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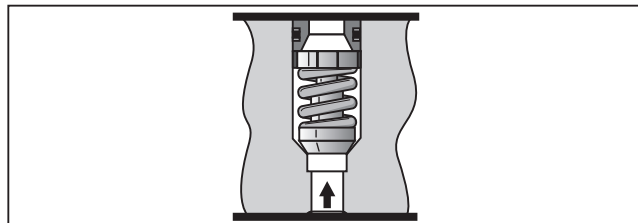
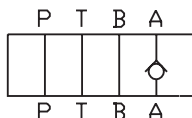
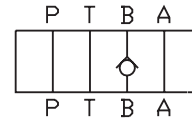
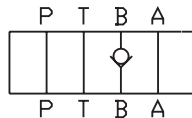
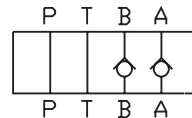
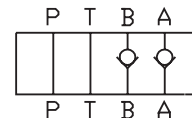
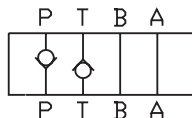
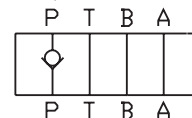
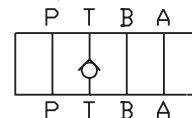
Mounting Pattern Dimensions.....	B133 - B134
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Sandwich valves provide a variety of check, flow control, pressure relief and pressure reducing functions in a compact NFPA D03, D05, D07 and D08 sandwich style valve. The NFPA D03 valve body conforms to the ISO 40 mm (1.57") thickness. These valves are mounted between directional control valves and their mounting surface.

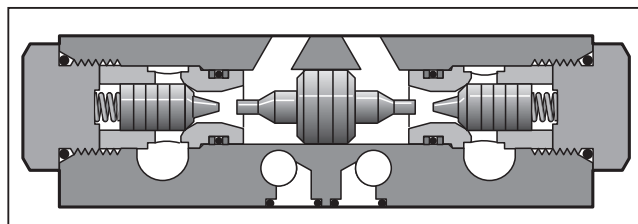
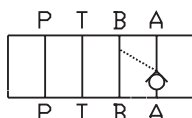
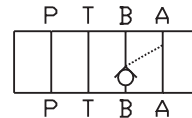
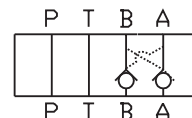
The NFPA D03 Sandwich valves may also be used in conjunction with Parker's Cartpak Series of sandwich valves which offer a wide variety of additional functions including relief, pressure reducing/relieving, load check, back pressure check, needle, flow control, pressure compensated flow control, crossover, relief and directional valves.

Check Valves**Series CM, ZRV**

- Valve bodies are manufactured from steel which provide extra strength and durability for longer life. Internal hardened steel components also provide longer life.
- Positive shut-off is provided by a fully guided poppet and allows full flow in the unchecked position.
- Parker CM, ZRV sandwich style check valves can be used either on the 'P', 'A', 'B', 'T' port or combination.
- Large internal flow paths allow high flow at low pressure drop.

**CM*AA****CM*AAF****CM*BB****CM*BBF****CM*DD****CM*DDF****CM*PT****CM*PP, ZRV-P****CM*TT, ZRV-T****P.O. Check Valves****Series CPOM, ZRE**

- Parker CPOM, ZRE sandwich style, pilot operated check valves can be provided in either single or double configurations.
- The pilot operated checks may be positioned in 'A' port or 'B' port; or both 'A' and 'B' ports.
- Valve bodies are manufactured from steel which provide extra strength and durability for longer life. Internal hardened steel components also provide longer life.
- Large internal flow paths allow high flow at low pressure drop.

**CPOM*AA, ZRE-A****CPOM*BB, ZRE-B****CPOM*DD, ZRE-AB**

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

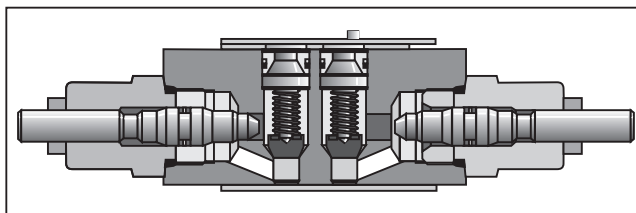
Flow Control Valves

Series FM, ZRD

- Parker FM, ZRD sandwich style flow control valves can be provided in either single or double configurations.

The flow controls may be positioned in 'P' port, 'A' port, 'B' port, or both 'A' and 'B' ports.

- Valve bodies are manufactured from steel which provide extra strength and durability for longer life. Internal hardened steel components also provide longer life.
- Two step needles (standard) provide fine adjustment for the first three turns and course adjustment for the last three turns. Fine metering needles are available as an option on D03 and D05 valves.
- Large bypass checks allow high flow at a low pressure drop.
- Reversible (invert 180°) for meter-in or meter-out (D03 & D05 only).



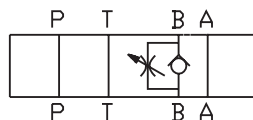
FM*AA, ZRD-AA

(Meter Out)



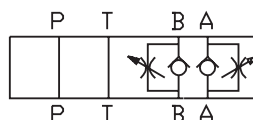
FM*BB, ZRD-BA

(Meter Out)



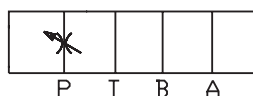
FM*DD, ZRD-ABA

(Meter Out)



FM*PP

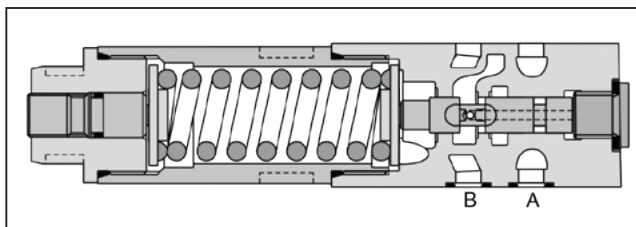
(Meter Out)



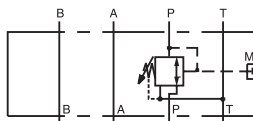
Pressure Reducing Valves

Series PRDM

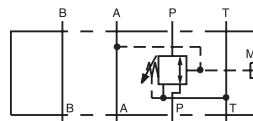
- PRDM sandwich valves have three-way design for pressure relieving of the secondary side.
- The direct operated, cushioned piston design results in fast response, low leakage and minimal hysteresis.
- PRDM sandwich valves may be selected to reduce pressure in the 'P' port, 'A' port or 'B' port.
- Up to nine pressure adjustment ranges are available with maximum pressure settings.
- PRDM2 is NG06 (CETPO 03)
PRDM3 is NG10 (CETOP05)
- Adjustment options include: internal hex screw, hand knob or internal hex with keylock.



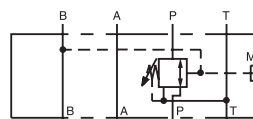
PRDM*PP



PRDM*AA



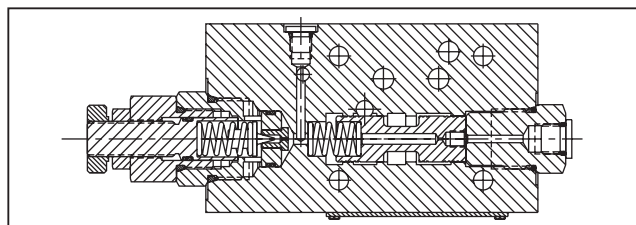
PRDM*BB



Pressure Reducing Valves

Series PRM, ZDR

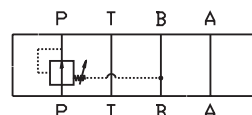
- Parker PRM, ZDR sandwich style pressure reducing valves can be used to reduce pressure on the 'P' port, the 'A' port, or the 'B' port.
- Three pressure adjustment options available: slotted screw, knob and locking knob.
- Valve bodies are manufactured from steel which provide extra strength and durability for longer life. Internal hardened steel components also provide longer life.



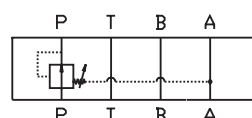
PRM*AA, ZDR-A



PRM*BB, ZDR-B



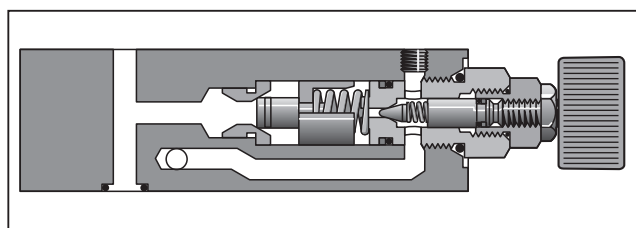
PRM*PP, ZDR-P



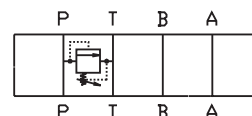
Pressure Relief Valves

Series RM, ZDV

- Parker RM, ZDV sandwich style relief valve is a 'P' port to 'T' port relief.
- Valve bodies are manufactured from steel which provide extra strength and durability for longer life. Internal hardened steel components also provide longer life.
- Three pressure adjustment options available: slotted screw, knob and locking knob.



RM*PT, ZDV-P



General Description

Series CM check valves provide an integral, full flow check valve in the pressure 'P' port, 'A' port, 'B' port, or the tank 'T' port of the directional valve. Reverse flow is blocked. The CM2 and CM3 sizes offer a combination P&T check version.

B

Features

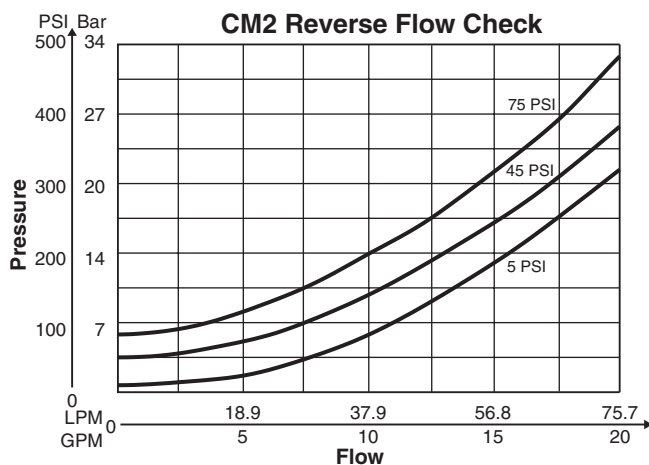
- Valve bodies are manufactured from steel which provides extra strength and durability for longer life. Internal hardened steel components also provide longer life.
- Positive shut-off is provided by a fully guided poppet and allows full flow in the unchecked position.
- Parker CM sandwich style check valves can be used either on the 'P', 'A', 'B', 'T' ports, or combinations.
- Large internal flow paths allow high flow at low pressure drop.

Specifications

	CM2	CM3	CM6
Mounting Pattern	NFPA D03, CETOP 3, NG6	NFPA D05, CETOP 5, NG10	NFPA D08, CETOP 8, NG25
Maximum Pressure	345 Bar (5000 PSI)	345 Bar (5000 PSI)	345 Bar (5000 PSI)
Maximum Flow	76 LPM (20 GPM)	113 LPM (30 GPM)	340 LPM (90 GPM)
Cracking Pressure	0.3 Bar (5 PSI), 3 Bar* (45 PSI), 5 Bar* (75 PSI)	0.3 Bar (5 PSI), 3 Bar* (45 PSI), 5 Bar* (75 PSI)	0.3 Bar (5 PSI)

* Optional

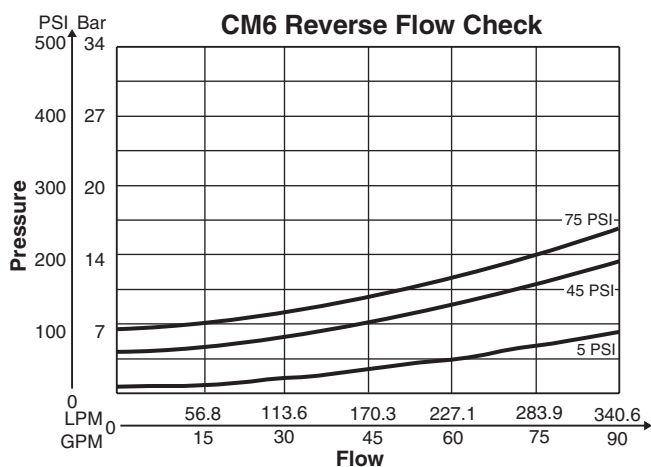
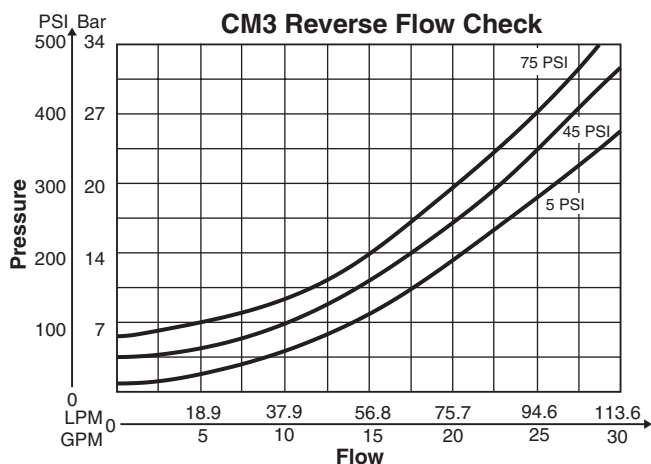
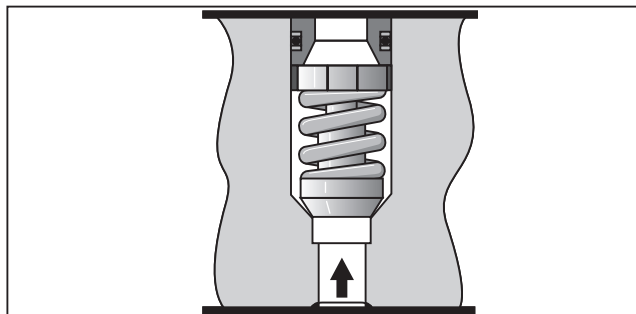
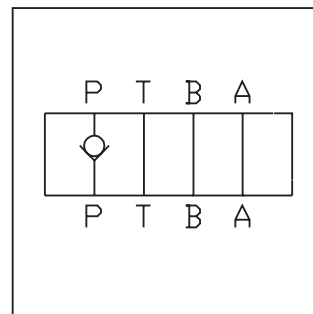
Performance Curves



VISCOSITY CORRECTION FACTOR							
Viscosity (SSU)	75	150	200	250	300	350	400
% of ΔP (Approx.)	93	111	119	126	132	137	141

Curves were generated using 100 SSU hydraulic oil. For any other viscosity, pressure drop will change per chart.

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.



CM Check Valve	Size	Port	Cracking Pressure	Seal	* Design Series NOTE: Not required when ordering.																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Code</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>NFPA D03 Subplate Mounting</td> </tr> <tr> <td>3</td> <td>NFPA D05 Subplate Mounting</td> </tr> <tr> <td>6</td> <td>NFPA D08 Subplate Mounting</td> </tr> </tbody> </table>	Code	Description	2	NFPA D03 Subplate Mounting	3	NFPA D05 Subplate Mounting	6	NFPA D08 Subplate Mounting	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Code</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>PP*</td> <td>P Port Check</td> </tr> <tr> <td>PT*</td> <td>P and T Port Checks</td> </tr> <tr> <td>TT*</td> <td>T Port Check</td> </tr> <tr> <td>DD</td> <td>A and B Port Checks</td> </tr> <tr> <td>AA</td> <td>A Port Check</td> </tr> <tr> <td>BB</td> <td>B Port Check</td> </tr> <tr> <td>AAF</td> <td>A Port Inverted</td> </tr> <tr> <td>BBF</td> <td>B Port Inverted</td> </tr> <tr> <td>DDF</td> <td>A and B Ports Inverted</td> </tr> </tbody> </table>		Code	Description	PP*	P Port Check	PT*	P and T Port Checks	TT*	T Port Check	DD	A and B Port Checks	AA	A Port Check	BB	B Port Check	AAF	A Port Inverted	BBF	B Port Inverted	DDF	A and B Ports Inverted	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Code</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>Omit</td> <td>5 PSI</td> </tr> <tr> <td>Y</td> <td>45 PSI*</td> </tr> <tr> <td>Z</td> <td>75 PSI*</td> </tr> </tbody> </table> * Not available on 6 size.	Code	Type	Omit	5 PSI	Y	45 PSI*	Z	75 PSI*	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Code</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>V</td> <td>Fluorocarbon</td> </tr> <tr> <td>N</td> <td>Nitrile</td> </tr> </tbody> </table>	Code	Type	V	Fluorocarbon	N	Nitrile
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Z	75 PSI*																																													
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V	Fluorocarbon																																													
N	Nitrile																																													

* Not available on 6 size.

Bold: Designates Tier I products and options.

Non-Bold: Designates Tier II products and options. These products will have longer lead times.

Manapak Bolt Kits

Size "2"				Size "3"			
No. of Sandwich	Sandwich & Valve Combination	Bolt Kit	Bolt Length mm (in)	No. of Sandwich	Sandwich & Valve Combination	D3W-30 D3DW & D31*W*	Bolt Length mm (in)
1	Sandwich & D1	BK243	73.2 (2.88)	1	Sandwich & D3	BK141	88.9 (3.50)
2	Sandwich & D1	BK225	111.3 (4.38)	2	Sandwich & D3	BK142	139.7 (5.50)
3	Sandwich & D1	BK244	152.4 (6.00)	3	Sandwich & D3	BK143	190.5 (7.50)
4	Sandwich & D1	BK245	190.5 (7.50)				

Bolt Kits must be ordered separately. *D31VW with internal pilot and internal drain only.

Size "6"				
Sandwich & Valve Combination	Bolt Kit	Description	Qty/Kit	Torque IN-LBS
1 Sandwich & D6*VW Valve	BK121	1/2 - 13 x 5.25	6	80
2 Sandwich & D6*VW Valve	BK122	1/2 - 13 x 8.00	6	80
3 Sandwich & D6*VW Valve	BK123	1/2 - 13 x 10.75	6	80
4 Sandwich & D6*VW Valve	BK124	1/2 - 13 x 13.50	6	80

Note: Bolt Kits must be ordered separately.

