In-Line Mounted Flow, Pressure Control, Check and Ball Valves

Catalog HY14-3300/US

Fully guided poppets are used on all Colorflow valves rather than the less durable ball-check type construction. Poppets open and close more smoothly — last longer — and eliminate the distortion of seats and springs.

The exclusive “Colorflow” feature on metering, flow control, and needle valves gives highly visible check-points for setting valve openings accurately and quickly. This feature also provides a reference point that allows the valve to be precisely reset to a previous setting.

Colorflow valves are available with a variety of porting options.

Steel, brass or stainless steel bodies are available, both include stainless steel needles as standard.

WARNING: Colorflow valves are not repairable

Colorflow® Needle, Flow and Check Valves
Provide a Visual Check of Precise Valve Settings

Actuation and speed of response of fluid power systems on any type of industrial equipment can be controlled precisely, instantly, and repeatedly with Parker Control Valves.

The Colorflow line includes flow control valves rated from 0 to 568 LPM (0 to 150 GPM), needle valves from 0 to 265 LPM (0 to 70 GPM), and for very accurate control, the metering valves provide linear adjustment of flows from 0 to 151 LPM (0 to 40 GPM).

Fast actuation and deceleration…precise control of fluid power…protection for fluid power systems against back-pressure and vibration…accurate settings for fluid valves and controls…

These are a few functions that the complete line of Parker Hydraulic and Pneumatic Control Valves are filling on all kinds of machinery and equipment around the world.

Engineered to top design, built to top quality standards, these are the finest, most accurate controls you can install on your machines. Features include the exclusive "Colorflow" color-coded system that gives operators a visual checkpoint in setting valves precisely. And the use of quality materials and components in bodies assure a control valve that withstands shock, vibration and wear, and has extraordinary life expectancy.

Why we use poppets exclusively.

Poppets are used in all Colorflow Valves, instead of check balls. As the poppets are opened and closed, they move in precision-fitted cylinders that eliminate wobble and erratic travel.

Poppets also have hydraulic cushioning to soften the impact of the poppet against the valve spring and seat at the end of travel. By contrast, check balls (not used by Colorflow) have large mass that develops heavy impact on the seat and causes the spring to bottom. These hammer blows can peen the seat, roughen the ball, and eventually create a leaker. Springs that are bottomed frequently are susceptible to early fatigue and failure. Worn balls can develop chatter; and may shift position and not shut off tightly.

Balls cannot be decelerated at the end of their travel in the way poppets are slowed by hydraulic bleeding ports and channels.

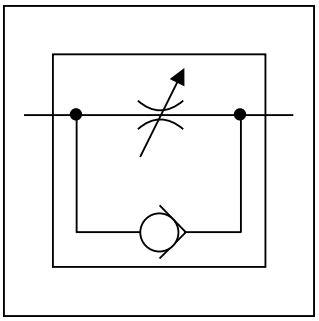
A worldwide organization of well-stocked Parker Colorflow distributors means immediate delivery of any control valve in our line of top-quality products to control air and oil on any fluid-power system.

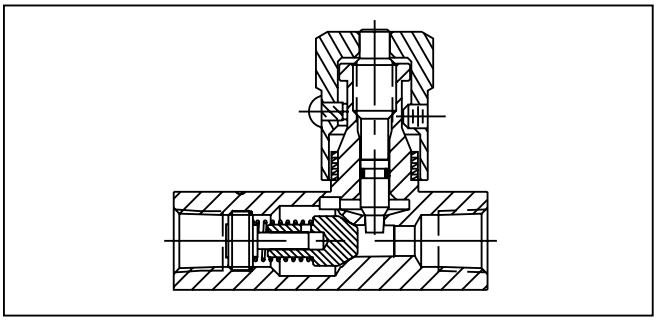
Contents

In-Line Mounted Valves

General Description

Series F flow control valves provide precise control of flow and shut-off in one direction, and automatically permit full flow in the opposite direction.





Operation

A two-step needle allows fine adjustment at low flow by using the first three turns of the adjusting knob. The next three turns open the valve to full flow, and also provide standard throttling adjustments.

Features

- The exclusive “Colorflow” color-band reference scale on the valve stem is a great convenience and time-saver in setting the valve originally and in returning it to any previous setting.
- A simple set screw locks the valve on any desired setting.
- A tamperproof option (T) feature is also available to prevent accidental or intentional adjustment of flow setting.

Specifications

Maximum Operating Pressure	Brass:	140 Bar (2000 PSI); except for F1600 brass which is 35 Bar (500 PSI)
	Steel & Stainless Steel:	345 Bar (5000 PSI) for 200 thru 1020; 207 Bar (3000 PSI) for all other sizes
Material	Body	see ordering code
	Knob	Steel - Zinc plated
	Spring	316 Stainless Steel
	Needle	416 Stainless Steel
	Poppet	416 Stainless Steel
	Retainer	416 Stainless Steel
	Stainless Steel Bodies	303 Stainless Steel

Poppets	Soft seal poppet in brass 200 - 820 sizes Solid metal 416 stainless steel poppet on all other sizes and styles
Nominal Cracking Pressure	0.4 Bar (5 PSI) standard
Operating Temperature	-40°C to +121°C (-40°F to +250°F) Nitrile (standard) -26°C to +205°C (-15°F to +400°F) Fluorocarbon

Options | F Series | Size | Material | Needle Options | Other Options | — | Seal Compound | Design Series

NOTE: Not required when ordering.

Code	Description
Omit	NPTF/SAE
★8	BSPT
★★9	BSPP

★ Code 8 can be used with sizes 200, 400, 600, 800, 1200 Steel only

★★ Code 9 can be used with sizes 200, 400, 600, 800, 1200, 1600, 2000, 2400, 3200

Code	Size	Code	Size	Code	Size
200 *	1/8"	820 *	#8 SAE	2000	1 1/4"
400 *†	1/4"	1020	#10 SAE	2020	#20 SAE
420 *	#4 SAE	1200 *	3/4"	2400	1 1/2"
600 *†	3/8"	1220	#12 SAE	2420	#24 SAE
620	#6 SAE	1600 *	1"	3200	2"
800 *†	1/2"	1620	#16 SAE	3220	#32 SAE

* Sizes available in Brass.

† Sizes available in Stainless Steel.

Code	Description
B	Brass
S	Steel
SS*	Stainless Steel

Series F Brass Valves can be used for both air and oil service.

* Available in 400, 600 and 800 sizes.

Code	Description
Omit	Standard
4	Fine Metering (200, 400, 600, 620, 820 sizes)

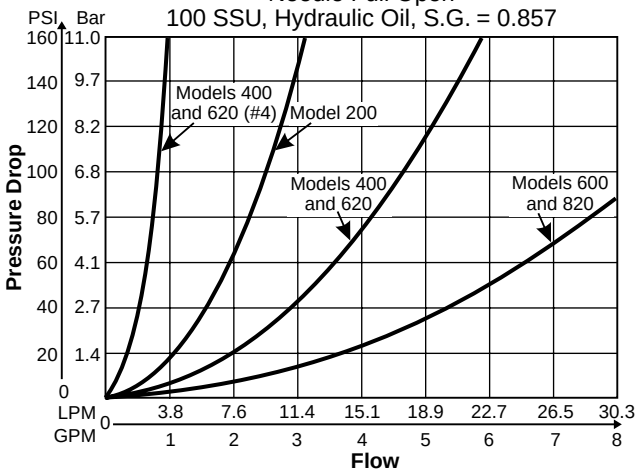
Code	Description
Omit	Standard Knob
T *	Tamperproof
F	Finger Screw

* Not available above 1200 size.

Code	Description
Omit	Nitrile (Standard)
V	Fluorocarbon

Model Number	Free Flow Rate, Max. LPM (GPM)	Free Flow Orifice Area $in.^2$	Free Flow C_v	Effective Orifice Area, Control Flow $in.^2$	Effective Control Flow C_v
F200	11 (3)	0.023	0.53	0.0102	0.230
F420	11 (3)	0.023	0.53	0.0102	0.230
F400	19 (5)	0.068	1.56	0.0194	0.433
F620	19 (5)	0.068	1.56	0.0194	0.433
F600	30 (8)	0.099	2.27	0.0344	0.787
F820	30 (8)	0.099	2.27	0.0344	0.787
F800	57 (15)	0.224	5.11	0.0427	0.976
F1020	57 (15)	0.224	5.11	0.0427	0.976
F1200	95 (25)	0.348	7.95	0.1080	2.470
F1220	95 (25)	0.348	7.95	0.1080	2.470
F1600	151 (40)	0.453	10.35	0.2300	5.250
F1620	151 (40)	0.453	10.35	0.3070	7.000
F2000	265 (70)	0.855	19.52	0.2300	5.250
F2020	265 (70)	0.855	19.52	0.3710	8.470
F2400	379 (100)	0.955	21.82	0.2300	5.250
F2420	379 (100)	0.955	21.82	0.3710	8.470
F3200	568 (150)	1.046	23.90	0.2300	5.250
F3220	568 (150)	1.046	23.90	0.6010	13.410

Controlled Flow vs. Pressure Drop
Needle Full Open
100 SSU, Hydraulic Oil, S.G. = 0.857



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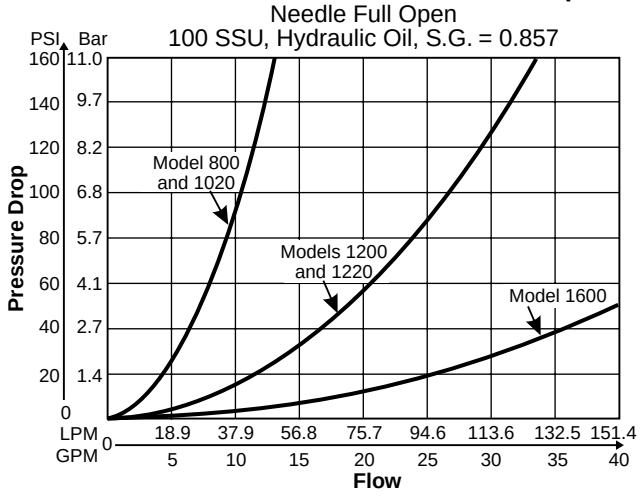

Controlled Flow vs. Pressure Drop
Needle Full Open
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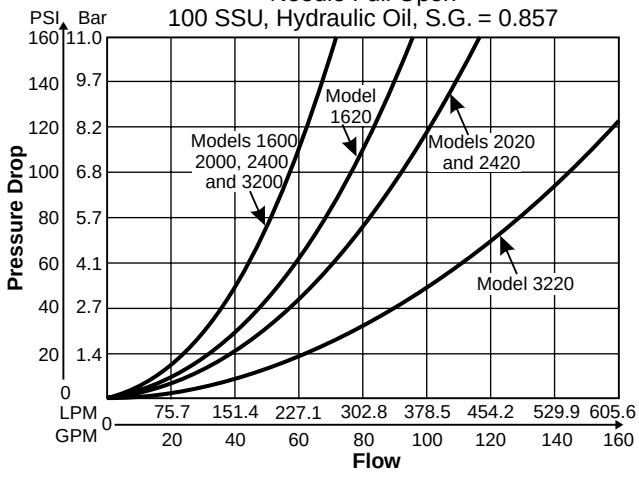
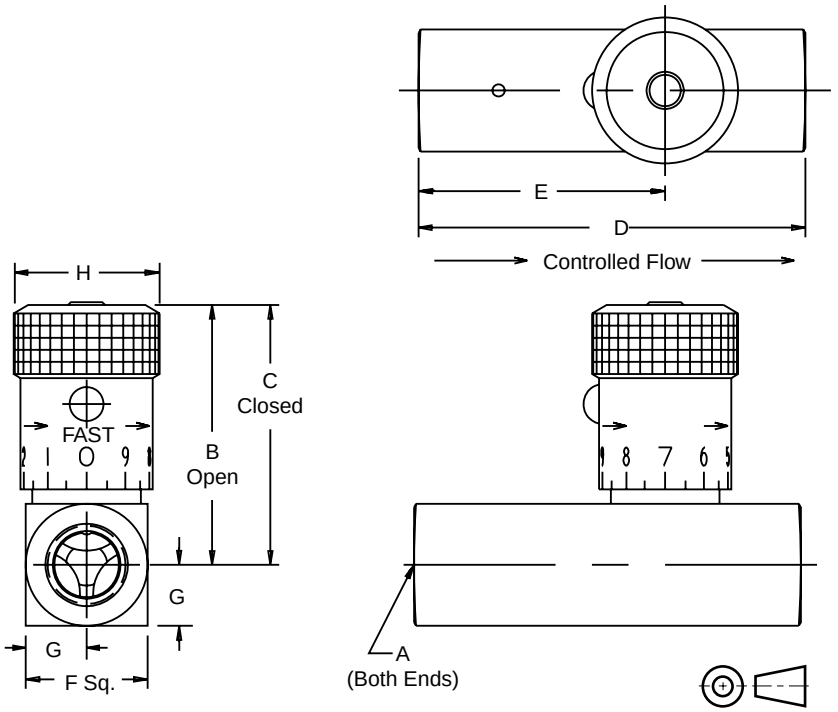
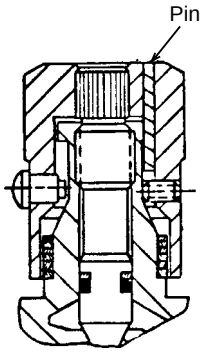


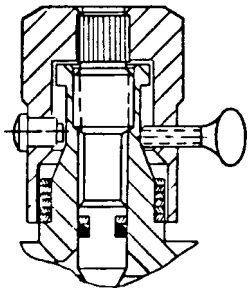
Inch equivalents for millimeter dimensions are shown in (**)



Knob Options



Tamperproof Option (Code "T") permanently locks knob at desired flow setting by installing a pin in predrilled hole.



Finger screw Option (Code "F") provides this thumb-screw in place of set screw.

Model Number	Weight kg	Weight (lbs)	A	B	C	D	E	F	G	H
F200	0.1	(0.3)	1/8–27 NPTF	39.1 (1.54)	35.3 (1.39)	50.8 (2.00)	32.5 (1.28)	16.0 (0.63)	7.9 (0.31)	19.1 (0.75)
F400	0.2	(0.5)	1/4–18 NPTF	45.5 (1.79)	40.4 (1.59)	66.8 (2.63)	42.2 (1.66)	20.6 (0.81)	10.4 (0.41)	20.6 (0.81)
F420	0.2	(0.5)	7/16–20 UNF #4 SAE	41.4 (1.63)	37.6 (1.48)	68.3 (2.69)	42.9 (1.69)	20.6 (0.81)	10.4 (0.41)	19.1 (0.75)
F600	0.3	(0.7)	3/8–18 NPTF	55.4 (2.18)	49.5 (1.95)	69.9 (2.75)	44.5 (1.75)	25.4 (1.00)	12.7 (0.50)	25.4 (1.00)
F620	0.3	(0.6)	9/16–18 UNF #6 SAE	47.7 (1.88)	42.7 (1.68)	79.2 (3.12)	48.8 (1.92)	25.4 (1.00)	12.7 (0.50)	20.6 (0.81)
F800	0.7	(1.5)	1/2–14 NPTF	68.6 (2.70)	61.5 (2.42)	87.4 (3.44)	56.6 (2.23)	31.8 (1.25)	16.0 (0.63)	30.2 (1.19)
F820	0.5	(1.0)	3/4–16 UNF #8 SAE	56.9 (2.24)	51.1 (2.01)	88.9 (3.50)	53.8 (2.12)	28.4 (1.12)	14.2 (0.56)	25.4 (1.00)
F1020	0.8	(1.8)	7/8–14 UNF #10 SAE	68.6 (2.70)	61.5 (2.42)	101.6 (4.00)	65.0 (2.56)	31.8 (1.25)	15.7 (0.62)	30.2 (1.19)
F1200	1.2	(2.6)	3/4–14 NPTF	85.9 (3.38)	71.4 (2.81)	98.6 (3.88)	65.5 (2.58)	38.1 (1.50)	19.1 (0.75)	35.1 (1.38)
F1220	1.2	(2.6)	1 1/6–12 UN #12 SAE	85.9 (3.38)	71.4 (2.81)	117.3 (4.62)	76.5 (3.01)	38.1 (1.50)	19.1 (0.75)	35.1 (1.38)
F1600	2.3	(5.1)	1–11 1/2 NPTF	123.7 (4.87)	106.9 (4.21)	127.0 (5.00)	81.8 (3.22)	44.5 (1.75)	22.4 (0.88)	47.8 (1.88) *
F1620	2.3	(5.1)	1 5/16–12 UN #16 SAE	130.8 (5.15)	114.0 (4.49)	142.7 (5.62)	88.9 (3.50)	57.2 (2.25)	28.4 (1.12)	47.8 (1.88) *
F2000	3.7	(8.1)	1 1/4–11 1/2 NPTF	130.0 (5.12)	113.3 (4.46)	143.0 (5.63)	98.6 (3.88)	57.2 (2.25)	28.7 (1.13)	47.8 (1.88) *
F2020	3.7	(8.1)	1 5/8–12 UN #20 SAE	140.2 (5.52)	123.4 (4.86)	165.1 (6.50)	108.0 (4.25)	69.9 (2.75)	35.1 (1.38)	47.8 (1.88) *
F2400	4.6	(10.2)	1 1/2–11 1/2 NPTF	136.4 (5.37)	119.6 (4.71)	143.0 (5.63)	113.5 (4.47)	69.9 (2.75)	35.1 (1.38)	47.8 (1.88) *
F2420	4.6	(10.2)	1 7/8–12 UN-2B #24 SAE	143.5 (5.65)	126.7 (4.99)	184.2 (7.25)	127.0 (5.00)	76.2 (3.00)	38.1 (1.50)	47.8 (1.88) *
F3200	7.9	(17.4)	2–11 1/2 NPTF	146.1 (5.75)	129.3 (5.09)	165.1 (6.50)	134.9 (5.31)	88.9 (3.50)	44.5 (1.75)	47.8 (1.88) *
F3220	7.9	(17.4)	2 1/2–12 UN #32 SAE	163.6 (6.44)	139.4 (5.49)	228.6 (9.00)	155.7 (6.13)	101.6 (4.00)	50.8 (2.00)	47.8 (1.88) *

* = Hex

3300-1.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

General Description

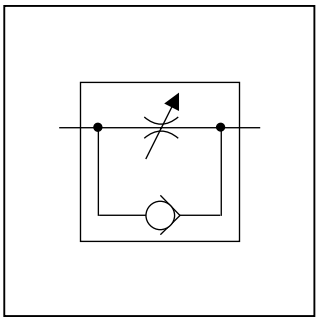
Series 6F flow control valves provide precise control of flow and shut-off in one direction, and automatically permit full flow in the opposite direction.

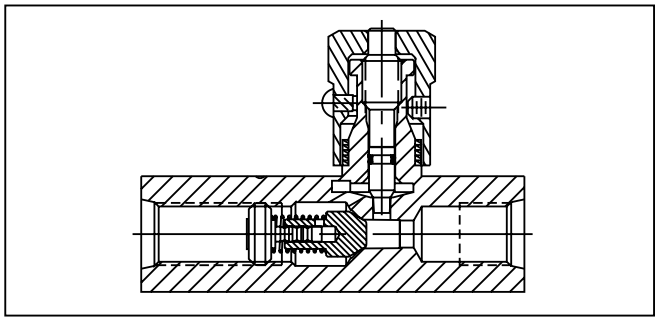
Operation

A two-step needle allows fine adjustment at low flow by using the first three turns of the adjusting knob. The next three turns open the valve to full flow, and also provide standard throttling adjustments.

Features

- Meets ISO 6149 standards.
- Hard metric dimensions.
- Reliable leak-free performance — straight thread port with o-ring sealing.
- Global interchangeablility.



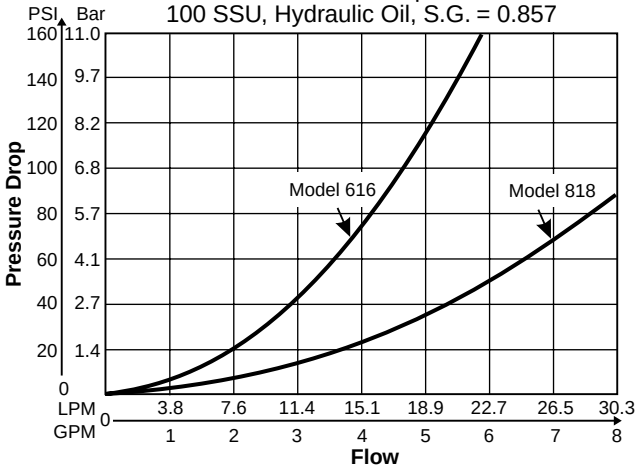


Specifications

Maximum Operating Pressure	M16 x 1.5	345 Bar	(5000 PSI)
	M18 x 1.5	345 Bar	(5000 PSI)
	M22 x 1.5	345 Bar	(5000 PSI)
	M27 x 2.0	207 Bar	(3000 PSI)
Maximum Flow	M16 x 1.5	19 LPM	(5 GPM)
	M18 x 1.5	30 LPM	(8 GPM)
	M22 x 1.5	57 LPM	(15 GPM)
	M27 x 2.0	95 LPM	(25 GPM)
	M33 x 2.0	151 LPM	(40 GPM)
	M42 x 2.0	265 LPM	(70 GPM)
	M48 x 2.0	379 LPM	(100 GPM)
Material	Body	ASTM 12L14	Carbon Steel
	Knob	ASTM 12L14	Carbon Steel
	Needle	ASTM 416	Stainless Steel
	Poppet	ASTM 416	Stainless Steel
	Retainer	ASTM 416	Stainless Steel
	Spring	ASTM 316	Stainless Steel
Seals	Nitrile — Standard Fluorocarbon — Optional		

Performance Curves

Controlled Flow vs. Pressure Drop
Needle Full Open
100 SSU, Hydraulic Oil, S.G. = 0.857



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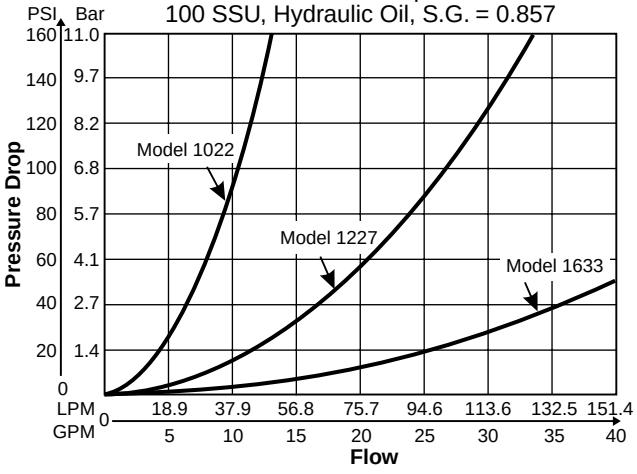

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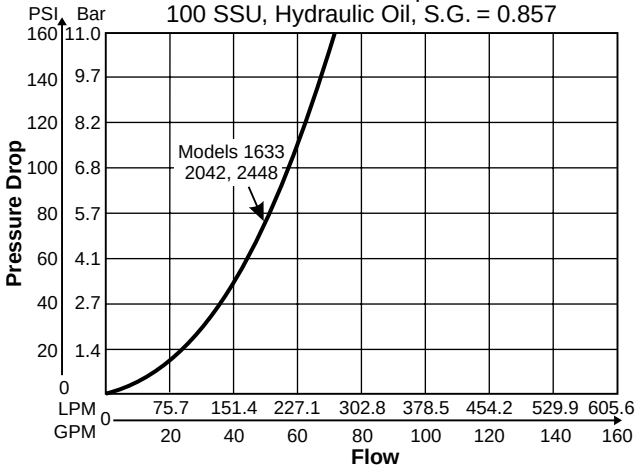


3300-1.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

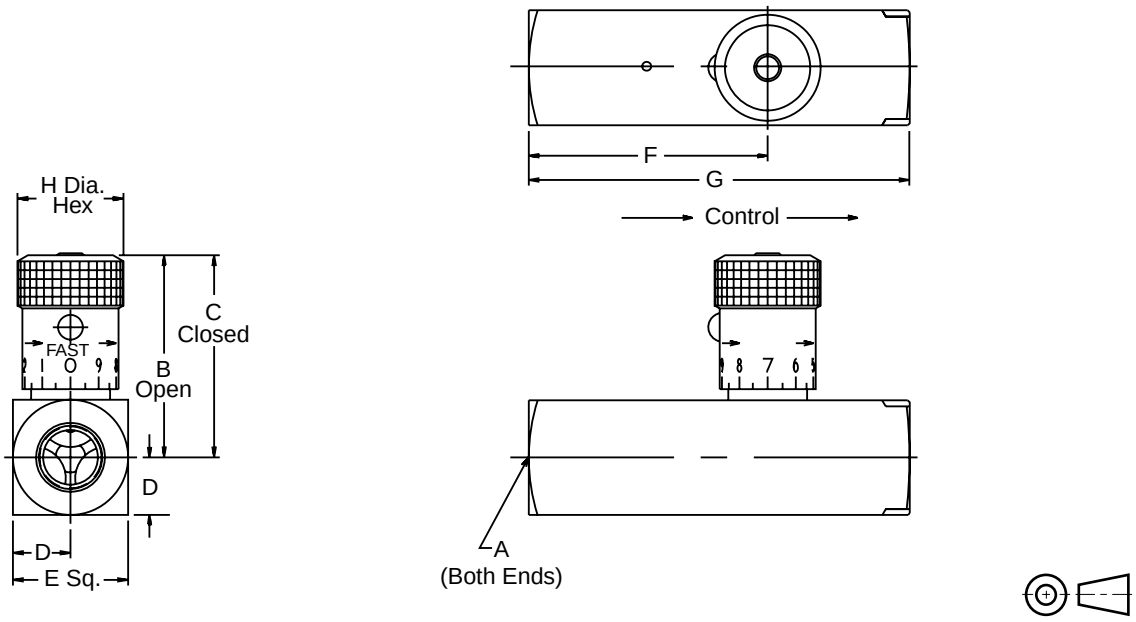
Ordering Information

6	F		S	
Ports	Style	Size	Material	Design Series
ISO 6149 ports	Flow Control Valve		Steel	NOTE: Not required when ordering.

Code	Description
616	M16 x 1.5
818	M18 x 1.5
1022	M22 x 1.5
1227	M27 x 2.0
1633	M33 x 2.0
2042	M42 x 2.0
2448	M48 x 2.0

Dimensions

Inch equivalents for millimeter dimensions are shown in (**)



Model Number	Weight kg (lbs.)	A	B	C	D	E	F	G	H
6F616	0.3 (0.6)	M16 x 1.5	47.8 (1.88)	42.7 (1.68)	12.7 (0.50)	25.4 (1.00)	48.7 (1.92)	79.2 (3.12)	20.6 (∅ 0.81)
6F818	0.5 (1.0)	M18 x 1.5	56.9 (2.24)	51.1 (2.01)	14.2 (0.56)	28.4 (1.12)	53.8 (2.12)	88.9 (3.50)	25.4 (∅1.00)
6F1022	0.8 (1.8)	M22 x 1.5	68.6 (2.70)	61.5 (2.42)	15.7 (0.62)	31.8 (1.25)	65.0 (2.56)	101.6 (4.00)	30.2 (∅ 1.19)
6F1227	1.2 (2.6)	M27 x 2.0	85.9 (3.38)	71.4 (2.81)	19.1 (0.75)	38.1 (1.50)	76.5 (3.01)	117.3 (4.62)	35.1 (∅1.38)
6F1633	2.3 (5.1)	M33 x 2.0	124.7 (4.91)	108.0 (4.25)	22.4 (0.88)	44.5 (1.75)	81.8 (3.22)	127.0 (5.00)	47.8 (*1.88)
6F2042	3.7 (8.1)	M42 x 2.0	133.9 (5.27)	117.1 (4.61)	28.7 (1.13)	57.2 (2.25)	98.6 (3.88)	132.8 (5.23)	47.8 (*1.88)
6F2448	4.6 (10.2)	M48 x 2.0	140.5 (5.53)	123.7 (4.87)	35.1 (1.38)	69.9 (2.75)	113.5 (4.47)	143.0 (5.63)	47.8 (*1.88)

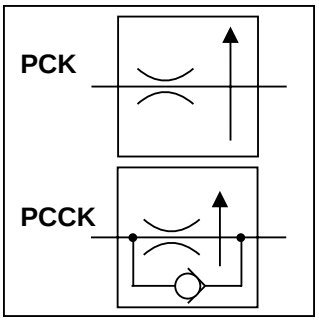
* = Hex

3300-1.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

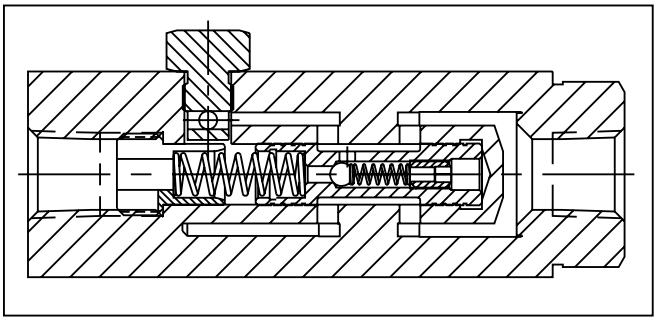
General Description

Series PCK pressure compensated flow control valves are designed to regulate flow at a selected rate, within 5%, regardless of fluctuations in inlet and outlet pressure.



Operation

Series PCK valves are factory-set for a specified flow. The flow can be changed with a different “PCK” Orifice Plug Kit (sold separately).



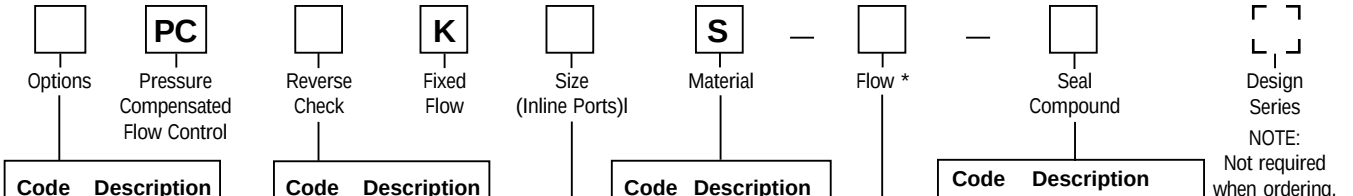
Features

- Available with reverse flow check.
- Flow precision within ±5% of full flow.

Specifications

	PC*K400S PC*K620S	PC*K600S PC*K820S	PC*K800S PC*K1020S	PC*K1200S PC*K1220S
Maximum Operating Pressure	207 Bar (3000 PSI)			
Minimum Pressure to Compensate	6.9 Bar (100 PSI)	6.9 Bar (100 PSI)	6.9 Bar (100 PSI)	10.4 Bar (150 PSI)
Operating Temperature	-40°C to +121°C (-40°F to +250°F) Nitrile (standard) -26°C to +205°C (-15°F to +400°F) Fluorocarbon			
Mounting	In-line			
Maximum Flow	11 LPM (3 GPM)	23 LPM (6 GPM)	57 LPM (15 GPM)	95 LPM (25 GPM)
Minimum Flow	1 LPM (0.3 GPM)	2 LPM (0.6 GPM)	6 LPM (1.5 GPM)	10 LPM (2.5 GPM)
Reverse Flow, Maximum thru Check	19 LPM (5 GPM)	30 LPM (8 GPM)	76 LPM (20 GPM)	132 LPM (35 GPM)
Pressure Drop, ∆P at Maximum Reverse Flow Flow thru Check	3 Bar (40 PSI)	3 Bar (40 PSI)	PC*K800S: 8 Bar (116 PSI) PC*K1020S: 3 Bar (40 PSI)	PC*K1200S: 8 Bar (116 PSI) PC*K1220S: 3 Bar (40 PSI)
Port Size (in.)	PC*K400S: 1/4 NPTF PC*K620S: 9/16-18 UNF (SAE 6)	PC*K600S: 3/8 NPTF PC*K820S: 3/4-16 UNF (SAE 8)	PC*K800S: 1/2 NPTF PC*K1020S: 7/8-14 UNF (SAE 10)	PC*K1200S: 3/4 NPTF PC*K1220S: 1-1/16-12 UN (SAE 12)

*For optional reverse-flow check, insert “C” in model number at asterisk (*).



Code	Description
Omit	NPTF/SAE
★ 9	BSPP

★ Code 9 can be used with sizes 400, 600, 1200

Code	Description
Omit	Without
C	Check

Code	Material
S	Steel

Code	Description
Omit	Nitrile (Standard)
V	Fluorocarbon

Code	Size
400	1/4"
600	3/8"
620	#6 SAE
800	1/2"
820	#8 SAE
1020	#10 SAE
1200	3/4"
1220	#12 SAE

Model Number	Weight kg (lbs.)
PCK400	0.3 (0.7)
PCK600	1.0 (2.1)
PCK620	0.3 (0.7)
PCK800	1.5 (3.2)
PCK820	1.0 (2.1)
PCK1020	1.5 (3.2)
PCK1200	1.5 (3.3)
PCK1220	1.5 (3.3)

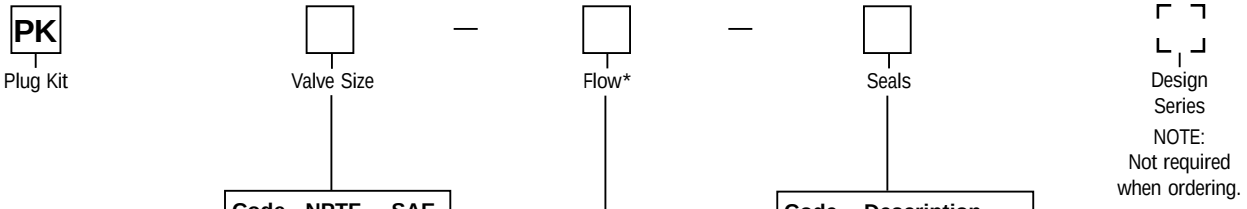
Available Flow Settings GPM (LPM)

PCK 400/620 GPM (LPM)	PCK 600/820 GPM (LPM)	PCK 800/1020 GPM (LPM)	PCK 1200/1220 GPM (LPM)
0.25 (0.9)	0.50 (1.9)	2.00 (7.57)	4.00 (15.14)
0.50 (1.9)	1.00 (3.8)	3.00 (11.36)	6.00 (22.71)
0.75 (2.8)	1.50 (5.7)	4.00 (15.14)	8.00 (30.28)
1.00 (3.8)	2.00 (7.6)	5.00 (18.93)	10.00 (37.85)
1.25 (4.7)	2.50 (9.5)	6.00 (22.71)	12.00 (45.42)
1.50 (5.7)	3.00 (11.4)	7.00 (26.50)	14.00 (52.99)
1.75 (6.6)	3.50 (13.2)	8.00 (30.28)	16.00 (60.56)
2.00 (7.6)	4.00 (15.1)	9.00 (34.07)	18.00 (68.13)
2.25 (8.5)	4.50 (17.0)	10.00 (37.85)	20.00 (75.70)
2.50 (9.5)	5.00 (18.9)	11.00 (41.64)	22.00 (83.27)
2.75 (10.4)	5.50 (20.8)	12.00 (45.42)	24.00 (90.84)
3.00 (11.4)	6.00 (22.7)	13.00 (49.21)	
		14.00 (52.99)	
		15.00 (56.78)	

Note: Settings are based on using 100 SSU at +49°C (+120°F).

* **To order this valve you must indicate appropriate GPM value from table. Example: 9PCCK600S-3.50-V**

"PK" Orifice Plug Kits



Code	NPTF	SAE
4	400	620
6	600	820
8	800	1020
12	1200	1220

Code	Description
N	Nitrile (Standard)
V	Fluorocarbon

Available Flow Settings GPM (LPM)

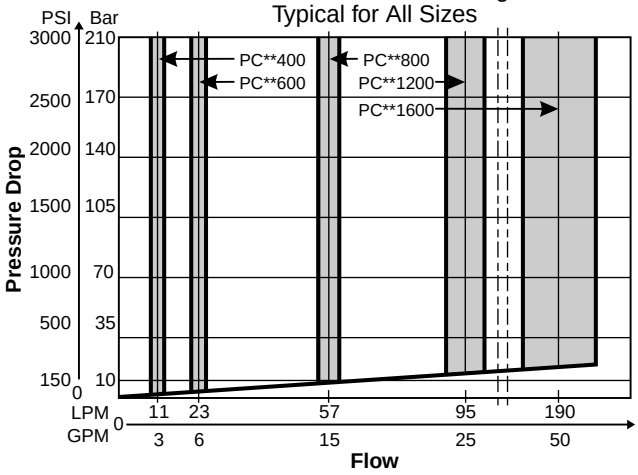
PCK 400/620 GPM (LPM)	PCK 600/820 GPM (LPM)	PCK 800/1020 GPM (LPM)	PCK 1200/1220 GPM (LPM)
0.25 (0.9)	0.50 (1.9)	2.00 (7.57)	4.00 (15.14)
0.50 (1.9)	1.00 (3.8)	3.00 (11.36)	6.00 (22.71)
0.75 (2.8)	1.50 (5.7)	4.00 (15.14)	8.00 (30.28)
1.00 (3.8)	2.00 (7.6)	5.00 (18.93)	10.00 (37.85)
1.25 (4.7)	2.50 (9.5)	6.00 (22.71)	12.00 (45.42)
1.50 (5.7)	3.00 (11.4)	7.00 (26.50)	14.00 (52.99)
1.75 (6.6)	3.50 (13.2)	8.00 (30.28)	16.00 (60.56)
2.00 (7.6)	4.00 (15.1)	9.00 (34.07)	18.00 (68.13)
2.25 (8.5)	4.50 (17.0)	10.00 (37.85)	20.00 (75.70)
2.50 (9.5)	5.00 (18.9)	11.00 (41.64)	22.00 (83.27)
2.75 (10.4)	5.50 (20.8)	12.00 (45.42)	24.00 (90.84)
3.00 (11.4)	6.00 (22.7)	13.00 (49.21)	
		14.00 (52.99)	
		15.00 (56.78)	

Note: Settings are based on using 100 SSU at +120°F (+49°C).

* **To order this plug kit you must indicate appropriate GPM value from table. Example: PK6-3.50-N**

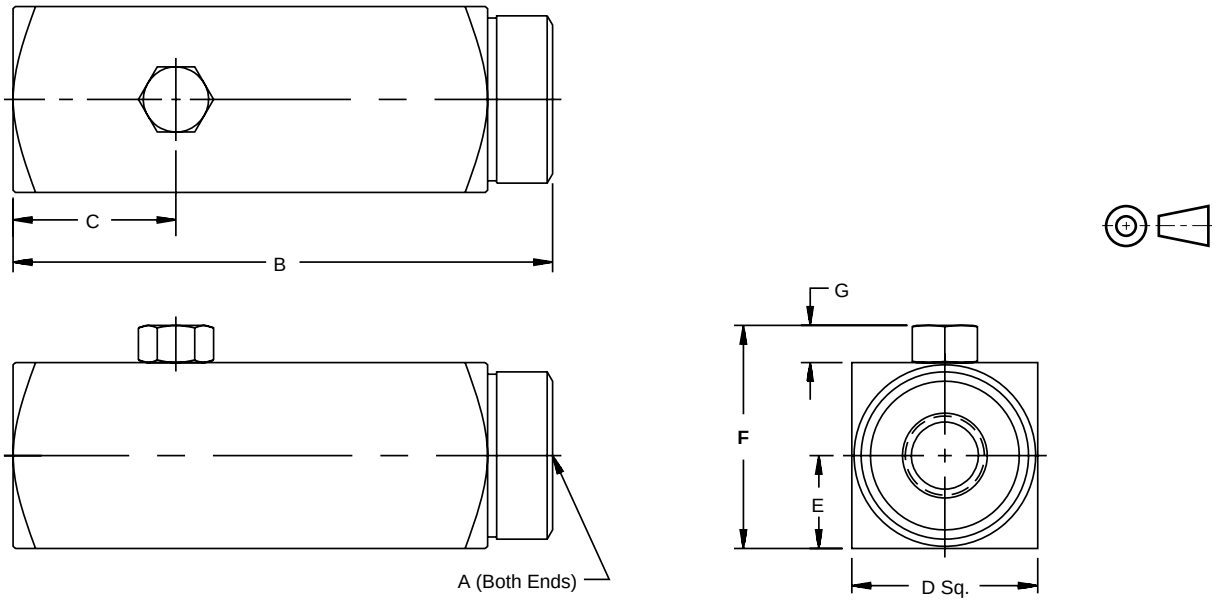
Performance Curves

PC*K Series
Controlled Flow vs. Pressure Drop
at Maximum Flow Setting
Typical for All Sizes



Dimensions

Inch equivalents for millimeter dimensions are shown in (**)



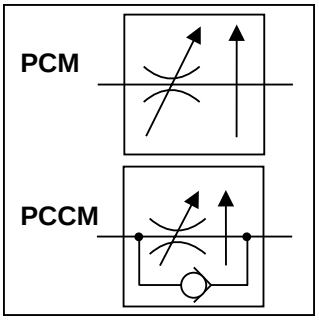
Model Number	Weight kg (lbs.)	A	B	C	D	E	F	G
PC*K400/620	0.05 (0.1)	1/4–18 NPTF/9/16–18 UNF	92.2 (3.63)	27.7 (1.09)	31.8 (1.25)	17.5 (0.69)	38.1 (1.50)	6.4 (0.25)
PC*K600/820	0.05 (0.1)	3/8–18 NPTF/3/4–16 UNF	105.7 (4.16)	30.2 (1.19)	38.1 (1.50)	19.1 (0.75)	44.5 (1.75)	6.4 (0.25)
PC*K800/1020	0.05 (0.1)	1/2–14 NPTF/7/8–14 UNF	125.5 (4.94)	36.6 (1.44)	44.5 (1.75)	22.4 (0.88)	50.8 (2.00)	6.4 (0.25)
PC*K1200/1220	0.05 (0.1)	3/4–14 NPTF/1 1/16–12 UNF	149.4 (5.88)	48.5 (1.91)	57.2 (2.25)	28.7 (1.13)	63.5 (2.50)	6.4 (0.25)

3300-1.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

General Description

Series PCM pressure compensated flow control valves are designed to regulate flow at a selected rate, within 5%, regardless of fluctuations in inlet and outlet pressure.

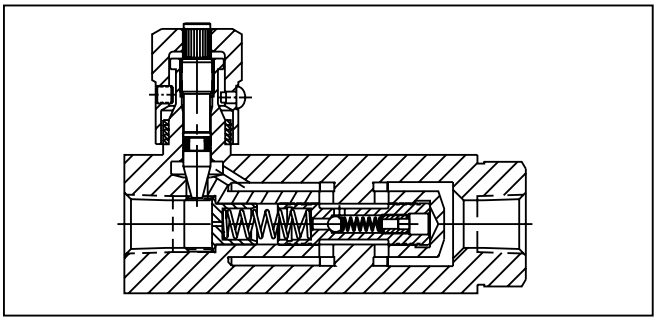


Operation

Series PCM valves can be adjusted for required flows after being installed.

Features

- Available with reverse flow check.
- The exclusive “Colorflow” color-band reference scale on the valve stem is a great convenience and time-saver in setting the valve originally and in returning it to any previous setting.
- A simple set screw locks the valve on any desired setting.
- A tamperproof option (T) feature is also available to prevent accidental or intentional adjustment of flow setting.



Specifications

	PC*M400S PC*M620S	PC*M600S PC*M820S	PC*M800S PC*M1020S	PC*M1200S PC*M1220S	PC*M1600S PC*M1620	PC*M2000S
Maximum Operating Pressure	207 Bar (3000 PSI)					
Minimum Pressure to Compensate	6.9 Bar (100 PSI)	6.9 Bar (100 PSI)	6.9 Bar (100 PSI)	10.4 Bar (150 PSI)	10.4 Bar (150 PSI)	10.4 Bar (150 PSI)
Operating Temperature	-40°C to +121°C (-40°F to +250°F) Nitrile (standard) -26°C to +205°C (-15°F to +400°F) Fluorocarbon					
Mounting			Inline			
Maximum Flow	11 LPM (3 GPM)	23 LPM (6 GPM)	57 LPM (15 GPM)	95 LPM (25 GPM)	189 LPM (50 GPM)	303 LPM (80 GPM)
Minimum. Flow	1 LPM (0.3 GPM)	2 LPM (0.6 GPM)	6 LPM (1.5 GPM)	10 LPM (2.5 GPM)	19 LPM (5.0 GPM)	30 LPM (8 GPM)
Reverse Flow, Maximum thru Check	19 LPM (5 GPM)	30 LPM (8 GPM)	76 LPM (20 GPM)	132 LPM (35 GPM)	227 LPM (60 GPM)	378 LPM (100 GPM)
Pressure Drop, ΔP at Maximum Reverse Flow thru Check	3 Bar (40 PSI)	3 Bar (40 PSI)	PC*M800S: 8 Bar (116 PSI) PC*M1020S: 3 Bar (40 PSI)	PC*M1200S: 8 Bar (116 PSI) PC*M1220S: 3 Bar (40 PSI)	10 Bar (140 PSI)	11 Bar (155 PSI)
Port Size (in.)	PC*M400S: 1/4 NPTF PC*M620S: 9/16-18 UNF (SAE 6)	PC*M600S: 3/8 NPTF PC*M820S: 3/4-16 UNF (SAE 8)	PC*M800S: 1/2 NPTF PC*M1020S: 7/8-14 UNF (SAE 10)	PC*M1200S: 3/4 NPTF PC*M1220S: 1-1/16-12 UN (SAE 12)	PCM1600S: 1 NPTF PC*M1620: 1-15/16-12 UN (SAE 16)	PCM2000S: 1 1/4" NPTF

*For optional reverse-flow check, insert “C” in model number at asterisk (*).

Ordering Information

Options	PC	Reverse Check	M	Size	Material	Adjustable Knob Options	–	Seals	Design Series
	Pressure Compensated Flow Control		Adjustable Flow						NOTE: Not required when ordering.

Code	Description
Omit	NPTF/SAE
★ 9	BSPP

★ Code 9 can be used with sizes 400, 600, 800, 1200, 1600

Code	Description
Omit	Without
C	Check

Code	Size
400	1/4"
600 *	3/8"
620	#6 SAE
800 *	1/2"
820 *	#8 SAE
1020	#10 SAE
1200	3/4"
1220	#12 SAE
1600	1"
1620	#16 SAE
2000	1 1/4"

* Available in Stainless Steel

Code	Description
S	Steel
SS	Stainless Steel

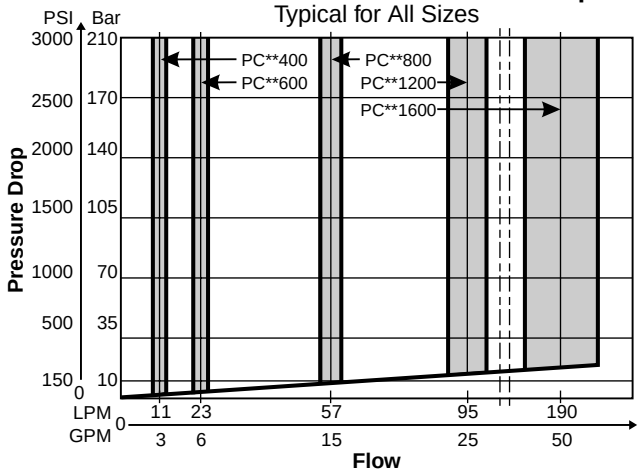
Code	Description
Omit	Standard Knob
T *	Tamperproof
F	Finger Screw

* Not available above 1200 size.

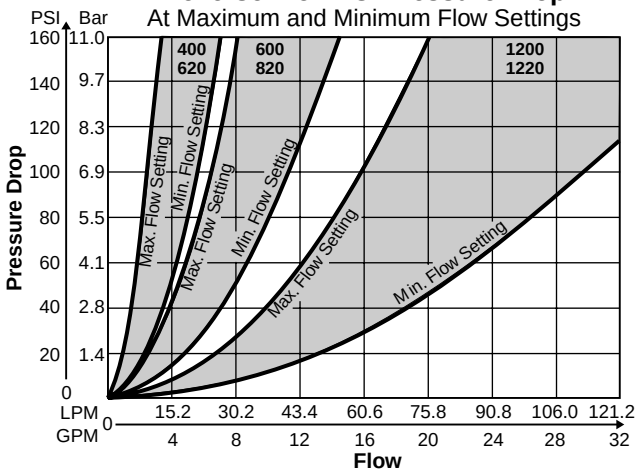
Code	Description
Omit	Nitrile (Standard)
V	Fluorocarbon

Performance Curves

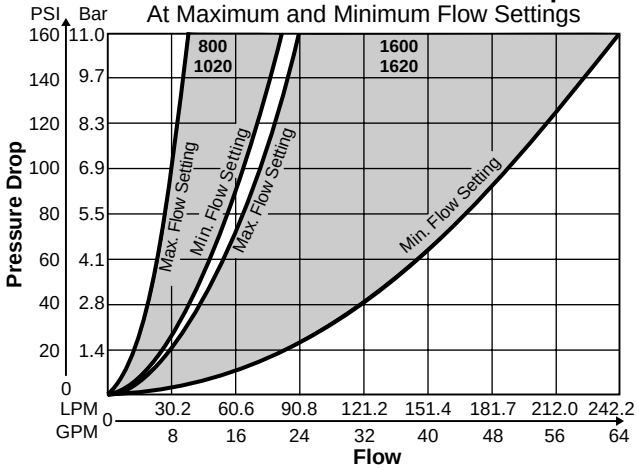
PC*M Series
Controlled Flow vs. Pressure Drop
Typical for All Sizes



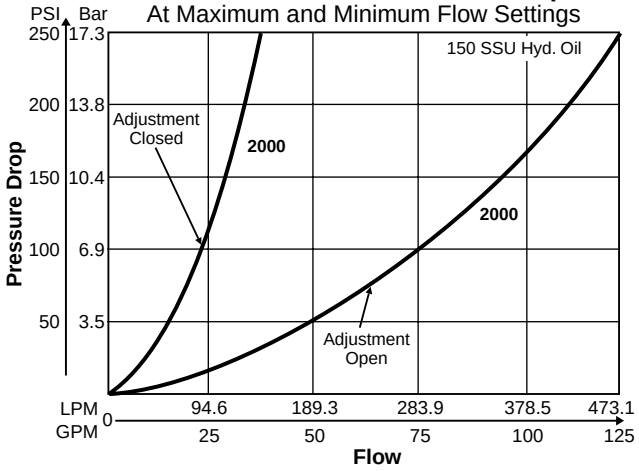
PCCM 400, 600 and 1200 Series
Reverse Flow vs. Pressure Drop
At Maximum and Minimum Flow Settings



PCCM 800 and 1600 Series
Reverse Flow vs. Pressure Drop
At Maximum and Minimum Flow Settings



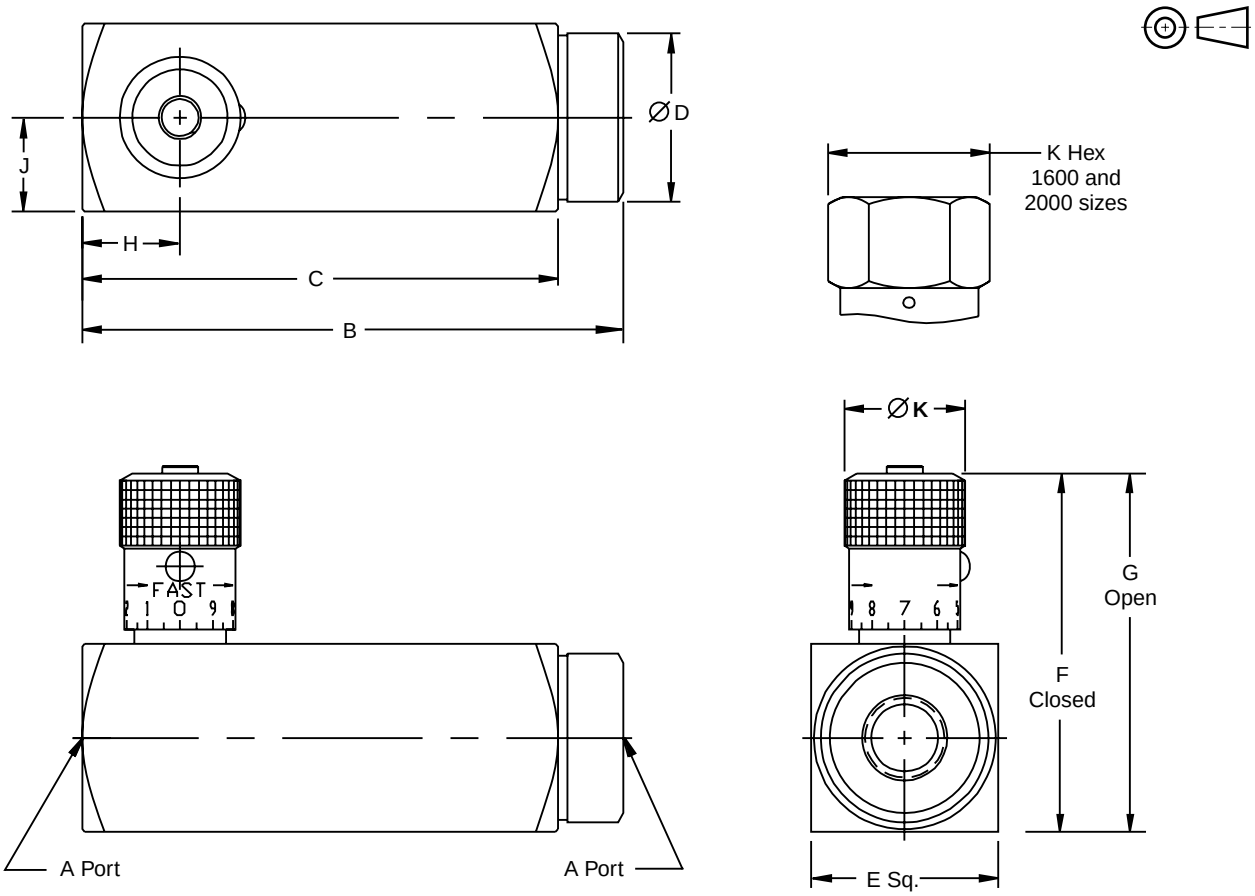
PCCM 2000S Series
Reverse Flow vs. Pressure Drop
At Maximum and Minimum Flow Settings



3300-1.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

Inch equivalents for millimeter dimensions are shown in (**)



Model Number	Weights kg (lbs.)	A	B	C	D	E	F	G	H	J	K
PC*M400/620	0.8 (1.8)	1/4–18 NPTF 9/16–18 UNF	92.2 (3.63)	81.0 (3.19)	28.7 (1.13)	35.1 (1.38)	64.0 (2.52)	69.3 (2.73)	16.8 (0.66)	17.5 (0.69)	20.6 (0.81)
PC*M600/820	1.0* (2.3)*	3/8–18 NPTF 3/4–16 UNF	105.7 (4.16)	93.0 (3.66)	31.8 (1.25)	38.1 (1.50)	73.7 (2.90)	80.0 (3.15)	17.5 (0.69)	19.1 (0.75)	25.4 (1.00)
PC*M800/1020	1.7 (3.7)	1/2–14 NPTF 7/8–14 UNF	125.5 (4.94)	109.5 (4.31)	38.1 (1.50)	44.5 (1.75)	95.0 (3.74)	102.6 (4.04)	22.4 (0.88)	22.4 (0.88)	30.2 (1.19)
PC*M1200/1220	3.6 (8.0)	3/4–14 NPTF 1 1/16–12 UNF	149.4 (5.88)	130.3 (5.13)	50.8 (2.00)	57.2 (2.25)	115.8 (4.56)	128.5 (5.06)	27.7 (1.09)	28.7 (1.13)	35.1 (1.38)
PC*M1600/1620	6.6 (14.5)	1–11 1/2 NPTF 1 5/16–12 UNF	176.3 (6.94)	155.7 (6.13)	63.5 (2.50)	69.9 (2.75)	158.2 (6.23)	175.3 (6.90)	33.3 (1.31)	35.1 (1.38)	47.8 (1.88)
PC*M2000	11.8 (26.0)	1 1/4–11 1/2 NPTF	212.9 (8.38)	190.5 (7.50)	76.2 (3.00)	88.9 (3.50)	182.1 (7.17)	201.2 (7.92)	41.4 (1.63)	44.5 (1.75)	47.8 (1.88)

* Weights are for PC*M600; weights for PC*M820 are 1.4 kg (3.1lbs.)

General Description

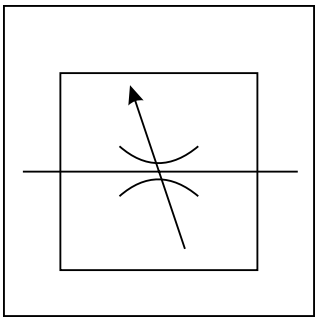
Series N needle valves are ideal as speed controls on hydraulic and pneumatic systems where a reverse flow check is not needed. They provide excellent control and a reliable shut-off in a very small envelope.

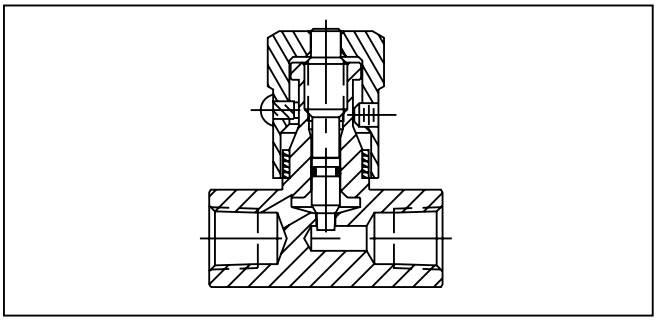
Operation

A two-step needle allows fine adjustment at low flow by using the first three turns of the adjusting knob. The next three turns open the valve to full flow, and also provide standard throttling adjustments.

Features

- The exclusive “Colorflow” color-band reference scale on the valve stem is a great convenience and time-saver in setting the valve originally and in returning it to any previous setting.
- A simple set screw locks the valve on any desired setting.
- A tamperproof option (T) feature is also available to prevent accidental or intentional adjustment of flow setting.



