing materials . . . . . Aluminum or steel

Temperature range . . . . . -40 to 120°C (-40° to 248°F)

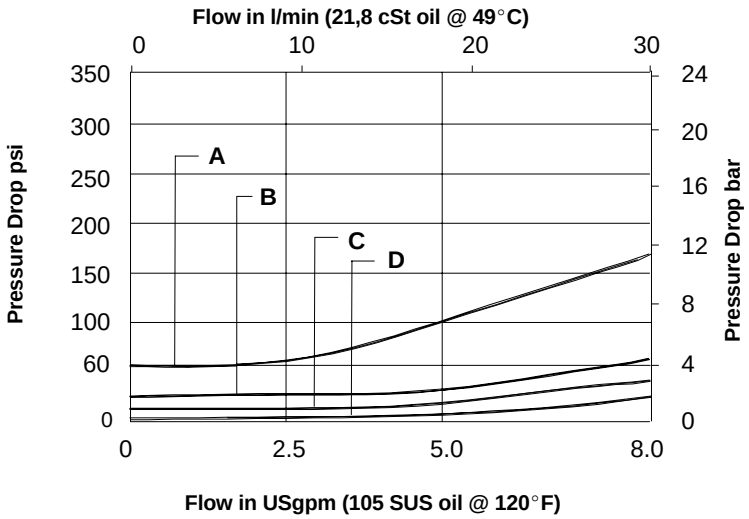
Fluids . . . . . All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18/**16/13**
Weight cartridge only . . . . . 0,05 kg. (0.12 lbs.)

Seal kits . . . . . 02-165875 Buna–N
02-165877 Viton®

Viton is a registered trademark of E.I.DuPont

Pressure Drop Curves
Cartridge only



A – CV3-8-P-O-60
B – CV3-8-P-O-25
C – CV3-8-P-O-10
D – CV3-8-P-O-4

Model Code

CV3-8-P

CV 3 - 8 (V) - P - (*)* * - * * * **

1 2 3 4 5 6 7

1 Function

CV3 – Check valve

2 Size

8 – 8 Size

3 Seals

Blank– Buna-N
V – Viton

4 Style

P – Poppet

5 Valve housing material
Omit for cartridge only

A – Aluminum
S – Steel

6 Port size

O – Cartridge only

Code	Port size	Housing number	
		Aluminum Fatigue rated	**Steel Fatigue rated**
4T	SAE 4	02–160730	02–160736
6T	SAE 6	02–160731	02–160737
8T	SAE 8	02–160732	02–160738
2G	1/4” BSPP	02–160727	02–160733
3G	3/8” BSPP	02–160728	02–160734

(See pages 43 & 44 for housing details.)

7 Cracking pressure

004 – 0,28 bar (4 psi)
010 – 0,70 bar (10 psi)
025 – 1,70 bar (25 psi)
060 – 4,00 bar (60 psi)

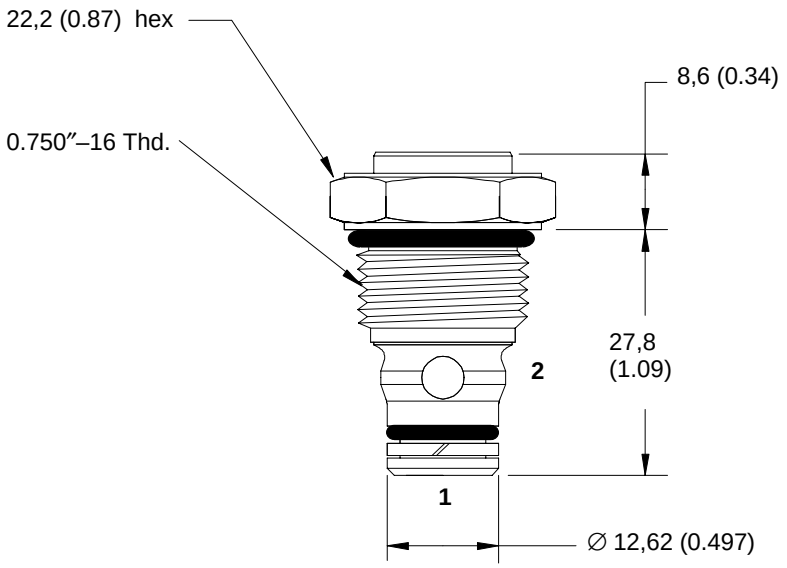
Aluminum housings can be used for pressures up to 210 bar (3000 psi)

Steel housings **must** be used for operating pressures **above** 210 bar (3000 psi)

Dimensions

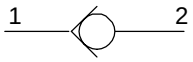
mm (inch)

Torque cartridge in housing 34–41 Nm (25–30 lbf ft)

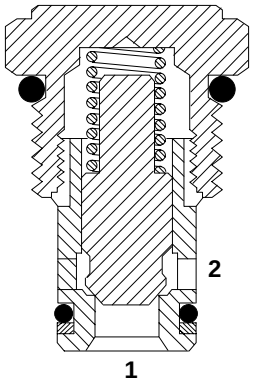


CV1-10-P
Check valve

Functional Symbol



Sectional View



Description

The CV1-10-P is a poppet type, screw-in cartridge check valve.

Operation

This valve remains closed until the spring bias is reached at port 1 at which time the poppet lifts off the seat and allows flow from port 1 to port 2.

Ratings and specifications

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

Typical application pressure (all ports) . . . . . 210 bar (3000 psi)

Cartridge fatigue pressure (infinite life) . . . . . 210 bar (3000 psi)

Rated flow . . . . . 45 l/min (12 USgpm)

Free flow cracking pressure @1 l/min (0.25 USgpm) . . . . . **5** – 0,34 bar (5 psi)
15 – 1,03 bar (15 psi)
30 – 2,07 bar (30 psi)
65 – 4,48 bar (65 psi)
100 – 6,90 bar (100 psi)
300 – 20,7 bar (300 psi)

Internal leakage . . . . . **Port 2 to 1** 5 drops / min. maximum @210 bar (3000 psi)

Temperature range . . . . . –40 to 120°C (–40° to 248°F)

Cavity . . . . . C–10–2 (See page 40)

Fluids . . . . . All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18/**16/13**

Standard housing materials . . . . . Aluminum

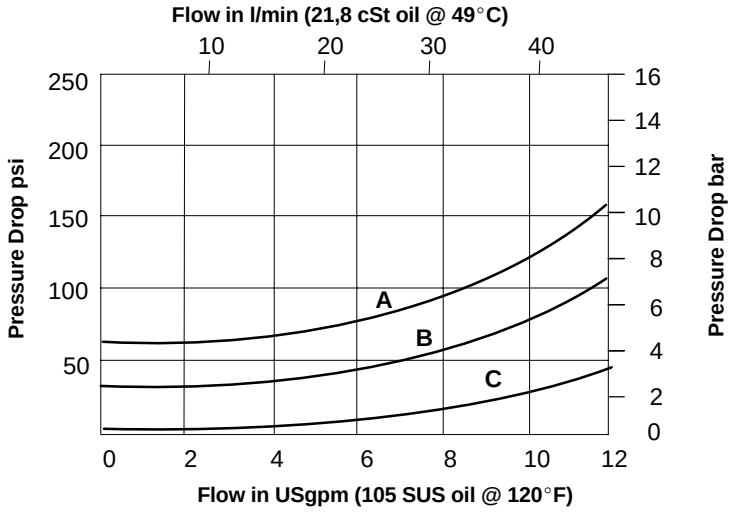
Weight cartridge only . . . . . 0,08 kg (0.17 lb.)

Seal kit . . . . . 565803 Buna–N
566086 Viton®

Viton is a registered trademark of E.I.DuPont

Pressure Drop Curves

Cartridge only



A – CV1-10-P-O-65
B – CV1-10-P-O-30
C – CV1-10-P-O-5

Model Code

CV1-10-P

CV 1 - 10 (V) – P – ** – **

1 2 3 4 5 6

1 Function

CV1 – Check valve

2 Size

10 – 10 Size

3 Seals

Blank– Buna-N
V – Viton

4 Style

P – Poppet

5 Port size

O – Cartridge only

Code	Port size	Housing number	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02–175462	———
6T	SAE 6	566151	
2G	1/4" BSPP	———	876702
3G	3/8" BSPP		876703
6H	SAE 6		876700
8H	SAE 8		876701

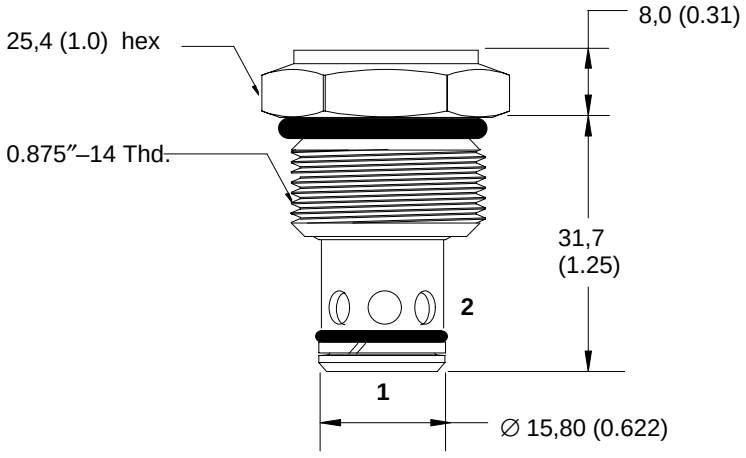
(See pages 42 & 43 for housing details.)

6 Free flow cracking pressure

5 – 0,34 bar (5 psi) (Anti-cavitation)
15 – 1,03 bar (15 psi)
30 – 2,07 bar (30 psi)
65 – 4,48 bar (65 psi)
100– 6,90 bar (100 psi)
300– 20,7 bar (300 psi)

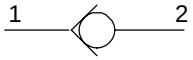
Dimensions
mm (inch)

Torque cartridge in housing
47–54 Nm (35–40 lbf ft)

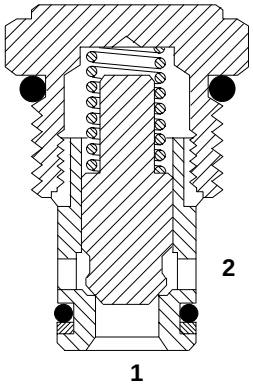


CV3-10-P
Check valve

Functional Symbol



Sectional View



Description

The CV3-10-P is a poppet type, screw-in cartridge check valve.

Operation

This valve remains closed until the spring bias is reached at port 1 at which time the poppet lifts off the seat and allows flow from port 1 to port 2.

Ratings and specifications

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

Typical application pressure (all ports) . . . . . 210 bar (3000 psi)

Cartridge fatigue pressure (infinite life) . . . . . 210 bar (3000 psi)

Rated flow . . . . . 76 l/min (20 USgpm)

Free flow cracking pressure @1 l/min (0.25 USgpm) . . . . . **3** – 0,21 bar (3 psi)
10 – 0,69 bar (10 psi)
20 –1,38 bar (20 psi)
40 – 2,76 bar (40 psi)
65 – 4,48 bar (65 psi)
100 – 6,90 bar (100 psi)
180 –12,40 bar (180 psi)
210 –14,50 bar (210 psi)

Internal leakage . . . . . **Port 2 to 1** 5 drops / min. maximum @210 bar (3000 psi)

Temperature range . . . . . –40 to 120°C (–40° to 248°F)

Cavity . . . . . C–10–2 (See page 40)

Fluids . . . . . All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18/**16/13**

Standard housing materials . . . . . Aluminum

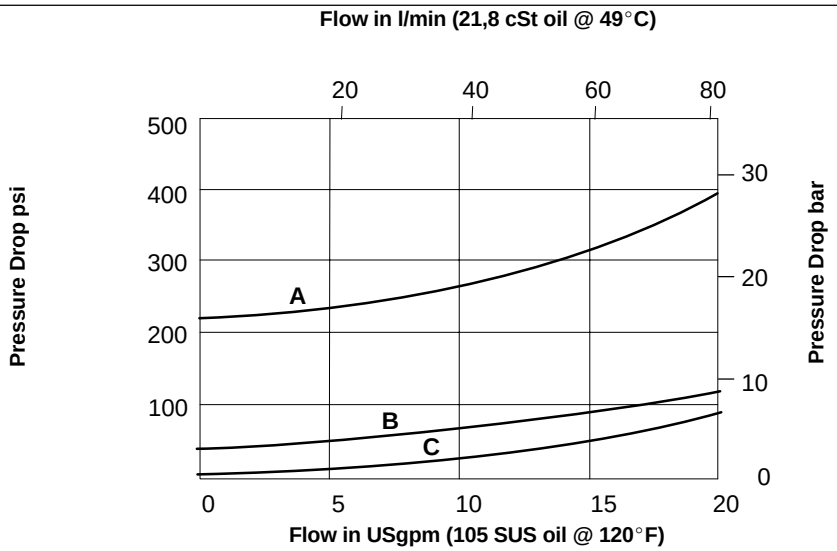
Weight cartridge only . . . . . 0,08 kg (0.17 lb.)

Seal kit . . . . . 565803 Buna–N
566086 Viton®

Viton is a registered trademark of E.I.DuPont

Pressure Drop Curves

Cartridge only



A – CV3-10-P-O-210
B – CV3-10-P-O-40
C – CV3-10-P-O-3

Model Code

CV3-10-P

CV 3 - 10 (V) – P – ** – **

1 2 3 4 5 6

1 Function

CV3 – Check valve

2 Size

10 – 10 Size

3 Seals

Blank– Buna-N
V – Viton

4 Style

P – Poppet

5 Port size

O – Cartridge only

Code	Port size	Housing number	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8" BSPP	02–175462	———
6T	SAE 6	566151	
2G	1/4" BSPP	———	876702
3G	3/8" BSPP		876703
6H	SAE 6		876700
8H	SAE 8		876701

(See pages 42 & 43 for housing details.)

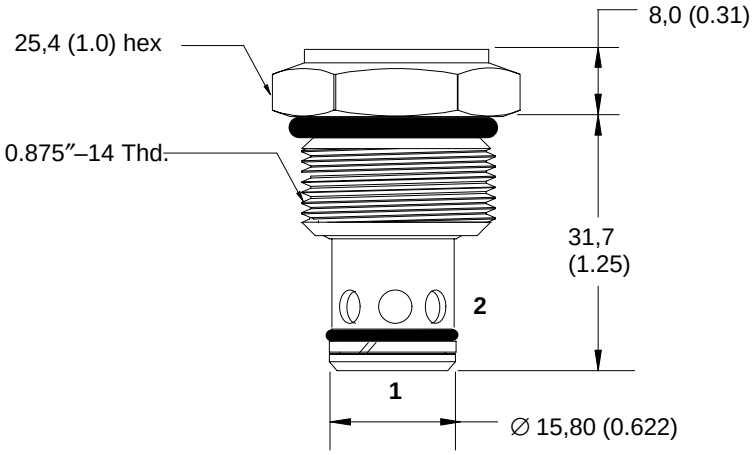
6 Free flow cracking pressure

3 – 0,21 bar (3 psi) (Anti-cavitation)
10 – 0,69 bar (10 psi) (Anti-cavitation)
20 – 1,38 bar (20 psi)
40 – 2,76 bar (40 psi)
65 – 4,48 bar (65 psi)
100– 6,90 bar (100 psi)
180– 12,4 bar (180 psi)
210– 14,5 bar (210 psi)

Dimensions

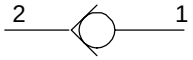
mm (inch)

Torque cartridge in housing 47–54 Nm (35–40 lbf ft)

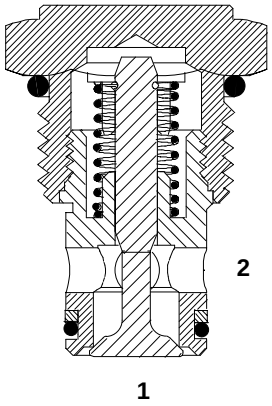


CV16-10-P
Check valve

Functional Symbol



Sectional View



Description

The CV16-10-P is a poppet type, screw-in cartridge check valve.

Operation

This valve remains closed until the spring bias is reached at port 2 at which time the poppet lifts off the seat and allows flow from port 2 to port 1.

Ratings and specifications

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

Typical application pressure (all ports) . . . . . 350 bar (5000 psi)

Cartridge fatigue pressure (infinite life) . . . . . 310 bar (4500 psi)

Rated flow . . . . . 76 l/min (20 USgpm)

Free flow cracking pressure @1 l/min (0.25 USgpm) . . . . . **5** – 0,34 bar (5 psi)
15 – 1,03 bar (15 psi)
25 –1,70 bar (25 psi)
50 – 3,40 bar (50 psi)

Internal leakage . . . . . **Port 2 to 1;** 5 drops / min. maximum @210 bar (3000 psi)

Temperature range . . . . . –40 to 120°C (–40° to 248°F)

Cavity . . . . . C–10–2 (See page 40)

Fluids . . . . . All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18/**16/13**

Standard housing materials . . . . . Aluminum or steel

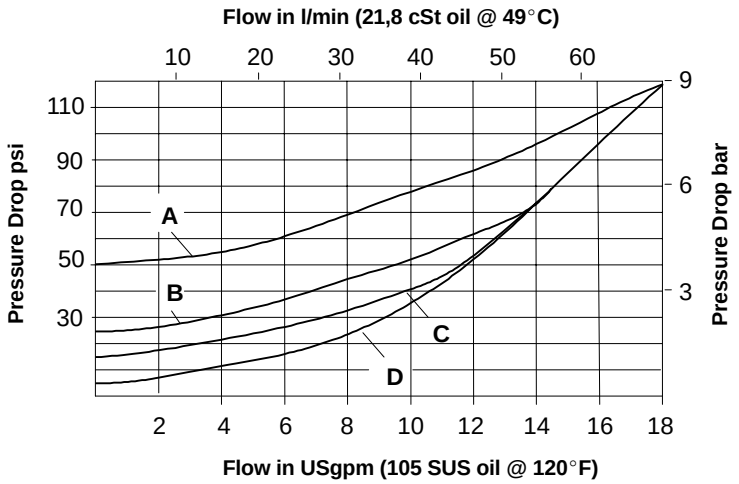
Weight cartridge only . . . . . 0,08 kg (0.17 lb.)

Seal kit . . . . . 565803 Buna–N
566086 Viton®

Viton is a registered trademark of E.I.DuPont

Pressure Drop Curves

Cartridge only



A – CV16-10-P-O-50
B – CV16-10-P-O-25
C – CV16-10-P-O-15
D – CV16-10-P-O-5

Model Code

CV16-10-P

CV16 - 10 (V) - P -(*) ** - ***

1 2 3 4 5 6 7

1 Function

CV16– Check valve

2 Size

10 – 10 Size

3 Seals

Blank– Buna-N
V – Viton

4 Style

P – Poppet

5 Valve housing material
Omit for cartridge only

A – Aluminum
S – Steel

6 Port size

O – Cartridge only

Code	Port size	Housing number		
		Aluminum Light duty	Aluminum Fatigue rated	Steel Fatigue rated
3B	3/8" BSPP	02–175462		———
6T	SAE 6	566151	———	02–175100
8T	SAE 8			02–175101
2G	1/4" BSPP		876702	02–175102
3G	3/8" BSPP	———	876703	02–175103
6H	SAE 6		876700	———
8H	SAE 8		876701	

(See pages 42 – 44 for housing details.)

7 Free flow cracking pressure

5 – 0,34 bar (5 psi) (Anti-cavitation))
15 – 1,03 bar (15 psi)
25 – 1,70 bar (25 psi)
50 – 3,40 bar (50 psi)

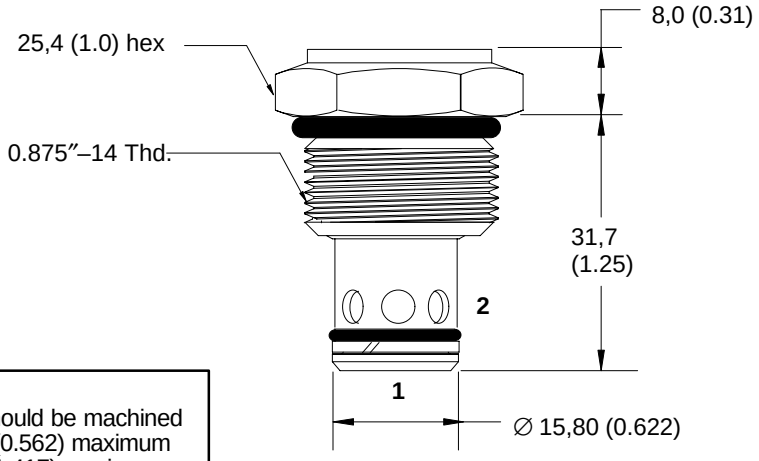
Aluminum housings can be used for pressures up to 210 bar (3000 psi)

Steel housings **must** be used for operating pressures **above** 210 bar (3000 psi)

Dimensions

mm (inch)

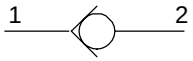
Torque cartridge in housing
A - 47–54 Nm (35–40 lbf ft)
S - 68–75 Nm (50–55 lbf ft)



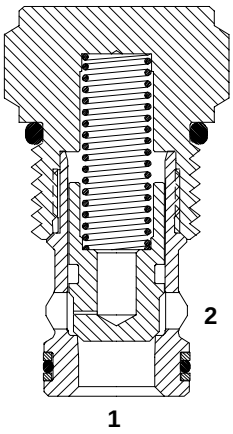
WARNING:
The cavity should be machined to the 14,29 (0.562) maximum diameter and 36,00 (1.417) maximum depth (See Cavity, page 40).

CV11-12
Check valve

Functional symbol



Sectional view



Description

The CV11-12 is a poppet type, screw-in cartridge check valve.

Operation

This valve remains closed until the spring bias is reached at port 1 at which time the poppet lifts off the seat and allows flow from port 1 to port 2.