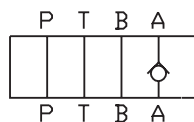
Unit Weight:

CM2 0.8 kg (1.7 lbs.)

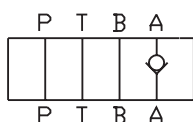
CM3 1.8 kg (3.9 lbs.)

CM6 7.7 kg (17 lbs.)

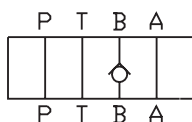
Schematics



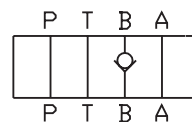
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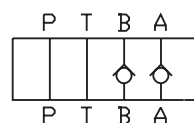
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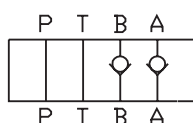
BB Option



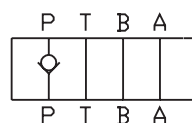
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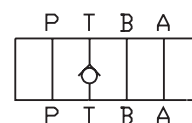
DD Option



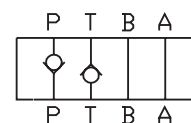
DDF Option



PP Option

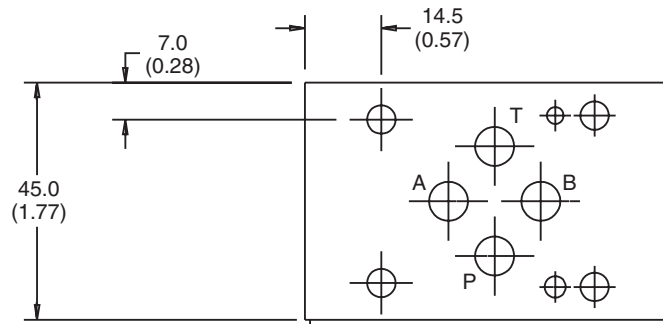
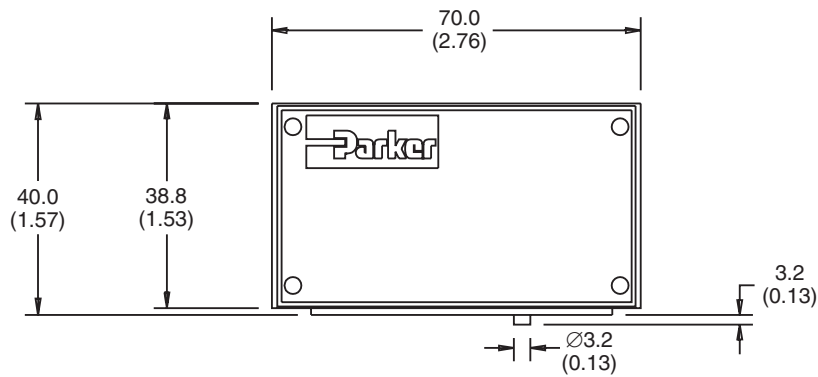
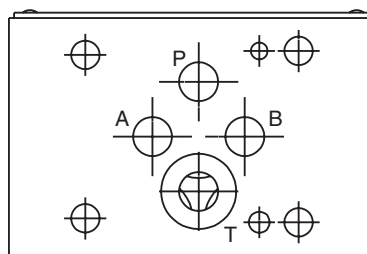


TT Option



PT Option

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

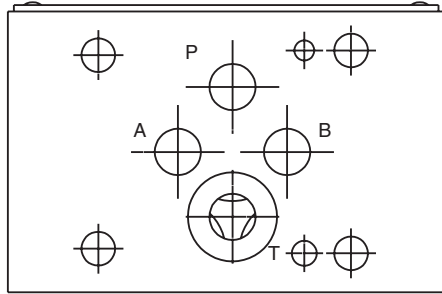
**Top View****Face View**

SHOWN WITHOUT O-RING PLATE

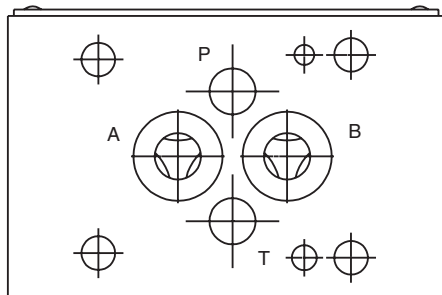
Bottom View

Note: Transfer the locating pin to the hole on the opposite side of the valve body for 'T' port option.
(Invert body 180°)

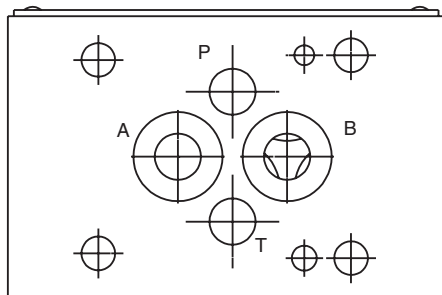
Bottom Views



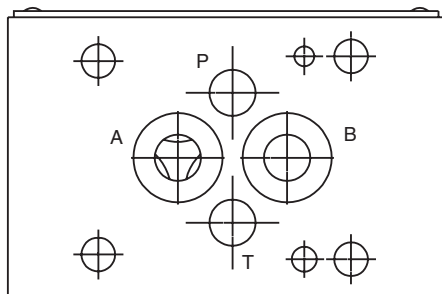
TT



DD

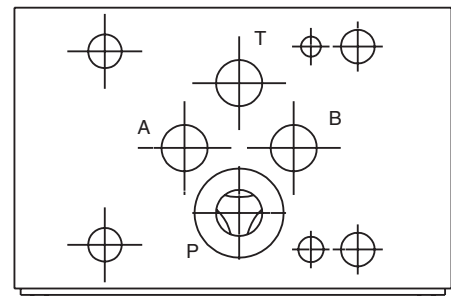


BB

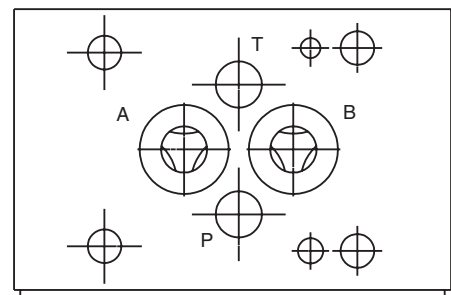


AA

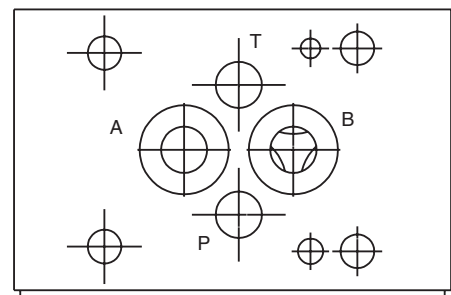
Top Views



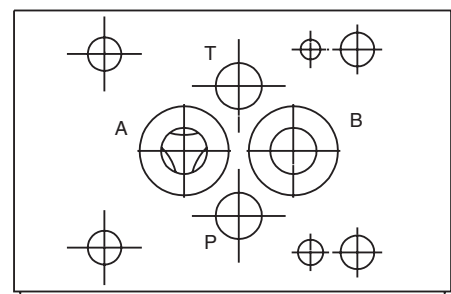
PP/PT



DDF



BBF

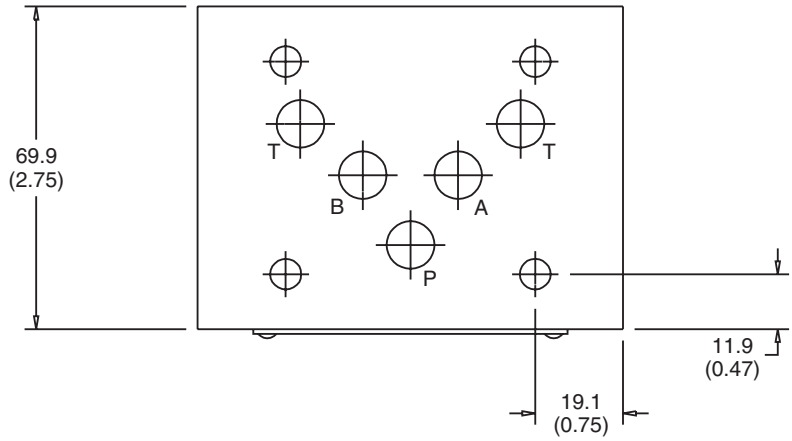


AAF

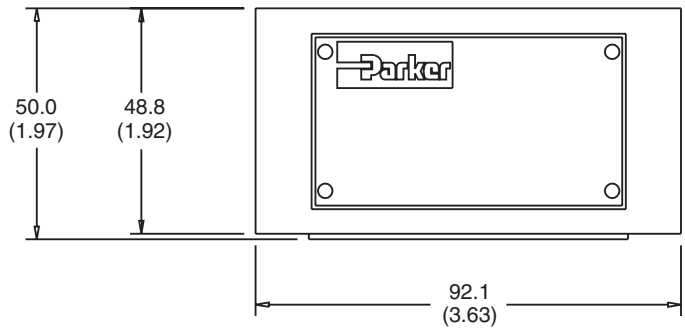
B

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

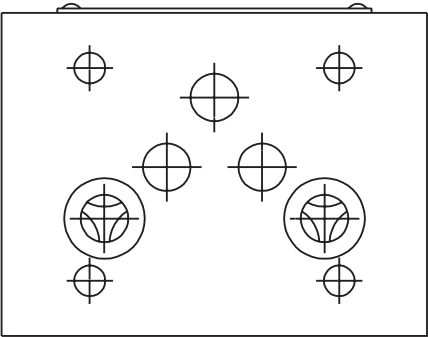
B



Top View



Face View

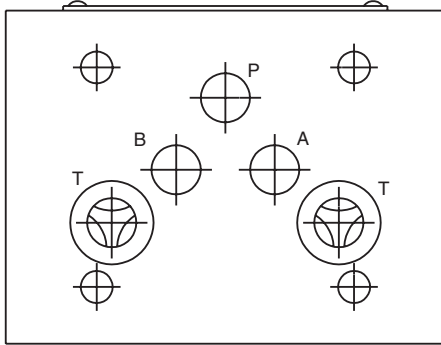


SHOWN WITHOUT O-RING PLATE

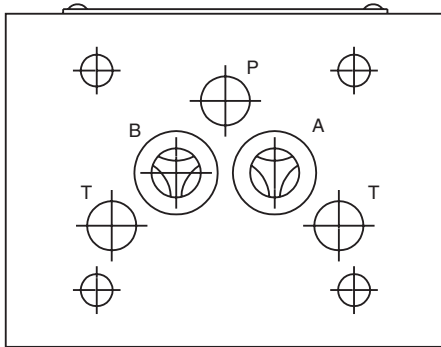
Bottom View



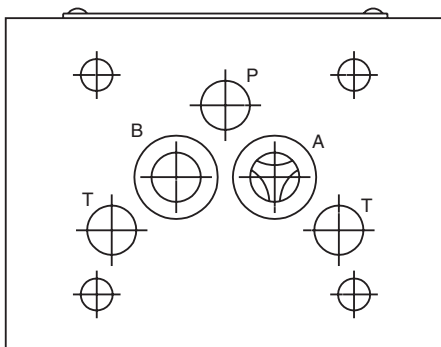
Bottom Views



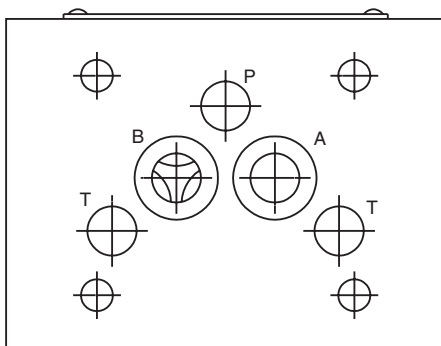
TT



DD

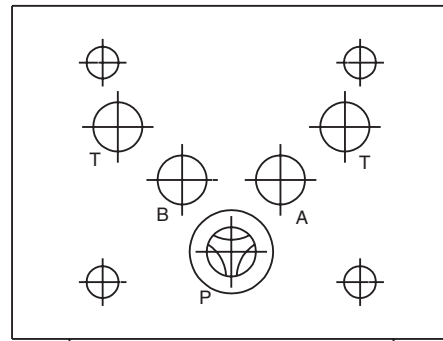


AA

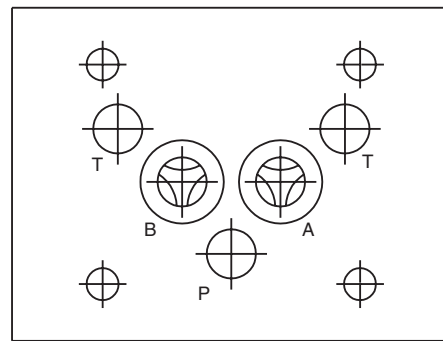


BB

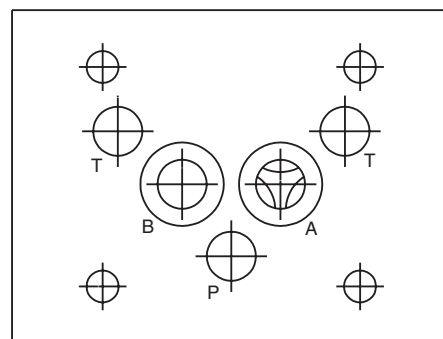
Top Views



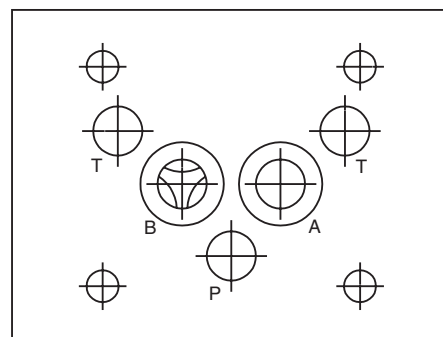
PP/PT



DDF



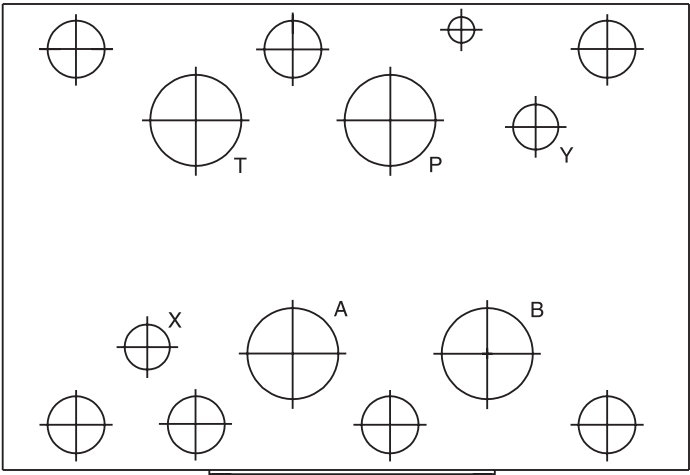
AAF



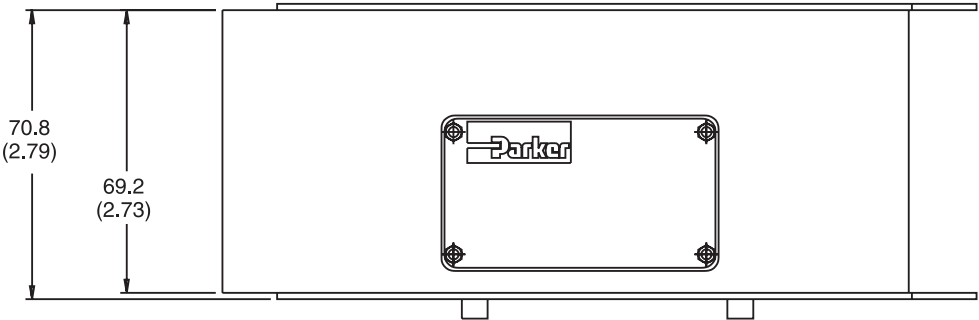
BBF

B

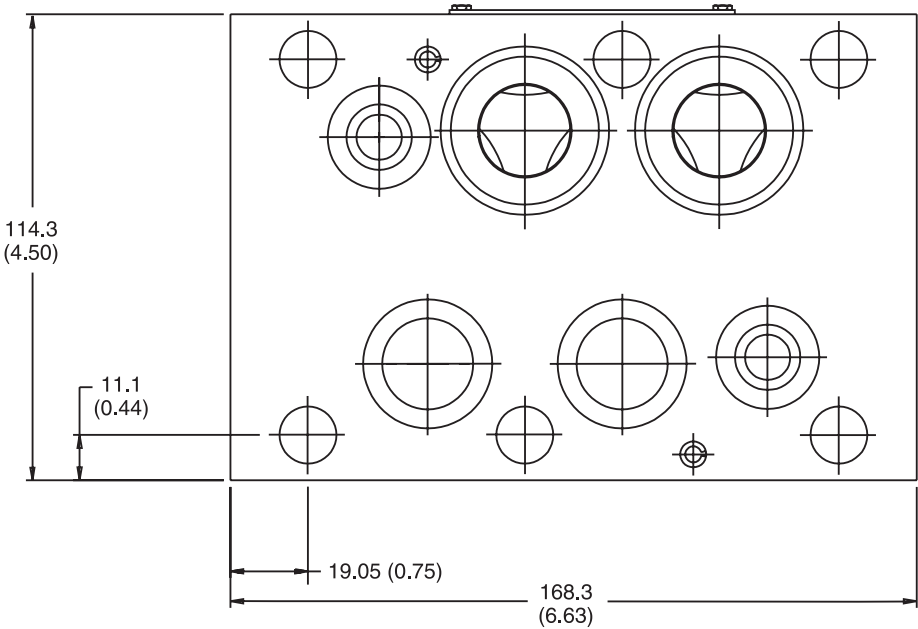
Inch equivalents for millimeter dimensions are shown in (**)