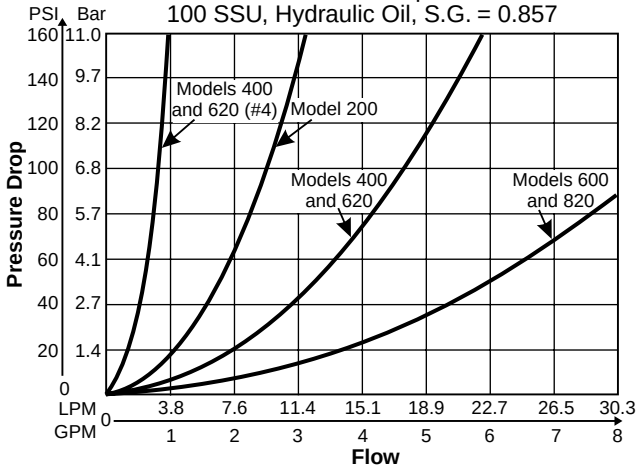


Specifications

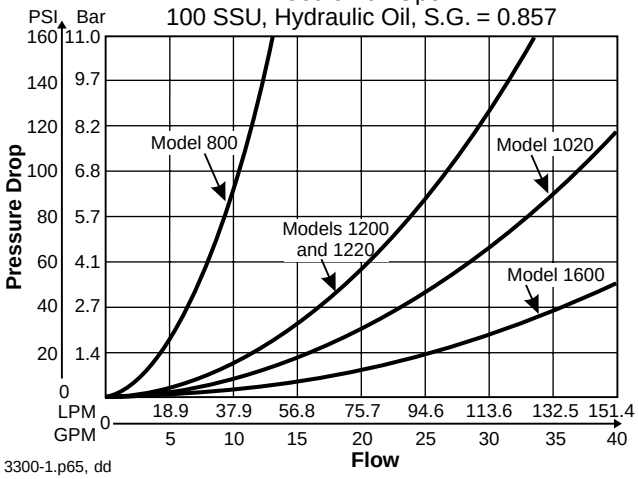
Maximum Operating Pressure	Brass:	140 Bar (2000 PSI); except for N1600 brass which is 35 Bar (500 PSI)
	Steel & Stainless Steel:	345 Bar (5000 PSI) for 200 thru 1220; 207 Bar (3000 PSI) for all other sizes
Material	Body	see ordering code
	Knob	Steel - Zinc plated
	Needle	416 Stainless Steel
	Stainless Steel Bodies	303 Stainless Steel
Operating Temperature	-40°C to +121°C (-40°F to +250°F) Nitrile (standard)	
	-26°C to +205°C (-15°F to +400°F) Fluorocarbon	

Performance Curves

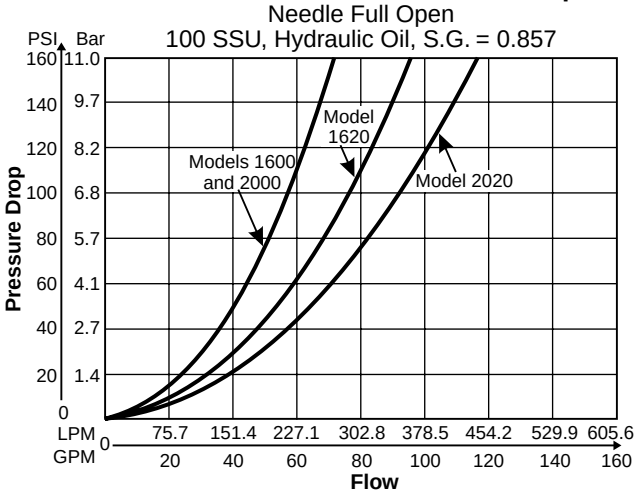
Controlled Flow vs. Pressure Drop
Needle Full Open
100 SSU, Hydraulic Oil, S.G. = 0.857



Controlled Flow vs. Pressure Drop
Needle Full Open
100 SSU, Hydraulic Oil, S.G. = 0.857

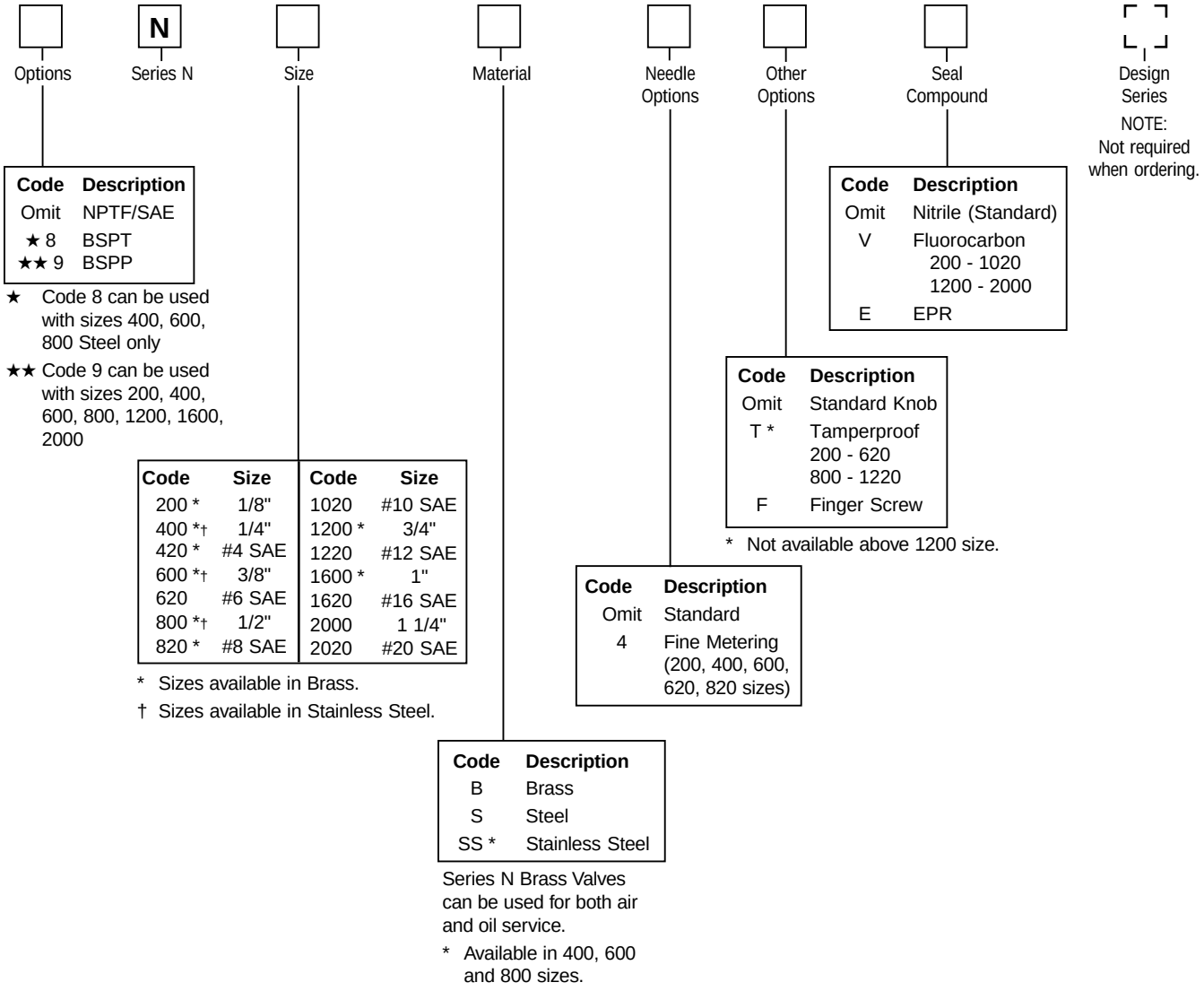


Controlled Flow vs. Pressure Drop
Needle Full Open
100 SSU, Hydraulic Oil, S.G. = 0.857



3300-1.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA



Code	Description
Omit	NPTF/SAE
★ 8	BSPT
★★ 9	BSPP

★ Code 8 can be used with sizes 400, 600, 800 Steel only

★★ Code 9 can be used with sizes 200, 400, 600, 800, 1200, 1600, 2000

Code	Size	Code	Size
200 *	1/8"	1020	#10 SAE
400 *†	1/4"	1200 *	3/4"
420 *	#4 SAE	1220	#12 SAE
600 *†	3/8"	1600 *	1"
620	#6 SAE	1620	#16 SAE
800 *†	1/2"	2000	1 1/4"
820 *	#8 SAE	2020	#20 SAE

* Sizes available in Brass.

† Sizes available in Stainless Steel.

Code	Description
B	Brass
S	Steel
SS *	Stainless Steel

Series N Brass Valves can be used for both air and oil service.

* Available in 400, 600 and 800 sizes.

Code	Description
Omit	Standard
4	Fine Metering (200, 400, 600, 620, 820 sizes)

Code	Description
Omit	Standard Knob
T *	Tamperproof 200 - 620 800 - 1220
F	Finger Screw

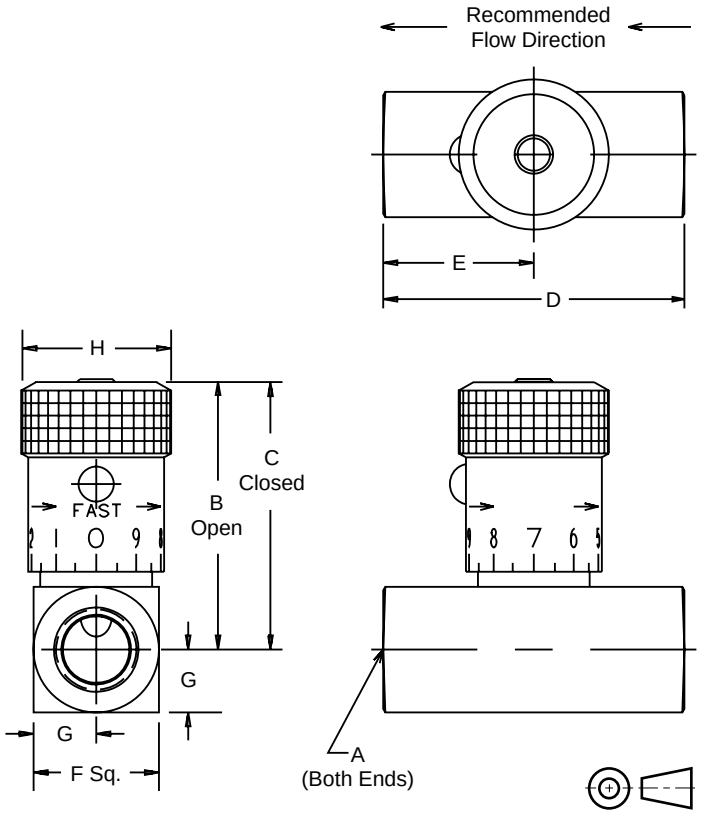
* Not available above 1200 size.

Code	Description
Omit	Nitrile (Standard)
V	Fluorocarbon 200 - 1020 1200 - 2000
E	EPR

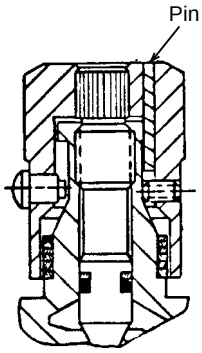
NOTE: Not required when ordering.

Model Number	Max Flow LPM (GPM)	Effective Orifice Area Control Flow $in.^2$	Effective Control Flow C_v
N200	11 (3)	0.0102	0.230
N420	11 (3)	0.0102	0.230
N400	19 (5)	0.0194	0.443
N620	19 (5)	0.0194	0.443
N600	30 (8)	0.0344	0.787
N820	30 (8)	0.0344	0.787
N800	57 (15)	0.0427	0.976
N1020	57 (15)	0.0427	0.976
N1200	95 (25)	0.1080	2.470
N1220	95 (25)	0.1080	2.470
N1600	151 (40)	0.2300	5.250
N1620	151 (40)	0.3070	7.000
N2000	264 (70)	0.2300	5.250
N2020	264 (70)	0.3710	8.470
N2400	379 (100)	0.2300	5.250

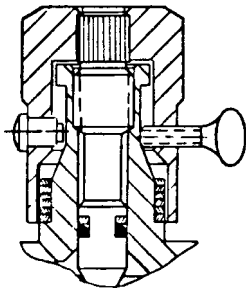
Inch equivalents for millimeter dimensions are shown in (**)



Knob Options



Tamperproof Option (Code “T”) permanently locks knob at desired flow setting by installing a pin in predrilled hole.



Finger screw Option (Code “F”) provides this thumb-screw in place of set screw.

Model Number	Weight kg (lbs.)	A	B	C	D	E	F	G	H
N200	0.1 (0.3)	1/8–27 NPTF	39.1 (1.54)	35.3 (1.39)	38.1 (1.50)	19.1 (0.75)	15.7 (0.62)	7.9 (0.31)	19.1 (0.75)
N400	0.2 (0.5)	1/4–18 NPTF	45.5 (1.79)	40.4 (1.59)	50.8 (2.00)	25.4 (1.00)	20.6 (0.81)	10.4 (0.41)	20.6 (0.81)
N420	0.1 (0.3)	7/16–20 UNF #4 SAE	41.4 (1.63)	37.6 (1.48)	50.8 (2.00)	25.4 (1.00)	20.6 (0.81)	10.4 (0.41)	19.1 (0.75)
N600	0.4 (0.9)	3/8–18 NPTF	55.4 (2.18)	49.5 (1.95)	63.5 (2.50)	31.8 (1.25)	25.4 (1.00)	12.7 (0.50)	25.4 (1.00)
N620	0.2 (0.5)	9/16–18 UNF #6 SAE	47.8 (1.88)	42.7 (1.68)	60.5 (2.38)	30.2 (1.19)	25.4 (1.00)	12.7 (0.50)	20.6 (0.81)
N800	0.6 (1.4)	1/2–14 NPTF	68.6 (2.70)	61.5 (2.42)	66.5 (2.62)	33.3 (1.31)	31.8 (1.25)	15.7 (0.62)	30.2 (1.19)
N820	0.4 (0.9)	3/4–16 UNF #8 SAE	56.9 (2.24)	51.1 (2.01)	76.2 (3.00)	38.1 (1.50)	28.4 (1.12)	14.2 (0.56)	25.4 (1.00)
N1020	0.6 (1.3)	7/8–14 UNF #10 SAE	68.6 (2.70)	61.5 (2.42)	88.9 (3.50)	44.5 (1.75)	31.8 (1.25)	15.7 (0.62)	30.2 (1.19)
N1200	1.0 (2.3)	3/4–14 NPTF	85.9 (3.38)	71.4 (2.81)	82.6 (3.25)	41.1 (1.62)	38.1 (1.50)	19.1 (0.75)	35.1 (1.38)
N1220	1.0 (2.3)	1 1/6–12 UN #12 SAE	85.9 (3.38)	71.4 (2.81)	101.6 (4.00)	50.8 (2.00)	38.1 (1.50)	19.1 (0.75)	35.1 (1.38)
N1600	2.1 (4.7)	1–11 1/2 NPTF	123.7 (4.87)	106.9 (4.21)	108.0 (4.25)	53.8 (2.12)	44.5 (1.75)	22.4 (0.88)	47.8 * (1.88)
N1620	2.1 (4.7)	1 5/16–12 UN #16 SAE	130.8 (5.15)	114.0 (4.49)	108.0 (4.25)	53.8 (2.12)	57.2 (2.25)	28.4 (1.12)	47.8 * (1.88)
N2000	2.9 (6.4)	1 1/4–11 1/2 NPTF	130.0 (5.12)	113.3 (4.46)	108.0 (4.25)	53.8 (2.12)	57.2 (2.25)	28.4 (1.12)	47.8 * (1.88)
N2020	2.9 (6.4)	1 5/8–12 UN #20 SAE	140.2 (5.52)	123.4 (4.86)	114.3 (4.50)	57.2 (2.25)	69.9 (2.75)	60.5 (2.38)	47.8 * (1.88)

* = Hex

General Description

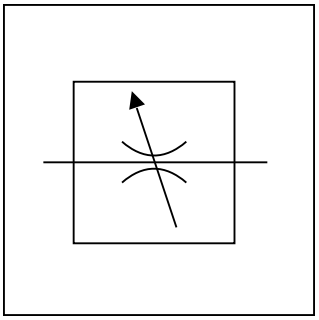
Series 6N needle valves are ideal as speed controls on hydraulic and pneumatic systems where a reverse flow check is not needed. They provide excellent control and a reliable shut-off in a very small envelope.

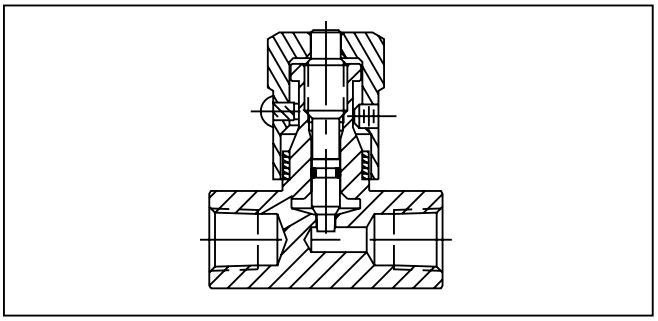
Operation

A two-step needle allows fine adjustment at low flow by using the first three turns of the adjusting knob. The next three turns open the valve to full flow, and also provide standard throttling adjustments.

Features

- Meets ISO 6149 standards.
- Hard metric dimensions.
- Reliable leak-free performance — straight thread port with o-ring sealing.
- Global interchangeablility.



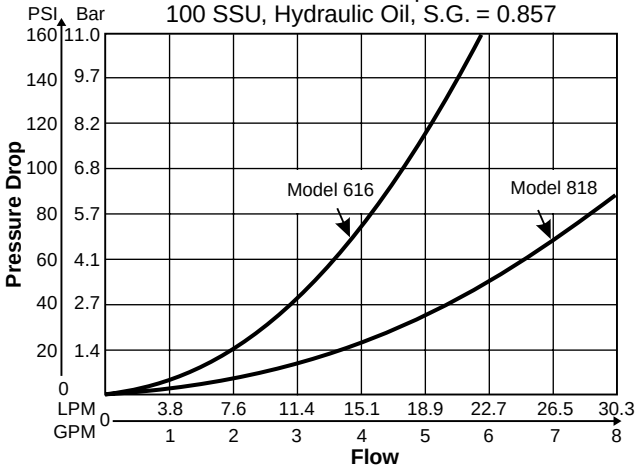


Specifications

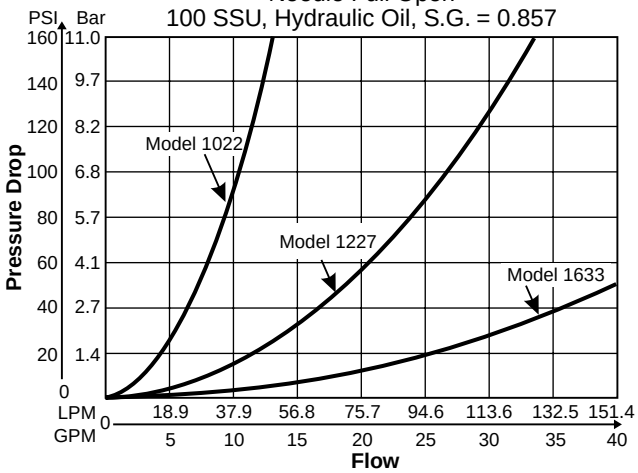
Maximum Operating Pressure	345 Bar (5000 PSI)
Maximum Flow	M16 x 1.5 19 LPM (5 GPM) M18 x 1.5 30 LPM (8 GPM) M22 x 1.5 57 LPM (15 GPM) M27 x 2.0 95 LPM (25 GPM) M33 x 2.0 151 LPM (40 GPM) M42 x 2.0 265 LPM (70 GPM) M48 x 2.0 379 LPM (100 GPM)
Material	Body ASTM 12L14 Carbon Steel Knob ASTM 12L14 Carbon Steel Needle ASTM 416 Stainless Steel
Seals	Nitrile — Standard Fluorocarbon — Optional

Performance Curves

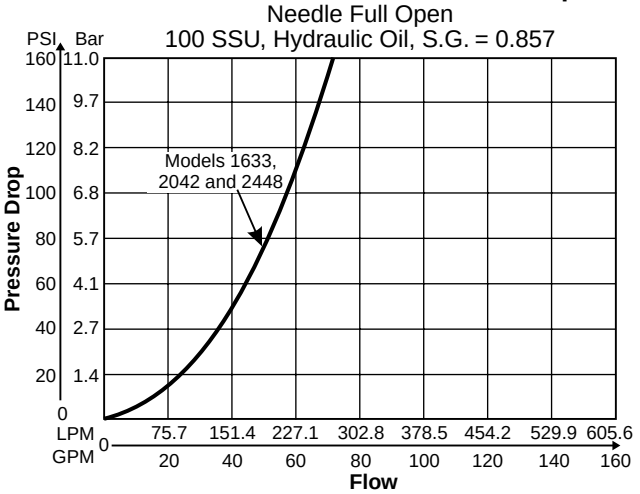
Controlled Flow vs. Pressure Drop
Needle Full Open
100 SSU, Hydraulic Oil, S.G. = 0.857



Controlled Flow vs. Pressure Drop
Needle Full Open
100 SSU, Hydraulic Oil, S.G. = 0.857



Controlled Flow vs. Pressure Drop
Needle Full Open
100 SSU, Hydraulic Oil, S.G. = 0.857



3300-1.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

Ordering Information

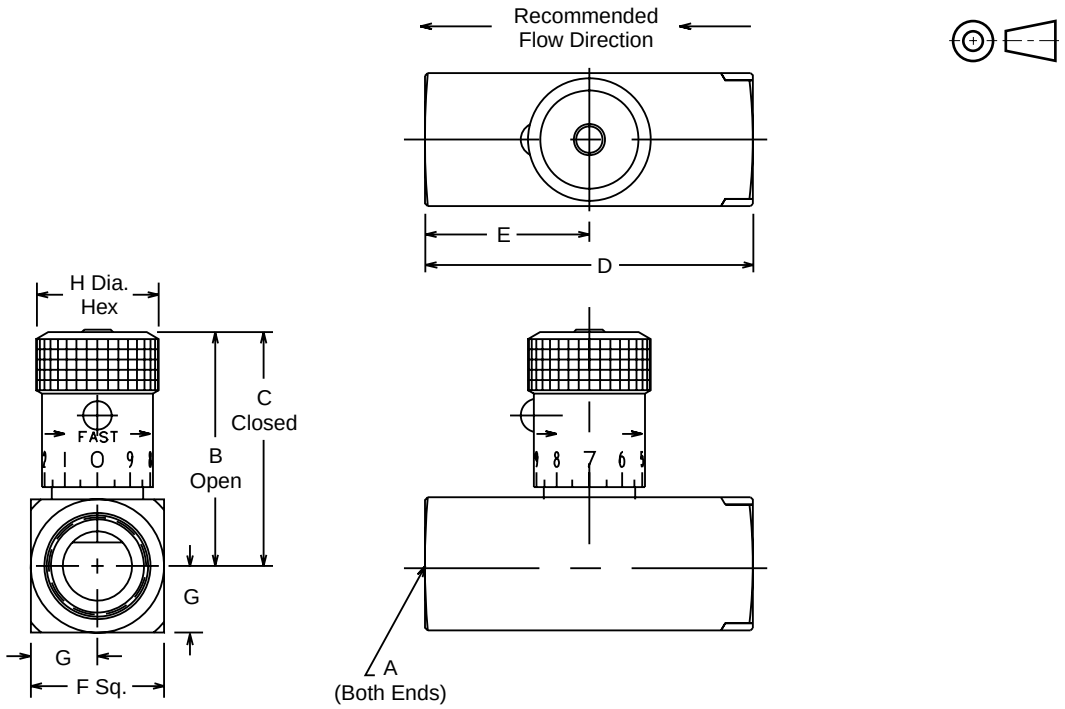
6	N		S	
Ports	Style	Size	Material	Design Series
ISO 6149 ports	Needle Valve		Steel	

NOTE: Not required when ordering.

Code	Ratio
616	M16 x 1.5
818	M18 x 1.5
1022	M22 x 1.5
1227	M27 x 2.0
1633	M33 x 2.0
2042	M42 x 2.0
2448	M48 x 2.0

Dimension

Inch equivalents for millimeter dimensions are shown in (**)



Model Number	Weight kg (lbs.)	A	B	C	D	E	F	G	H
6N616	0.2 (0.5)	M16 x 1.5	47.8 (1.88)	42.7 (1.68)	60.5 (2.38)	30.2 (1.19)	25.4 (1.00)	12.7 (0.50)	20.6 ∅(0.81)
6N818	0.4 (0.9)	M18 x 1.5	56.9 (2.24)	51.1 (2.01)	76.2 (3.00)	38.1 (1.50)	28.4 (1.12)	14.2 (0.56)	25.4 ∅(1.00)
6N1022	0.6 (1.3)	M22 x 1.5	68.6 (2.70)	61.5 (2.42)	88.9 (3.50)	44.5 (1.75)	31.8 (1.25)	15.7 (0.62)	30.2 ∅(1.19)
6N1227	1.0 (2.3)	M27 x 2.0	85.9 (3.38)	71.4 (2.81)	101.6 (4.00)	50.8 (2.00)	38.1 (1.50)	19.1 (0.75)	35.1 ∅(1.38)
6N1633	2.1 (4.7)	M33 x 2.0	123.7 (4.87)	106.9 (4.21)	108.0 (4.25)	53.8 (2.12)	44.5 (1.75)	22.4 (0.88)	47.8 *(1.88)
6N2042	2.9 (6.4)	M42 x 2.0	130.0 (5.12)	113.3 (4.46)	108.0 (4.25)	53.8 (2.12)	57.2 (2.25)	28.4 (1.12)	47.8 *(1.88)
6N2448	3.9 (8.6)	M48 x 2.0	136.4 (5.37)	119.6 (4.71)	108.0 (4.25)	53.8 (2.12)	69.9 (2.75)	35.1 (1.38)	47.8 *(1.88)

3300-1.p65, dd

* = Hex

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

General Description

Series MV high-precision metering and shut-off valves allow extremely close control of fluids used in actuating and governing equipment.

Operation

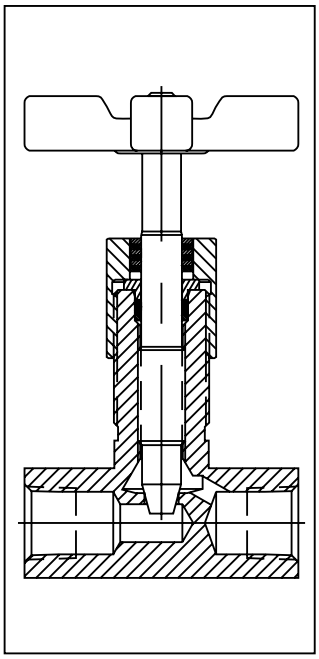
The standard needle allows fine adjustment at low flow by using the first three turns of the adjusting knob. The next three turns open the valve to full flow, and also provide standard throttling adjustments.

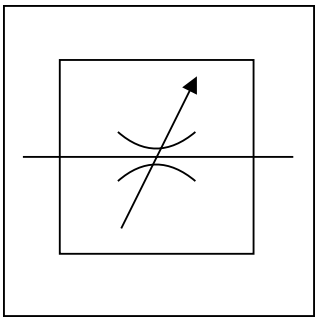
Features

- The exclusive “Colorflow” color-band reference scale on the valve stem is a great convenience and time-saver in setting the valve originally and in returning it to any previous setting.
- Fine and Micro-fine needles available for extremely fine control.
- MVK mounting kit makes panel mounting simple.
- High efficiency o-ring stem seal that eliminates packing.

Specifications

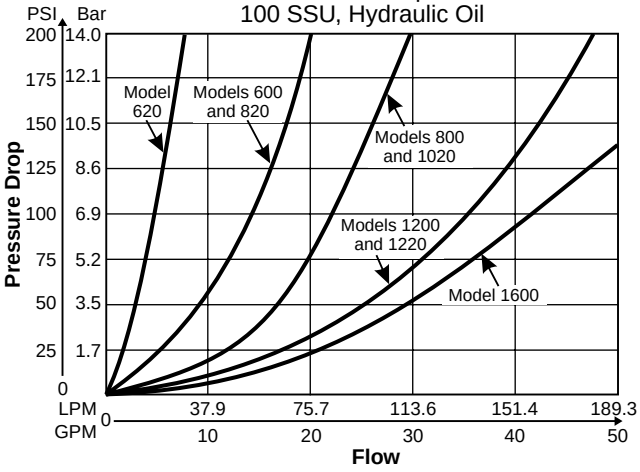
Maximum Operating Pressure	Brass: 140 Bar (2000 PSI); except for MV1600 brass which is 35 Bar (500 PSI) Steel: 413 Bar (6000 PSI) for MV261, 461, 661, 861. 345 Bar (5000 PSI) for MV200, 400, 401, 420, 600, 601,620, 800, 820, 1020, 1200, 1220. 207 Bar (3000 PSI) for all other sizes and styles.
Material	Body: see ordering code Handle: Zinc alloy - Zinc chromate Needle: 416 Stainless Steel
Operating Temperature	-40°C to +121°C (-40°F to +250°F) Nitrile (standard) -26°C to +205°C (-15°F to +400°F) Fluorocarbon



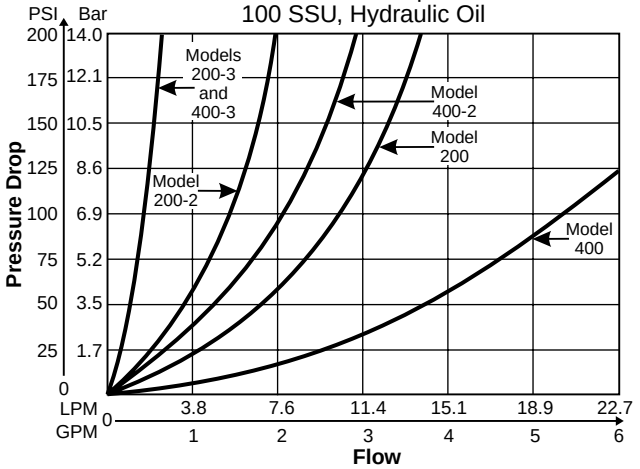


Performance Curves

Controlled Flow vs. Pressure Drop
Needle Full Open
100 SSU, Hydraulic Oil



Controlled Flow vs. Pressure Drop
Needle Full Open
100 SSU, Hydraulic Oil



3300-1.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

Ordering Information

□ MV □ — □ □ □

Options | Series MV | Size | Material | Needle Options | Seal Compound | Design Series

NOTE: Not required when ordering.

Code	Description
Omit	NPTF/SAE
★ 8	BSPT
★★ 9	BSPP

★ Code 8 can be used with sizes 400, 600, 800 Steel only

★★ Code 9 can be used with sizes 200, 261, 400, 461, 600, 661, 800, 861, 1200, 1261, 1600

Code	Size	Code	Size
200 *	1/8"	661	3/8"
260	1/8"	681	#6 SAE
261	1/8"	800 *	1/2"
400 *	1/4"	820	#8 SAE
401	1/4"	860	1/2"
420	#4 SAE	861	1/2"
460	1/4"	1020	#10 SAE
461	1/4"	1200	3/4"
600 *	3/8"	1220	#12 SAE
601	3/8"	1261	3/4"
620	#6 SAE	1600	1"
660	3/8"	1620	#16 SAE

* Sizes available in Brass
00 is Female to Female
01 is Female to Male
6* is Right Angle
60 is Male to Female
61 is Female to Female

Code	Description
B	Brass
S	Steel

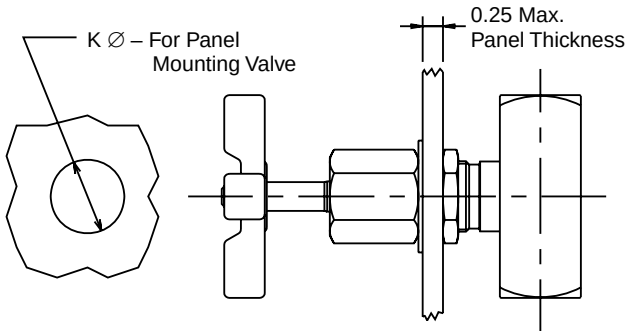
Code	Description
Omit	Standard 30° Taper
2	Fine
3	Micro-fine

2 and 3 available only in Series 200, 400, 600 and 620.

Code	Description
Omit	Nitrile (Standard)
V	Fluorocarbon

Model Number	Effective Orifice Area Max Flow LPM (GPM)	Control Flow $in.^2$	Effective Control Flow C_v
MV200	11 (3)	0.0107	0.244
MV420	11 (3)	0.0107	0.244
MV200-2	7 (1.8)	0.0053	0.121
MV200-3	2 (0.5)	0.0014	0.032
MV400	19 (5)	0.0216	0.493
MV620	19 (5)	0.0216	0.493
MV400-2	11 (2.8)	0.0081	0.186
MV400-3	2 (0.5)	0.0017	0.039
MV600	30 (8)	0.0567	1.294
MV820	30 (8)	0.0567	1.294
MV800	57 (15)	0.0845	1.930
MV1020	57 (15)	0.0845	1.930
MV1200	95 (25)	0.1400	3.205
MV1220	95 (25)	0.1400	3.205
MV-1600	151 (40)	0.1675	3.829
MV-1620	151 (40)	0.1675	3.829

Mounting Kit



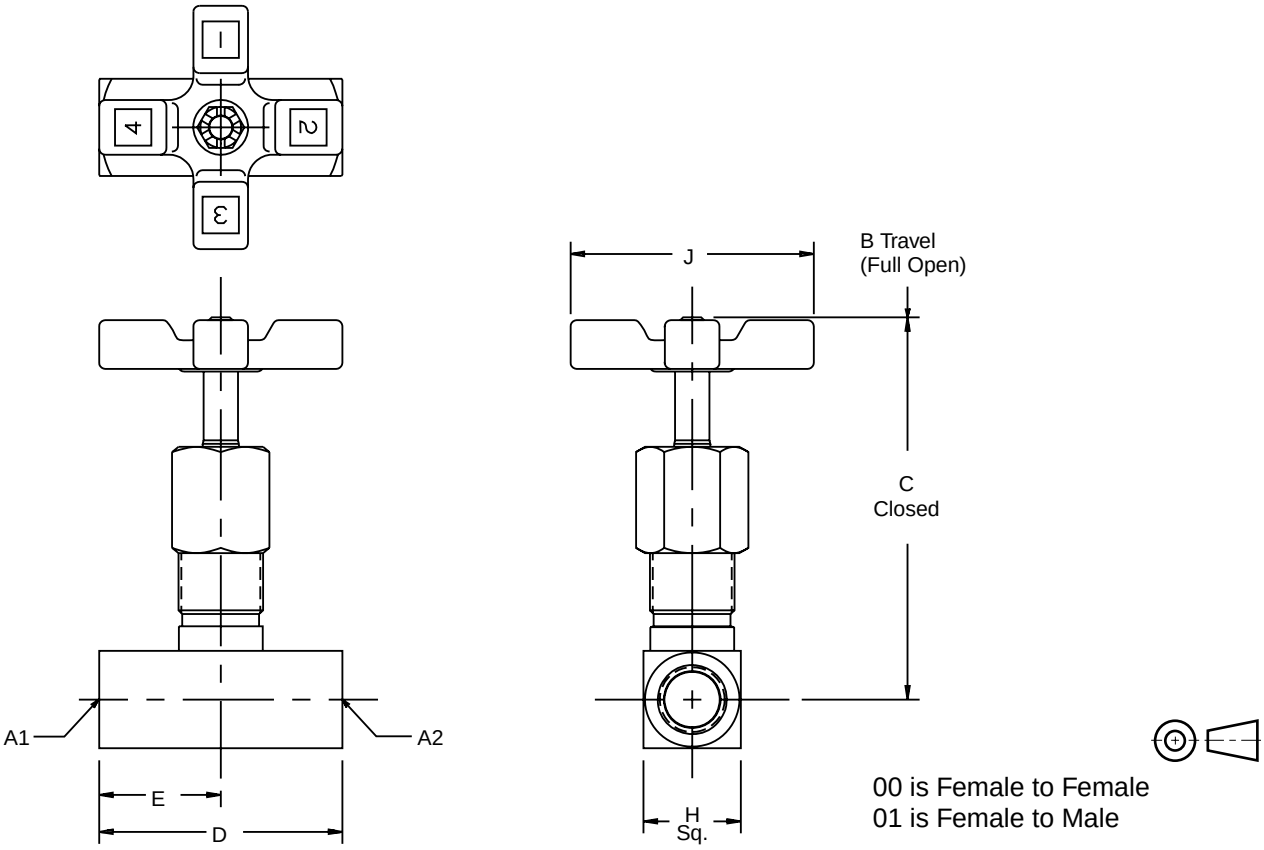
Panel Mounting Kits

Kit Number	K	Valve Model
MVK2	15.0 (0.59)	MV200 MV260 MV261S MV420
MVK4	19.8 (0.78)	MV400 MV401 MV460S MV461S MV620 MV681
MVK6	23.1 (0.91)	MV600 MV601 MV660 MV661S MV820
MVK8	29.5 (1.16)	MV800 MV861S MV1020
MVK12	35.8 (1.41)	MV1200 MV1261
MVK16	35.8 (1.41)	MV-1600 MV-1620

3300-1.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

Inch equivalents for millimeter dimensions are shown in (**)

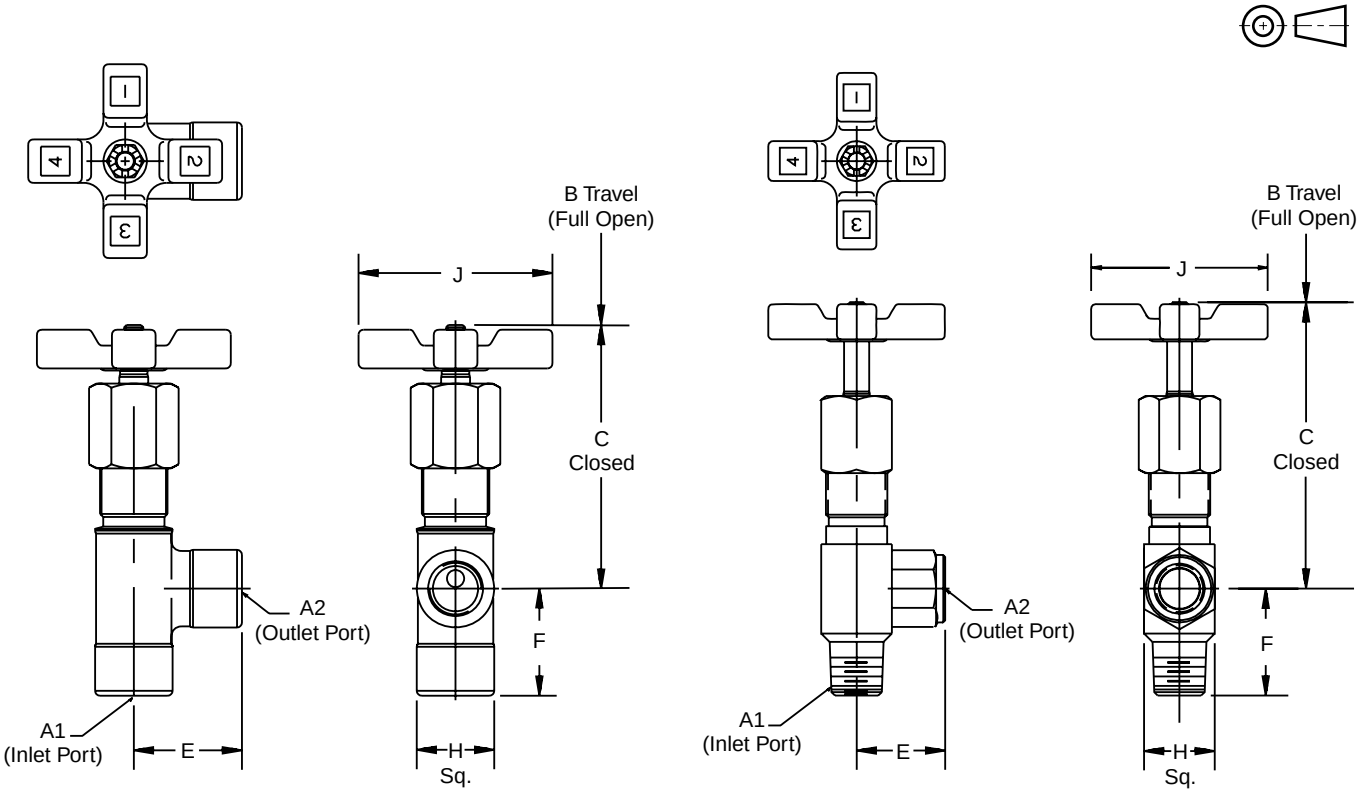


Model Number	Weight kg (lbs.)	A1	A2	B	C	D	E	F	H	J
MV200	0.1 (0.3)	1/8–27 NPTF Female	1/8–27 NPTF Female	69.1 (2.72)	63.8 (2.51)	38.1 (1.50)	19.1 (0.75)		15.7 (0.62)	44.5 (1.75)
MV400	0.3 (0.7)	1/4–18 NPTF Female	1/4–18 NPTF Female	86.9 (3.42)	81.5 (3.21)	50.8 (2.00)	25.4 (1.00)		20.6 (0.81)	50.8 (2.00)
MV401	0.3 (0.7)	1/4–18 NPTF Male	1/4–18 NPTF Female	86.9 (3.42)	81.5 (3.21)	55.4 (2.18)	30.0 (1.18)		20.6 (0.81)	50.8 (2.00)
MV620	0.5 (1.0)	9/16–18 UNF #6 SAE	9/16–18 UNF #6 SAE	89.2 (3.51)	83.8 (3.30)	60.5 (2.38)	30.2 (1.19)		25.4 (1.00)	50.8 (2.00)
MV600	0.5 (1.2)	3/8–18 NPTF Female	3/8–18 NPTF Female	99.6 (3.92)	91.9 (3.62)	63.5 (2.50)	31.8 (1.25)		25.4 (1.00)	63.5 (2.50)
MV601	0.5 (1.1)	3/8–18 NPTF Male	3/8–18 NPTF Female	99.6 (3.92)	91.9 (3.62)	68.1 (2.68)	36.3 (1.43)		25.4 (1.00)	63.5 (2.50)
MV820	0.5 (1.2)	3/4–16 UNF #8 SAE	3/4–16 UNF #8 SAE	108.7 (4.28)	101.1 (3.98)	76.2 (3.00)	38.1 (1.50)		28.4 (1.12)	63.5 (2.50)
MV800	1.0 (2.1)	1/2–14 NPTF Female	1/2–14 NPTF Female	129.3 (5.09)	116.6 (4.59)	66.5 (2.62)	33.3 (1.31)		31.8 (1.25)	82.6 (3.25)
MV1020	1.0 (2.1)	7/8–14 UNF #10 SAE	7/8–14 UNF #10 SAE	129.5 (5.10)	116.6 (4.59)	88.9 (3.50)	44.5 (1.75)		31.8 (1.25)	82.6 (3.25)
MV1200	1.6 (3.50)	3/4–14 NPTF Female	3/4–14 NPTF Female	141.8 (5.58)	127.8 (5.03)	82.6 (3.25)	41.1 (1.62)		38.1 (1.50)	98.6 (3.88)
MV1221	1.6 (3.50)	1 1/16–12 UNF #12 SAE	1 1/16–12 UNF #12 SAE	141.8 (5.58)	127.8 (5.03)	101.6 (4.00)	50.8 (2.00)		38.1 (1.50)	98.6 (3.88)
MV1600	1.9 (4.20)	1–11 1/2 NPTF Female	1–11 1/2 NPTF Female	146.8 (5.78)	132.8 (5.23)	108.0 (4.25)	53.8 (2.12)		44.5 (1.75)	98.6 (3.88)

An optional MVK mounting kit makes panel mounting quite simple.

3300-1.p65, dd

Inch equivalents for millimeter dimensions are shown in (**)



61 is Female to Female

60 is Male to Female

Model Number	Weight kg (lbs.)	A1	A2	B	C	D	E	F	H	J
MV260	0.1 (0.3)	1/8–27 NPTF Male	1/8–27 NPTF Female	72.4 (2.85)	67.1 (2.64)		19.1 (0.75)	22.1 (0.87)	15.7 (0.62)	44.5 (1.75)
MV460	0.3 (0.7)	1/4–18 NPTF Male	1/4–18 NPTF Female	90.2 (3.55)	84.8 (3.34)		27.2 (1.07)	30.7 (1.21)	20.6 (0.81)	50.8 (2.00)
MV660	0.5 (1.2)	3/8–18 NPTF Male	3/8–18 NPTF Female	110.7 (4.36)	103.1 (4.06)		31.8 (1.25)	34.8 (1.37)	25.4 (1.00)	63.5 (2.50)
MV860	0.9 (2.0)	1/2–14 NPTF Male	1/2–14 NPTF Female	133.4 (5.25)	120.7 (4.75)		36.8 (1.45)	42.7 (1.68)	31.8 (1.25)	82.6 (3.25)
MV261	0.1 (0.3)	1/8–27 NPTF Female	1/8–27 NPTF Female	93.98 (3.70)	60.7 (2.39)		26.9 (1.06)	26.9 (1.06)	17.5 (0.69)	44.5 (1.75)
MV461	0.3 (0.6)	1/4–18 NPTF Female	1/4–18 NPTF Female	86.1 (3.39)	76.4 (3.01)		33.5 (1.32)	31.2 (1.23)	22.3 (0.88)	50.8 2.00
MV661	0.5 (1.2)	3/8–18 NPTF Female	3/8–18 NPTF Female	98.04 (3.86)	86.4 (3.40)		38.3 (1.51)	35.0 (1.38)	25.4 (1.00)	63.5 (2.50)
MV861	1.0 (2.1)	1/2–14 NPTF Female	1/2–14 NPTF Female	118.3 (4.66)	106.9 (4.21)		43.43 (1.71)	40.3 (1.59)	29.4 (1.16)	82.6 (3.25)
MV1261	1.6 (3.5)	3/4–14 NPTF Female	3/4–14 NPTF Female	146.8 (5.78)	132.8 (5.23)		44.5 (1.75)	41.1 (1.62)	38.1 (1.50)	98.6 (3.88)

An optional MKV mounting kit makes panel mounting quite simple.

General Description

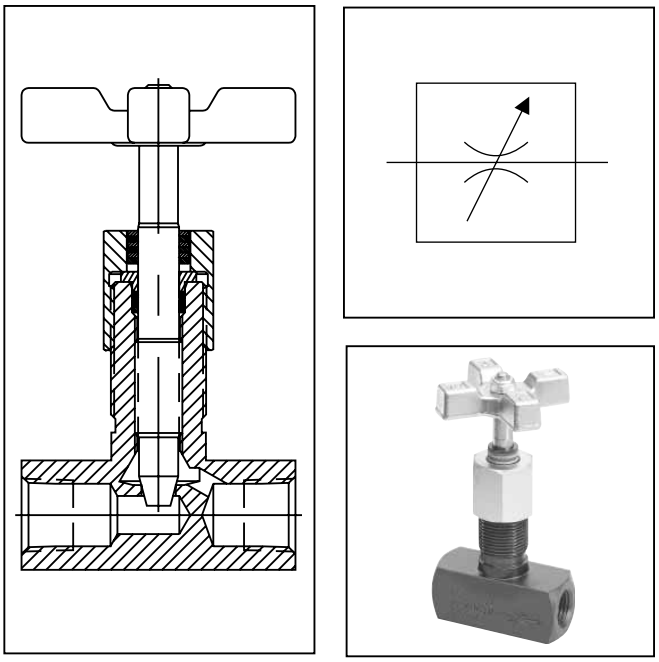
Series 6MV high-precision metering and shut-off valves allow extremely close control of fluids used in actuating and governing equipment.

Operation

The standard needle allows fine adjustment at low flow by using the first three turns of the adjusting knob. The next three turns open the valve to full flow, and also provide standard throttling adjustments.

Specifications

Maximum Operating Pressure	345 Bar (5000 PSI)
Maximum Flow	M12 x 1.5 11 LPM (3 GPM) M14 x 1.5 11 LPM (3 GPM) M16 x 1.5 19 LPM (5 GPM) M18 x 1.5 30 LPM (8 GPM) M22 x 1.5 57 LPM (15 GPM) M27 x 2.0 95 LPM (25 GPM)
Material	Body ASTM 12L14 Carbon Steel Bonnet ASTM 12L14 Carbon Steel Knob ASTM 12L14 Carbon Steel Needle ASTM 416 Stainless Steel Handle Zinc Die Cast
Seals	Nitrile — Standard

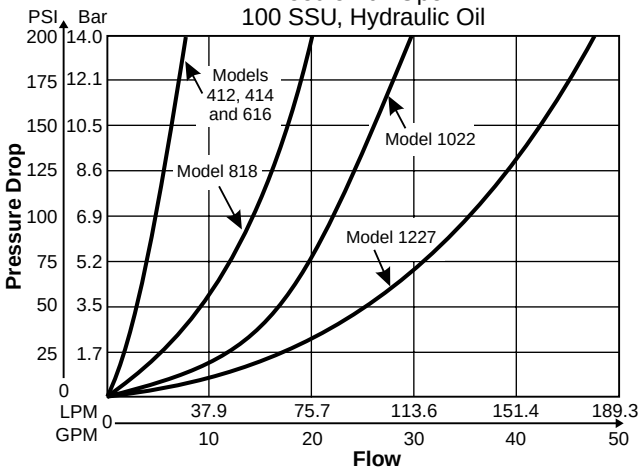


Features

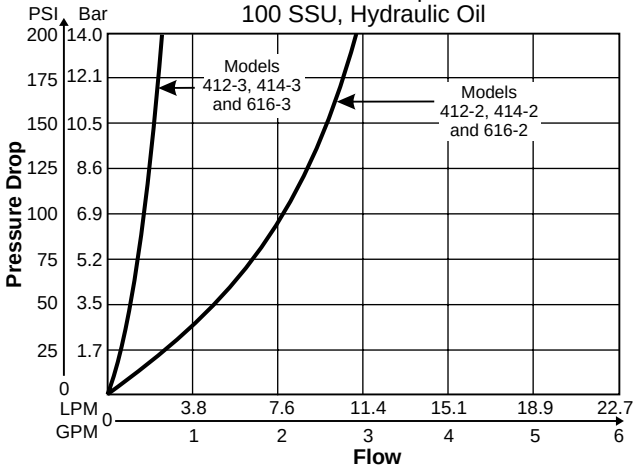
- Meets ISO 6149 standards.
- Hard metric dimensions.
- Reliable leak-free performance — straight thread port with o-ring sealing.
- Global interchangeablility.

Performance Curves

Controlled Flow vs. Pressure Drop
Needle Full Open
100 SSU, Hydraulic Oil



Controlled Flow vs. Pressure Drop
Needle Full Open
100 SSU, Hydraulic Oil



3300-1.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

Ordering Information

6 — Ports

Code	Description
6	ISO 6149 ports

MV — Style

Code	Description
MV	Metering Valve

□ — Size

Code	Ratio
412	M12 x 1.5
414	M14 x 1.5
616	M16 x 1.5
818	M18 x 1.5
1022	M22 x 1.5
1227	M27 x 2.0

S — Material

Code	Description
S	Steel

□ — Needle Options

Code	Description
Omit	Standard 30° Taper
2	Fine
3	Micro Fine

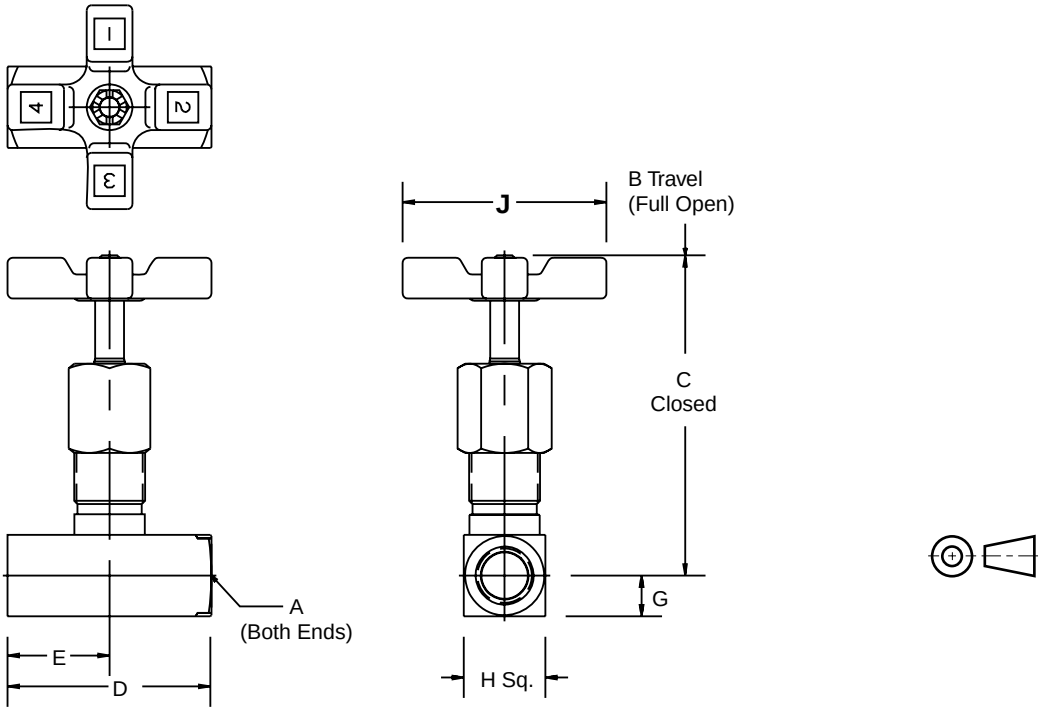
Option 2 and 3 available only in 412, 414 and 616

Design Series

NOTE: Not required when ordering.

Dimensions

Inch equivalents for millimeter dimensions are shown in (**)

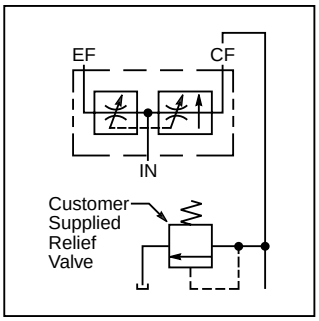


Model Number	Weight kg (lbs.)	A	B	C	D	E	F	G	H	J
6MV412	0.5 (1.0)	M12 x 1.5	86.9 (3.42)	81.5 (3.21)	50.8 (2.00)	25.4 (1.00)		10.4 (0.41)	20.6 (0.81)	50.8 (2.00)
6MV414	0.5 (1.0)	M14 x 1.5	86.9 (3.42)	81.5 (3.21)	50.8 (2.00)	25.4 (1.00)		10.4 (0.41)	20.6 (0.81)	50.8 (2.00)
6MV616S	0.5 (1.0)	M16 x 1.5	89.2 (3.51)	83.8 (3.30)	60.5 (2.38)	30.2 (1.19)		12.7 (0.50)	25.4 (1.00)	50.8 (2.00)
6MV818S	0.5 (1.2)	M18 x 1.5	108.7 (4.28)	101.1 (3.98)	76.2 (3.00)	38.1 (1.50)		14.2 (0.56)	28.4 (1.12)	63.5 (2.50)
6MV1022S	1.0 (2.1)	M22 x 1.5	129.3 (5.09)	116.6 (4.59)	88.9 (3.50)	44.5 (1.75)		15.7 (0.62)	31.8 (1.25)	82.6 (3.25)
6MV1227S	1.6 (3.5)	M27 x 2.0	141.7 (5.58)	127.8 (5.03)	101.6 (4.00)	50.8 (2.00)		19.1 (0.75)	38.1 (1.50)	98.6 (3.88)

3300-1.p65, dd

General Description

Series MFB flow control valves are designed for applications where it is necessary to supply flow from a single pump to two separate circuits (Snow plow attachment and a dump body). One of the two circuits will be the primary circuit and receive priority flow from the Series MFB valve. Any excess flow above the priority requirement is available to a second circuit.



Features

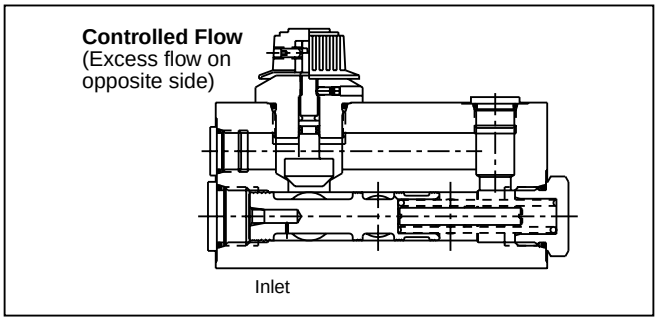
- Hardened parts provide long life.
- In-line mounting.
- When reverse flow is applied from the priority port, the valve acts as a fixed orifice.
- Dial style knob provides an easy adjustable method for setting flow rate.

Operation

Series MFB flow controls use a control orifice in a spring-biased, compensated spool to supply a priority flow requirement. Any flow over and above the priority flow will be directed to a bypass port. The priority flow is fully compensated, meaning that as load pressure at the priority port changes, the priority flow will change to meet that requirement.

If the pump supply is less than required for the priority circuit, all flow will go to the priority circuit, and none will be diverted to the excess flow port.

This valve can also be used as a restrictive-type, pressure compensated flow control by plugging the excess flow port.



Caution: If the priority flow port is totally blocked, the compensator spool shifts completely to block the bypass port thus closing the valve completely. If a fixed displacement pump is being used in this type of application, there must be a relief mounted between the pump and the Series MFB flow control valve.

Specifications

Maximum Inlet Flow	MFB-025 – 93.75 LPM (25 GPM) MFB-050 – 187.5 LPM (50 GPM)	**Operating Temp. Range (Ambient)**	-31.7°C to +121.1°C (-25°F to +250°F) (Fluorocarbon Seals Only)
Maximum Control Flow	MFB-025 – 56.25 LPM (15 GPM) MFB-050 – 56.25 LPM (15 GPM)	**Internal Material**	Steel
Operating Press.	210 Bar (3000 PSI)	**Body Material**	Steel (chromate plated)
Flow Accuracy	±10%	**Filtration**	ISO code 16/13 SAE Class 4 or better
Compensator Bias Spring	6.2 Bar (90 PSI) Differential	**Mounting**	In-line (no restrictions)

Ordering Information

MFB — [ ] — [ ] **P** **AP** — **K** — [ ]

- **MFB**: Mobile Flow Control in Body
- [ ]: Nominal Inlet Flow

Code	Flow
025	56.25 LPM (15 GPM)
050	56.25 LPM (15 GPM)

- **P**: Priority Flow
- **AP**: Style

Code	Description
AP	Adjustable Priority

- **K**: Knob

Code	Style
K	Knob

- [ ]: Porting

MFB-025		MFB-050	
Code	**Type**	**Code**	**Type**
06	3/8″ NPTF	12	3/4″ NPTF
52	SAE – 8	54	SAE – 12
		56	SAE – 16

Weight:

MFB-025, MFB-050 2.7 kg (6.0 lbs.)

3300-1.p65, dd

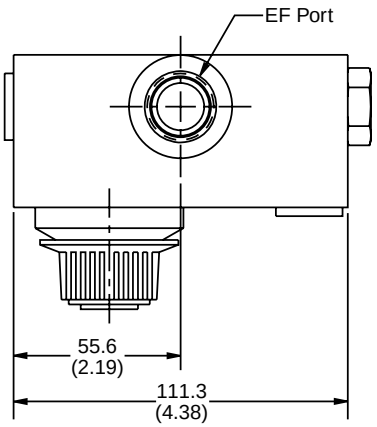
Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

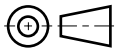
Inch equivalents for millimeter dimensions are shown in (**)

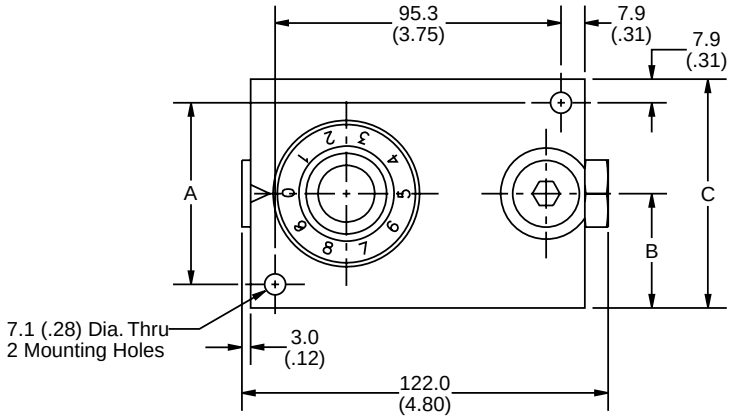
	A	B	C
MFB-025	34.9 (1.38)	25.4 (1.00)	50.8 (2.00)
MFB-050	60.5 (2.38)	38.1 (1.50)	76.2 (3.00)

	Code	"EF" Port	"IN" Port	"CF" Port
MFB-025	06	3/8″ NPTF	3/8″ NPTF	3/8″ NPTF
	52	#8 SAE	#8 SAE	#8 SAE
MFB-050	12	3/4″ NPTF	3/4″ NPTF	3/4″ NPTF
	54	#12 SAE	#12 SAE	#12 SAE
	56	#16 SAE	#16 SAE	#12 SAE

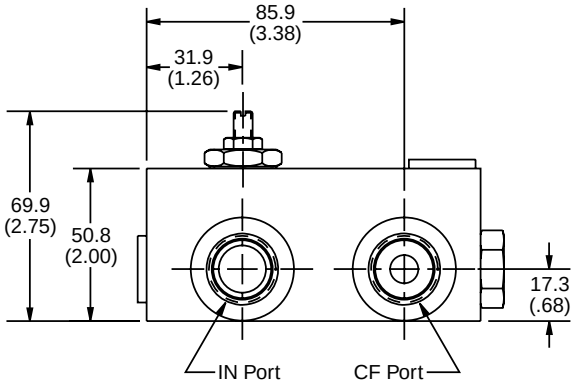
Knob Adjustable

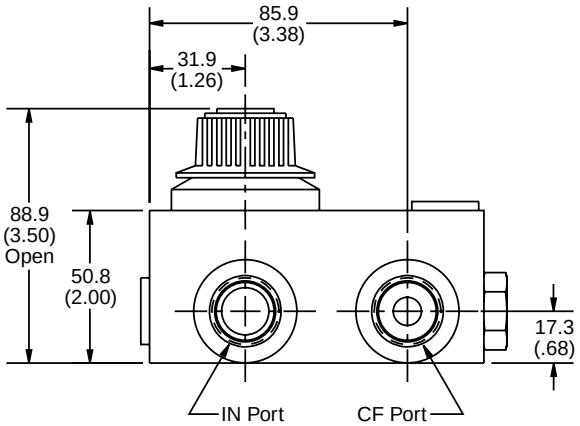






Stem Adjustable





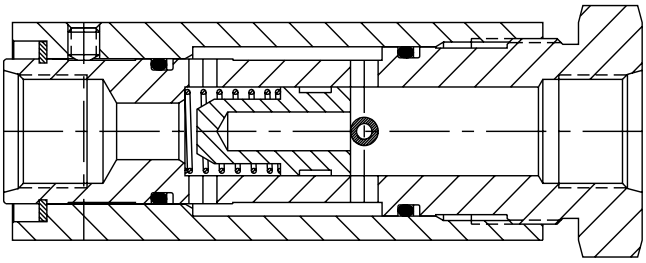
General Description

Series AVF (Hydraulic) adjustable velocity fuses are designed to provide automatic hydraulic line rupture shut-off, as well as the ability to isolate a problem circuit on parallel circuit applications. Use of the fuses limits oil spillage and potential component damage. The fuses feature an adjustable flow for easy set-up and operation. A set screw in the body is provided to "lock in" the selected flow.

Features

- Provides automatic line rupture shut-off.
- Isolates problem circuit on parallel circuit applications.
- Limits oil spillage and potential component damage.
- Adjustable closing flow — simple readjustment.

Construction View



Specifications

Service Application	Hydraulic	
Maximum Operating Pressure	340 Bar (5000 PSI)	
Material	Body, Sleeve, Poppet, Roll Pin	Steel
	Spring	Stainless Steel
	O-ring	Fluorocarbon
	Back-up Ring	PTFE
	Finish	Zinc Plated
Operating Temperature	-27°C to +177°C (-20°F to +350°F)	
Mounting	Any	

Performance Data

Valve Size	Closing Flow Adjustment Range	
	Minimum	**Maximum**
1/4"	1.9 LPM (1/2 GPM)	15 LPM (4 GPM)
3/8"	3.8 LPM (1 GPM)	30 LPM (8 GPM)
1/2"	5.7 LPM (1-1/2 GPM)	45 LPM (12 GPM)
3/4"	7.6 LPM (2 GPM)	68 LPM (18 GPM)
1"	11 LPM (3 GPM)	102 LPM (27 GPM)
1-1/2"	23 LPM (6 GPM)	227 LPM (60 GPM)

Pressure drop at maximum rated flow is less than 100 PSID on all sizes.