Ratings and specifications

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

Typical application pressure (all ports) . . . . . 350 bar (5000 psi)

Cartridge fatigue pressure (infinite life) . . . . . 350 bar (5000 psi)

Rated flow . . . . . 114 l/min (30 USgpm)

Free flow cracking pressure @1 l/min (0.25 USgpm) . . . . . **2.5** – 0,17 bar (2.5 psi)
5.0 – 0,35 bar (5.0 psi)
10 – 0,69 bar (10 psi)
20 –1,38 bar (20 psi)
40 – 2,76 bar (40 psi)
80 – 5,50 bar (80 psi)
160 – 11,0 bar (160 psi)

Internal leakage . . . . . **Port 2 to 1** 5 drops / min. maximum @350 bar (5000 psi)

Hysteresis . . . . . Less than 0,35 bar (5 psi)

Temperature range . . . . . –40 to 120°C (–40° to 248°F)

Cavity . . . . . C–12–2 or C–12–2U (See page 40)

Fluids . . . . . All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18/**16/13**

Standard housing materials . . . . . Aluminum or steel

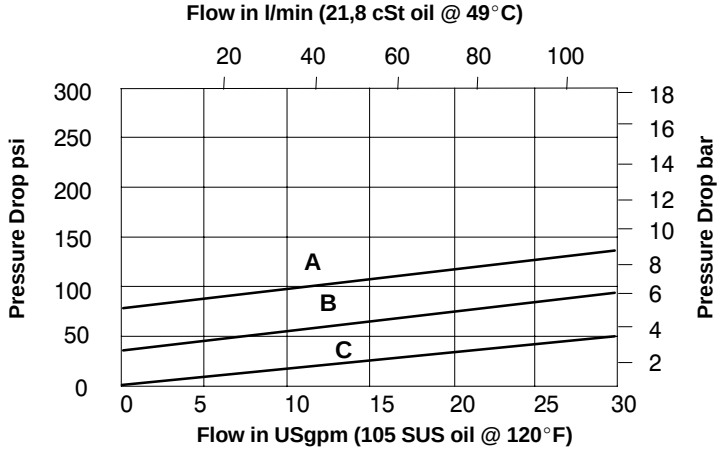
Weight cartridge only . . . . . 0,24 kg (0.54 lb.)

Seal kit . . . . . 02–165889 Buna–N
02–165888 Viton®

Viton is a registered trademark of E.I.DuPont

Pressure Drop Curves

Cartridge only



A – CV11-12-P-O-80
B – CV11-12-P-O-20
C – CV-11-12-P-O-2.5

Model Code

CV11-12

CV11 - 12 (V) - P - (*)* (U) - ****

1 2 3 4 5 6 7 8

1 Function

CV11– Check valve

2 Size

12 – 12 Size

3 Seals

Blank– Buna-N
V – Viton

4 Style

P – Poppet

5 Valve housing material
Omit for cartridge only

A – Aluminum
S – Steel

6 Port size

O – Cartridge only

Code	Port size	Housing number			
		C-12-2U Aluminum Fatigue rated	**C-12-2 Aluminum Fatigue rated**	**C-12-2U Steel Fatigue rated**	**C-12-2 Steel Fatigue rated**
10T	SAE 10	02–160641	02–160640	02–169817	02–169744
12T	SAE 12	02–160645	02–160644	02–169790	02–169782
4G	1/2” BSPP	02–161116	02–161118	02–172512	02–172062
6G	3/4” BSPP	02–161115	02–161117	02–162922	02–169665

(See pages 43 & 44 for housing details.)

7 Cavity

Blank – Cavity without undercut
U – Cavity with undercut

Aluminum housings can be used for pressures up to 210 bar (3000 psi)

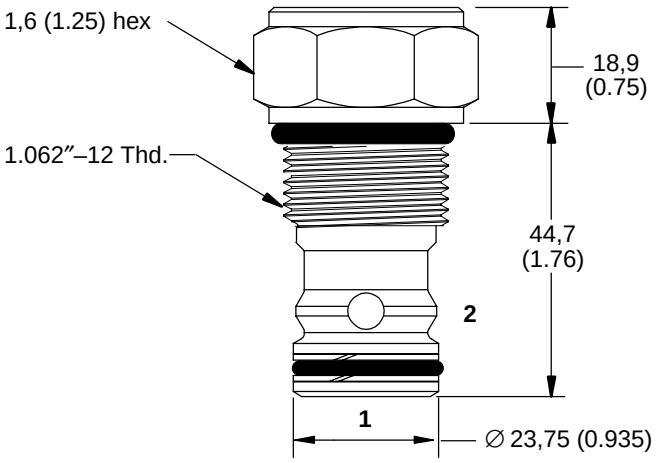
Steel housings **must** be used for operating pressures **above** 210 bar (3000 psi)

8 Cracking pressure

2.5 – 0,17 bar (2.5 psi)
5.0 – 0,35 bar (5.0 psi)
10 – 0,69 bar (10.0 psi)
20 – 1,38 bar (20.0 psi)
40 – 2,75 bar (40.0 psi)
80 – 5,50 bar (80.0 psi)
160– 11,0 bar (160 psi)

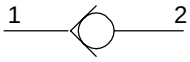
Dimensions
mm (inch)

Torque cartridge in housing
A – 81–95 Nm (60–70 lbf ft)
S – 102–115 Nm (75–85 lbf ft)

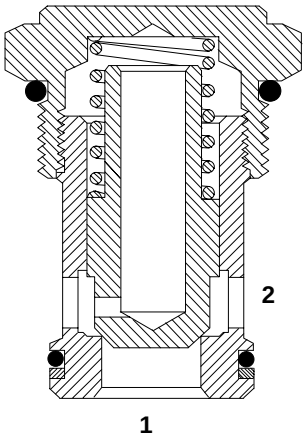


CV1-16-P
Check valve

Functional Symbol



Sectional View



Description

The CV1-16-P is a poppet type, screw-in cartridge check valve.

Operation

This valve remains closed until the spring bias is reached at port 1 at which time the poppet lifts off the seat and allows flow from port 1 to port 2.

Ratings and specifications

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

Typical application pressure (all ports) . . . . . 210 bar (3000 psi)

Cartridge fatigue pressure (infinite life) . . . . . 210 bar (3000 psi)

Rated flow . . . . . 151 l/min (40 USgpm)

Free flow cracking pressure @1 l/min (0.25 USgpm) . . . . . **5** – 0,34 bar (5 psi)
20 – 1,34 bar (20 psi)
30 – 2,07 bar (30 psi)
50 – 3,45 bar (50 psi)

Internal leakage . . . . . **Port 2 to 1** 5 drops / min maximum @210 bar (3000 psi)

Temperature range . . . . . –40 to 120°C (–40° to 248°F)

Cavity . . . . . C–16–2 (See page 40)

Fluids . . . . . All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18/**16/13**

Standard housing materials . . . . . Aluminum

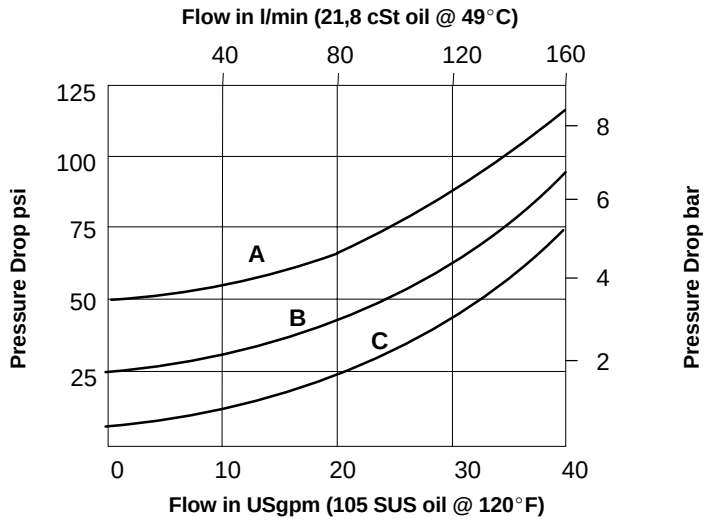
Weight cartridge only . . . . . 0,26 kg (0.58 lb.)

Seal kit . . . . . 565810 Buna–N
889609 Viton®

Viton is a registered trademark of E.I.DuPont

Pressure Drop Curves

Cartridge only



A – CV1-16-P-O-50
B – CV1-16-P-O-20
C – CV1-16-P-O-5

Model Code

CV1-16-P

CV1 - 16 (V) - P - * - ****

1 2 3 4 5 6

1 Function

CV1– Check valve

2 Size

16 – 16 Size

3 Seals

Blank– Buna-N
V – Viton

4 Style

P – Poppet

5 Port size

O – Cartridge only

Code	Port size	Housing number	
		Aluminum Light duty	**Aluminum Fatigue rated**
6B	3/4” BSPP	02–175463	———
12T	SAE 12	566149	
4G	1/2” BSPP	———	876716
6G	3/4” BSPP		876718
10H	SAE 10		876717
12H	SAE 12		566113

(See pages 42 & 43 for housing details.)

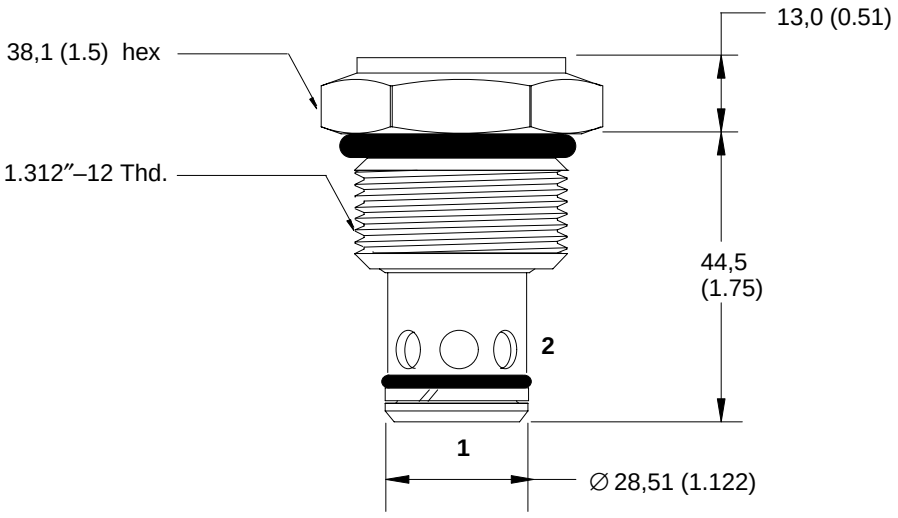
6 Free flow cracking pressure

5 – 0,34 bar (5 psi) (Anti-cavitation)
20 – 1,34 bar (20 psi)
30 – 2,07 bar (30 psi)
50 – 3,45 bar (50 psi)

Dimensions

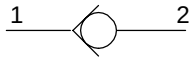
mm (inch)

Torque cartridge in housing
108–122 Nm (80–90 lbf ft)

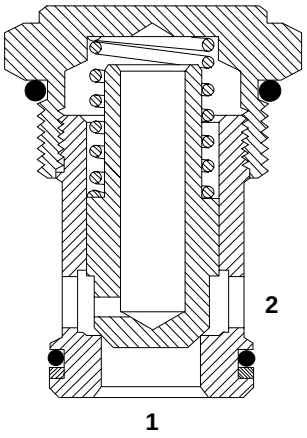


CV2-20-P
Check valve

Functional Symbol



Sectional View



Description

The CV2-20-P is a poppet type, screw-in cartridge check valve.

Operation

This valve remains closed until the spring bias is reached at port 1 at which time the poppet lifts off the seat and allows flow from port 1 to port 2.

Ratings and specifications

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

Typical application pressure (all ports) . . . . . 210 bar (3000 psi)

Cartridge fatigue pressure (infinite life) . . . . . 210 bar (3000 psi)

Rated flow . . . . . 227 l/min (60 USgpm)

Free flow cracking pressure @1 l/min (0.25 USgpm) . . . . . **5** – 0,34 bar (5 psi)
15 – 1,03 bar (15 psi)
30 – 2,07 bar (30 psi)
60 – 4,14 bar (60 psi)
100 – 6,90 bar (100 psi)

Internal leakage . . . . . **Port 2 to 1** 5 drops / min maximum @210 bar (3000 psi)

Temperature range . . . . . –40 to 120°C (–40° to 248°F)

Cavity . . . . . C–20–2 (See page 40)

Fluids . . . . . All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18/**16/13**

Standard housing materials . . . . . Aluminum

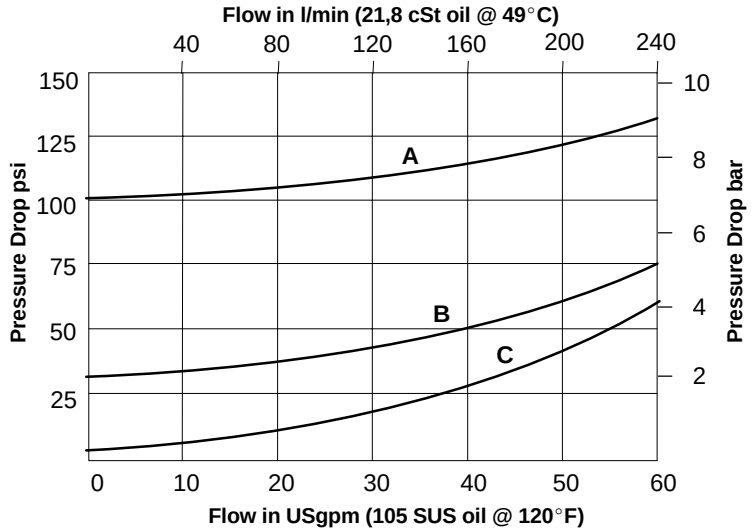
Weight cartridge only . . . . . 0,49 kg (1.09 lb.)

Seal kit . . . . . 889615 Buna–N
889619 Viton®

Viton is a registered trademark of E.I.DuPont

Pressure Drop Curves

Cartridge only



A – CV2-20-P-O-100
B – CV2-20-P-O-30
C – CV2-20-P-O-5

Model Code

CV2-20-P

CV2 - 20 (V) - P - * - ***** - *** - ***

1 2 3 4 5 6

1 Function

CV2– Check valve

2 Size

20 – 20 Size

3 Seals

Blank– Buna-N
V – Viton

4 Style

P – Poppet

5 Port size

O – Cartridge only

Code	Port size	Housing number	
		Aluminum Light duty	Aluminum Fatigue rated
8B	1” BSPP	02–175464	———
16T	SAE 16	566409	
6G	3/4” BSPP	———	876732
8G	1” BSPP		876734
12H	SAE 12		876733
16H	SAE 16		876735

(See pages 42 & 43 for housing details.)

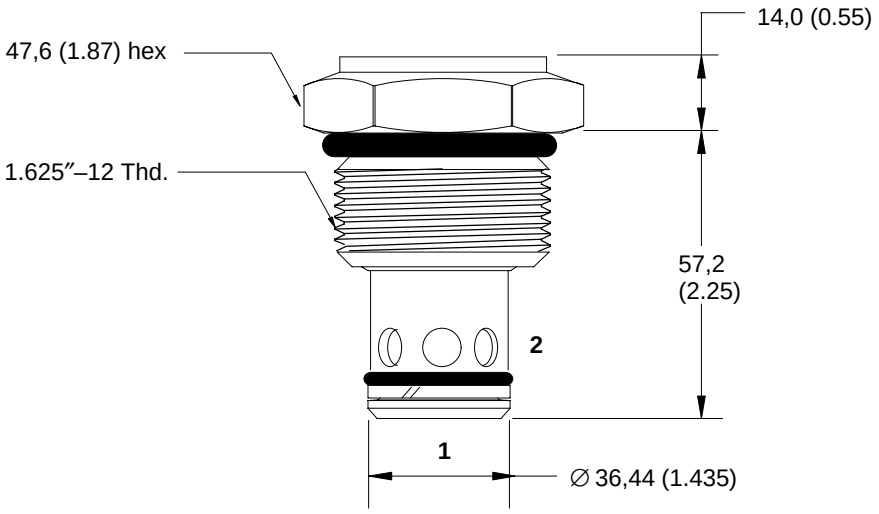
6 Free flow cracking pressure

5 – 0,34 bar (5 psi) (Anti-cavitation)
15 – 1,03 bar (15 psi)
30 – 2,07 bar (30 psi)
60 – 4,14 bar (60 psi)
100– 6.90 bar (100 psi)

Dimensions

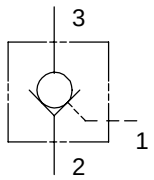
mm (inch)

Torque cartridge in housing
128–155 Nm (95–115 lbf ft)

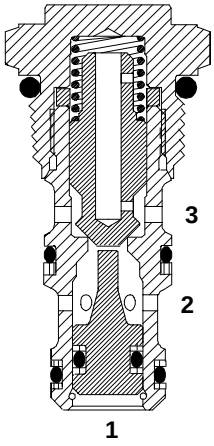


SPC2-8
Single pilot check valve

Functional Symbol



Sectional View



Description

The SPC2–8 is a poppet type, pilot-to-open, screw-in cartridge type check valve.

Operation

The SPC2–8 allows flow from port 2 to port 3 when the spring bias is overcome. Flow is blocked from port 3 to port 2 until sufficient pilot pressure is applied at port 1.

Ratings and specifications

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

Typical application pressure (all ports) . . . . . 240 bar (3500 psi)

Cartridge fatigue pressure (infinite life) . . . . . 240 bar (3500 psi)

Rated flow . . . . . 19 l/min (5 USgpm)

Pilot ratio 3:1

Cracking pressure . . . . . **15** – 1,0 bar (15 psi)
35 – 2,4 bar (35 psi)
65 – 4,5 bar (65 psi)

Internal leakage. All leakage rates @240 bar (3500 psi).
Port 3 to 2 . . . . . 5 drops / min maximum
Port 2 to 1 Unsealed piston* . . . 140 cc/min maximum, zero leakage with sealed piston.
**Unsealed piston supplied with 15 spring option only.*

Temperature range . . . . . -40 to 120°C (-40° to 248°F)

Cavity . . . . . C–8–3 (See page 41)

Fluids . . . . . All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18/**16/13**

Standard housing materials . . . . . Aluminum or steel

Weight cartridge only . . . . . 0,07 kg (0.15 lbs.)

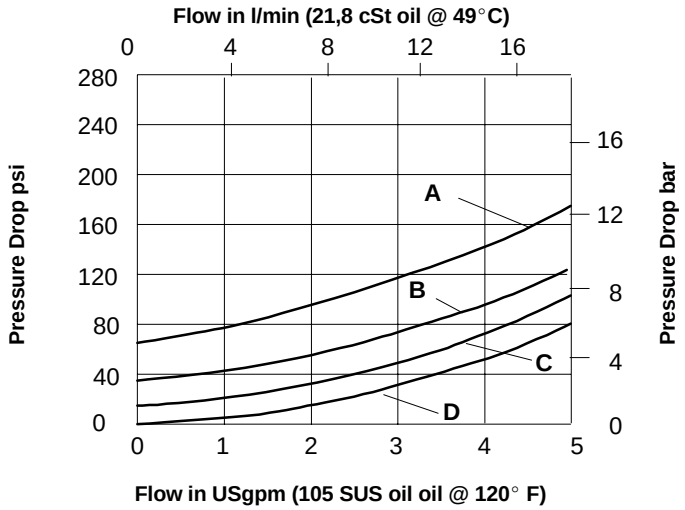
Seal kits . . . . . 02–173326 Buna N
02–173327 Viton®

Viton is a registered trademark of E.I.DuPont

Pressure Drop Curves

Cartridge only

WARNING: Do not use Single pilot check valves in load holding applications where either overrunning loads are possible; or, load release speed is critical. Failure to observe these guidelines may result in bodily injury or damage to equipment.



A – 65 psi (port 2 to 3)
B – 35 psi (port 2 to 3)
C – 15 psi (port 2 to 3)
D – Port 3 to 2 (piloted open)

Model Code

SPC2-8

SPC2 – 8 (V) – P – (*) ** – **

1 2 3 4 5 6 7

1 Function

SPC2– Single pilot check valve

2 Size

8 – 8 Size

3 Seals

Blank– Buna-N
V – Viton

4 Style

P – Poppet

5 Valve housing material
Omit for cartridge only

A – Aluminum
S – Steel

6 Port size

O – Cartridge only

Code	Port size	Housing number	
		Aluminum Fatigue rated	Steel Fatigue rated
4T	SAE 4	02–160741	02–160745
6T	SAE 6	02–160742	02–160744
2G	1/4" BSPP	02–160739	02–160743
3G	3/8" BSPP	02–160740	02–160746

(See pages 43 & 44 for housing details.)

7 Cracking pressure

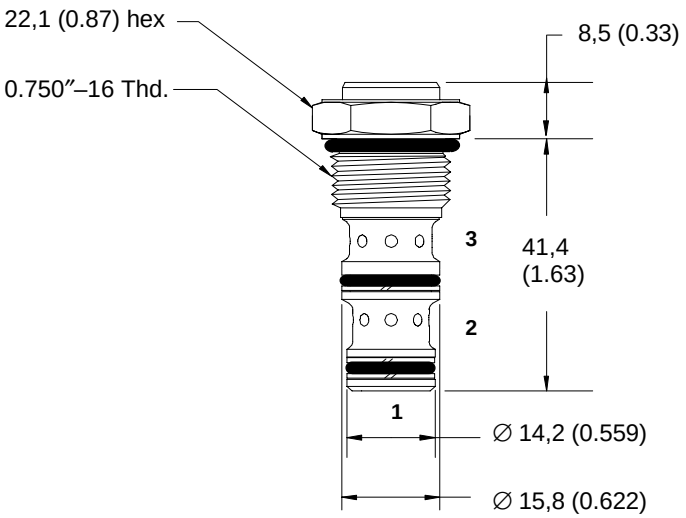
15 – 1,0 bar (15 psi)
35 – 2,4 bar (35 psi)
65 – 4,5 bar (65 psi)

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)

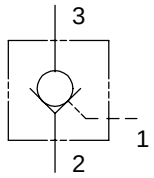
Dimensions
mm (inch)

Torque cartridge in housing 34–41 Nm (25–30 lbf ft))

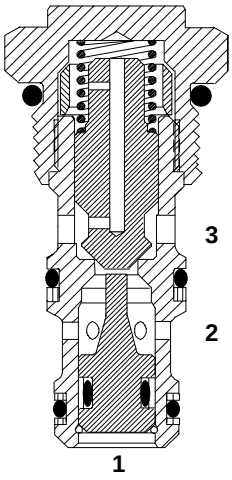


SPC2-10
Single pilot check valve

Functional Symbol



Sectional View



Description
The SPC2-10 is a poppet type pilot- to-open check valve, screw in cartridge type.

Operation
This valve allows flow from Port 2 to Port 3, when the spring bias is overcome. Flow is blocked from Port 3 to Port 2 until sufficient pilot pressure is applied at Port 1.