Top View



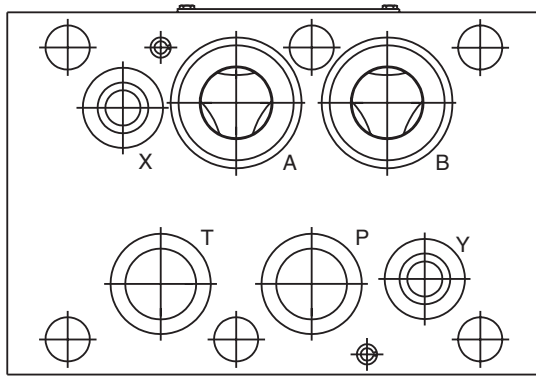
Face View



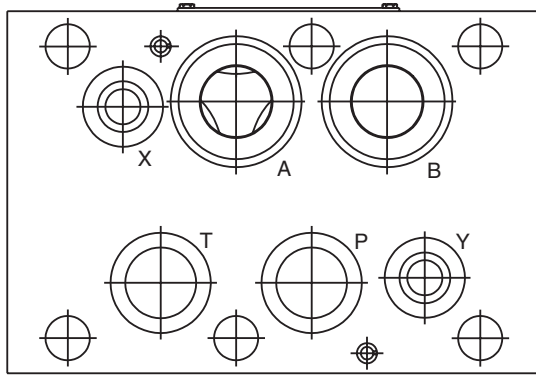
Bottom View



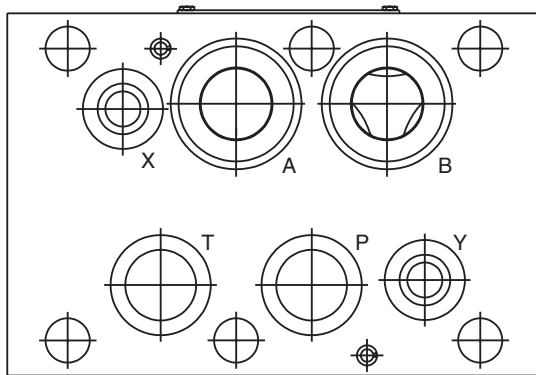
Bottom Views



DD

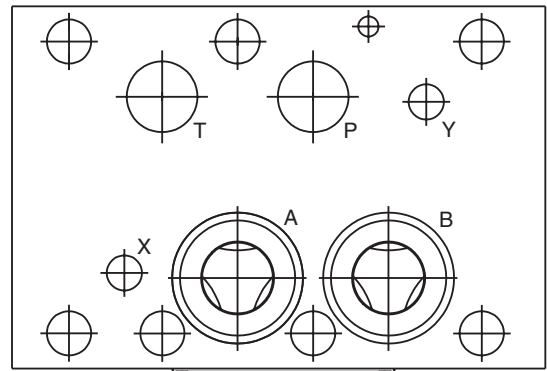


AA

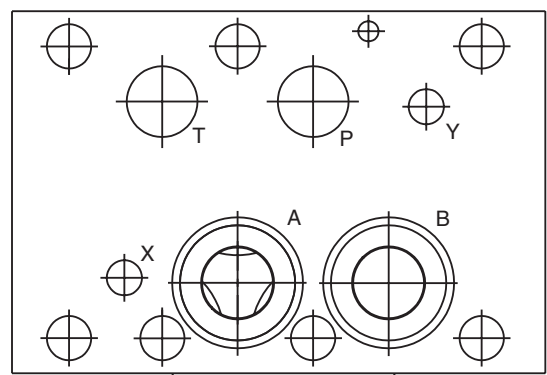


BB

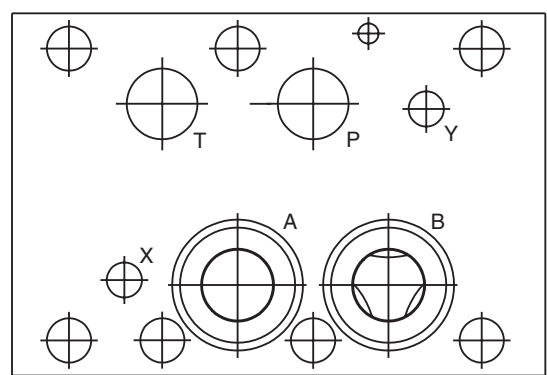
Top Views



DDF



AAF



BBF

B

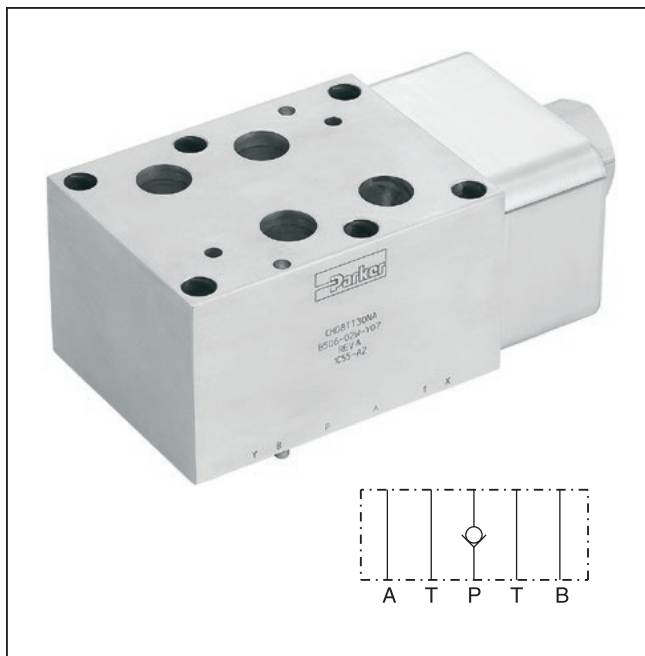
General Description

Series CH check valves provide free flow in one direction and blocked flow in the reverse direction. The check can be located in the P port or in the T port.

B

Features

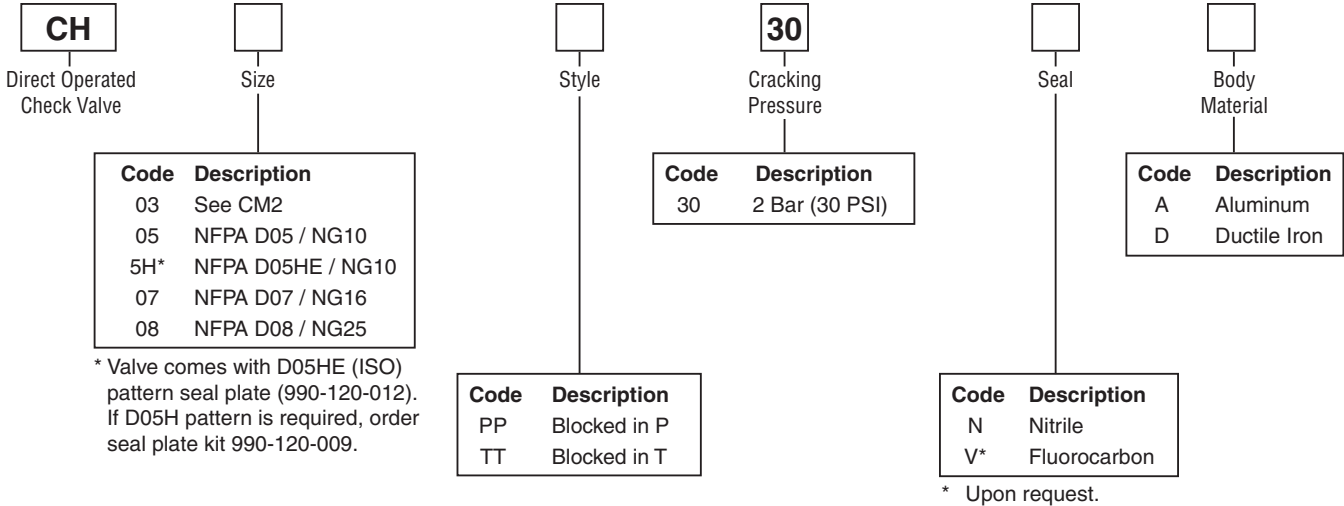
- Cracking pressure 2.0 Bar (30 PSI).
- Sizes:
 - CH05 – NFPA D05 / NG10 / CETOP 5
 - CH5H – NFPA D05HE / NG10 / CETOP 5H
 - CH07 – NFPA D07 / NG16 / CETOP 7
 - CH08 – NFPA D08 / NG25 / CETOP 8



Specifications

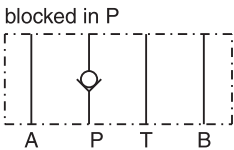
General				
Size	D05 / NG10	D05HE / NG10	D07 / NG16	D08 / NG25
Mounting Position	Unrestricted			
Ambient Temperature Range	-20°C to +50°C (-4°F to +122°F)			
Hydraulic				
Maximum Operating Pressure	Aluminum Body – up to 207 Bar (3000 PSI); Ductile Iron Body – up to 345 Bar (5000 PSI)			
Nominal Flow	151 LPM (40 GPM)	151 LPM (40 GPM)	303 LPM (80 GPM)	606 LPM (160 GPM)
Leakage	< 1 DPM	< 1 DPM	< 1 DPM	< 1 DPM
Fluid Temperature	-20°C to +80°C (-4°F to +176°F)			
Viscosity	Permitted Recommended	10 to 650 cSt / mm ² /s (46 to 3013 SSU) 30 cSt / mm ² /s (139 SSU)		
Filtration	ISO Class 4406 (1999) 18/16/13 (acc. NAS 1638: 7)			

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

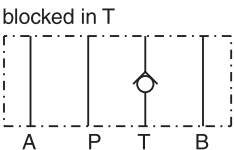


B

CH**PP



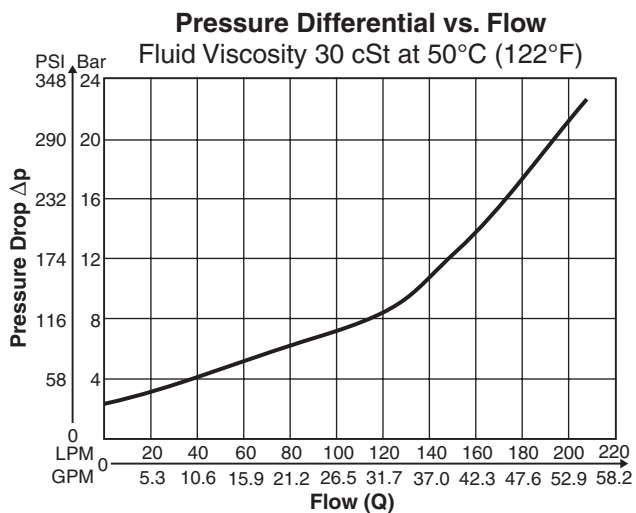
CH**TT



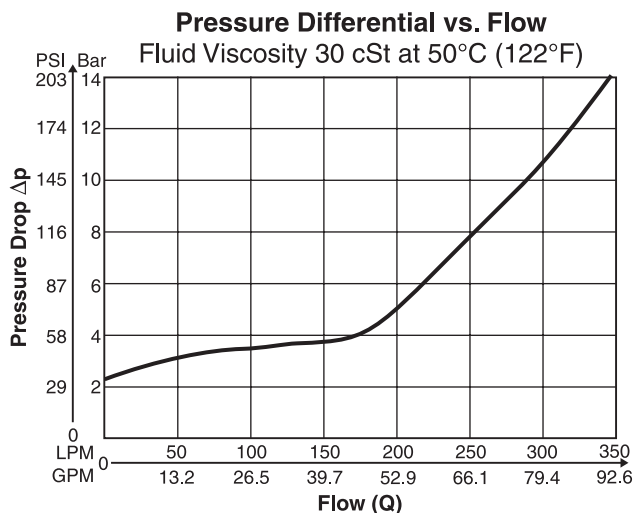
Weight:

Size	CH**PP30NA	CH**PP30ND	CH**TT30NA	CH**TT30ND
CH05, CH5H	0.8 kg (1.9 lbs.)	1.9 kg (4.2 lbs.)	0.8 kg (1.9 lbs.)	1.9 kg (4.2 lbs.)
CH07	2.2 kg (4.9 lbs.)	4.9 kg (10.9 lbs.)	2.7 kg (6.0 lbs.)	6.2 kg (13.7 lbs.)
CH08	4.7 kg (10.4 lbs.)	10.8 kg (23.8 lbs.)	5.3 kg (11.7 lbs.)	12.4 kg (27.3 lbs.)

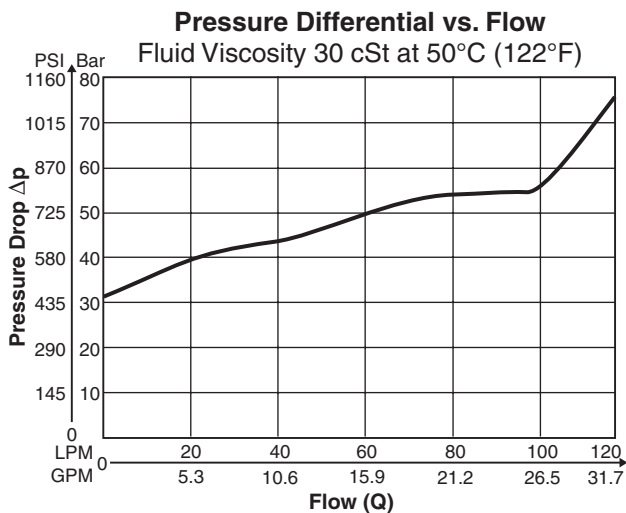
CH05/CH5H



CH07

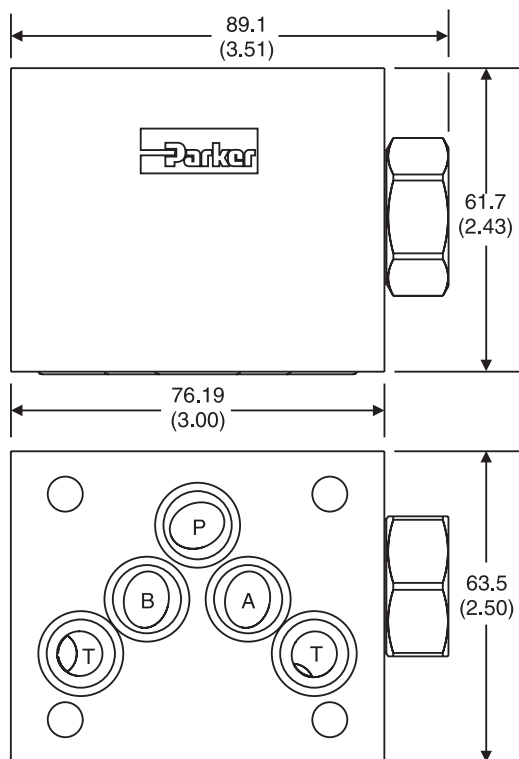


CH08

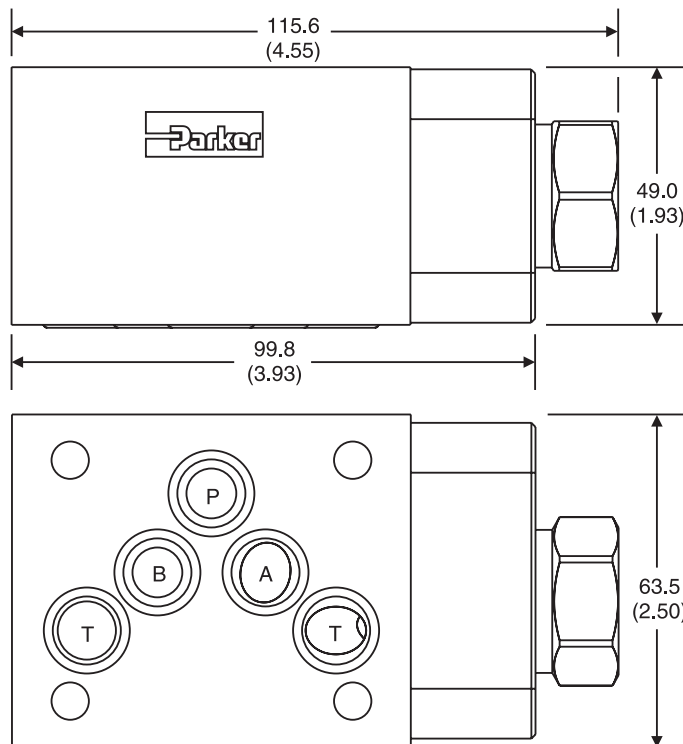


Dimensions**Sandwich Valves
Series CH05, CH5H****CH05PP**

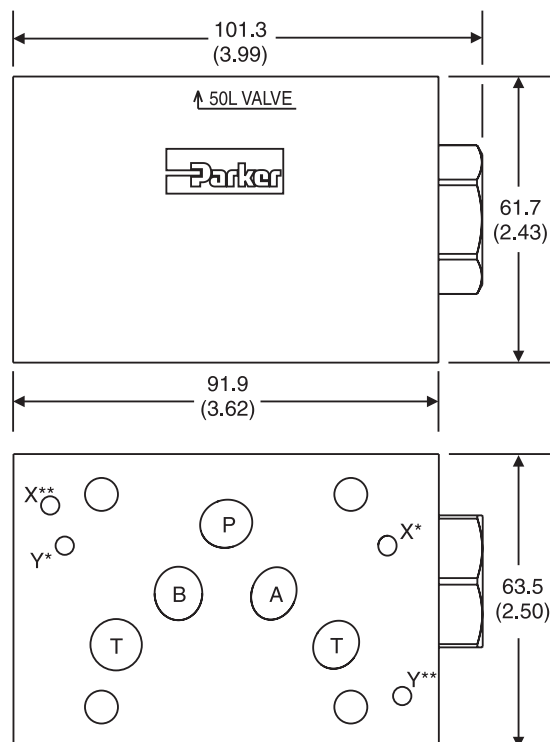
Inch equivalents for millimeter dimensions are shown in (**)

**CH05TT**

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

**CH5HPP**

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



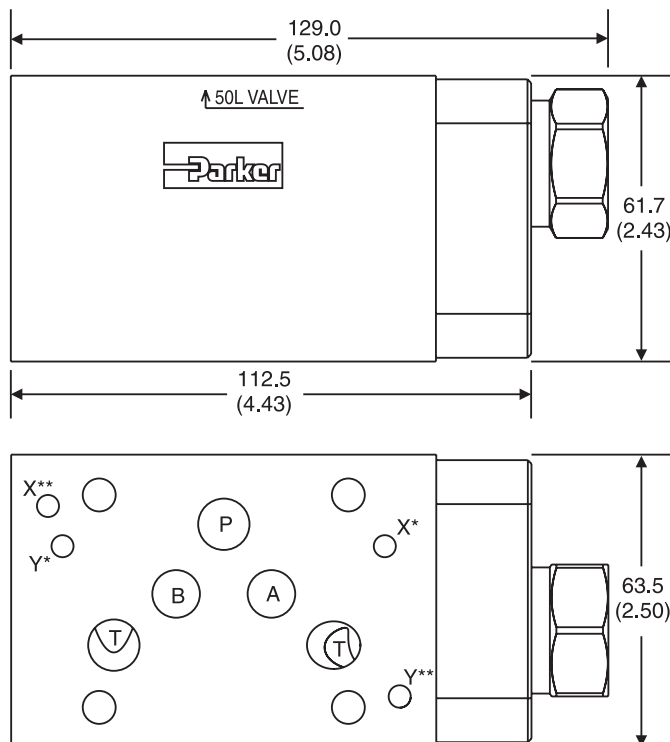
* D05HE (Standard)

** D05H

Valve comes with D05HE (ISO) pattern seal plate (990-120-012). If D05H pattern is required, order seal plate kit 990-120-009.