Ordering Information

Nominal Size	Port Type	
	NPT P/N	**SAE P/N**
1/4"	AVF-1/4-S28	AVF-106-S28
3/8"	AVF-3/8-S28	AVF-108-S28
1/2"	AVF-1/2-S28	AVF-110-S28
3/4"	AVF-3/4-S28	AVF-112-S28
1"	AVF-1-S28	AVF-116-S28
1-1/2"	AVF-1 1/2-S28	AVF-124-S28

Operation

Series AVF adjustable velocity fuse is a normally open, in-line valve. Under normal conditions, a spring holds the fuse poppet off its seat.

Flow Path

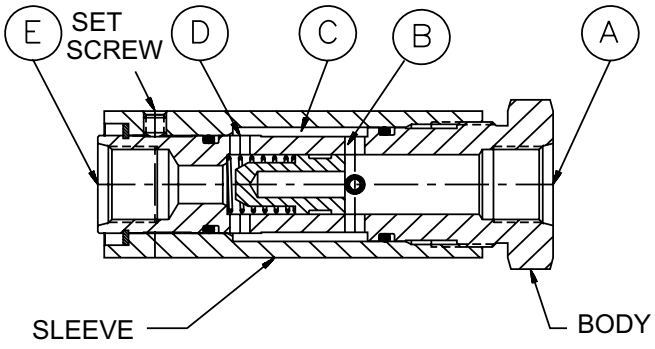
Flow enters the fuse at the flanged inlet port (A). Before reaching the poppet, a series of radial holes (B) in the body directs flow from the body core into an annular cavity (C) between the body and the adjusting sleeve. Flow is directed axially between the body and sleeve until it reaches another series of radial holes (D) at the poppet seat. Flow is then directed back into the body core through the seat and out the fuse outlet port (E).

Making Adjustments

External adjustments of the sleeve reduce the “free” area of the radial holes (D). This reduction in area creates an increase in flow velocity, resulting in a higher pressure drop. When the pressure drop exceeds the spring force holding the poppet open, the inlet pressure will force the poppet against its seat, effectively closing the fuse.

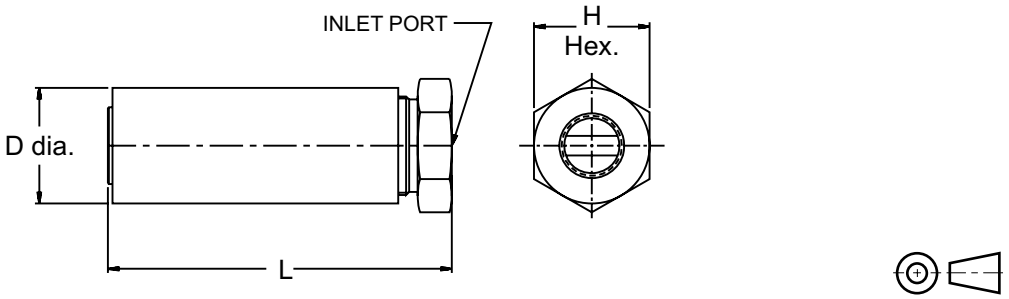
Line Rupture Shut-Off

The sleeve can be adjusted such that, at normal flows, the fuse will remain open but increased flow rates (such as caused by downstream line rupture) will result in a rapid closing of the fuse. The fuse will remain closed until the inlet pressure is eliminated or the downstream pressure is equalized with the inlet.



Dimensions

Inch equivalents for millimeter dimensions are shown in (**)



Nominal Size	L mm - (in)	D mm - (in)	H mm - (in)	Weight kg - (lbs.)
1/4"	90 (3.56)	29 (1.13)	29 (1.13)	0.36 (0.8)
3/8"	108 (4.25)	33 (1.31)	33 (1.31)	0.54 (1.2)
1/2"	128 (5.02)	43 (1.69)	43 (1.69)	1.1 (2.4)
3/4"	143 (5.62)	51 (2.0)	51 (2.0)	1.7 (3.8)
1"	168 (6.62)	61 (2.38)	61 (2.38)	2.8 (6.1)
1-1/2"	221 (8.69)	76 (3.0)	76 (3.0)	5.3 (11.6)

Conventional Fuse

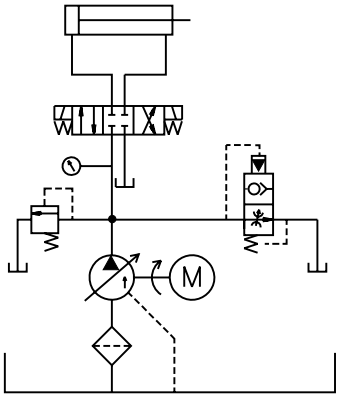
- Closing flow must be calculated
- Calculation error results in unusable valve
- System changes make valve unusable
- “Matched” fuses are very expensive
- Special order to meet requirements

AVF Series Adjustable Velocity Fuse

- No calculations required
- Correct size always supplied
- Simple re-adjustment
- Minor adjustment only
- Stocked by pipe size

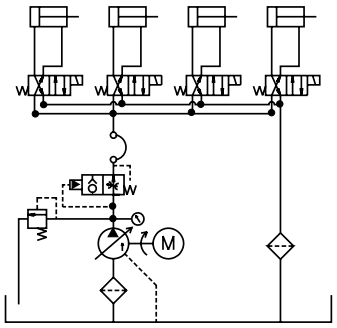
Pump/System Air Bleed

When starting a pump under load, the blocked port resists flow, and more torque is required from the prime mover. This condition may cause an electric motor to draw higher “pull-up current,” or may cause a combustion engine powered pump to stall. The velocity fuse is normally open and when tied into the tank, it will provide an open, load free path to tank when the pump first starts. As the pump nears operating speed, the resulting flow will cause the fuse to close, directing all flow into the primary circuit.



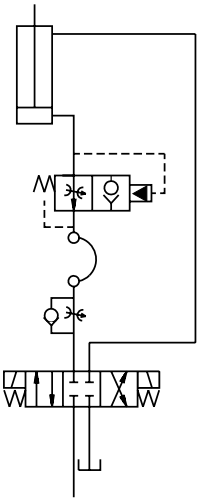
Main Pressure Line from Pump to Manifold

A line rupture in a central power unit would allow fluid to be pumped out through the broken line. The loss of oil can be expensive to clean up, dispose of, and replace; plus it must be done in accordance with EPA regulations. Ruptured lines may cause physical damage or the release of oil into a flammable area. A velocity fuse closes down flow when failure of a line occurs and eliminates these problems.



Cylinder/Actuator Shut-Off

A line rupture that occurs when a cylinder is supporting a load allows the load to fall unrestricted. A velocity fuse installed at the cylinder port will shut off flow and prevent the load from falling in the event of a hose or tubing failure.



General Description

Series AVF (Pneumatic) adjustable velocity fuses are designed to provide automatic air line shut-off if a line should rupture or break. The use of fuses limits the possibility of personal injury or damage to equipment from whipping hoses. The fuses are field adjustable for easy setup and operation. A set screw in the body allows the selected setting to be locked.

Features

- Provides automatic line rupture shut-off.
- Limits runaway conditions.
- Eliminates hose whip.
- Air or water compatible.

Benefits

- Eliminates “line whip.” No injury or damage possible.
- Limits runaway conditions. Load will stay in place after break.
- Precise sizing not required. Each valve has an adjustable flow range.
- Simple readjustments. Turn barrel to reset.
- Setting may be locked.
- Four sizes available.
- Resets quickly after line repair. Pressurize downstream line.

Specifications

Service Application	Pneumatic	
Maximum Operating Pressure	136 Bar (2000 PSI)	
Material	Body, Sleeve,	Brass
	Poppet, Roll Pin Spring	Stainless Steel
	O-ring	Nitrile
	Back-up Ring	PTFE
Operating Temperature	-27°C to +177°C (-20°F to +350°F)	
Mounting	Any	
Sizes	1/4", 3/8", 1/2" and 3/4" NPT	

Ordering Information

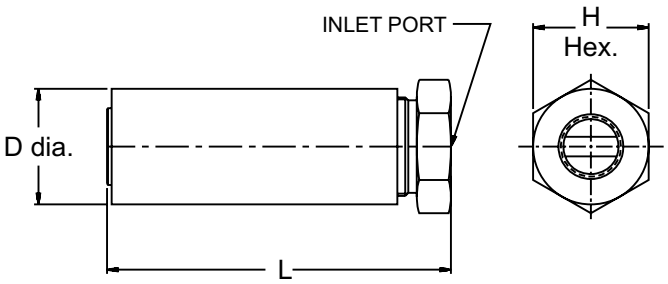
Series AVF Air Service	
Valve Size	**Part Number**
1/4" NPT	AVF-1/4-B2
3/8" NPT	AVF-3/8-B2
1/2" NPT	AVF-1/2-B2
3/4" NPT	AVF-3/4-B2

Performance Data

Valve Size	Series AVF Air Service Closing Flow Adjustment Range	
	Minimum	**Maximum**
1/4" NPT	5 SCFM	30 SCFM
3/8" NPT	5 SCFM	45 SCFM
1/2" NPT	10 SCFM	60 SCFM
3/4" NPT	10 SCFM	60 SCFM

Dimensions

Inch equivalents for millimeter dimensions are shown in (**)



Nom. Size	L mm (Inches)	D mm (Inches)	H mm (Inches)	Weight kg (lbs.)
1/4"	90 (3.56)	29 (1.13)	29 (1.13)	0.36 (0.80)
3/8"	108 (4.25)	33 (1.31)	33 (1.31)	0.54 (1.20)
1/2"	128 (5.02)	43 (1.69)	43 (1.69)	1.10 (2.40)
3/4"	143 (5.62)	51 (2.00)	51 (2.00)	1.70 (3.80)

Operation

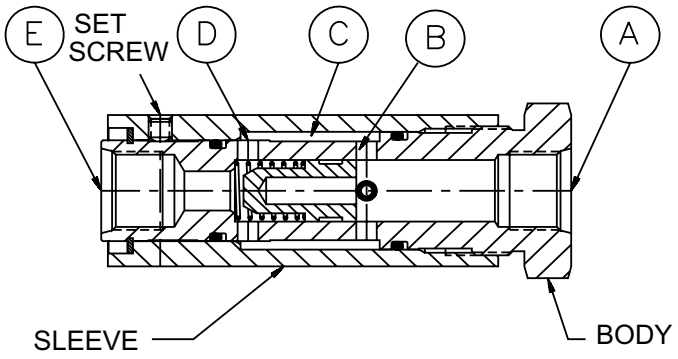
The AVF Series adjustable velocity fuse is a normally open, in-line valve. Under normal conditions, a spring holds the fuse poppet off its seat.

Flow Path

Flow enters the fuse at the flanged inlet port (A). Before reaching the poppet, a series of radial holes (B) in the body directs flow from the body core into an annular cavity (C) between the body and the adjusting sleeve. Flow is directed axially between the body and sleeve until it reaches another series of radial holes (D) at the poppet seat. Flow is then directed back into the body core through the seat and out the fuse outlet port (E).

Making Adjustments

External adjustments of the sleeve reduce the “free” area of the radial holes (D). This reduction in area creates an increase in flow velocity, resulting in a higher pressure drop. When the pressure drop exceeds the spring force holding the poppet open, the inlet pressure will force the poppet against its seat, effectively closing the fuse.



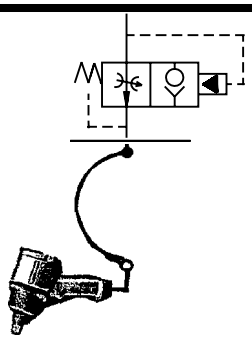
Line Rupture Shut-Off

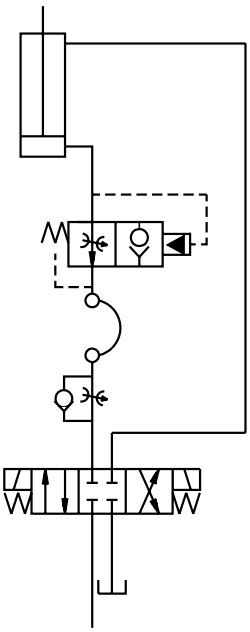
The sleeve can be adjusted such that, at normal flows, the fuse will remain open but increased flow rates (such as caused by downstream line rupture) will result in a rapid closing of the fuse. The fuse will remain closed until the inlet pressure is eliminated or the downstream pressure is equalized with the inlet.

Applications

Air Line Drop

A broken air hose may cause a violent whipping action that could cause injury to employees or damage to equipment. A velocity fuse will provide an automatic shut-off of air in case of a broken hose and eliminate this problem.





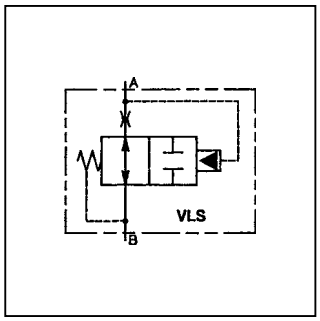
Cylinder / Actuator Shut-Off

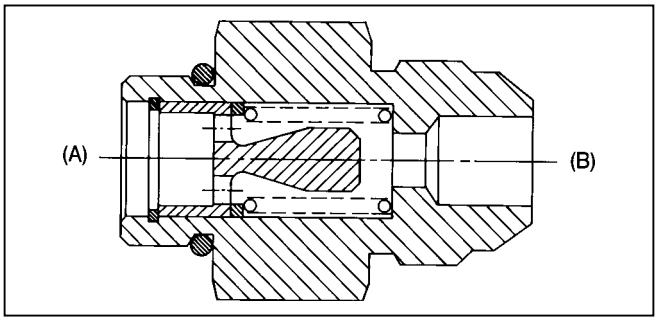
A line rupture that occurs when a cylinder is supporting a load allows the load to fall unrestricted. A velocity fuse installed at the cylinder port will shut off flow and prevent the load from falling in the event of a hose or tube failure.

General Description

Series VLS velocity check valves protect your hydraulic system in the event of line rupture. These valves return to the open position once the pressure is equalized.

Series VLS valve is a flow sensing, hydraulic check. Flow will pass through the check until the designated closing flow is reached. Then the check will close, stopping further flow.





Features

- Up to 207 Bar (3,000 PSI), 0.01 to 23.8 LPM (0.5 to 90 GPM)

Specifications

Maximum Operating Pressure	207 Bar (3000 PSI)
Normal Closing Flow	To be based on a nominal 3.5 Bar (50 PSI) with 150 SUS oil
Leakage After Closing	10 DPM maximum
Reverse Flow	Not to exceed 150% of specified closing flow
Fluid Recommended	Premium grade hydraulic fluid with viscosity of 10cSt (60 SUS) to 216 cSt (1000 SUS) at operating temperature.

Operating Temperature	Under normal conditions of continuous operation, fluid temperature should not exceed -82°C (180° F). In no instance should the temperature exceed 93°C (200°F).
Torque Required for Installation	See chart
Material	All steel
Seals	Nitrile standard. For other seal compounds, consult factory
Mounting	Not restricted

VLS	—		M		—		M		—	
Velocity Fuse		Inlet Porting	Male Thread	Port Type		Outlet Porting	Male Thread	Port Type		Fusing Flow

Code	Size
50	1/2" NPTF
06	SAE -6
08	SAE -8
10	SAE -10
12	SAE -12

Code	Type
1	NPTF
2	SAE

Code	Size
50	1/2" NPTF
06	SAE -6
08	SAE -8
10	SAE -10
12	SAE -12

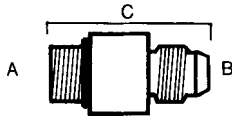
Code	Type
1	NPTF
2	SAE
3	JIC
4	ORS

Code	Flow*
0.8	3.0 LPM (0.8 GPM)
1.5	5.7 LPM (1.5 GPM)
2.0	7.6 LPM (2.0 GPM)
3.0	11.4 LPM (3.0 GPM)
6.0	22.7 LPM (6.0 GPM)
7.0	26.5 LPM (7.0 GPM)
10	37.9 LPM (10 GPM)
22	83.3 LPM (22 GPM)

VLS Flow Chart	
Max Flow	**Models**
26.5 LPM (7 GPM)	06M2-06M3
37.9 LPM (10 GPM)	08M2-08M3 10M2-08M4
45.4 LPM (12 GPM)	10M2-10M3
56.8 LPM (15 GPM)	50M1-50M1
90.8 LPM (24 GPM)	12M2-12M3

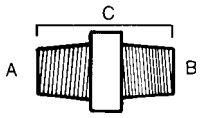
Inch equivalents for millimeter dimensions are shown in (**)

SAE TO JIC
MALE TO MALE



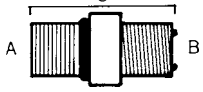
A (In.)	B (In.)	C (In.)	C (mm)	Hex (In.)	Hex (mm)	Part Number	Recommended Installation Torque* (In Lb. Ft.) In Aluminum	In Steel
3/8	3/8	1.30	(33.0)	11/16	(17.5)	VLS-06M2-06M3-**	85-100	13-16
1/2	1/2	2.25	(57.2)	7/8	(22.2)	VLS-08M2-08M3-**	15-20	25-33
5/8	5/8	2.06	(52.3)	1	(25.4)	VLS-10M2-10M3-**	25-30	42-50
3/4	3/4	1.97	(50.0)	1 1/4	(31.8)	VLS-12M2-12M3-**	35-40	55-65

NPT TO NPT
MALE TO MALE



A (In.)	B (In.)	C (In.)	C (mm)	Hex (In.)	Hex (mm)	Part Number	Recommended Installation Torque* (In Lb. Ft.) In Aluminum	In Steel
1/2	1/2	1.90	(48.4)	7/8	(22.2)	VLS-50M1-50M1-**	55-60	85-90

SAE TO ORS
MALE TO MALE



A (In.)	B (In.)	C (In.)	C (mm)	Hex (In.)	Hex (mm)	Part Number	Recommended Installation Torque* (In Lb. Ft.) In Aluminum	In Steel
3/8	3/8	1.25	(31.8)	3/4	(19.1)	VLS-06M2-06M4-**	85-100	13-16
5/8	1/2	2.10	(53.3)	1	(25.4)	VLS-10M2-08M4-**	25-30	42-50

General Description

Series C check valves permit free flow in one direction, and dependable shut-off in the reverse direction.

Operation

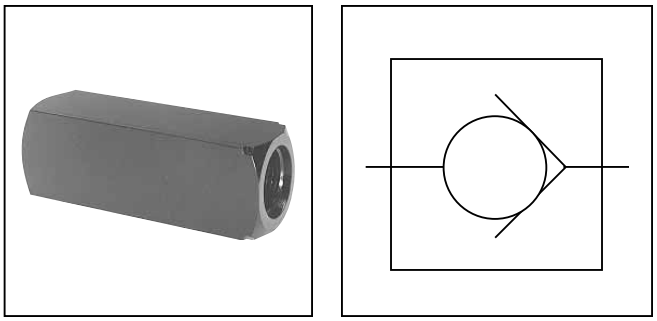
When pressure going through the valve is increased to the cracking level, the valve opens. When the pressure is reduced to below the cracking level, the valve closes.

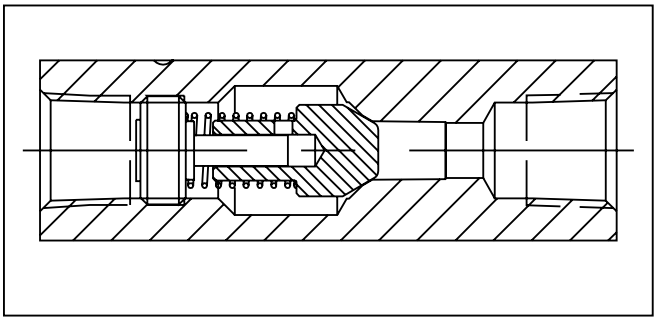
Features

- Stainless steel poppets standard.
- Soft seal poppets are available.
- Triangular retainers guide the poppets, and hold the spring firmly in place even under high velocity and shock.

Specifications

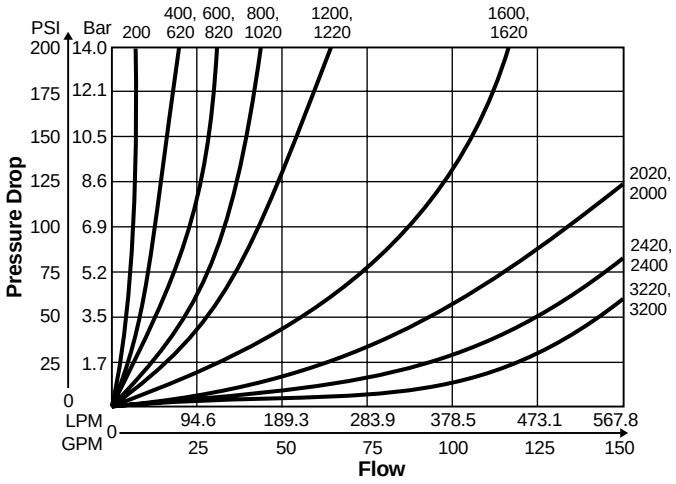
Maximum Operating Pressure	Brass:	140 Bar (2000 PSI); except for C1600 brass which is 35 Bar (500 PSI)
	Steel & Stainless Steel:	345 Bar (5000 PSI) for 200 thru 1220; 207 Bar (3000 PSI) for all other sizes and styles
Material	Body	see ordering code
	Spring	316 Stainless Steel
	Poppet	416 Stainless Steel
	Retainer	416 Stainless Steel
	Stainless Steel Bodies	303 Stainless Steel
Poppets	Soft seal poppet is standard for 200 through 800/1020 size. For cracking pressures > 15 PSI, solid metal poppets are standard	
Nominal Cracking Pressure	0.4 Bar (5 PSI) standard 0.07 Bar (1 PSI), 1.38 Bar (20 PSI), 4.48 Bar (65 PSI) optional	
Operating Temperature	-40°C to +121°C (-40°F to +250°F) Nitrile (standard) -26°C to +205°C (-15°F to +400°F) Fluorocarbon	





Performance Curves

Controlled Flow vs. Pressure Drop
Free Flow 0.3 Bar (5 PSI) Cracking
100 SSU, Hydraulic Oil



Options | Series C | Size | Material | Cracking Pressure (nominal) | Seal Compound | Design Series

NOTE: Not required when ordering.

Code	Description
Omit	NPTF/SAE
★ 8	BSPT
★★ 9	BSPP

★ Code 8 can be used with sizes 200, 400, 600, 800, 1200 Steel only

★★ Code 9 can be used with sizes 200, 400, 600, 800, 1200, 1600, 2000, 2400, 3200

Code	Size	Code	Size
200 *	1/8"	1600 *	1"
400 *†	1/4"	1620	#16 SAE
600 *†	3/8"	2000	1 1/4"
620	#6 SAE	2020	#20 SAE
800 *†	1/2"	2400	1 1/2"
820	#8 SAE	2420	#24 SAE
1020	#10 SAE	3200	2"
1200 *	3/4"	3220	#32 SAE
1220 *	#12 SAE		

* Sizes available in Brass

† Sizes available in Stainless Steel

Code	Description
B	Brass
S	Steel
SS *	Stainless Steel

Series C Brass Valves can be used for both air and oil service.

* Available in 400, 600 and 800 sizes.

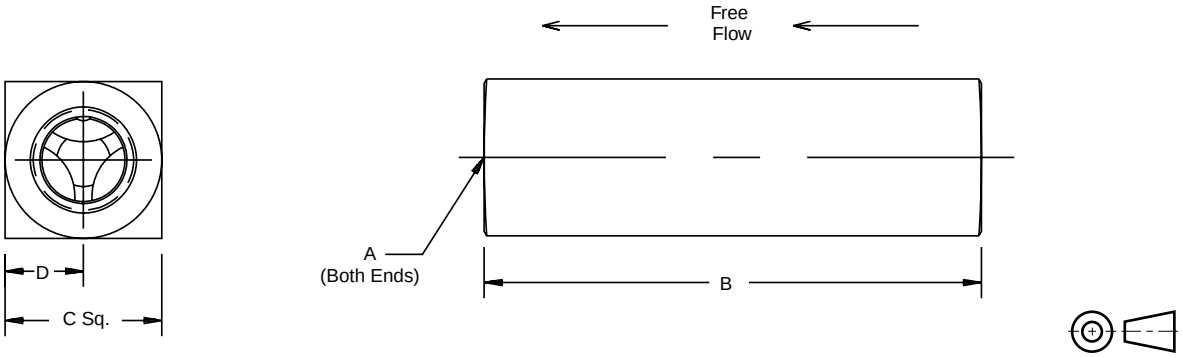
Code	Description
Omit	Standard 0.4 Bar (5 PSI)
1	0.07 Bar (1 PSI)
20	1.38 Bar (20 PSI)
65	4.5 Bar (65 PSI)

Other cracking pressures available.

Code	Description
Omit	Nitrile (Standard)
V	Fluorocarbon

Model Number	Max Flow LPM (GPM)	Effective Orifice Area Control Flow $in.^2$	Effective Control Flow C_v
C200	15 (3)	0.023	0.53
C400	23 (5)	0.068	1.56
C620	23 (5)	0.068	1.56
C600	30 (8)	0.099	2.27
C820	30 (8)	0.099	2.27
C800	45 (15)	0.224	5.11
C1020	45 (15)	0.224	5.11
C1200	100 (25)	0.348	7.95
C1220	100 (25)	0.348	7.95
C1600	150 (40)	0.453	10.35
C1620	150 (40)	0.453	10.35
C2000	284 (70)	0.855	19.52
C2020	284 (70)	0.855	19.52
C2400	378 (100)	0.955	21.82
C2420	378 (100)	0.955	21.82
C3200	605 (150)	1.046	23.90
C3220	605 (150)	1.046	23.90

Inch equivalents for millimeter dimensions are shown in (**)



Model Number	Weight kg (lbs.)	A	B	C	D
C200	0.0 (0.1)	1/8–27 NPTF	50.8 (2.00)	16.0 (0.63)	7.9. (0.31)
C400	0.2 (0.4)	1/4–18 NPTF	66.8 (2.63)	20.6 (0.81)	10.4 (0.41)
C420	0.0 (0.1)	7/16–20 UNF #4 SAE	68.3 (2.69)	20.6 (0.81)	10.4 (0.41)
C600	0.2 (0.5)	3/8–18 NPTF	69.9 (2.75)	25.4 (1.00)	12.7 (0.50)
C620	0.2 (0.5)	9/16–18 UNF #6 SAE	79.2 (3.12)	25.4 (1.00)	12.7 (0.50)
C800	0.6 (1.3)	1/2–14 NPTF	87.4 (3.44)	31.8 (1.25)	16.0 (0.63)
C820	0.3 (0.7)	3/4–16 UNF #8 SAE	88.9 (3.50)	28.4 (1.12)	14.2 (0.56)
C1020	0.6 (1.3)	7/8–14 UNF #10 SAE	101.6 (4.00)	31.8 (1.25)	15.7 (0.62)
C1200	0.9 (2.0)	3/4–14 NPTF	98.6 (3.88)	38.1 (1.50)	19.1 (0.75)
C1220	0.9 (2.0)	1 1/6–12 UN #12 SAE	117.3 (4.62)	38.1 (1.50)	19.1 (0.75)
C1600	1.5 (3.3)	1–11 1/2 NPTF	127.0 (5.00)	44.5 (1.75)	22.4 (0.88)
C1620	1.5 (3.3)	1 5/16–12 UN #16 SAE	142.7 (5.62)	57.2 (2.25)	28.4 (1.12)
C2000	2.8 (6.2)	1 1/4–11 1/2 NPTF	143.0 (5.63)	57.2 (2.25)	28.7 (1.13)
C2020	2.8 (6.2)	1 5/8–12 UN #20 SAE	165.1 (6.50)	69.9 (2.75)	35.1 (1.38)
C2400	3.8 (8.4)	1 1/2–11 1/2 NPTF	143.0 (5.63)	69.9 (2.75)	35.1 (1.38)
C2420	3.8 (8.4)	1 7/8–12 UN #24 SAE	184.2 (7.25)	76.2 (3.00)	38.1 (1.50)
C3200	7.0 (15.4)	2–11 1/2 NPTF	165.1 (6.50)	88.9 (3.50)	44.5 (1.75)
C3220	7.0 (15.4)	2 1/2–12 UN #32 SAE	228.6 (9.00)	101.6 (4.00)	50.8 (2.00)

General Description

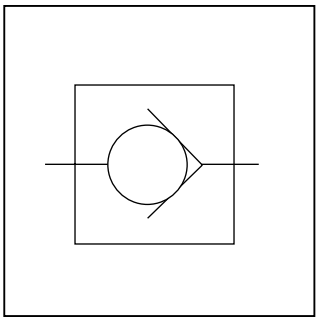
Series 6C check valves provide free flow in one direction and dependable shut-off in the reverse direction.

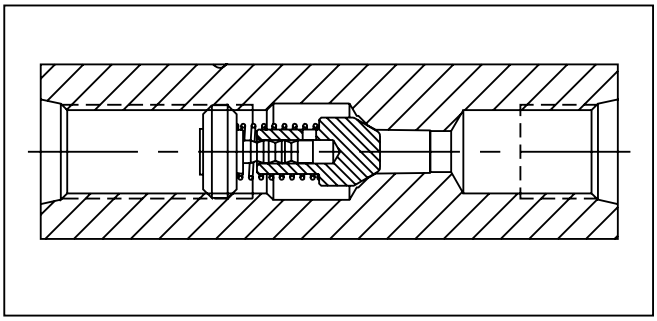
Operation

When pressure going through the valve is increased to the cracking level, the valve opens. When the pressure is reduced to below the cracking level, the valve closes.

Features

- Meets ISO 6149 standards.
- Hard metric dimensions.
- Reliable leak-free performance — straight thread port with o-ring sealing.
- Global interchangeablility.



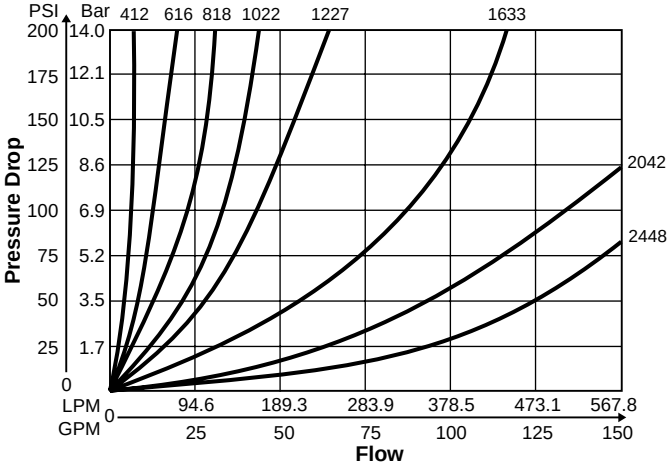


Specifications

Maximum Operating Pressure	345 Bar (5000 PSI)
Maximum Flow	M12 x 1.5 11 LPM (3 GPM) M16 x 1.5 19 LPM (5 GPM) M18 x 1.5 30 LPM (8 GPM) M22 x 1.5 57 LPM (15 GPM) M27 x 2.0 95 LPM (25 GPM) M33 x 2.0 151 LPM (40 GPM) M42 x 2.0 265 LPM (70 GPM) M48 x 2.0 379 LPM (100 GPM)
Cracking Pressure	Standard: 0.3 Bar (5 PSI) Optional: 0.1 Bar (1 PSI) 4.5 Bar (65 PSI)
Material	Body ASTM 12L14 Carbon Steel Poppet ASTM 416 Stainless Steel Retainer ASTM 416 Stainless Steel Spring ASTM 316 Stainless Steel
Seals	Standard: Nitrile Optional: Fluorocarbon

Performance Curves

Controlled Flow vs. Pressure Drop
Free Flow 0.3 Bar (5 PSI) Cracking
100 SSU, Hydraulic Oil



Ordering Information

6	C		S	
Ports	Style	Size	Material	Design Series

NOTE: Not required when ordering.

Code	Description
6	ISO 6149 ports

Code	Description
C	Check Valve

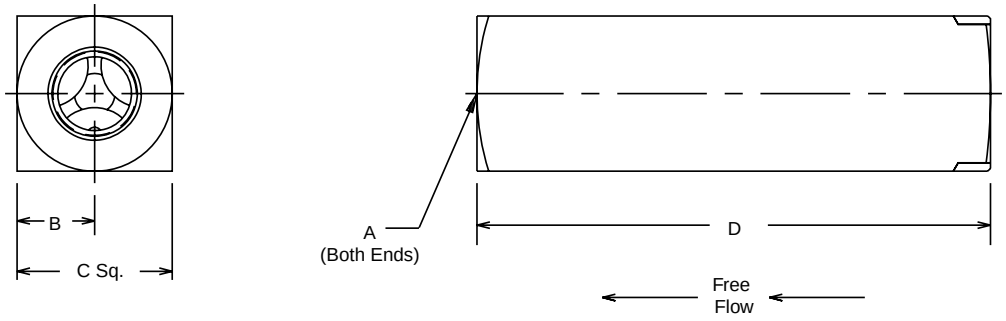
Code	Ratio
412	M12 X 1.5
616	M16 x 1.5
818	M18 x 1.5
1022	M22 x 1.5
1227	M27 x 2.0
1633	M33 x 2.0
2042	M42 x 2.0
2448	M48 x 2.0

Code	Description
S	Steel

Model Number	Weight kg (lbs.)
6C412	0.1 (0.3)
6C616	0.2 (0.5)
6C818	0.3 (0.7)
6C1022	0.6 (1.3)
6C1227	0.9 (2.0)
6C1633	1.5 (3.3)
6C2042	2.8 (6.2)
6C2448	3.8 (8.4)

Dimensions

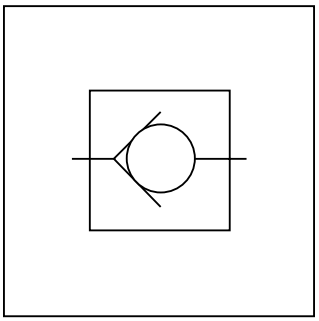
Inch equivalents for millimeter dimensions are shown in (**)



Model Number	Weight kg (lbs.)	A	B	C	D
6C412	0.1 (0.3)	M12 x 1.5	10.4 (0.41)	20.6 (0.81)	68.3 (2.69)
6C616	0.2 (0.5)	M16 x 1.5	12.7 (0.50)	25.4 (1.00)	79.2 (3.12)
6C818	0.3 (0.7)	M18 x 1.5	14.2 (0.56)	28.4 (1.12)	88.9 (3.50)
6C1022	0.6 (1.3)	M22 x 1.5	15.7 (0.62)	31.8 (1.25)	101.6 (4.00)
6C1227	0.9 (2.0)	M27 x 2.0	19.1 (0.75)	38.1 (1.50)	117.3 (4.62)
6C1633	1.5 (3.3)	M33 x 2.0	22.4 (0.88)	44.5 (1.75)	127.0 (5.00)
6C2042	2.8 (6.2)	M42 x 2.0	28.7 (1.13)	57.2 (2.25)	132.8 (5.23)
6C2448	3.8 (8.4)	M48 x 2.0	35.1 (1.38)	69.9 (2.75)	143.0 (5.63)

General Description

Series VCL check valves operate at free flow in one direction. Reverse flow is blocked.

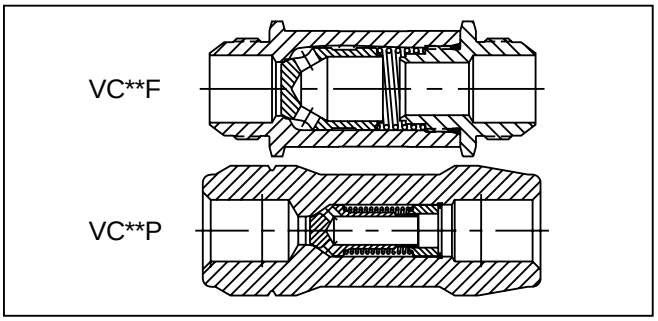


Operation

The spring keeps the poppet closed until the valve reaches the preset pressure. The valve stays open until the pressure goes below the spring setting.

Features

- Available in a wide variety of crack pressures.
- Poppet spring is isolated from liquid flow stream minimizing turbulence.
- Close tolerance fit between poppet and poppet retainer creates a cushion that protects valve from surge shock damage.



Specifications

Models VCL*P (female pipe to female pipe)

Valve Model	Max. Oper. Press. Bar (PSI)	Material	Rated Flow LPM (GPM)	Cracking Press. ΔP Bar (PSI)	Total ΔP Bar (PSI)	Port Size
VCL4P5	207 (3000)	Steel†	23 (5)	0.3 (5)	0.6 (8.3)	1/4 NPSF
VCL4P65	207 (3000)	Steel†	23 (5)	4.5 (65)	5.0 (72.5)	1/4 NPSF
VCL6P5	207 (3000)	Steel†	30 (8)	0.3 (5)	0.4 (6.0)	3/8 NPSF
VCL6P65	207 (3000)	Steel†	30 (8)	4.5 (65)	4.6 (66.0)	3/8 NPSF
VCL8P5	207 (3000)	Steel†	45 (15)	0.3 (5)	0.5 (7.2)	1/2 NPSF
VCL8P65	207 (3000)	Steel†	45 (15)	4.5 (65)	4.6 (66.0)	1/2 NPSF
VCL12P5	207 (3000)	Steel†	100 (25)	0.3 (5)	0.8 (11.0)	3/4 NPSF
VCL12P65	207 (3000)	Steel†	100 (25)	4.5 (65)	4.6 (67.0)	3/4 NPSF
VCL16P5	207 (3000)	Steel†	133 (35)	0.3 (5)	0.4 (5.3)	1 NPSF
VCL16P65	207 (3000)	Steel†	133 (35)	4.5 (65)	4.6 (66.0)	1 NPSF
VCL20P5	207 (3000)	Steel†	189 (50)	0.3 (5)	1.1 (15.9)	1-1/4 NPSF
VCL20P65	207 (3000)	Steel†	189 (50)	4.5 (65)	5.4 (78.0)	1-1/4 NPSF

* Available in “L” or “R” Style.
† All steel construction with zinc chromate plating.

Models VCL*F (male 37° flare to male 37°)

Valve Model	Max. Oper. Press. Bar (PSI)	Material	Seals	Rated Flow LPM (GPM)	Cracking Press. ΔP Bar (PSI)	Total ΔP Bar (PSI)	Port Size
VCL6F5	207 (3000)	Steel†	Nitrile O-Rings	23 (5)	0.3 (5)	0.6 (8.3)	9/16-18 UNF
VCL6F65	207 (3000)	Steel†	Nitrile O-Rings	23 (5)	4.5 (65)	5.0 (72.5)	(SAE 6)
VCL8F5	207 (3000)	Steel†	Nitrile O-Rings	30 (8)	0.3 (5)	0.4 (6.0)	3/4-16 UNF
VCL8F65	207 (3000)	Steel†	Nitrile O-Rings	30 (8)	4.5 (65)	4.6 (66.0)	(SAE 8)
VCL10F5	207 (3000)	Steel†	Nitrile O-Rings	45 (15)	0.3 (5)	0.5 (7.2)	7/8-14 UNF
VCL10F65	207 (3000)	Steel†	Nitrile O-Rings	45 (15)	4.5 (65)	4.6 (66.0)	(SAE 10)
VCL12F5	207 (3000)	Steel†	Nitrile O-Rings	100 (25)	0.3 (5)	0.8 (11.0)	1 1/16-12 UN
VCL12F65	207 (3000)	Steel†	Nitrile O-Rings	100 (25)	4.5 (65)	4.6 (67.0)	(SAE 12)
VCL16F5	207 (3000)	Steel†	Nitrile O-Rings	133 (35)	0.3 (5)	0.4 (5.3)	1 5/16-12 UN
VCL16F65	207 (3000)	Steel†	Nitrile O-Rings	133 (35)	4.5 (65)	4.6 (66.0)	(SAE 16)
VCL20F5	207 (3000)	Steel†	Nitrile O-Rings	189 (50)	0.3 (5)	1.1 (15.9)	1 5/8-12 UN
VCL20F65	207 (3000)	Steel†	Nitrile O-Rings	189 (50)	4.5 (65)	5.4 (78.0)	(SAE 20)

* Available in “L” or “R” Style.
† All steel construction with zinc chromate plating.
3300-1.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

VCL — Series VCL

□ — Size

Code	Description
4*	1/4"
6	3/8"
8	1/2"
10†	5/8"
12	3/4"
16	1"
20	1 1/4"

* 37° flare not available in size 4.

† NPTF not available in size 10.

□ — Port Style

Code	Description
F	37° Flare Tube Both Ends
P	NPTF Female Both Ends

□ — Cracking Pressure

Code	Description
05	0.3 Bar (5 PSI)
65	4.5 Bar (65 PSI)

A

□ — Seal Compound*

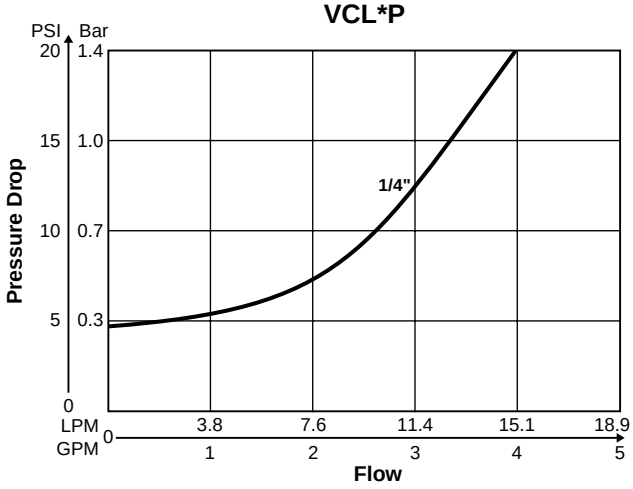
Code	Description
Omit	Nitrile (Standard)
V	Fluorocarbon

* Only available with "F" port style.

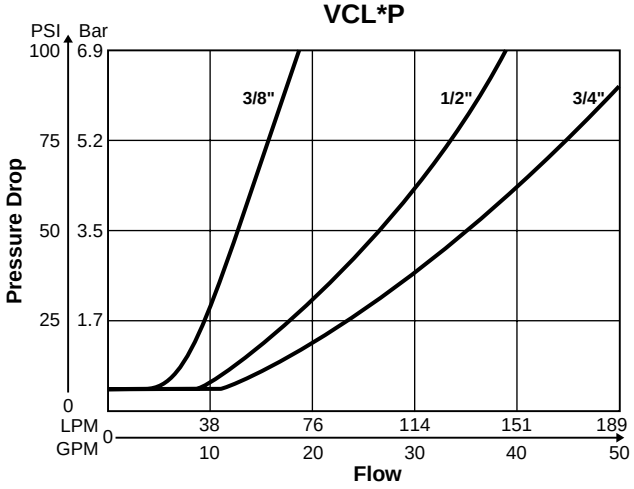
[ ] — Design Series

NOTE: Not required when ordering.

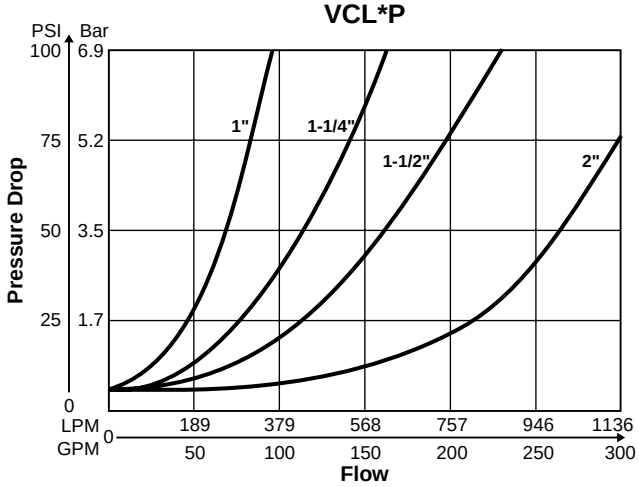
VCL*P



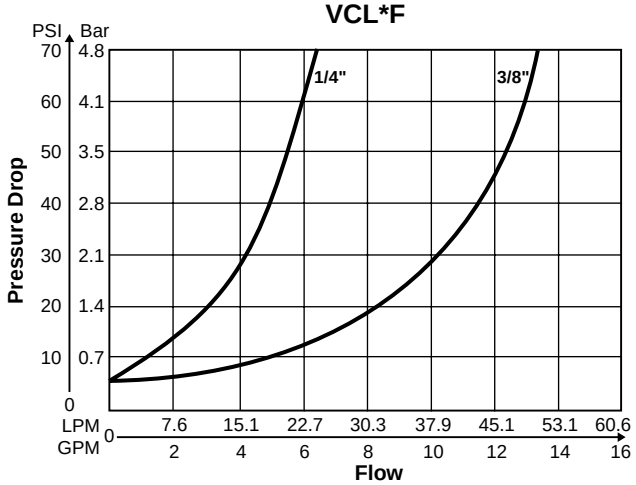
VCL*P



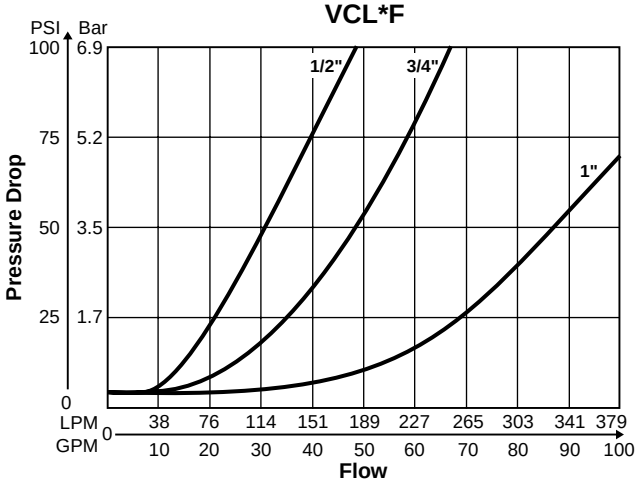
VCL*P



VCL*F



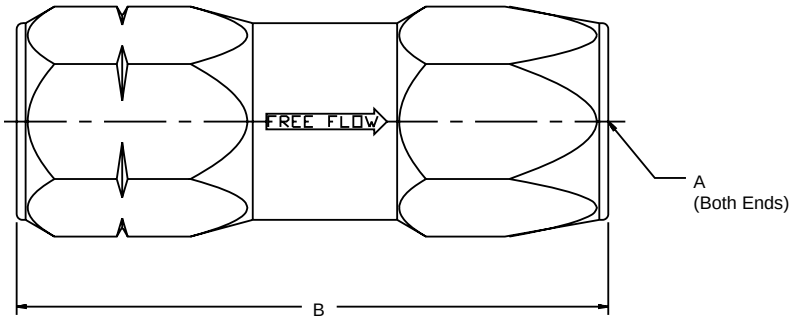
VCL*F

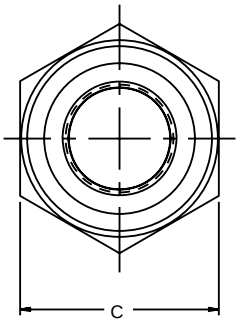


3300-1.p65, dd

Inch equivalents for millimeter dimensions are shown in (**)

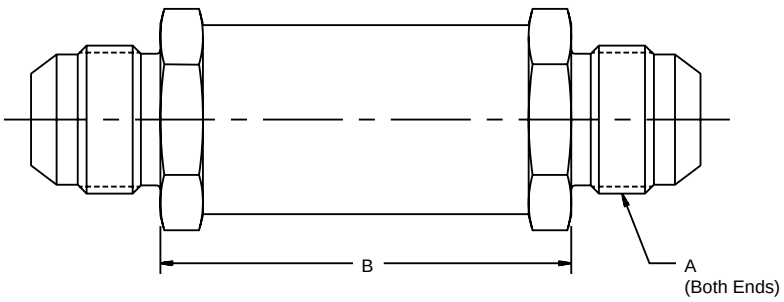
Models VCL*P

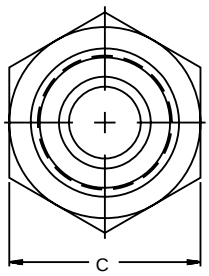




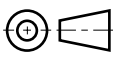
Valve Model	Weight kg (lbs.)	A	B	C
VC*4PA**	0.2 (0.4)	1/4-1/8 NPSF	62.0 (2.44)	20.6 (0.81)
VC*6PA**	0.3 (0.7)	3/8-18 NPSF	69.9 (2.75)	22.4 (0.88)
VC*8PA**	0.4 (0.9)	1/2-14 NPSF	88.9 (3.50)	26.9 (1.06)
VC*12PA**	0.5 (1.2)	3/4-14 NPSF	98.6 (3.88)	34.8 (1.37)
VC*16PA**	0.8 (1.8)	1-11 1/2 NPSF	124.0 (4.88)	40.6 (1.60)
VC*20PA**	2.0 (4.3)	1 1/4-11 1/2 NPSF	125.0 (4.94)	50.8 (2.00)

Models VCL*F



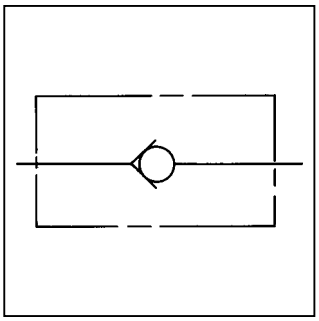


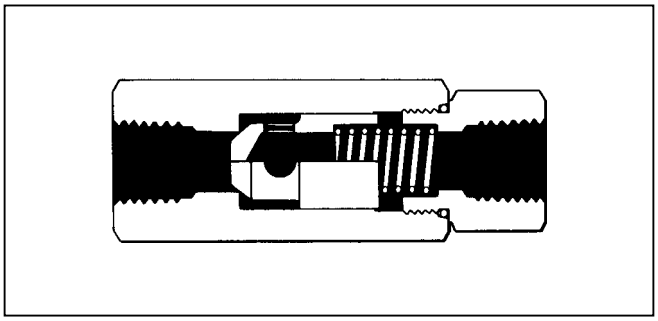
Valve Model	Weight kg (lbs.)	A	B	C
VC*6FA**	0.2 (0.4)	9/16-18 UNF (SAE 6)	44.5 (1.75)	20.6 (0.81)
VC*8FA**	0.3 (0.7)	3/4-16 UNF (SAE 8)	56.4 (2.22)	25.4 (1.00)
VC*10FA**	0.4 (0.9)	7/8-14 UNF (SAE 10)	61.2 (2.41)	28.4 (1.12)
VC*12FA**	0.5 (1.2)	1 1/16-12 UN (SAE 12)	69.9 (2.75)	35.1 (1.38)
VC*16FA**	0.8 (1.8)	1 15/16-12 UN (SAE 16)	84.1 (3.31)	44.1 (1.62)
VC*20FA**	2.0 (4.3)	1 5/8-12 UN (SAE 20)	84.1 (3.31)	47.8 (1.88)



General Description

Series CLS in-line check valves are designed to provide free flow in one direction and a positive check in the opposite direction. They are available with a variety of port types and sizes and may be mounted in any position.





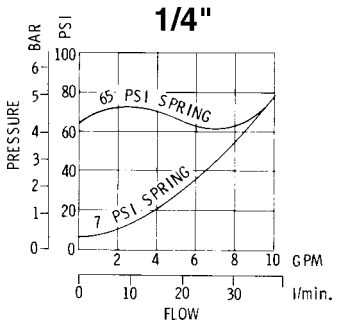
Specifications

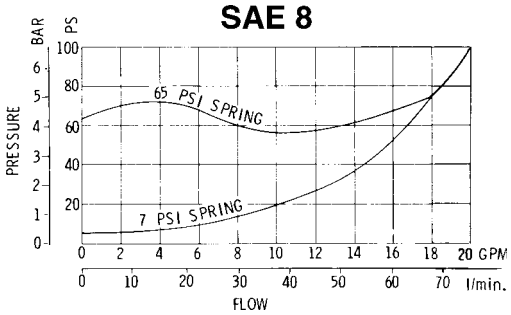
Maximum Operating Pressure	207 Bar (3000 PSI)
Flow Rating	Consult pressure drop data
Fluid Recommended	Premium grade hydraulic fluid with viscosity of 10cSt (60 SUS) to 216 cSt (1000 SUS) at operating temperature.
Operating Temperature	Under normal conditions of continuous operation, fluid temperature should not exceed -82°C (180° F). In no instance should the temperature exceed 93°C (200°F).
Material	All steel
Mounting	Not restricted

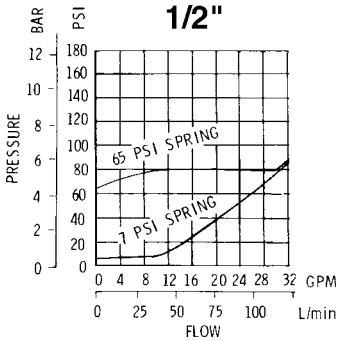
Features

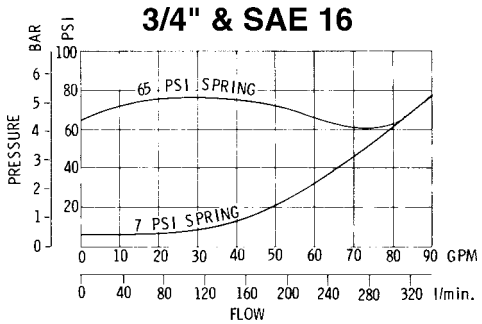
- Up to 3000 PSI (207 Bar)
- 1/4", 1/2", 3/4" NPTF
- #8, #12, #16 SAE

Performance Curves









Ordering Information

CLS — [ ] — [ ] [ ] [ ]

Check Valve | Port Size | Port Type | Spring Rate | Type

Code	Size
25	1/4" NPTF
50	1/2" NPT
75	3/4" NPT
08	SAE 8
12	SAE 12
16	SAE 16

NOTE: NPT ports not available on Male type valves.

Code	Type
1	NPT
2	SAE

Code	Size
7	7 PSI
45	45 PSI
65	65 PSI

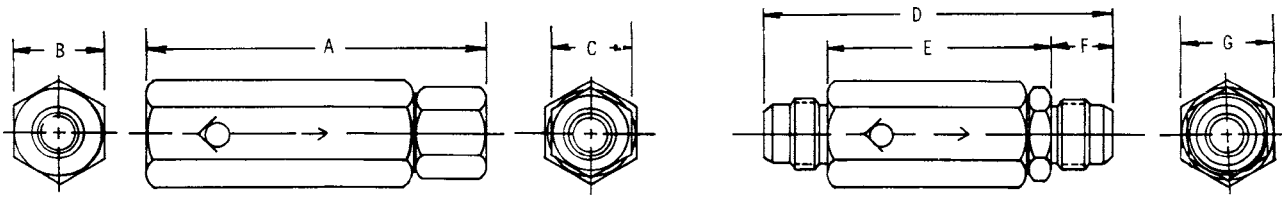
Code	Type
M	Male
F	Female

Weight (approx.)

¼″ . . . . . 0.50 lbs. [0,23 kg]
½″ . . . . . 1.00 lbs. [0,45 kg]
¾″ . . . . . 2.88 lbs. [1,30 kg]
SAE 8 . . . . . 1.00 lbs. [0,45 kg]
SAE 12 . . . . . 2.80 lbs. [1,27 kg]
SAE 16 . . . . . 3.00 lbs. [1,36 kg]

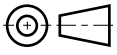
Dimensions

Millimeter equivalents for inch dimensions are shown in (**)



VALVE SIZE NPT & FEMALE SAE	A	B	C
1/4″	3.30 (83.8)	0.88 (22.3)	0.75 (19.1)
SAE 8	3.66 (92.9)	1.00 (25.4)	0.88 (22.3)
1/2″ & SAE 10	4.50 (114.3)	1.38 (35.0)	1.25 (31.7)
3/4″ & SAE 12	5.22 (132.6)	1.75 (44.4)	1.50 (38.1)

VALVE SIZE MALE TUBE	D	E	F	G
SAE 12	5.30 (134.6)	3.58 (90.9)	0.86 (21.8)	1.75 (44.4)
SAE 16	5.36 (136.1)	3.54 (89.9)	0.91 (23.1)	1.75 (44.4)

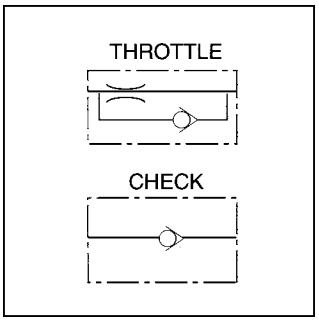


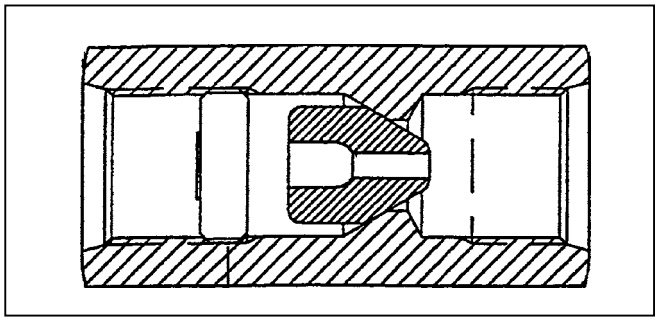
General Description

Series LT and LTF Valves will operate satisfactorily when installed in any position. These valves may be used as Line Check Valves, permitting full flow of hydraulic oil in one direction only or they may be used as restrictors.

An assortment of restrictors are available. When installed, the valve becomes a Line Throttle Valve permitting free flow of hydraulic oil in one direction and a restricted flow in the opposite direction.

An array of color-coded poppets allows easy and quick identification.





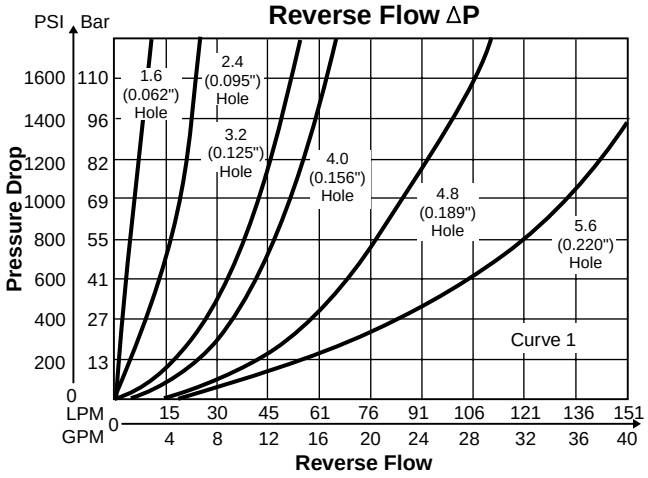
Features

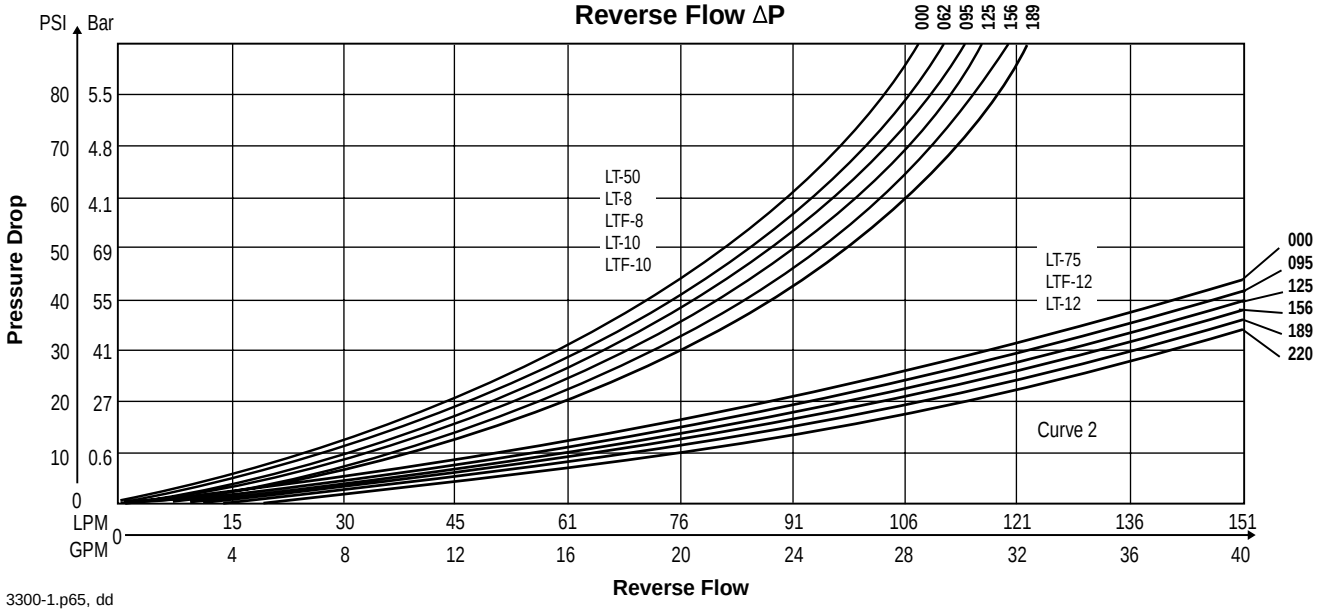
- Accurate control of double-acting cylinder by having both sides of the piston pressurized.
- For improving control of the lowering stroke of a cylinder.
- For preventing cavitation of a cylinder or motor having an inertia load.
- For metering oil flow to a hydraulic motor for proper motor speed.
- For improving control of the extend stroke of a hydraulic cylinder.
- Unidirectional.