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

Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (Infinite life)	210 bar (3000 psi)
Rated flow	23 l/min (6 USgpm)
Cracking pressure @1 l/min (0.25 USgpm)	**25** – 1,72 bar (25 psi) **50** – 3,45 bar (50 psi) **100** – 6,90 bar (100 psi)
Internal leakage	**Port 3 to 2** 5 drops / min maximum @210 bar (3000 psi)
Temperature range	–40 to 120°C (–40° to 248°F)
Pilot ratio	4:1
Cavity	C–10–3 (See page 41)
Fluids	All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/**16/13**
Standard housing materials	Aluminum
Weight cartridge only	0,08 kg (0.18)
Seal kit (Check valve)	02-153267 Buna–N 02-173666 Viton®

Pilot Pressure calculation
Nominal pressure to open valve by remote control

Pilot pressure at port 1 =

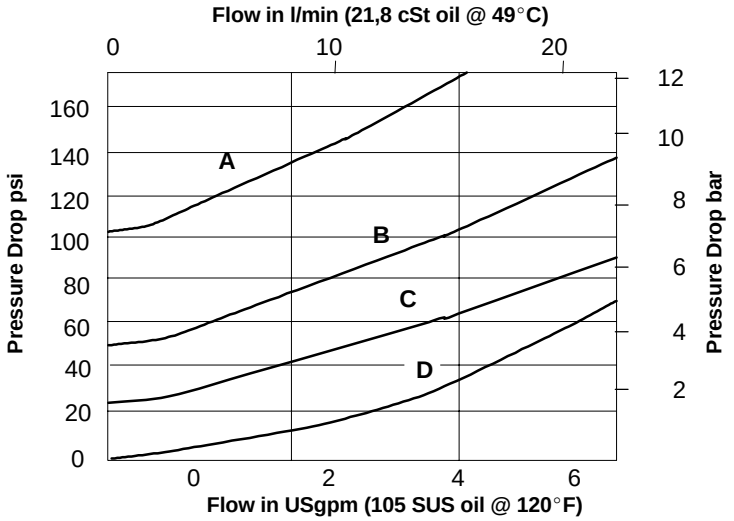
$$\frac{\text{Cracking pressure} + \text{Pressure at port 3}}{4} + (0.75 \times \text{Pressure at Port 2})$$

Viton is a registered trademark of E.I.DuPont

Pressure Drop Curves
Cartridge only

WARNING: Do not use Single pilot check valves in load holding applications where either overrunning loads are possible; or, load release speed is critical. Failure to observe these guidelines may result in bodily injury or damage to equipment.

A – SPC2-10-P-0-100
B – SPC2-10-P-0-50
C – SPC2-10-P-0-25
D – Piloted Open all cartridges



Model Code

SPC2-10

SPC2 - 10 (V) - P - ** - ***

1 2 3 4 5 6

1 Function

SPC2– Single pilot check valve

2 Size

10 – 10 Size

3 Seals

Blank– Buna-N
V – Viton

4 Style

P – Poppet

5 Port size

O – Cartridge only

Code	Port size	Housing number	
		Aluminum Light duty	Aluminum Fatigue rated
3B	3/8” BSPP	02–173358	———
6T	SAE 6	566162	
2G	1/4” BSPP	———	876705
3G	3/8” BSPP		876714
6H	SAE 6		876704
8H	SAE 8		876711

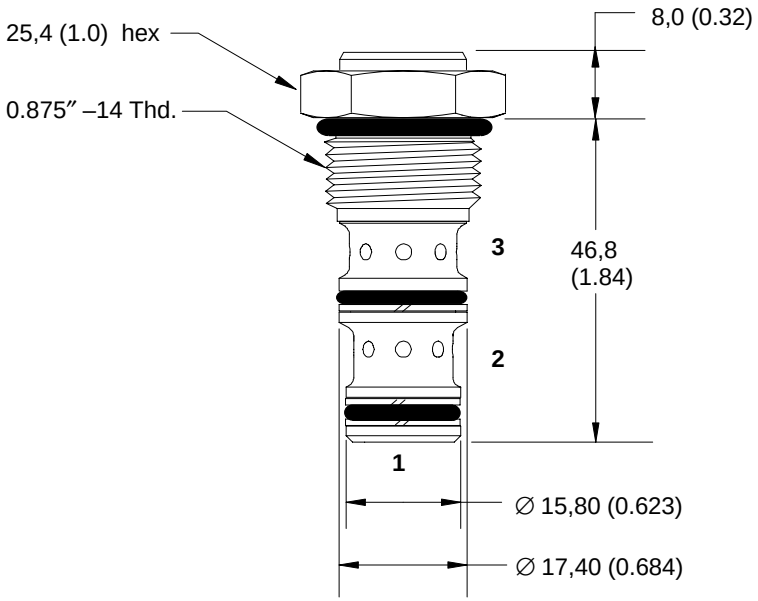
(See pages 42 & 43 for housing details.)

6 Free flow cracking pressure

25 – 1,72 bar (25 psi)
50 – 3,45 bar (50 psi)
100– 6,90 bar (100 psi)

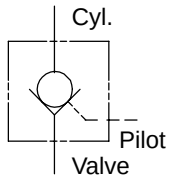
Dimensions
mm (inch)

Torque cartridge in housing
47–54 Nm (35–40 lbf ft)

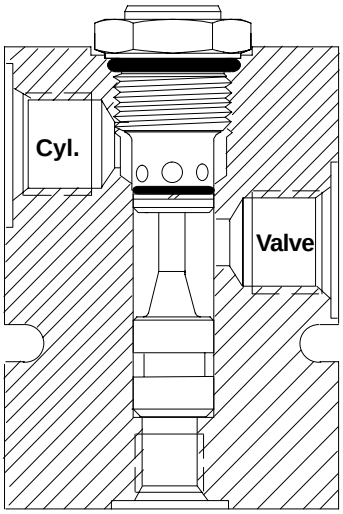


SPC1-10
Single pilot check valve

Functional Symbol



Sectional View



Pilot

Description

The SPC1-10 is an in-line housing type, pilot-to-open check valve.

Operation

This valve allows flow from the valve port to the cylinder port when the spring bias is overcome. Flow is blocked from the cylinder port to the valve port until sufficient pilot pressure is applied at the pilot port.

Ratings and specifications

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

Typical application pressure (all ports) . . . . . 210 bar (3000 psi)

Rated flow . . . . . 45 l/min (12 USgpm)

Free flow cracking pressure @1 l/min (0.25 USgpm) . . . . . 1,03 bar (15 psi)

Internal leakage cylinder port to valve port . . . . . 5 drops / min maximum @ 210 bar (3000 psi)

Temperature range . . . . . –40 to 120°C (–40° to 248°F)

Pilot ratio 4:1

Fluids . . . . . All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18/**16/13**

Standard housing materials . . . . . Aluminum

Weight . . . . . 0,52 kg (1.14 lb.)

Seal kit (Check valve) . . . . . 565803 Buna–N
566086 Viton®

Seal kit (Pilot piston) . . . . . 889648 Buna–N
889649 Viton®

Pilot Pressure calculation

Nominal pressure to open valve by remote control

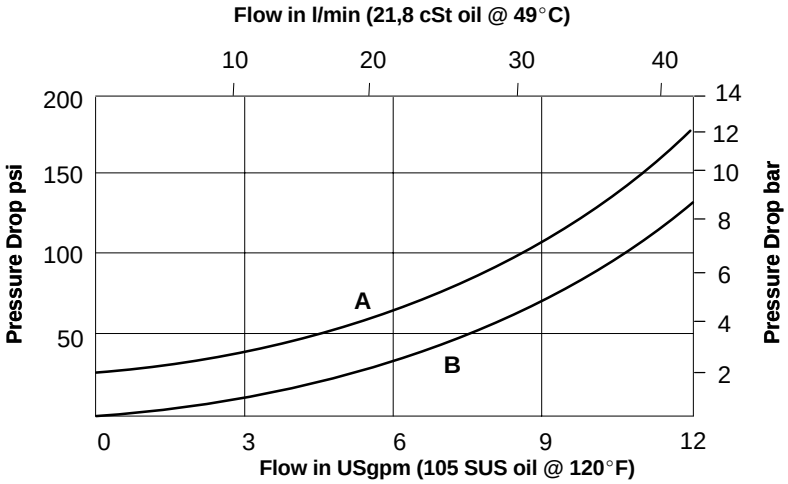
Pilot pressure at Pilot port =

$$\frac{\text{Cracking pressure + Pressure at Cyl port}}{4} + (0.75 \times \text{Pressure at Valve port})$$

Viton is a registered trademark of E.I.DuPont

Pressure Drop Curves

WARNING: Do not use Single pilot check valves in load holding applications where either overrunning loads are possible; or, load release speed is critical. Failure to observe these guidelines may result in bodily injury or damage to equipment.



A – Port 2-3 Free Flow

B – Port 3-2 Piloted Open

Model Code

SPC1-10

SPC1 - 10 (S) (V) - P - **

1 2 3 4 5 6

1 Function

SPC1– Single pilot check valve

2 Size

10 – 10 Size

3 Piston Seals

Blank– No seals
S – With seals

4 Seals

Blank– Buna-N
V – Viton

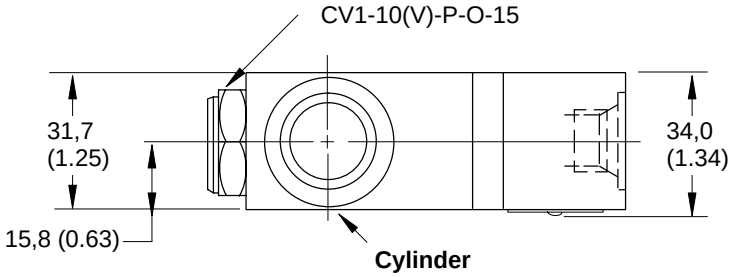
5 Seating type

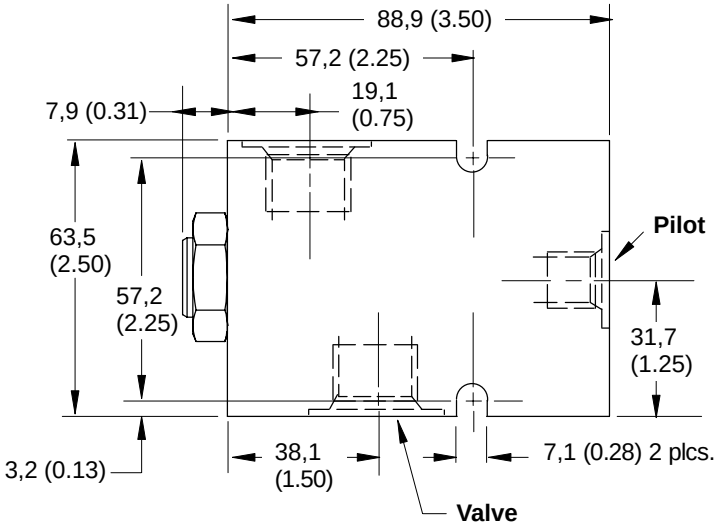
P – Poppet

6 Port size

3B– 3/8” BSPP (Light duty)
6T – SAE 6 (Light duty)

Dimensions
mm (inch)





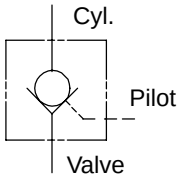
Torque cartridge in housing
47–54 Nm (35–40 lbf ft)

Housing Port Size	All Ports	Part Number
3B	3/8” BSPP	02-178259
6T	SAE 6	02-161386

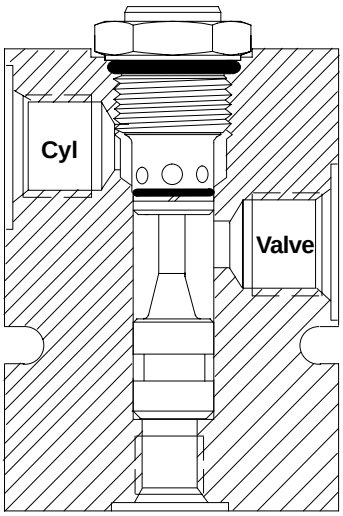
See page 53 for piston numbers

SPC1-16
Single pilot check valve

Functional Symbol



Sectional View



Pilot

Description

The SPC1-16 is an in-line housing type, pilot-to-open screw in cartridge type check valve.

Operation

This valve allows flow from the valve port to the cylinder port when the spring bias is overcome. Flow is blocked from the cylinder port to the valve port until sufficient pilot pressure is applied at the pilot port.

Ratings and specifications

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

Typical application pressure (all ports) . . . . . 210 bar (3000 psi)

Rated flow . . . . . 151 l/min (40 USgpm)

Free flow cracking pressure @1 l/min (0.25 USgpm) . . . . . 1,38 bar (20 psi)

Internal leakage cylinder port to valve port . . . . . 5 drops / min maximum @ 210 bar (3000 psi)

Temperature range . . . . . –40 to 120°C (–40° to 248°F)

Pilot ratio 4:1

Fluids . . . . . All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18/**16/13**

Standard housing materials . . . . . Aluminum

Weight . . . . . 1,83 kg (4.03 lb.)

Seal kit (Check valve) . . . . . 565810 Buna–N
889609 Viton®

Seal kit (Pilot piston) . . . . . 889644 Buna–N
02-173598 Viton®

Pilot Pressure calculation

Nominal pressure to open valve by remote control

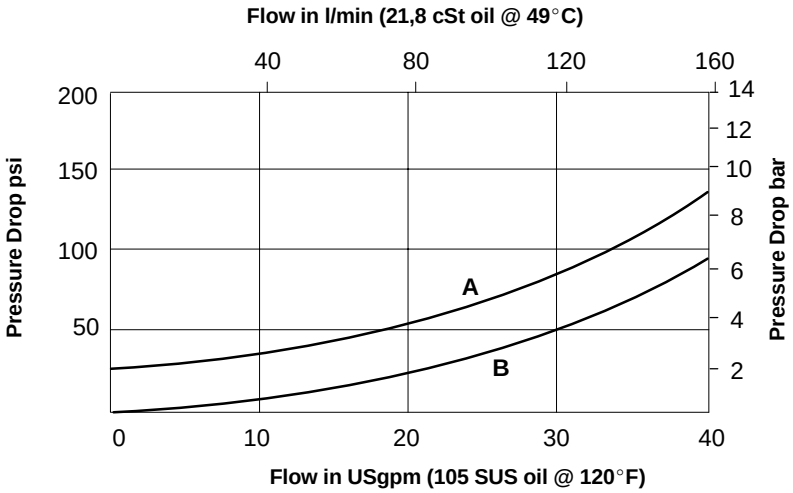
Pilot pressure at Pilot port =

$$\frac{\text{Cracking pressure} + \text{Pressure at Cyl port}}{4} + (0.75 \times \text{Pressure at Valve port})$$

Viton is a registered trademark of E.I.DuPont

Pressure Drop Curves

WARNING: Do not use Single pilot check valves in load holding applications where either overrunning loads are possible; or, load release speed is critical. Failure to observe these guidelines may result in bodily injury or damage to equipment.



A – Port 2-3 Free Flow
B – Port 3-2 Piloted Open

Model Code

SPC1-16

SPC1 - 16 (S) (V) - P - *

1 2 3 4 5 6

1 Function

SPC1 – Single pilot check valve

2 Size

16 – 16 Size

3 Piston Seals

Blank- No seals
S – With seals

4 Seals

Blank–Buna-N
V – Viton

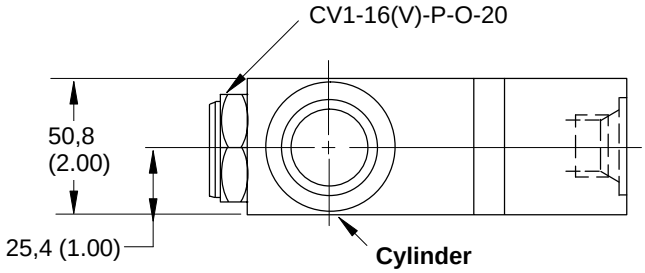
5 Seating type

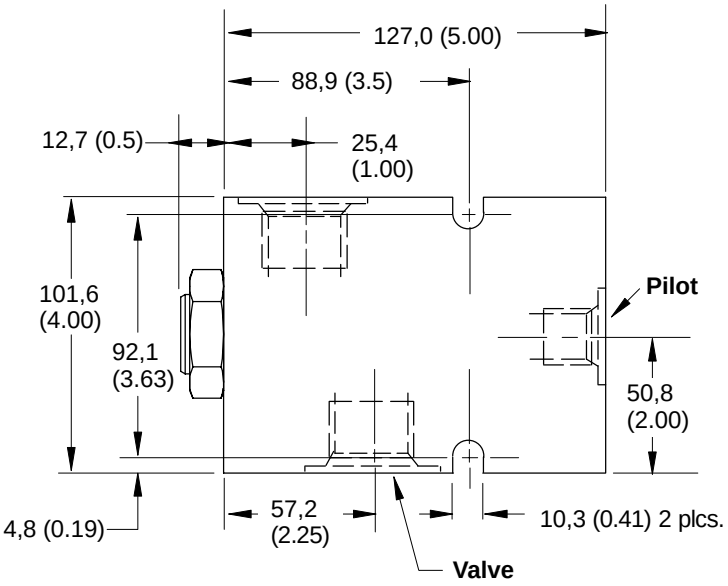
P – Poppet

6 Port size

6B– 3/4” BSPP (Light duty)
12 – SAE 12 (Light duty)

Dimensions
mm (inch)





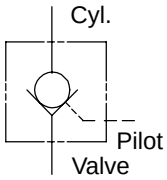
Torque cartridge in housing
108–122 Nm (80–90 lbf ft)

Housing Port Size	All Ports	Part Number
6B	3/4” BSPP	02-178260
12T	SAE 12	889158

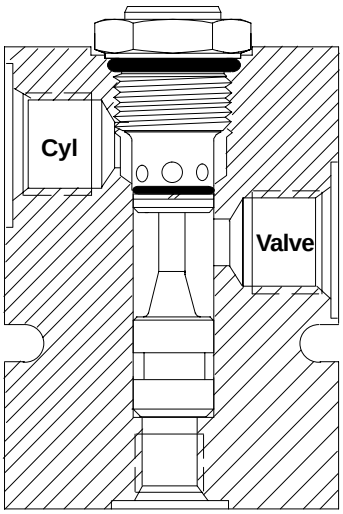
See page 53 for piston numbers

SPC1-20
Single pilot check valve

Functional Symbol



Sectional View



Pilot

Description

The SPC1-20 is an inline housing type, pilot-to-open check valve.

Operation

This valve allows flow from the valve port to the cylinder port when the spring bias is overcome. Flow is blocked from the cylinder port to the valve port until sufficient pilot pressure is applied at the pilot port.

Ratings and specifications

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

Typical application pressure (all ports) . . . . . 210 bar (3000 psi)

Rated flow . . . . . 227 l/min (60 USgpm)

Free flow cracking pressure @1 l/min (0.25 USgpm) . . . . . 1,03 bar (15 psi)

Internal leakage cylinder port to valve port . . . . . 5 drops / min maximum @ 210 bar (3000 psi)

Temperature range . . . . . –40 to 120°C (–40° to 248°F)

Pilot ratio 4:1

Fluids . . . . . All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18/**16/13**

Standard housing materials . . . . . Aluminum

Weight . . . . . 3,17 kg (6.98 lb.)

Seal kit (Check valve) . . . . . 889615 Buna–N
889619 Viton®

Seal kit (Pilot piston) . . . . . 889656 Buna–N
02-173599 Viton®

Pilot Pressure calculation

Nominal pressure to open valve by remote control

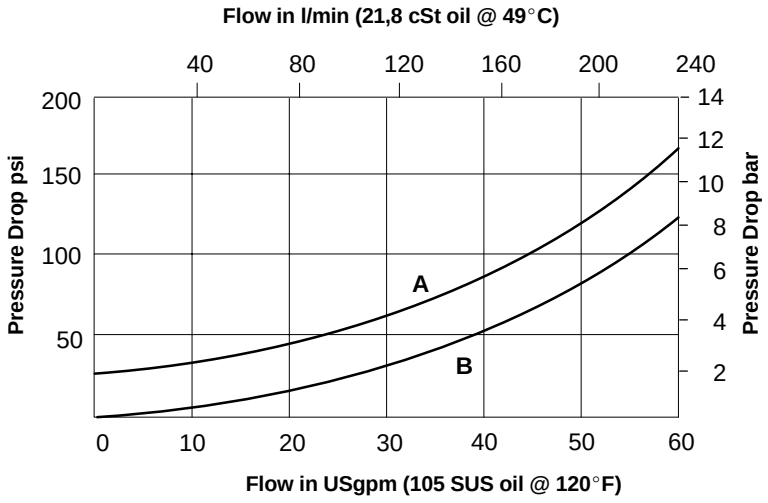
Pilot pressure at Pilot port =

$$\frac{\text{Cracking pressure + Pressure at Cyl port}}{4} + (0.75 \times \text{Pressure at Valve port})$$

Viton is a registered trademark of E.I.DuPont

Pressure Drop Curves

WARNING: Do not use Single pilot check valves in load holding applications where either overrunning loads are possible; or, load release speed is critical. Failure to observe these guidelines may result in bodily injury or damage to equipment.