CH5HTT

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



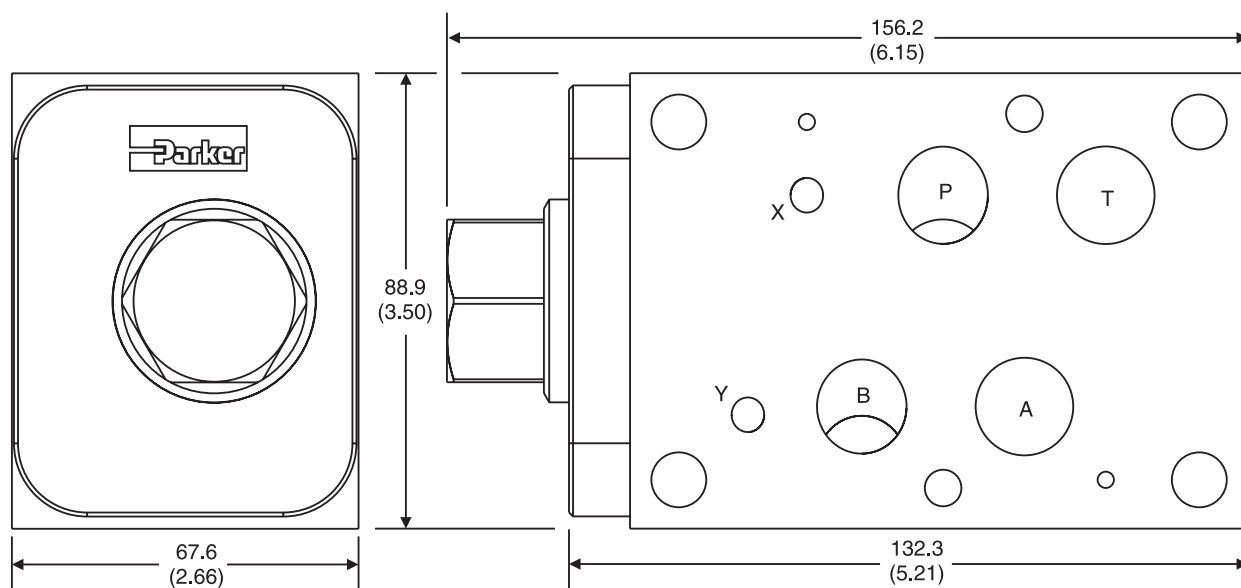
* D05HE (Standard)

** D05H

Valve comes with D05HE (ISO) pattern seal plate (990-120-012). If D05H pattern is required, order seal plate kit 990-120-009.

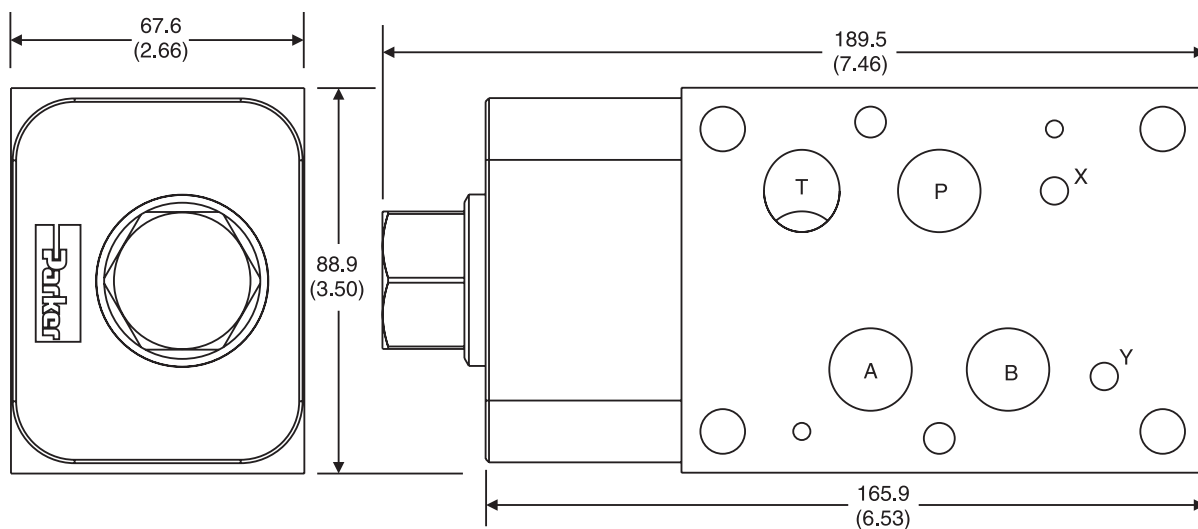


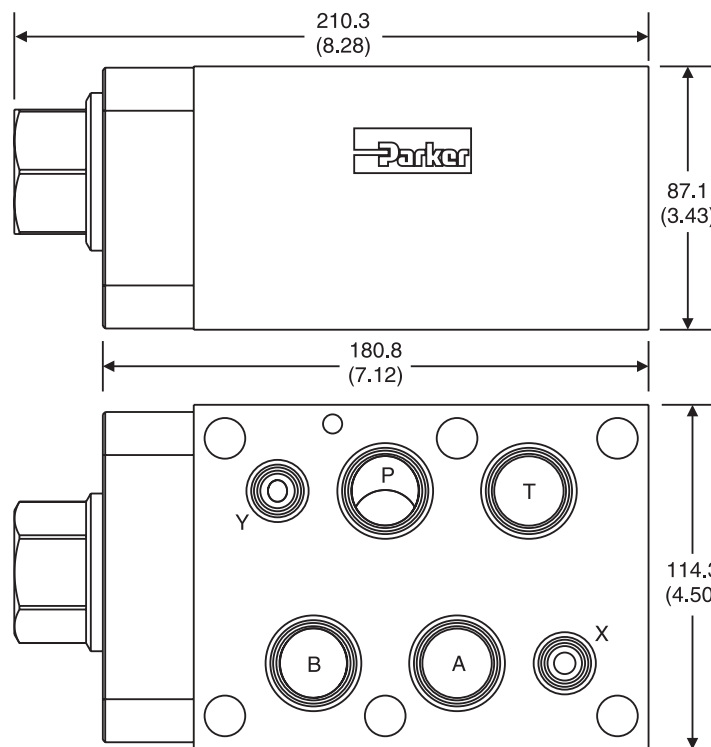
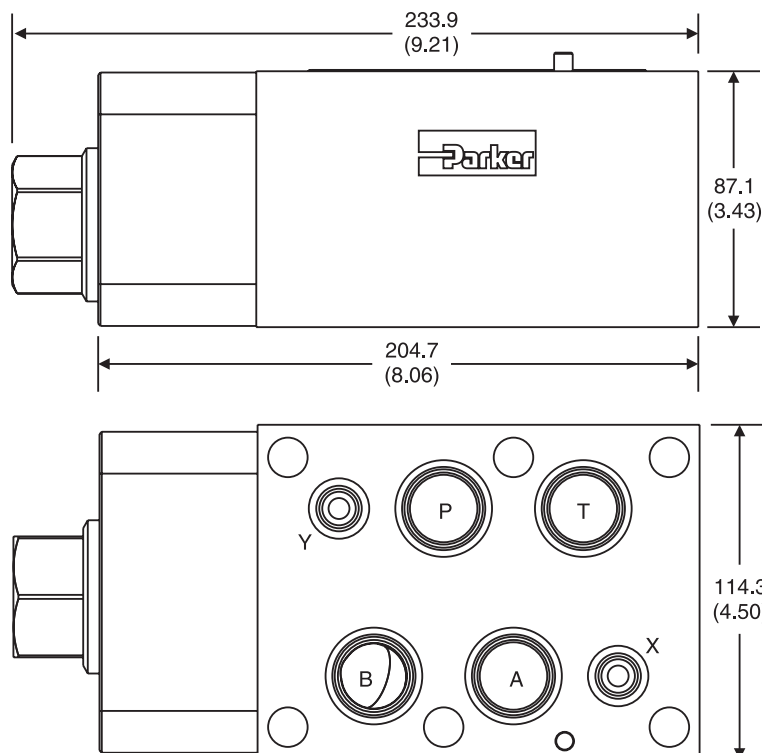
CH07PP — Inch equivalents for millimeter dimensions are shown in (**)



CH07TT — Inch equivalents for millimeter dimensions are shown in (**)

Note: This is a top view.



CH08PP — Inch equivalents for millimeter dimensions are shown in (**)**CH08TT** — Inch equivalents for millimeter dimensions are shown in (**)

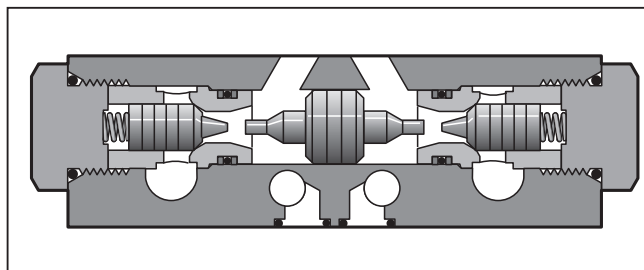
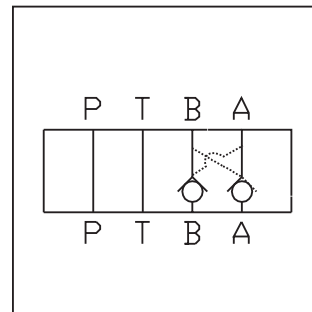
General Description

Series CPOM double pilot operated check valves block leakage from the actuator ports to tank when the directional valve is in the center position.

NOTE: For maximum response and shut off, a directional valve with both cylinder ports drained to tank in the center position is recommended for use with sandwich double pilot operated check valves.

Features

- Sandwich style, pilot operated check valves can be provided in either single or double configurations.
- The pilot operated checks may be positioned in A port or B port; or both A and B ports.
- Valve bodies are manufactured from steel providing extra strength and durability for longer life. Internal hardened steel components also provide longer life.
- Positive shut-off is provided by a hardened poppet and cage assembly.
- Large internal flow paths allow high flow at low pressure drop.



Ordering Information

CPOM

Pilot Operated Check Valve

Size

Poppet Style

Cracking Pressure

Seal

Design Series

NOTE: Not required when ordering.

Code	Description
2	NFPA D03, CETOP3, NG6 Subplate Mounting
3	NFPA D05, CETOP5, NG10 Subplate Mounting
6	NFPA D08, CETOP8, NG25 Subplate Mounting

Code	Description
AA	A Port Only
BB	B Port Only
DD	Double Poppet A and B Ports

Code	Description
Omit	0.3 Bar (5 PSI)
Y*	3.1 Bar (45 PSI)
Z*	5.2 Bar (75 PSI)

* Size 2 only.

Code	Description
N	Nitrile
V	Fluorocarbon

* Size 2 only.

CPOM	4		HT	V	
Pilot Operated Check Valve	Size NFPA D07 CETOP7 NG16	Poppet Style	Pilot Ratio 13:1	Seal Fluorocarbon	Design Series
					NOTE: Not required when ordering.
					Weight:
					CPOM2 0.8
					CPOM3 4.4
					CPOM4 7.7
					CPOM6 9.5

Bold: Designates Tier I products and options.

Non-Bold: Designates Tier II products and options. These products will have longer lead times.

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

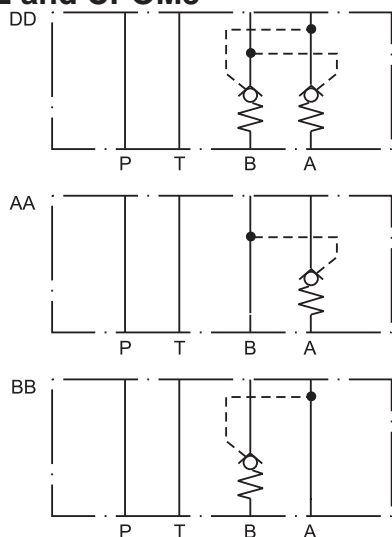
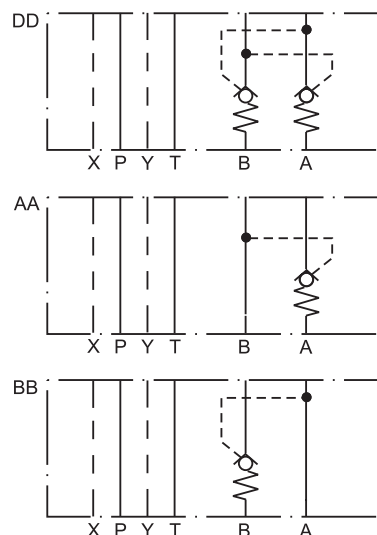
Specifications

	CPOM2	CPOM3	CPOM4	CPOM6
Mounting Pattern	NFPA D03, CETOP 3, NG6	NFPA D05, CETOP 5, NG10	NFPA D07, CETOP 7, NG16	NFPA D08, CETOP 8, NG25
Maximum Pressure	345 Bar (5000 PSI)	345 Bar (5000 PSI)	345 Bar (5000 PSI)	205 Bar (3000 PSI)
Maximum Flow	53 LPM (14 GPM) @ 21 Bar (305 PSI) Pressure Drop	76 LPM (20 GPM) @ 11 Bar (155 PSI) Pressure Drop	200 LPM (53 GPM) @ 11 Bar (155 PSI) Pressure Drop	227 LPM (60 GPM) @ 24 Bar (350 PSI) Pressure Drop
Cracking Pressure	1.0 Bar (15 PSI)	0.3 Bar (5 PSI)	2.0 Bar (29 PSI)	0.4 Bar (6 PSI)
Pilot Ratio	3:1	3:1	13:1	3:1
Leakage	5 DPM	5 DPM	Consult Factory	5 DPM

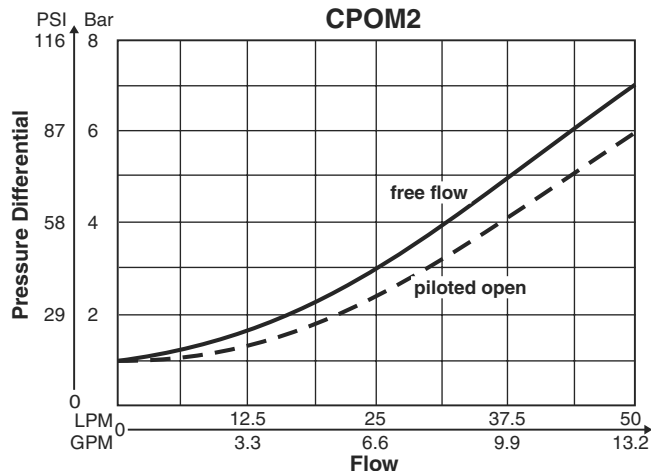
Bolt Kits

Size 2				Size 3			
No. of Sandwich	Sandwich & Valve Combination	Bolt Kit	Bolt Length mm (in)	No. of Sandwich	Sandwich & Valve Combination	D3W-30 D3DW & D31*W* Bolt Length mm (in)	
1	Sandwich & D1	BK243	73.2 (2.88)	1	Sandwich & D3	BK141	88.9 (3.50)
2	Sandwich & D1	BK225	111.3 (4.38)	2	Sandwich & D3	BK142	139.7 (5.50)
3	Sandwich & D1	BK244	152.4 (6.00)	3	Sandwich & D3	BK143	190.5 (7.50)
4	Sandwich & D1	BK245	190.5 (7.50)	* D31VW with internal pilot and internal drain only.			
Size 4				Size 6			
No. of Sandwich	Sandwich & Valve Combination	Bolt Length mm		No. of Sandwich	Sandwich & Valve Combination	Bolt Kit	Bolt Length mm (in)
1	Sandwich & D4	4x M10 x 140		1	Sandwich & D6	BK121	133.4 (5.25)
		2x M6 x 135		2	Sandwich & D6	BK122	203.2 (8.00)
2	Sandwich & D4	4x M10 x 220		3	Sandwich & D6	BK123	273.1 (10.75)
		2x M6 x 215		4	Sandwich & D6	BK124	342.9 (13.5)
3	Sandwich & D4	4x M10 x 300					
		2x M10 x 295					

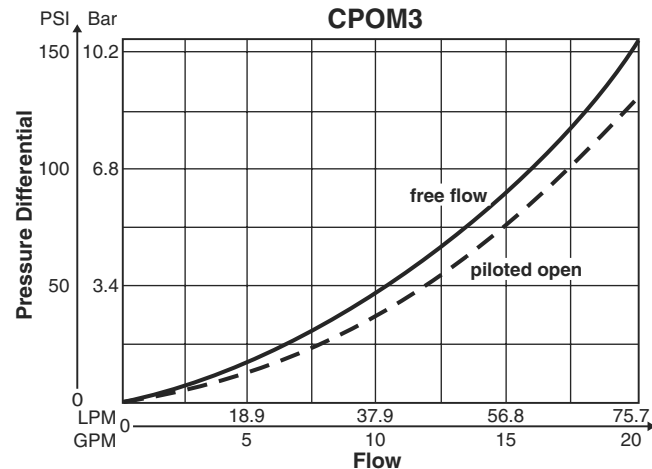
Bolt Kits must be ordered separately.