Specifications

Maximum Operating Pressure	207 Bar (3000 PSI)
Materials	Body: Steel/Zinc-plated Poppet: Nylon Retainer: 416 Stainless Steel
Operating Temperature	-30°C to +100°C (-22°F to +212°F)

Performance Curves





3300-1.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

Ordering Information

□ — □ — □

Series | Port Size | Throttle and Check Poppets

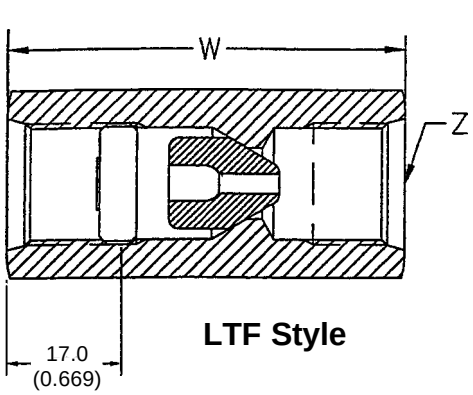
Code	Series
LT	Male-Female Ports
LTF	Female-Female Ports

Code	Size
8	3/4" – 16 UNF-2
10	7/8" – 14 UNF-2
12	1 1/16" – 12 UNF-2
50	1/2" – 14 NPT (LT Only)
75	3/4" – 14 NPT (LT Only)

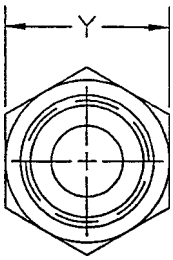
Poppet Order Symbol	Diameter of Hole in Poppet		Poppet Color
For Part Numbers LT-8, LT-10, LT-50, LTF-8, LTF-10			
4	1.19	(.947)	Brown
6	1.57	(.062)	Purple
8	1.98	(.078)	Pink
9	2.41	(.095)	Red
11	2.77	(.109)	Beige
12	3.18	(.125)	Yellow
15	3.96	(.156)	Lt. Green
18	4.80	(.189)	Black
25	6.40	(.252)	Dk. Green
0	Check (No Hole)		Beige
For Part Numbers LT-12, LT-75, LTF-12			
180	4.80	(.189)	Black
210	5.59	(.220)	Orange
250	6.40	(.252)	Lt. Blue
00	Check (No Hole)		White

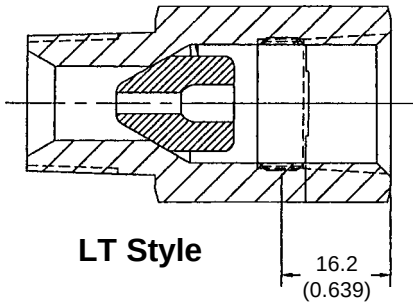
Dimensions

Inch equivalents for millimeter dimensions are shown in (**)



LTF Style



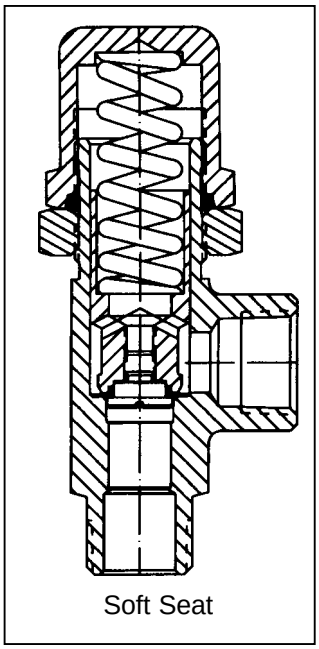


LT Style

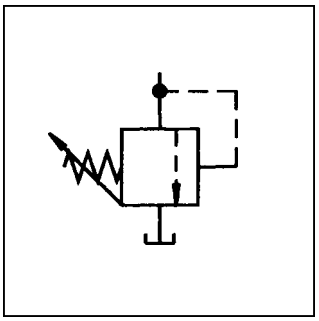
Model Number	W Length	Y Hex Size	Z Thread (Both Ends)
LT-50	54.1 (2.13)	25.4 (1.00)	1/2" – 14 NPT
LT-8	54.1 (2.13)	25.4 (1.00)	SAE 8 (3/4" – 16 UNF)
LT-10	58.7 (2.31)	28.7 (1.13)	SAE 10 (7/8" – 14 UNF)
LT-12	77.7 (3.06)	35.1 (1.38)	SAE 12 (1 1/16" – 12 UN)
LT-75	73.2 (2.88)	35.1 (1.38)	3/4" – 14 NPT
LTF-8	62.0 (2.44)	25.4 (1.00)	SAE 8 (3/4" – 16 UNF)
LTF-10	68.3 (2.69)	28.7 (1.13)	SAE 10 (7/8" – 14 UNF)
LTF-12	82.6 (3.25)	35.1 (1.38)	SAE 12 (1 1/16" – 12 UN)

General Description

Series 620 - 649 in-line pressure control valves open the system to tank when the system pressure reaches the pressure setting of the control valve. The pressure setting is externally adjustable so that it can be tuned accordingly within its range. However, the valve can be factory set to a specified pressure setting.



Soft Seat



Hard Seat
available only in
Brass and Stainless Steel

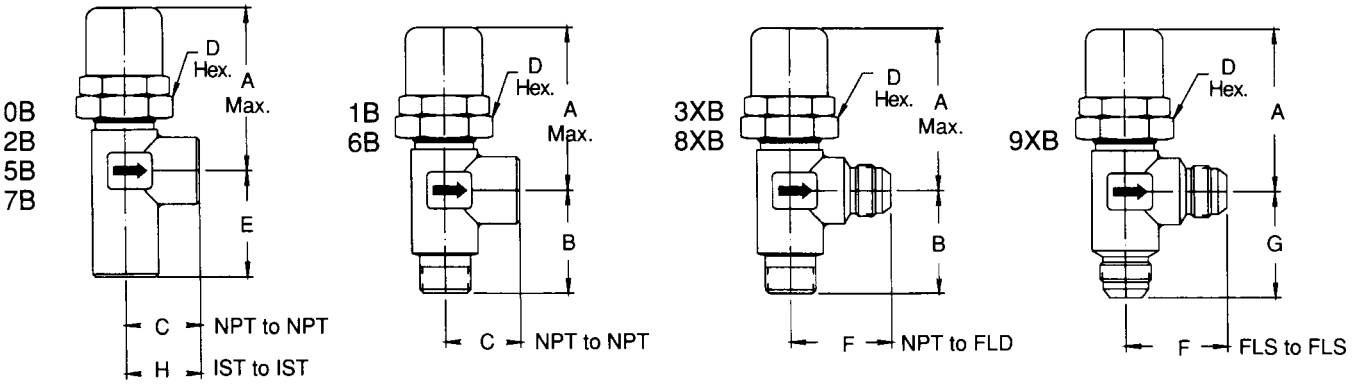
Specifications

Service App.	Hydraulic and Pneumatic	
Maximum Operating Pressure	Working: Reseat:	0.3 to 248.4 Bar (4 to 3600 PSI) in 13 ranges Range 1: 80% of cracking press. Ranges 2 - 13: 90% of cracking pressure
Sizes	NPT IST FLD	1/4", 1/2", 3/4" SAE 6, SAE 10, SAE 12 SAE 6, SAE 10, SAE 12
Ports	NPT IST FLD	Pipe threads Internal straight threads Flared Tube Connection SAE 37°
Material	Body, Cap Finish Poppet Seat (soft) Spring Cap O-ring	Brass, aluminum alloy, stainless steel Aluminum alloy, anodized; stainless steel 416 Stainless Steel (Hard seat) 303 Stainless Steel (Soft seat) Ranges 1 -3: Synthetic rubber - Code 2 Ranges 4 - 13: PTFE Stainless steel Synthetic rubber
Operating Temperature	-40°C to +121°C (-40°F to +250°F) Higher on special order	

Features

- Externally adjustable.
- Available for hydraulic or pneumatic service.
- Quick response for venting applications.

Dimensions Inch equivalents for millimeter dimensions are shown in (**)

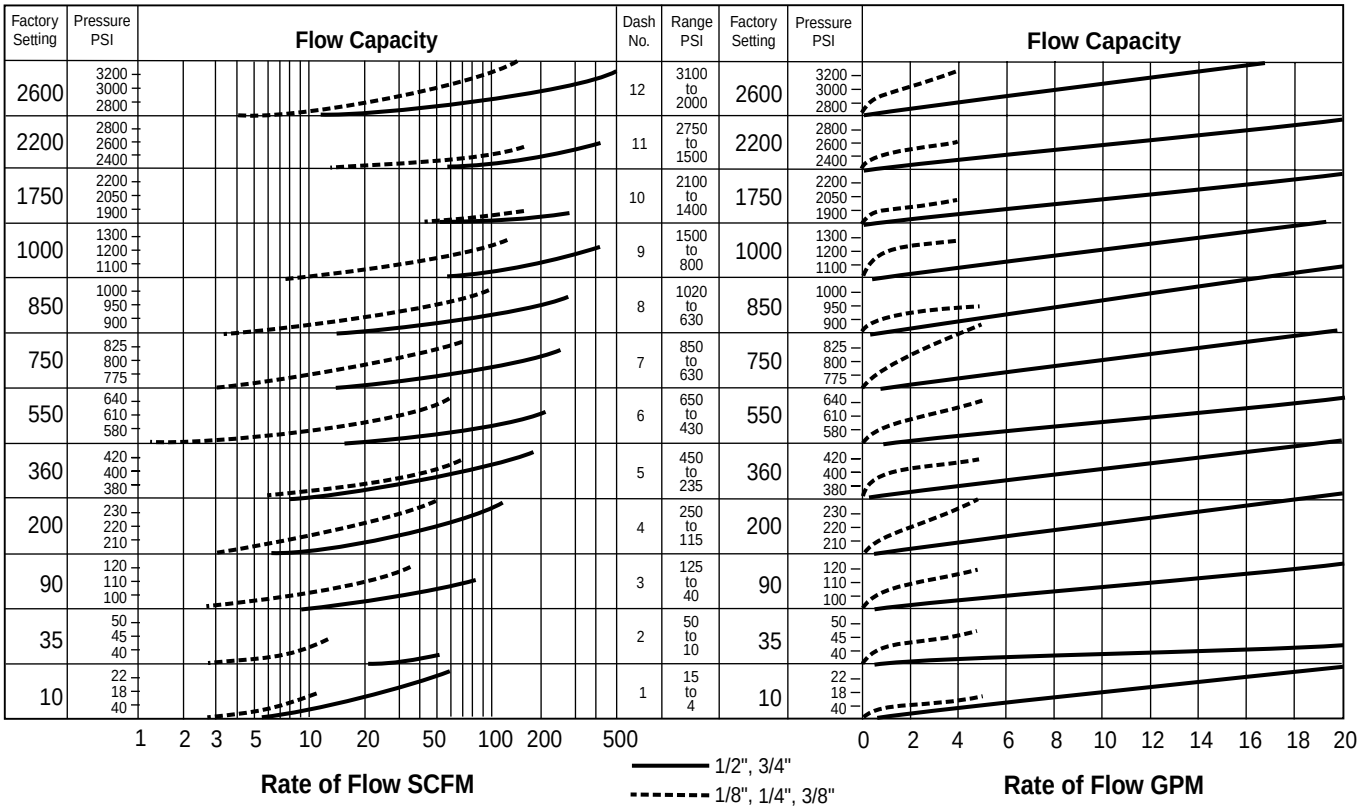


Valve Size		Dimensions								Maximum Rated Flow LPM (GPM)	Weights (Approx.)		
Pipe	Tube	A	B	C	D	E	F	G	H		Allum. Alloy	Brass	Stainless Steel
1/4	6	60.3 (2.38)	34.9 (1.38)	27.0 (1.06)	31.8 (1.25)	32.5 (1.28)	36.5 (1.44)	38.1 (1.50)	27.0 (1.06)	15.1 (4.0)	4 oz.	10 oz.	12 oz.
1/2	10	94.5 (3.72)	54.0 (2.13)	38.1 (1.50)	44.5 (1.75)	54.8 (2.16)	52.4 (2.06)	55.6 (2.19)	38.1 (1.50)	37.9 (10.0)	14 oz.	2 lbs. 2 oz.	2 lbs. 4 oz.
3/4	12	94.5 (3.72)	54.0 (2.13)	39.7 (1.56)	44.5 (1.75)	55.6 (2.19)	53.2 (2.09)	55.6 (2.19)	39.7 (1.56)	56.8 (15.0)	14 oz.	2 lbs. 2 oz.	2 lbs. 4 oz.

3300-1.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

Performance Curves



Examples

Pneumatic:

Establish cracking pressure setting of 1/2" valve for flow of 70 SCFM at 27.6 Bar (400 PSI) pressure:

1. Project 70 SCFM on vertical scale.
2. Project 27.6 Bar (400 PSI) scale horizontally intersectiong 1.
3. Project line parallel to curves back to vertical line 1.
4. Read cracking pressure setting: 24.8 Bar (360 PSI).

Hydraulic:

Find amount of pressure increase above 24.8 Bar (360 PSI) cracking pressure when flow through 3/4" valve is increased to 54 LPM (14 GPM):

1. From 360 on vertical pressure scale, follow 3/4" curve until it intersects with the vertical line representing 54 LPM (14 GPM).
2. Project intersecting point horizontally and read pressure, i.e., 29 Bar (420 PSI).
3. Accumulated Pressure:
   420 minus 360 = 4.1 Bar (60 PSI).

Ordering Information

□ Materials — □ Type Ports & Type Seals — □ Pressure Range — □ Size — □ O-Ring Code

Code	Description
62	Aluminum (Soft Seat Only)
63	Brass
64	Stainless Steel Type 303

Code	Size
1/4	1/4" NPT
1/2	1/2" NPT
3/4	3/4" NPT
6	(IST or FLD)
10	(IST or FLD)
12	(IST or FLD)

Code	Description
2	Nitrile
28	Fluorocarbon

Code	Inlet	Outlet
Hard Seat		
0B	IST	IST
1B	NPT	NPT
2B	NPT	NPT
3XB	NPT	FLD
Soft Seat		
5B	IST	IST
6B	NPT	NPT
7B	NPT	NPT
8XB	NPT	FLD
629XB only	FLD	FLD

Hard Seat available in Brass and Stainless Steel only.

Code	Description
1	0.3 - 1.0 Bar (4-15 PSI)
2	0.7 - 3.5 Bar (10-50 PSI)
3	2.8 - 8.6 Bar (40-125 PSI)
4	7.9 - 17.3 Bar (115-250 PSI)
5	16.2 - 31.1 Bar (235-450 PSI)
6	29.7 - 44.9 Bar (430-650 PSI)
7	43.5 - 58.7 Bar (630-850 PSI)
8*	43.5 - 70.4 Bar (630-1020 PSI)
9*	55.2 - 103.5 Bar (800-1500 PSI)
10*	96.6 - 144.9 Bar (1400-2100 PSI)
11*	103.5 - 189.8 Bar (1500-2750 PSI)
12*	138.0 - 213.9 Bar (2000-3100 PSI)
13*	207.0 - 248.4 Bar (3000-3600 PSI)

* Hard Seat only.

PTFE seats for Ranges 4, 5, 6 and 7 only.

Pressure Range

Range Bar (PSI)	Pre-Set Cracking Pressure	Soft Seat Material (when used)	Range Dash Number
0.3 - 1.0 Bar (4-15 PSI)	0.7 Bar (10 PSI)	Synthetic Rubber	-1
0.7 - 3.5 Bar (10-50 PSI)	2.4 Bar (35 PSI)	Synthetic Rubber	-2
2.8 - 3.5 Bar (40-125 PSI)	6.2 Bar (90 PSI)	Synthetic Rubber	-3
7.9 - 17.3 Bar (115-250 PSI)	13.8 Bar (200 PSI)	PTFE	-4
16.2 - 31.1 Bar (235-450 PSI)	24.8 Bar (360 PSI)	PTFE	-5
29.7 - 44.9 Bar (430-650 PSI)	38.0 Bar (550 PSI)	PTFE	-6
43.5 - 58.7 Bar (630-850 PSI)	51.8 Bar 750 PSI)	PTFE	-7
43.5 - 70.4 Bar (630-1020 PSI)	58.7 Bar (850 PSI)	PTFE	-8
55.2 - 103.5 Bar (800-1500 PSI)	69.0 Bar (1000 PSI)	PTFE	-9
96.6 - 144.9 Bar (1400-2100 PSI)	120.8 Bar (1750 PSI)	PTFE	-10
103.5 - 189.8 Bar (1500-2750 PSI)	151.8 Bar (2200 PSI)	PTFE	-11
138.0 - 213.9 Bar (2000-3100 PSI)	179.4 Bar (2600 PSI)	PTFE	-12
207.0 - 248.4 Bar (3000-3600 PSI)	220.8 Bar (3200 PSI)	PTFE	-13

Definitions:

Cracking pressure – Liquid: 15 tp 20 DPM
Air: steady stream of bubbles

Reseat leakage – Less than 1 DPM or 1 BPM

3300-1.p65, dd

General Description

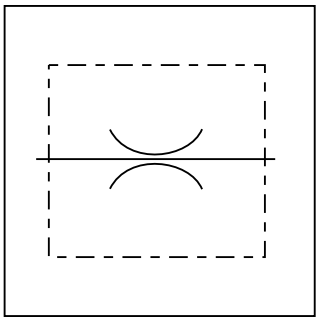
Series GF valves isolate gages from damage and inaccurate readings caused by line pressure surges and hydraulic hammer.

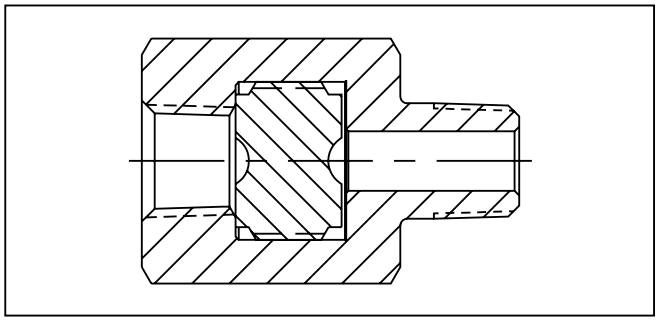
Operation

The GF uses a capillary orifice to smooth out line pulsations and surges without the use of any moving parts.

Features

- One piece construction.
- The GF requires no adjustment or maintenance.





Specifications

Maximum Operating Pressure	207 Bar (3000 PSI)

Ordering Information

Options	Series	Size	Material	Design Series
☐	GF	☐	S	⌐ ¬ ⌊ ⌋

Code	Description
Omit	NPTF/SAE
★9	BSPP

★ Code 9 can be used with size 400

Code	Description
400	1/4"
420	7/16 - 20 UNF (SAE 4)

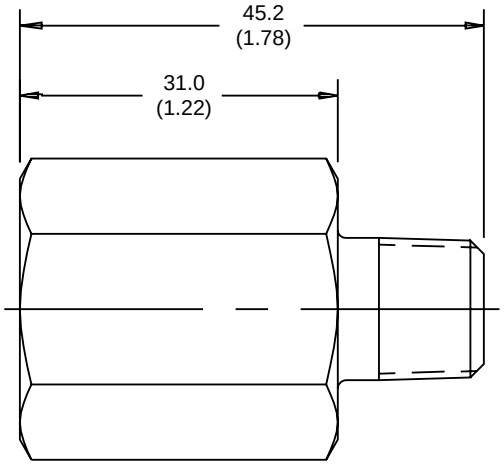
Code	Description
S	Steel

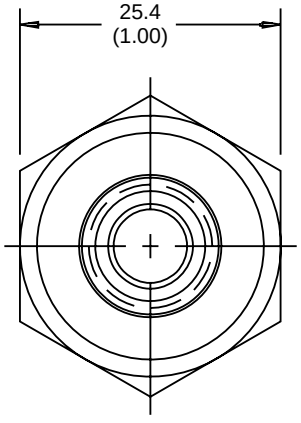
NOTE:
Not required when ordering.

Weight: 0.6 kg (1.3 lbs.)

Dimensions

Inch equivalents for millimeter dimensions are shown in (**)





3300-1.p65, dd

General Description

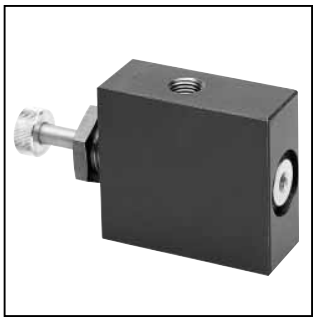
Series GT valves isolate gages from damage and inaccurate readings caused by line pressure surges and hydraulic hammer.

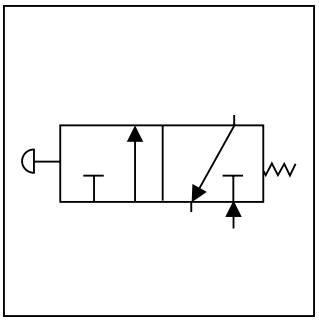
Operation

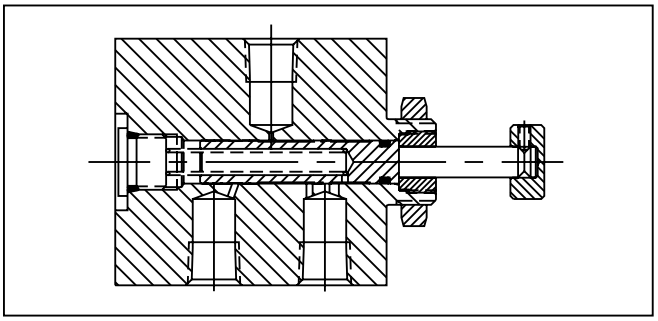
The GT has a push-to-read knob that delivers instant pressure to the gage, yet isolates the gage from the fluid line until the knob is pressed. When the knob is released, a spring-loaded spool closes instantly and drains all fluid from the gage back into the reservoir.

Features

- Has a hardened steel spool.
- Partial snubbing action protects the gage from surge damage.
- Optional panel mount.







Specifications

Maximum Operating Pressure	207 Bar (3000 PSI)
Mounting	In-line

Ordering Information

Options	Series GT	Size	Material	Seal Compound	Design Series
□	GT	□	S	□	⌐ ¬

Code	Description
Omit	NPTF/SAE
★9	BSPP

Code	Description
400	1/4"
420	7/16-20 UNF (SAE 4)

Code	Description
S	Steel

Code	Description
Omit	Nitrile (Std.)
V	Fluorocarbon

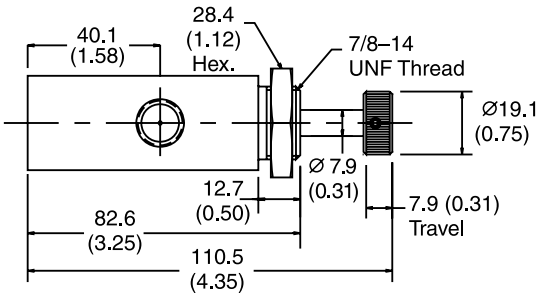
NOTE: Not required when ordering.

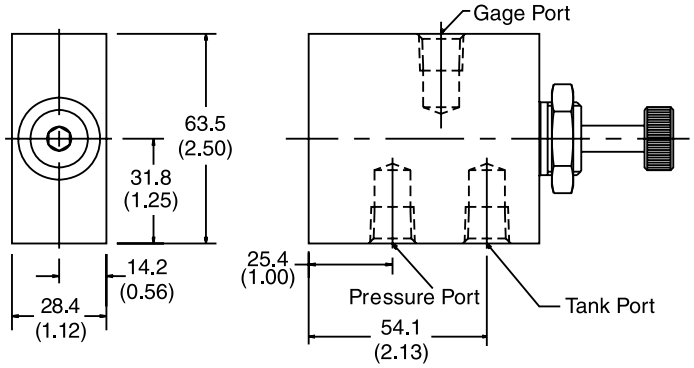
★ Code 9 can be used with size 400

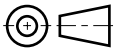
Weight: 1.0 kg (2.2 lbs.)

Dimensions

Inch equivalents for millimeter dimensions are shown in (**)







3300-1.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

The Parker High Pressure Ball Valve Product Line serves in applications ranging from 3000 to 10,000 PSI. Included in this section is the Series BVAL, especially designed for leak-free hydraulic suction and return line applications.

Features

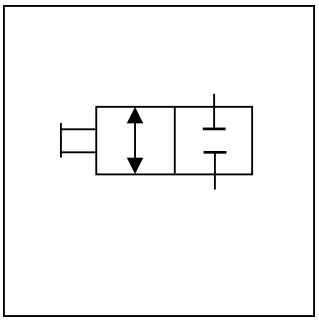
- ☐ *Full Ported*
- ☐ *Polyamide Thrust Bearings and Ball Seal Compounds*
- ☐ *Unique Rotating 4-Bolt SAE Flange Design*
- ☐ *Wide Variety of Port Configurations*

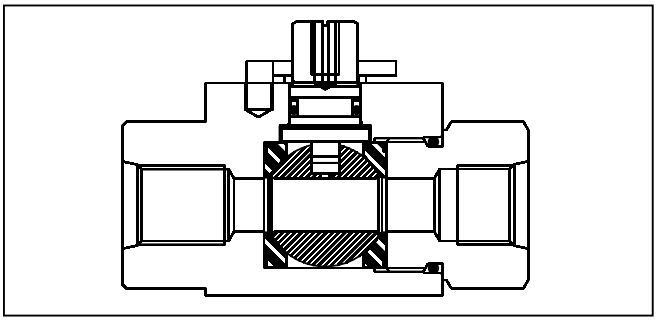
Advantages

- ☐ *Very low pressure drop*
- ☐ *Low actuation torque and high cycle expectancy*
- ☐ *Easy alignment, reducing potential leaks and installation costs*
- ☐ *Applicable to most system requirements*

General Description

Series BVHP valves are used for shut-off applications and are rated at 414 Bar (6000 PSI). The wide variety of porting options plus the wide range of accessories make the BVHP the choice for high pressure systems with ports up to 1".





Operation

Parker's 2-way ball valves operate to either off or full flow by rotating the handle 90°. Ball valves are not designed to be a metering or flow control device.

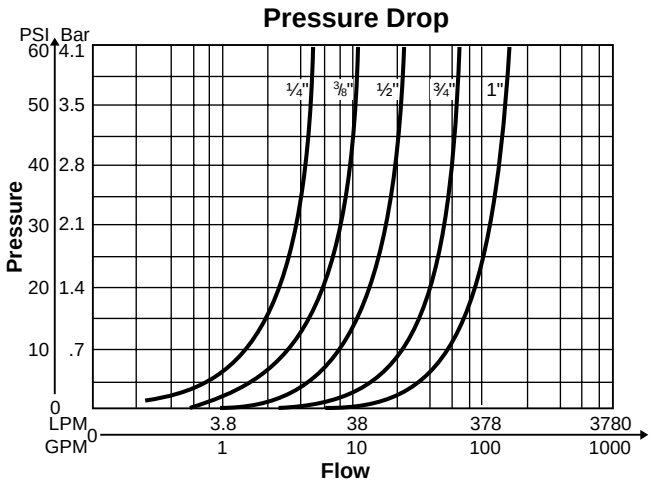
Specifications

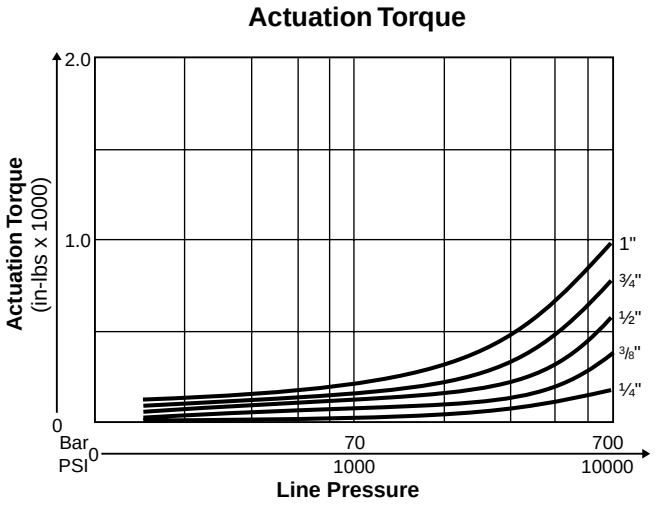
Maximum Pressure	414 Bar (6000 PSI)
Body Material	Carbon Steel, Black Oxide, Stainless Steel
Ball Material	Steel, Chrome Plated, Stainless Steel
Stem Material	Steel, Zinc Plated, Stainless Steel
Standard Handle	Steel Offset, Nickel Plated
Ball Seals	Delrin + MoS_2
Spindle Seals	O-ring & Backup, Nitrile
Operating Temperature	-30°C to +100°C (-22°F to +212°F)

Features

- The use of nylon thrust bearings and synthetic lube packing reduces the actuation torque and helps prevent valve seizures even after long term exposure.
- Delrin™ seals with molybdenum disulphide (MoS_2) results in lower actuation torque and will increase high duty life cycle expectancy.
- BVHP products are full ported, which means an unrestricted bore which results in C_v and ΔP closely approximating a like length section of fluid line.
- Code 61 and 62 rotating flange design allows easy alignment with mating flanges.
- Limit switch is NEMA 4 with CSA/UL approval.

Performance Curves





3300-2.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

BVHP — Series

Size

Code	Size
04	1/4"
06	3/8"
08	1/2"
12	3/4"
16	1"

Port

Code	Type
N	NPT Thread
S	SAE Thread
B	BSPP Thread
U	ISO 6149 Thread
†*C	C.61 4-Bolt Flange
*D	C.62 4-Bolt Flange
†*E	C.61 Split Flange
*F	C.62 Split Flange
†*G	C.61 Combo 4B + Split
*H	C.62 Combo 4B + Split

* Available in ½" – 1"

† C.61 Flanges rated to 207 Bar (3000 PSI) with Delrin or Peek seals

Body Material

Code	Type
S	Steel
K	Stainless Steel

Ball & Stem Material

Code	Type
S	Steel
K	Stainless Steel

Ball Seals

Code	Type
1	Delrin
2*	PTFE
4	Peek

*Valve pressure rating reduced. Consult factory.

Stem Seals

Code	Type
N	Nitrile
V	Fluorocarbon
E	EPR

Options

Code	Type
A	Locking Handle
B	Security Locking Handle
★C	1 Way Limit Switch
★D	2 Way Limit Switch
*E	Panel Mount
G	Flat Non-offset Handle
★**K	1 Way Limit Switch w/Lock
★L	2 Way Limit Switch w/Lock

* Cannot be combined with other options

** Switch is set to indicate valve open condition

★ When selecting this option, your ball valve will come with the limit switch bracket, but does not include the switch. The switch is sold separately (Part #LSB)

Design Series

NOTE: Not required when ordering.

ISO 6149-1 Port Dimensions (inches)

Size	Thread
04	M12 x 1.5
06	M16 x 1.5
08	M18 x 1.5
12	M27 x 2
16	M33 x 2
20	M42 x 2
24	M48 x 2
32	M60 x 2
40	M76 x 2
48	M90 x 2
64	M114 x 2

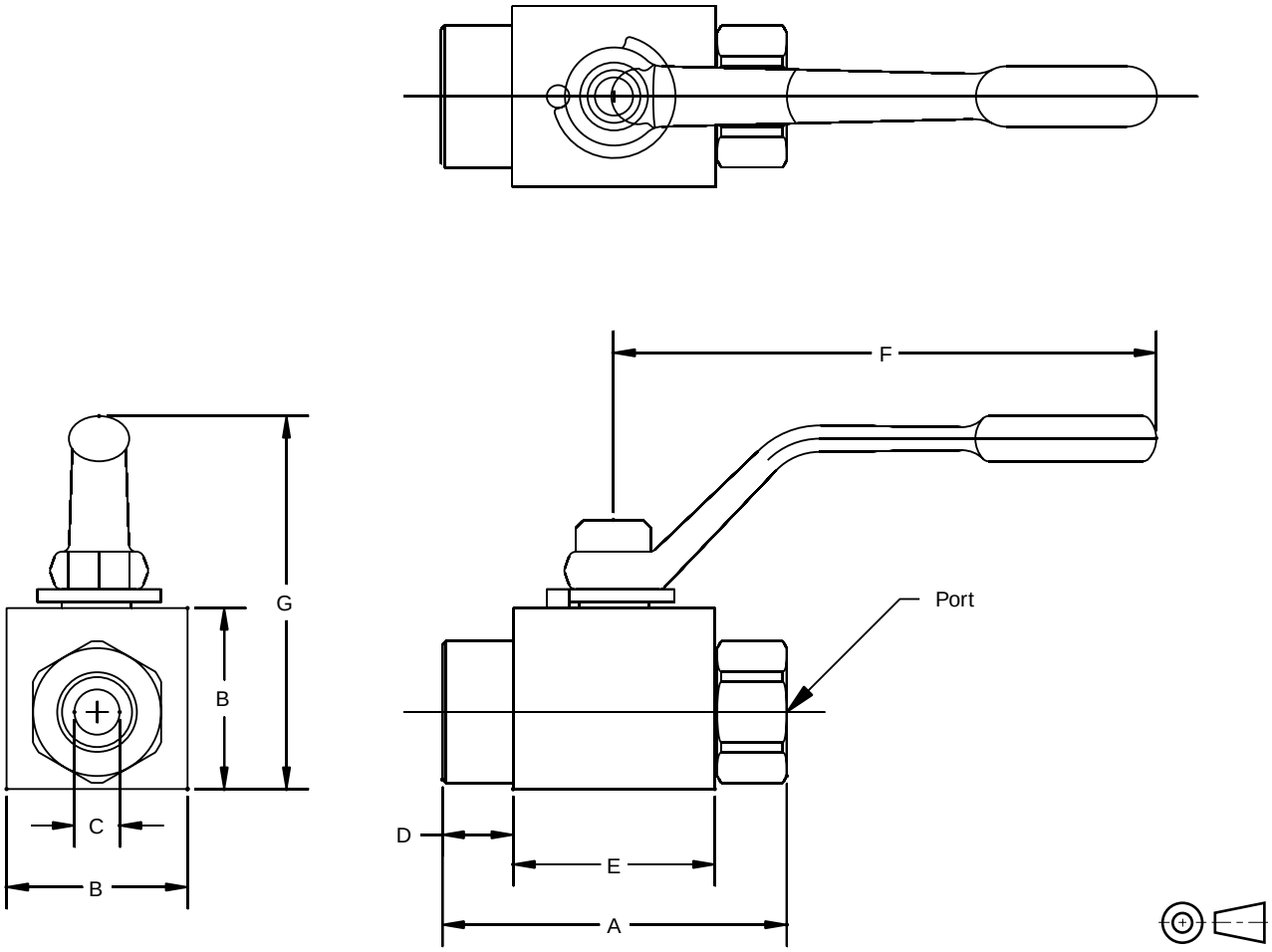
Replacement Handles Standard Steel Offset

Series	Part Number
BVHP04	BVH-HS1
BVHP06	BVH-HS1
BVHP08	BVH-HS1
BVHP12	BVH-HS2
BVHP16	BVH-HS2

Weights

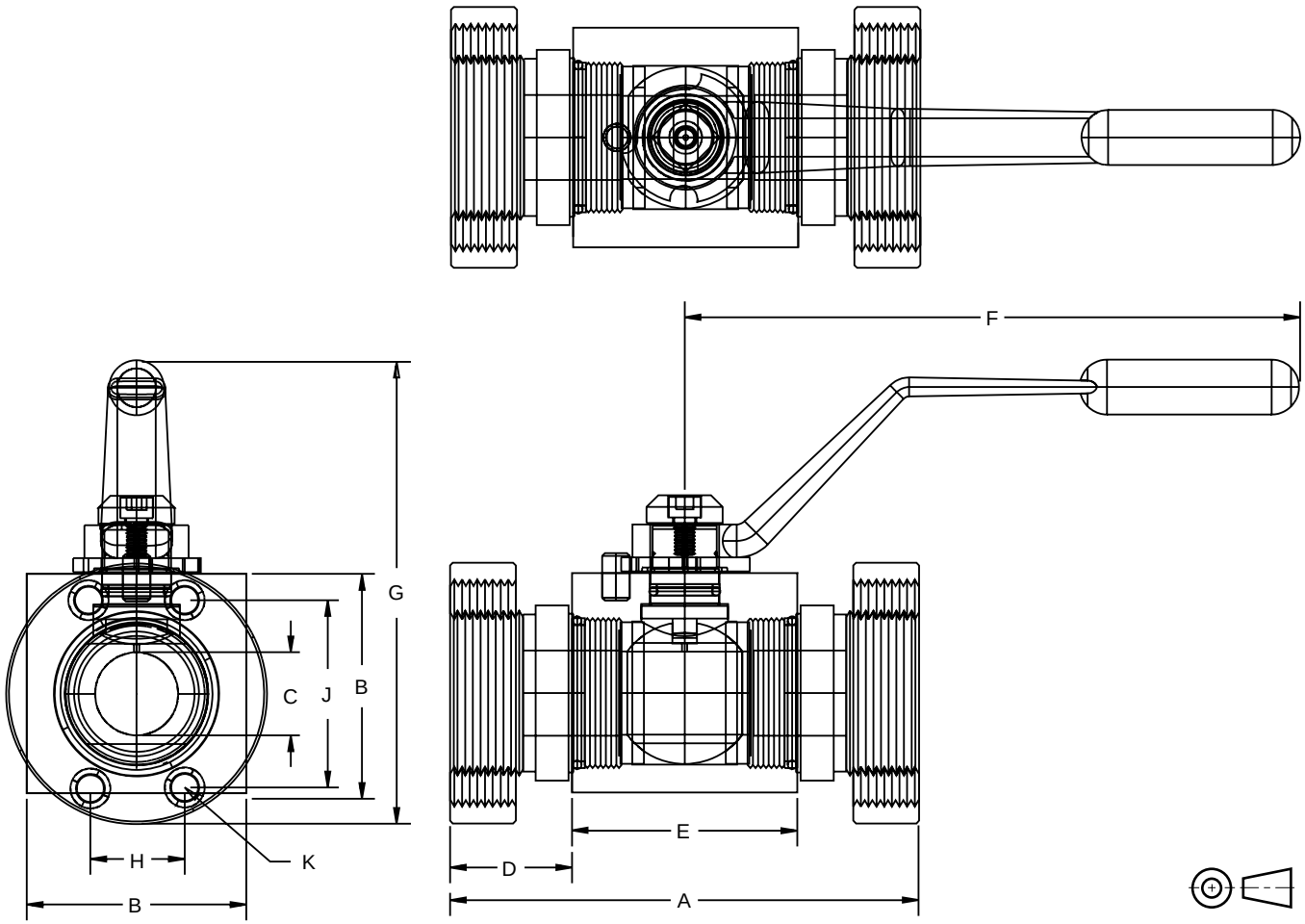
Code	Threaded kg (lbs.)	C.61, 3000 psi kg (lbs.)	C.62, 6000 psi kg (lbs.)
04	0.5 (1.0)	—	—
06	0.7 (1.5)	—	—
08	0.9 (2.0)	1.7 (3.5)	1.8 (3.9)
12	1.8 (4.0)	2.7 (6.0)	2.9 (6.4)
16	2.3 (5.0)	3.6 (8.0)	4.0 (8.8)

Threaded Ports



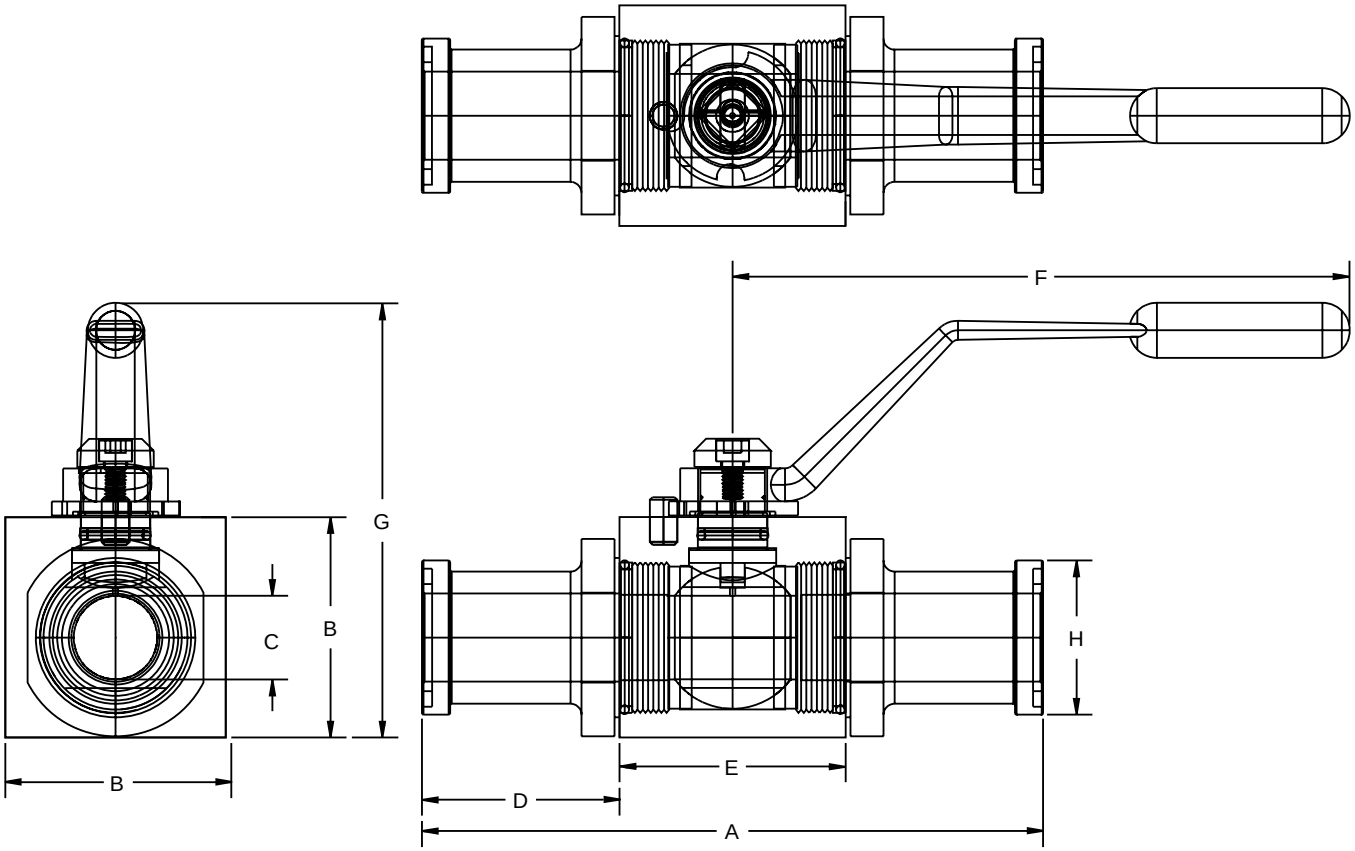
Code	Port Thread Size	Working Pressure	Dimensions mm (in) A	B	C	D	E	F	G
NPT and SAE Thread									
04	1/4"	414 Bar (6000 PSI)	69.6 (2.74)	35.1 (1.38)	7.9 (0.31)	17.5 (0.69)	35.6 (1.40)	114.3 (4.50)	74.9 (2.95)
06	3/8"	414 Bar (6000 PSI)	72.9 (2.87)	38.1 (1.50)	9.7 (0.38)	14.2 (0.56)	42.4 (1.67)	114.3 (4.50)	78.7 (3.10)
08	1/2"	414 Bar (6000 PSI)	85.1 (3.35)	41.4 (1.63)	12.7 (0.50)	19.1 (0.75)	47.5 (1.87)	114.3 (4.50)	81.3 (3.20)
12	3/4"	414 Bar (6000 PSI)	95.0 (3.74)	57.2 (2.25)	19.1 (0.75)	17.5 (0.69)	61.5 (2.42)	177.8 (7.00)	119.4 (4.70)
16	1"	414 Bar (6000 PSI)	114.0 (4.49)	63.5 (2.50)	23.9 (0.94)	23.9 (0.94)	65.8 (2.59)	177.8 (7.00)	125.7 (4.95)

SAE 4-Bolt Flange



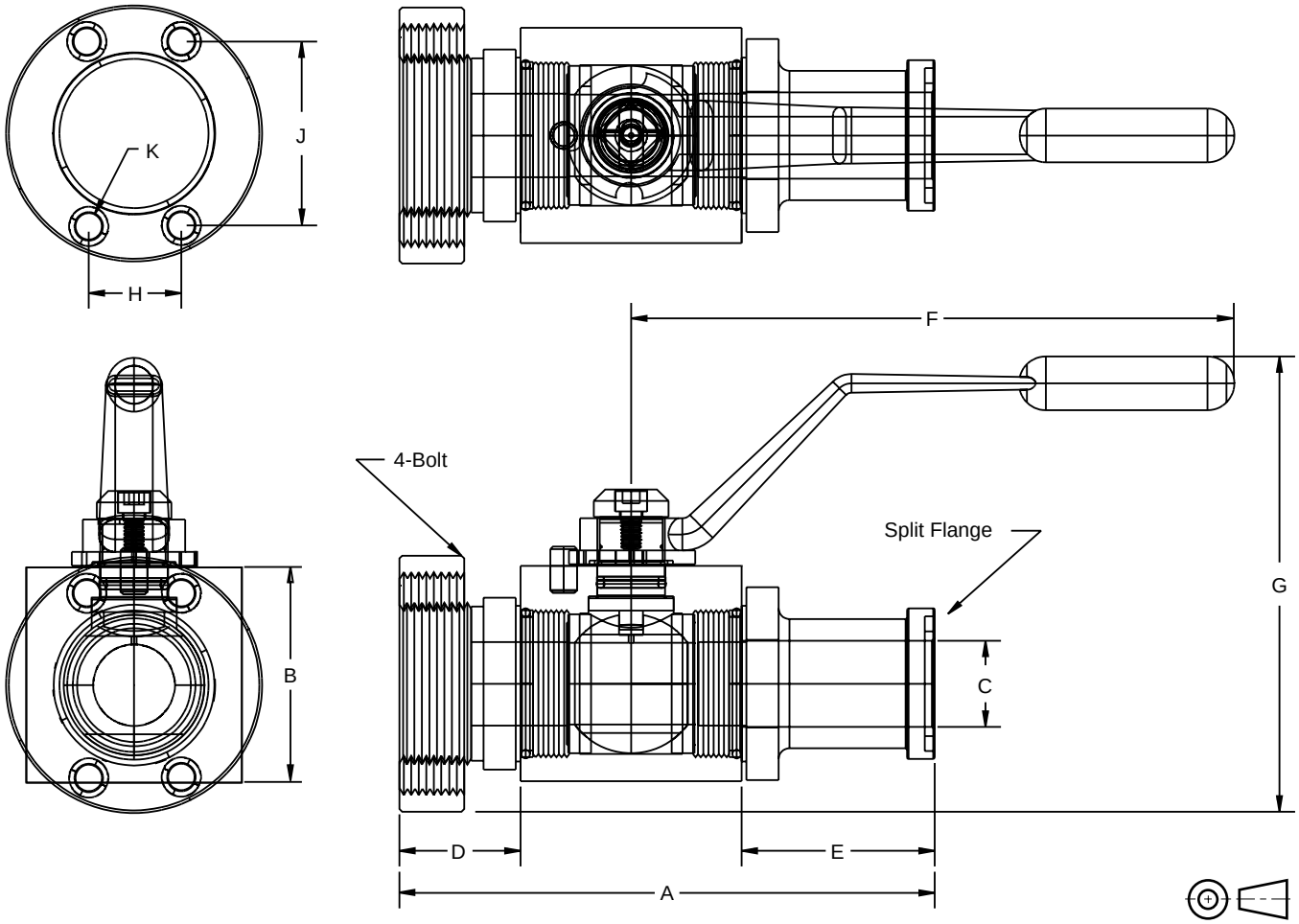
Code	Flange Size	Working Pressure	Dimensions mm (in)									
			A	B	C	D	E	F	G	H	J	K
SAE 4-Bolt C.61 Companion												
08	1/2"	207 Bar (3000 PSI)	105.7 (4.16)	41.4 (1.63)	13.0 (0.51)	29.5 (1.16)	47.0 (1.85)	114.3 (4.50)	82.0 (3.23)	17.5 (0.69)	38.1 (1.50)	5/16"-18 5/16"-18
12	3/4"	207 Bar (3000 PSI)	119.6 (4.71)	57.2 (2.25)	20.1 (0.79)	29.5 (1.16)	61.0 (2.40)	177.8 (7.00)	119.4 (4.70)	22.2 (0.88)	47.6 (1.88)	3/8"-16 3/8"-16
16	1"	207 Bar (3000 PSI)	129.8 (5.11)	63.5 (2.50)	24.9 (0.98)	32.3 (1.27)	65.3 (2.57)	177.8 (7.00)	125.7 (4.95)	26.2 (1.03)	52.6 (2.07)	3/8"-16 3/8"-16
SAE 4-Bolt C.62 Companion												
08	1/2"	414 Bar (6000 PSI)	105.7 (4.16)	41.4 (1.63)	13.0 (0.51)	29.5 (1.16)	47.0 (1.85)	114.3 (4.50)	82.0 (3.23)	18.3 (0.72)	40.4 (1.59)	5/16"-18 5/16"-18
12	3/4"	414 Bar (6000 PSI)	119.6 (4.71)	57.2 (2.25)	20.1 (0.79)	29.5 (1.16)	61.0 (2.40)	177.8 (7.00)	119.4 (4.70)	23.9 (0.94)	50.8 (2.00)	3/8"-16 3/8"-16
16	1"	414 Bar (6000 PSI)	129.8 (5.11)	63.5 (2.50)	24.9 (0.98)	32.3 (1.27)	65.3 (2.57)	177.8 (7.00)	125.7 (4.95)	27.8 (1.10)	57.1 (2.25)	7/16"-14 7/16"-14

SAE Split Flange



Code	SAE Split Flange Size	Working Pressure	Dimensions mm (in) A	B	C	D	E	F	G	H
SAE Split Flange C.61 Companion										
08	1/2"	207 Bar (3000 PSI)	151.1 (5.95)	41.4 (1.63)	13.0 (0.51)	5.21 (2.05)	47.0 (1.85)	114.3 (4.50)	82.0 (3.23)	30.2 (1.19)
12	3/4"	207 Bar (3000 PSI)	162.1 (6.38)	57.2 (2.25)	20.1 (0.79)	50.5 (1.99)	61.0 (2.40)	177.8 (7.00)	119.4 (4.70)	38.1 (1.50)
16	1"	207 Bar (3000 PSI)	177.6 (6.99)	63.5 (2.50)	24.9 (0.98)	56.1 (2.21)	65.3 (2.57)	177.8 (7.00)	125.7 (4.95)	44.4 (1.75)
SAE Split Flange 4-Bolt C.62 Companion										
08	1/2"	414 Bar (6000 PSI)	151.1 (5.95)	41.4 (1.63)	13.0 (0.51)	52.1 (2.05)	47.0 (1.85)	114.3 (4.50)	82.0 (3.23)	31.8 (1.25)
12	3/4"	414 Bar (6000 PSI)	174.2 (6.86)	57.2 (2.25)	20.1 (0.79)	56.6 (2.23)	61.0 (2.40)	177.8 (7.00)	119.4 (4.70)	41.4 (1.63)
16	1"	414 Bar (6000 PSI)	197.9 (7.79)	63.5 (2.50)	24.9 (0.98)	66.3 (2.61)	65.3 (2.57)	177.8 (7.00)	125.7 (4.95)	47.5 (1.87)

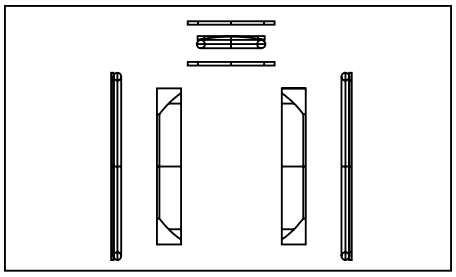
Combination SAE 4-Bolt and SAE Split Flange



Code	SAE Flange Size	Working Pressure	Dimensions mm (in)									
			A	B	C	D	E	F	G	H	J	K
SAE 4-Bolt + Split C.61 Companion												
08	1/2"	207 Bar (3000 PSI)	128.5 (5.06)	41.4 (1.63)	13.0 (0.51)	29.5 (1.16)	52.1 (2.05)	114.3 (4.50)	82.0 (3.23)	17.5 (0.69)	38.1 (1.50)	5/16"-18 5/16"-18
12	3/4"	207 Bar (3000 PSI)	141.0 (5.55)	57.2 (2.25)	20.1 (0.79)	29.5 (1.16)	50.6 (1.99)	177.8 (7.00)	119.4 (4.70)	22.2 (0.88)	47.6 (1.88)	3/8"-16 3/8"-16
16	1"	207 Bar (3000 PSI)	153.7 (6.05)	63.5 (2.50)	24.9 (0.98)	32.3 (1.27)	56.1 (2.21)	177.8 (7.00)	125.7 (4.95)	26.2 (1.03)	52.6 (2.07)	3/8"-16 3/8"-16
SAE 4-Bolt + Split C.62 Companion												
08	1/2"	414 Bar (6000 PSI)	128.5 (5.06)	41.4 (1.63)	13.0 (0.51)	29.5 (1.16)	52.1 (2.05)	114.3 (4.50)	82.0 (3.23)	18.3 (0.72)	40.4 (1.59)	5/16"-18 5/16"-18
12	3/4"	414 Bar (6000 PSI)	147.1 (5.79)	57.2 (2.25)	20.1 (0.79)	29.5 (1.16)	56.6 (2.23)	177.8 (7.00)	119.4 (4.70)	23.9 (0.94)	50.8 (2.00)	3/8"-16 3/8"-16
16	1"	414 Bar (6000 PSI)	163.8 (6.45)	63.5 (2.50)	24.9 (0.98)	32.3 (1.27)	66.3 (2.61)	177.8 (7.00)	125.7 (4.95)	27.8 (1.10)	57.1 (2.25)	7/16"-14 7/16"-14

Parker Ball Valve Seal Kits restore a ball valve to factory specifications, providing no erosion or metal-to-metal wear has taken place.

The Seal Kit includes all the o-rings, ball seals and thrust bearings that were originally installed at the factory. A sketch of these parts for most 2-way valves is provided at the right.



Ordering Information

SK Accessory | **BVHP** Series | Size | Port | Body Material | Ball & Stem Material | Ball Seals | Stem Seals | Design Series

NOTE: Not required when ordering.

Code	Type
SK	Seal Kit

Code	Size
04	1/4"
06	3/8"
08	1/2"
12	3/4"
16	1"

Code	Type
N	NPT Thread
S	SAE Thread
B	BSPP Thread
U	ISO 6149 Thread
†C	C.61 4-Bolt Flange
†E	C.61 Split Flange
F	C.62 Split Flange
†G	C.61 Combo 4B + Split
H	C.62 Combo 4B + Split

† C.61 Flanges rated to 207 Bar (3000 PSI) with Delrin or Peek seals

Code	Type
S	Steel
K	Stainless Steel

Code	Type
S	Steel
K	Stainless Steel

Code	Type
1	Delrin
2 *	PTFE
4	Peek

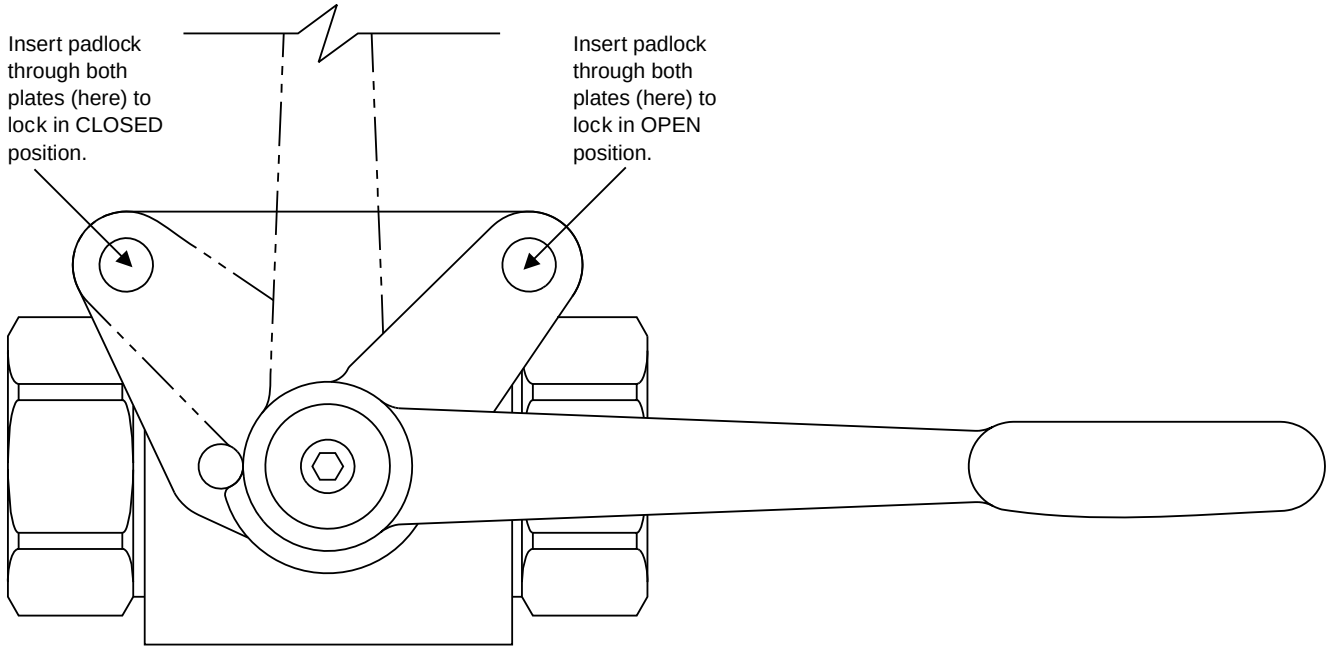
* Valve pressure rating reduced. Consult factory.

Code	Type
N	Nitrile
V	Fluorocarbon
E	EPR

Replacement Handles Standard Steel Offset

Series	Part Number
BVHP04	BVH-HS1
BVHP06	BVH-HS1
BVHP08	BVH-HS1
BVHP12	BVH-HS2
BVHP16	BVH-HS2

BVHPLK: Standard Series 'BVHPLK-*' kit replaces the stopwasher with a stationary and moving plate, as illustrated below. As the handle is actuated, the moving plate aligns with one of the two locking positions in the stationary plate, enabling the valve to be locked in either **fully closed** or **fully open** position.

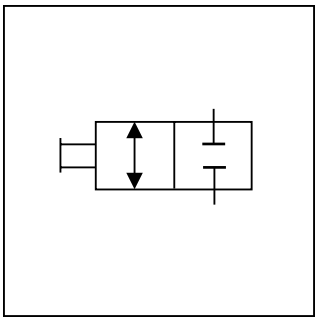


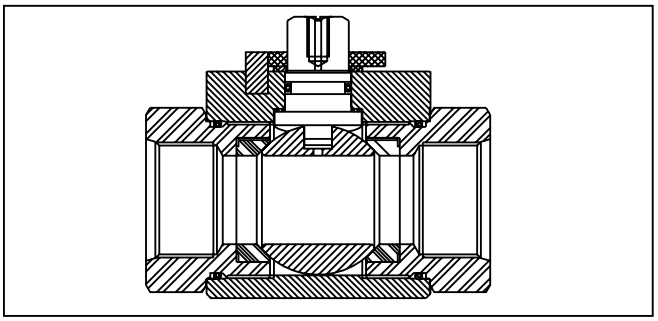
Ordering Information

BVHP		Standard Locking (Part Number)
Code	Size	
04	1/4"	BVHPLK-1
06	3/8"	BVHPLK-1
08	1/2"	BVHPLK-1
12	3/4"	BVHPLK-2
16	1"	BVHPLK-2

General Description

Series BVAH are 414 Bar (6000 PSI) ball valves with ports from 1¼" to 2". Series BVAH are 2-way shut-off valves to use in those applications with large ports. A variety of porting options are available including threaded, SAE 4-bolt flange, split flange and a combination of the two.





Operation

Parker's 2-way ball valves operate to either off or full flow by rotating the handle 90°. Ball valves are not designed to be a metering or flow control device.