A – Port 2-3 Free Flow
B – Port 3-2 Piloted Open

Model Code

SPC1-20

SPC1 - 20 (S) (V) - P - *

1 2 3 4 5 6

1 Function

SPC1–Single pilot check valve

2 Size

20 – 20 Size

3 Piston Seals

Blank-No seals
S – With seals

4 Seals

Blank–Buna-N
V – Viton

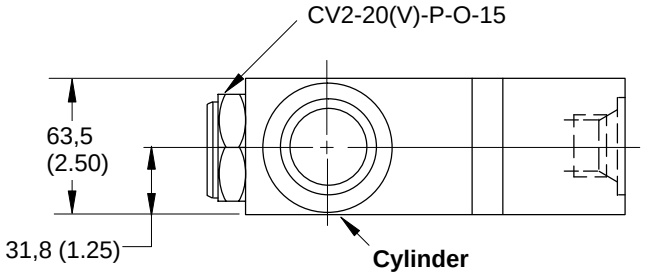
5 Seating type

P – Poppet

6 Port size

8B – 1” BSPP (Light duty)
16T – SAE 16 (Light duty)
20T – SAE 20 (Light duty)

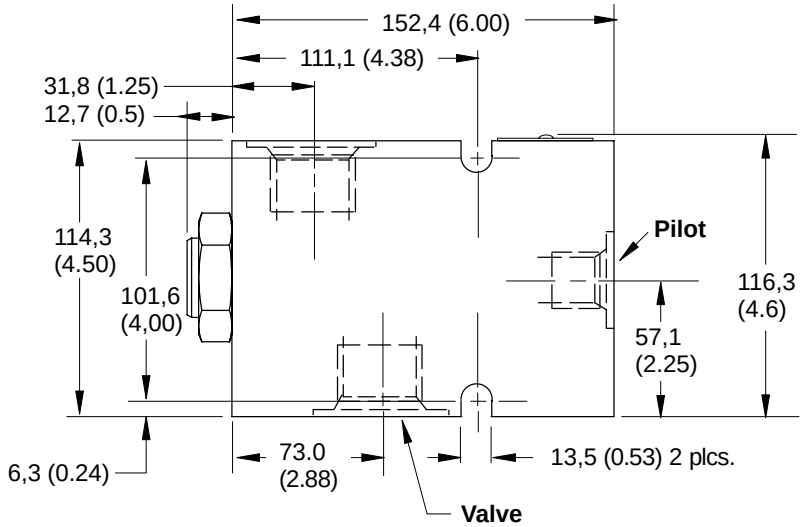
Dimensions
mm (inch)



Torque cartridge in housing
128–155 Nm (95–115 lbf ft)

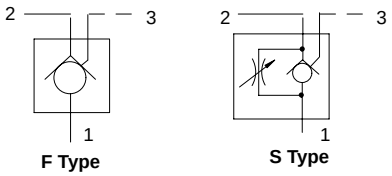
Housing Port Size	All Ports	Part Number
8B	1” BSPP	02-178261
16T	SAE 16	889161
20T	SAE 20	889162

See page 53 for piston numbers

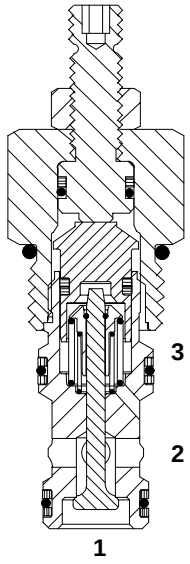


POC1-10
Pilot operated check valve

Functional Symbol



Sectional View



Description

The POC1-10 is a pilot-to-open, screw-in cartridge type check valve.

Operation

The POC1-10 will positively lock a load from port 1 to port 2, but will release the load by applying pressure to the pilot port (port 3). The load can also be released by adjusting the optional override.

Ratings and specifications

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

Typical application pressure (all ports) . . . . . 350 bar (5000 psi)

Cartridge fatigue pressure (infinite life) . . . . . 310 bar (4500 psi)

Rated flow . . . . . 57 l/min (15 USgpm)

Pilot ratio 3:1

Internal leakage . . . . . **Port 1 to 2** Less than 5 drops / min maximum @ 350 bar (5000 psi).

Free flow cracking Pressure @ 1.0 l/min (0.25 USgpm) . . . . . 0,3 bar (5 psi); 2,0 bar (30 psi); 5,1 bar (75 psi); 6,9 bar (100 psi)

Hysteresis . . . . . less than 3 bar (45 psi)

Temperature range . . . . . –40 to 120°C (–40° to 248°F)

Cavity . . . . . C–10–3S (see page 41)

Fluids . . . . . All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18/**16/13**

Standard housing materials . . . . . Aluminum or steel

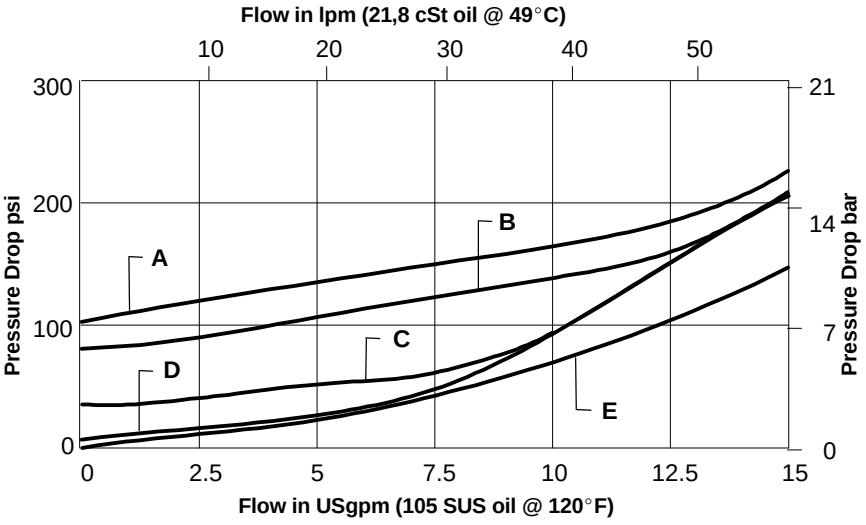
Weight cartridge w/out override . . . . . 0,10 kg (0.23 lb.)
cartridge w/override . . . . . 0,17 kg (0.36 lb.)

Seal kit . . . . . 889650 Buna-N
889652 Viton®

Viton is a registered trademark of E.I.DuPont

Pressure Drop Curves

Cartridge only



WARNING: Do not use Pilot-to-Open check valves in load holding applications where either overrunning loads are possible; or, load release speed is critical. Failure to observe these guidelines may result in bodily injury or damage to equipment.

A – 100 psi
B – 75 psi
C – 30 psi
D – 5 psi
E – Full pilot

3:1 Ratio

$$\text{Pilot pressure, nominal at Port 3} = \frac{(\text{Crack Pressure} + \text{Port 1 Pressure} - \text{Port 2 Pressure})}{3} + \text{Port 2 Pressure}$$

Model Code

POC1-10

POC1 – 10 (V) – * – * * * – ***** 1 2 3 4 5 6 7 8

1 Function

POC1–Pilot operated check valve

2 Valve size

10 – Size 10

3 Seals

Blank–Buna-N
V – Viton

4 Override option

F – None
S – Adjustable override

5 Cartridge/valve housing

O – Cartridge only
I – Inline body
N – Close coupled – nipple mounting
G – Gasket mounted – single
D – Dual P.O. check – line mounted
P – Dual P.O. check – gasket mounted

6 Valve housing material

A – Aluminum
S – Steel

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)

7 Housing type/port sizes

I – Inline Mounted
Aluminum fatigue rated
6H – SAE 6
8H – SAE 8
2G – 1/4" BSPP
3G – 3/8" BSPP

Aluminum light duty
6T – SAE 6

Steel fatigue rated
6T – SAE 6
8T – SAE 8
10T– SAE 10
3G – 3/8" BSPP
4G – 1/2" BSPP

(See pages 45–48 for housing dimensions and page 52 for housing part numbers)

7 Housing type/port sizes (cont'd)

N – Nipple mounted
6T – SAE 6
3G – 3/8" BSPP

G – Gasket mounted (single)
6T – SAE 6
3G – 3/8" BSPP

D – Dual line mounted
6T – SAE 6
8T – SAE 8
10T– SAE 10
2G – 1/4" BSPP
3G – 3/8" BSPP
4G – 1/2" BSPP

P – Dual gasket mounted
6T – SAE 6
3G – 3/8" BSPP

(See pages 45 – 48 for housing details)

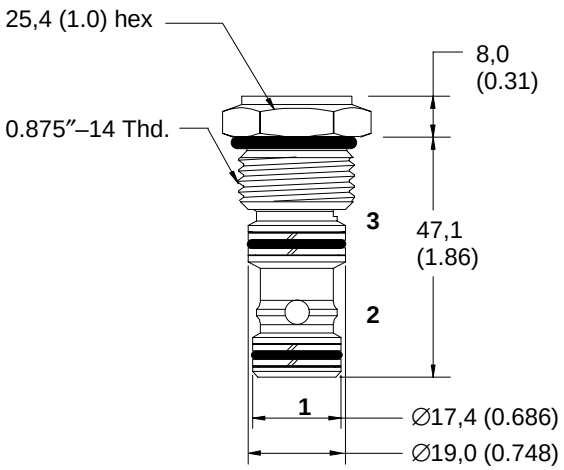
8 Free flow cracking pressure

005 – 0,3 bar (5 psi) (anti-cavitation)
030 – 2,0 bar (30 psi)
075 – 5,1 bar (75 psi)
100 – 6,9 bar (100 psi)

Dimensions

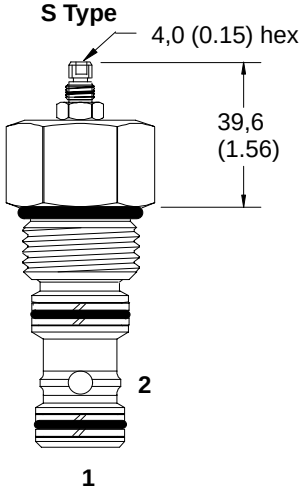
mm (inch)

F Type



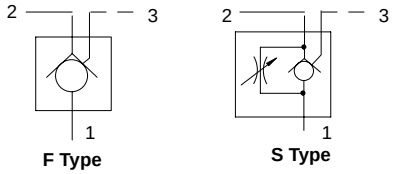
Torque cartridge in housing
A – 47–54 Nm (35–40 lbf ft)
S – 68–75 Nm (50–55 lbf ft)

S Type

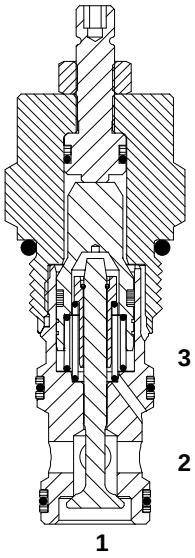


POC1-12
Pilot operated check valve

Functional Symbol



Sectional View



Description

The POC1-12 is a pilot-to-open, screw-in cartridge type check valve.

Operation

The POC1-12 will positively lock a load from port 1 to port 2, but will release the load by applying pressure to the pilot port (port 3). The load can also be released by adjusting the optional override.

Ratings and specifications

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

Typical application pressure (all ports) . . . . . 350 bar (5000 psi)

Cartridge fatigue pressure (infinite life) . . . . . 310 bar (4500 psi)

Rated flow . . . . . 114 l/min (30 USgpm)

Pilot ratio 3:1

Internal leakage . . . . . **Port 1 to 2** 5 drops / min maximum @ 350 bar (5000 psi).

Free flow cracking pressure @ 1.0 l/min (0.25 USgpm) . . . . . 0,3 bar (5 psi); 2,0 bar (30 psi); 5,1 bar (75 psi); 6,9 bar (100 psi)

Hysteresis . . . . . less than 3 bar (45 psi)

Temperature range . . . . . –40 to 120°C (–40° to 248°F)

Cavity . . . . . C–12–3S (see page 41)

Fluids . . . . . All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18/**16/13**

Standard housing materials . . . . . Aluminum or steel

Weight cartridge w/out override . . . . . 0,26 kg (0.58 lb.)
cartridge w/override . . . . . 0,34 kg (0.74 lb.)

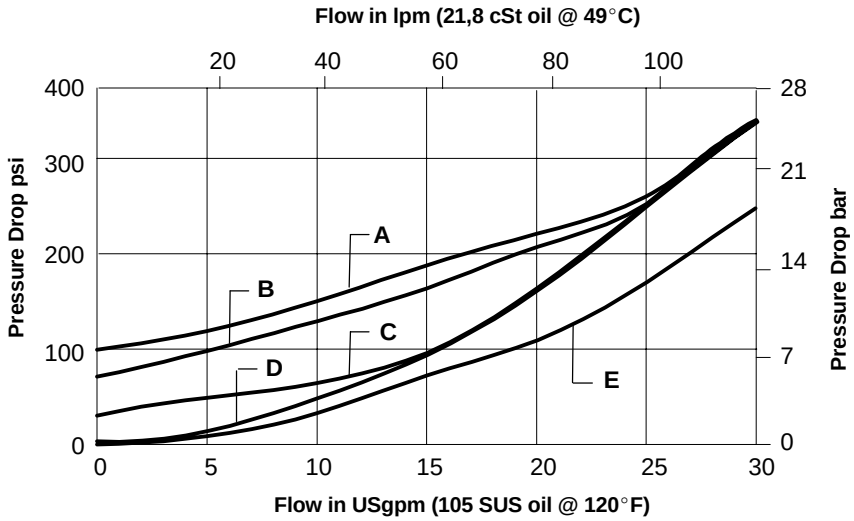
Seal kits . . . . . 02-180095 Buna-N
02-165887 Viton®

Viton is a registered trademark of E.I.DuPont

Pressure Drop Curves

Cartridge only

WARNING: Do not use Pilot-to-Open check valves in load holding applications where either overrunning loads are possible; or, load release speed is critical. Failure to observe these guidelines may result in bodily injury or damage to equipment.



A – 100 psi
B – 75 psi
C – 30 psi
D – 5 psi
E – Full pilot

3:1 Ratio

$$\text{Pilot pressure, nominal at Port 3} = \frac{\text{Crack Pressure} + \text{Port 1 Pressure} - \text{Port 2 Pressure}}{3} + \text{Port 2 Pressure}$$

Model Code

POC1-12

POC1 – 12 (V) – * – * * * – *****

1 2 3 4 5 6 7 8

1 Function

POC1– Pilot operated check valve

2 Valve size

12 – Size 12

3 Seals

Blank– Buna-N
V – Viton

4 Override option

F – None
S – Adjustable override

5 Cartridge/valve housing

O – Cartridge only
I – Inline body
B – SAE Code 61 4-bolt pad
N – Close coupled–nipple mounting
G – Gasket mounted–single
D – Dual counterbalance–line mounted
P – Dual counterbalance–gasket mounted

6 Valve housing material

A – Aluminum
S – Steel

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)

7 Housing type/port sizes

I – Inline Mounted
Fatigue Rated
10T– SAE 10
12T– SAE 12
4G – 1/2" BSPP
6G – 3/4" BSPP

B – 4-Bolt Pad
6T – 3/4" SAE Code 61

N – Nipple Mounted
8T – SAE 8
4G – 1/2" BSPP

(See pages 49–51 for housing dimensions and page 52 for part numbers)

7 Housing type/port sizes (Cont'd)

G – Gasket Mounted (Single)
8T – SAE 8
4G – 1/2" BSPP

D – Dual Line Mounted
10T– SAE 10
12T– SAE 12
4G – 1/2" BSPP

P – Dual Gasket Mounted
8T – SAE 8
4G – 1/2" BSPP

(See page 49 – 51 for housing details)

8 Free flow cracking pressure

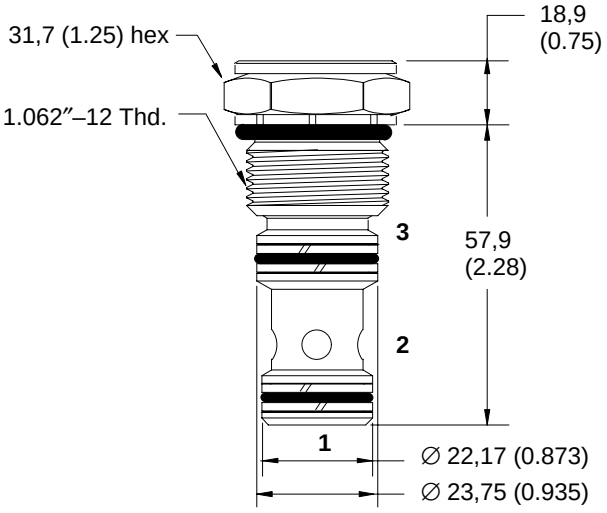
005 – 0,3 bar (5 psi) (anti-cavitation)
030 – 2,0 bar (30 psi)
075 – 5,1 bar (75 psi)
100 – 6,9 bar (100 psi)

Dimensions

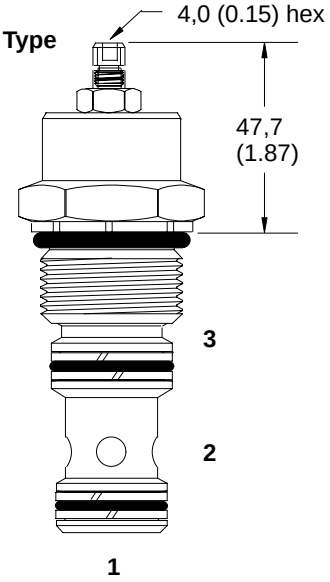
mm (inch)

Torque cartridge in housing
A – 81–95 Nm (60–70 lbf ft)
S – 102–115 Nm (75–85 lbf ft)

F Type

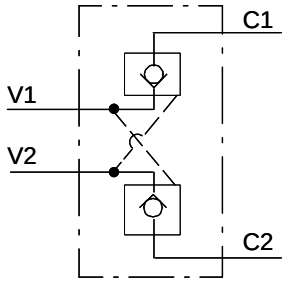


S Type

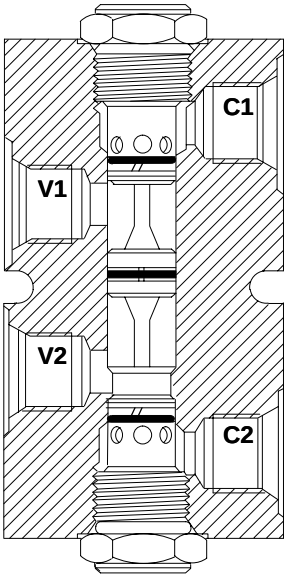


DPC1-10
Double pilot check valve

Functional Symbol



Sectional View



Description

The DPC1-10 is an inline housing type, double pilot operated check valve.

Operation

This valve allows flow from the V ports to the C ports, while blocking flow from the C ports to the V ports. Flow will be allowed from the C ports to the V ports when pressure is applied at the opposite V port.

Ratings and specifications

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

Typical application pressure (all ports) . . . . . 210 bar (3000 psi)

Rated flow . . . . . 45 l/min (12 USgpm)

Free flow cracking pressure @1 l/min (0.25 USgpm) . . . . . 1,03 bar (15 psi)

Internal leakage cylinder port to valve port . . . . . 5 drops / min maximum @ 210 bar (3000 psi)

Temperature range . . . . . –40 to 120°C (–40° to 248°F)

Pilot ratio 4:1

Fluids . . . . . All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18/**16/13**

Standard housing materials . . . . . Aluminum

Weight . . . . . 1,83 kg (4.03 lb.)

Seal kit (Check valve) . . . . . 889615 Buna–N
889619 Viton®

Seal kit (Pilot piston) . . . . . 889656 Buna–N
02-173599 Viton®

Pilot Pressure calculation

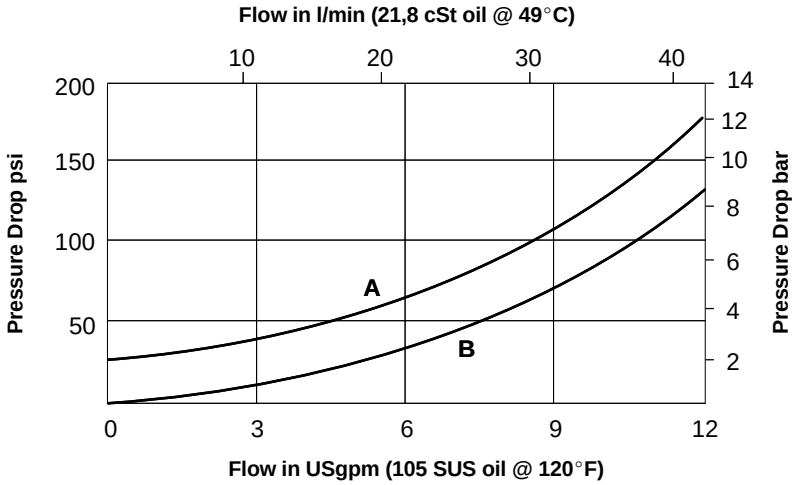
Nominal pressure to open valve by remote control

Pilot pressure at Pilot port =

$$\frac{\text{Cracking pressure + Pressure at Cyl port}}{4} + (0.75 \times \text{Pressure at Valve port})$$

Viton is a registered trademark of E.I.DuPont

Pressure Drop Curves



A – Port 2-3 Free Flow

B – Port 3-2 Piloted Open

Model Code

DPC1-10

DPC1 - 10 (S) (V) - P - **

1 2 3 4 5 6

1 Function

DPC1– Double pilot check valve

2 Size

10 – 10 Size

3 Pilot piston seals

Blank– No seals
S – With seals

4 Seals

Blank– Buna-N
V – Viton

5 Style

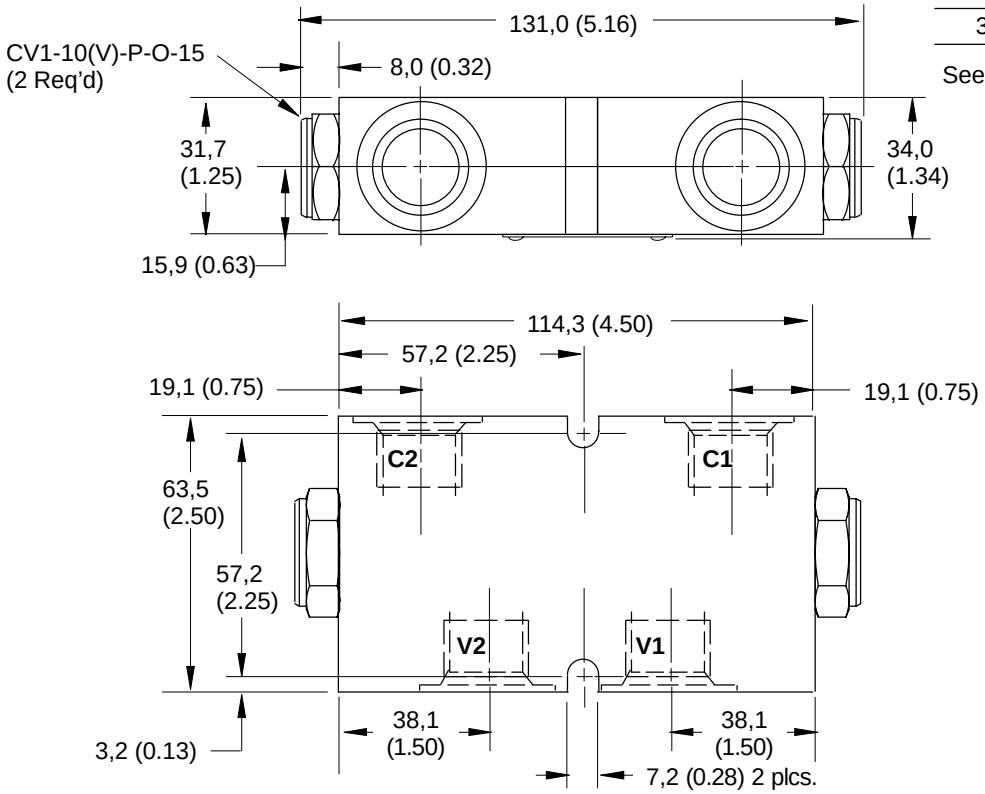
P – Poppet

6 Port size

3B– 3/8” BSPP (Light duty)
6T – SAE 6 (Light duty)

Dimensions

mm (inch)



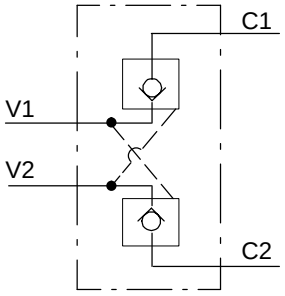
Torque cartridge in housing
47–54 Nm (35–40 lbf ft)

Housing Port Size	All Ports	Part Number
6T	SAE 6	02-161393
3B	3/8” BSPP	02-171120

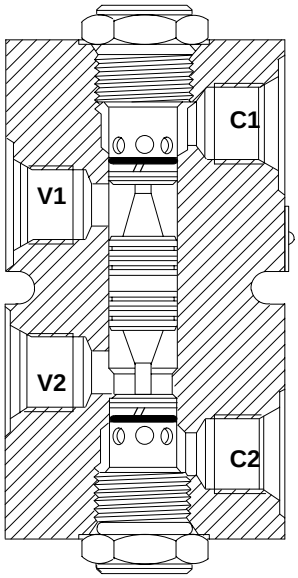
See page 53 for piston number

DPC1-16
Double pilot check valve

Functional Symbol



Sectional View



Description

The DPC1-16 is an inline housing type, double pilot operated check valve.