Schematics
CPOM2 and CPOM3Schematics
CPOM4 and CPOM6

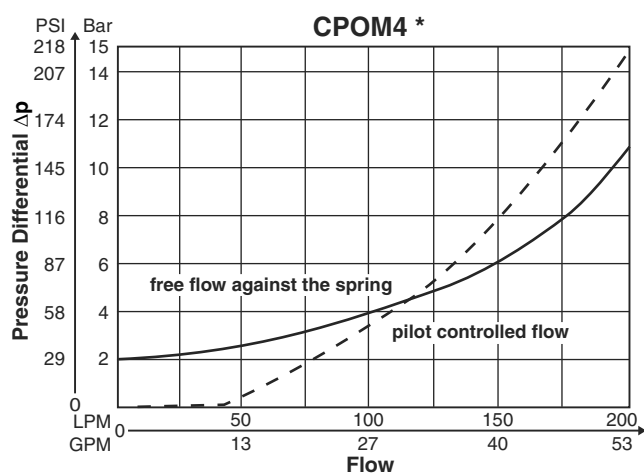
CPOM2



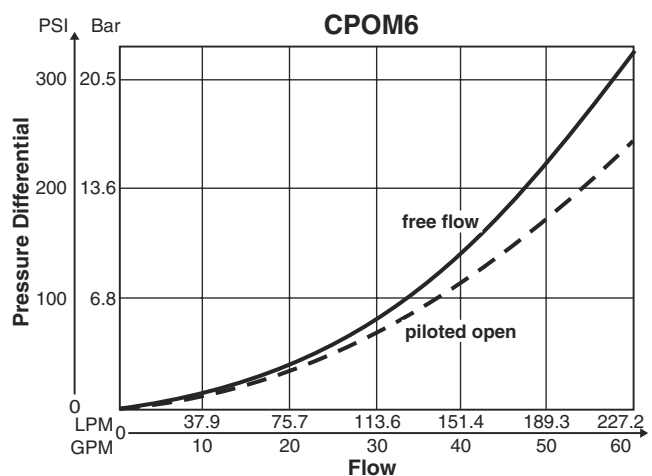
CPOM3



CPOM4



CPOM6



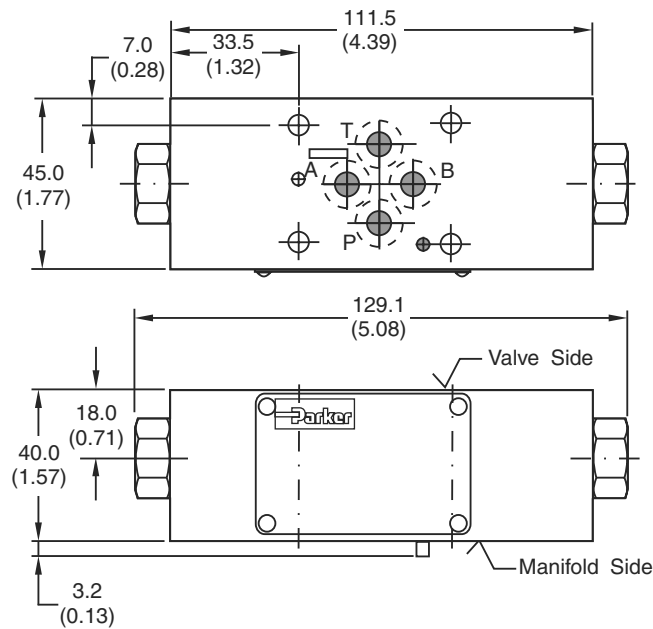
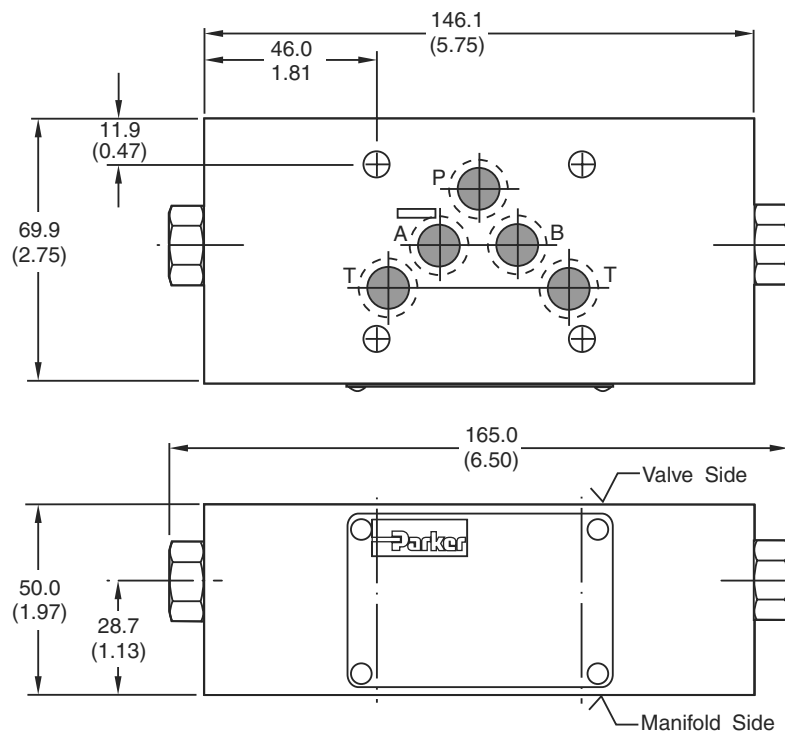
* Curves measured with ISO 46 fluid at 50°C (122°F).

Curves were generated using 100 SSU hydraulic oil. For any other viscosity, pressure drop will change as per chart.

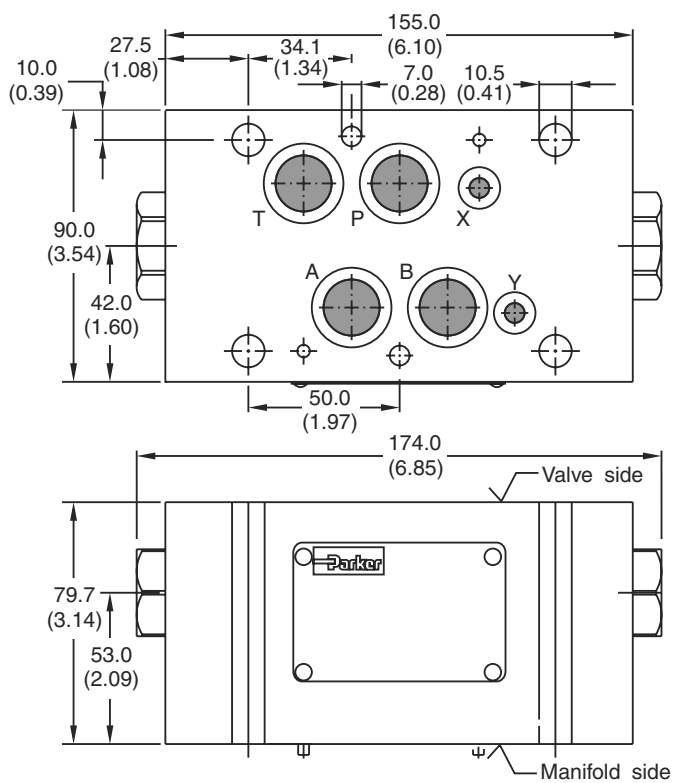
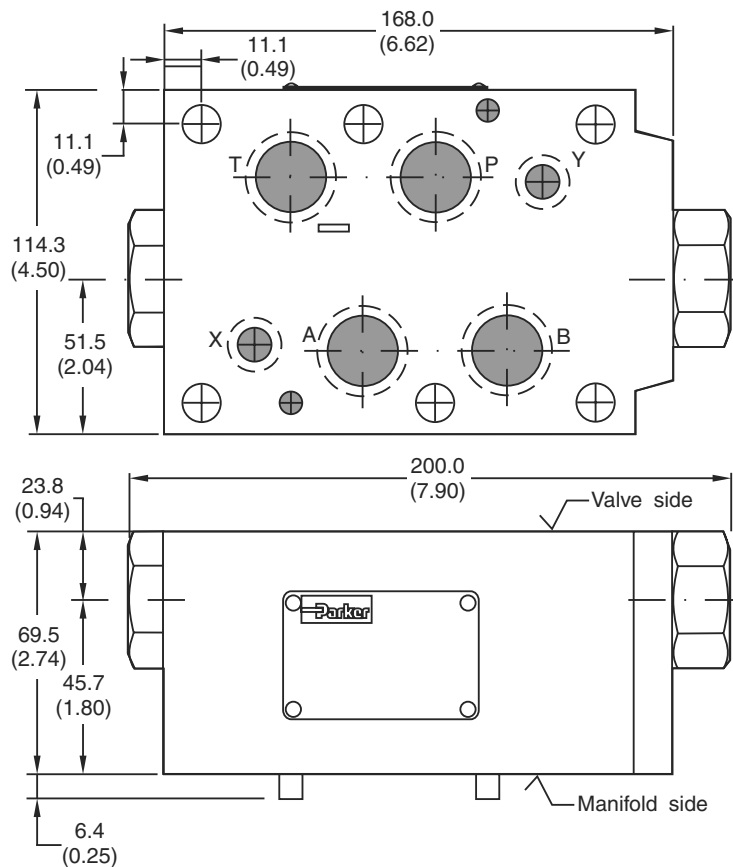
Viscosity Correction Factor

Viscosity (SSU)	75	150	200	250	300	350	400
Percentage of ΔP (Approx.)	93	111	119	126	132	137	141

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

CPOM2**CPOM3**

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

CPOM4**CPOM6**

General Description.

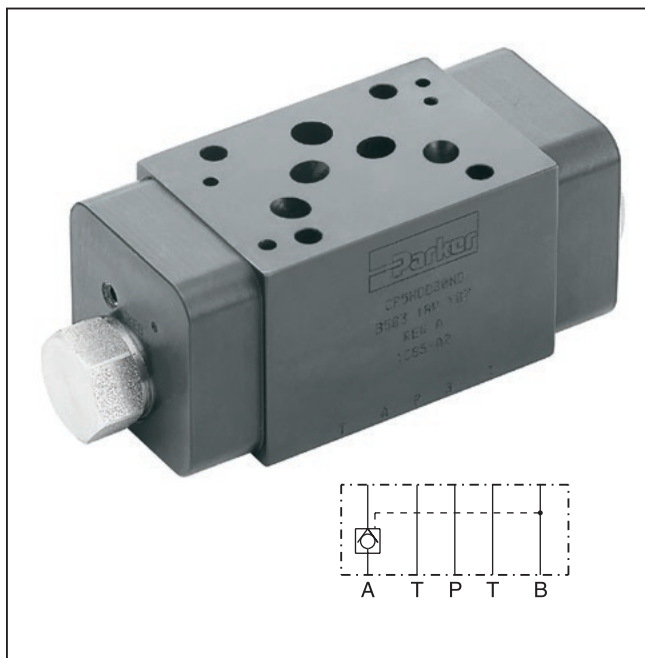
Series CP pilot operated check valves are designed for maximum flow rates.

The valves are typically used in combination with spool type directional control valves to ensure leak free positioning of the actuator.

The inlet flow is free while the outlet flow is blocked. Pressure in the inlet line opens the check valve and allows free outlet flow.

Features

- High life time.
- Check function in A, B or A + B.
- Sizes:
 - CP05 – NFPA D05 / NG10 / CETOP 5
 - CP5H – NFPA D05HE / NG10 / CETOP 5H
 - CP07 – NFPA D07 / NG16 / CETOP 7
 - CP08 – NFPA D08 / NG25 / CETOP 8



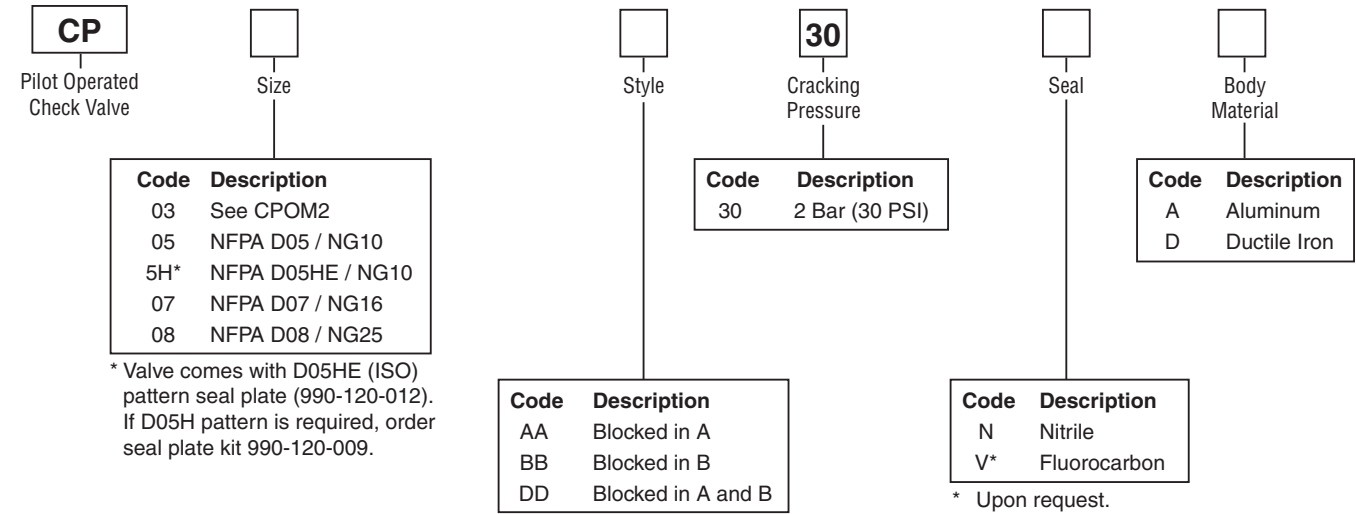
B

Specifications

General				
Size	D05 / NG10	D05HE / NG10	D07 / NG16	D08 / NG25
Mounting Position	Unrestricted			
Ambient Temperature Range	-20°C to +50°C (-4°F to +122°F)			
Hydraulic				
Maximum Operating Pressure	Aluminum Body – up to 207 Bar (3000 PSI); Ductile Iron Body – up to 345 Bar (5000 PSI)			
Nominal Flow	114 LPM (30 GPM)	114 LPM (30 GPM)	227 LPM (60 GPM)	454 LPM (120 GPM)
Leakage	1 DPM	1 DPM	1 DPM	1 DPM
Cracking Pressure	30 ± 0.2 Bar (3 PSI)			
Pilot Ratio	3:1	3:1	3:1	3:1
Fluid Temperature	-20°C to +80°C (-4°F to +176°F)			
Viscosity	Permitted Recommended	10 to 650 cSt / mm ² /s (46 to 3013 SSU) 30 cSt / mm ² /s (139 SSU)		
Filtration	ISO Class 4406 (1999) 18/16/13 (acc. NAS 1638: 7)			

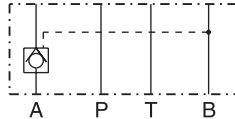
WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

B



CPAA**

blocked in A



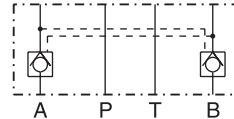
CPBB**

blocked in B



CPDD**

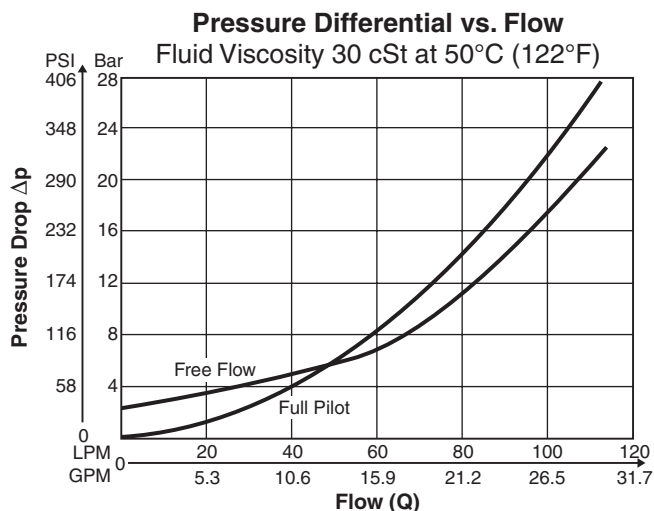
blocked in A and B



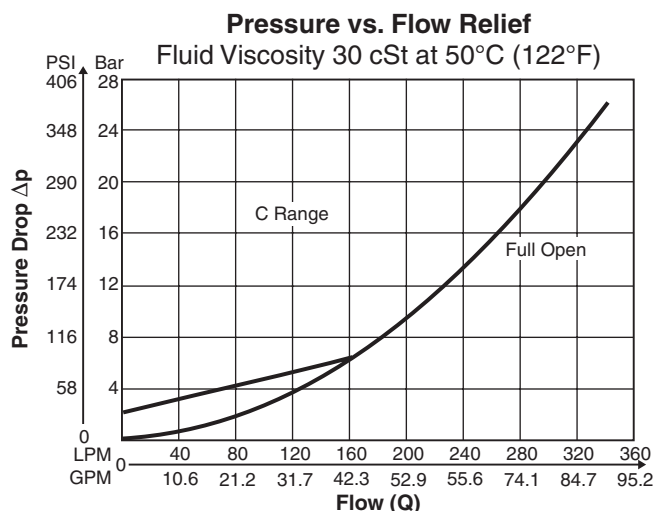
Weight:

Size	CP**AA30NA	CP**AA30ND	CP**BB30NA	CP**BB30ND	CP**DD30NA	CP**DD30ND
CP05, CP5H	0.8 kg (1.8 lbs.)	1.7 kg (3.8 lbs.)	0.8 kg (1.8 lbs.)	1.7 kg (3.8 lbs.)	1.3 kg (2.9 lbs.)	2.7 kg (5.9 lbs.)
CP07	2.4 kg (5.4 lbs.)	5.3 kg (11.8 lbs.)	2.4 kg (5.3 lbs.)	5.2 kg (11.6 lbs.)	3.5 kg (7.6 lbs.)	7.2 kg (15.8 lbs.)
CP08	5.2 kg (11.4 lbs.)	11.6 kg (25.6 lbs.)	5.8 kg (12.7 lbs.)	13.1 kg (29 lbs.)	7.6 kg (16.7 lbs.)	15.9 kg (35.1 lbs.)