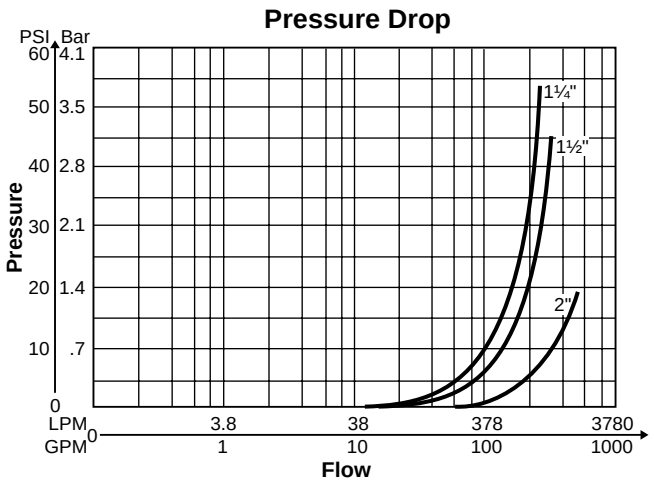
Specifications

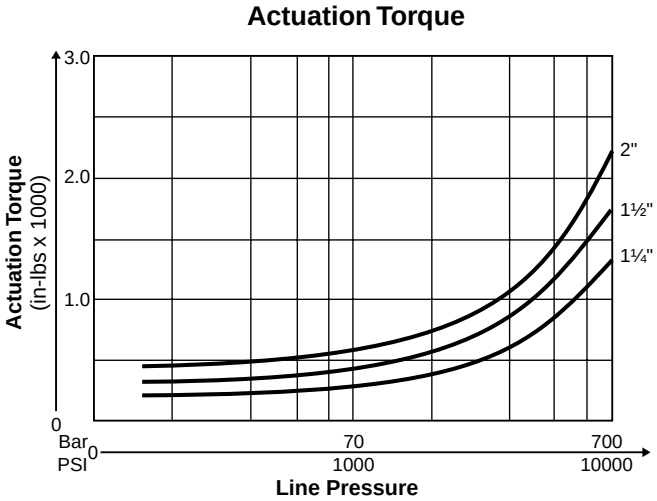
Maximum Pressure	414 Bar (6000 PSI)
Body Material	Carbon Steel, Black Oxide, Stainless Steel
Ball Material	Steel, Chrome Plated, Stainless Steel
Stem Material	Steel, Zinc Plated, Stainless Steel
Standard Handle	Steel Offset, Nickel Plated
Ball Seals	Delrin + MoS_2
Spindle Seals	O-ring & Backup, Nitrile
Operating Temperature	-30°C to +100°C (-22°F to +212°F)

Features

- Thrust bearings and synthetic lubrication in the spindle results in one of the lowest torque requirements in the industry.
- A wide variety of porting options and mounting options make the BVAH suitable for all mounting applications.
- Delrin seals with molybdenum disulphide (MoS_2) results in lower actuation torque and will increase high duty life cycle expectancy.
- The variety of spindle and ball sealing options makes the BVAH suitable for most media applications.
- Limit switch is NEMA 4 with CSA/UL approval.

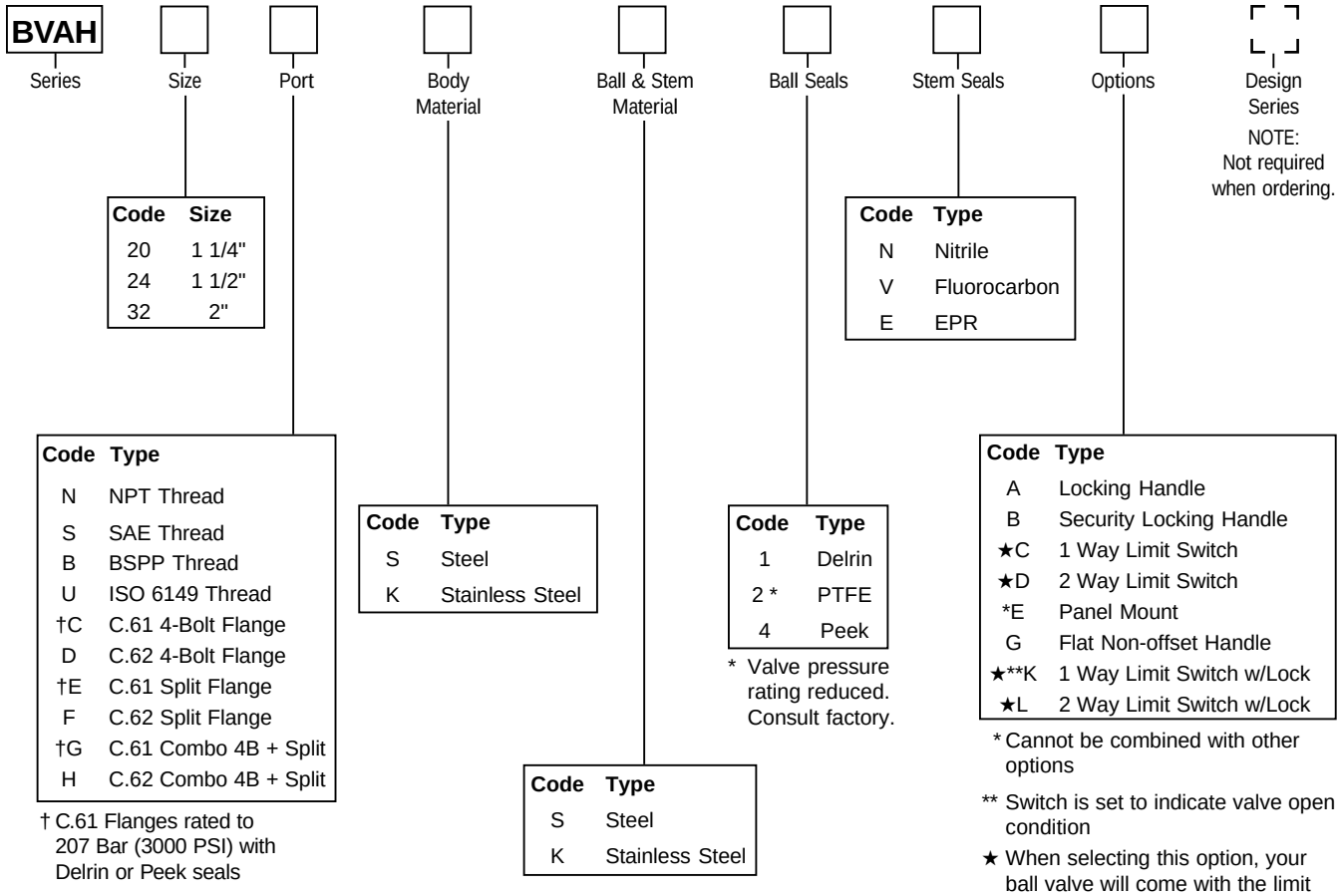
Performance Curves





3300-2.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA



ISO 6149-1 Port Dimensions (inches)

Size	Thread
04	M12 x 1.5
06	M16 x 1.5
08	M18 x 1.5
12	M27 x 2
16	M33 x 2
20	M42 x 2
24	M48 x 2
32	M60 x 2
40	M76 x 2
48	M90 x 2
64	M114 x 2

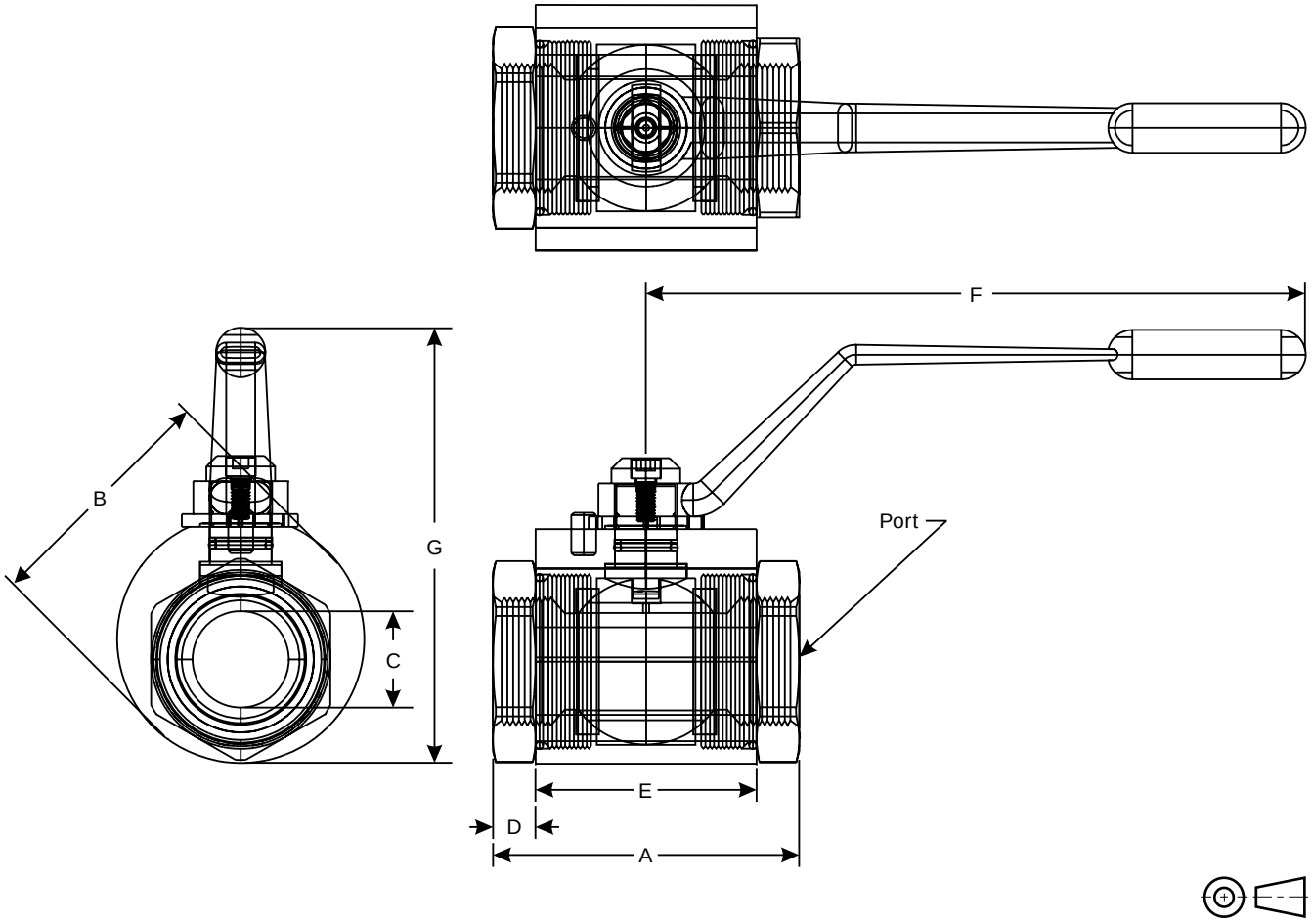
Replacement Handles Standard Steel Offset

Series	Part Number
BVAH20	BVH-HS3
BVAH24	BVH-HS3
BVAH32	BVH-HS3

Weights

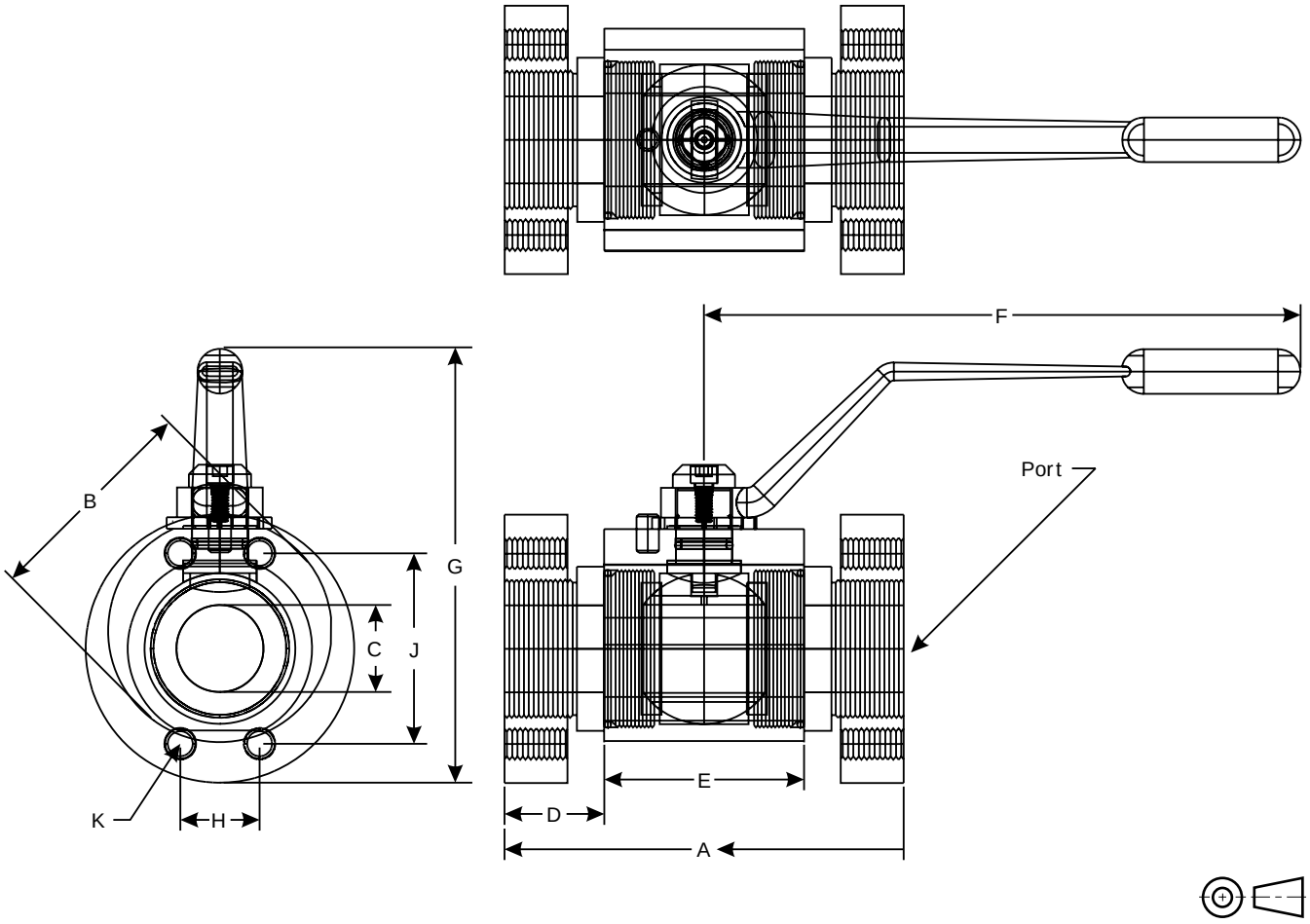
Code	Threaded kg (lbs.)	C. 61 kg (lbs.)	C. 62 kg (lbs.)
20	3.2 (7.0)	5.0 (11.0)	5.2 (12.9)
24	4.5 (10.0)	7.0 (15.5)	7.3 (16.5)
32	10.5 (23.0)	10.4 (26.2)	7.0 (15.5)

Threaded Ports



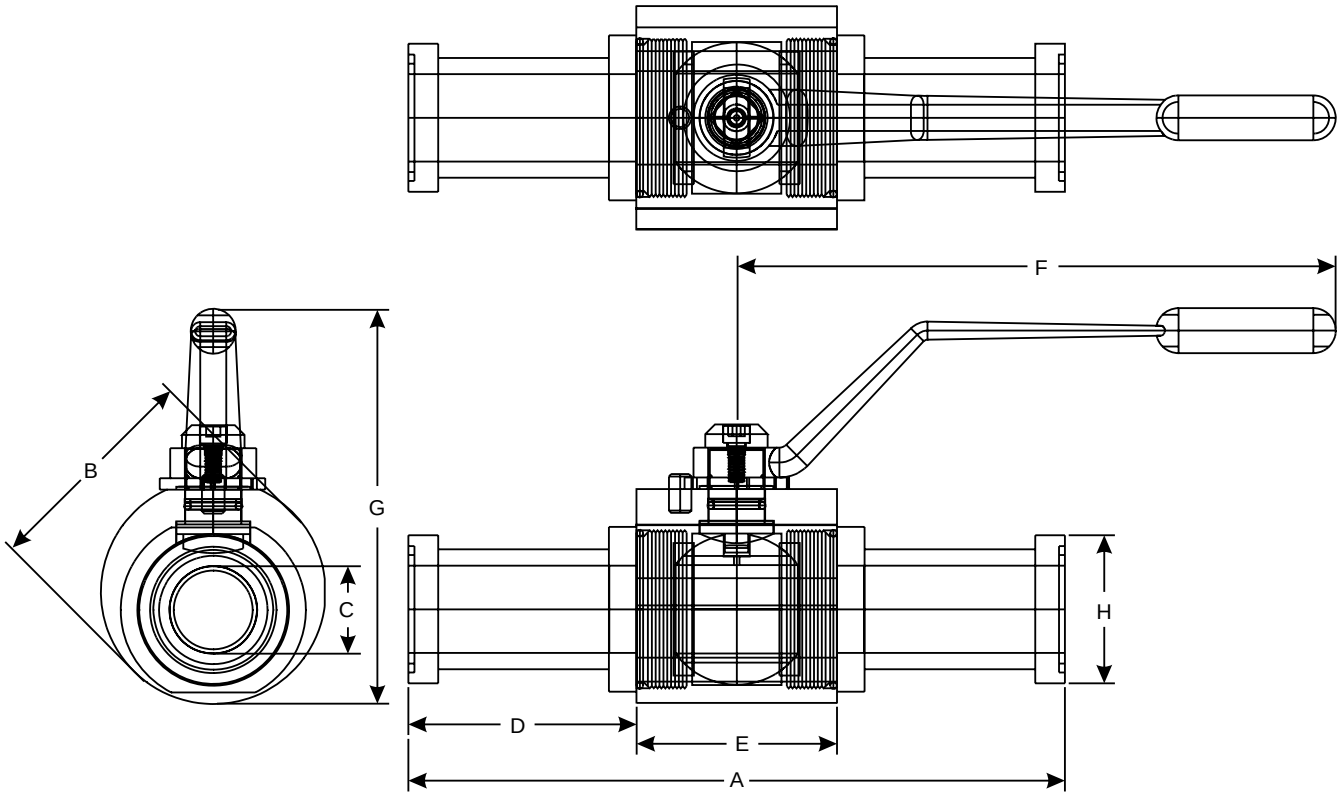
Code	Port Thread Size	Working Pressure	Dimensions mm (in) A	B	C	D	E	F	G
NPT Thread and BSPP Thread									
20	1 1/4"	414 Bar (6000 PSI)	122.9 (4.84)	82.6 (3.25)	32.0 (1.26)	21.6 (0.85)	80.0 (3.15)	254.0 (10.00)	160.3 (6.31)
24	1 1/2"	414 Bar (6000 PSI)	135.4 (5.33)	95.3 (3.75)	38.1 (1.50)	25.1 (0.99)	85.1 (3.35)	254.0 (10.00)	171.7 (6.76)
32	2"	414 Bar (6000 PSI)	166.1 (6.54)	114.3 (4.50)	48.0 (1.89)	33.0 (1.30)	100.1 (3.94)	254.0 (10.00)	188.5 (7.42)
SAE Thread									
20	1 1/4"	414 Bar (6000 PSI)	122.9 (4.84)	88.9 (3.50)	32.0 (1.26)	21.6 (0.85)	80.0 (3.15)	254.0 (10.00)	160.3 (6.31)
24	1 1/2"	414 Bar (6000 PSI)	135.4 (5.33)	95.3 (3.75)	38.1 (1.50)	25.1 (0.99)	85.1 (3.35)	254.0 (10.00)	171.7 (6.76)
32	2"	414 Bar (6000 PSI)	166.1 (6.54)	114.3 (4.50)	48.0 (1.89)	33.0 (1.30)	100.1 (3.94)	254.0 (10.00)	188.5 (7.42)

SAE 4-Bolt Flange



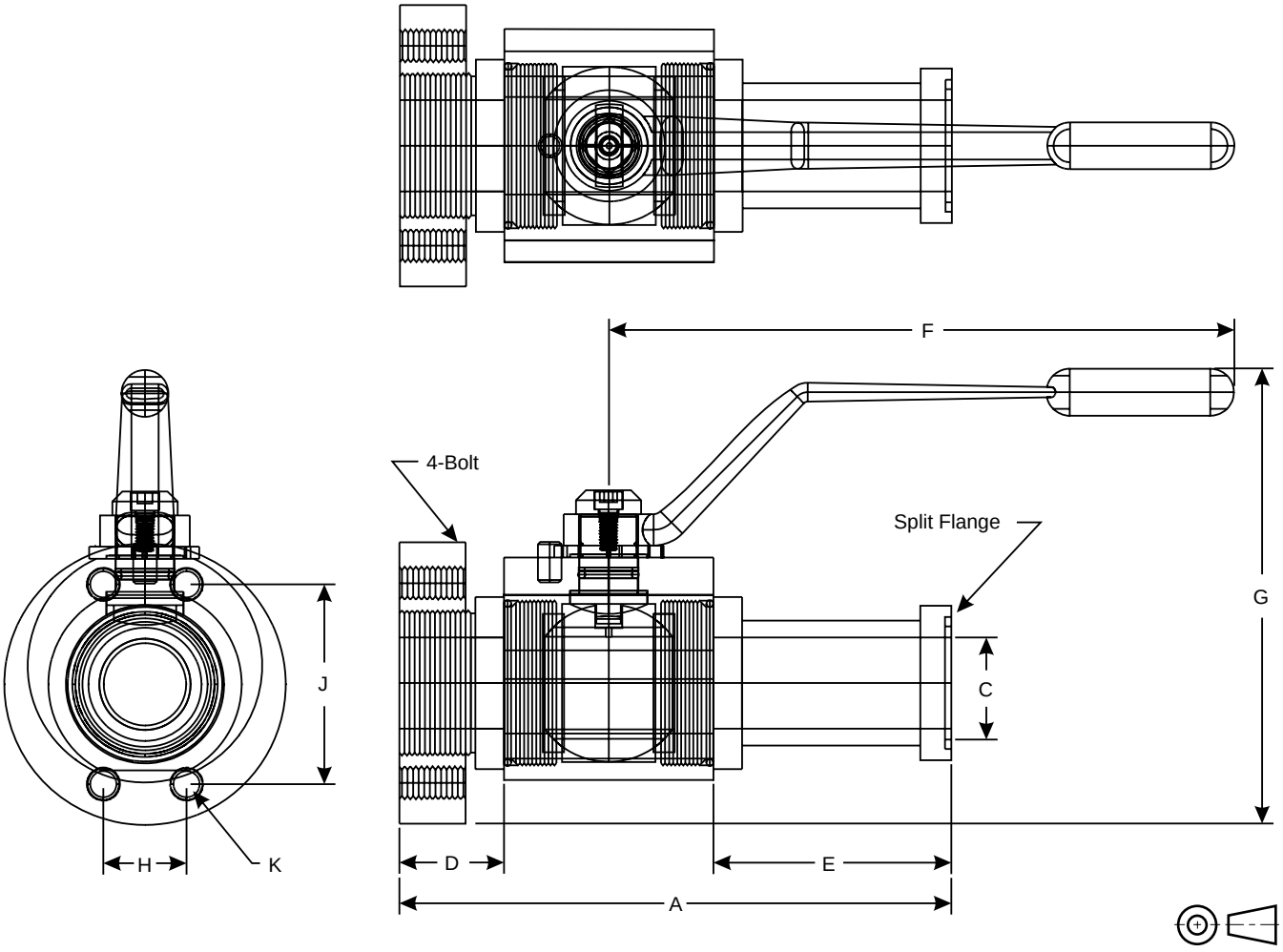
Code	SAE 4-B Flange Size	Working Pressure	Dimensions mm (in) A	B	C	D	E	F	G	H	J	K
SAE 4-Bolt C.61 Companion												
20	1 1/4"	207 Bar (3000 PSI)	175.3 (6.90)	82.6 (3.25)	32.0 (1.26)	47.8 (1.88)	80.0 (3.15)	254.0 (10.00)	160.3 (6.31)	30.2 (1.19)	58.7 (2.31)	7/16''-14 7/16''-14
24	1 1/2"	207 Bar (3000 PSI)	180.3 (7.10)	95.3 (3.75)	38.1 (1.50)	47.8 (1.88)	85.1 (3.35)	254.0 (10.00)	171.7 (6.76)	35.7 (1.41)	69.8 (2.75)	1/2''-13 1/2''-13
32	2"	207 Bar (3000 PSI)	204.7 (8.06)	114.3 (4.50)	48.0 (1.89)	52.3 (2.06)	100.1 (3.94)	254.0 (10.00)	188.5 (7.42)	42.9 (1.69)	77.9 (3.06)	1/2''-13 1/2''-13
SAE 4-Bolt C.62 Companion												
20	1 1/4"	414 Bar (6000 PSI)	175.3 (6.90)	82.6 (3.25)	32.0 (1.26)	47.8 (1.88)	80.0 (3.15)	254.0 (10.00)	160.3 (6.31)	31.8 (1.25)	66.7 (2.63)	1/2''-13 1/2''-13
24	1 1/2"	414 Bar (6000 PSI)	180.3 (7.10)	95.3 (3.75)	38.1 (1.50)	47.8 (1.88)	85.1 (3.35)	254.0 (10.00)	171.7 (6.76)	36.4 (1.44)	79.4 (3.13)	5/8''-11 5/8''-11
32	2"	414 Bar (6000 PSI)	204.7 (8.06)	114.3 (4.50)	48.0 (1.89)	52.3 (2.06)	100.1 (3.94)	254.0 (10.00)	188.5 (7.42)	44.4 (1.75)	96.8 (3.81)	3/4''-10 3/4''-10

SAE Split Flange



Code	Split Flange Size	Working Pressure	Dimensions mm (in) A	B	C	D	E	F	G	H
SAE Split Flange C.61 Companion										
20	1 1/4"	207 Bar (3000 PSI)	190.8 (7.51)	82.6 (3.25)	32.0 (1.26)	55.4 (2.18)	80.0 (3.15)	254.0 (10.00)	160.3 (6.31)	50.8 (2.00)
24	1 1/2"	207 Bar (3000 PSI)	230.9 (9.09)	95.3 (3.75)	38.1 (1.50)	72.9 (2.87)	85.1 (3.35)	254.0 (10.00)	171.7 (6.76)	60.2 (2.37)
32	2"	207 Bar (3000 PSI)	231.7 (9.12)	114.3 (4.50)	48.0 (1.89)	65.8 (2.59)	100.1 (3.94)	254.0 (10.00)	188.5 (7.42)	71.4 (2.81)
SAE Split Flange C.62 Companion										
20	1 1/4"	414 Bar (6000 PSI)	222.8 (8.77)	82.6 (3.25)	32.0 (1.26)	71.4 (2.81)	80.0 (3.15)	254.0 (10.00)	160.3 (6.31)	54.1 (2.13)
24	1 1/2"	414 Bar (6000 PSI)	281.2 (11.07)	95.3 (3.75)	38.1 (1.50)	98.0 (3.86)	85.1 (3.35)	254.0 (10.00)	171.7 (6.76)	63.5 (2.50)
32	2"	414 Bar (6000 PSI)	316.0 (12.44)	114.3 (4.50)	48.0 (1.89)	108.0 (4.25)	100.1 (3.94)	254.0 (10.00)	188.5 (7.42)	79.5 (3.13)

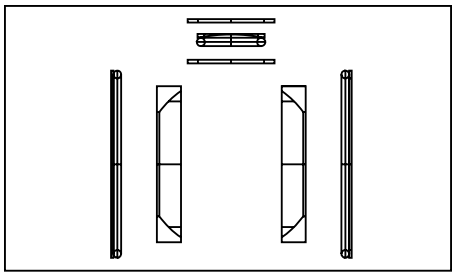
Combination SAE 4-Bolt and SAE Split Flange



Code	SAE Flange Size	Working Pressure	Dimensions mm (in) A	B	C	D	E	F	G	H	J	K
SAE 4-Bolt + Split, C.61 Companion												
20	1 1/4"	207 Bar (3000 PSI)	183.9 (7.24)	82.6 (3.25)	32.0 (1.26)	47.8 (1.88)	55.4 (2.18)	254.0 (10.00)	160.3 (6.31)	30.2 (1.19)	58.7 (2.31)	7/16''-14 7/16''-14
24	1 1/2"	207 Bar (3000 PSI)	205.5 (8.09)	95.3 (3.75)	38.1 (1.50)	47.8 (1.88)	72.9 (2.87)	254.0 (10.00)	171.7 (6.76)	35.7 (1.41)	69.8 (2.75)	1/2''-13 1/2''-13
32	2"	207 Bar (3000 PSI)	218.2 (8.59)	114.3 (4.50)	48.0 (1.89)	52.3 (2.06)	68.3 (2.69)	254.0 (10.00)	188.5 (7.42)	42.9 (1.69)	78.0 (3.07)	1/2''-13 1/2''-13
SAE 4-Bolt + Split, C.62 Companion												
20	1 1/4"	414 Bar (6000 PSI)	198.9 (7.83)	82.6 (3.25)	32.0 (1.26)	47.8 (1.88)	71.4 (2.81)	254.0 (10.00)	160.3 (6.31)	31.8 (1.25)	66.7 (2.63)	1/2''-13 1/2''-13
24	1 1/2"	414 Bar (6000 PSI)	230.6 (9.08)	95.3 (3.75)	38.1 (1.50)	47.8 (1.88)	98.0 (3.86)	254.0 (10.00)	171.7 (6.76)	36.4 (1.44)	79.4 (3.13)	5/8''-11 5/8''-11
32	2"	414 Bar (6000 PSI)	260.4 (10.25)	114.3 (4.50)	48.0 (1.89)	52.3 (2.06)	108.0 (4.25)	254.0 (10.00)	188.5 (7.42)	44.4 (1.75)	96.8 (3.81)	3/4''-10 3/4''-10

Ball Valve Seal Kits restore a ball valve to factory specifications, providing no erosion or metal-to-metal wear has taken place.

The Seal Kit includes all the o-rings, ball seals and thrust bearings that were originally installed at the factory.



Ordering Information

SK Accessory | **BVAH** Series | Size | Port | Body Material | Ball & Stem Material | Ball Seals | Stem Seals | Design Series

NOTE: Not required when ordering.

Code	Type
SK	Seal Kit

Code	Size
20	1 1/4"
24	1 1/2"
32	2"

Code	Type
N	NPT Thread
S	SAE Thread
B	BSPP Thread
U	ISO 6149 Thread
†C	C.61 4-Bolt Flange
D	C.62 4-Bolt Flange
†E	C.61 Split Flange
F	C.62 Split Flange
†G	C.61 Combo 4B + Split
H	C.62 Combo 4B + Split

† C.61 Flanges rated to 207 Bar (3000 PSI) with Delrin or Peek seals

Code	Type
S	Steel
K	Stainless Steel

Code	Type
S	Steel
K	Stainless Steel

Code	Type
1	Delrin
2 *	PTFE
4	Peek

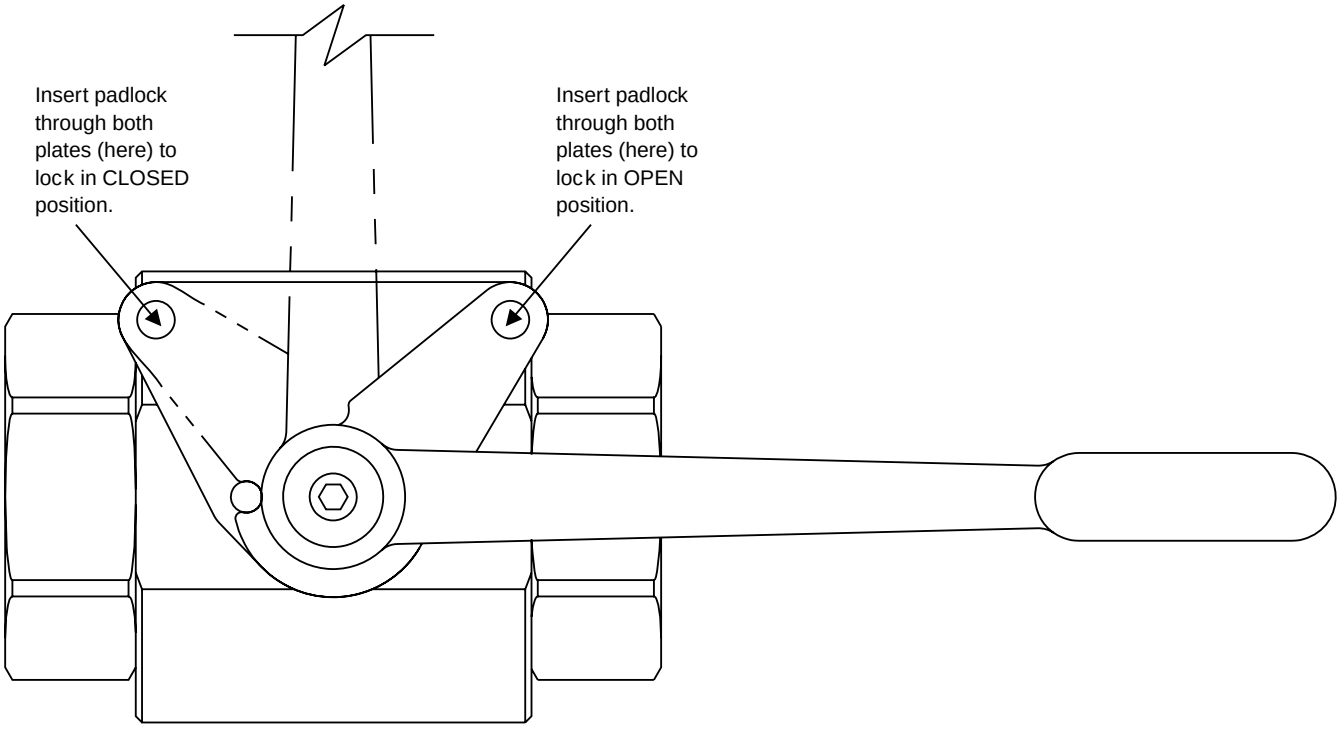
* Valve pressure rating reduced. Consult factory.

Code	Type
N	Nitrile
V	Fluorocarbon
E	EPR

Replacement Handles Standard Steel Offset

Series	Part Number
BVAH20	BVH-HS3
BVAH24	BVH-HS3
BVAH32	BVH-HS3

BVHPLK: Standard Series 'BVHPLK-*' kit replaces the stopwasher with a stationary and moving plate, as illustrated below. As the handle is actuated, the moving plate aligns with one of the two locking positions in the stationary plate, enabling the valve to be locked in either **fully closed** or **fully open** position.

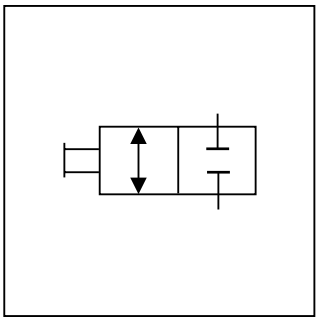


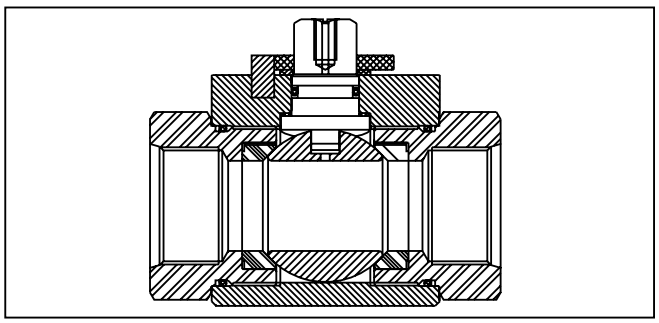
Ordering Information

BVAH Code	Size	Standard Locking (Part Number)
20	1 1/4"	BVHPLK-3
24	1 1/2"	BVHPLK-3
32	2"	BVHPLK-3

General Description

Series BVHH valves are used for shut-off applications and are rated at 690 Bar or 10,000 PSI. These valves represent the strongest ball valve in the industry. Series BVHH valves come in ports 1/2" to 2" and SAE, NPT and BSPP ports.





Operation

Parker's 2-way ball valves operate to either off or full flow by rotating the handle 90°. Ball valves are not designed to be a metering or flow control device.

Specifications

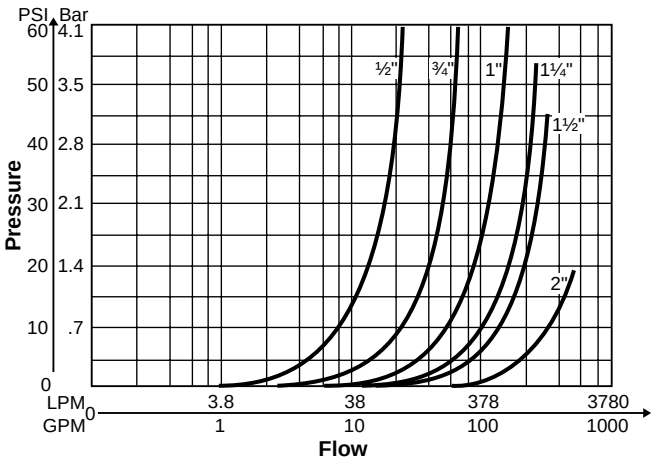
Maximum Pressure	690 Bar (10,000 PSI)
Body Material	Carbon Steel, Black Oxide
Ball Material	Steel, Chrome Plated, Stainless Steel
Stem Material	Steel, Zinc Plated, Stainless Steel
Standard Handle	Steel Offset, Nickel Plated
Ball Seals	Delrin + MoS_2
Spindle Seals	O-ring & Backup, Nitrile
Operating Temperature	-30°C to +100°C (-22°F to +212°F)

Features

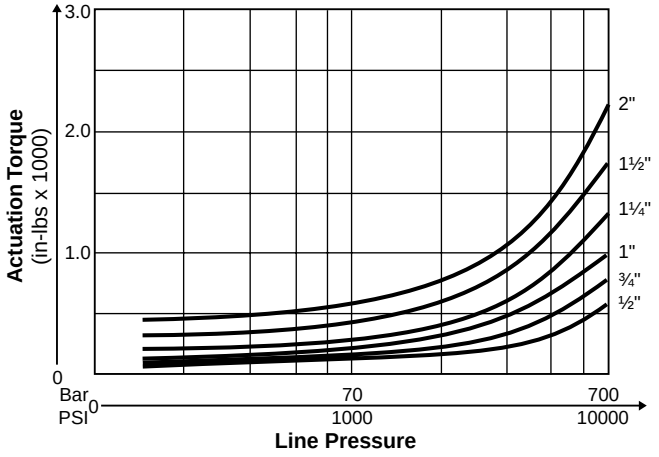
- Encased Delrin moly ball seals increase the reliability compared to ring reinforcement designs.
- The BVHH is fully ported resulting in very low pressure drop.
- Nitrile seals are standard with fluorocarbon and EPR as options.
- The BVHH is available with options found in the 404 Bar (6000 PSI) models.

Performance Curves

Pressure Drop



Actuation Torque



3300-2.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

BVHH — Series

□ — Size

Code	Size
08	1/2"
12	3/4"
16	1"
20	1 1/4"
24	1 1/2"
32	2"

Weights

Code	kg (lbs.)
08	1.7 (3.8)
12	2.9 (6.3)
16	4.8 (10.5)
20	6.8 (15.0)
24	9.7 (21.4)
32	14.8 (32.6)

□ — Port

Code	Type
N	NPT
S	SAE
B	BSPP

S — Body Material

Code	Type
S	Steel

□ — Ball & Stem Material

Code	Type
S	Steel
K	Stainless Steel

□ — Ball Seals

Code	Type
1	Delrin
4	Peek

□ — Stem Seals

Code	Type
N	Nitrile
V	Fluorocarbon
E	EPR

□ — Options

Code	Type
A	Locking Handle
B	Security Locking Handle
★C	1 Way Limit Switch
★D	2 Way Limit Switch
*E	Panel Mount
G	Flat Non-offset Handle
★**K	1 Way Limit Switch w/Lock
★L	2 Way Limit Switch w/Lock

* Cannot be combined with other options

** Switch is set to indicate valve open condition

★ When selecting this option, your ball valve will come with the limit switch bracket, but does not include the switch. The switch is sold separately (Part #LSB)

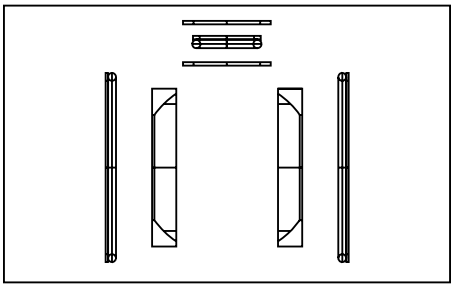
⌐ ¬ | L ⌙ — Design Series

NOTE: Not required when ordering.

Seal Kit Accessories

Ball Valve Seal Kits restore a ball valve to factory specifications, providing no erosion or metal-to-metal wear has taken place.

The Seal Kit includes all the o-rings, ball seals and thrust bearings that were originally installed at the factory. A sketch of these parts is provided at the right.



Ordering Information

SK — Accessory

Code	Type
SK	Seal Kit

BVHH — Series

□ — Size

Code	Size
08	1/2"
12	3/4"
16	1"
20	1 1/4"
24	1 1/2"
32	2"

□ — Port

Code	Type
N	NPT
S	SAE
B	BSPP

S — Body Material

Code	Type
S	Steel

□ — Ball & Stem Material

Code	Type
S	Steel
K	Stainless Steel

□ — Ball Seals

Code	Type
1	Delrin
4	Peek

□ — Stem Seals

Code	Type
N	Nitrile
V	Fluorocarbon
E	EPR

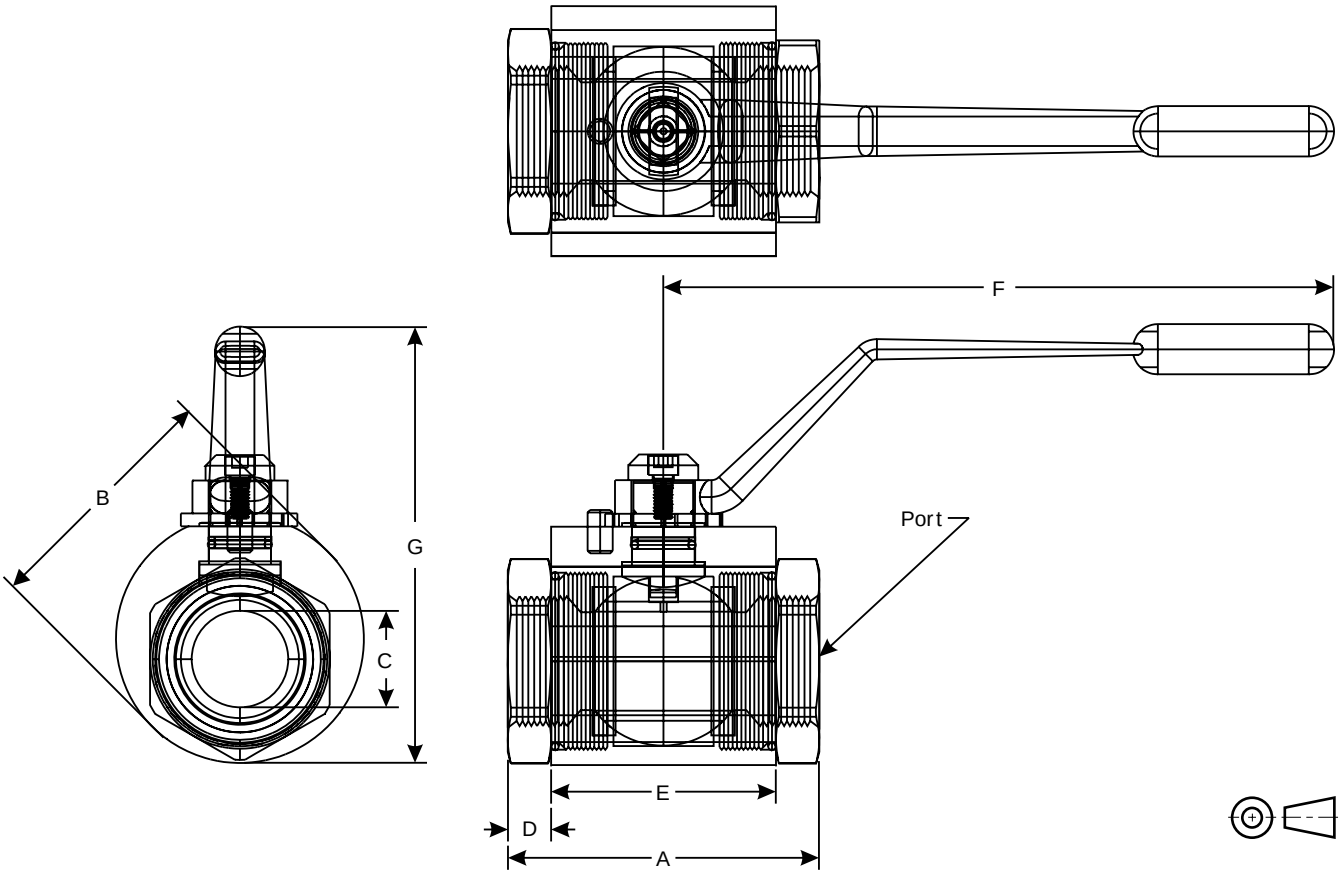
⌐ ¬ | L ⌙ — Design Series

NOTE: Not required when ordering.

3300-2.p65, dd

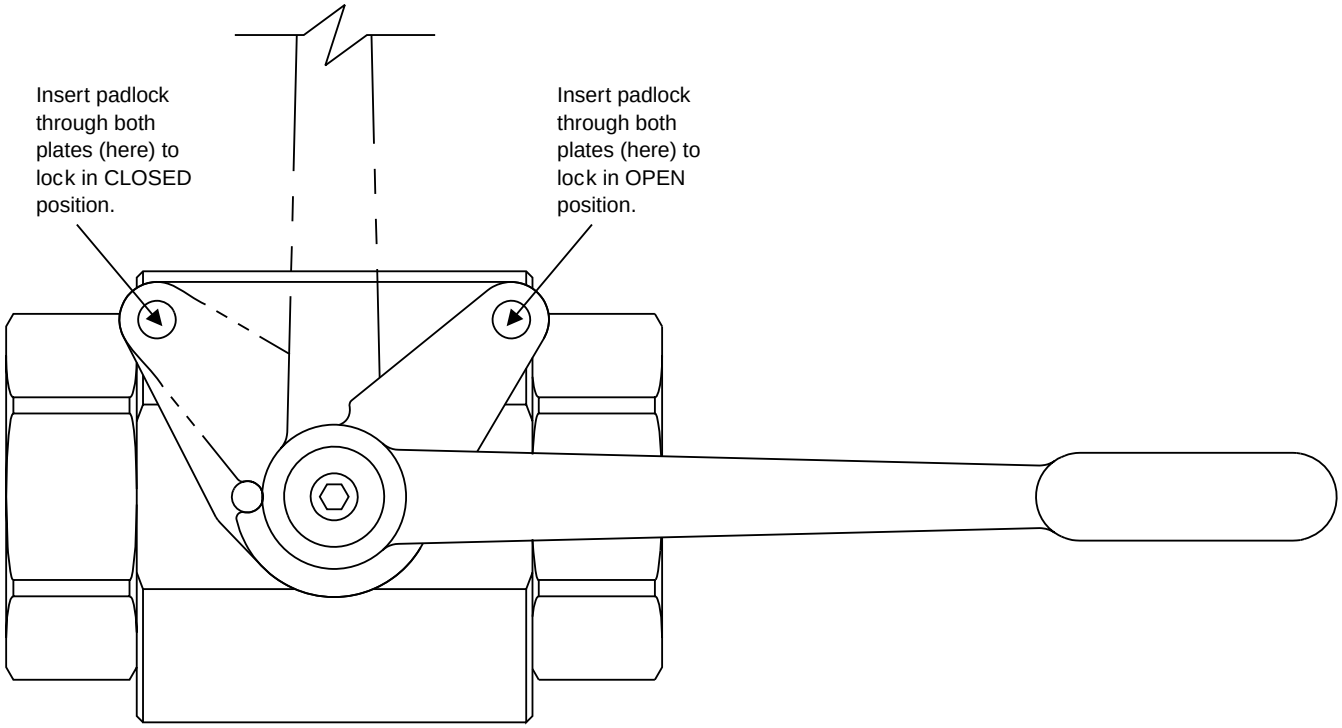
Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

Threaded Ports



Code	Port Thread Size	Working Pressure	Dimensions mm (in)						
			A	B	C	D	E	F	G
NPT and SAE									
08	1/2"	690 Bar (10,000 PSI)	107.9 (4.25)	50.8 (2.00)	11.9 (0.47)	22.9 (0.90)	63.5 (2.50)	114.3 (4.50)	72.4 (2.85)
12	3/4"	690 Bar (10,000 PSI)	114.3 (4.50)	63.5 (2.50)	18.5 (0.73)	22.9 (0.90)	70.1 (2.76)	155.7 (6.13)	91.4 (3.60)
16	1"	690 Bar (10,000 PSI)	133.3 (5.25)	76.2 (3.00)	24.4 (0.96)	27.9 (1.10)	77.5 (3.05)	155.7 (6.13)	107.9 (4.25)
20	1 1/4"	690 Bar (10,000 PSI)	139.7 (5.50)	88.9 (3.50)	30.7 (1.21)	30.5 (1.20)	78.7 (3.10)	210.8 (8.30)	124.5 (4.90)
24	1 1/2"	690 Bar (10,000 PSI)	152.4 (6.00)	101.6 (4.00)	36.1 (1.42)	34.3 (1.35)	83.8 (3.30)	210.8 (8.30)	139.7 (5.50)
32	2"	690 Bar (10,000 PSI)	165.1 (6.50)	120.6 (4.75)	48.5 (1.91)	38.1 (1.50)	88.9 (3.50)	210.8 (8.30)	167.6 (6.60)

BVHPLK: Standard Series 'BVHPLK-*' kit replaces the stopwasher with a stationary and moving plate, as illustrated below. As the handle is actuated, the moving plate aligns with one of the two locking positions in the stationary plate, enabling the valve to be locked in either **fully closed** or **fully open** position.

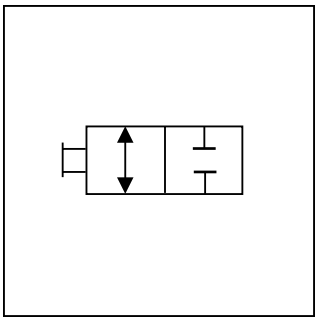


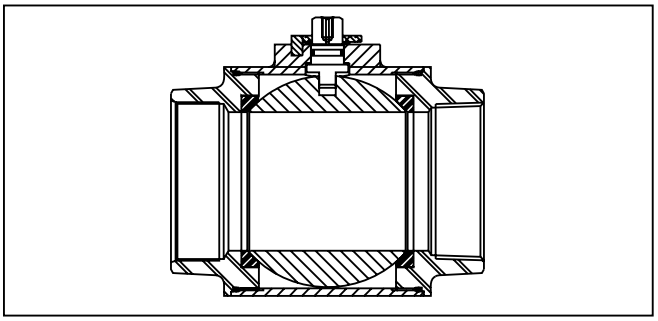
Ordering Information

BVHH Code	Size	Standard Locking (Part Number)
08	1/2"	BVHPLK-1
12	3/4"	BVHPLK-2
16	1"	BVHPLK-2
20	1 1/4"	BVHPLK-3
24	1 1/2"	BVHPLK-3
32	2"	BVHPLK-3

General Description

Series BVAM are 2-way ball valves rated at 138 Bar (2000 PSI). This product provides a cost effective solution where 414 Bar (6000 PSI) is not required. Many features found on the 414 Bar (6000 PSI) unit are incorporated in this cost effective product.





Operation

Parker's 2-way ball valves operate to either off or full flow by rotating the handle 90°. Ball valves are not designed to be a metering or flow control device.

Specifications

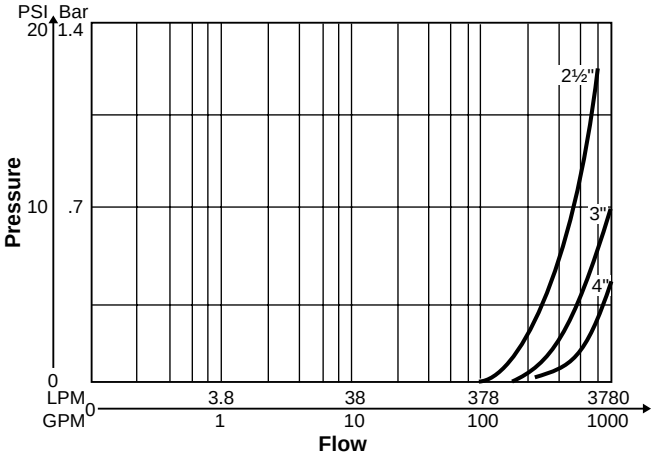
Maximum Pressure	138 Bar (2000 PSI)
Body Material	Carbon Steel, Black Oxide
Ball Material	Steel, Chrome Plated
Stem Material	Steel, Zinc Plated
Standard Handle	Steel Offset, Nickel Plated
Ball Seals	Delrin + MoS_2
Spindle Seals	O-ring & Backup, Nitrile
Operating Temperature	-30°C to +100°C (-22°F to +212°F)

Features

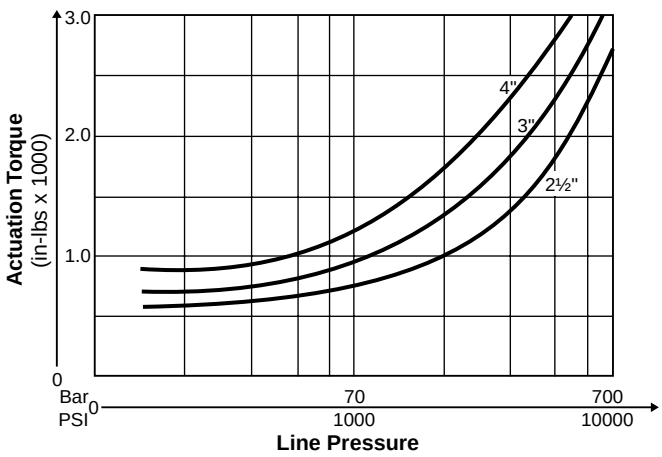
- A full range of threaded porting options allows mounting in most applications.
- The use of MoS_2 mounted ball seals and synthetic lubricant creates a low actuation torque and ensures long life.
- The wide range of spindle and ball sealing materials allows use in most known fluid applications.

Performance Curves

Pressure Drop



Actuation Torque



BVAM — Series

□ — Size

Code	Size
40	2 1/2"
48	3"
64	4"

□ — Port

Code	Type
N	NPT Thread
S	SAE Thread
B	BSPP Thread

S — Body Material

Code	Type
S	Steel

S — Ball & Stem Material

Code	Type
S	Steel

1 — Ball Seals

Code	Type
1	Delrin

□ — Stem Seals

Code	Type
N	Nitrile
V	Fluorocarbon
E	EPR

□ — Options

Code	Type
A	Locking Handle
B	Security Locking Handle
★C	1 Way Limit Switch
★D	2 Way Limit Switch
*E	Panel Mount
G	Flat Non-offset Handle
★**K	1 Way Limit Switch w/Lock
★L	2 Way Limit Switch w/Lock

* Cannot be combined with other options

** Switch is set to indicate valve open condition

★ When selecting this option, your ball valve will come with the limit switch bracket, but does not include the limit switch. The switch is sold separately (Part #LSB)

[ ] — Design Series

NOTE: Not required when ordering.

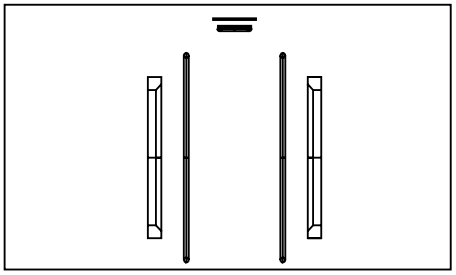
Weights

Code	kg (lbs.)
40	12.3 (27.0)
48	16.9 (37.2)
64	24.8 (54.5)

Seal Kit Accessories

Ball Valve Seal Kits restore a ball valve to factory specifications, providing no erosion or metal-to-metal wear has taken place.

The Seal Kit includes all the o-rings, ball seals and thrust bearings that were originally installed at the factory.



Seal Kit Ordering Information

SK — Accessory

Code	Type
SK	Seal Kit

BVAM — Series

□ — Size

Code	Size
40	2 1/2"
48	3"
64	4"

□ — Port

Code	Type
N	NPT Thread
S	SAE Thread
B	BSPP Thread

S — Body Material

Code	Type
S	Steel

S — Ball & Stem Material

Code	Type
S	Steel

1 — Ball Seals

Code	Type
1	Delrin

□ — Stem Seals

Code	Type
N	Nitrile
V	Fluorocarbon
E	EPR

[ ] — Design Series

NOTE: Not required when ordering.

3300-2.p65, dd

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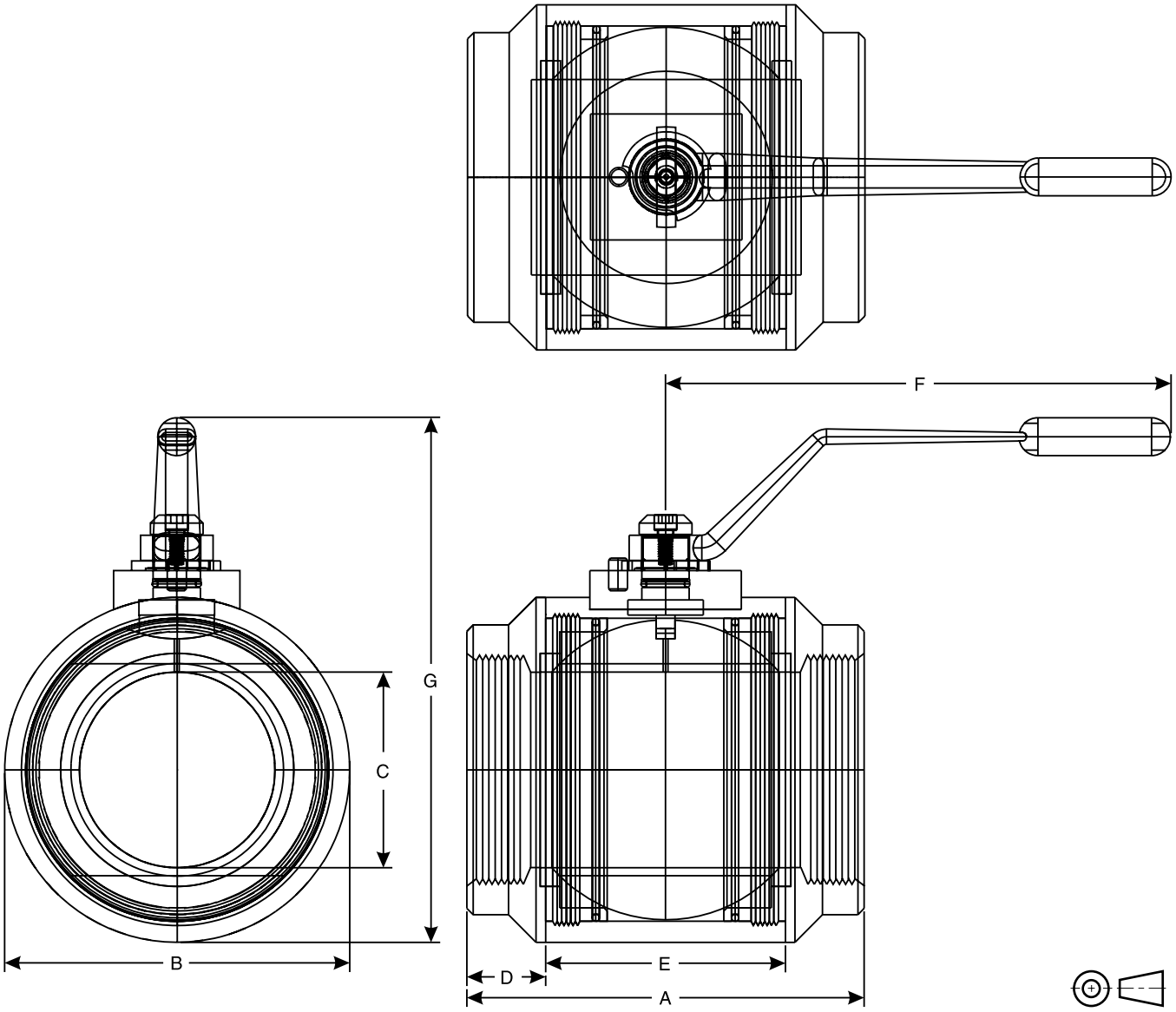
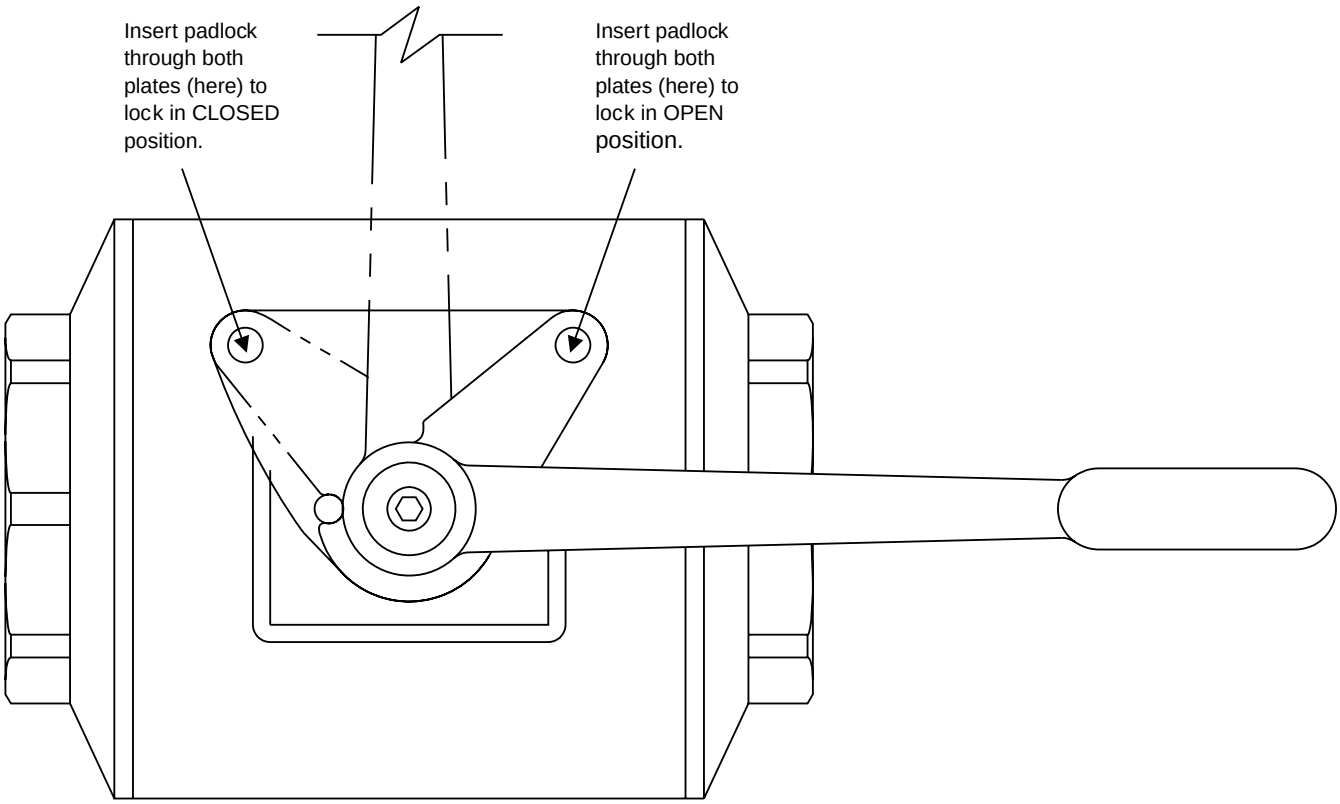
Hydraulic Valve Division
Elyria, Ohio, USA

Threaded Ports



Code	Port Thread Size	Working Pressure	Dimensions mm (in)						
			A	B	C	D	E	F	G
40	2 1/2"	138 Bar (2000 PSI)	184.2 (7.25)	133.4 (5.25)	63.5 (2.50)	28.7 (1.13)	127.0 (5.00)	254.0 (10.00)	228.3 (8.99)
48	3"	138 Bar (2000 PSI)	221.2 (8.71)	158.8 (6.25)	76.2 (3.00)	35.1 (1.38)	151.4 (5.96)	254.0 (10.00)	253.7 (9.99)
64	4"	138 Bar (2000 PSI)	248.9 (9.80)	184.2 (7.25)	101.6 (4.00)	38.1 (1.50)	172.7 (6.80)	254.0 (10.00)	279.1 (10.99)

BVHPLK: Standard Series 'BVHPLK-*' kit replaces the stopwasher with a stationary and moving plate, as illustrated below. As the handle is actuated, the moving plate aligns with one of the two locking positions in the stationary plate, enabling the valve to be locked in either **fully closed** or **fully open** position.