Operation

This valve allows flow from the V ports to the C ports, while blocking flow from the C ports to the V ports. Flow will be allowed from the C ports to the V ports when pressure is applied at the opposite V port.

Ratings and specifications

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

Typical application pressure (all ports) . . . . . 210 bar (3000 psi)

Rated flow . . . . . 151 l/min (40 USgpm)

Free flow cracking pressure @1 l/min (0.25 USgpm) . . . . . 1,38 bar (20 psi)

Internal leakage cylinder port to valve port . . . . . 5 drops / min maximum @ 210 bar (3000 psi)

Temperature range . . . . . –40 to 120°C (–40° to 248°F)

Pilot ratio 4:1

Fluids . . . . . All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18/**16/13**

Standard housing materials . . . . . Aluminum

Weight . . . . . 2,61 kg (5.75 lb.)

Seal kit (Check valve–2 req'd) . . . . . 565810 Buna–N
889609 Viton®

Seal kit (Pilot piston) . . . . . 889644 Buna–N
02-173598 Viton®

Pilot Pressure calculation

Nominal pressure to open valves

Pilot pressure at V1 for flow from C2 to V2 =

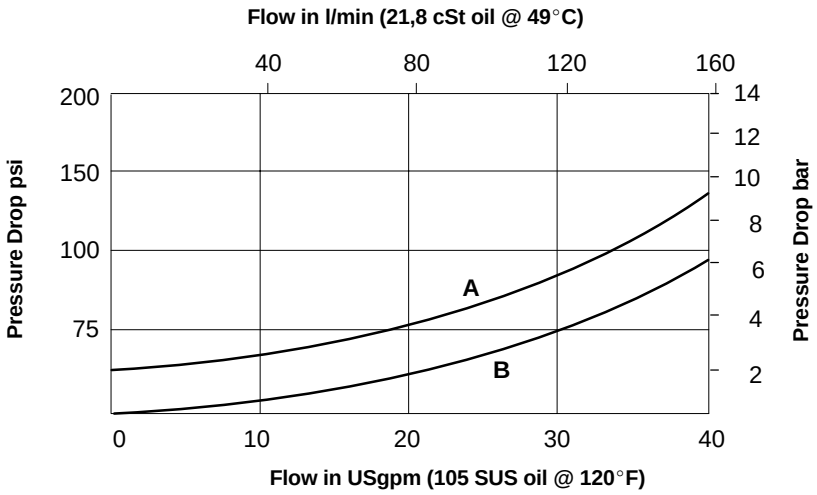
$$\frac{\text{Cracking pressure + Pressure at C2}}{4} + (0.75 \times \text{Pressure at V2})$$

Pilot pressure at V2 for flow from C1 to V1 =

$$\frac{\text{Cracking pressure + Pressure at C1}}{4} + (0.75 \times \text{Pressure at V1})$$

Viton is a registered trademark of E.I.DuPont

Pressure Drop Curves



A – Port 2-3 Free Flow

B – Port 3-2 Piloted Open

Model Code

DPC1-16

DPC1 - 16 (S) (V) - P - *

1 2 3 4 5 6

1 Function

DPC1 – Double pilot check valve

2 Size

16 – 16 Size

3 Pilot piston seals

Blank– No seal
S – With seal

4 Seals

Blank– Buna-N
V – Viton

5 Seating type

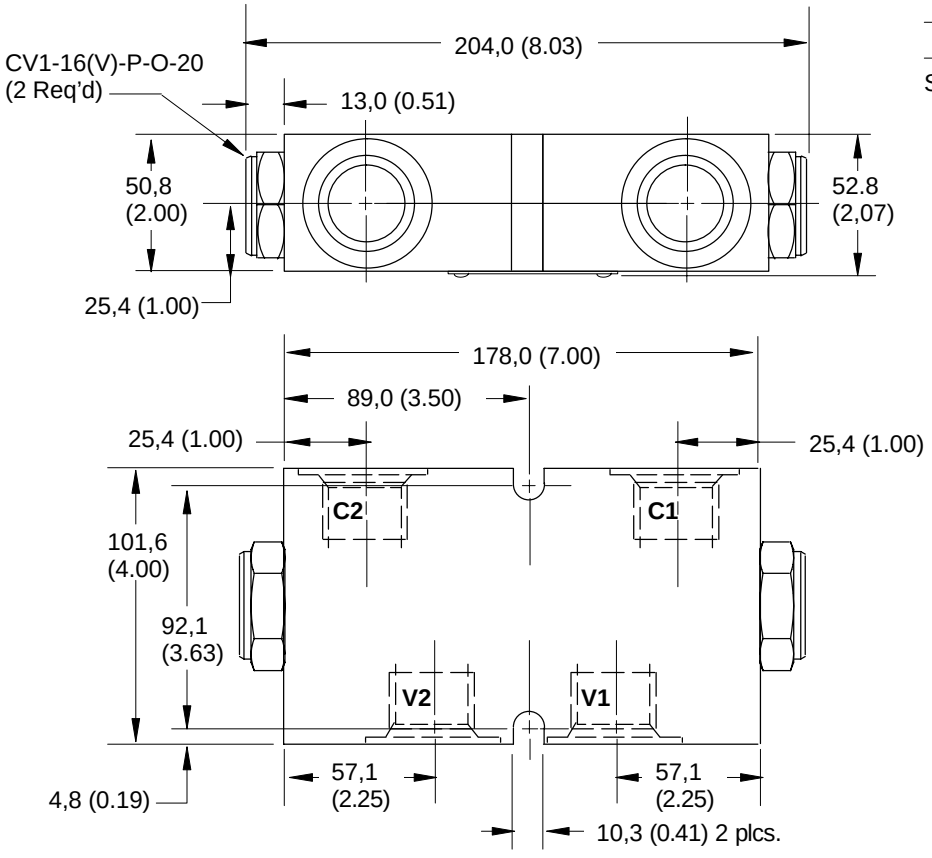
P – Poppet

6 Port size

12T – SAE 12 (Light duty)
6B – 3/4” BSPP (Light duty)

Dimensions

mm (inch)



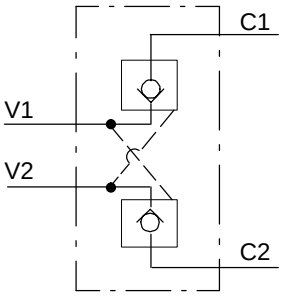
Torque cartridge in housing
108–122 Nm (80–90 lbf ft)

Housing Port Size	All Ports	Part Number
12T	SAE 12	889155
6B	3/4” BSPP	02-175414

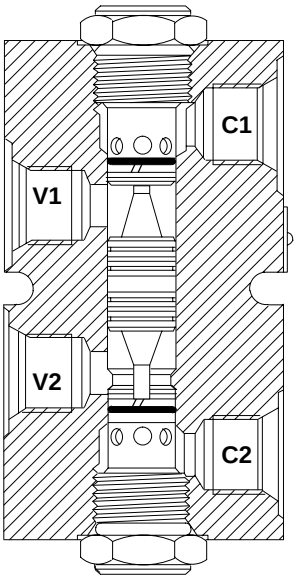
See page 53 for piston number

DPC1-20
Double pilot check valve

Functional Symbol



Sectional View



Description

The DPC1-20 is an inline housing type, double pilot operated check valve.

Operation

This valve allows flow from the V ports to the C ports, while blocking flow from the C ports to the V ports. Flow will be allowed from the C ports to the V ports when pressure is applied at the opposite V port.

Ratings and specifications

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

Typical application pressure (all ports) . . . . . 210 bar (3000 psi)

Rated flow . . . . . 227 l/min (60 USgpm)

Free flow cracking pressure @1 l/min (0.25 USgpm) . . . . . 1,03 bar (15 psi)

Internal leakage cylinder port to valve port . . . . . 5 drops / min maximum @ 210 bar (3000 psi)

Temperature range . . . . . –40 to 120°C (–40° to 248°F)

Pilot ratio 4:1

Fluids . . . . . All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18/**16/13**

Standard housing materials . . . . . Aluminum

Weight . . . . . 4,45 kg (9.80 lb.)

Seal kit (Check valve–2 req'd) . . . . . 889615 Buna–N
889619 Viton®

Seal kit (Pilot piston) . . . . . 889656 Buna–N
02-173599 Viton®

Pilot Pressure calculation

Nominal pressure to open valves

Pilot pressure at V1 for flow from C2 to V2 =

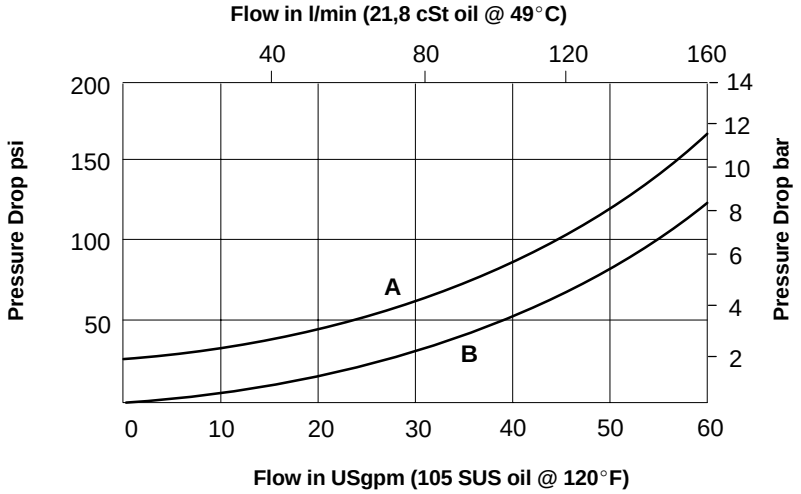
$$\frac{\text{Cracking pressure + Pressure at C2}}{4} + (0.75 \times \text{Pressure at V2})$$

Pilot pressure at V2 for flow from C1 to V1 =

$$\frac{\text{Cracking pressure + Pressure at C1}}{4} + (0.75 \times \text{Pressure at V1})$$

Viton is a registered trademark of E.I.DuPont

Pressure Drop Curves



A – Port 2-3 Free Flow

B – Port 3-2 Piloted Open

Model Code

DPC1-20

DPC1 - 20 (S) (V) - P - *

1 2 3 4 5 6

1 Function

DPC1 – Double pilot check valve

2 Size

20 – 20 Size

3 Pilot piston seals

Blank– No seal
S – With seal

4 Seals

Blank– Buna-N
V – Viton

5 Seating type

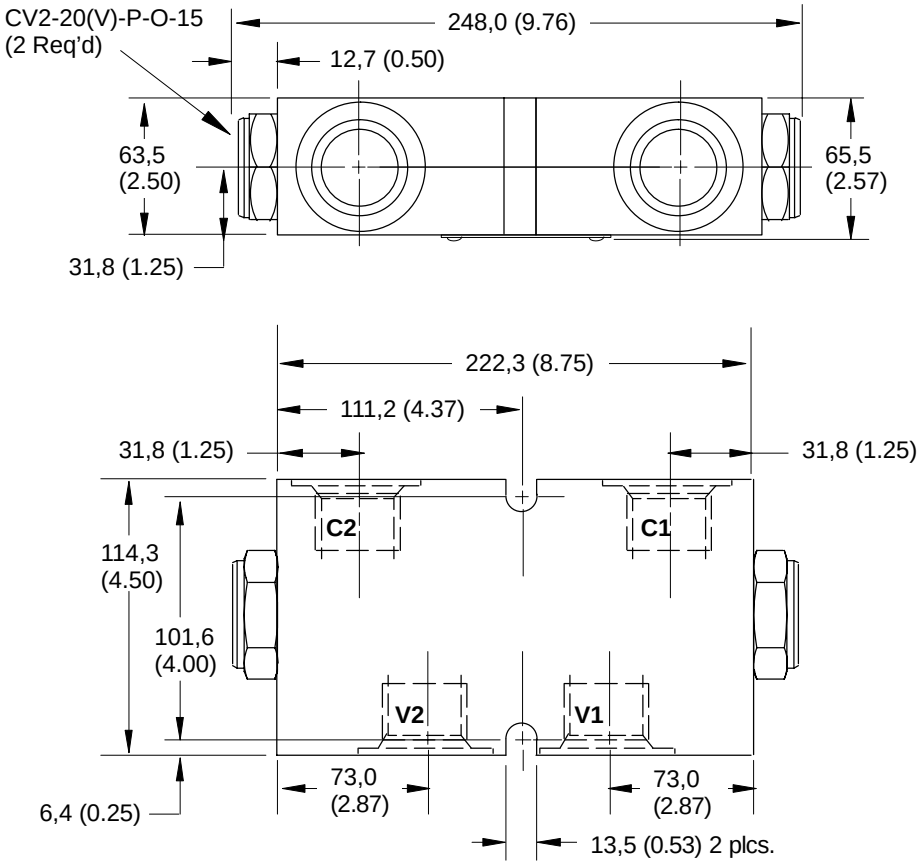
P – Poppet

6 Port size

20T – SAE 20 (Light duty)
8B – 1” BSPP (Light duty)

Dimensions

mm (inch)



Torque cartridge in housing
128–155 Nm (95–115 lbf ft)

Housing Port Size	All Ports	Part Number
20T	SAE 20	889159
8B	1” BSPP	02-175415

See page 53 for piston number

C-**-2(U) Cavity Dimensions

Dimensions

mm (inch)

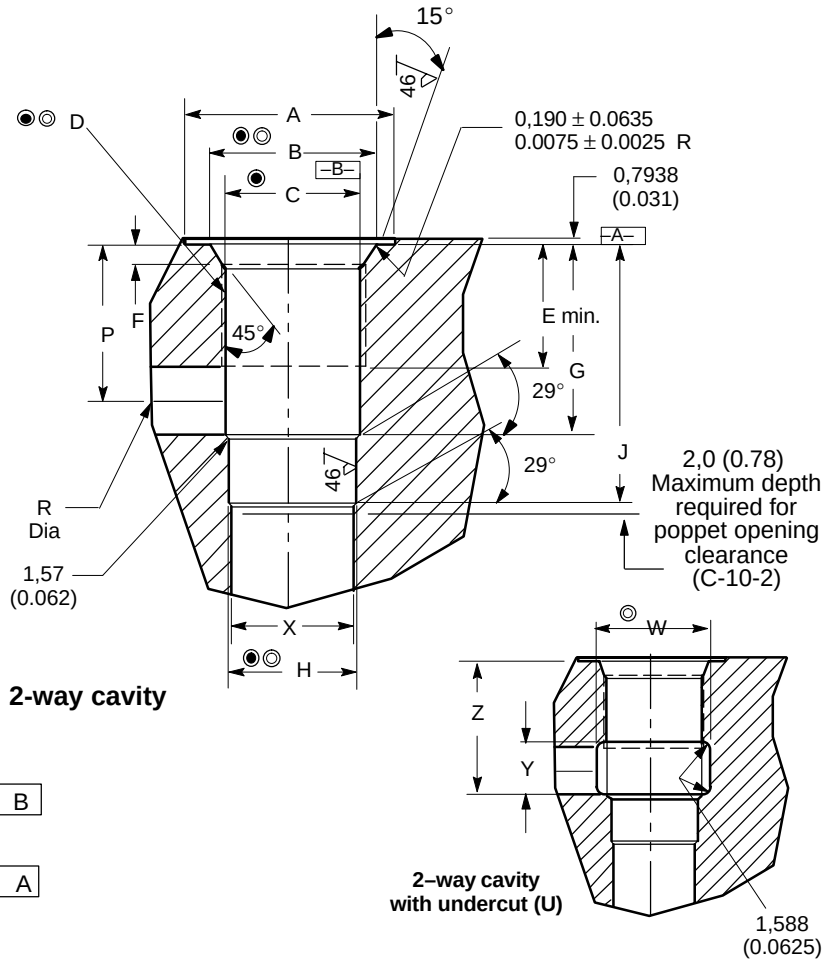
Cavity bores can be machined accurately in aluminum or steel. The necessary UNF, or UN threads may be machined using standard small tools, possibly already in your machine shop or from a local tool supplier. For in depth advice on the machining of cavities, consult your Vickers sales specialist.

Either you, our customer, or Vickers can design and manufacture customized manifolds or housings dedicated to individual applications. We call the resulting valve packages Modular Circuit Designs (MCDs). Cartridges selected for your application can be accommodated in one or more MCDs, according to your requirements.

WARNING:
For CV16–10, the cavity should be machined to the 14,29 (0.562) maximum diameter and 36,00 (1.417) maximum depth.

◉ These diameters ⌖ 0,051 mm (.002 inch) Ⓜ B unless otherwise specified.

◎ These diameters ⊥ 0,025 mm (.001 inch) Ⓜ A unless otherwise specified.



2-way cavity

2–way cavity with undercut (U)

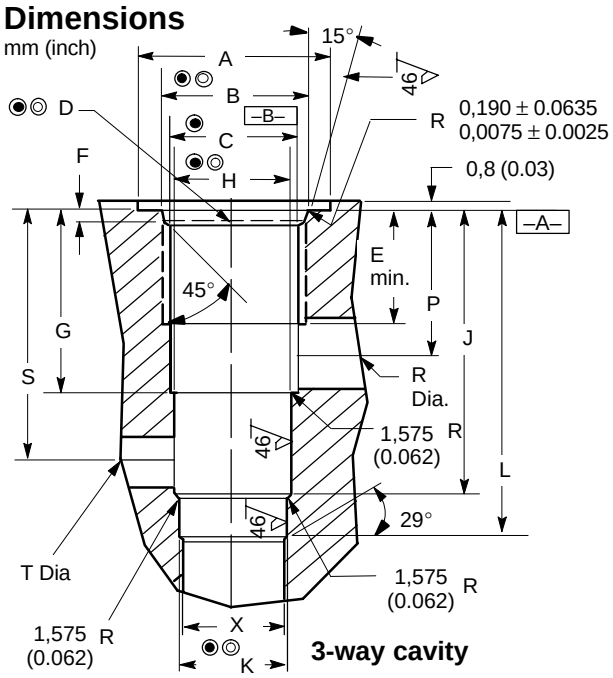
Cavity mm (inch)	A Spotface	B +0,051 0 (+0.002 0)	C +0,051 0 (+0.002 0)	D Thread	E Full Thread	F	G	H ±0,0254 (±0.001)	J	P	R Max. Dia.	X Max. Dia.
C–8–2	30,16 (1.188)	20,65 (0.813)	17,47 (0.688)	.750”–16	12,70 (0.500)	2,54/2,92 (0.100/0.115)	19,05 (0.750)	12,72 (0.501)	30,17 (1.188)	14,68 (0.578)	8,74 (0.344)	11,11 (0.438)
C–10–2	30,16 (1.188)	24,00 (0.945)	20,62 (0.812)	.875”–14	15,88 (0.625)	2,54/2,92 (0.100/0.115)	23,81 (0.937)	15,90 (0.626)	33,32 (1.312)	18,23 (0.718)	11,11 (0.437)	14,29 (0.562)
C–12–2 (U)	38,10 (1.500)	29,15 (1.148)	24,76 (0.975)	1.062”-12	22,22 (0.875)	3,30/3,68 (0.130/0.145)	34,92 (1.375)	23,82 (0.938)	46,35 (1.825)	27,94 (1.100)	12,70 (0.500)	22,22 (0.875)
C–16–2	44,45 (1.750)	35,58 (1.401)	31,34 (1.234)	1.312”–12	22,22 (0.875)	3,30/3,68 (0.130/0.145)	34,14 (1.344)	28,62 (1.127)	46,84 (1.844)	24,60 (0.968)	19,05 (0.750)	19,05 (0.750)
C–20–2	57,66 (2.270)	43,59 (1.716)	39,12 (1.540)	1.625”–12	20,64 (0.812)	3,35/3,73 (0.132/0.147)	44,45 (1.750)	36,55 (1.439)	58,72 (2.312)	30,96 (1.218)	25,40 (1.000)	30,16 (1.186)

Cavity mm (inch)	W	Y	Z
C–12–2U (only)	30,83 (1.214)	12,70 (0.500)	34,29 (1.350)

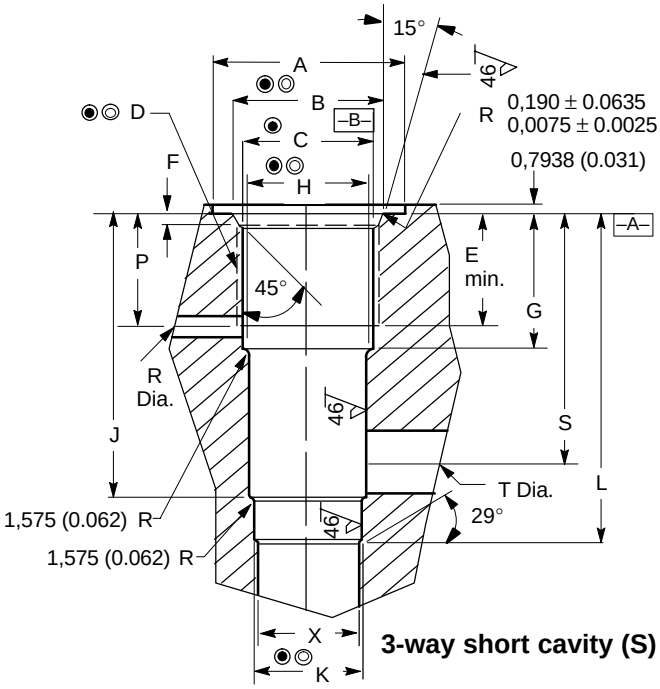
C-**-3(S) Cavity Dimensions

Dimensions

mm (inch)



3-way cavity



3-way short cavity (S)

◉ These diameters ⌭ 0,051 mm (.002 inch) B unless otherwise specified.