CP05/CP5H

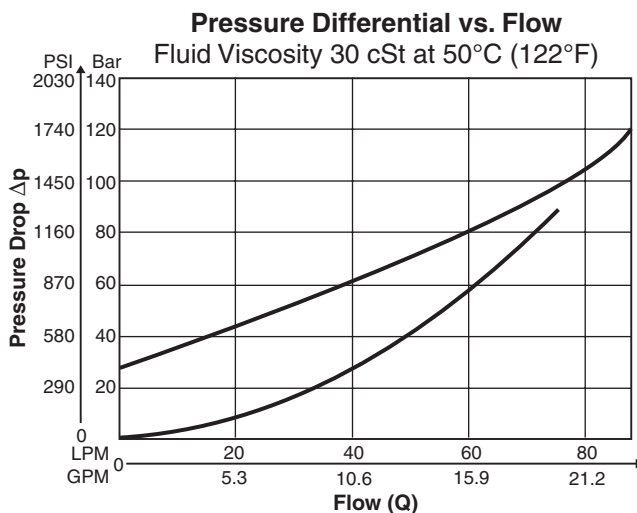


CP07



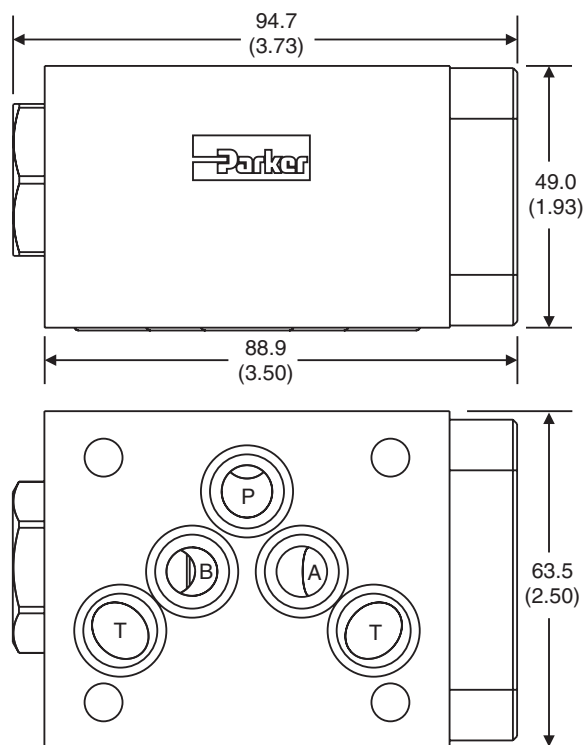
B

CP08

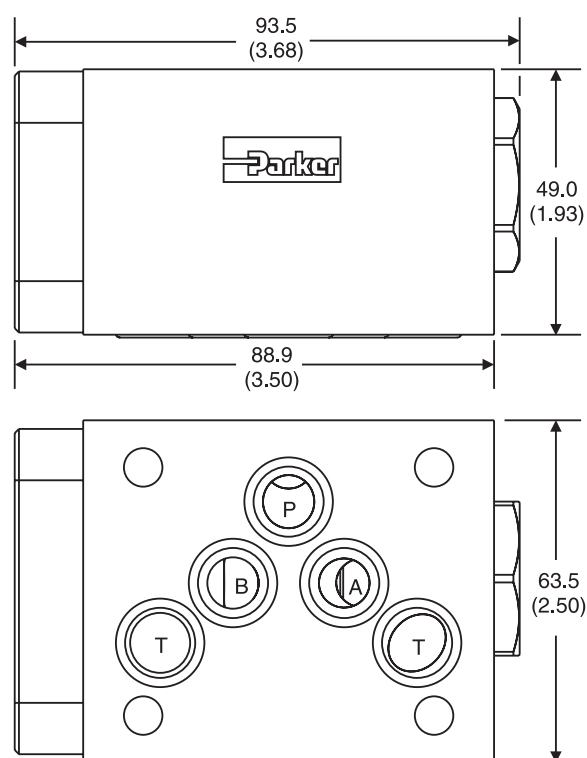
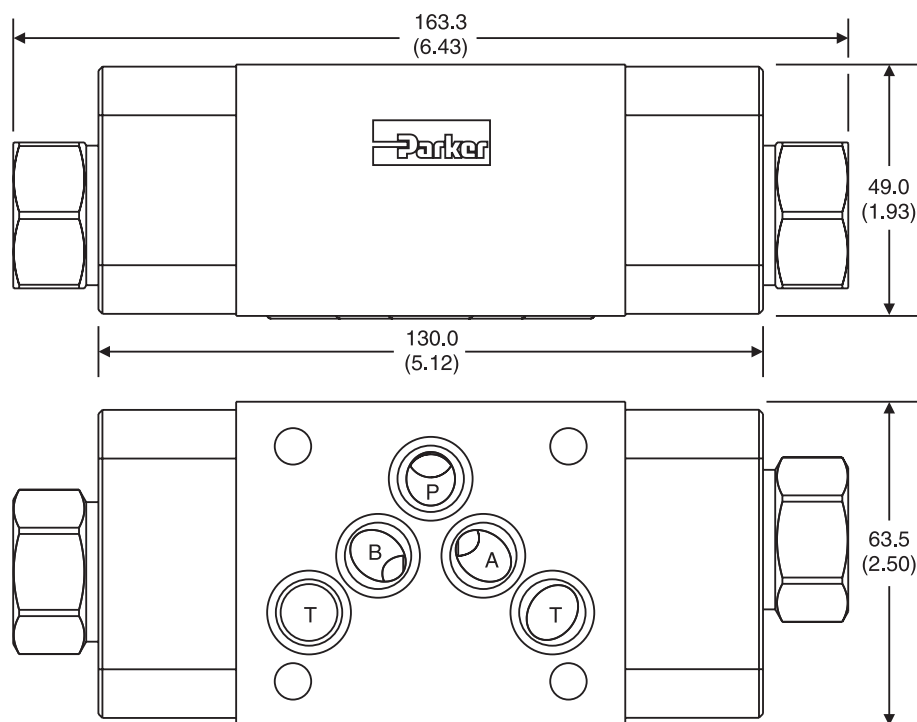


CP05AA

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

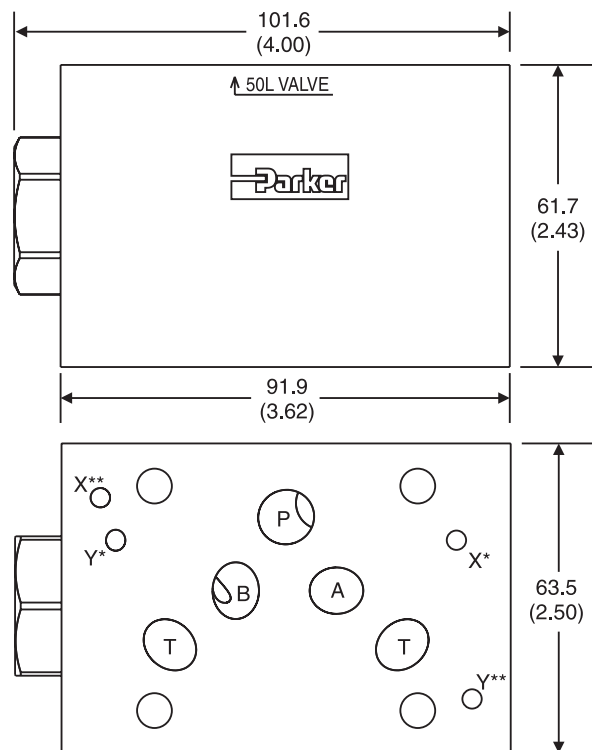
**CP05BB**

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

**CP05DD** — Inch equivalents for millimeter dimensions are shown in (**)

CP5HAA

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

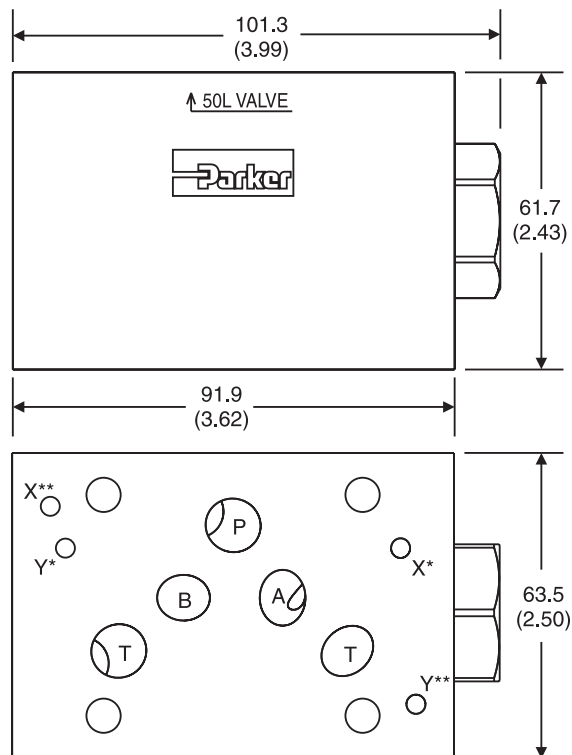


* D05HE (Standard)

** D05H

CP5HBB

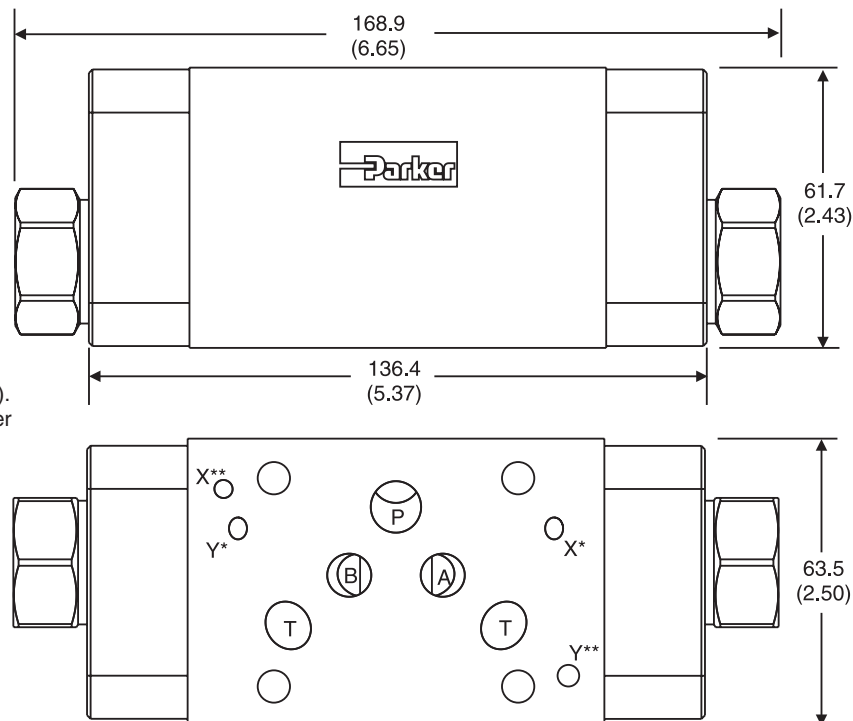
Inch equivalents for millimeter dimensions are shown in (**)



* D05HE (Standard)

** D05H

Valve comes with D05HE (ISO) pattern seal plate (990-120-012). If D05H pattern is required, order seal plate kit 990-120-009.

CP5HDD — Inch equivalents for millimeter dimensions are shown in (**)

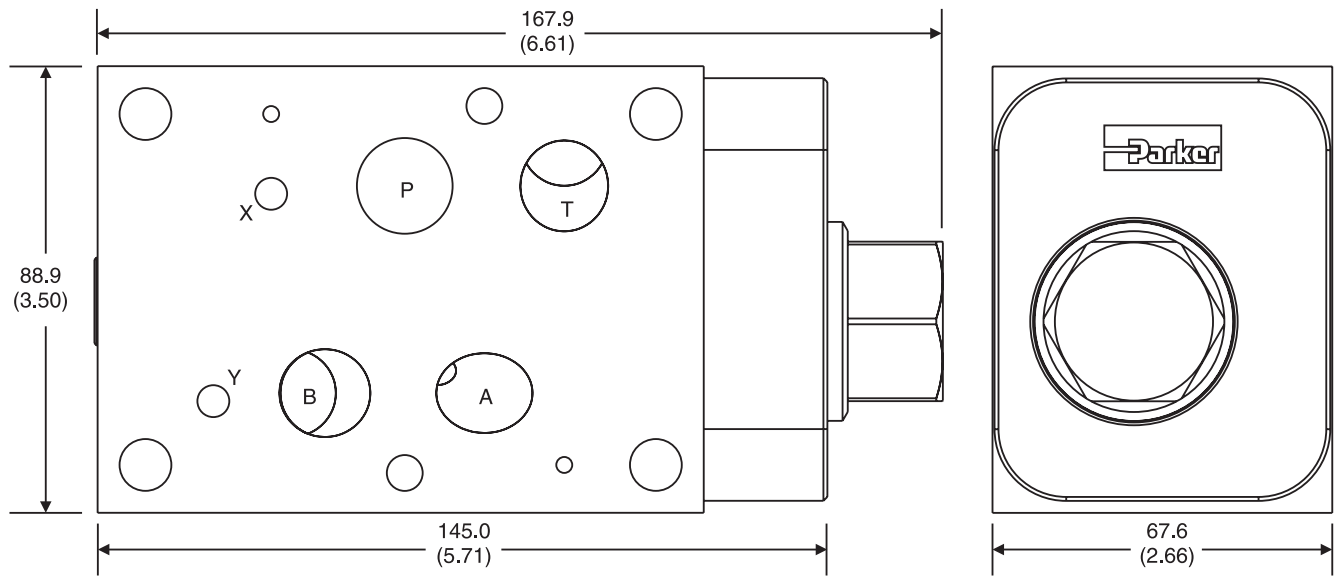
Valve comes with D05HE (ISO) pattern seal plate (990-120-012). If D05H pattern is required, order seal plate kit 990-120-009.

* D05HE (Standard)

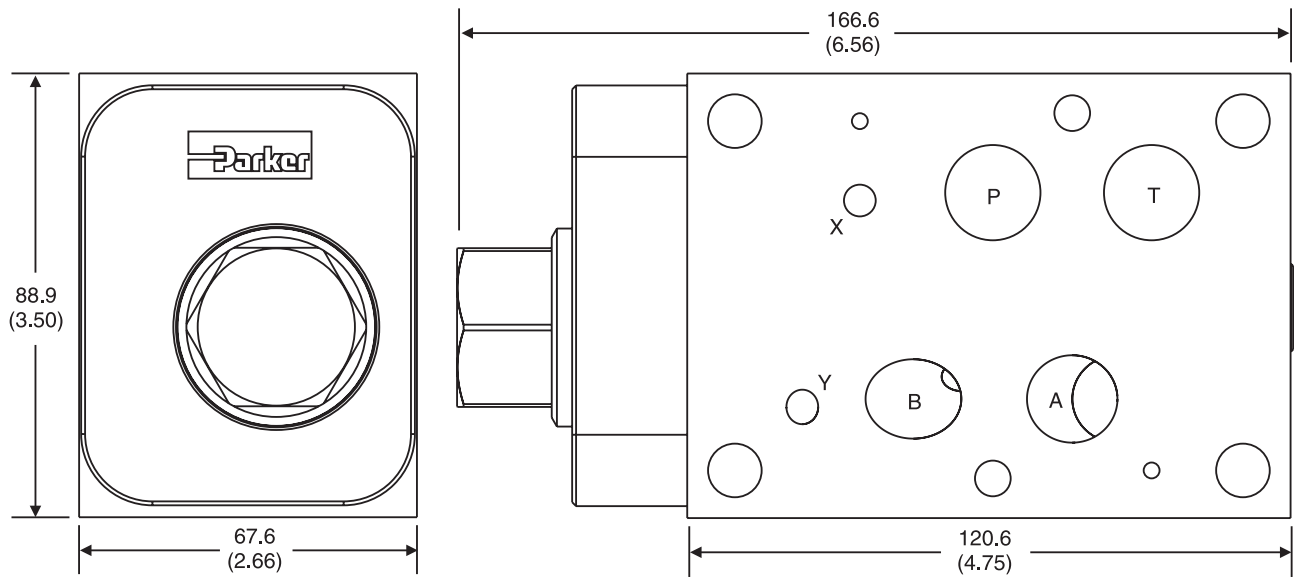
** D05H

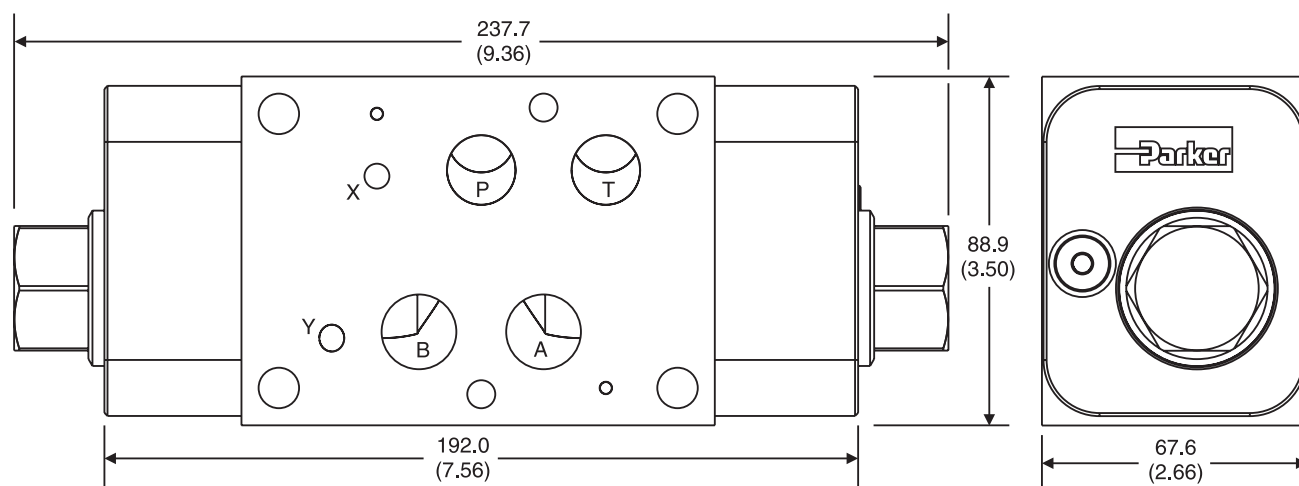
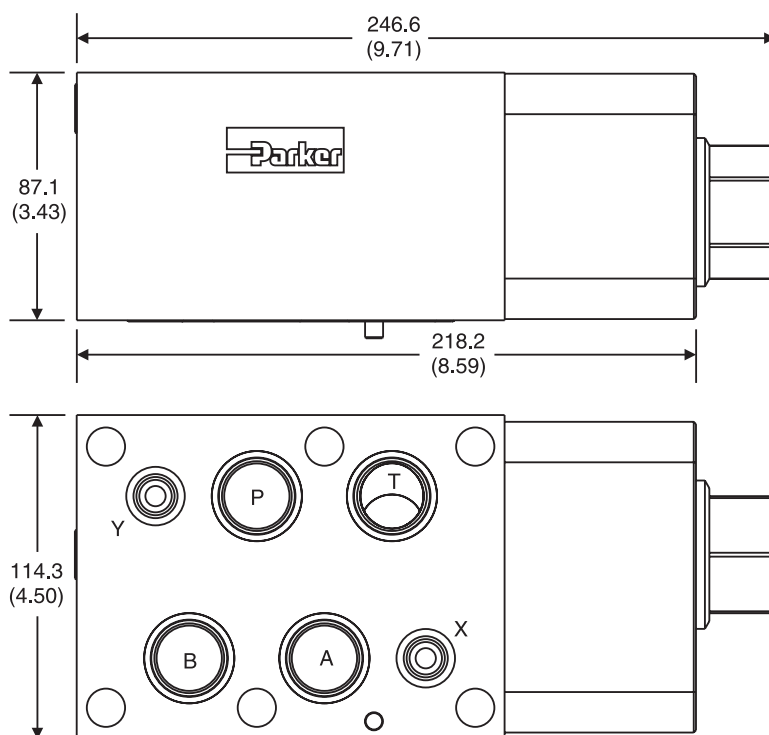