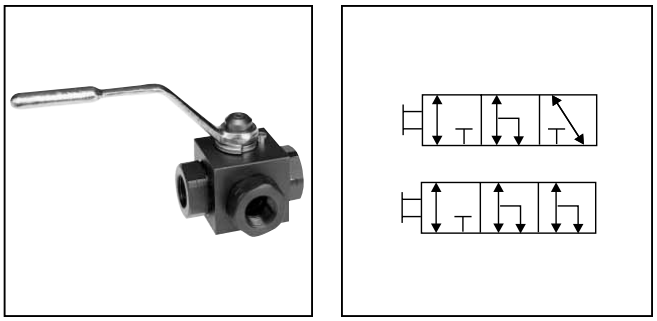


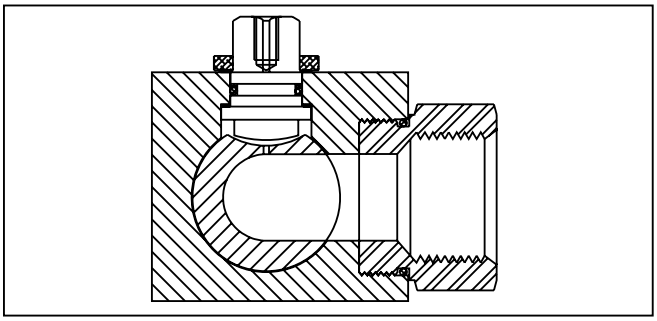
Ordering Information

BVAM Code	Size	Standard Locking (Part Number)
40	2 1/2"	BVHPLK-4
48	3"	BVHPLK-4
64	4"	BVHPLK-4

General Description

Series BV3D is a 3-way diverter. The product is rated at 207 Bar (3000 PSI) and designed to economically satisfy many 3-way applications.





Operation

The BV3D Series operates by rotating the handle 90° or 180° depending on the chosen ball pattern. There is a slight port to port overlap. Pressure is applied to Port 1.

Specifications

Maximum Pressure	207 Bar (3000 PSI)
Body Material	Carbon Steel, Black Oxide, Stainless Steel
Ball Material	Steel, Chrome Plated, Stainless Steel
Stem Material	Steel, Zinc Plated, Stainless Steel
Standard Handle	Steel Offset, Nickel Plated
Ball Seals	Delrin + MoS_2
Spindle Seals	O-ring & Backup, Nitrile
Operating Temperature	-30°C to +100°C (-22°F to +212°F)

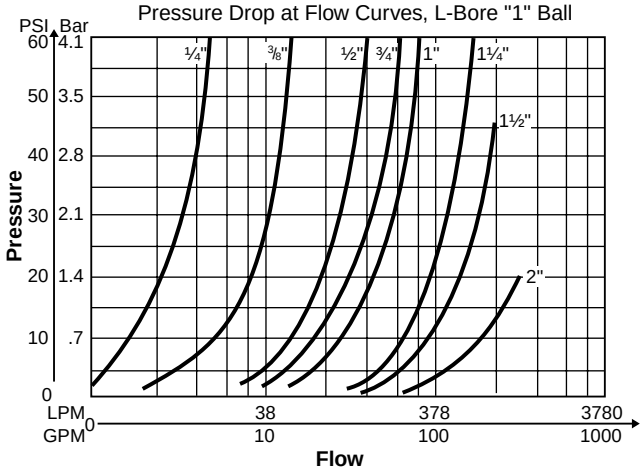
Features

- The standard L-bore ball and T-bore option allows the valve to be utilized in a variety of applications.
- Slight port overlap reduces upstream shock during shifting.
- Utilizing the unique spindle thrust bearing design reduces actuation torque.
- The BV3D can be panel mounted which allows a variety of installation options.
- Delrin seals with molybdenum disulphide (MoS_2) results in lower actuation torque and will increase high duty life cycle expectancy.

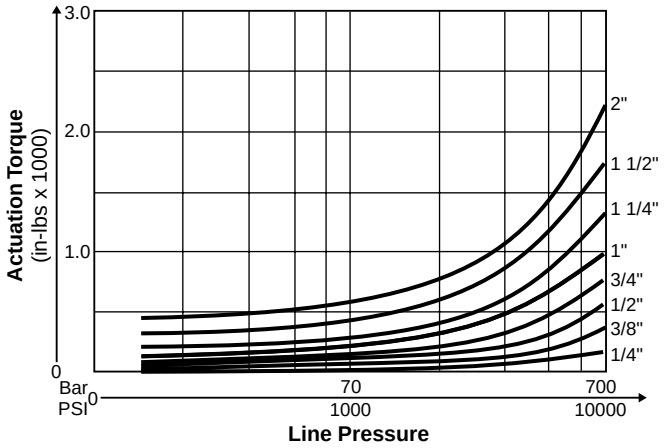
Performance Curves

Pressure Drop

Pressure Drop at Flow Curves, L-Bore "1" Ball



Actuation Torque



3300-2.p65, dd

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Hydraulic Valve Division
Elyria, Ohio, USA

BV3D — Series | Size | Port | Ball Pattern | Body Material | Ball & Stem Material | Ball Seals | Stem Seals | Options | Design Series

NOTE: Not required when ordering.

Code	Size
04	1/4"
06	3/8"
08	1/2"
12	3/4"
16	1"
20	1 1/4"
24	1 1/2"
32	2"

Code	Type
N	NPT Thread
S	SAE Thread
B	BSPP Thread
U	ISO 6149 Thread

Code	Type
S	Steel
K	Stainless Steel

Code	Type
S	Steel
K	Stainless Steel

Code	Type
1	Delrin
2 *	PTFE
4	Peek

* Valve pressure rating reduced. Consult factory.

Code	Type
N	Nitrile
V	Fluorocarbon
E	EPR

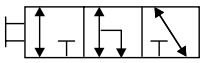
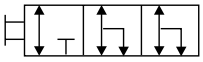
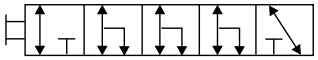
Code	Type
A	Locking Handle
★C	1 Way Limit Switch
*E	Panel Mount
G	Flat Non-offset Handle
★**K	1 Way Limit Switch w/Lock

* Cannot be combined with other options

** Switch is set to indicate valve open condition

★ When selecting this option, your ball valve will come with limit switch bracket, but does not include the switch. The switch is sold separately (Part #LSB)

Diverter Valve Ball Porting Options

Ball Code	ISO Circuit Symbol	Ball Pattern	Handle Phase 90°	45°	0°	-45°	-90°	Stop Washer Type
1		L-Bore Standard						
2		T-Bore 90°						
3		T-Bore 180°						

Pressure is applied to Port 1.

Weights

Code	kg (lbs.)	Code	kg (lbs.)
04	0.7 (1.5)	16	3.4 (7.5)
06	0.9 (2.0)	20	4.5 (10.0)
08	1.1 (2.5)	24	6.4 (14.0)
12	2.7 (6.0)	32	9.5 (21.0)

ISO 6149-1 Port Dimensions (inches)

Size	Thread
04	M12 x 1.5
06	M16 x 1.5
08	M18 x 1.5
12	M27 x 2
16	M33 x 2
20	M42 x 2
24	M48 x 2
32	M60 x 2
40	M76 x 2
48	M90 x 2
64	M114 x 2

3300-2.p65, dd

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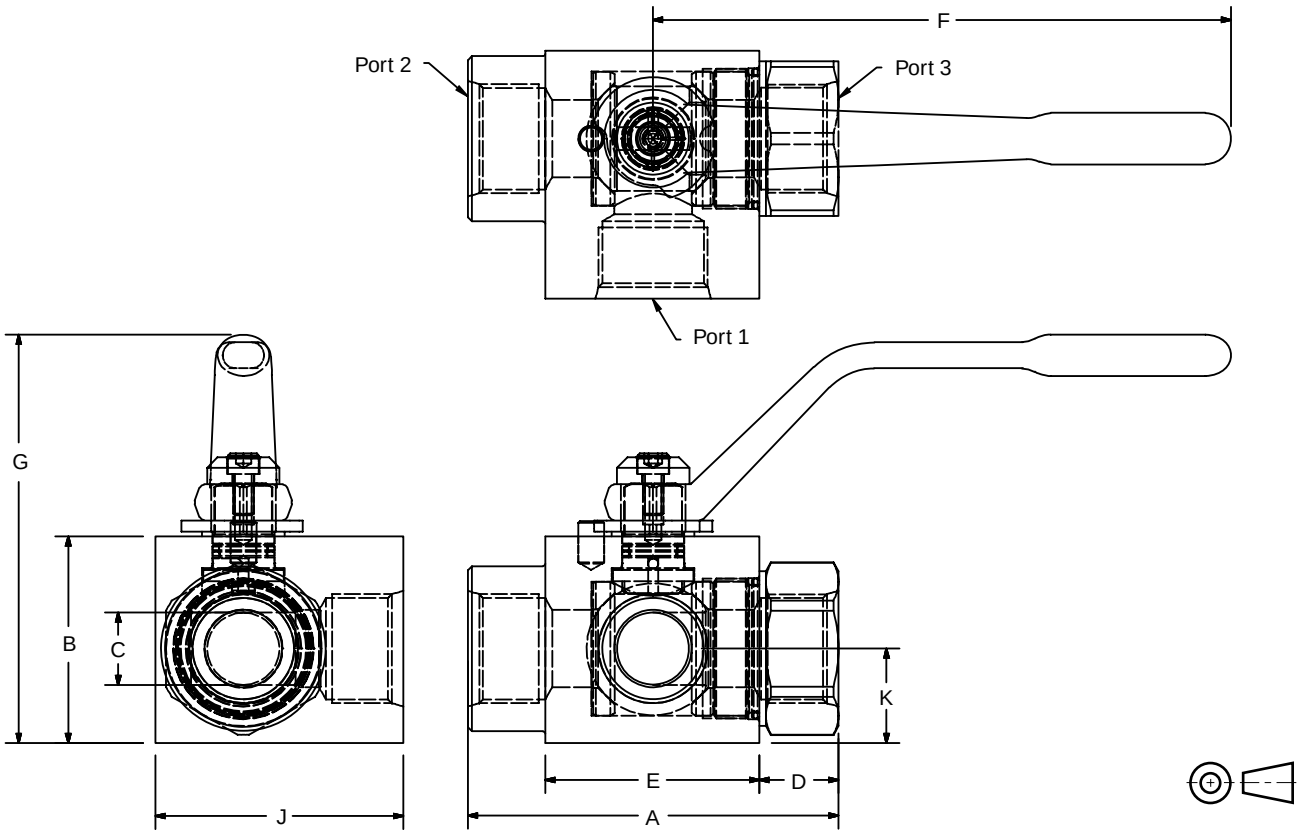
Hydraulic Valve Division
Elyria, Ohio, USA

Threaded Ports



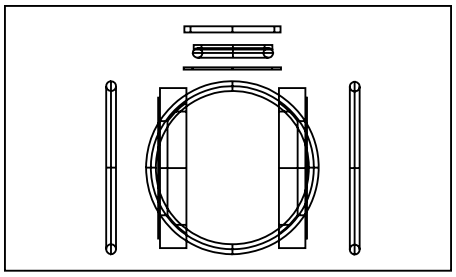
Port 1 is the pressure port.

Code	Port Thread Size	Working Pressure	Dimensions mm (in)									
			A	B	C_L	C_T	D	E	F	G	J	K
NPT and SAE Thread												
04	1/4"	207 Bar (3000 PSI)	69.6 (2.74)	38.1 (1.50)	6.4 (0.25)	6.4 (0.25)	17.3 (0.68)	35.6 (1.40)	114.3 (4.50)	78.2 (3.08)	44.5 (1.75)	18.8 (0.74)
06	3/8"	207 Bar (3000 PSI)	72.6 (2.86)	44.5 (1.75)	7.9 (0.31)	7.9 (0.31)	15.5 (0.61)	42.2 (1.66)	114.3 (4.50)	84.6 (3.33)	50.8 (2.00)	22.6 (0.89)
08	1/2"	207 Bar (3000 PSI)	84.6 (3.33)	44.5 (1.75)	11.2 (0.44)	11.2 (0.44)	18.5 (0.73)	46.7 (1.85)	114.3 (4.50)	84.6 (3.33)	57.2 (2.25)	21.6 (0.85)
12	3/4"	207 Bar (3000 PSI)	96.5 (3.80)	63.5 (2.50)	17.5 (0.69)	17.5 (0.69)	17.8 (0.70)	59.7 (2.35)	177.8 (7.00)	125.7 (4.95)	63.5 (2.50)	31.8 (1.25)
16	1"	207 Bar (3000 PSI)	114.0 (4.49)	63.5 (2.50)	22.4 (0.88)	22.4 (0.88)	24.4 (0.96)	65.8 (2.59)	177.8 (7.00)	125.7 (4.95)	76.2 (3.00)	29.0 (1.14)
20	1 1/4"	207 Bar (3000 PSI)	126.2 (4.97)	88.9 (3.50)	28.7 (1.13)	28.7 (1.13)	21.6 (0.85)	79.5 (3.13)	242.6 (9.55)	167.9 (6.61)	101.6 (4.00)	43.0 (1.69)
24	1 1/2"	207 Bar (3000 PSI)	139.4 (5.49)	88.9 (3.50)	35.1 (1.38)	35.1 (1.38)	25.1 (0.99)	85.9 (3.38)	242.6 (9.55)	167.9 (6.61)	114.3 (4.50)	39.1 (1.54)
32	2"	207 Bar (3000 PSI)	160.0 (6.30)	114.3 (4.50)	44.5 (1.75)	44.5 (1.75)	33.0 (1.30)	95.3 (3.75)	242.6 (9.55)	193.3 (7.61)	127.0 (5.00)	56.1 (2.21)

Seal Kit Accessories

Ball Valve Seal Kits restore a ball valve to factory specifications, providing no erosion or metal-to-metal wear has taken place.

The Seal Kit includes all the o-rings, ball seals and thrust bearings that were originally installed at the factory. A sketch of these parts is provided at the right.



Seal Kit Ordering Information

SK — Accessory

Code	Type
SK	Seal Kit

BV3D — Series

Size

Code	Size
04	1/4"
06	3/8"
08	1/2"
12	3/4"
16	1"
20	1 1/4"
24	1 1/2"
32	2"

Port

Code	Type
N	NPT Thread
S	SAE Thread
B	BSPP Thread
U	ISO 6149 Thread

Ball Pattern

Body Material

Code	Type
S	Steel
K	Stainless Steel

Ball & Stem Material

Code	Type
S	Steel
K	Stainless Steel

Ball Seals

Code	Type
1	Delrin
2 *	PTFE
4	Peek

* Valve pressure rating reduced. Consult factory.

Stem Seals

Code	Type
N	Nitrile
V	Fluorocarbon
E	EPR

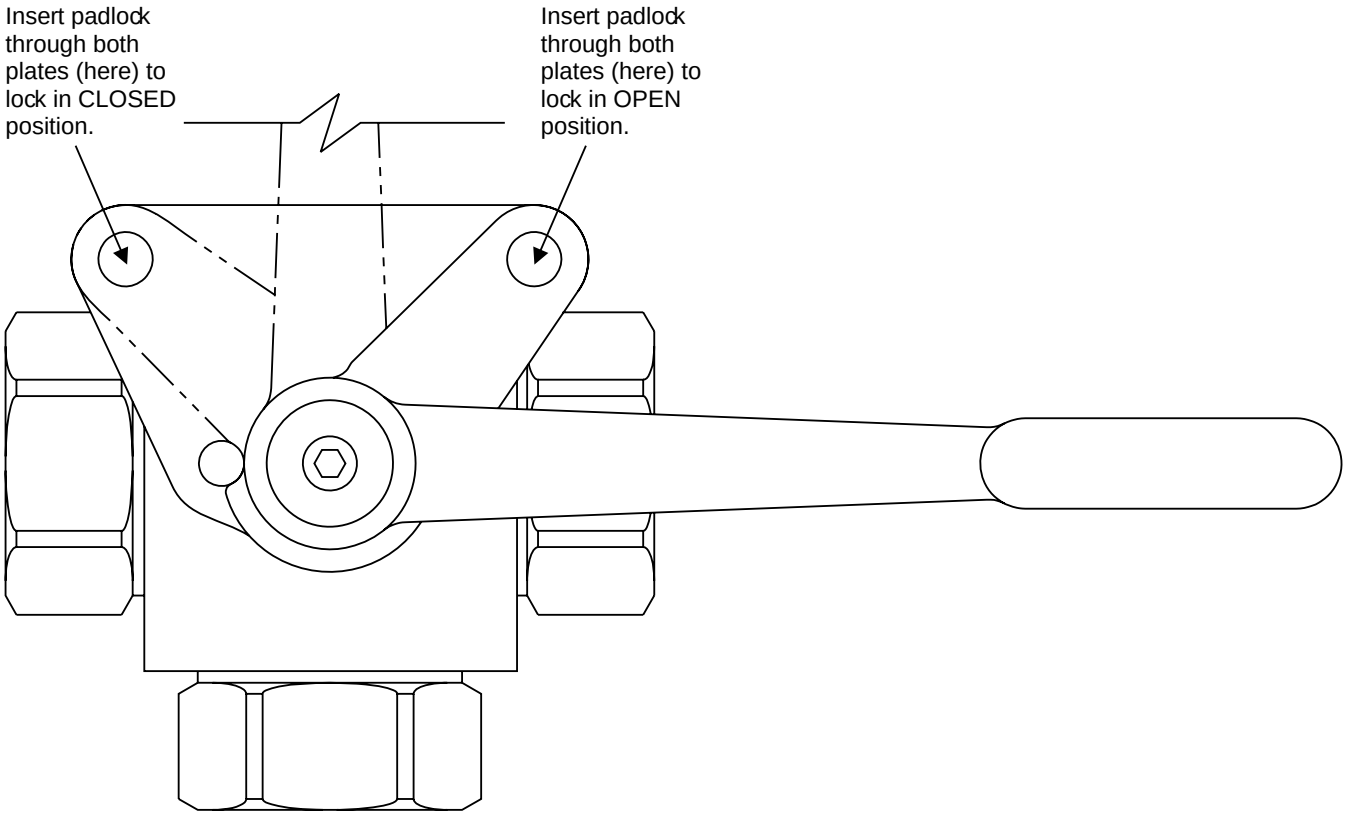
Design Series

NOTE: Not required when ordering.

Diverter Valve Ball Porting Options

Ball Code	ISO Circuit Symbol	Ball Pattern	Handle Phase 90° 45° 0° -45° -90°	Stop Washer Type
1		L-Bore Standard		
2		T-Bore 90°		
3		T-Bore 180°		

BVHPLK: Standard Series 'BVHPLK-*' kit replaces the stopwasher with a stationary and moving plate, as illustrated below. As the handle is actuated, the moving plate aligns with one of the two locking positions in the stationary plate, enabling the valve to be locked in either **fully closed** or **fully open** position.



Ordering Information

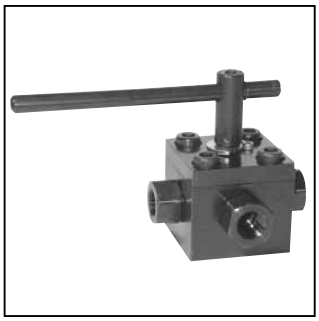
BV3D Code	Size	Standard Locking (Part Number)
04	1/4"	BVHPLK-1
06	3/8"	BVHPLK-1
08	1/2"	BVHPLK-1
12	3/4"	BVHPLK-2
16	1"	BVHPLK-2
20	1 1/4"	BVHPLK-3
24	1 1/2"	BVHPLK-3
32	2"	BVHPLK-3

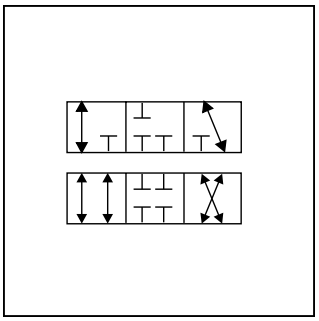
General Description

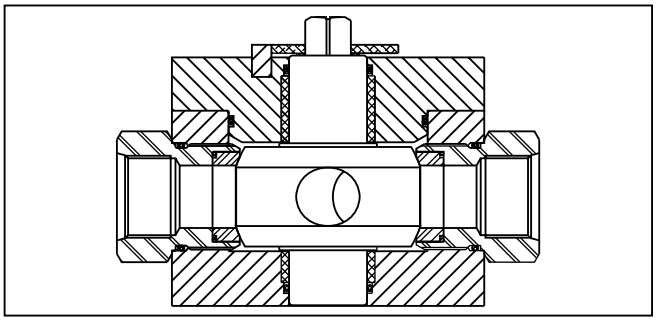
Series BV3H and BV4H are true 3-way and 4-way high pressure valves, incorporating many of the advanced features of the 2-way product. These products come in steel and are rated at 414 Bar (6000 PSI). Ports range from 1/4" to 2" with a variety of porting options.

Operation

The BV3H Series operates by rotating the handle 90° and BV4H operates through 180° rotation of the handle, depending on the flow path. A BV4H with ball #4 is 90° operation. There is no port-to-port overlap during transition.







Specifications

Maximum Pressure	414 Bar (6000 PSI)
Body Material	Carbon Steel, Black Oxide
Ball Material	Steel, Chrome Plated, Trunnion mount
Standard Pattern	“L” Bore (3W), “T” Bore (4W)
Spindle Material	Steel, Zinc Plated
Standard Handle	T-Type Handle
Ball Seals	Delrin + MoS_2
Spindle Seals	O-rings + Bearing Stacks
Operating Temperature	-30C° to +100°C (-22°F to +212°F)

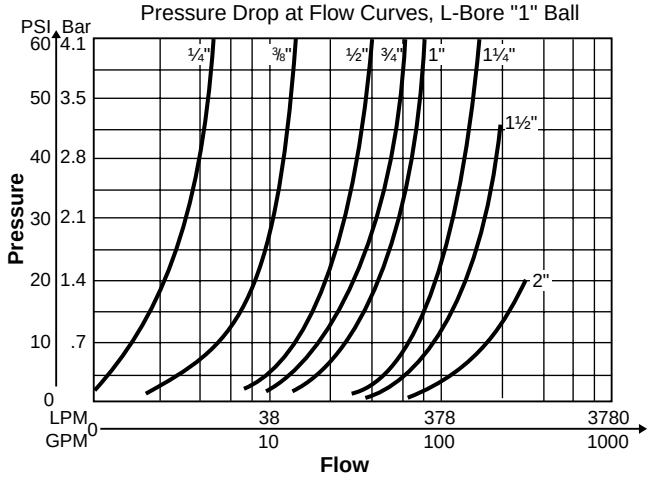
Features

- Three dimensional balanced sealing for near zero leakage in any circuit.
- The unique thrust bearing spindle design reduces actuation torque and reduces the chance of the valve seizing when inactive for periods of time.
- Special seal design enables high port to port ΔP application suitability.
- A variety of ball patterns allows flexibility in many applications.

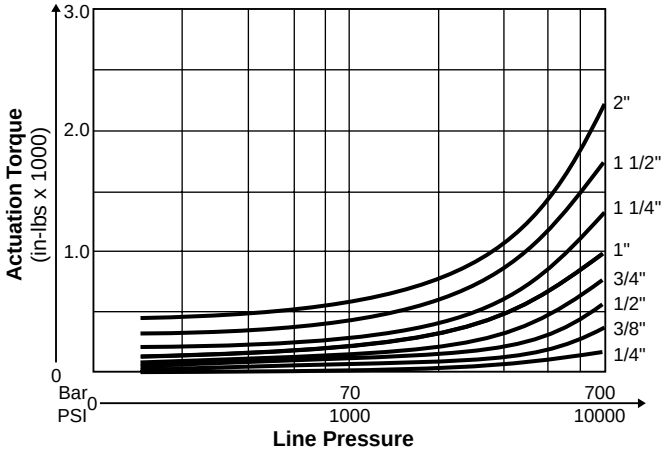
Performance Curves

Pressure Drop

Pressure Drop at Flow Curves, L-Bore "1" Ball



Actuation Torque



3300-2.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

Series | Size | Port | Ball Pattern | Body Material | Ball & Stem Material | Ball Seals | Stem Seals | Options | Design Series

NOTE: Not required when ordering.

Code	Type
BV3H	3-Way
BV4H	4-Way

Code	Size
04	1/4"
06	3/8"
08	1/2"
12	3/4"
16	1"
20	1 1/4"
24	1 1/2"
32	2"

Code	Type
N	NPT Thread
S	SAE Thread
B	BSPP Thread

Code	Type
S	Steel
K	Stainless Steel

Code	Type
S	Steel
K	Stainless Steel

Code	Type
1	Delrin
2 *	PTFE
4	Peek

* Valve pressure rating reduced. Consult factory.

Code	Type
N	Nitrile
V	Fluorocarbon
E	EPR

Code	Type
A	Locking Handle
★C	1 Way Limit Switch
★K	1 Way Limit Switch w/Lock

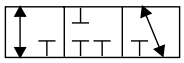
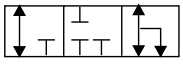
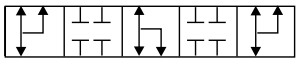
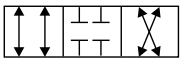
★ When selecting this option, your ball valve will come with limit switch bracket, but does not include the switch. The switch is sold separately (Part #LSB)

Weights

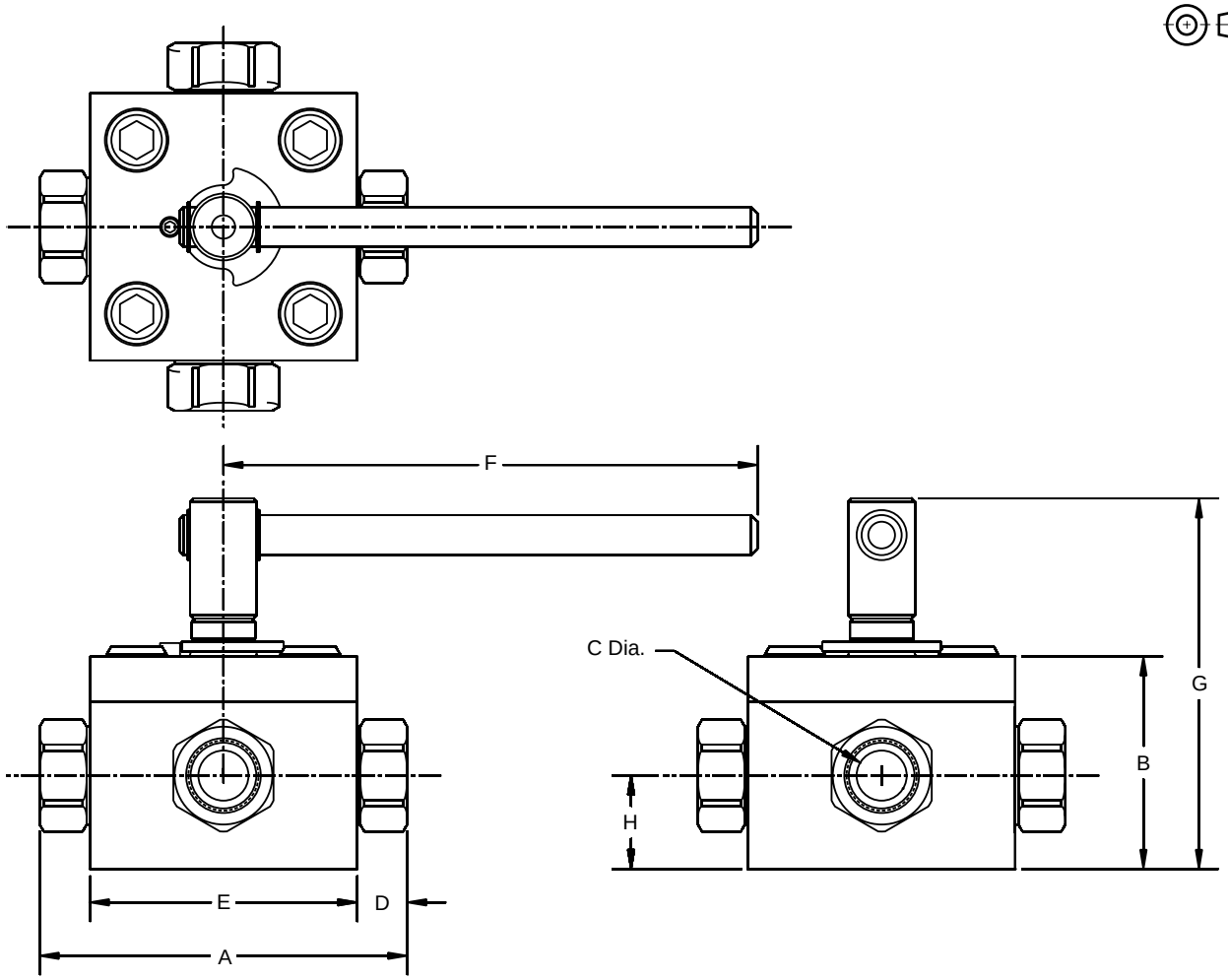
Code	kg	(lbs.)
04	1.8	(4.0)
06	1.9	(4.2)
08	2.9	(6.4)
12	6.3	(13.9)
16	11.5	(25.4)
20	17.1	(37.7)
24	24.3	(53.6)
32	41.8	(92.2)

Multiway Manifold Mount Valve Porting Options

BV3H and BV4H valves are designed with no port-to-port overlap (see ISO symbols) during transition. Use the table below to select the ball pattern ordering code.

Ball Code	ISO Circuit Symbol	Ball Pattern	Handle Phase 90°	45°	0°	-45°	-90°	Stop Washer Type
1		L-Bore 3-Way Std						
2		T-Bore 90° 3-Way Opt						
3		T-Bore 180° 4-WayStd						
4		X-Bore 90° 4-Way Opt						

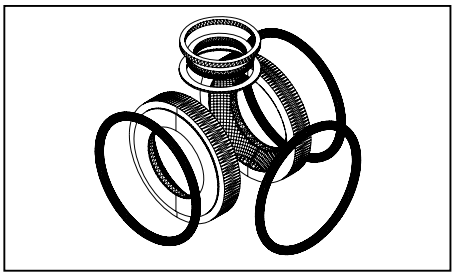
Threaded Ports



Code	Port Size	Working Pressure	Dimensions mm (in)							
			A	B	C-Dia.	D	E	F	G	H
NPT and SAE Thread										
04	1/4"	414 Bar (6000 PSI)	87.9 (3.46)	63.0 (2.48)	7.9 (0.31)	12.2 (0.48)	63.5 (2.50)	177.8 (7.00)	122.2 (4.81)	31.0 (1.22)
06	3/8"	414 Bar (6000 PSI)	87.9 (3.46)	63.0 (2.48)	7.9 (0.31)	12.2 (0.48)	63.5 (2.50)	177.8 (7.00)	122.2 (4.81)	31.0 (1.22)
08	1/2"	414 Bar (6000 PSI)	115.6 (4.55)	69.9 (2.75)	11.2 (0.44)	19.6 (0.77)	76.2 (3.00)	177.8 (7.00)	127.0 (5.00)	33.8 (1.33)
12	3/4"	414 Bar (6000 PSI)	136.1 (5.36)	82.0 (3.23)	16.0 (0.63)	17.3 (0.68)	101.6 (4.00)	254.0 (10.00)	157.2 (6.19)	38.1 (1.50)
16	1"	414 Bar (6000 PSI)	174.8 (6.88)	101.1 (3.98)	22.4 (0.88)	23.9 (0.94)	127.0 (5.00)	254.0 (10.00)	176.3 (6.94)	44.5 (1.75)
20	1 1/4"	414 Bar (6000 PSI)	188.7 (7.43)	116.6 (4.59)	28.7 (1.13)	21.1 (0.83)	146.6 (5.77)	368.3 (14.50)	206.5 (8.13)	52.8 (2.08)
24	1 1/2"	414 Bar (6000 PSI)	233.4 (9.19)	129.0 (5.08)	33.3 (1.31)	24.6 (0.97)	184.2 (7.25)	368.3 (14.50)	219.2 (8.63)	57.7 (2.27)
32	2"	414 Bar (6000 PSI)	300.0 (11.81)	157.7 (6.21)	44.5 (1.75)	32.5 (1.28)	235.0 (9.25)	368.3 (14.50)	256.0 (10.08)	68.8 (2.71)

Ball Valve Seal Kits restore a ball valve to factory specifications, providing no erosion or metal-to-metal wear has taken place.

The Seal Kit includes all the o-rings, ball seals and thrust bearings that were originally installed at the factory. A sketch of these parts is provided at the right.



Ordering Information

SK Accessory

Code	Type
SK	Seal Kit

Series

Code	Type
BV3H	3-Way
BV4H	4-Way

Size

Code	Size
04	1/4"
06	3/8"
08	1/2"
12	3/4"
16	1"
20	1 1/4"
24	1 1/2"
32	2"

Port

Code	Type
N	NPT Thread
S	SAE Thread
B	BSPP Thread

Ball Pattern

S Body Material

Code	Type
S	Steel

S Ball & Stem Material

Code	Type
S	Steel

Ball Seals

Code	Type
1	Delrin
2 *	PTFE
4	Peek

* Valve pressure rating reduced. Consult factory.

Stem Seals

Code	Type
N	Nitrile
V	Fluorocarbon
E	EPR

Design Series

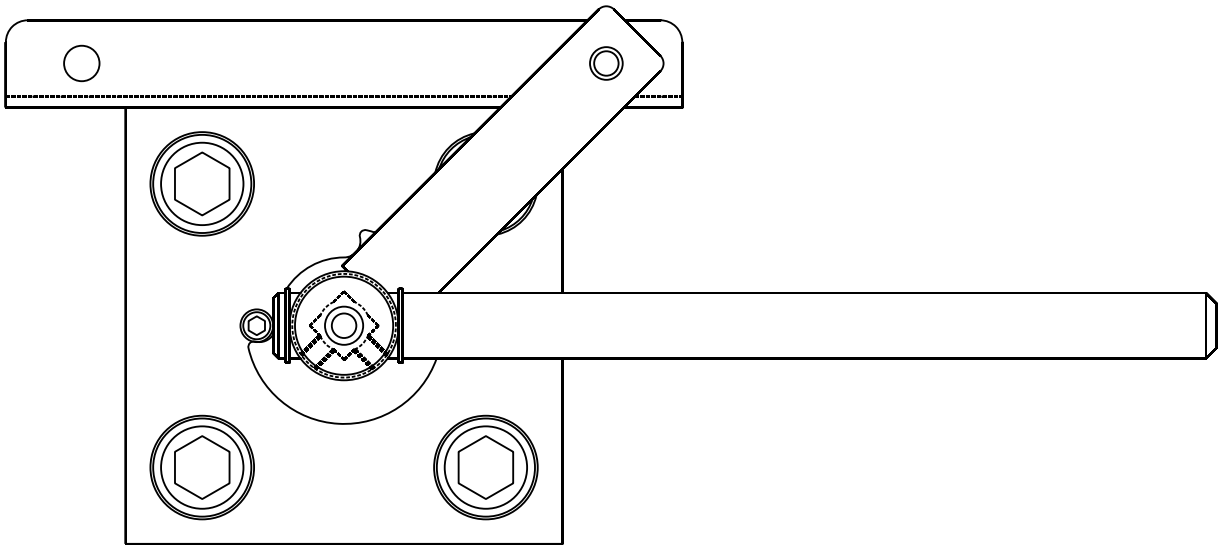
NOTE: Not required when ordering.

Multiway Manifold Mount Valve Porting Options

BV3H and BV4H valves are designed with no port-to-port overlap (see ISO symbols) during transition. Use the table below to select the ball pattern ordering code.

Ball Code	ISO Circuit Symbol	Ball Pattern	Handle Phase 90°	45°	0°	-45°	-90°	Stop Washer Type
1		L-Bore 3-Way Std						
2		T-Bore 90° 3-Way Opt						
3		T-Bore 180° 4-WayStd						
4		X-Bore 90° 4-Way Opt						

BVHPLH: Standard Series 'BVHPLH-*' kit replaces the stopwasher with a stationary and moving plate, as illustrated below. As the handle is actuated, the moving plate aligns with one of the two locking positions in the stationary plate, enabling the valve to be locked in either **fully closed** or **fully open** position.

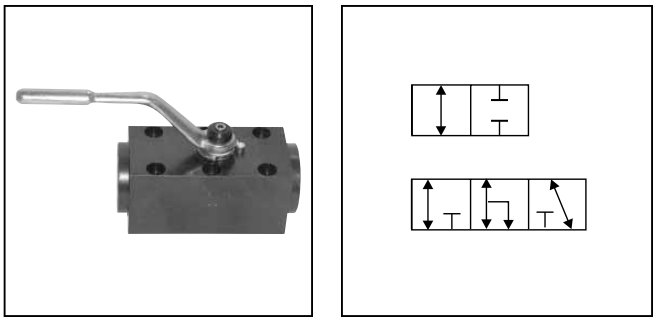


Ordering Information

BV3H and BV4H		Standard Locking
Code	**Size**	**(Part Number)**
04	1/4"	BVHPLH-2
06	3/8"	BVHPLH-2
08	1/2"	BVHPLH-3
12	3/4"	BVHPLH-4
16	1"	BVHPLH-5
20	1 1/4"	BVHPLH-6
24	1 1/2"	BVHPLH-7
32	2"	BVHPLH-8

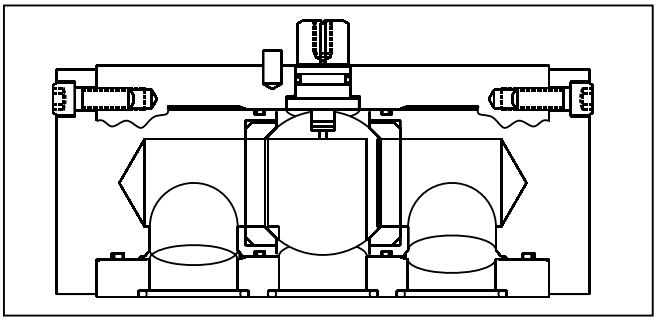
General Description

Series BVMM is a manifold mounted high pressure 414 Bar (6000 PSI) 2 or 3-way ball valve. Manifold mounting eliminates an external fluid connection.



Operation

Series BVMM valves operate through either 90° or 180° depending on the ball pattern chosen. For 3-way valves, pressure is applied to Port 1.



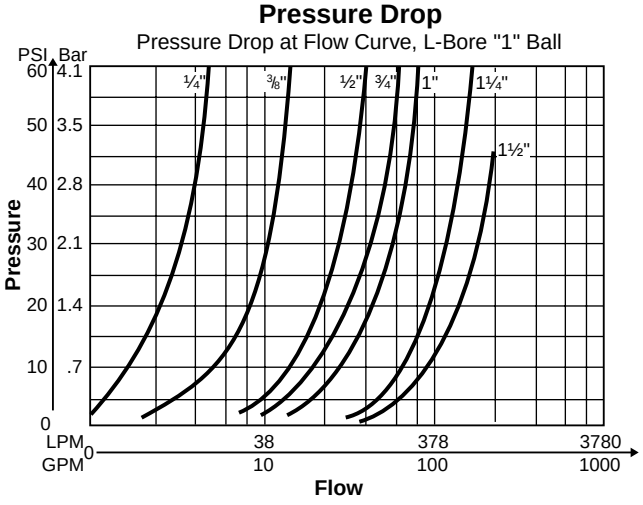
Specifications

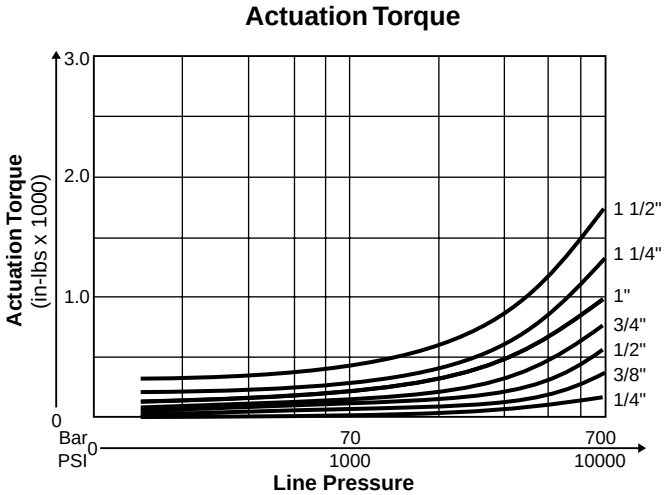
Maximum Pressure	414 Bar (6000 PSI)
Body Material	Carbon Steel, Black Oxide
Ball Material	Steel, Chrome Plated
Spindle Material	Steel, Nickel Plated
Standard Handle	Steel, Offset, Nickel Plated
Ball Seals	Delrin + MoS_2
Spindle Seals	O-rings & Backup, Nitrile
Operating Temperature	-30°C to +100°C (-22°F to +212°F)

Features

- Variety of ball patterns allow for different flow paths and flexibility for many applications.
- Thrust bearings in the spindle and delrin moly ball seals result in low actuation torque as well as extended service life.

Performance Curves





3300-2.p65, dd

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Elyria, Ohio, USA

BVMM — Series

□ — Size

Code	Size
04	1/4"
06	3/8"
08	1/2"
12	3/4"
16	1"
20	1 1/4"
24	1 1/2"
32	2"

□ — Ball Pattern

S — Body Material

Code	Type
S	Steel

S — Ball & Stem Material

Code	Type
S	Steel

□ — Ball Seals

Code	Type
1	Delrin
2 *	PTFE
4	Peek

* Valve pressure rating reduced. Consult factory.

□ — Stem Seals

Code	Type
N	Nitrile
V	Fluorocarbon
E	EPR

□ — Options

Code	Type
A	Locking Handle
★C	1 Way Limit Switch
G	Flat Non-offset Handle
★*K	1 Way Limit Switch w/Lock

* Switch is set to indicate valve open condition

★ When selecting this option, your ball valve will come with limit switch bracket, but does not include the switch. The switch is sold separately (Part #LSB)

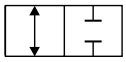
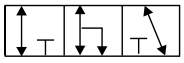
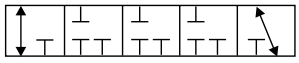
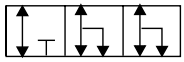
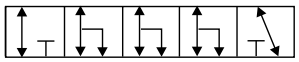
Design Series

NOTE: Not required when ordering.

Weights

Code	kg	(lbs.)
04	1.1	(2.5)
06	2.0	(4.4)
08	2.3	(5.1)
12	3.4	(7.5)
16	5.2	(11.5)
20	10.5	(23.1)
24	15.1	(33.3)
32	24.0	(52.9)

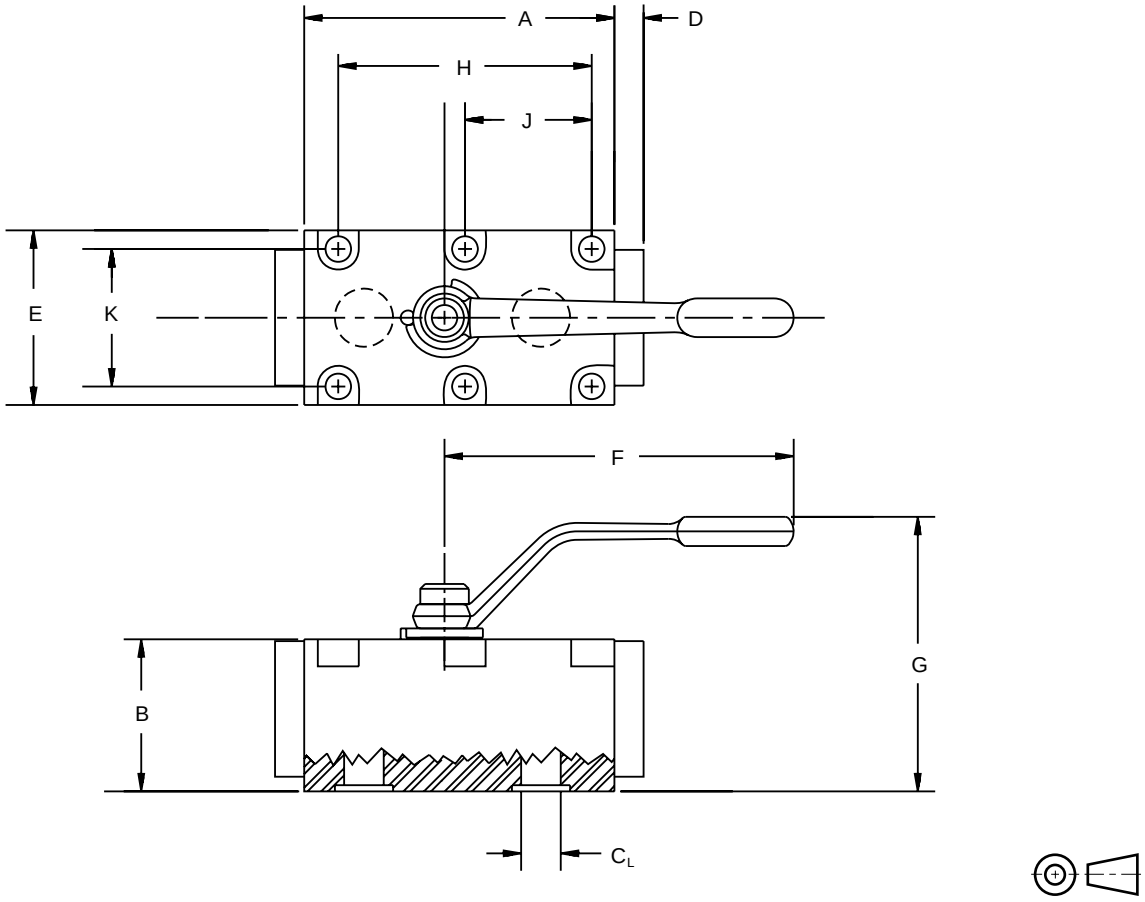
Multiway Manifold Mount Valve Porting Options

Ball Code	ISO Circuit Symbol	Ball Pattern	Handle Phase 90°	45°	0°	-45°	-90°	Stop Washer Type
1		2-Way						
2		L-Bore Port Overlap						
3		L-Bore No Overlap						
4		T-Bore 90°						
5		T-Bore 180°						

Please request a certified print before building a manifold.

For 3-way valves, pressure is applied to Port 1.

Manifold Mounted



Please request a certified print before building a manifold.

Code	Port Size	Working Pressure	Dimensions mm (in) A	B	C_L	D	E	F	G	H	J	K
BVMM 2-Way and 3-Way Manifold Mounted												
04[1]	1/4"	414 Bar (6000 PSI)	66.5 (2.62)	38.1 (1.50)	6.1 (0.24)	9.5 (0.375)	50.8 (2.00)	114.3 (4.50)	78.2 (3.08)	42.0 (1.653)	n/a (n/a)	35.0 (1.377)
06[1]	3/8"	414 Bar (6000 PSI)	81.8 (3.22)	50.0 (1.97)	9.7 (0.38)	9.5 (0.375)	57.2 (2.25)	114.3 (4.50)	90.2 (3.55)	55.0 (2.165)	n/a (n/a)	40.0 (1.575)
08	1/2"	414 Bar (6000 PSI)	106.1 (4.00)	50.0 (1.97)	13.0 (0.51)	9.5 (0.375)	57.2 (2.25)	114.3 (4.50)	89.9 (3.54)	83.0 (3.267)	41.5 (1.634)	45.0 (1.771)
12	3/4"	414 Bar (6000 PSI)	141.5 (5.57)	69.3 (2.73)	20.1 (0.79)	9.5 (0.375)	69.9 (2.75)	177.8 (7.00)	131.6 (5.18)	97.0 (3.818)	48.5 (1.909)	51.0 (2.007)
16	1"	414 Bar (6000 PSI)	156.5 (6.16)	81.0 (3.19)	23.9 (0.94)	9.5 (0.375)	82.6 (3.25)	177.8 (7.00)	143.0 (5.63)	115.0 (4.528)	57.5 (2.264)	60.0 (2.362)
20	1 1/4"	414 Bar (6000 PSI)	180.3 (7.10)	100.1 (3.94)	31.8 (1.25)	12.7 (0.50)	101.6 (4.00)	254.0 (10.00)	179.1 (7.05)	136.0 (5.354)	68.0 (2.677)	78.0 (3.070)
24	1 1/2"	414 Bar (6000 PSI)	196.1 (7.72)	100.3 (3.95)	38.1 (1.50)	17.5 (0.69)	127.0 (5.00)	254.0 (10.00)	179.6 (7.07)	112.0 (4.409)	55.9 (2.199)	95.0 (3.740)
32	2"	414 Bar (6000 PSI)	246.9 (9.72)	124.0 (4.88)	47.8 (1.88)	22.4 (0.88)	152.4 (6.00)	254.0 (10.00)	202.9 (7.99)	136.0 (5.354)	68.2 (2.684)	112.0 (4.409)

NOTES: (1) These sizes use only the four outside mounting holes. Dimension J is not applicable.
(2) Ball portings for multiway valves are somewhat smaller than their 2-way counterparts. Please refer to dimension C to confirm suitability.

3300-2.p65, dd

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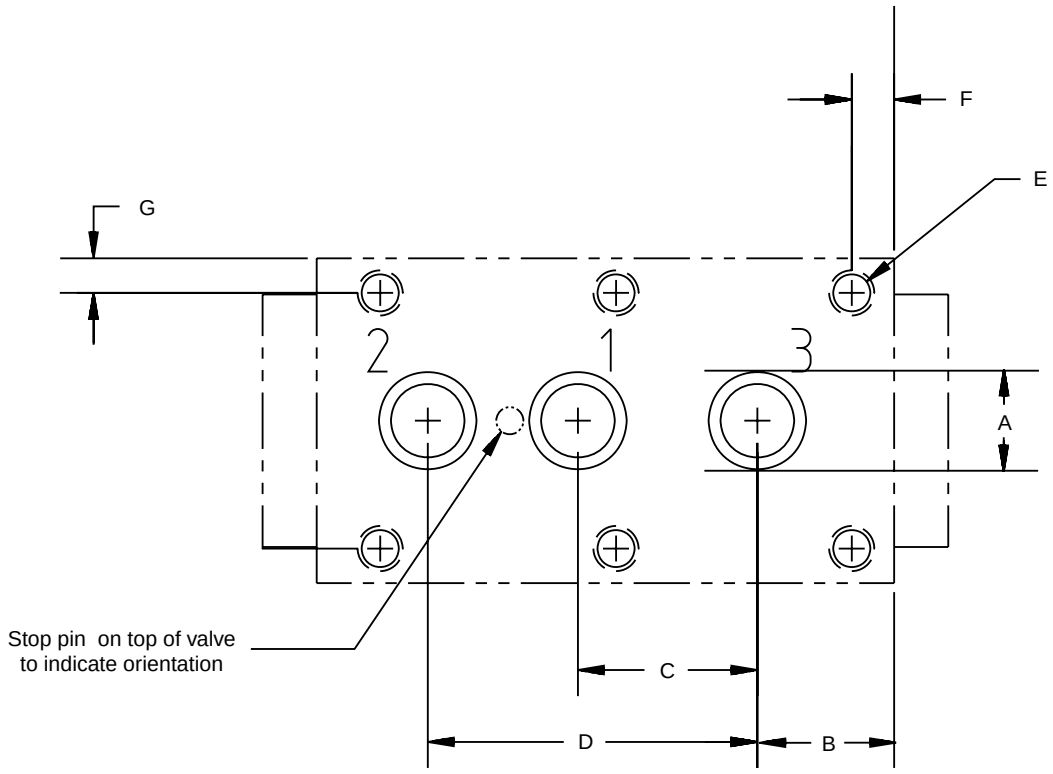
Hydraulic Valve Division
Elyria, Ohio, USA

Manifold Porting Specifications



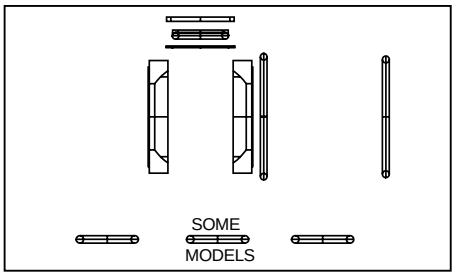
For 3-way valves, pressure is applied to Port 1.

Please request a certified print before building a manifold.

Code	Port Size	A	B	C	D	E	F	G
BVMM Mounting Pad Specifications								
04	1/4"	12.7 (0.500)	16.3 (0.642)	17.0 (0.670)	39.0 (1.535)	8.4 (0.330)	15.5 (0.612)	7.9 (0.312)
06	3/8"	15.9 (0.625)	21.8 (0.860)	19.1 (0.750)	44.0 (1.732)	8.4 (0.330)	19.6 (0.770)	8.6 (0.340)
08	1/2"	19.1 (0.750)	24.1 (0.947)	31.6 (1.243)	58.0 (2.283)	8.4 (0.330)	7.4 (0.293)	6.1 (0.240)
12	3/4"	27.0 (1.063)	40.5 (1.594)	38.3 (1.506)	69.0 (2.716)	10.4 (0.410)	22.7 (0.892)	9.4 (0.372)
16	1"	33.4 (1.313)	39.3 (1.549)	43.0 (1.692)	81.0 (3.188)	13.0 (0.510)	19.3 (0.760)	11.3 (0.444)
20	1 1/4"	39.7 (1.563)	40.1 (1.580)	50.0 (1.970)	96.0 (3.780)	13.0 (0.510)	17.2 (0.676)	11.8 (0.465)
24	1 1/2"	47.6 (1.875)	42.2 (1.661)	55.9 (2.199)	112.0 (4.409)	16.8 (0.660)	42.2 (1.661)	16.0 (0.630)
32	2"	57.2 (2.250)	55.3 (2.176)	68.2 (2.684)	136.0 (5.354)	20.6 (0.810)	55.3 (2.178)	20.2 0.796)

Ball Valve Seal Kits restore a ball valve to factory specifications, providing no erosion or metal-to-metal wear has taken place.

The Seal Kit includes all the o-rings, ball seals and thrust bearings that were originally installed at the factory. A sketch of these parts is provided at the right.



Ordering Information

SK — Accessory

Code	Type
SK	Seal Kit

BVMM — Series

☐ — Size

Code	Size
04	1/4"
06	3/8"
08	1/2"
12	3/4"
16	1"
20	1 1/4"
24	1 1/2"
32	2"

☐ — Ball Pattern

S — Body Material

Code	Type
S	Steel

S — Ball & Stem Material

Code	Type
S	Steel

☐ — Ball Seals

Code	Type
1	Delrin
2 *	PTFE
4	Peek

* Valve pressure rating reduced. Consult factory.

☐ — Stem Seals

Code	Type
N	Nitrile
V	Fluorocarbon
E	EPR

Design Series

NOTE: Not required when ordering.

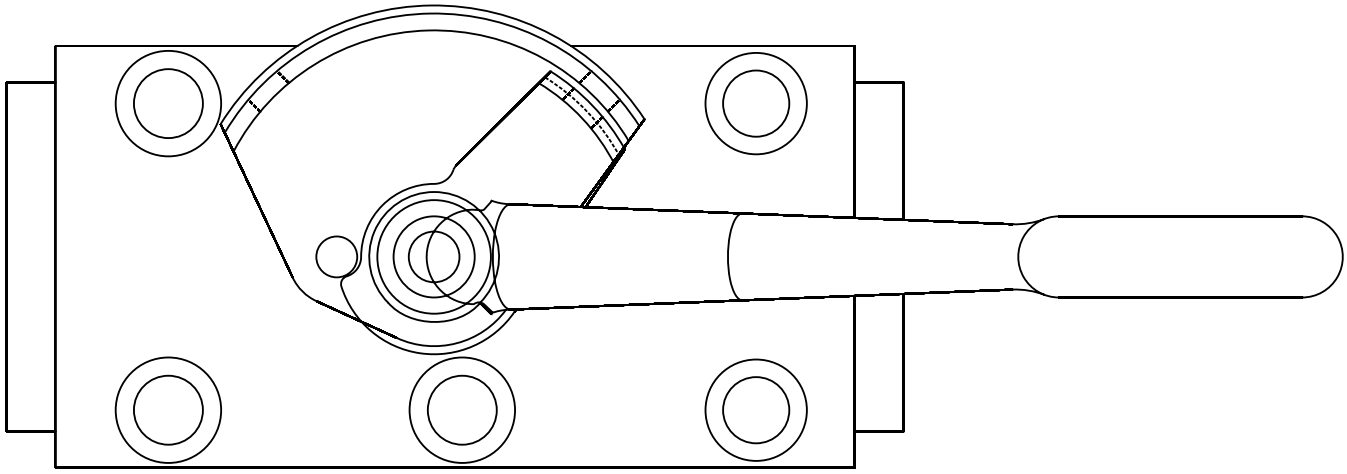
Multiway Manifold Mount Valve Porting Options

Ball Code	ISO Circuit Symbol	Ball Pattern	Handle Phase 90°	45°	0°	-45°	-90°	Stop Washer Type
1		2-Way						
2		L-Bore Port Overlap						
3		L-Bore No Overlap						
4		T-Bore 90°						
5		T-Bore 180°						

3300-2.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

BVMM2LK: Standard Series 'BVMM2LK-*' kit replaces the stopwasher with a stationary and moving plate, as illustrated below. As the handle is actuated, the moving plate aligns with one of the two locking positions in the stationary plate, enabling the valve to be locked in either **fully closed** or **fully open** position.



Ordering Information

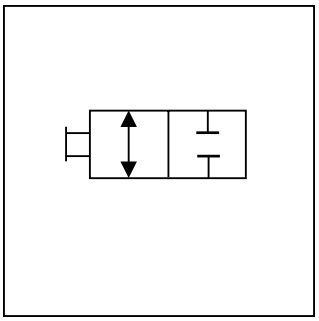
BVMM		Standard Locking
Code	**Size**	**(Part Number)**
04	1/4"	BVMM2LK-1
06	3/8"	BVMM2LK-2
08	1/2"	BVMM2LK-3
12	3/4"	BVMM2LK-4
16	1"	BVMM2LK-5
20	1 1/4"	BVMM2LK-6
24	1 1/2"	BVMM2LK-7
32	2"	BVMM2LK-8

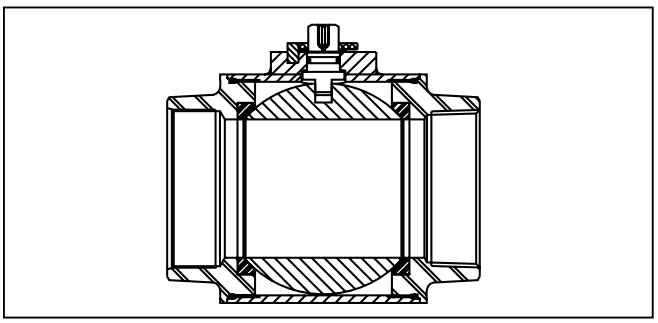
3300-2.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

General Description

Series BVAL ball valves are designed to meet the needs of suction line and low pressure applications. This series is available from 1/4" to 4" ports NPT, SAE and BSPP, and is designed to assure leak free hydraulic suction and return line durability.