◎ These diameters ⊥ 0,025 mm (.001 inch) A unless otherwise specified.

Cavity mm (inch)	A Spotface	B +0,051 0 (+0.002 0)	C +0,051 0 (+0.002 0)	D Thread	E Full Thread	F	G	H ±0,0254 (±0.001)
C–8–3	30,16 (1.188)	20,65 (0.813)	17,47 (0.688)	0.750”-16	12,70 (0.500)	2,54/2,92 (0.100/0.115)	18,24 (0.718)	15,90 (0.626)
C–10–3	30,16 (1.188)	24,00 (0.945)	20,62 (0.812)	0.875”-14	15,88 (0.625)	2,54/2,92 (0.100/0.115)	21,59 (0.850)	17,50 (0.689)
C–10–3S	30,16 (1.188)	24,00 (0.945)	20,62 (0.812)	0.875”-14	14,29 (0.562)	2,54/2,92 (0.100/0.115)	16,51 (0.650)	19,08 (0.751)
C–12–3	38,10 (1.500)	29,15 (1.148)	24,76 (0.975)	1.062”-12	22,22 (0.875)	3,30/3,68 (0.130/0.145)	34,92 (1.375)	23,82 (0.938)
C–12–3S	38,10 (1.500)	29,15 (1.148)	24,76 (0.975)	1.062”-12	22,22 (0.875)	3,30/3,68 (0.130/0.145)	25,40 (1.000)	23,82 (0.938)
C–16–3	44,45 (1.750)	35,58 (1.401)	31,34 (1.234)	1.312”-12	22,22 (0.875)	3,30/3,68 (0.130/0.145)	34,14 (1.344)	28,62 (1.127)
C–16–3S	44,45 (1.750)	35,58 (1.401)	31,34 (1.234)	1.312”-12	17,46 (0.687)	3,30/3,68 (0.130/0.145)	20,62 (0.812)	28,62 (1.127)
C–20–3	57,66 (2.270)	43,59 (1.716)	39,12 (1.540)	1.625”-12	20,64 (0.812)	3,35/3,73 (0.132/0.147)	44,45 (1.750)	36,55 (1.439)
C–20–3S	57,66 (2.270)	43,59 (1.716)	39,12 (1.540)	1.625”-12	20,64 (0.812)	3,35/3,73 (0.132/0.147)	23,82 (0.938)	36,55 (1.439)

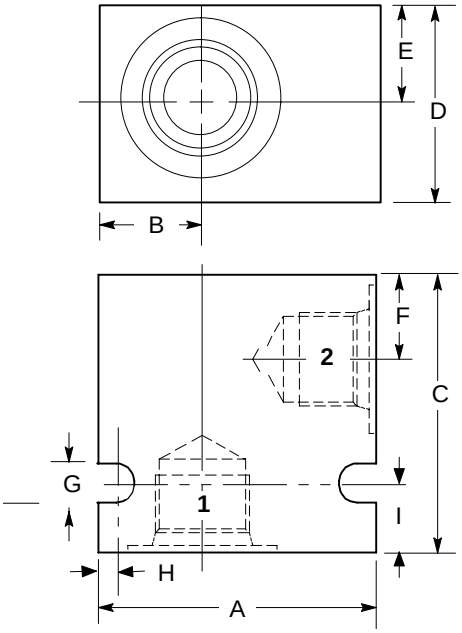
Cavity mm (inch)	J	K ±0,0254 (±0.001)	L	P	R Max. Dia.	S	T Max. Dia.	X Max. Dia.
C–8–3	33,26 (1.270)	14,30 (0.563)	43,26 (1.703)	14,68 (0.578)	5,94 (0.234)	28,98 (1.141)	5,94 (0.234)	12,70 (0.500)
C–10–3	38,10 (1.500)	15,90 (0.626)	47,62 (1.875)	18,26 (0.719)	6,35 (0.250)	34,13 (1.344)	6,35 (0.250)	14,29 (0.562)
C–10–3S	38,48 (1.515)	17,50 (0.689)	47,62 (1.875)	14,29 (0.562)	3,18 (0.125)	30,96 (1.218)	13,49 (0.531)	15,88 (0.625)
C–12–3	57,78 (2.275)	22,25 (0.876)	69,21 (2.725)	27,94 (1.100)	12,70 (0.500)	50,80 (2.000)	12,70 (0.500)	20,62 (0.812)
C–12–3S	48,26 (1.900)	22,25 (0.876)	59,69 (2.350)	22,22 (0.875)	4,82 (0.190)	41,27 (1.625)	12,70 (0.500)	20,62 (0.812)
C–16–3	62,71 (2.469)	27,02 (1.064)	75,39 (2.968)	24,60 (0.968)	15,88 (0.626)	53,18 (2.093)	15,88 (0.625)	19,05 (0.750)
C–16–3S	46,02 (1.812)	25,45 (1.002)	55,58 (2.188)	16,67 (0.656)	6,35 (0.250)	37,31 (1.468)	15,88 (0.625)	19,05 (0.750)
C–20–3	85,72 (3.375)	33,38 (1.314)	100,02 (3.938)	30,96 (1.218)	25,40 (1.000)	71,44 (2.812)	25,40 (1.000)	30,16 (1.188)
C–20–3S	64,29 (2.531)	33,38 (1.314)	77,77 (3.062)	19,84 (0.781)	6,35 (0.250)	50,00 (1.968)	25,40 (1.000)	30,16 (1.188)

C-**-2/C-**-3 Aluminum Housings (Light Duty)

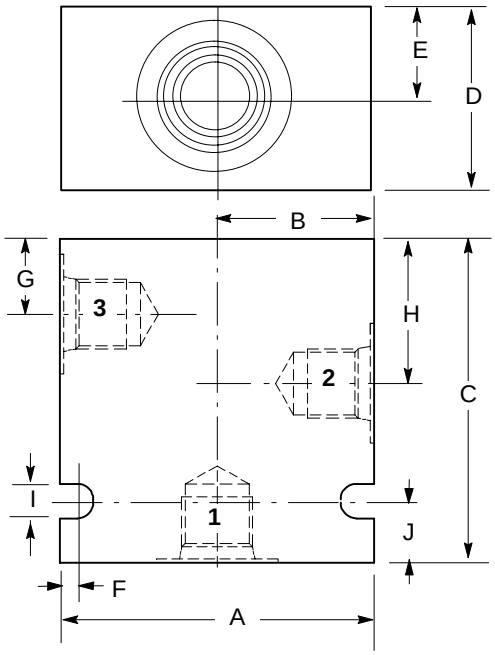
Housing	Ports 1 & 2	Part Number
C–10–2	3/8” BSPP	02-175462
	SAE 6	566151
C–16–2	3/4” BSPP	02-175463
	SAE 12	566149
C–20–2	1” BSPP	02-175464
	SAE 16	566409

Housing	Ports 1, 2 & 3	Part Number
C–10–3	3/8” BSPP	02–173358
	SAE 6	566162

Note: BSPP porting is designated by “B” in the model code
SAE porting is designated “T” in the model code



C––2**



C––3**

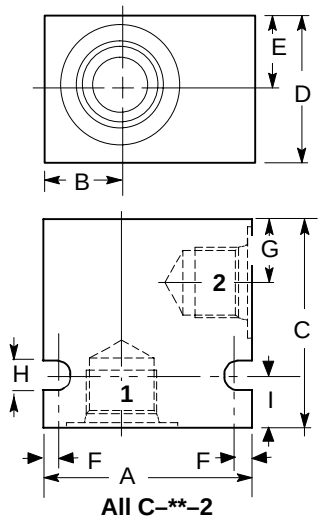
Cavity mm (inch)	A	B	C	D	E	F	G	H	I	Mass kg (lb.)
C-10-2	50,8 (2.00)	19,0 (0.75)	50,8 (2.00)	31,7 (1.25)	15,9 (0.62)	19,0 (0.75)	7,1 (0.28)	3,1 (0.12)	12,7 (0.50)	0,1 (0.35)
C-16-2	76,2 (3.0)	28,5 (1.12)	76,2 (3.00)	47,6 (1.87)	23,8 (0.94)	25,4 (1.00)	8,6 (0.34)	4,0 (0.16)	19,0 (0.75)	0,5 (1.21)
C-20-2	88,9 (3.5)	34,3 (1.35)	88,9 (3.50)	68,5 (2.70)	34,3 (1.35)	36,8 (1.45)	8,6 (0.34)	4,0 (0.16)	21,6 (0.85)	0,8 (1.90)

Cavity mm (inch)	A	B	C	D	E	F	G	H	I	J	Mass kg (lb.)
C-10-3	63,5 (2.50)	31,7 (1.25)	66,6 (2.62)	31,7 (1.25)	15,8 (0.62)	3,1 (0.12)	19,0 (0.75)	34,9 (1.37)	7,1 (0.28)	12,7 (0.50)	0,3 (0.64)

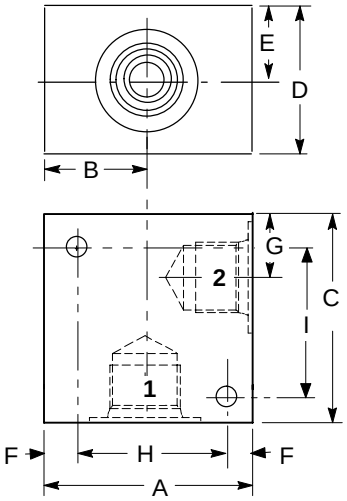
C-**-2(U) / C-**-3 Aluminum Housings (Fatigue Rated)

Housing	Ports 1 & 2	Part Number
C–8–2	1/4” BSPP	02–160727
	3/8” BSPP	02–160728
	SAE 4	02–160730
	SAE 6	02–160731
	SAE 8	02–160732
C–10–2	1/4” BSPP	876702
	3/8” BSPP	876703
	SAE 6	876700
	SAE 8	876701
C–12–2U	1/2” BSPP	02–161116
	3/4” BSPP	02–161115
	SAE 10	02–160641
	SAE 12	02–160645
C–12–2	1/2” BSPP	02–161118
	3/4” BSPP	02–161117
	SAE 10	02–160640
	SAE 12	02–160644
C–16–2	1/2” BSPP	876716
	3/4” BSPP	876718
	SAE 10	876717
	SAE 12	566113
C–20–2	3/4” BSPP	876732
	1” BSPP	876734
	SAE 12	876733
	SAE 16	876735

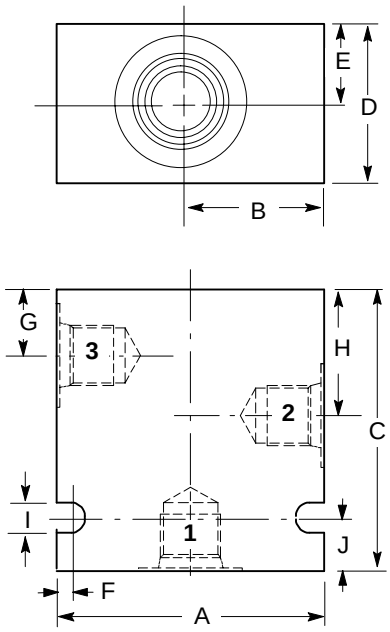
Note: BSPP porting is designated by “G” in the model code SAE porting is designated by either “H” or “T” in the model code



All C––2 except (U)**



C–12–2U



C–*–3

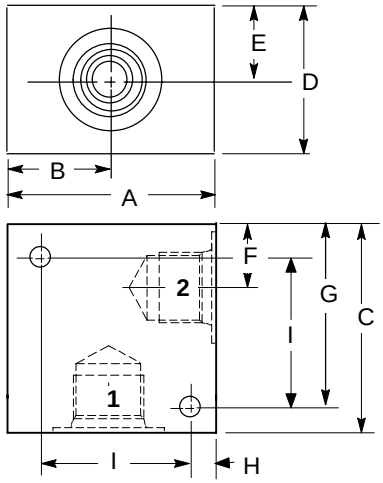
Housing	Ports 1, 2 & 3	Part Number
C–8–3	1/4” BSPP	02–160739
	3/8” BSPP	02–160740
	SAE 4	02–160741
	SAE 6	02–160742
C–10–3	1/4” BSPP	876705
	3/8” BSPP	876714
	SAE 6	876704
	SAE 8	876711

Cavity mm (inch)	A	B	C	D	E	F	G	H	I	J	Mass kg (lb.)
C-8-2	50,8 (2.00)	19,0 (0.75)	51,0 (2.00)	38,1 (1.50)	19,0 (0.75)	3,4 (0.13)	15,5 (0.61)	7,1 (0.28)	12,7 (0.50)	N/A	0,2 (0.46)
C-10-2	63,5 (2.50)	25,4 (1.00)	63,5 (2.50)	50,8 (2.00)	25,4 (1.00)	9,5 (0.37)	20,8 (0.81)	7,1 (0.28)	19,0 (0.75)	N/A	0,4 (1.00)
C-12-2(U)	88,9 (3.50)	44,5 (1.75)	88,9 (3.50)	50,8 (2.00)	25,4 (1.00)	12,7 (0.50)	28,7 (1.13)	63,5 (2.50)	63,5 (2.50)	N/A	0,8 (1.96)
C-16-2	88,9 (3.50)	34,9 (1.37)	88,9 (3.50)	63,5 (2.50)	31,7 (1.25)	10,3 (0.40)	28,4 (1.11)	8,7 (0.34)	25,4 (1.00)	N/A	1,2 (2.75)
C-20-2	101,6 (4.00)	38,1 (1.50)	101,6 (4.00)	82,5 (3.25)	41,3 (1.62)	10,3 (0.40)	36,0 (1.41)	8,7 (0.34)	25,4 (1.00)	N/A	1,8 (4.00)
C-8-3	63,5 (2.50)	31,8 (1.25)	66,6 (2.62)	38,1 (1.50)	19,0 (0.75)	3,4 (0.13)	15,5 (0.61)	29,8 (1.17)	7,1 (0.28)	13,0 (0.51)	0,4 (0.83)
C-10-3	76,2 (3.00)	38,1 (1.50)	76,2 (3.00)	50,8 (2.00)	25,4 (1.00)	9,5 (0.37)	20,8 (0.81)	36,6 (1.44)	7,1 (0.28)	19,0 (0.75)	0,7 (1.65)

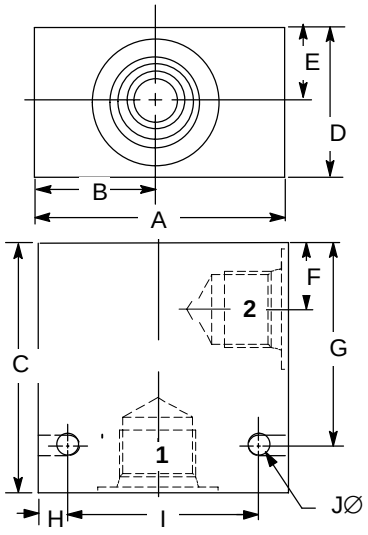
C-**-2(U) / C-**-3 Steel Housings

Housing	Ports 1 & 2	Part Number
C–8–2	1/4” BSPP	02-160733
	3/8” BSPP	02-160734
	SAE 4	02-160736
	SAE 6	02-160737
	SAE 8	02-160738
C–10–2	1/4” BSPP	02-175102
	3/8” BSPP	02-175103
	SAE 6	02-175100
	SAE 8	02-175101
C–12–2U	1/2” BSPP	02-172512
	3/4” BSPP	02-162922
	SAE 10	02-169817
	SAE 12	02-169790
C–12–2	1/2” BSPP	02-172062
	3/4” BSPP	02-169665
	SAE 10	02-169744
	SAE 12	02-169782

Note: BSPP porting is designated “G” in the model code
SAE porting is designated by “T” in the model code



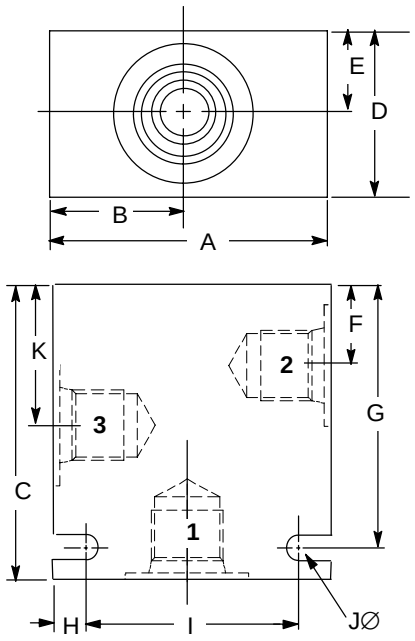
C–12–2(U)



C--2**

NOTE:
8 series utilizes slot in place of mounting hole

Housing	Ports 1, 2 & 3	Part Number
C–8–3	1/4” BSPP	02-160743
	3/8” BSPP	02-160746
	SAE 4	02-160745
	SAE 6	02-160744



C-8-3

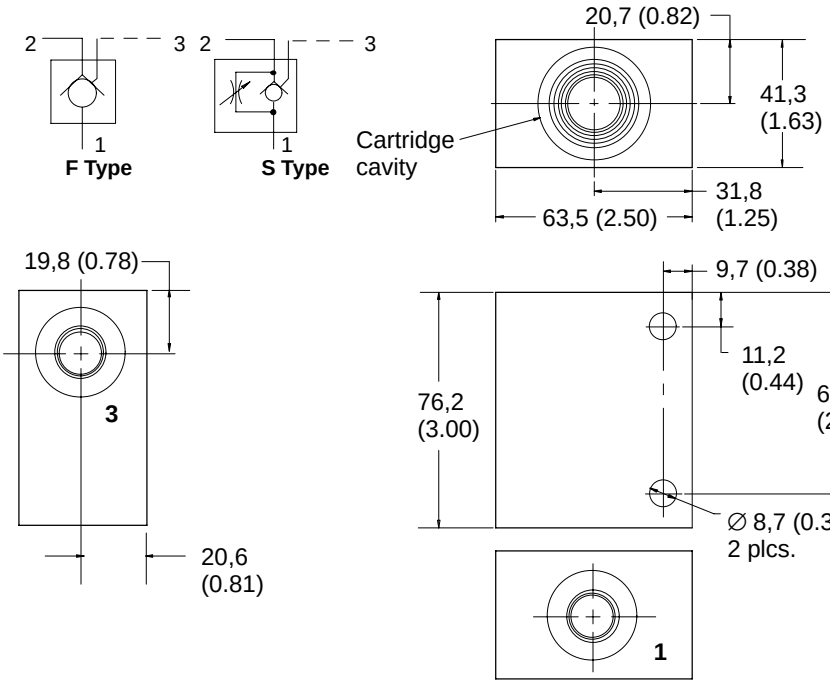
Cavity mm (inch)	A	B	C	D	E	F	G	H	I	J	Mass kg (lb.)
C-8-2	50,8 (2.00)	19,0 (0.75)	50,8 (2.00)	38,1 (1.50)	19,0 (0.75)	15,5 (0.61)	38,1 (1.50)	3,3 (0.13)	43,9 (1.73)	7,1 (0.28)	0,5 (1.19)
C-10-2	63,5 (2.50)	25,4 (1.00)	63,5 (2.50)	44,4 (1.75)	22,2 (0.87)	19,0 (0.75)	50,8 (2.00)	9,5 (0.37)	44,4 (1.75)	7,1 (0.28)	0,3 (0.83)
C-12-2(U)	88,9 (3.50)	28,5 (1.12)	88,9 (3.50)	50,8 (2.00)	25,4 (1.00)	28,7 (1.13)	76,2 (3.00)	12,7 (0.50)	63,5 (2.50)	10,3 (0.40)	1,9 (4.28)

Cavity mm (inch)	A	B	C	D	E	F	G	H	I	J	K	Mass kg (lb.)
C-8-3	63,5 (2.50)	31,8 (1.25)	66,0 (2.75)	38,1 (1.50)	19,0 (0.75)	15,5 (0.61)	53,0 (2.12)	3,3 (0.13)	56,6 (2.23)	7,1 (0.28)	29,8 (1.17)	0,9 (2.15)

POC1-10 Housings

I - Inline – Steel

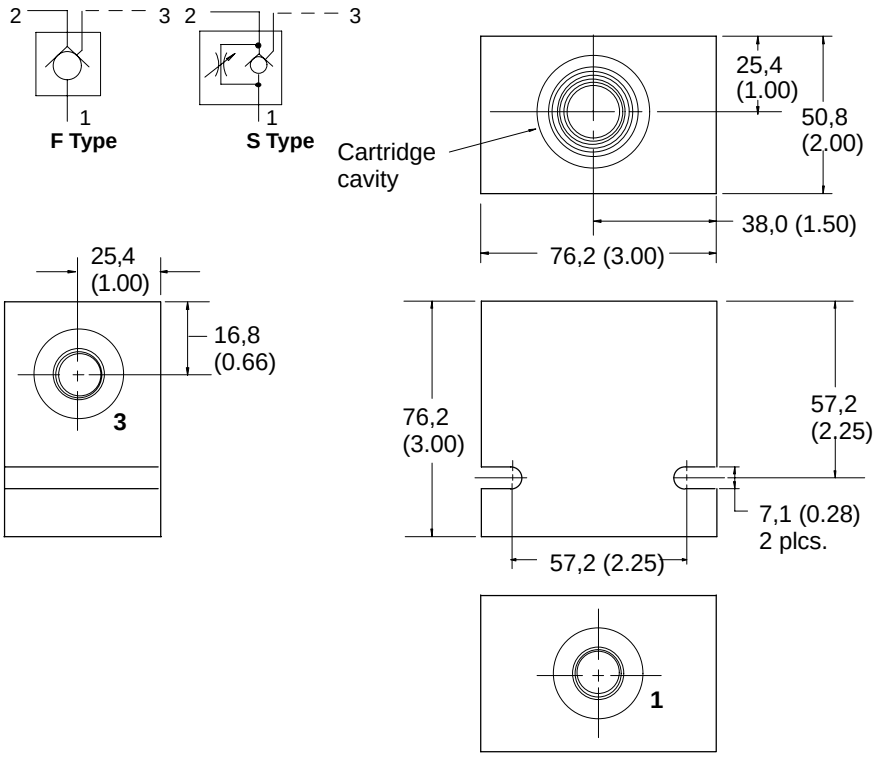
Dimensions
mm (inch)