CP07AA – Inch equivalents for millimeter dimensions are shown in (**)

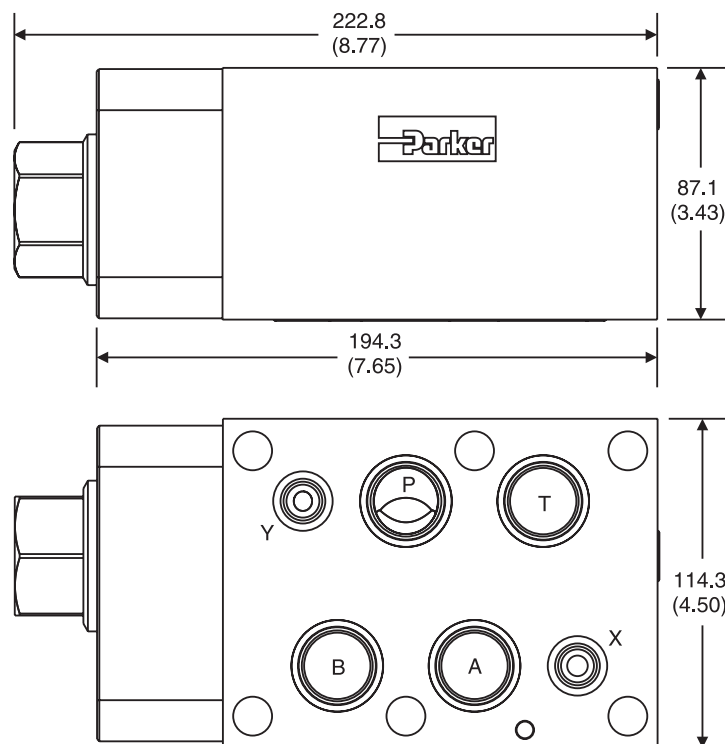


CP07BB – Inch equivalents for millimeter dimensions are shown in (**)

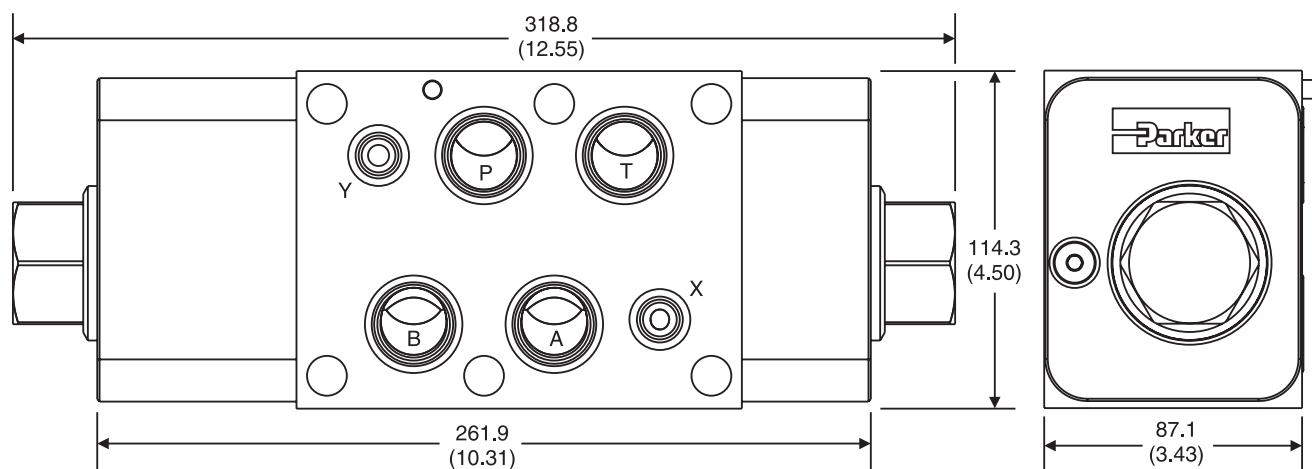


CP07DD — Inch equivalents for millimeter dimensions are shown in (**)**B****CP08AA** — Inch equivalents for millimeter dimensions are shown in (**)

CP08BB — Inch equivalents for millimeter dimensions are shown in (**)



CP08DD — Inch equivalents for millimeter dimensions are shown in (**)

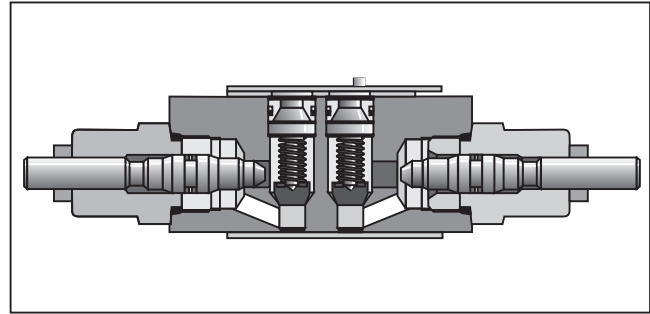
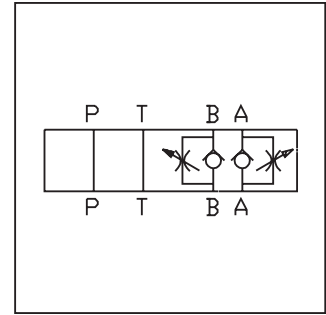


General Description

Series FM double flow control valves permit free flow from the directional valve to the actuator and adjustable independent flow regulation in each return line from the actuator (meter-out). The FM2 and FM3 have a seal plate and can be inverted for meter-in applications (see installation drawing for flow direction).

Features

- FM style flow control valves can be provided in either single or double configurations.
- The flow controls may be positioned in 'A' port, 'B' port, both 'A' and 'B' ports or 'P' port.
- Valve bodies are manufactured from steel providing extra strength and durability for longer life. Internal hardened steel components also provide longer life.
- Two step needles provide fine adjustment for the first few turns and course adjustment for the last few turns. Standard and fine adjustment needles available.
- Large bypass checks allow high flow at a low pressure drop.
- Valve is reversible (invert 180°) for meter-in or meter-out applications (FM2 and FM3 only).
- Adjustment options include Allen hex or hand knob.



Specifications

	FM2	FM3	FM6
Mounting Pattern	NFPA D03, CETOP 3, NG 6	NFPA D05, CETOP 5, NG 10	NFPA D08, CETOP 8, NG 25
Maximum Pressure	345 Bar (5000 PSI)	345 Bar (5000 PSI)	205 Bar (3000 PSI)
Maximum Flow	76 LPM (20 GPM)	113 LPM (30 GPM)	341 LPM (90 GPM)
Cracking Pressure	0.3 Bar (5 PSI)	0.3 Bar (5 PSI)	0.3 Bar (5 PSI)

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

B

FM Flow Valve Control	Size	Meter Option	Needles	Adjustment	Seal	* Design Series NOTE: Not required when ordering.
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Code	Description
2	NFPA D03 Subplate Mounting
3	NFPA D05 Subplate Mounting
6*	NFPA D08 Subplate Mounting

* FM6 - Meter out only

Code	Type
N	Nitrile
V	Fluorocarbon

Code	Type
K	Knob
S	Allen Hex

Code	Description
AA	Single Function A Port Only
BB	Single Function B Port Only
DD	A and B Ports Dual Function
PP**	Single Function P Port

** Not available on size 6.

Code	Description
Omit	Standard
D*	Fine Meter

* D needle is the standard needle in valves used as pilot chokes. Not available on size 6.

Bold: Designates Tier I products and options.

Non-Bold: Designates Tier II products and options. These products will have longer lead times.

Sandwich Bolt Kits

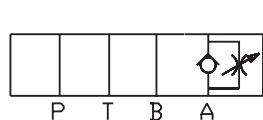
Size "2"				Size "3"			
No. of Sandwich	Sandwich & Valve Combination	Bolt Kit	Bolt Length mm (in)	No. of Sandwich	Sandwich & Valve Combination	D3W-30 D3DW & D31*W*	Bolt Length mm (in)
1	Sandwich & D1	BK243	73.2 (2.88)	1	Sandwich & D3	BK141	88.9 (3.50)
2	Sandwich & D1	BK225	111.3 (4.38)	2	Sandwich & D3	BK142	139.7 (5.50)
3	Sandwich & D1	BK244	152.4 (6.00)	3	Sandwich & D3	BK143	190.5 (7.50)
4	Sandwich & D1	BK245	190.5 (7.50)	* D31VW with internal pilot and internal drain only.			
Size "6"				Unit Weight FM2 1.0 FM3 2.0 FM6 7.0			
No. of Sandwich	Sadnwich & Valve Combination	Bolt Kit	Bolt Length mm (in)				
1	Sandwich & D6	BK121	133.4 (5.25)				
2	Sandwich & D6	BK122	203.2 (8.00)				
3	Sandwich & D6	BK123	273.1 (10.75)				
4	Sandwich & D6	BK124	342.9 (13.5)				

Unit Weight:

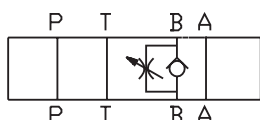
FM2	1.7 kg (3.8 lbs.)
FM3	2.4 kg (5.2 lbs.)
FM6	7.9 kg (17.5 lbs.)

Bolt Kits must be ordered separately.

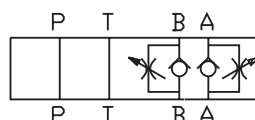
Schematics



AA Option



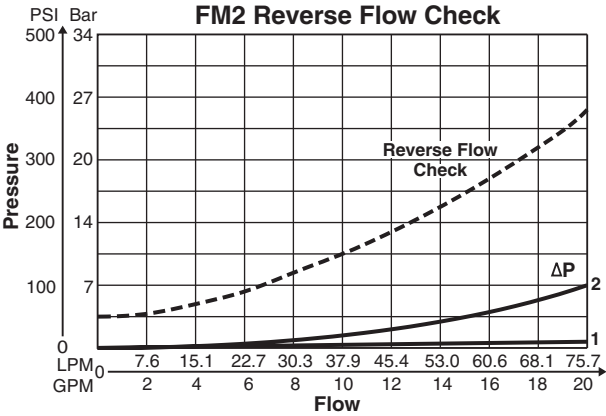
BB Option



DD Option



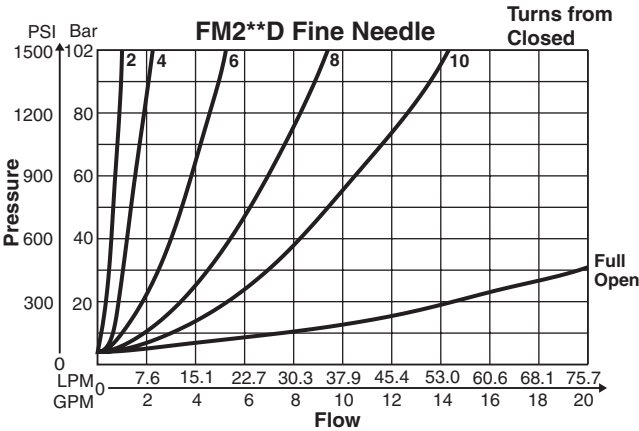
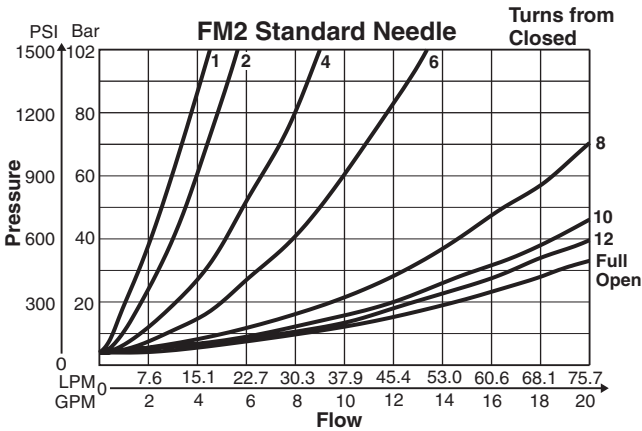
PP Option



Pressure Drop
Reference
Chart

	P	A	B	T
PP	*	2	2	1
DD	1	*	*	1
AA	1	*	1	1
BB	1	1	*	1

* See specific
flow vs. turns

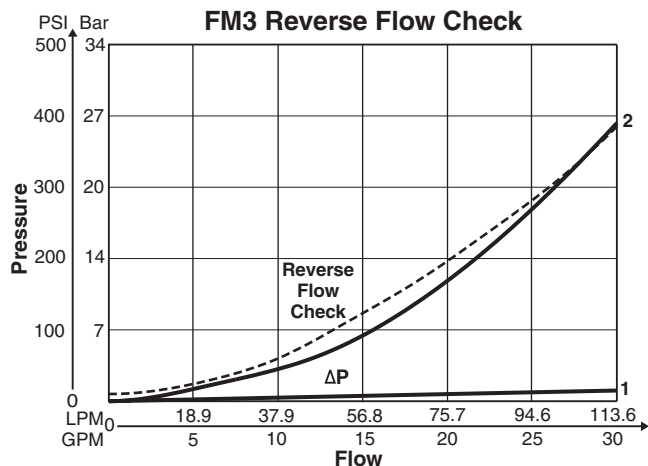


Curves were generated using 100 SSU hydraulic oil @49°C (120°F). For any other viscosity, pressure drop will change as per chart.

Viscosity Correction Factor

Viscosity (SSU)	75	150	200	250	300	350	400
Percentage of ΔP (Approx.)	93	111	119	126	132	137	141

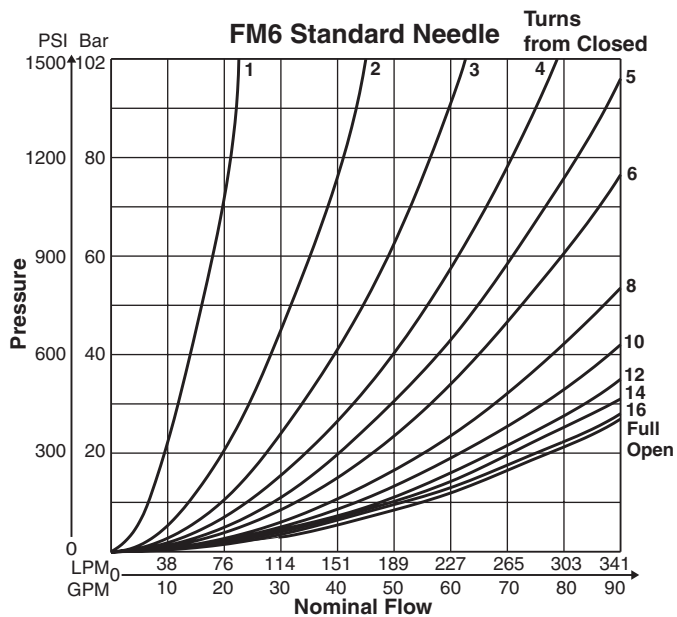
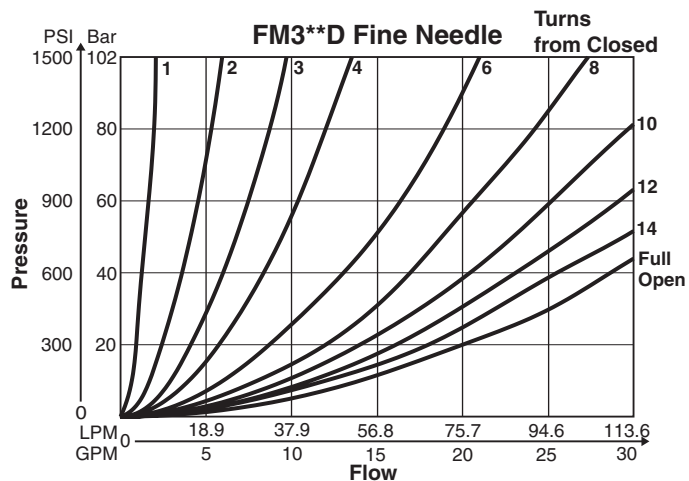
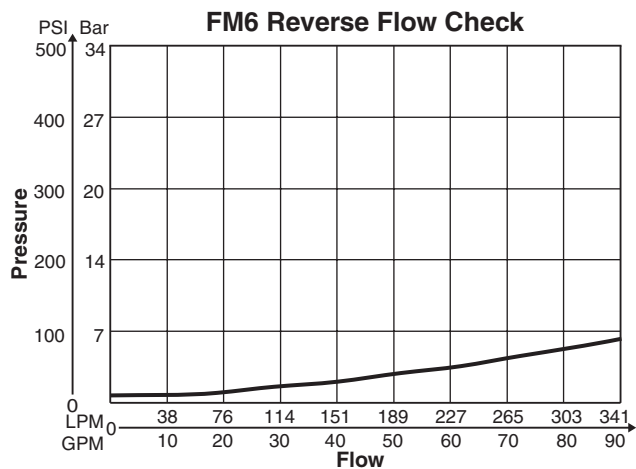
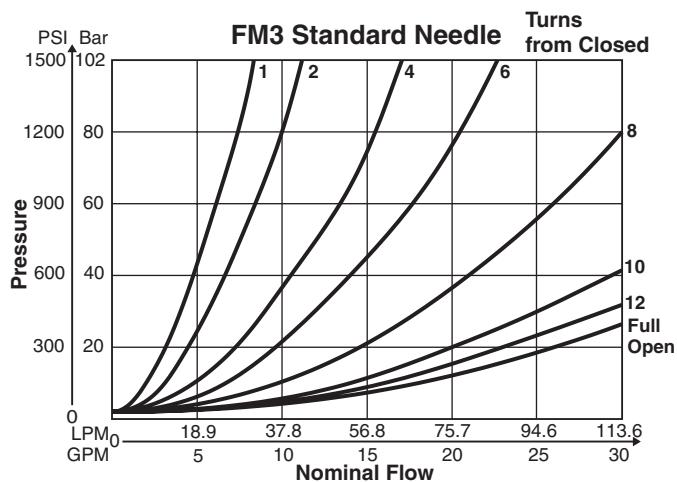
B