Operation

Parker's 2-way ball valves operate to either off or full flow by rotating the handle 90°. Ball valves are not designed to be a metering or flow control device.

Specifications

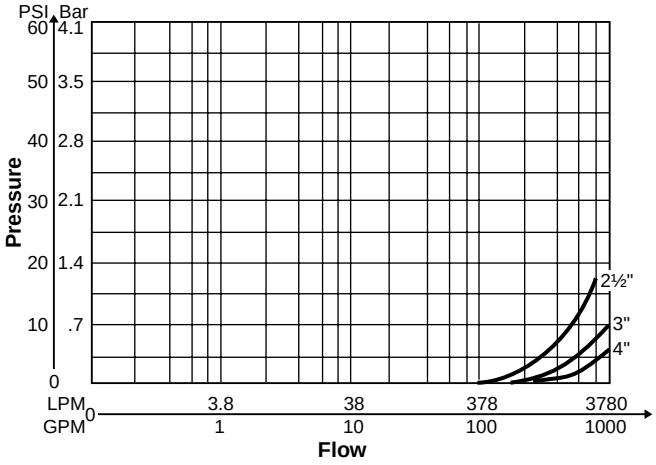
Maximum Pressure	28 Bar (400 PSI)
Body Material	Aluminum
Ball Material	Brass, Chrome Plated
Stem Material	Brass, Oversize Bearing Area
Standard Handle	Steel Offset, Nickel Plated
Ball Seals	PTFE standard
Spindle Seals	O-ring & Backup, Nitrile
Operating Temperature	-30°C to +100°C (-22°F to +212°F)

Features

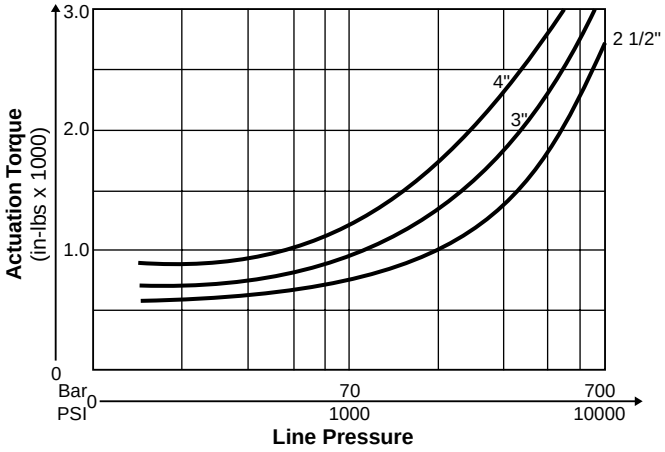
- Unrestricted bore from 1/4" to 4".
- Unrestricted flow and cavitation eliminated.
- Availability of NPT, SAE and BSPP o-ring sealed ports assure leak-free service.
- Choice of optional seal materials allows use with phosphate esters, water glycols and other media.
- Utilizes top grade PTFE ball seats with o-ring seals throughout to assure smooth and leak-free operation.

Performance Curves

Pressure Drop



Actuation Torque



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Elyria, Ohio, USA

BVAL (Series) | [ ] Size | [ ] Port | **S** Body Material | **S** Ball & Stem Material | **2** Ball Seals | [ ] Stem Seals | [ ] Options | [ ] Design Series

NOTE: Not required when ordering.

Code	Size
4	1/4"
6	3/8"
8	1/2"
12	3/4"
16	1'
20	1 1/4"
24	1 1/2"
32	2"
40	2 1/2"
48	3"
64	4"

Code	Type
N	NPT Thread
S	SAE Thread
B	BSPP Thread
U	ISO 6149 Thread

Code	Type
S	Aluminum

Code	Type
S	Brass

Code	Type
2	PTFE

Code	Type
N	Nitrile
V	Fluorocarbon
E	EPR

Code	Type
A	Locking Handle
B	Security Locking Handle
★C	1 Way Limit Switch
D	2 Way Limit Switch
*E	Panel Mount
G	Flat Non-offset Handle
★**K	1 Way Limit Switch w/Lock
★L	2 Way Limit Switch w/Lock

* Cannot be combined with other options

** Switch is set to indicate valve open condition

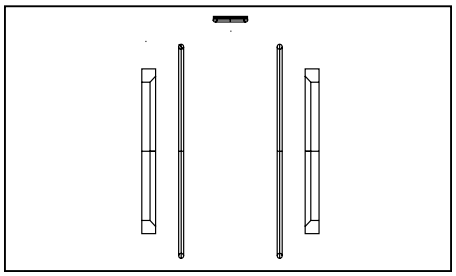
★ When selecting this option, your ball valve will come with limit switch bracket, but does not include the switch. The switch is sold separately (Part #LSB)

Code	Weight kg (lbs.)	Code	Weight kg (lbs.)	Code	Weight kg (lbs.)
4	0.3 (0.6)	16	0.3 (0.6)	40	4.8 (10.5)
6	0.3 (0.6)	20	0.8 (1.8)	48	5.1 (11.2)
8	0.2 (0.4)	24	1.1 (2.4)	64	7.7 (17.0)
12	0.3 (0.6)	32	1.7 (3.8)		

Seal Kit Accessories

Ball Valve Seal Kits restore a ball valve to factory specifications, providing no erosion or metal-to-metal wear has taken place.

The Seal Kit includes all the o-rings, ball seals and thrust bearings that were originally installed at the factory. A sketch of these parts for most 2-way valves is provided at the right.



Seal Kit Ordering Information

SK (Accessory) | **BVAL** (Series) | [ ] Size | [ ] Port | **S** Body Material | **S** Ball & Stem Material | **2** Ball Seals | [ ] Stem Seals | [ ] Design Series

NOTE: Not required when ordering.

Code	Type
SK	Seal Kit

Code	Size
40	2 1/2"
48	3"
64	4"

Code	Type
N	NPT Thread
S	SAE Thread
B	BSPP Thread
U	ISO 6149 Thread

Code	Type
S	Aluminum

Code	Type
S	Brass

Code	Type
2	PTFE

Code	Type
N	Nitrile
V	Fluorocarbon
E	EPR

3300-2.p65, dd

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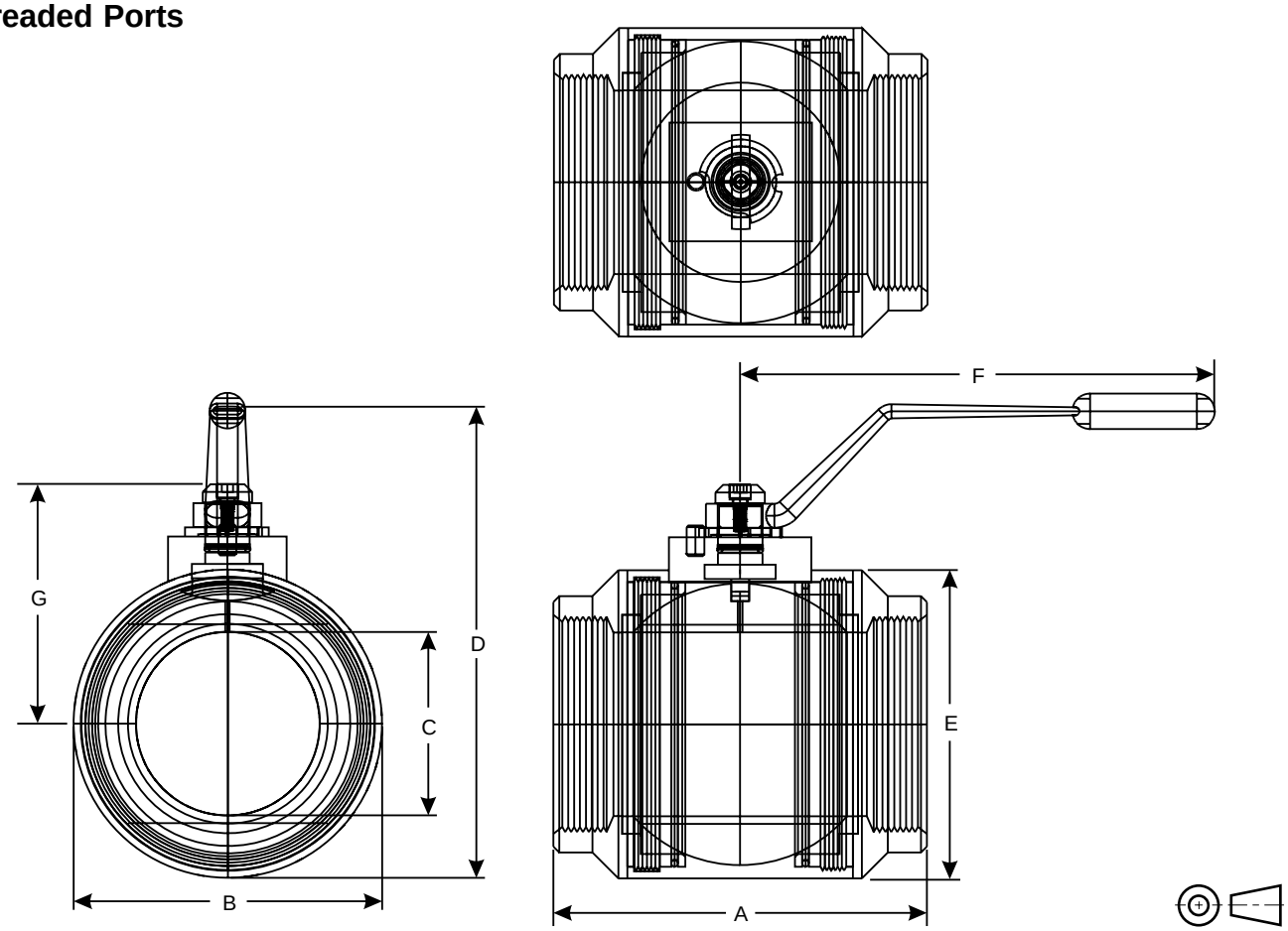
Threaded Ports



Code	Port Thread Size	Working Pressure	Dimensions mm (in)						
			A	B	C	D	E	F	G
NPT and SAE Thread									
4	1/4"	28 Bar (400 PSI)	66.8 (2.63)	38.1 (1.50)	6.4 (0.25)	65.8 (2.59)	38.1 (1.50)	85.6 (3.37)	33.3 (1.31)
6	3/8"	28 Bar (400 PSI)	66.8 (2.63)	38.1 (1.50)	9.7 (0.38)	65.8 (2.59)	38.1 (1.50)	85.6 (3.37)	33.3 (1.31)
8	1/2"	28 Bar (400 PSI)	66.8 (2.63)	38.1 (1.50)	12.7 (0.50)	65.8 (2.59)	38.1 (1.50)	85.6 (3.37)	33.3 (1.31)
12	3/4"	28 Bar (400 PSI)	83.3 (3.28)	44.5 (1.75)	19.1 (0.75)	95.8 (3.77)	44.5 (1.75)	130.0 (5.12)	36.3 (1.43)
16	1"	28 Bar (400 PSI)	88.4 (3.48)	50.8 (2.00)	25.4 (1.00)	102.1 (4.02)	50.8 (2.00)	130.0 (5.12)	39.6 (1.56)
20	1 1/4"	28 Bar (400 PSI)	99.1 (3.90)	69.9 (2.75)	31.8 (1.25)	129.8 (5.11)	66.3 (2.61)	173.0 (6.81)	53.8 (2.12)
24	1 1/2"	28 Bar (400 PSI)	109.7 (4.32)	82.6 (3.25)	38.1 (1.50)	142.2 (5.60)	78.7 (3.10)	173.0 (6.81)	59.9 (2.36)
32	2"	28 Bar (400 PSI)	124.5 (4.90)	101.6 (4.00)	50.8 (2.00)	160.8 (6.33)	97.3 (3.83)	173.0 (6.81)	67.3 (2.65)
40	2 1/2"	28 Bar (400 PSI)	152.4 (6.00)	127.0 (5.00)	63.5 (2.50)	200.4 (7.89)	135.9 (5.35)	222.3 (8.75)	92.2 (3.63)
48	3"	28 Bar (400 PSI)	185.7 (7.31)	152.4 (6.00)	76.2 (3.00)	224.8 (8.85)	160.3 (6.31)	222.3 (8.75)	103.9 (4.09)
64	4"	28 Bar (400 PSI)	225.8 (8.89)	177.8 (7.00)	101.6 (4.00)	251.5 (9.90)	186.9 (7.36)	222.3 (8.75)	117.6 (4.63)

3300-2.p65, dd

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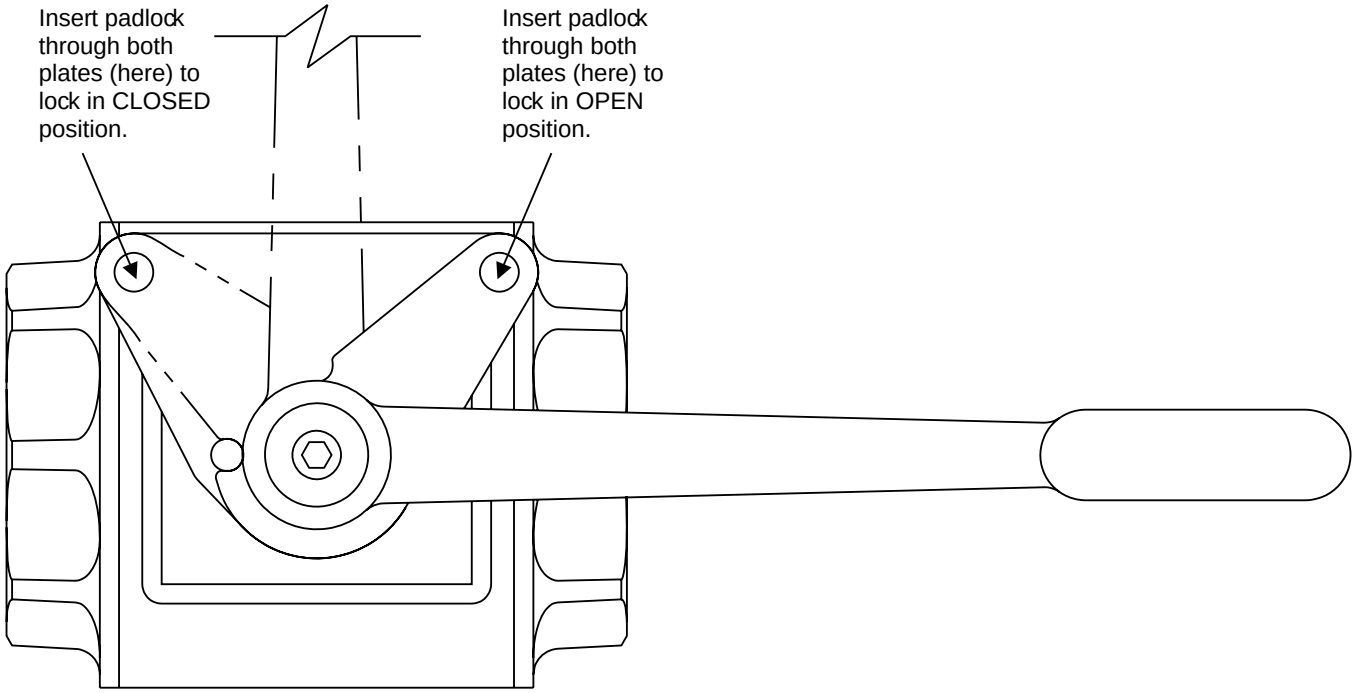
BVHPLK: Standard Series 'BVHPLK-*' kit replaces the stopwasher with a stationary and moving plate, as illustrated below. As the handle is actuated, the moving plate aligns with one of the two locking positions in the stationary plate, enabling the valve to be locked in either **fully closed** or **fully open** position.



Ordering Information

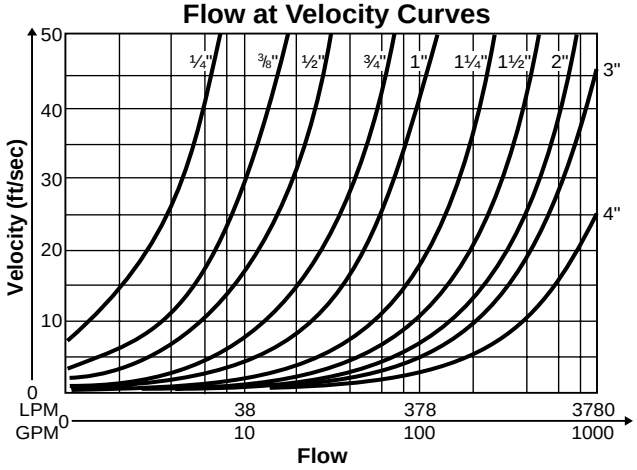
BVAL		Standard Locking
Code	**Size**	**(Part Number)**
4	1/4"	BVHPLK-1
6	3/8"	BVHPLK-1
8	1/2"	BVHPLK-1
12	3/4"	BVHPLK-2
16	1"	BVHPLK-2
20	1 1/4"	BVHPLK-3
24	1 1/2"	BVHPLK-3
32	2"	BVHPLK-3
40	2 1/2"	BVHPLK-4
48	3"	BVHPLK-4
64	4"	BVHPLK-4

Ball Valve Sizing Chart (2-Way)

Parker's unrestricted bore ball valves provide a fluid path which, in most cases, imposes no discernable pressure drop in standard hydraulic circuits. As a result, you can treat our valves as just like a length of fluid line, unless you are working with closed loop or other circuits where a tiny pressure drop carries a price tag in heat generation, etc.

The selection chart at the right may be used as a guide for confirming your choice of ball valve fluid line size relative to the expected flow in LPM (GPM) at a given velocity.

Flow at Velocity Curves



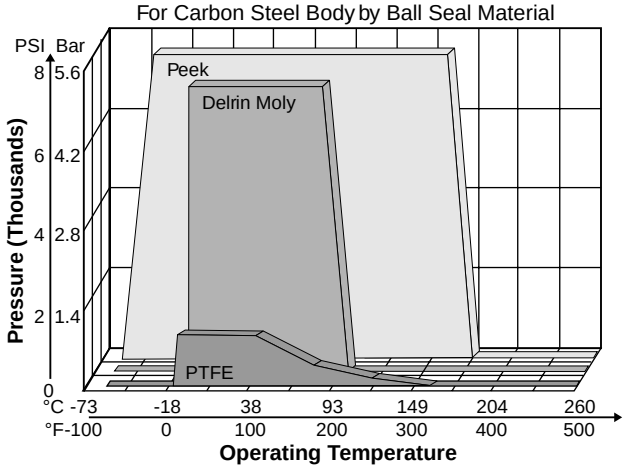
Ball Seals and Internal O-Rings

Standard Ball Seal Materials: Most application needs can be met by specifying one of the following ball seal materials:

- **Delrin™ Moly:** Standard with most ball valves. High pressure, moderate temperature range.
- **PTFE:** Excellent for suction and low pressure use. Inert to most substances and safe for food/water use.
- **Peek Hi-Temp:** Cost effective, provides additional temperature range up to 176.7°C (350°F). Best results with fluorocarbon sealing.

Ball Seal Temperature Ranges

For Carbon Steel Body by Ball Seal Material

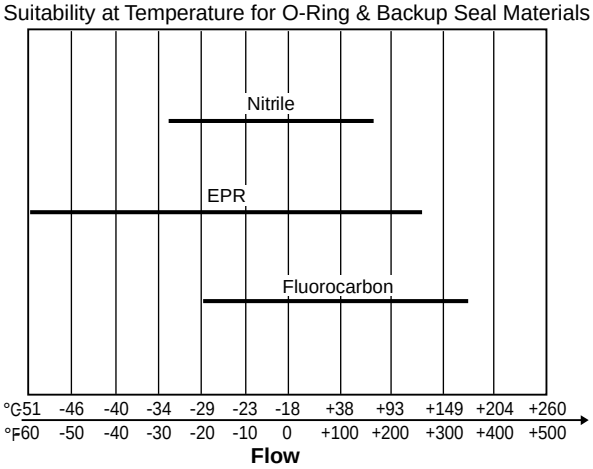


O-Ring and Backup Ring Material

- **Nitrile:** The industry standard for hydraulics using petroleum based fluids. Not suitable above 100°C (212°F).
- **EPR:** For use with Phosphate Esters (“Skydrol”), strong acids and bases, and other hostile media. Not compatible with petroleum based fluids. Good temperature range.
- **Fluorocarbon:** Extends temperature range to 350°F (176.7°C) with most Nitrile compatible media. Somewhat resistant to hostile media.

Elastomer Temperature Ranges

Suitability at Temperature for O-Ring & Backup Seal Materials



Sealing Materials Technical Data

Never operate Parker Ball Valves outside the temperature range published below for your selected thermoplastic and elastomer materials, even if the combination is approved in the Media Acceptability Table. You may experience valve leakage or failure.

	Ball Seal Materials (Box 6)			O-Ring & Backup Seal Materials (Digit 4)		
Order Code	**1**	**2**	**4**	**N**	**E**	**V**
Description	**Delrin™ Moly**	**PTFE**	**PEEK Hi-Temp**	**Nitrile**	**EPR**	**Fluorocarbon**
Temperature Range	-30°C to +100°C (-22°F to +212°F)	-60°C to +180°C (-76°F to +356°F)	-40°C to +250°C (-40°F to +482°F)	-30°C to +100°C (-22°F to +212°F)	-50°C to +150°C (-58°F to +302°F)	-25°C to +250°C (-13°F to +482°F)
Seal Compound Identification	Delrin+MoS2 Polyoxymethylene impregnated with Molybdenum Disulphide	Polytetra-fluoroethylene	Polyether-ether-ketone	Nitrile Butadiene rubber	Ethylene-polypropylene-diene rubber	Fluoropropylene methylene
Acronym	DM	PTFE	PEEK	NBR	EPR EPDM	FPM
Classification Synthesis	**Thermoplast** Saturated heteropolymer of heterogeneous polymer chains compounded with sulphide of molyb-denum metal for lubrication	**Thermoplast** Homogeneous, pure polymer chains, contain-ing fluorine	**Thermoplast** Aromatic linear polymer	**Elastomer** Unsaturated heteropolymer compounded from acrylonitrate and butadiene	**Elastomer** Saturated heteropolymer utilizing double valence bands outside the primary chain	**Elastomer** Multiple monomers & fluorine com-pounded into saturated hetero-polymer
Commercial Trade Names	Made to Parker's specifications	PTFE Hostaflon Fluon	Victrex	Nitrile Perbunan Chemigum Elaprim Krynac	Buna AP Dutral Epcar Keltran Nordel	Viton Fluorel Technoflon
Chemical Resistance Examples						
Suitable	Hydraulic fluids Water Inert Gases Air Alcohols Glycols Petroleum based fluids	Foodstuffs Acids & Alkalis Organic & inorganic solvents	Most fluids acceptable with Delrin Moly	Hydraulic fluids (except Skydrol) Water Air Petroleum based fluids	Phosphate esters Brake fluid Acids & Alkalis	NBR compatible fluids Acids & Alkalis
Not suitable	High molar acids & alkalis Fluorines Liquids for human consumption	Fluorines Liquid alkali metals	High molar acids & alkalis	Phosphate esters	Petroleum based oil & grease Chlorinated hydrocarbons	Phosphate esters

The Parker Low Pressure Ball Valve Product Line serves in applications ranging from 600 to 2,000 PSI.

Features

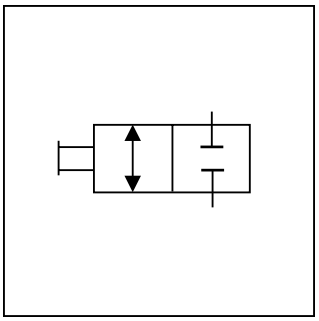
- *Packing Nut Stem*
- *PTFE Seals*
- *Full Optimum Flow*
- *Blow Out Proof Stem*
- *Brass, Carbon Steel, and Stainless Steel Bodies*

Advantages

- *Seals leak by tightening*
- *High resistance to corrosion*
- *Maximum system efficiency*
- *Safety and reliability*
- *One ball valve source*

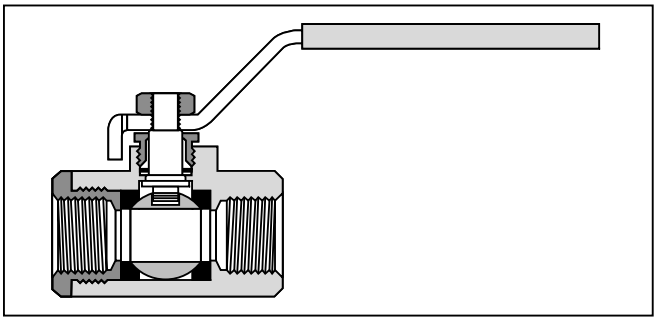
General Description

Series 500 low pressure ball valves provide total shut-off capability for services up to 41 Bar (600 PSI). Series 500 consists of NPT female/female ports, Series 510 and 501 are male/female in SAE and NPT respectively, and Series 506 are female/female in SAE. Series 502 features panel mounting capability.



Operation

A quarter turn of the handle is on or off. Ball valves are not intended for use as a throttling valve. Attempting to use it in these applications may result in premature seal failure and/or inability to turn the valve handle.



Features

- Ball valve bodies are machined from high quality CA377 forgings which provide extended service life and resist failure caused by severe temperature conditions.
- Highly inert PTFE seats and seals provide resistance to chemical corrosion.
- Blowout proof stem design, chrome plated brass ball and a special design handle enable increased turn and leverage for ease of opening and closing.
- Padlocking handle option provides lock-out capability where required.
- Venting option relieves downstream pressure in pneumatic applications.

Specifications

Maximum Pressure	41 Bar (600 PSI)
Vented Up To	17 Bar (250 PSI)
Working Pressure	Saturated steam 10 Bar (150 PSI) and 204°C (400°F) Vacuum 29 in. Hg

Ordering Information

Style

Code	Type
V	Valve
VP *	Valve, Padlocking Handle
VV **	Valve, Vented
VVP **	Valve Vented, Padlocking Handle

* Only available up to #16 SAE in Series 506.

** Not available in Series 506.

Type

Code	Type
500	Female/Female NPT Ports
501	Male/Female NPT Ports
502	Female/Female NPT Ports Panel Mount
506	Female/Female Straight Thread O-ring Ports
510	Male/Female Straight Thread O-ring Ports

Material: **P**

Code	Type
P	Brass

Size

Code	Size
4	1/4" NPT
6	3/8" NPT
8	1/2" NPT
12	3/4" NPT
16	1" NPT
20*	1 1/4" NPT
24*	1 1/2" NPT
32*	2" NPT

* Available only in 500 Type

Options

Code	Type
01	Stainless Steel Ball & Stem (-4 to -16)
02	Stainless Steel Handle & Nut
03	Stainless Steel Ball, Stem, Handle & Nut (-4 to -16)

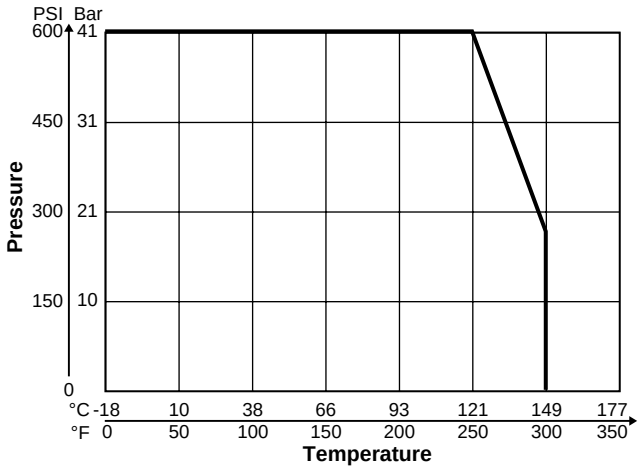
Design Series

NOTE: Not required when ordering.

3300-2.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

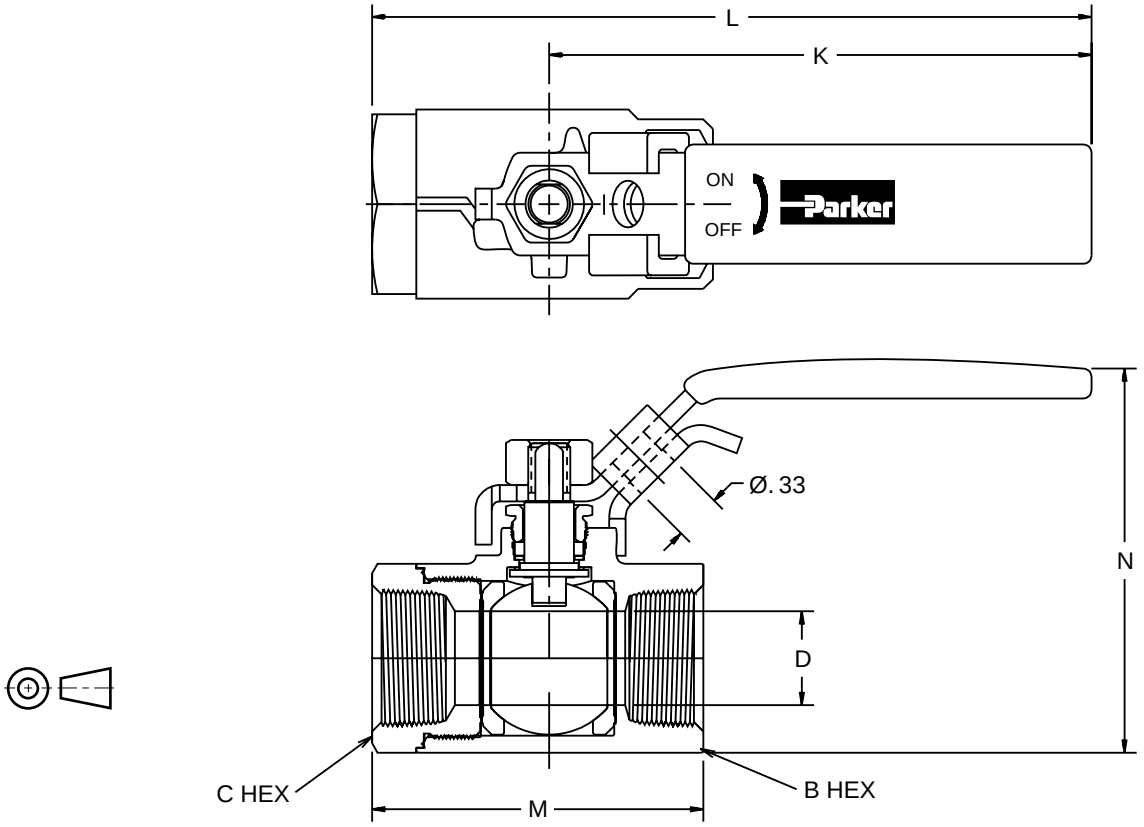
Performance Curve



Flow Data

Type 500, 502		Type 510		Type 501		Type 506	
Valve Size	**C_v**	**Valve Size**	**C_v**	**Valve Size**	**C_v**	**Valve Size**	**C_v**
1/4"	4.0	#4	0.8	1/4"	6.3	#4	4.0
3/8"	5.8	#6	2.1	3/8"	5.7	#6	5.8
1/2"	12.0	#8	5.3	1/2"	10.0	#8	12.0
3/4"	35.0	#12	13.0	3/4"	25.0	#12	25.0
1"	54.0	#16	33.0	1"	35.0	#16	35.0
1-1/4"	57.0	—	—	—	—	#20	57.0
1-1/2"	92.0	—	—	—	—	#24	92.0
2"	224.0	—	—	—	—	#32	224.0

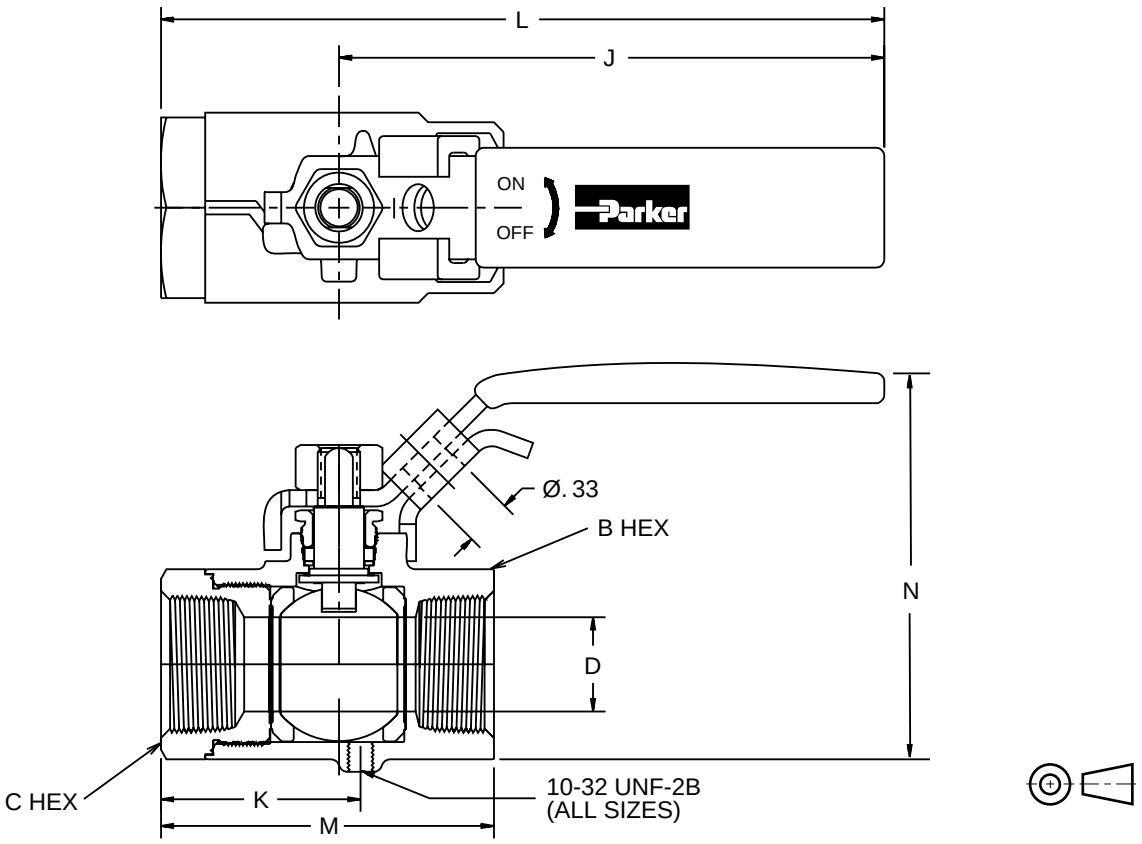
Model V500P and VP500P



Part Number	Pipe Thread (PTF)	B Hex	C Hex	Dimensions mm (in)				D Flow Ø
				K	L	M	N	
Female-Female Pipe Ends V500P								
V500P4	1/4"	15/16"	15/16"	100.6 (3.96)	124.5 (4.90)	51.6 (2.03)	62.7 (2.47)	9.5 (.375)
V500P6	3/8"	15/16"	15/16"	100.6 (3.96)	124.5 (4.90)	51.6 (2.03)	62.7 (2.47)	9.5 (.375)
V500P8	1/2"	1-1/16"	1-1/16"	100.6 (3.96)	127.0 (5.00)	55.9 (2.20)	65.5 (2.58)	12.7 (.500)
V500P12	3/4"	1-1/4"	1-5/16"	100.6 (3.96)	133.4 (5.25)	61.5 (2.42)	71.4 (2.81)	17.4 (.685)
V500P16	1"	1-1/2"	1-9/16"	100.6 (3.96)	135.6 (5.34)	69.9 (2.75)	78.2 (3.08)	22.2 (.875)
Locking Handle, Female Pipe Ends VP500P (Shown above)								
VP500P4	1/4"	15/16"	15/16"	100.6 (3.96)	124.5 (4.90)	51.6 (2.03)	62.7 (2.47)	9.5 (.375)
VP500P6	3/8"	15/16"	15/16"	100.6 (3.96)	124.5 (4.90)	51.6 (2.03)	62.7 (2.47)	9.5 (.375)
VP500P8	1/2"	1-1/16"	1-1/16"	100.6 (3.96)	127.0 (5.00)	55.9 (2.20)	65.5 (2.58)	12.7 (.500)
VP500P12	3/4"	1-1/4"	1-5/16"	100.6 (3.96)	133.4 (5.25)	61.5 (2.42)	71.4 (2.81)	17.4 (.685)
VP500P16	1"	1-1/2"	1-9/16"	100.6 (3.96)	135.6 (5.34)	69.9 (2.75)	78.2 (3.08)	22.2 (.875)

Locking handle parts: For use with 5/16" Ø shank lock; 33Ø

Model VV500P and VVP500P



Part Number	Pipe Thread	B Hex	C Hex	Dimensions mm (in)					D Flow Ø
				J	K	L	M	N	
Vented, Female Pipe Ends VV500P									
VV500P4	1/4"	15/16"	15/16"	100.6 (3.96)	28.2 (1.11)	124.5 (4.90)	51.6 (2.03)	62.7 (2.47)	9.5 (.375)
VV500P6	3/8"	15/16"	15/16"	100.6 (3.96)	28.2 (1.11)	124.5 (4.90)	51.6 (2.03)	62.7 (2.47)	9.5 (.375)
VV500P8	1/2"	1-1/16"	1-1/16"	100.6 (3.96)	31.2 (1.23)	127.0 (5.00)	55.9 (2.20)	65.5 (2.58)	12.7 (.500)
VV500P12	3/4"	1-1/4"	1-5/16"	100.6 (3.96)	36.8 (1.45)	133.4 (5.25)	61.5 (2.42)	71.4 (2.81)	17.4 (.685)
VV500P16	1"	1-1/2"	1-9/16"	100.6 (3.96)	40.1 (1.58)	135.6 (5.34)	69.9 (2.75)	78.2 (3.08)	22.2 (.875)
OSHA 29 CFR Part 1910 Vented, Locking Handle, Female Pipe Ends VVP500P (Shown above)									
VVP500P4	1/4"	15/16"	15/16"	100.6 (3.96)	28.2 (1.11)	124.5 (4.90)	51.6 (2.03)	62.7 (2.47)	9.5 (.375)
VVP500P6	3/8"	15/16"	15/16"	100.6 (3.96)	28.2 (1.11)	124.5 (4.90)	51.6 (2.03)	62.7 (2.47)	9.5 (.375)
VVP500P8	1/2"	1-1/16"	1-1/16"	100.6 (3.96)	31.2 (1.23)	127.0 (5.00)	55.9 (2.20)	65.5 (2.58)	12.7 (.500)
VVP500P12	3/4"	1-1/4"	1-5/16"	100.6 (3.96)	36.8 (1.45)	133.4 (5.25)	61.5 (2.42)	71.4 (2.81)	17.4 (.685)
VVP500P16	1"	1-1/2"	1-9/16"	100.6 (3.96)	40.1 (1.58)	135.6 (5.34)	69.9 (2.75)	78.2 (3.08)	22.2 (.875)

Locking handle parts: For use with 5/16" Ø shank lock

3300-2.p65, dd

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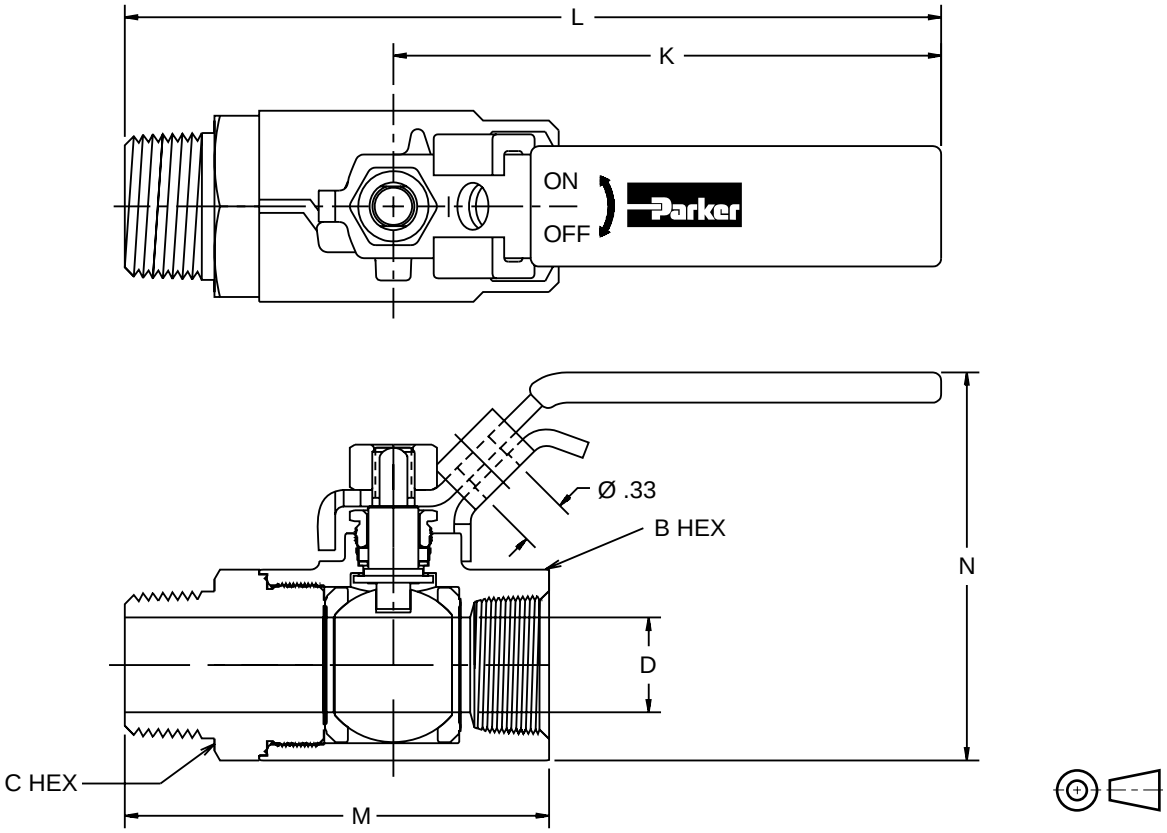
Hydraulic Valve Division
Elyria, Ohio, USA

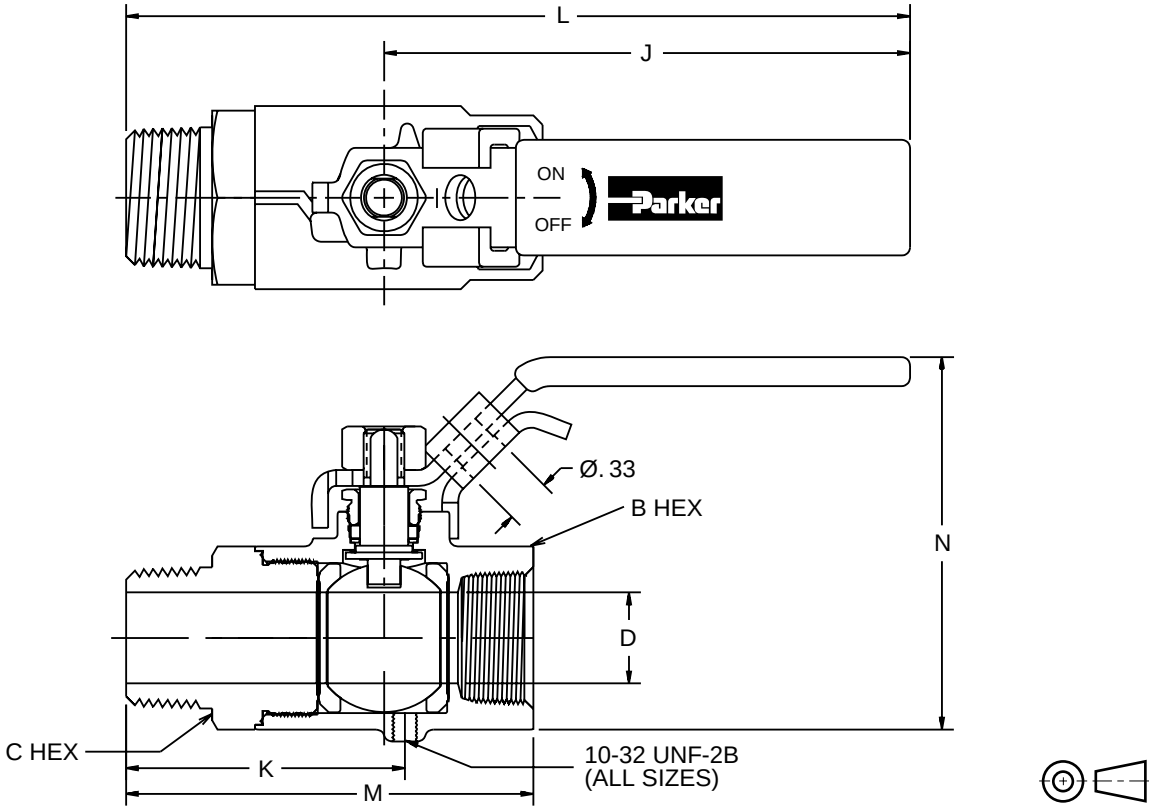
Model V501P and VP501P



Part Number	Pipe Thread	B Hex	C Hex	Dimensions mm (in)				D Flow Ø
				K	L	M	N	
Male-Female Pipe Ends V501P								
V501P4	1/4"	15/16"	15/16"	100.6 (3.96)	138.7 (5.46)	65.8 (2.59)	62.7 (2.47)	8.7 (.344)
V501P6	3/8"	15/16"	15/16"	100.6 (3.96)	138.7 (5.46)	65.8 (2.59)	62.7 (2.47)	9.5 (.375)
V501P8	1/2"	1-1/16"	1-1/16"	100.6 (3.96)	146.1 (5.75)	74.9 (2.95)	65.5 (2.58)	12.7 (.500)
V501P12	3/4"	1-1/4"	1-5/16"	100.6 (3.96)	148.1 (5.83)	76.2 (3.00)	71.4 (2.81)	17.4 (.685)
V501P16	1"	1-1/2"	1-9/16"	100.6 (3.96)	157.2 (6.19)	91.4 (3.60)	78.2 (3.08)	22.2 (.875)
Locking Handle, Male-Female Pipe Ends VP501P (Shown above)								
VP501P4	1/4"	15/16"	15/16"	100.6 (3.96)	138.7 (5.46)	65.8 (2.59)	62.7 (2.47)	8.7 (.344)
VP501P6	3/8"	15/16"	15/16"	100.6 (3.96)	138.7 (5.46)	65.8 (2.59)	62.7 (2.47)	9.5 (.375)
VP501P8	1/2"	1-1/16"	1-1/16"	100.6 (3.96)	146.1 (5.75)	74.9 (2.95)	65.5 (2.58)	12.7 (.500)
VP501P12	3/4"	1-1/4"	1-5/16"	100.6 (3.96)	148.1 (5.83)	76.2 (3.00)	71.4 (2.81)	17.4 (.685)
VP501P16	1"	1-1/2"	1-9/16"	100.6 (3.96)	157.2 (6.19)	91.4 (3.60)	78.2 (3.08)	22.2 (.875)

Locking handle parts: For use with 5/16" ∅ shank lock

Model VV501P and VVP501P



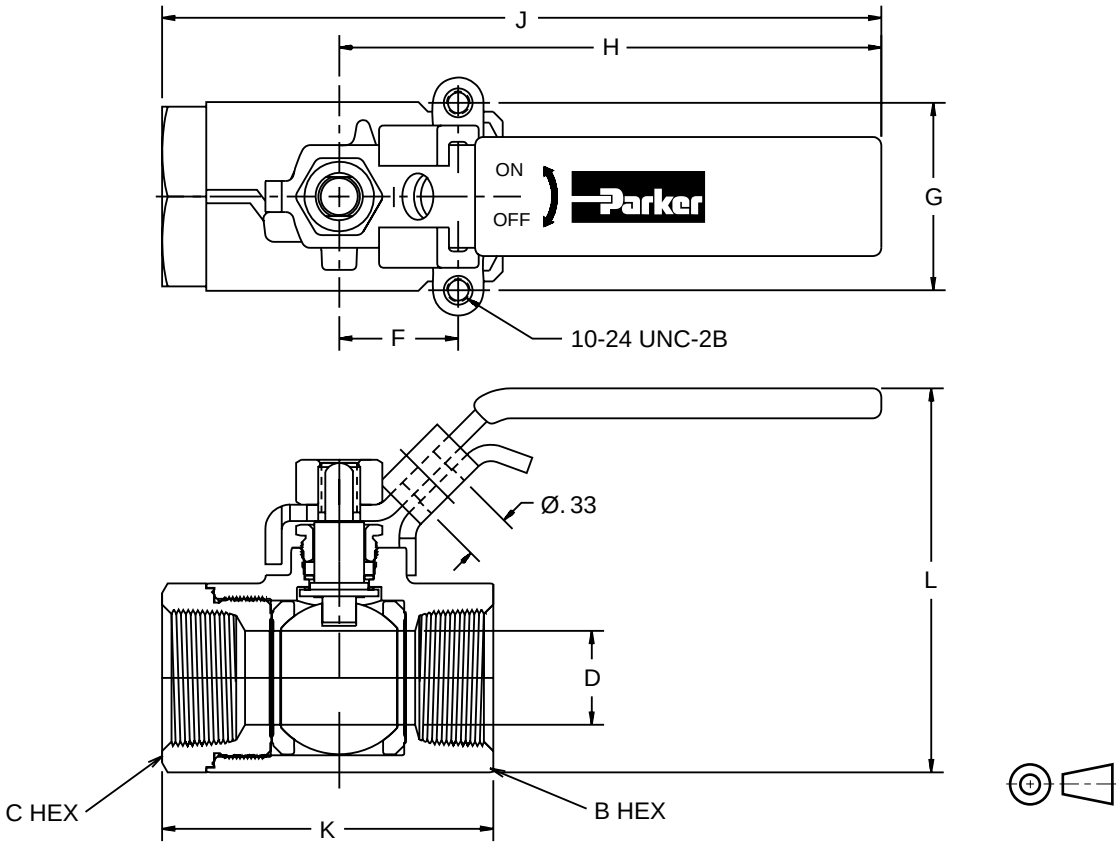
Part Number	Pipe Thread (PTF)	B Hex	C Hex	Dimensions mm (in)					D Flow Ø
				J	K	L	M	N	
Vented, Male-Female Pipe Ends VV501P									
VV501P4	1/4"	15/16"	15/16"	100.6 (3.96)	42.4 (1.67)	138.7 (5.46)	65.8 (2.59)	62.7 (2.47)	8.7 (.344)
VV501P6	3/8"	15/16"	15/16"	100.6 (3.96)	42.4 (1.67)	138.7 (5.46)	65.8 (2.59)	62.7 (2.47)	9.5 (.375)
VV501P8	1/2"	1-1/16"	1-1/16"	100.6 (3.96)	50.3 (1.98)	146.1 (5.75)	74.9 (2.95)	65.5 (2.58)	12.7 (.500)
VV501P12	3/4"	1-1/4"	1-5/16"	100.6 (3.96)	51.6 (2.03)	148.1 (5.83)	76.2 (3.00)	71.4 (2.81)	17.4 (.685)
VV501P16	1"	1-1/2"	1-9/16"	100.6 (3.96)	61.7 (2.43)	157.2 (6.19)	91.4 (3.60)	78.2 (3.08)	22.2 (.875)
OSHA 29 CFR Part 1910 Vented, Locking Handle, Male-Female Pipe Ends VVP501P (Shown above)									
VVP501P4	1/4"	15/16"	15/16"	100.6 (3.96)	42.4 (1.67)	138.7 (5.46)	65.8 (2.59)	62.7 (2.47)	8.7 (.344)
VVP501P6	3/8"	15/16"	15/16"	100.6 (3.96)	42.4 (1.67)	138.7 (5.46)	65.8 (2.59)	62.7 (2.47)	9.5 (.375)
VVP501P8	1/2"	1-1/16"	1-1/16"	100.6 (3.96)	50.3 (1.98)	146.1 (5.75)	74.9 (2.95)	65.5 (2.58)	12.7 (.500)
VVP501P12	3/4"	1-1/4"	1-5/16"	100.6 (3.96)	51.6 (2.03)	148.1 (5.83)	76.2 (3.00)	71.4 (2.81)	17.4 (.685)
VVP501P16	1"	1-1/2"	1-9/16"	100.6 (3.96)	61.7 (2.43)	157.2 (6.19)	91.4 (3.60)	78.2 (3.08)	22.2 (.875)

Locking handle parts: For use with 5/16" ∅ shank lock

3300-2.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

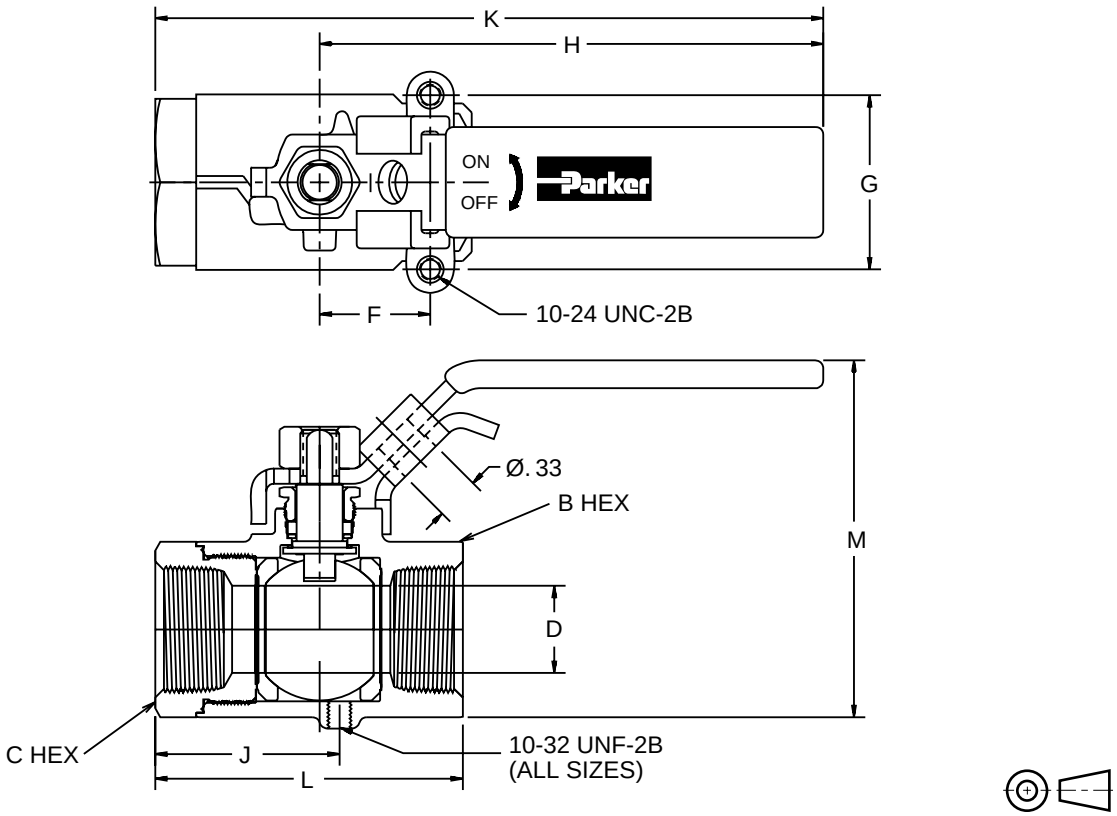
Model V502P and VP502P



Part Number	Size	B Hex	C Hex	Dimensions mm (in)						D Flow Ø
				F	G	H	J	K	L	
Female-Female Pipe Ends, Panel Mount V502P										
V502P4	1/4"	15/16"	15/16"	12.7 (0.50)	28.4 (1.12)	100.6 (3.96)	124.5 (4.90)	51.6 (2.03)	62.7 (2.47)	9.5 (.375)
V502P6	3/8"	15/16"	15/16"	12.7 (0.50)	28.4 (1.12)	100.6 (3.96)	124.5 (4.90)	51.6 (2.03)	62.7 (2.47)	9.5 (.375)
V502P8	1/2"	1-1/16"	1-1/16"	12.7 (0.50)	28.4 (1.12)	100.6 (3.96)	127.0 (5.00)	55.9 (2.20)	65.5 (2.58)	12.7 (.500)
V502P12	3/4"	1-1/4"	1-5/16"	22.1 (0.87)	34.8 (1.37)	100.6 (3.96)	133.4 (5.25)	61.5 (2.42)	71.4 (2.81)	17.4 (.685)
V502P16	1"	1-1/2"	1-9/16"	22.1 (0.87)	34.8 (1.37)	100.6 (3.96)	135.6 (5.34)	69.9 (2.75)	78.2 (3.08)	22.2 (.875)
Locking Handle, Female Pipe Ends, Panel Mount VP502P (Shown above)										
VP502P4	1/4"	15/16"	15/16"	12.7 (0.50)	28.4 (1.12)	100.6 (3.96)	124.5 (4.90)	51.6 (2.03)	62.7 (2.47)	9.5 (.375)
VP502P6	3/8"	15/16"	15/16"	12.7 (0.50)	28.4 (1.12)	100.6 (3.96)	124.5 (4.90)	51.6 (2.03)	62.7 (2.47)	9.5 (.375)
VP502P8	1/2"	1-1/16"	1-1/16"	12.7 (0.50)	28.4 (1.12)	100.6 (3.96)	127.0 (5.00)	55.9 (2.20)	65.5 (2.58)	12.7 (.500)
VP502P12	3/4"	1-1/4"	1-5/16"	22.1 (0.87)	34.8 (1.37)	100.6 (3.96)	133.4 (5.25)	61.5 (2.42)	71.4 (2.81)	17.4 (.685)
VP502P16	1"	1-1/2"	1-9/16"	22.1 (0.87)	34.8 (1.37)	100.6 (3.96)	135.6 (5.34)	69.9 (2.75)	78.2 (3.08)	22.2 (.875)

Locking handle parts: For use with 5/16" ∅ shank lock

Model VV502P and VVP502P



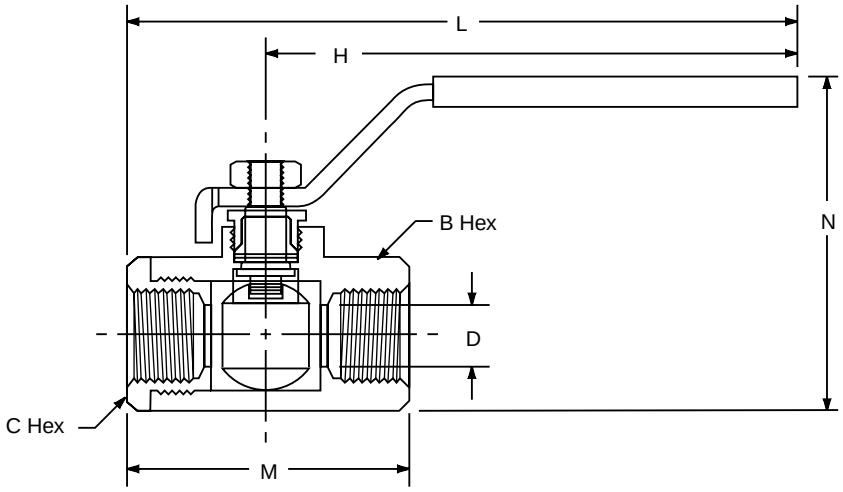
Part Number	Pipe Thread	B Hex	C Hex	Dimensions mm (in) F	G	H	J	K	L	M	D Flow Ø
Vented, Female-Female Pipe Ends, Panel Mount VV502P											
VV502P4	1/4"	15/16"	15/16"	12.7 (0.50)	28.4 (1.12)	100.6 (3.96)	28.2 (1.11)	124.5 (4.90)	51.6 (2.03)	62.7 (2.47)	9.5 (.375)
VV502P6	3/8"	15/16"	15/16"	12.7 (0.50)	28.4 (1.12)	100.6 (3.96)	28.2 (1.11)	124.5 (4.90)	51.6 (2.03)	62.7 (2.47)	9.5 (.375)
VV502P8	1/2"	1-1/16"	1-1/16"	12.7 (0.50)	28.4 (1.12)	100.6 (3.96)	31.2 (1.23)	127.0 (5.00)	55.9 (2.20)	65.5 (2.58)	12.7 (.500)
VV502P12	3/4"	1-1/4"	1-5/16"	22.1 (0.87)	34.8 (1.37)	100.6 (3.96)	36.8 (1.45)	133.4 (5.25)	61.5 (2.42)	71.4 (2.81)	17.4 (.685)
VV502P16	1"	1-1/2"	1-9/16"	22.1 (0.87)	34.8 (1.37)	100.6 (3.96)	40.1 (1.58)	135.6 (5.34)	69.9 (2.75)	78.2 (3.08)	22.2 (.875)
OSHA 29 CFR Part 1910 Vented, Locking Handle, Female Pipe Ends, Panel Mount VVP502P (Shown above)											
VVP502P4	1/4"	15/16"	15/16"	12.7 (0.50)	28.4 (1.12)	100.6 (3.96)	28.2 (1.11)	124.5 (4.90)	51.6 (2.03)	62.7 (2.47)	9.5 (.375)
VVP502P6	3/8"	15/16"	15/16"	12.7 (0.50)	28.4 (1.12)	100.6 (3.96)	28.2 (1.11)	124.5 (4.90)	51.6 (2.03)	62.7 (2.47)	9.5 (.375)
VVP502P8	1/2"	1-1/16"	1-1/16"	12.7 (0.50)	28.4 (1.12)	100.6 (3.96)	31.2 (1.23)	127.0 (5.00)	55.9 (2.20)	65.5 (2.58)	12.7 (.500)
VVP502P12	3/4"	1-1/4"	1-5/16"	22.1 (0.87)	34.8 (1.37)	100.6 (3.96)	36.8 (1.45)	133.4 (5.25)	61.5 (2.42)	71.4 (2.81)	17.4 (.685)
VVP502P16	1"	1-1/2"	1-9/16"	22.1 (0.87)	34.8 (1.37)	100.6 (3.96)	40.1 (1.58)	135.6 (5.34)	69.9 (2.75)	78.2 (3.08)	22.2 (.875)