Port Size	1	2	3
6T	SAE 6	SAE 6	SAE 6
8T	SAE 8	SAE 8	SAE 6
10T	SAE 10	SAE 10	SAE 6
3G	3/8” BSPP	3/8” BSPP	1/4” BSPP
4G	1/2” BSPP	1/2” BSPP	1/4” BSPP

I - Inline – Aluminum fatigue rated

Refer to page 52 for housing part numbers



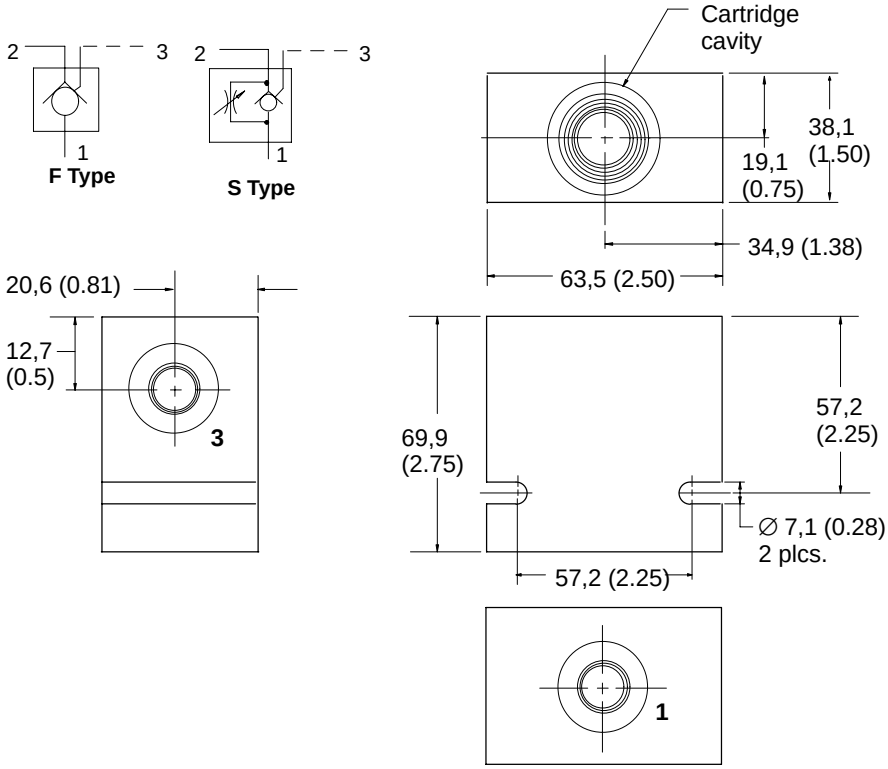
Port Size	1	2	3
6T	SAE 6	SAE 6	SAE 6
8T	SAE 8	SAE 8	SAE 6
2G	1/4” BSPP	1/4” BSPP	1/4” BSPP
3G	3/8” BSPP	3/8” BSPP	1/4” BSPP

POC1-10 Housings

I - Inline – Aluminum Light Duty

Dimensions
mm (inch)

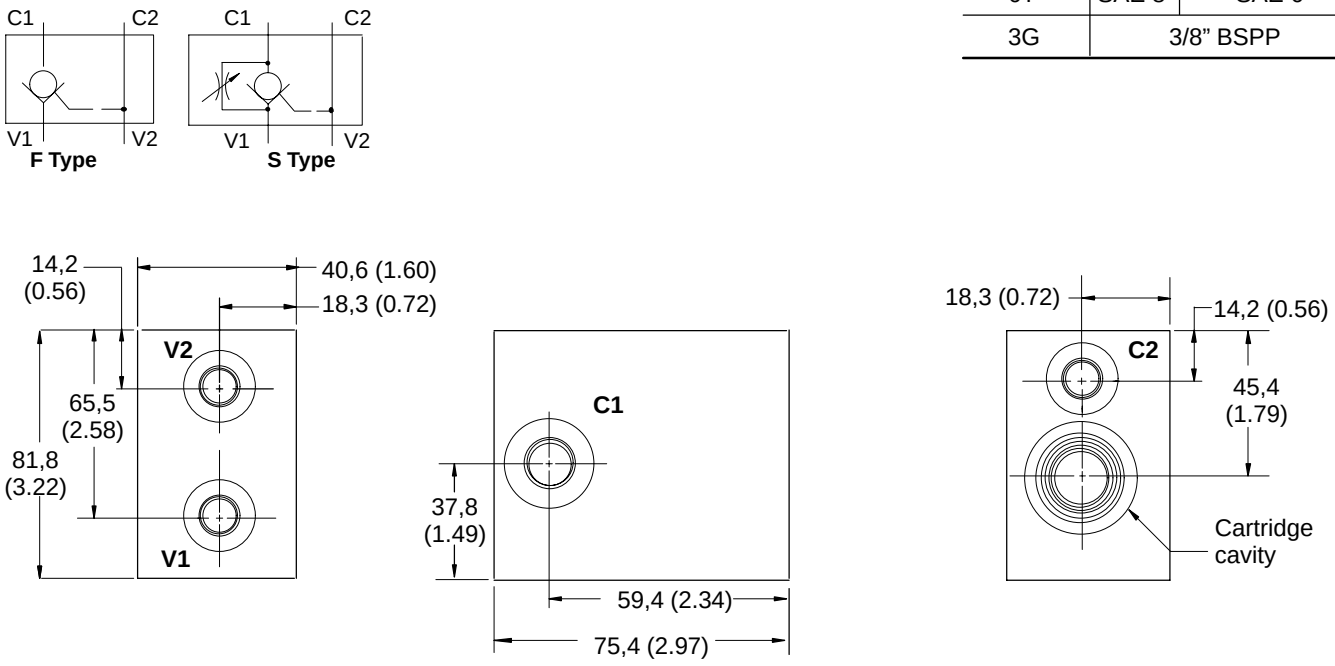
Port Size	1	2	3
6T	SAE 6		
3B	3/8” BSPP		



Refer to page 52 for housing part numbers

N - Close Coupled Nipple Mounted Aluminum & Steel

Port Size	C1	C2	V1	V2
6T	SAE 8	SAE 6		
3G	3/8” BSPP			



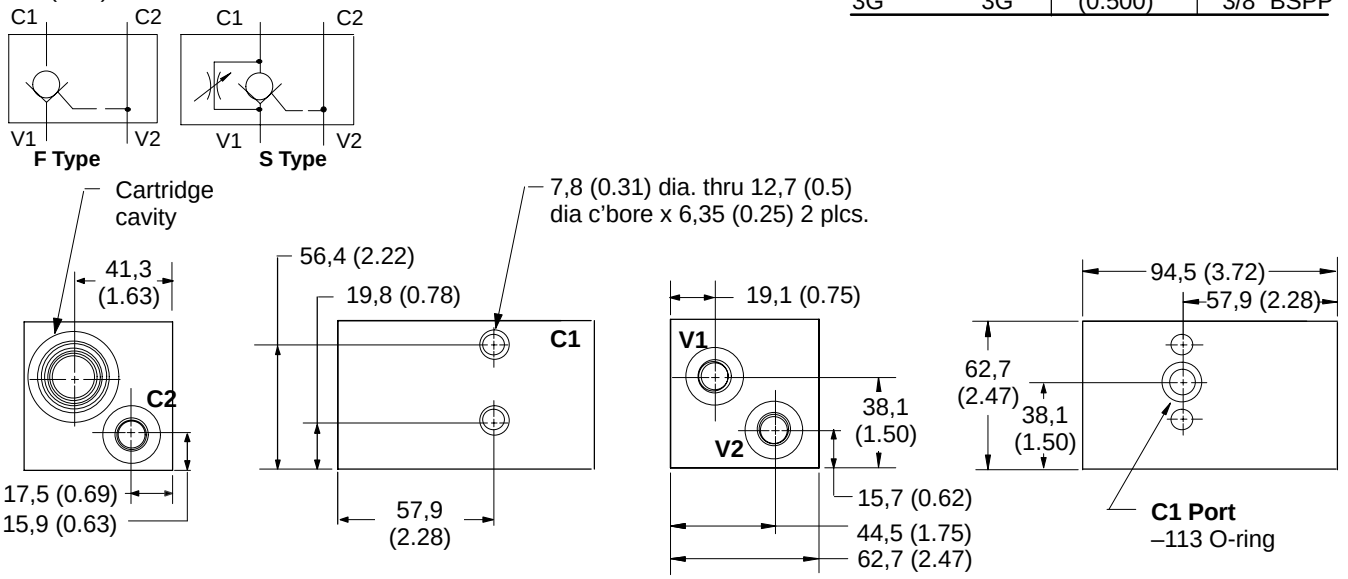
POC1-10 Housings

G - Gasket Mounted - Single
Aluminum & Steel

Dimensions

mm (inch)

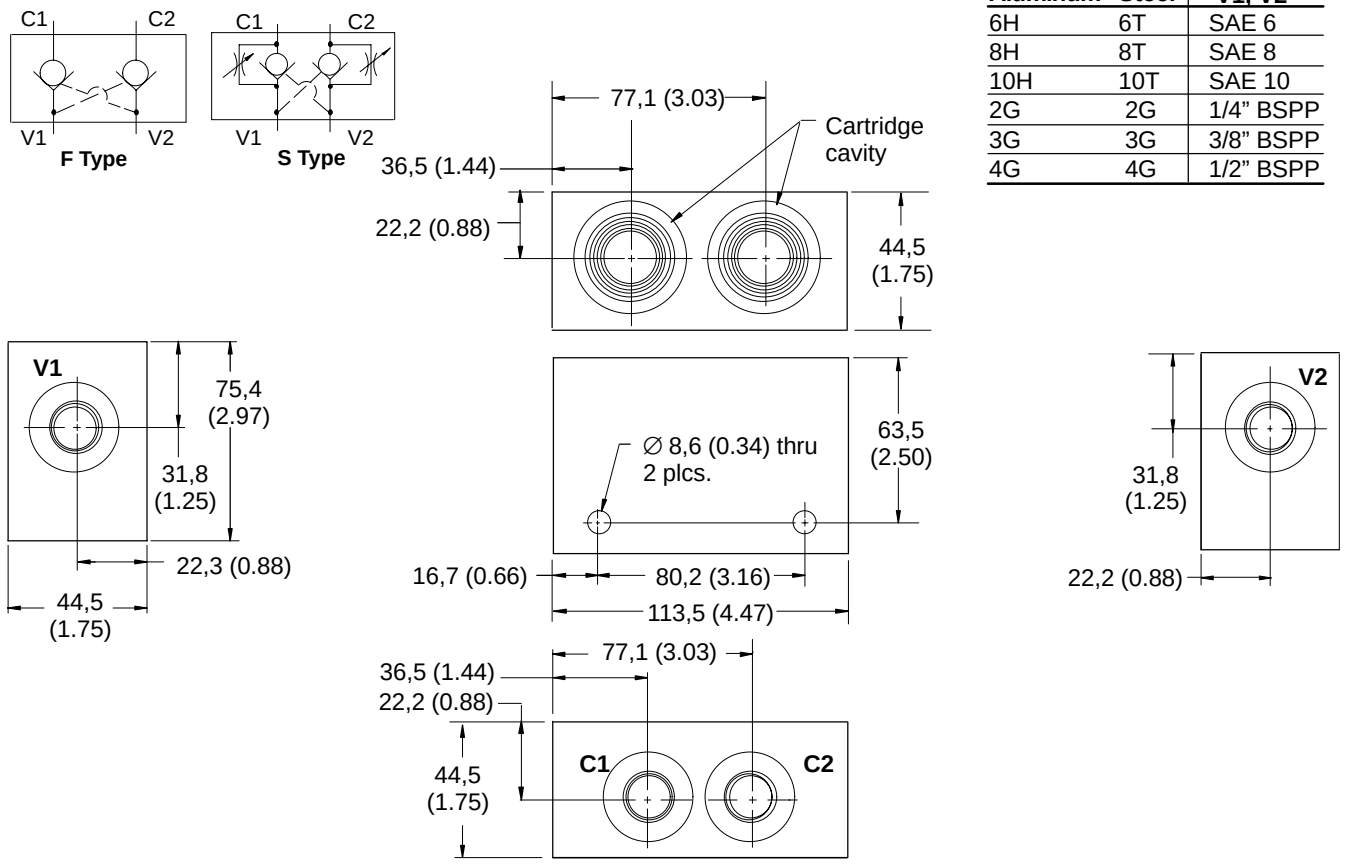
Port Aluminum	Steel	C1	C2,V1,V2
6H	6T	∅ 12,7	SAE 6
3G	3G	(0.500)	3/8" BSPP



Refer to page 52 for housing part numbers

D - Dual Line Mounted
Aluminum & Steel

Port size Aluminum	Steel	C1, C2, V1, V2
6H	6T	SAE 6
8H	8T	SAE 8
10H	10T	SAE 10
2G	2G	1/4" BSPP
3G	3G	3/8" BSPP
4G	4G	1/2" BSPP



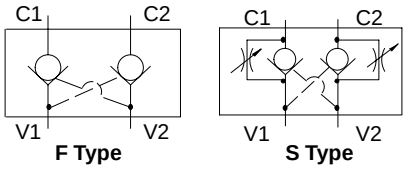
POC1-10 Housings

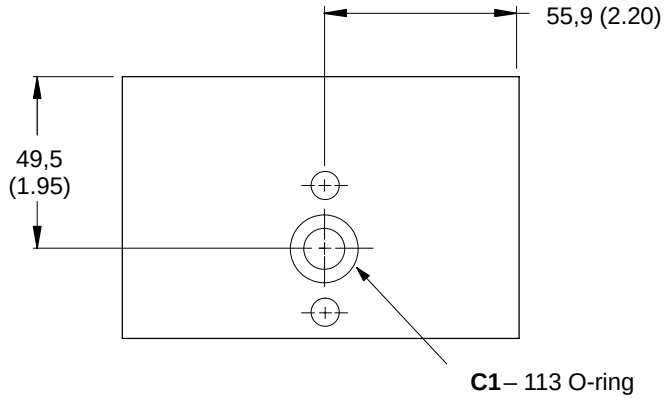
P - Dual Gasket Mounted
Aluminum & Steel

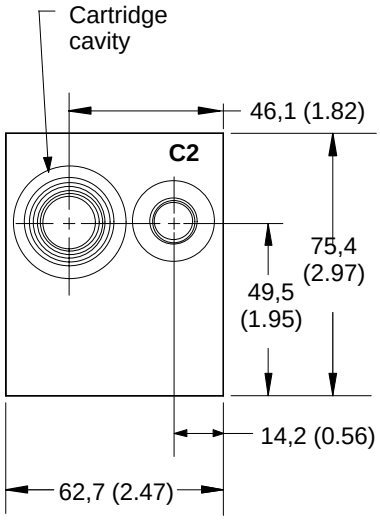
Dimensions
mm (inch)

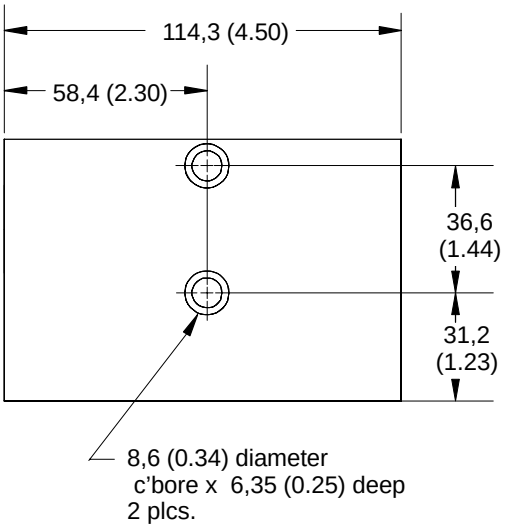
Port size Aluminum	Steel	C1	C2,V1,V2
6H	6T	∅ 12,7	SAE 6
3G	3G	(0.500)	3/8" BSPP

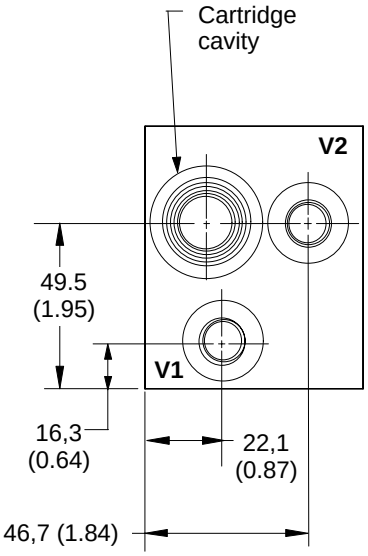
Refer to page 52 for housing part numbers







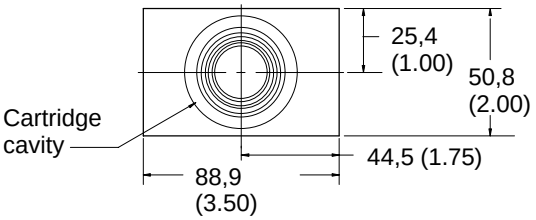




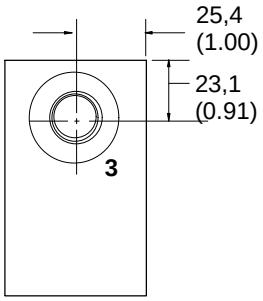
POC1-12 Housings

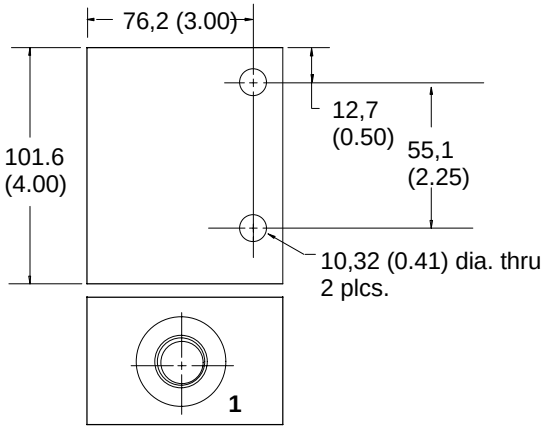
I - Inline Mounted Aluminum & Steel (Fatigue Rated)

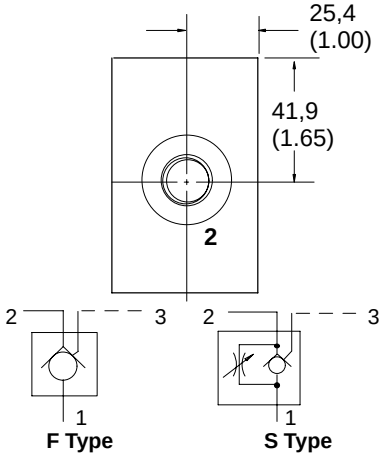
Dimensions
mm (inch)



Port Size	Cylinder Port (1)	Valve Port (2)	Pilot Port (3)
10T	SAE 10		SAE 6
12T	SAE 12		
4G	1/2" BSPP		3/8"
6G	3/4" BSPP		BSPP

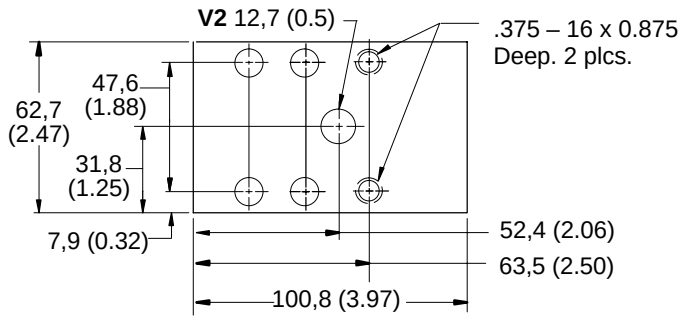




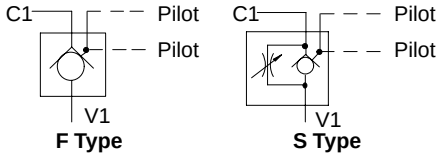


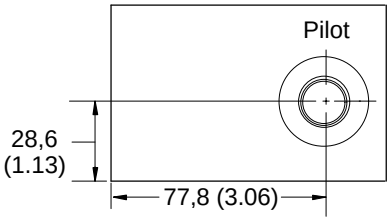
Refer to page 52 for housing part numbers

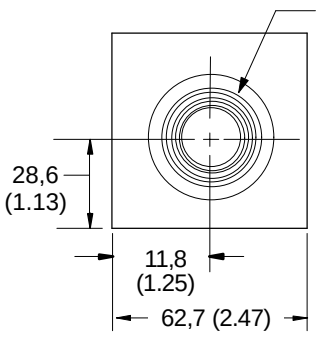
B - 3/4" SAE 4-Bolt Pad Mounting Aluminum & Steel

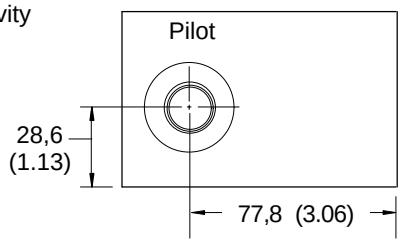


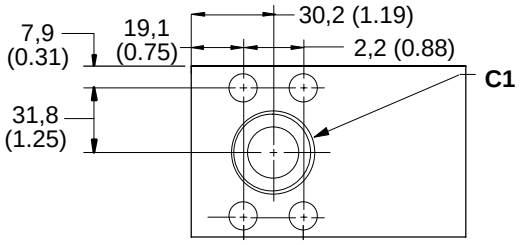
Port Size	C1	Pilot Port
6T	3/4" SAE 4 bolt Code 61	SAE 6









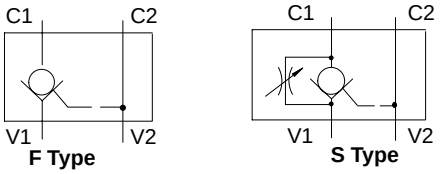


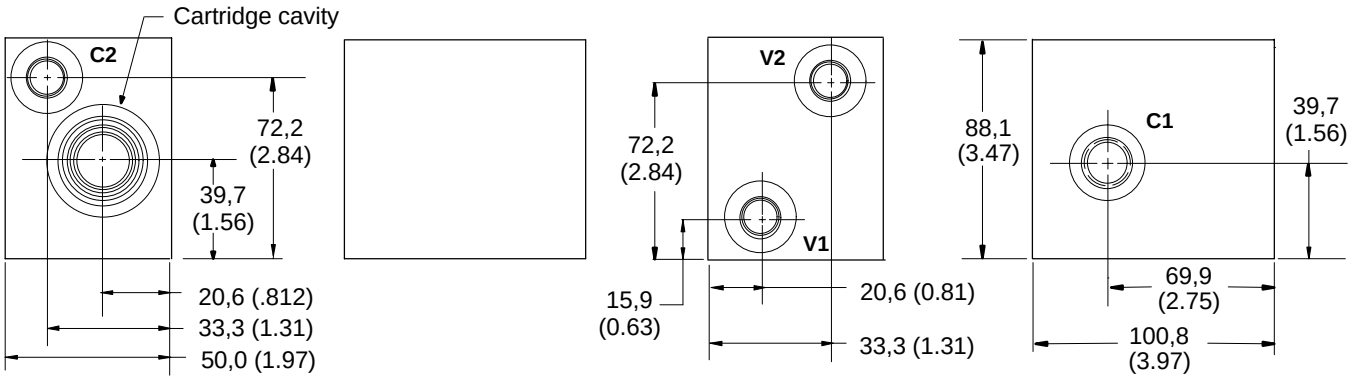
POC1-12 Housings

N - Close Coupled Nipple Mounted
Aluminum & Steel

Dimensions
mm (inch)

Port Size	C1	C2	V1	V2
8T	1/2" BSPP	SAE 8		
4G	1/2" BSPP	1/2" BSPP		

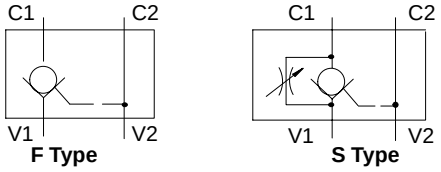


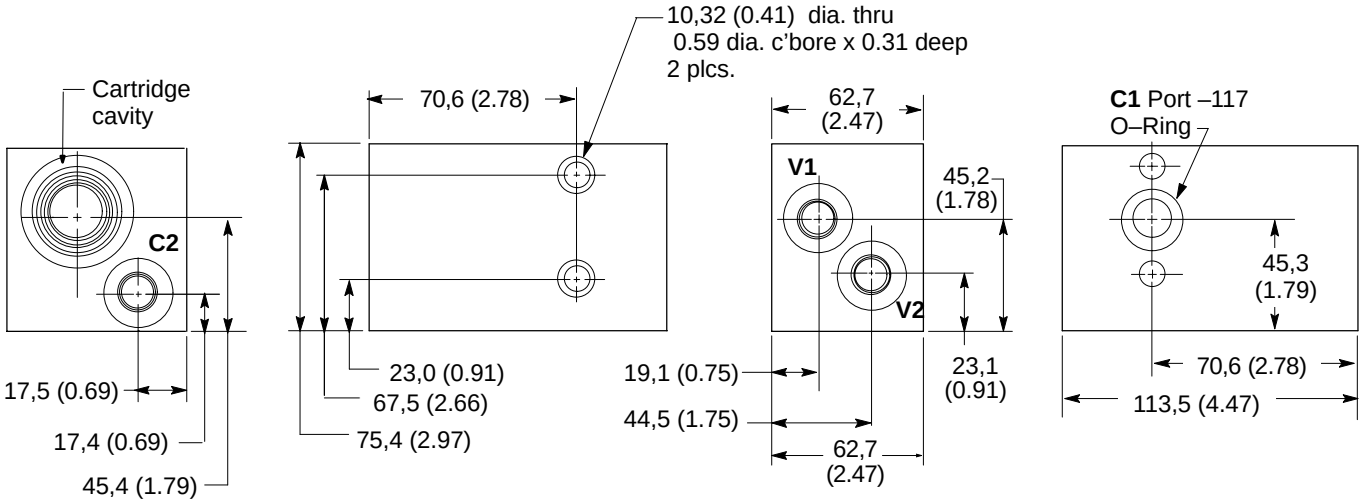


Refer to page 52 for housing part numbers

G - Gasket Mounted – Single
Aluminum & Steel

Port	C1	C2	V1	V2
8T	∅ 15,8 (0.625)	SAE 8		
4G		1/2" BSPP		

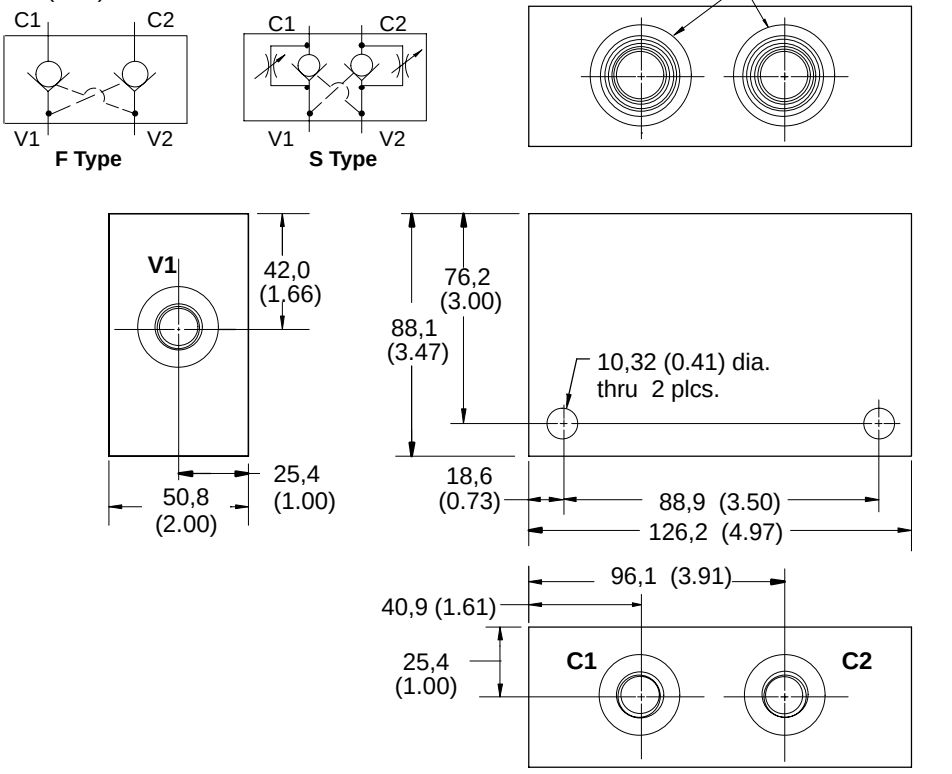




POC1-12 Housings

D - Dual Line Mounted – Aluminum & Steel

Dimensions
mm (inch)

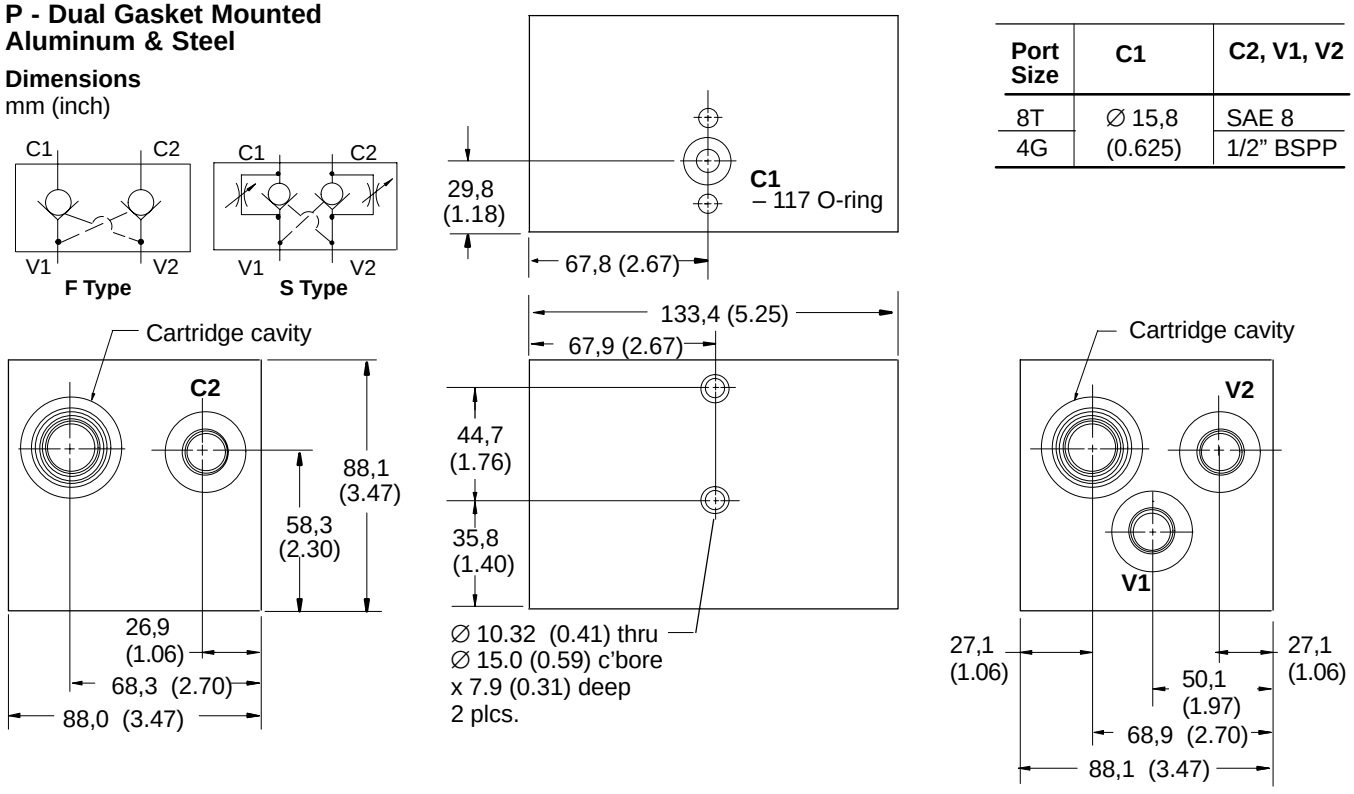


Port Size	C1, C2, V1, V2
10T	SAE 10
12T	SAE 12
4G	1/2” BSPP

Refer to page 52 for housing part numbers

P - Dual Gasket Mounted Aluminum & Steel

Dimensions
mm (inch)



Port Size	C1	C2, V1, V2
8T	∅ 15,8 (0.625)	SAE 8
4G		1/2” BSPP

POC1-10/12 Valve Housings

Housing Type	Port Size	Size 10 (A) Aluminum Light Duty	Size 10 (A) Aluminum NFPA Fatigue Rated	Size 10 (S) Steel NFPA Fatigue Rated	Size 12 (A) Aluminum NFPA Fatigue Rated	Size 12 Steel NFPA Fatigue Rated
I Inline	3B (3/8” BSPP)	02–175470	————	————	————	————
	6H (SAE 6)	————	876706			
	8H (SAE 8)		876712			
	6T (SAE 6)	566413	————	02–171961		
	8T (SAE 8)	————		02–163322		
	10T (SAE 10)			02–163323	02–178268	02–160996
	12T (SAE 12)			————	02–178269	02–160997
	2G (1/4” BSPP)		876707		————	————
	3G (3/8” BSPP)		876710	02–163313		
	4G (1/2” BSPP)		————	02–163324	02–178270	02–160994
	6G (3/4” BSPP)			————	02–178271	02–160995
B–4–Bolt Pad	4T (SAE 4)				02–160801	02–160800
N Close Coupled, Nipple Mounted	6H (SAE 6)		02–160853		————	————
	6T (SAE 6)		————	02–160851		
	8T (SAE 8)			————	02–160820	02–160818
	3G (3/8” BSPP)		02–172324	02–172323	————	————
	4G (1/2” BSPP)		————	————	02–160821	02–160819
G Gasket Mounted, single	6H (SAE 6)		02–160845		————	————
	6T (SAE 6)		————	02–160847		
	8T (SAE 8)			————	02–160824	02–160822
	3G (3/8” BSPP)	————	02–160844	02–160848	————	————
	4G (1/2” BSPP)		————	————	02–160825	02–160823
D Dual Line Mounted	6H (SAE 6)		02–160829	————	————	————
	8H (SAE 8)		02–160830			
	10H (SAE 10)		02–160831			
	6T (SAE 6)		————	02–160838		
	8T (SAE 8)			02–160839		
	10T (SAE 10)			02–160840	02–160811	02–160808
	12T (SAE 10)			————	02–160812	02–160809
	2G (1/4” BSPP)		02–171912	02–160841	————	————
	3G (3/8” BSPP)		02–160833	02–160842		
	4G (1/2” BSPP)		02–160834	02–160843	02–160813	02–160810
P Dual Gasket Mounted	6H (SAE 6)		02–160857	————	————	————
	6T (SAE 6)		————	02–160873		
	8T (SAE 8)			————	02–160816	02–160814
	3G (3/8” BSPP)		02–162241	02–160874	————	————
	4G (1/2” BSPP)		————	————	02–160817	02–160815

Approximate Weight for POC*-10/12 Valve Housings

Housing	Aluminum – Standard, kg (lbs) Size 10	Size 12	Aluminum – Light duty, kg (lbs) Size 10	Steel, kg (lbs) Size 10	Size 12
I	0,75 (1.65)	0,82 (1.80)	0,23 (0.51)	1,08 (2.40)	2,63 (5.40)
B	–	0,86 (1.90)		–	2,61 (5.75)
N	0,49 (1.10)	0,91 (2.00)		1,49 (3.30)	2,72 (6.00)
G	0,67 (1.85)	0,73 (1.60)	–	2,49 (5.50)	2,15 (4.75)
D	0,79 (1.75)	1,11 (2.45)		2,38 (5.25)	3,33 (7.35)
P	0,72 (1.60)	2,0 (4.40)		2,17 (4.80)	5,90 (10.00)

Spare Parts

The only parts available are cartridges and seal kits. Seal kits include external seals and back-up rings.

Model	Check Valve	Qty	Pilot Piston	Qty	Check Valve Seal Kits			
					Buna-N	Qty	Viton®	Qty
SPC1–10–P	CV1–10(V)–P–0–15	1	566417	1	565803	1	566086	1
SPC1–16–P	CV1–16(V)–P–0–20	1	889052	1	565810	1	889609	1
SPC1–20–P	CV2–20(V)–P–0–15	1	566430	1	889615	1	889619	1
DPC1–10–P	CV1–10(V)–P–0–15	2	02–166313	1	565803	2	566086	2
DPC1–16–P	CV1–16(V)–P–0–20	2	566427	1	565810	2	889609	2
DPC1–20–P	CV1–20(V)–P–0–15	2	566433	1	889615	2	889619	2

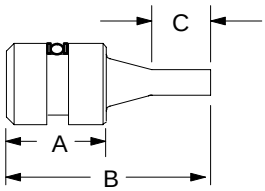
Viton® is a registered trademark of E.I. Dupont

Seal Kits

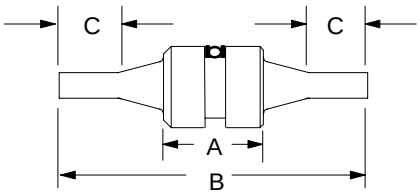
Cartridge seal kits, comprising external seals and back-up rings are available for servicing these units. Please refer to the individual model pages for the appropriate seal kits.

Pilot Pistons

Single acting
SPC1–10
SPC1–16
SPC1–20



Double acting
DPC1–10
DPC1–16
DPC1–20



Size	Acting	A	B	C	Req'd housing bore	Pilot Piston Part Number Buna N	Viton	No seals
8	Single	15,1 (0.60)	34,1 (1.34)	8,3 (0.33)	12,73 (0.500) 12,75 (0.502)	02–178662	02–178663	02–178653
	Double		53,2 (2.10)	8,3 (0.33)		02–178669	02–178670	02–178654
10	Single	19,1 (0.75)	41,3 (1.63)	13,5 (0.53)	15,88 (0.625) 15,90 (0.626)	02–166275	566418	566417
	Double		57,2 (2.25)	10,3 (0.41)		566419	566420	02–166313
12	Single	17,5 (0.69)	44,5 (1.75)	14,3 (0.56)	23,80 (0.937) 23,85 (0.939)	02–185700	02–185701	02–185699
	Double		71,4 (2.81)	14,3 (0.56)		02–185703	02–185704	02–185702
16	Single	31,8 (1.25)	63,5 (2.50)	12,7 (0.50)	28,58 (1.125) 28,60 (1.126)	566304	566425	566426
	Double		95,3 (3.75)			566427	566428	566429
20	Single	38,1 (1.50)	77,8 (3.06)	19,1 (0.75)	36,50 (1.437) 36,53 (1.438)	566430	566431	566432
	Double		117,5 (4.63)			566433	566434	566435

Form Tools

Roughing Tools

Roughers are basically step drills which leave .030” per cutting diameter and .015” above all radii for the finishing reamer, with an additional .015” depth in the cavity bottom as clearance.

The roughing tool is necessary to prepare the cavity for the finishing reamer, which has not been designed for the primary forming or bottom cutting.

We offer two types of roughers, one for aluminum and one for steel. The aluminum rougher is manufactured with a 4 facet point and polished flutes. The steel rougher is supplied with a standard drill point. Both types will work in either material, however, longevity of an aluminum tool will be sacrificed when used continually in steel.

Cavity	Material	Model Code	Assembly Number	Cavity	Material	Model Code	Assembly Number
2–Way				**3-Way**			
C-8-2	Aluminum/Steel	RT1-8-2-AS-8028	02–165580	C-8-3	Aluminum/Steel	RT1-8-3-AS-8291	02-162384
C-10-2	Aluminum	RT-10-2-A-8030	889509	C-10-3	Aluminum	RT-10-3-A-8038	889511
C-10-2	Steel	RT-10-2-S-8035	889510	C-10-3	Steel	RT-10-3-S-8043	889512
C-12-2	Aluminum/Steel	RT-12-2-AS-8213	02-160625	C-12-3	Aluminum/Steel	RT-12-3-AS-8217	02-153261
C-16-2	Aluminum	RT-16-2-A-8031	889515	**3-Way Short**			
C-16-2	Steel	RT-16-2-S-8036	889516	C-10-3S	Aluminum	RT-10-3S-A-8099	565824
C-20-2	Aluminum	RT-20-2-A-8032	565822	C-10-3S	Steel	RT-10-3S-S-8209	566703
				C-12-3S	Aluminum/Steel	RT-12-3S-AS-8220	02-113178

Finishing Tools

These finishing tools have been designed as precision reamers for finishing operations only. They are not intended for primary forming or bottom cutting operations. Vickers recommends that a finishing tool only be used in a properly roughed hole. Failure to conform to this practice will produce unsatisfactory size and finishes and possibly break the tool.

Cavity	Material	Model Code	Assembly Number	Cavity	Material	Model Code	Assembly Number
2–Way				**3-Way**			
C-8-2	Aluminum/Steel	FT1-8-2-AS-8070	02-112933	C-8-3	Aluminum/Steel	FT-8-3-AS-8295	02-171292
C-10-2	Aluminum/Steel	FT-10-2-AS-8048	566235	C-10-3	Aluminum/Steel	FT-10-3-AS-8050	565834
C-12-2	Aluminum/Steel	FT-12-2-AS-8214	02-162162	**3-Way Short**			
C-16-2	Aluminum/Steel	FT-16-2-AS-8078	565832	C-10-3S	Aluminum/Steel	FT-10-3S-AS-8210	566708
C-20-2	Aluminum/Steel	FT-20-2-AS-8079	565833	C-12-3S	Aluminum/Steel	FT-12-3S-AS-8242	02-162998

Finishing Form Tools Speed & Feed for Aluminum 6061-T6 (T651)

This information is recommended as a good starting point. Speeds and/or feeds may be increased or decreased depending on actual machining conditions.

NOTE: Finish form tools may require 1/2 to 1-1/2 second dwell to obtain necessary finish.

CNC MACHINE TOOL			**BRIDGEPORT / LAGUN TYPE MACHINES**		
Tool Size	RPM	IPM	Tool Size	RPM	IPM
C-8-2, C-10-2	600	4	C-8-2, C-10-2	800-1000	6-5
C-8-3, C-10-3(S), C-8-4			C-8-3, C-10-3(S), C-8-4		
C-12-2(U), C-12-3(S), C-16-2			C-12-2(U), C-12-3(S), C-16-2	250	2 1/2

Fluid Cleanliness

The recommended cleanliness code for the valves in this publication is 18/16/13.

Proper fluid condition is essential for long and satisfactory life of hydraulic components and systems. Hydraulic fluid must have the correct balance of cleanliness, materials, and additives for protection against wear of components, elevated viscosity, and inclusion of air.

Essential information on the correct methods for treating hydraulic fluid is included in Vickers publication 561 “Vickers Guide to Systemic Contamination Control” available from your local Vickers distributor or by contacting Vickers, Incorporated. Recommendations on filtration and the selection of products to control fluid condition are included in 561.

Index

MODEL	DESCRIPTION	PAGE
CV1-10-B	Ball Type Check Valve	4
CV1-10-P	Poppet Type Check Valve	8
CV1-16-P		16
CV2-20-P		18
CV3-8-P		6
CV3-10-P		10
CV11-12-P		14
CV16-10-P		12
DPC1-10-P	Double Pilot Check Valve In-line Housing Type	34
DPC1-16-P		36
DPC1-20-P		38
POC1-10	Pilot-to-Open Check Valve	30
POC1-12		32
SPC1-10-P	Single Pilot Check Valve In-line Housing Type	24
SPC1-16-P		26
SPC1-20-P		28
SPC2-8-P	Single Pilot Check Valve Cartridge Type	20
SPC2-10-P		22
C-**-2	Aluminum Housings (Light Duty)	42
C-**-2(U)	Aluminum Housings (Fatigue Rated)	43
C-**-2(U)	Cavity Dimensions	40
C-**-2(U)	Steel Housings (Fatigue Rated)	44
C-**-3	Cavity Dimensions	41
C-**-3	Steel Housings	44
C-**-3(S)	Aluminum Housings (Light Duty)	42
C-**-3(S)	Aluminum Housings (Fatigue Rated)	43
C-**-3(S)	Cavity Dimensions	41
Form Tools	Roughing	54
	Finishing	54
Housing Part Numbers & Weights	POC*-10 / 12	52
POC1-10 Housing Dimensions	I - Inline Steel & I - Inline Aluminum - NFPA Fatigue Rated	45
	I - Inline Aluminum - Light Duty & N - Close Coupled Nipple Mounting	46
	G - Gasket Mounted - Single D - Dual Line Mounted	47
	P - Dual Gasket Mounted	48
POC1-12 Housing Dimensions	I - Inline & B - $^3/_4$" SAE 4-Bolt Pad Mounting	49
	N - Close Coupled Nipple Mounting & G - Gasket Mounted - Single	50
	D - Dual Line Mounted P - Dual Gasket Mounted	51
Spare Parts		53