Locking handle parts: For use with 5/16" ∅ shank lock

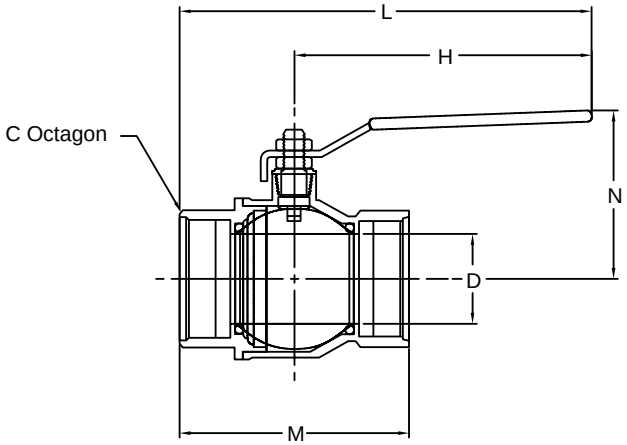
3300-2.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

Model V506P



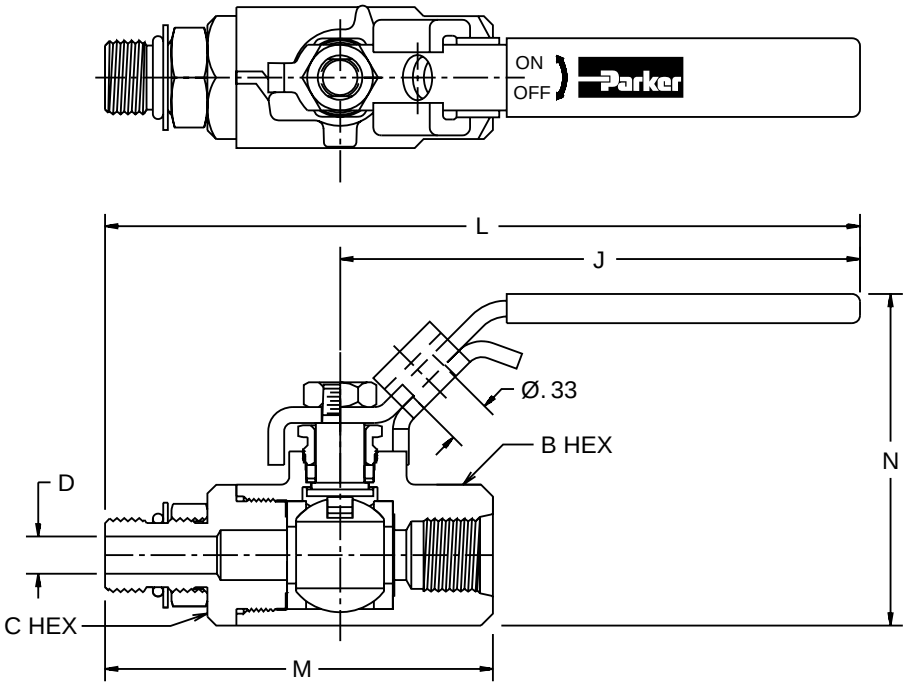
Part Number	Straight Thread	B Hex	C Hex	Dimensions mm (in) H	L	M	N	D Flow Ø
Female/Female, Straight Thread O-Ring Port V506P								
V506P4	7/16-20	15/16"	15/16"	100.6 (3.96)	127.3 (5.01)	55.9 (2.20)	62.7 (2.47)	9.5 (.375)
V506P6	9/16-18	15/16"	15/16"	100.6 (3.96)	128.8 (5.07)	57.4 (2.26)	62.7 (2.47)	9.5 (.375)
V506P8	3/4-16	1 1/16"	1 1/16"	100.6 (3.96)	131.6 (5.18)	61.5 (2.42)	66.0 (2.60)	12.7 (.500)
V506P12	1 1/16-12	1 1/4"	1 5/16"	100.6 (3.96)	149.1 (5.87)	87.9 (3.46)	71.4 (2.81)	17.4 (.685)
V506P16	1 5/16-12	1 1/2"	1 9/16"	100.6 (3.96)	151.4 (5.96)	93.5 (3.68)	78.2 (3.08)	22.2 (.875)



Part Number	Straight Thread	B Hex	C Hex	Dimensions mm (in) H	L	M	N	D Flow Ø
Female/Female, Straight Thread O-Ring Port V506P								
V506P20	1 5/8-12	49.0 (1.93)	49.0 (1.93)	158.0 (6.22)	204.5 (8.05)	93.0 (3.66)	76.5 (3.01)	30.0 (1.18)
V506P24	1 7/8-12	54.1 (2.13)	54.1 (2.13)	158.0 (6.22)	209.0 (8.23)	102.1 (4.02)	82.6 (3.25)	38.1 (1.50)
V506P32	2 1/2-12	72.4 (2.85)	72.4 (2.85)	158.0 (6.22)	218.4 (8.60)	120.9 (4.76)	89.4 (3.52)	48.0 (1.89)

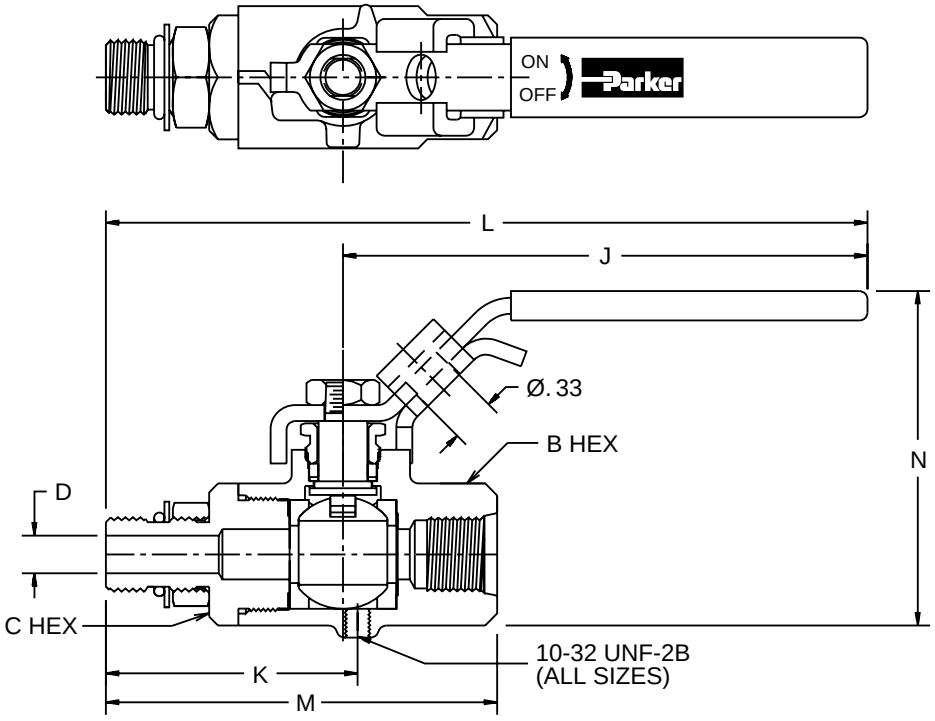
3300-2.p65, dd

Model V510P and VP510P



Part Number	Straight Thread	B Hex	C He	Dimensions mm (in)				D Flow Ø
				K	L	M	N	
Male-Female, Straight Thread O-Ring Port V510P								
V510P4	7/16-20	15/16"	15/16"	100.6 (3.96)	142.5 (5.61)	72.4 (2.85)	62.7 (2.47)	4.8 (.188)
V510P6	9/16-18	15/16"	15/16"	100.6 (3.96)	144.3 (5.68)	74.2 (2.92)	62.7 (2.47)	7.1 (.281)
V510P8	3/4-16	1-1/16"	1-1/16"	100.6 (3.96)	149.4 (5.88)	80.5 (3.17)	65.5 (2.58)	10.7 (.422)
V510P12	1-1/16-12	1-1/4"	1-5/16"	100.6 (3.96)	163.6 (6.44)	102.4 (4.03)	71.4 (2.81)	16.7 (.656)
V510P16	1-5/16-12	1-1/2"	1-9/16"	100.6 (3.96)	166.6 (6.56)	108.7 (4.28)	78.2 (3.08)	22.2 (.875)
Locking Handle, Straight Thread O-Ring Port VP510P (Shown above)								
VP510P4	7/16-20	15/16"	15/16"	100.6 (3.96)	142.5 (5.61)	72.4 (2.85)	62.7 (2.47)	4.8 (.188)
VP510P6	9/16-18	15/16"	15/16"	100.6 (3.96)	144.3 (5.68)	74.2 (2.92)	62.7 (2.47)	7.1 (.281)
VP510P8	3/4-16	1-1/16"	1-1/16"	100.6 (3.96)	149.4 (5.88)	80.5 (3.17)	65.5 (2.58)	10.7 (.422)

Model VV510P and VVP510P



Part Number	Straight Thread	B Hex	C Hex	Dimensions mm (in)					D Flow Ø
				J	K	L	M	N	
Vented, Straight Thread O-Ring Port VV510P									
VV510P4	7/16-20	15/16"	15/16"	100.6 (3.96)	46.2 (1.82)	142.5 (5.61)	72.4 (2.85)	62.7 (2.47)	4.8 (.188)
VV510P6	9/16-18	15/16"	15/16"	100.6 (3.96)	48.0 (1.89)	144.3 (5.68)	74.2 (2.92)	62.7 (2.47)	7.1 (.281)
VV510P8	3/4-16	1-1/16"	1-1/16"	100.6 (3.96)	53.8 (2.12)	149.4 (5.88)	80.5 (3.17)	65.5 (2.58)	10.7 (.422)
VV510P12	1-1/16-12	1-1/4"	1-5/16"	100.6 (3.96)	67.1 (2.64)	163.6 (6.44)	102.4 (4.03)	71.4 (2.81)	16.7 (.656)
OSHA 29 CFR Part 1910 **Vented, Locking Handle, Male-Female, Straight Thread O-Ring Port VV510P (Shown above)**									
VVP510P4	7/16-20	15/16"	15/16"	100.6 (3.96)	46.2 (1.82)	142.5 (5.61)	72.4 (2.85)	62.7 (2.47)	4.8 (.188)
VVP510P6	9/16-18	15/16"	15/16"	100.6 (3.96)	48.0 (1.89)	144.3 (5.68)	74.2 (2.92)	62.7 (2.47)	7.1 (.281)
VVP510P8	3/4-16	1-1/16"	1-1/16"	100.6 (3.96)	53.8 (2.12)	149.4 (5.88)	80.5 (3.17)	65.5 (2.58)	10.7 (.422)

General Description

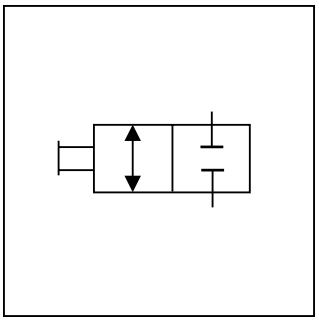
Series 520 low pressure ball valves provide total shut-off capability for services up to 41 Bar (600 PSI). This economical ball valve is available in female pipe sizes.

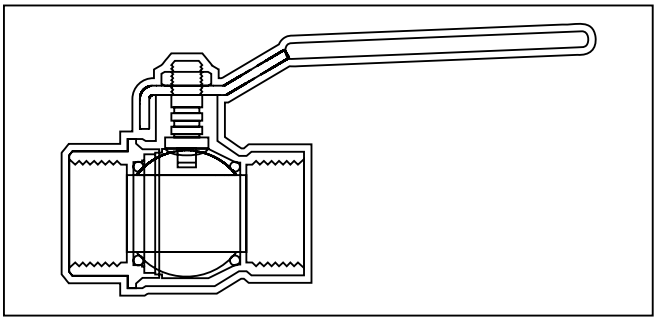
Operation

A quarter turn of the handle is on or off. Ball valves are not intended for use as a throttling valve. Attempting to use it in these applications may result in premature seal failure and/or inability to turn the valve handle.

Features

- Ball valve bodies are machined forgings which provide extended service life and resist failure caused by severe temperature conditions.
- Full flow design assures maximum system efficiency.
- Highly inert PTFE seats provide resistance to chemical corrosion.
- Two fluorocarbon o-rings at the stem provide maximum safety with no maintenance.
- Blowout proof stem design, chrome plated brass ball and a special design handle enable increased turn and leverage for ease of opening and closing.





Specifications

Maximum Pressure	41 Bar (600 PSI)
Working Pressure	Saturated steam 10 Bar (150 PSI) and 177°C (350°F) Vacuum 29 in. Hg

Ordering Information

V — Style

Code	Type
V	Valve

520 — Type

Code	Type
520	Female/Female NPT Ports

P — Material

Code	Type
P	Brass

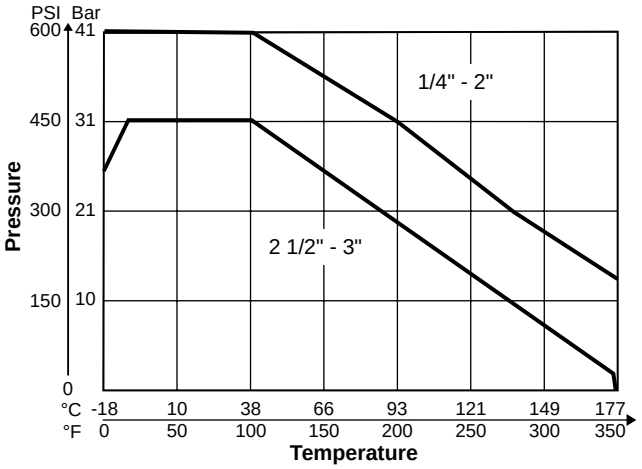
[ ] — Size

Code	Size
4	1/4" NPT
6	3/8" NPT
8	1/2" NPT
12	3/4" NPT
16	1" NPT
20	1 1/4" NPT
24	1 1/2" NPT
32	2" NPT
40	2 1/2" NPT
48	3" NPT

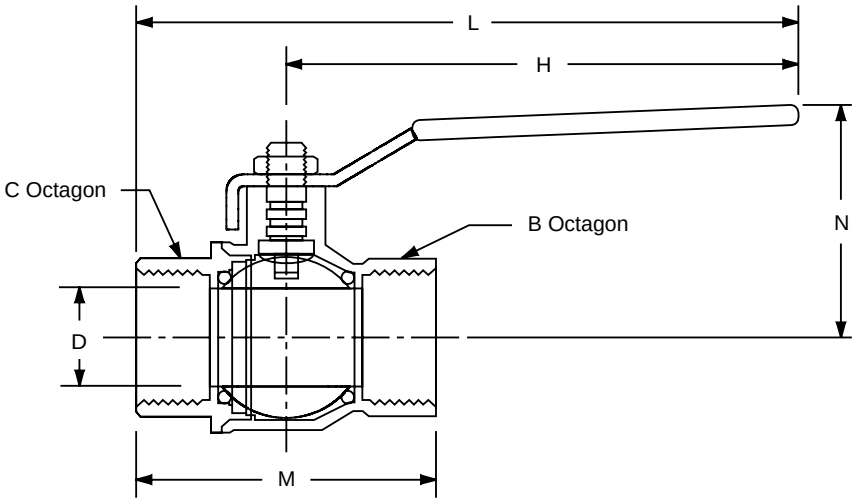
Design Series

NOTE:
Not required when ordering.

Performance Curves



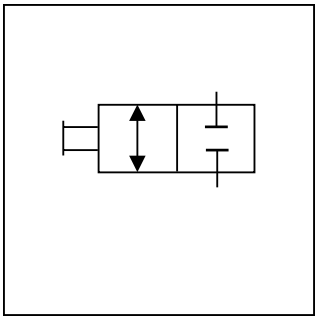
Dimensions

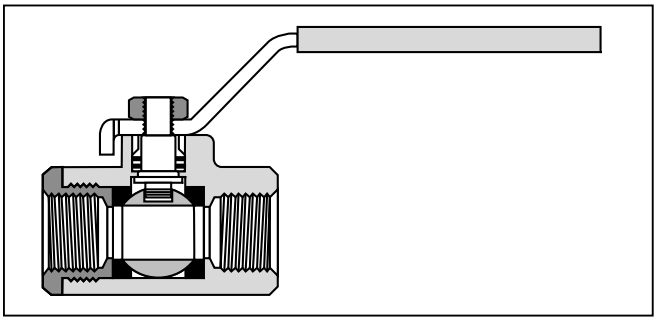


Part Number	Pipe Thread	B Octagon	C Octagon	Dimensions mm (in)				D Flow Ø
				H	L	M	N	
Brass Ball Valve V520P								
V520P4	1/4-18	20.1 (0.79)	20.1 (0.79)	100.1 (3.94)	122.7 (4.83)	45.0 (1.77)	38.1 (1.50)	7.9 (.310)
V520P6	3/8-18	20.1 (0.79)	20.1 (0.79)	100.1 (3.94)	122.7 (4.83)	45.0 (1.77)	38.1 (1.50)	10.2 (.400)
V520P8	1/2-14	24.9 (0.98)	24.9 (0.98)	100.1 (3.94)	129.5 (5.10)	58.9 (2.32)	42.9 (1.69)	15.2 (.600)
V520P12	3/4-14	31.0 (1.22)	31.0 (1.22)	119.9 (4.72)	151.9 (5.98)	64.0 (2.52)	50.0 (1.97)	20.1 (.790)
V520P16	1 -11.5	39.9 (1.57)	39.9 (1.57)	119.9 (4.72)	160.5 (6.32)	81.0 (3.19)	54.1 (2.13)	25.4 (1.000)
V520P20	1 1/4	49.0 (1.93)	49.0 (1.93)	158.0 (6.22)	204.5 (8.05)	93.0 (3.66)	71.6 (2.82)	31.8 (1.250)
V520P24	1 1/2	54.1 (2.13)	54.1 (2.13)	158.0 (6.22)	209.0 (8.23)	102.1 (4.02)	77.7 (3.06)	39.9 (1.570)
V520P32	2	68.3 (2.69)	68.3 (2.69)	158.0 (6.22)	217.9 (8.58)	120.9 (4.76)	84.6 (3.33)	50.8 (2.000)
V520P40	2 1/2	85.1 (3.35)	85.1 (3.35)	255.0 (10.04)	333.0 (13.11)	156.0 (6.14)	132.1 (5.20)	64.0 (2.520)
V520P48	3	98.8 (3.89)	98.8 (3.89)	255.0 (10.04)	343.4 (13.52)	177.0 (6.97)	140.0 (5.51)	76.2 (3.000)

General Description

Series 500CS low pressure carbon steel ball valves provide total shut-off capability for services up to 138 Bar (2000 PSI).





Operation

A quarter turn of the handle is on or off. Ball valves are not intended for use as a throttling valve. Attempting to use it in these applications may result in premature seal failure and/or inability to turn the valve handle.

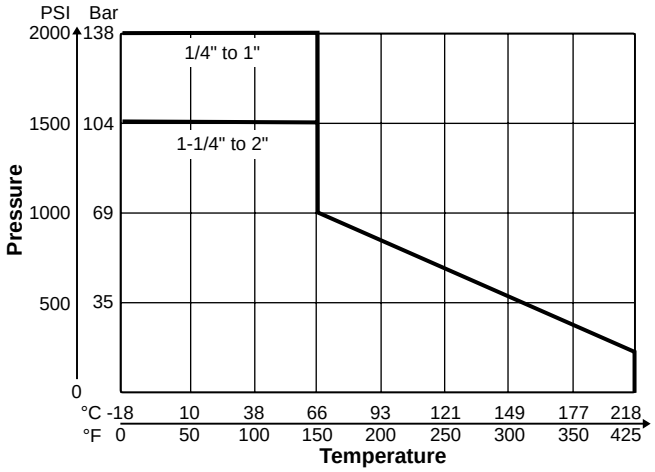
Features

- Ball valve bodies are machined from high quality carbon steel and phosphate coated forgings providing superior corrosion resistance.
- Highly inert PTFE seats and seals provide resistance to chemical corrosion.
- Blowout proof stem design, chrome plated brass ball and a special design handle enable increased turn and leverage for ease of opening and closing.
- Padlocking handle options provides lock-out capability where required.
- In-line or panel mount options provide installation flexibility.

Specifications

Working Pressure	138 Bar (2000 PSI)
Saturated Steam Service	10 Bar (150 PSI)
Body Material	Carbon Steel Phosphate Coated

Performance Curves



Flow Data

Type 500CS, 502CS	
Valve Size	**C_v**
1/4"	6.0
3/8"	12.0
1/2"	15.0
3/4"	23.0
1"	36.0
1-1/4"	44.0
1-1/2"	64.0
2"	114.0

□ Style

Code	Type
V	Valve
VP	Valve, Padlocking Handle

□ Tube Variations

Code	Type
500	Female/Female NPT Ports
502*	Female/Female Panel Mount

* 502 Panel mount is only available in sizes 20 – 32.

CS Material

Code	Type
CS	Carbon Steel

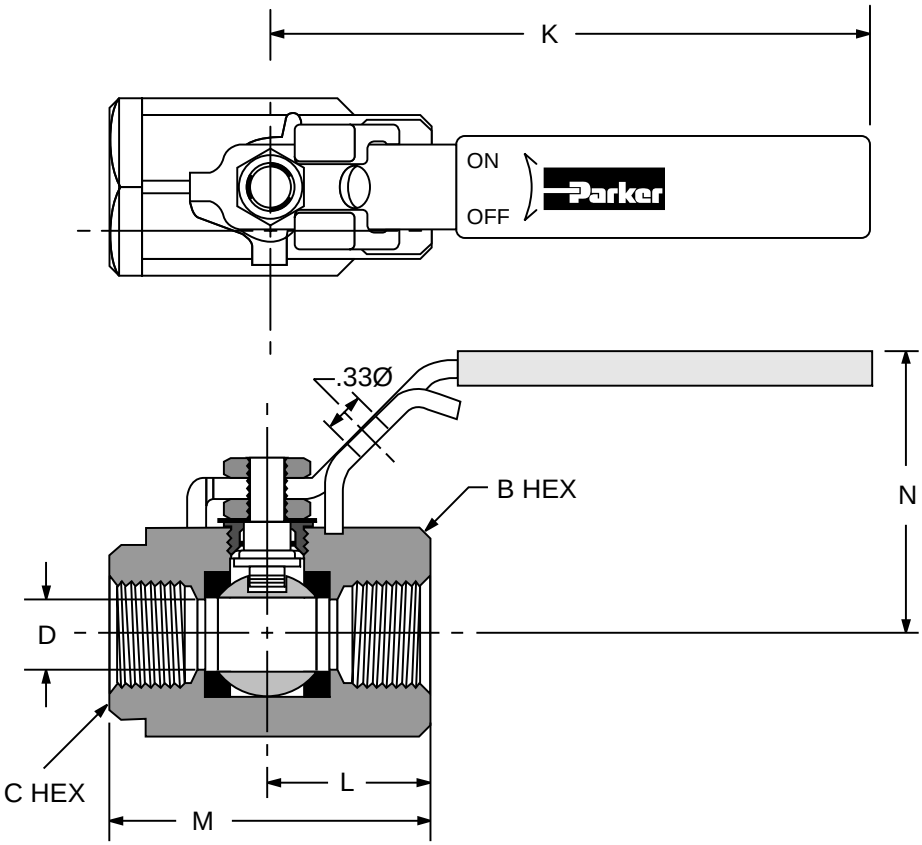
□ Size

Code	Size
4	1/4" NPT
6	3/8" NPT
8	1/2" NPT
12	3/4" NPT
16	1" NPT
20	1 1/4" NPT
24	1 1/2" NPT
32	2" NPT

⌐ ¬ Design Series

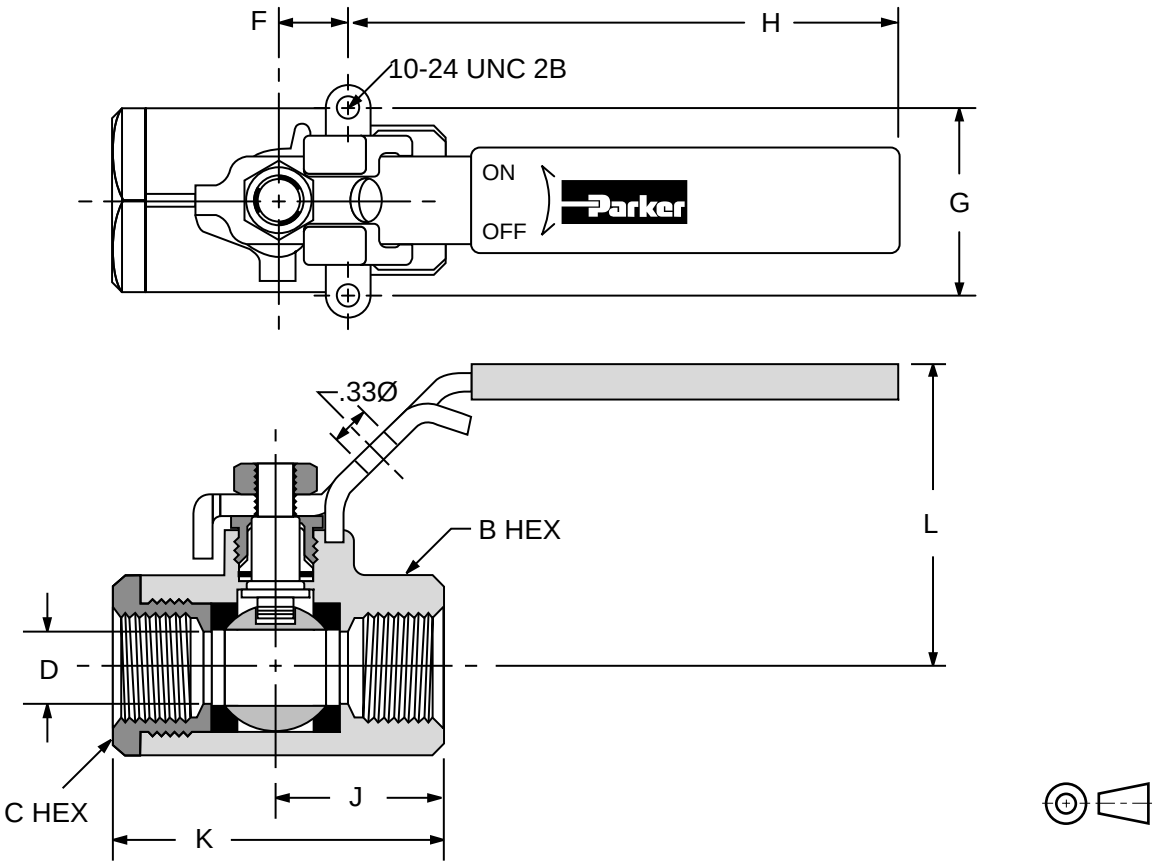
NOTE:
Not required when ordering.

Model V500CS and VP500CS



Part Number	Pipe Thread	B Hex	C Hex	Dimensions mm (in) K	L	M	N	D Flow Ø
Female-Female Pipe Ends V500CS								
V500CS4	1/4"	1-1/16"	15/16"	96.0 (3.78)	25.4 (1.00)	50.8 (2.00)	41.4 (1.63)	10.2 (.400)
V500CS6	3/8"	1-1/16"	15/16"	96.0 (3.78)	25.4 (1.00)	50.8 (2.00)	41.4 (1.63)	10.2 (.400)
V500CS8	1/2"	1-1/4"	1-1/16"	96.0 (3.78)	31.8 (1.25)	60.2 (2.37)	43.9 (1.73)	13.7 (.540)
V500CS12	3/4"	1-5/8"	1-3/8"	129.5 (5.10)	38.1 (1.50)	73.7 (2.90)	52.8 (2.08)	17.3 (.680)
V500CS16	1"	2"	1-5/8"	129.5 (5.10)	44.7 (1.76)	86.6 (3.41)	58.4 (2.30)	22.4 (.880)
Locking Handle, Female Pipe Ends VP500CS (Shown above)								
VP500CS4	1/4"	1-1/16"	15/16"	104.9 (4.13)	25.4 (1.00)	50.8 (2.00)	56.6 (2.23)	10.2 (.400)
VP500CS6	3/8"	1-1/16"	15/16"	104.9 (4.13)	25.4 (1.00)	50.8 (2.00)	56.6 (2.23)	10.2 (.400)
VP500CS8	1/2"	1-1/4"	1-1/16"	104.9 (4.13)	31.8 (1.25)	60.2 (2.37)	56.6 (2.33)	13.7 (.540)
VP500CS12	3/4"	1-5/8"	1-3/8"	127.0 (5.00)	38.1 (1.50)	73.7 (2.90)	71.1 (2.80)	17.3 (.680)
VP500CS16	1"	2"	1-5/8"	127.0 (5.00)	44.7 (1.76)	86.6 (3.41)	75.4 (2.97)	22.4 (.880)

Model V502CS and VP502CS



Part Number	Pipe Thread	B Hex	C Hex	Dimensions mm (in)						D Flow Ø
				F	G	H	J	K	L	
Female-Female Pipe Ends, Panel Mount V502CS										
V502CS20	1-1/4"	2"	2-1/4"	23.9 (0.94)	38.1 (1.50)	154.9 (6.10)	47.5 (1.87)	96.5 (3.80)	70.1 (2.76)	25.4 (1.000)
V502CS24	1-1/2"	2-5/16"	2-1/2"	23.9 (0.94)	38.1 (1.50)	154.9 (6.10)	57.7 (2.27)	115.6 (4.55)	75.7 (2.98)	31.8 (1.250)
V502CS32	2"	2-3/4"	3"	26.2 (1.03)	50.8 (2.00)	218.4 (8.60)	61.5 (2.42)	122.7 (4.83)	89.9 (3.54)	38.1 (1.500)
Locking Handle, Female Pipe Ends, Panel Mount VP502CS (Shown above)										
VP502CS20	1-1/4"	2"	2-1/4"	23.9 (0.94)	38.1 (1.50)	190.5 (7.50)	47.5 (1.87)	96.5 (3.80)	80.0 (3.15)	25.4 (1.000)
VP502CS24	1-1/2"	2-5/16"	2-1/2"	23.9 (0.94)	38.1 (1.50)	190.5 (7.50)	57.7 (2.27)	115.6 (4.55)	85.6 (3.37)	31.8 (1.250)
VP502CS32	2"	2-3/4"	3"	26.2 (1.03)	50.8 (2.00)	222.3 (8.75)	61.5 (2.42)	122.7 (4.83)	87.9 (3.46)	38.1 (1.500)

General Description

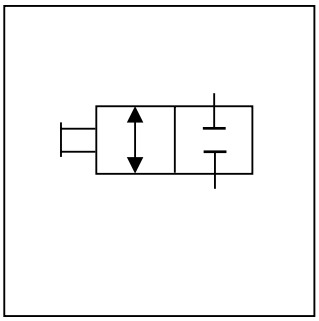
Series 50*SS low pressure, stainless steel ball valves provide total shut-off capability for services up to 138 Bar (2000 PSI).

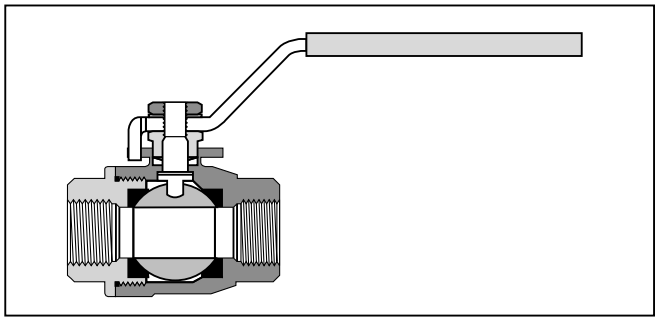
Operation

A quarter turn of the handle is on or off. Ball Valves are not intended for use as a throttling valve. Attempting to use it in these applications may result in premature seal failure and/or inability to turn the valve handle.

Features

- Ball valve bodies are machined from CF-8M stainless steel castings, equivalent of 316 stainless steel which is suited for corrosive environments.
- Highly inert PTFE seats and seals provide resistance to chemical corrosion.
- Blowout proof stem design, 316 stainless ball and a special design handle enable increased turn and leverage for ease of opening and closing.
- Padlocking handle option provides lock-out capability where required.
- Style 502 allows panel mounting for installation flexibility.

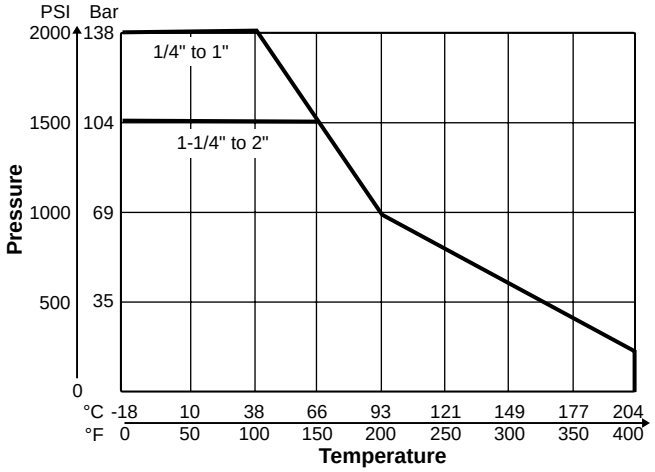




Specifications

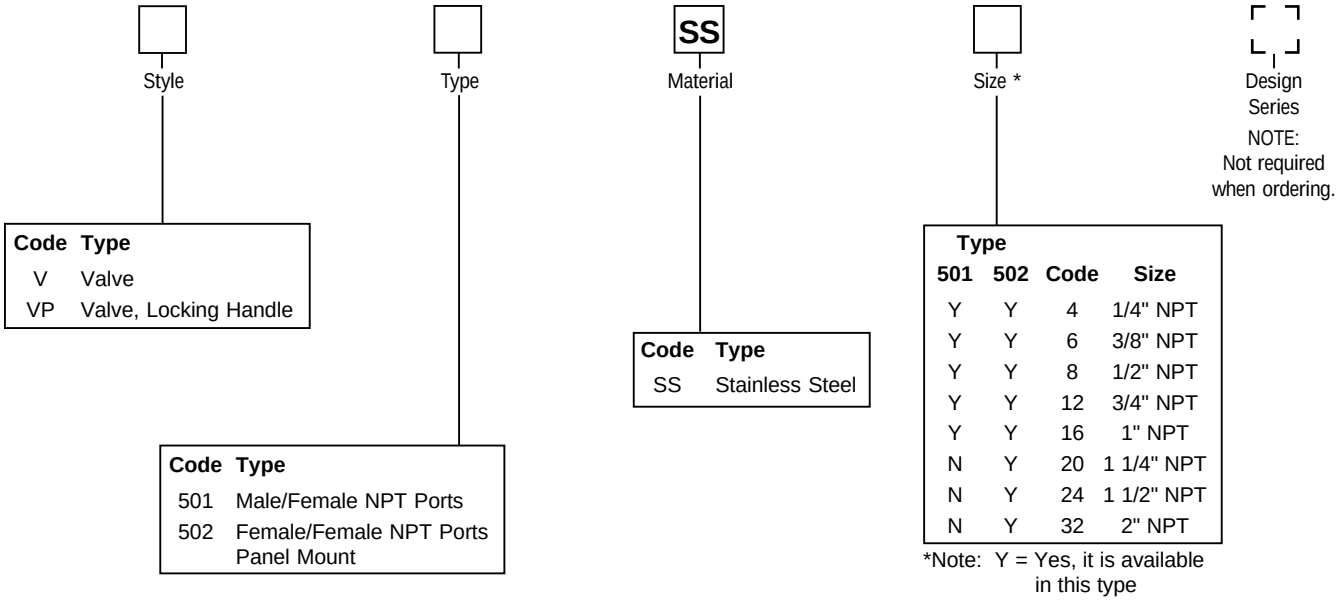
Working Pressure	138 Bar (2000 PSI)
Body Material	CF-8M Stainless Steel 316SS Cast Equivalent
Ball and Stem Material	316 Stainless Steel

Performance Curves



Flow Data

Type 501SS		Type 502SS	
Valve Size	**C_v**	**Valve Size**	**C_v**
1/4"	4.0	1/4"	4.0
3/8"	6.0	3/8"	6.0
1/2"	14.0	1/2"	14.0
3/4"	35.0	3/4"	35.0
1"	54.0	1"	54.0
		1-1/4"	74.0
		1-1/2"	120.0
		2"	226.0



Code	Type
V	Valve
VP	Valve, Locking Handle

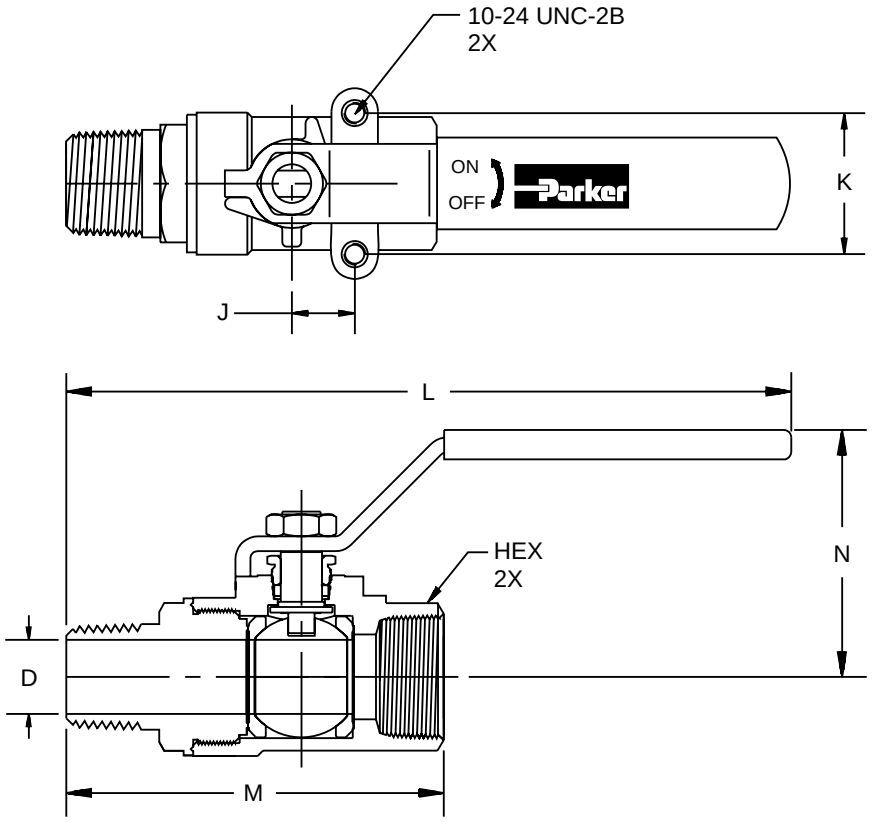
Code	Type
501	Male/Female NPT Ports
502	Female/Female NPT Ports Panel Mount

Code	Type
SS	Stainless Steel

Type 501	Type 502	Code	Size
Y	Y	4	1/4" NPT
Y	Y	6	3/8" NPT
Y	Y	8	1/2" NPT
Y	Y	12	3/4" NPT
Y	Y	16	1" NPT
N	Y	20	1 1/4" NPT
N	Y	24	1 1/2" NPT
N	Y	32	2" NPT

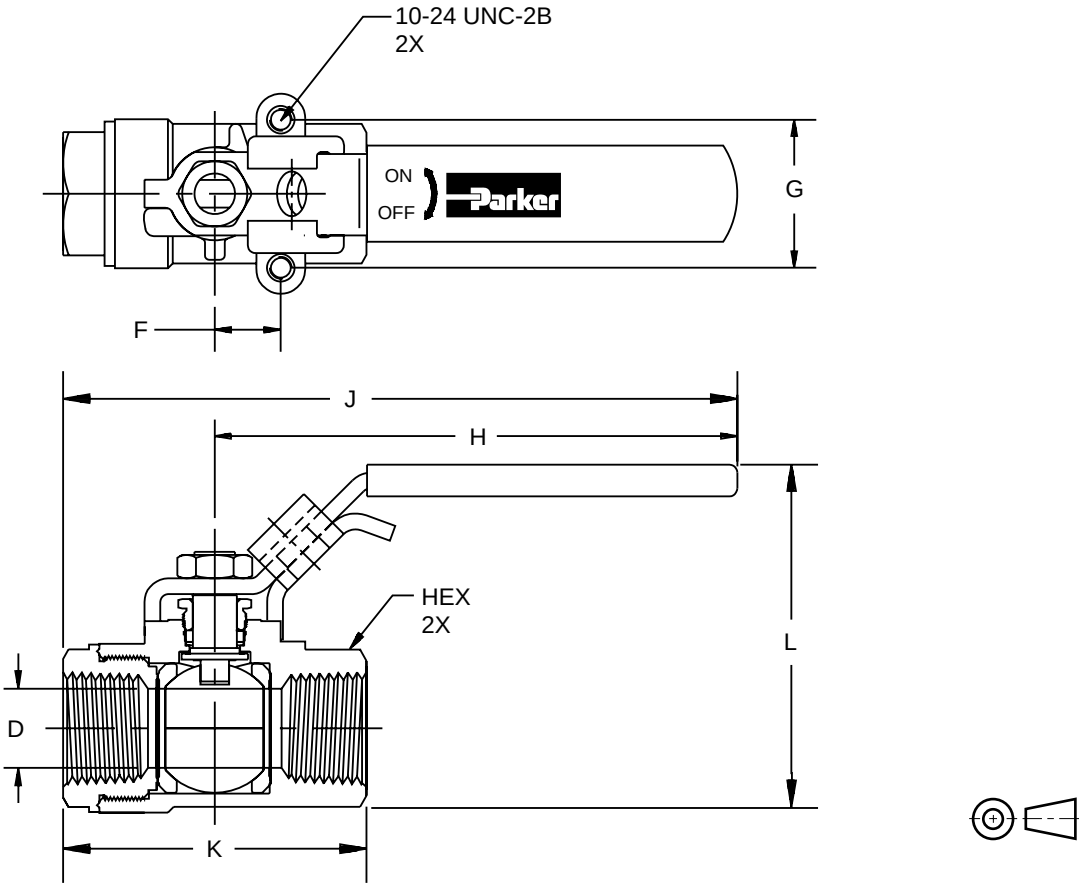
*Note: Y = Yes, it is available in this type
N = Not available in this type

Model V501SS



Part Number	Pipe Thread	Hex	Dimensions mm (in)					D Flow Ø
			J	K	L	M	N	
Male-Female Pipe Ends V501SS								
V501SS4	1/4"	15/16"	12.7 (.50)	28.4 (1.12)	142.2 (5.60)	67.3 (2.65)	50.0 (1.97)	7.1 (.280)
V501SS6	3/8"	15/16"	12.7 (.50)	28.4 (1.12)	142.2 (5.60)	67.3 (2.65)	50.0 (1.97)	9.5 (.375)
V501SS8	1/2"	1-1/16"	12.7 (.50)	28.4 (1.12)	148.6 (5.85)	77.5 (3.05)	50.8 (2.00)	12.7 (.500)
V501SS12	3/4"	1-3/8"	22.4 (.88)	34.8 (1.37)	184.7 (7.27)	97.8 (3.85)	64.8 (2.55)	18.3 (.720)
V501SS16	1"	1-5/8"	22.4 (.88)	34.8 (1.37)	190.0 (7.48)	108.0 (4.25)	68.1 (2.68)	23.9 (.940)

Model V502SS and VP502SS

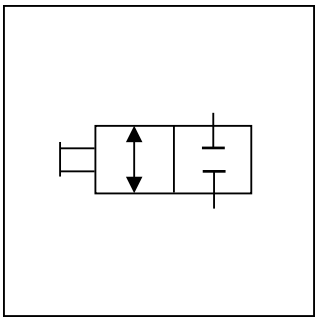


Part Number	Size	B/C Hex	F	Dimensions mm (in) G	H	J	K	L	D Flow Ø	Panel Mount Thread
Female to Female Panel Mount										
V*502SS4	1/4"	15/16"	12.7 (0.50)	28.6 (1.13)	101.6 4.00	127.8 (5.03)	52.6 (2.07)	64.0 (2.52)	9.5 (0.38)	10-24 UNC
V*502SS6	3/8"	15/16"	12.7 (0.50)	28.6 (1.13)	101.6 4.00	127.8 (5.03)	52.6 (2.07)	64.0 (2.52)	9.5 (0.38)	10-24 UNC
V*502SS8	1/2"	1-1/16"	12.7 (0.50)	28.6 (1.13)	101.6 4.00	130.3 (5.13)	57.7 (2.27)	67.3 (2.65)	12.7 (0.50)	10-24 UNC
V*502SS12	3/4"	1-3/8"	22.2 (0.88)	34.9 (1.38)	127.0 (5.00)	169.4 (6.67)	85.1 (3.35)	87.9 (3.46)	20.1 (0.79)	10-24 UNC
V*502SS16	1"	1-5/8"	22.2 (0.88)	34.9 (1.38)	127.0 (5.00)	172.0 (6.77)	89.9 (3.54)	95.0 (3.74)	25.4 (1.00)	10-24 UNC
V*502SS20	1-1/4"	2"	25.4 (1.00)	38.1 (1.50)	177.8 (7.00)	228.6 (9.00)	101.6 (4.00)	115.6 (4.55)	31.8 (1.25)	1/4-20 UNC
V*502SS24	1-1/2"	2-3/8"	25.4 (1.00)	38.1 (1.50)	177.8 (7.00)	182.6 (7.19)	111.3 (4.38)	137.7 (5.42)	38.1 (1.50)	1/4-20 UNC
V*502SS32	2"	3"	25.4 (1.00)	38.1 (1.50)	177.8 (7.00)	247.7 9.75	139.7 (5.50)	144.3 (5.68)	50.8 (2.00)	1/4-20 UNC

Locking handle parts: For use with 5/16" diameter shank lock

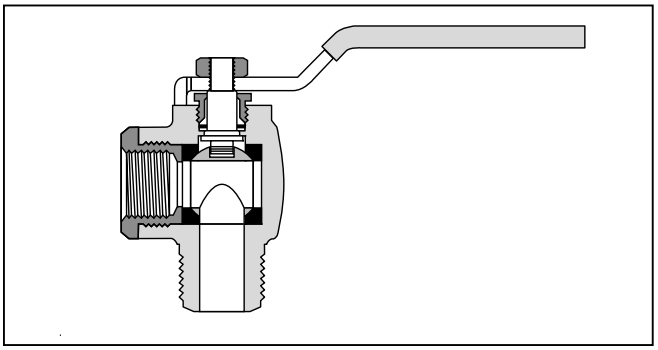
General Description

Series 590 low pressure 90° ball valves provide total shut-off capability for services up to 17 Bar (250 PSI).



Operation

A quarter turn of the handle is on or off. Ball valves are not intended for use as a throttling valve. Attempting to use it in these applications may result in premature seal failure and/or inability to turn the valve handle.



Features

- Ball Valve bodies are machined from high quality CA377 forgings which provide extended service life and resist failure caused by severe temperature conditions.
- Highly inert PTFE seats and seals provide resistance to chemical corrosion.
- Blowout proof stem design, chrome plated brass ball and a special design handle enable increased turn and leverage for ease of opening and closing.

Specifications

Working Pressure	17 Bar (250 PSI)

Ordering Information

V	[ ]	P	[ ]	[ ]
Style	Type	Material	Size	Design Series

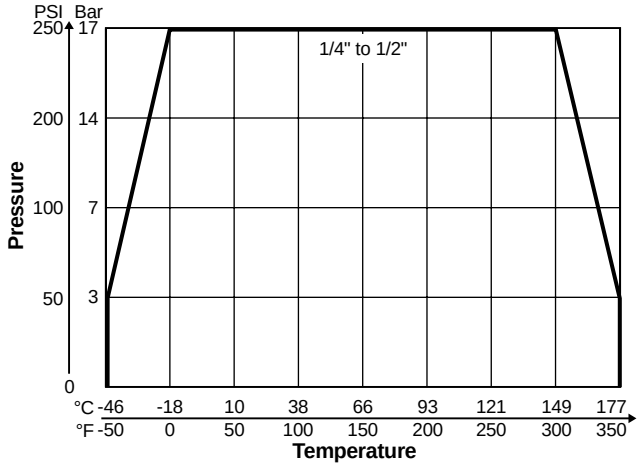
NOTE: Not required when ordering.

Code	Type
590	90° Male/Female NPT Ports
591	90° Male/Male NPT Ports

Code	Type
P	Brass

Code	Size
4	1/4" NPT
6	3/8" NPT
8	1/2" NPT

Performance Curve



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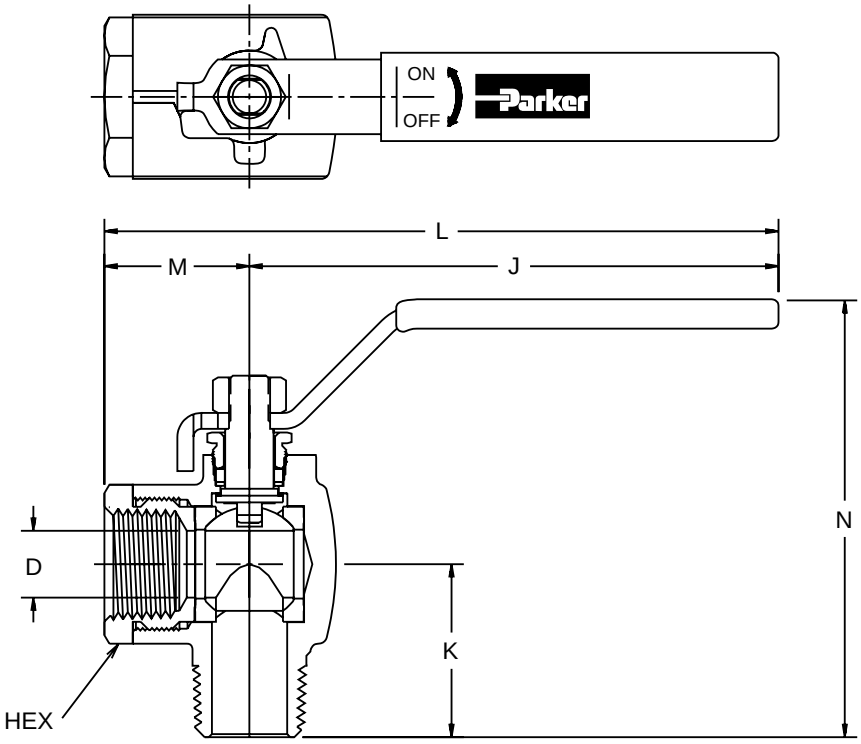
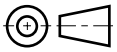
Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

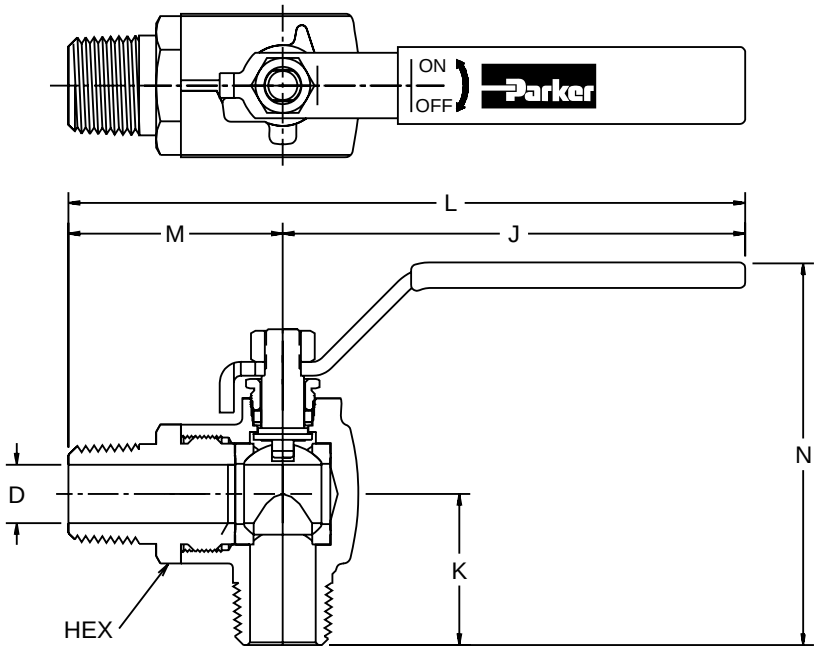
Model V590P





Part Number	Pipe Thread	Hex	Dimensions mm (in)					D Flow Ø
			J	K	L	M	N	
Lever Handle, 90° Flow, Male-Female Pipe Ends V590P								
V590P4	1/4"	15/16"	100.6 (3.96)	27.4 (1.08)	126.0 (4.96)	25.4 (1.00)	76.7 (3.02)	9.5 (.375)
V590P6	3/8"	15/16"	100.6 (3.96)	27.7 (1.09)	126.0 (4.96)	25.4 (1.00)	77.0 (3.03)	9.5 (.375)
V590P8	1/2"	1-1/16"	96.5 (3.80)	33.0 (1.30)	128.3 (5.05)	27.7 (1.09)	74.9 (2.95)	12.7 (.500)

Model V591P



Part Number	Pipe Thread (PTF)	B Hex	Dimensions mm (in)					D Flow Ø
			J	K	L	M	N	
Lever Handle, 90° Flow, Male-Male Pipe Ends V591P*								
V591P4	1/4"	15/16"	100.6 (3.96)	27.4 (1.08)	140.2 (5.52)	39.6 (1.56)	76.7 (3.02)	8.7 (.344)
V591P6	3/8"	15/16"	100.6 (3.96)	27.7 (1.09)	140.2 (5.52)	39.6 (1.56)	77.0 (3.03)	9.5 (.375)
V591P8	1/2"	1-1/16"	100.6 (3.96)	33.0 (1.30)	147.3 (5.80)	46.7 (1.84)	83.3 (3.28)	12.7 (.500)

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6. Changes, Reschedules and Cancellations: Buyer may request to modify the designs or specifications for the items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification or cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.

7. Special Tooling: A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the items sold hereunder, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

8. Buyer's Property: Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property, Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

9. Taxes: Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

10. Indemnity For Infringement of Intellectual Property Rights: Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. Patents, U.S. Trademarks, copyrights, trade dress and trade secrets (hereinafter 'Intellectual Property Rights'). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that an item sold pursuant to this contract infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If an item sold hereunder is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights. If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgments resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

11. Force Majeure: Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter 'Events of Force Majeure'). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

12. Entire Agreement/Governing Law: The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of the sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.

9/91-P

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(continued on next page)

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Parker Hannifin Corporation

About Parker Hannifin Corporation

Parker Hannifin is a leading global motion-control company dedicated to delivering premier customer service. A Fortune 300 corporation listed on the New York Stock Exchange (PH), our components and systems comprise over 1,400 product lines that control motion in some 1,000 industrial and aerospace markets. Parker is the only manufacturer to offer its customers a choice of hydraulic, pneumatic, and electromechanical motion-control solutions. Our Company has the largest distribution network in its field, with over 7,500 distributors serving nearly 400,000 customers worldwide.

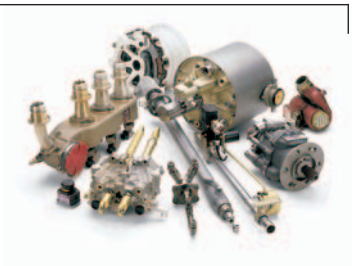
Parker's Charter

To be a leading worldwide manufacturer of components and systems for the builders and users of durable goods. More specifically, we will design, market and manufacture products controlling motion, flow and pressure. We will achieve profitable growth through premier customer service.

Product Information

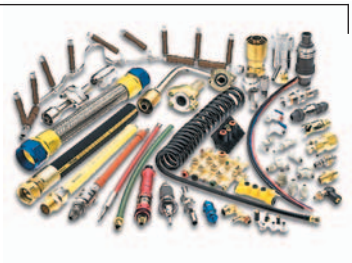
North American customers seeking product information, the location of a nearby distributor, or repair services will receive prompt attention by calling the Parker Product Information Center at our toll-free number: 1-800-C-PARKER (1-800-272-7537). In Europe, call 00800-C-PARKER-H (00800-2727-5374).

The Aerospace Group is a leader in the development, design, manufacture and servicing of control systems and components for aerospace and related high-technology markets, while achieving growth through premier customer service.



The Climate & Industrial Controls Group designs, manufactures and markets system-control and fluid-handling components and systems to refrigeration, air-conditioning and industrial customers worldwide.

The Fluid Connectors Group designs, manufactures and markets rigid and flexible connectors, and associated products used in pneumatic and fluid systems.



The Seal Group designs, manufactures and distributes industrial and commercial sealing devices and related products by providing superior quality and total customer satisfaction.

The Hydraulics Group designs, produces and markets a full spectrum of hydraulic components and systems to builders and users of industrial and mobile machinery and equipment.

The Filtration Group designs, manufactures and markets quality filtration and clarification products, providing customers with the best value, quality, technical support, and global availability.

The Automation Group is a leading supplier of pneumatic and electromechanical components and systems to automation customers worldwide.

The Instrumentation Group is a global leader in the design, manufacture and distribution of high-quality critical flow components for worldwide process instrumentation, ultra-high-purity, medical and analytical applications.

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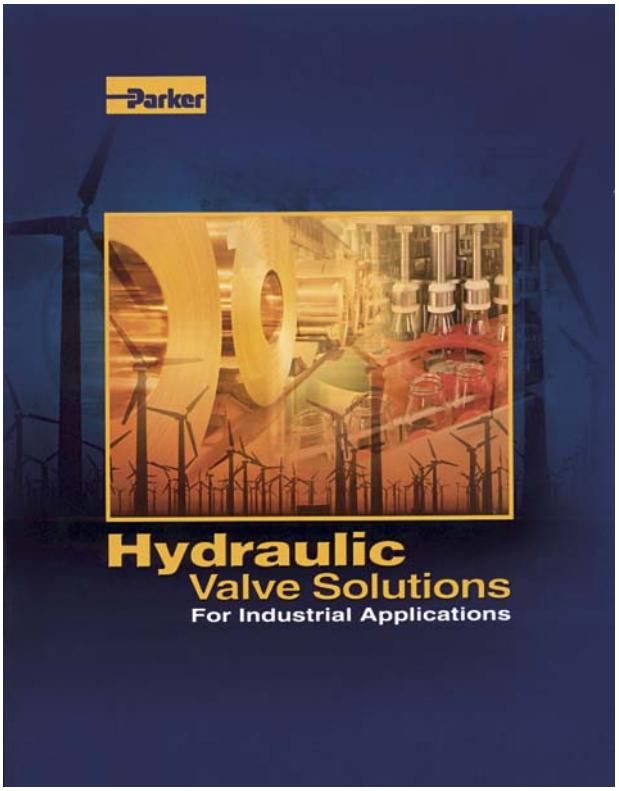


Bulletin HY14-2530/US
Catalog CD HY14-2530/US (included inside brochure)

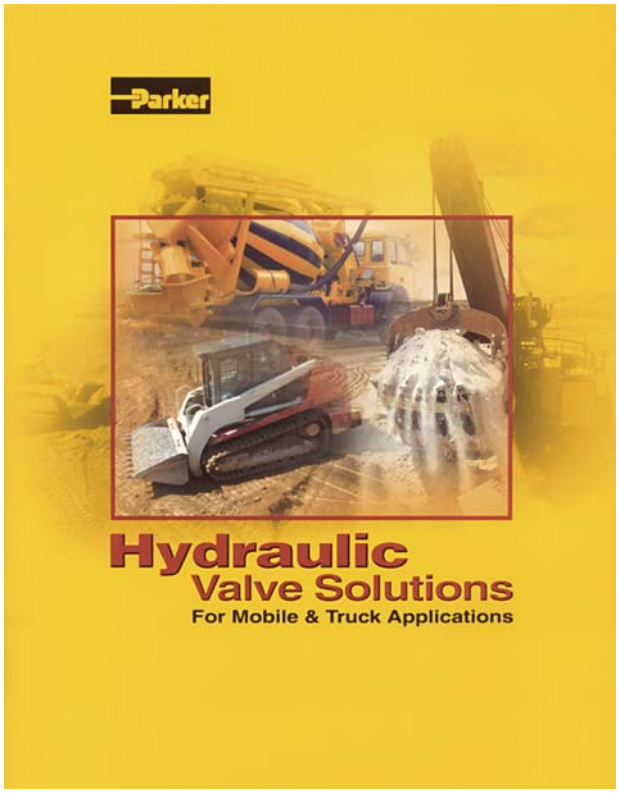
For the latest hydraulic valve information
www.parker.com/hydraulicvalve

To locate your nearest hydraulic valve distributor
www.parker.com/hyd/distloc

For North America, Europe and the rest of the world regional offices, see Parker Hydraulics International Sales Offices at the back of this catalog.

Parker Hydraulic Valve wants to keep you informed. Listed below are connection opportunities for you to resource additional information or speak directly with the industry's most knowledgeable hydraulic valve professionals.

To order literature or locate a distributor by phone
1-800-C-Parker



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