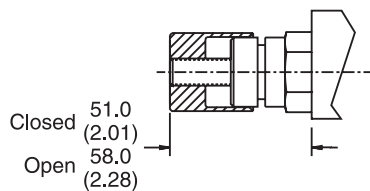
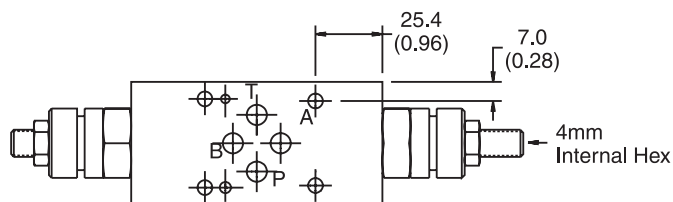
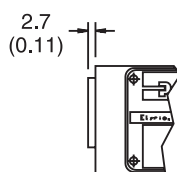
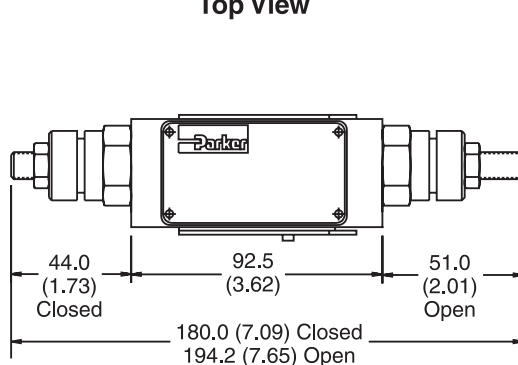
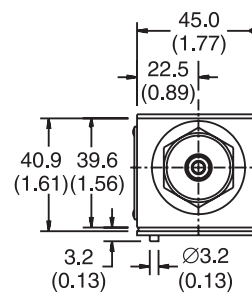
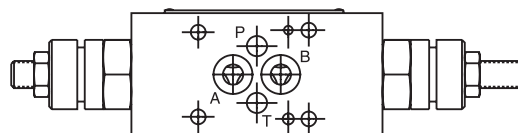
Pressure Drop Reference Chart

	P	A	B	T
PP	*	2	2	1
DD	1	*	*	1
AA	1	*	1	1
BB	1	1	*	1

* See specific flow vs. turns chart



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

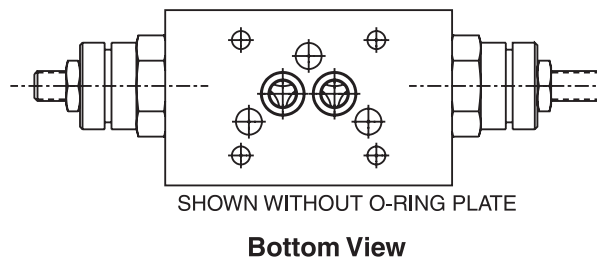
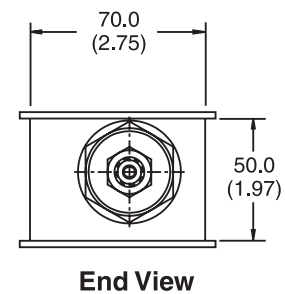
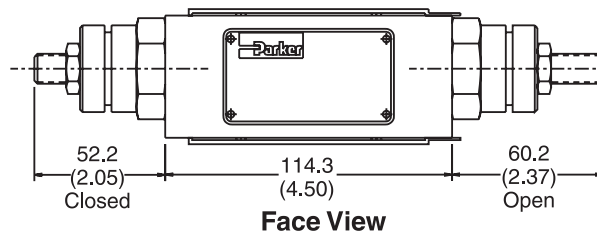
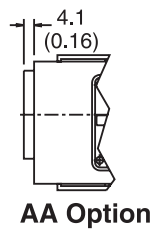
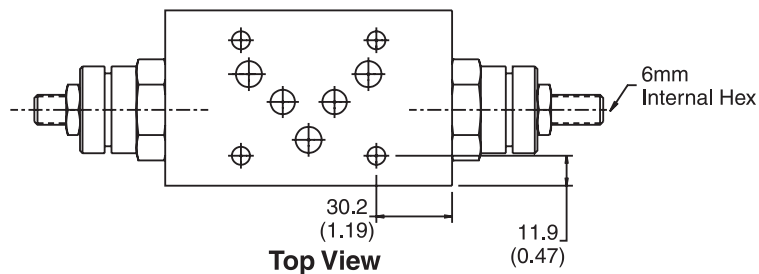
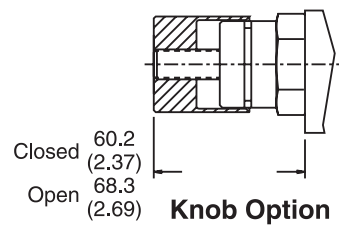
**Knob Option****Top View****BB Option****Face View****End View**

SHOWN WITHOUT O-RING PLATE

Bottom View

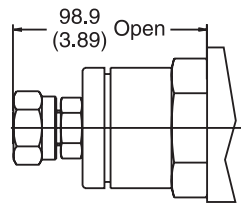
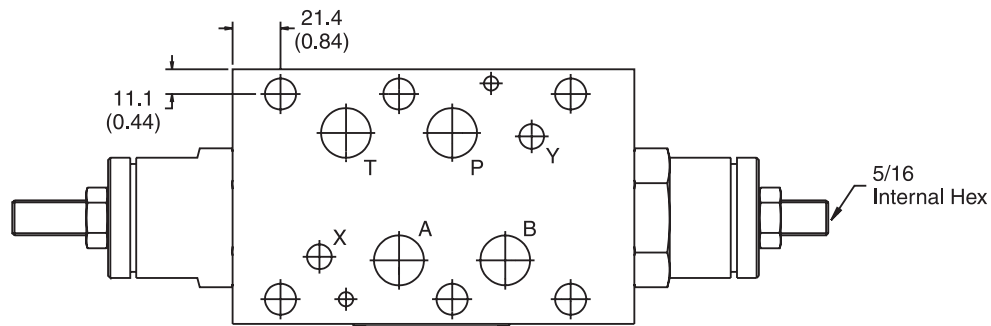
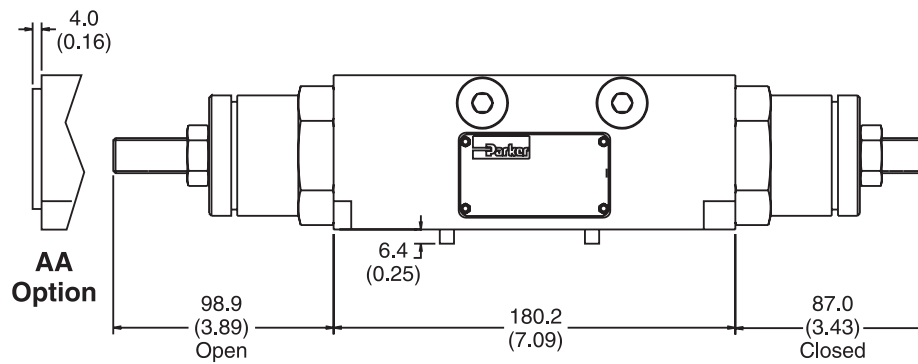
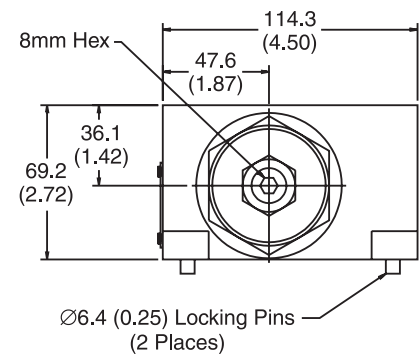
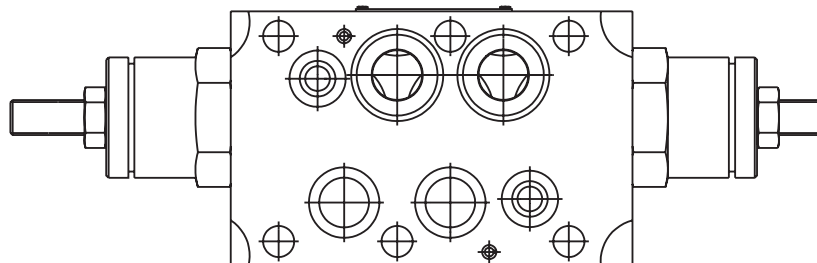
Note: For meter-in option, invert body 180°.

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



Note: For meter-in option, invert body 180°.

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

**Knob Option****Top View****Face View****End View****Bottom View**

General Description

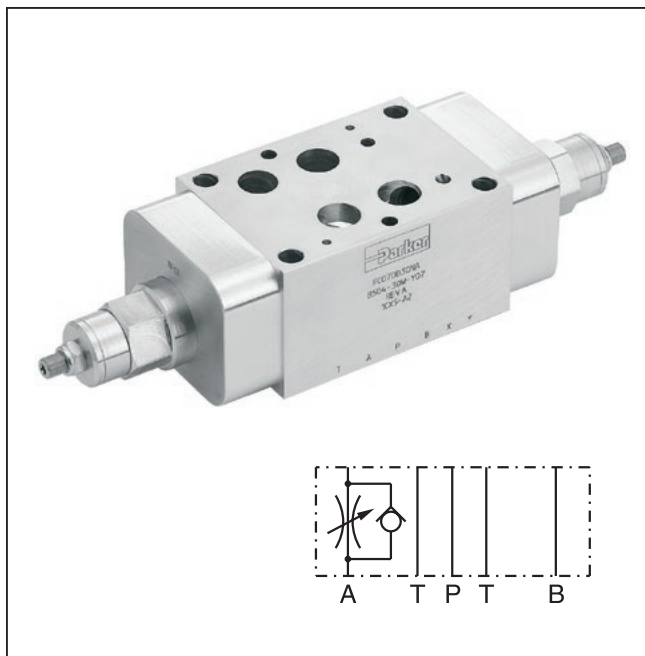
Series FC, FD throttle check valves are designed for maximum flow rates.

The throttle check function is located in ports A and B. Meter-in or meter-out functionality can be selected by model code.

B

Features

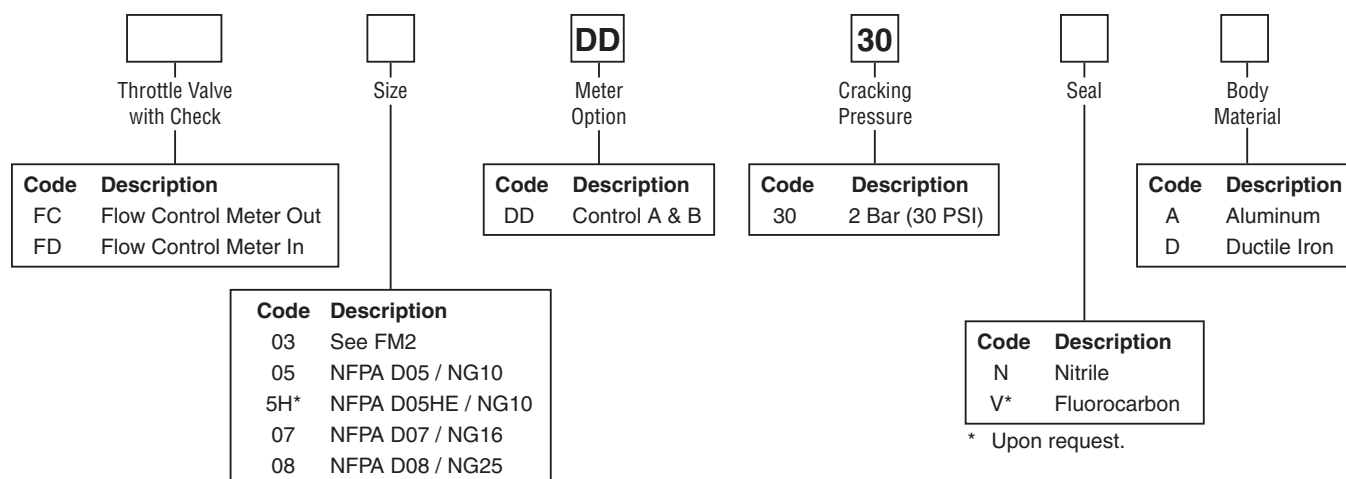
- High flow capacity.
- Various functional arrangements.
- Sizes:
 - FC05, FD05 – NFPA D05 / NG10 / CETOP 5
 - FC05H, FD5H – NFPA D05HE / NG10 / CETOP 5H
 - FC07, FD07 – NFPA D07 / NG16 / CETOP 7
 - FC08, FD08 – NFPA D08 / NG25 / CETOP 8



Specifications

General				
Size	D05 / NG10	D05HE / NG10	D07 / NG16	D08 / NG25
Mounting Position	Unrestricted			
Ambient Temperature Range	-20°C to +50°C (-4°F to +122°F)			
Hydraulic				
Maximum Operating Pressure	Aluminum Body – up to 207 Bar (3000 PSI); Ductile Iron Body – up to 345 Bar (5000 PSI)			
Nominal Flow	95 LPM (25 GPM)	95 LPM (25 GPM)	227 LPM (60 GPM)	454 LPM (120 GPM)
Leakage	< 5 DPM	< 5 DPM	< 5 DPM	< 5 DPM
Cracking Pressure	30 ± 0.2 Bar (3 PSI)			
Fluid Temperature	-20°C to +80°C (-4°F to +176°F)			
Viscosity	Permitted Recommended	10 to 650 cSt / mm ² /s (46 to 3013 SSU) 30 cSt / mm ² /s (139 SSU)		
Filtration	ISO Class 4406 (1999) 18/16/13 (acc. NAS 1638: 7)			

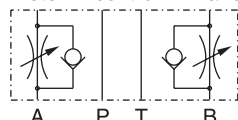
WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.



* Valve comes with D05HE (ISO) pattern seal plate (990-120-012). If D05H pattern is required, order seal plate kit 990-120-009.

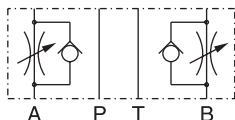
FC

Meter-in control in A and B



FD

Meter-out control in A and B

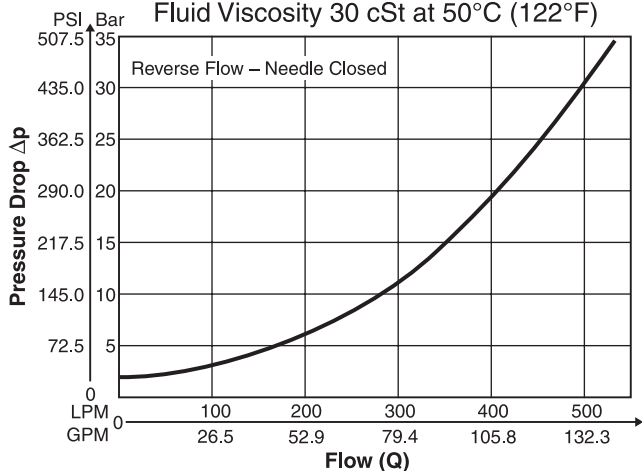


Weight:

Size	FC**DD30NA, FD**DD30NA	FC**DD30ND, FD**DD30ND
FC05, FC5H, FD05, FD5H	1.3 kg (2.9 lbs.)	2.6 kg (5.7 lbs.)
FC07	3.4 kg (7.6 lbs.)	6.9 kg (15.3 lbs.)
FC08	7.1 kg (15.7 lbs.)	14.7 kg (32.5 lbs.)

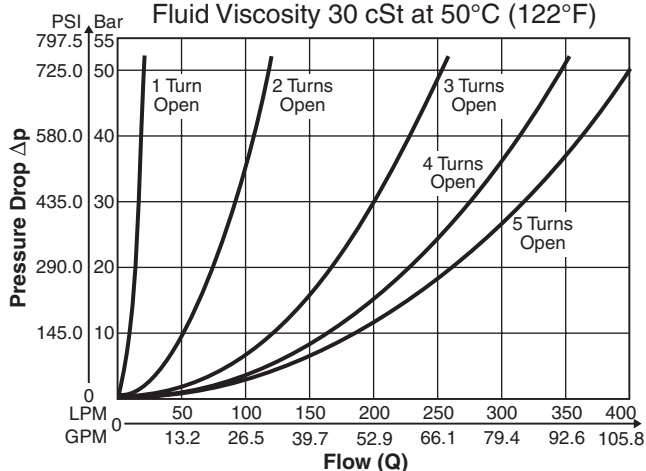
FC05/FC5H, FD05/FD5H

Pressure Differential vs. Free Flow
Fluid Viscosity 30 cSt at 50°C (122°F)



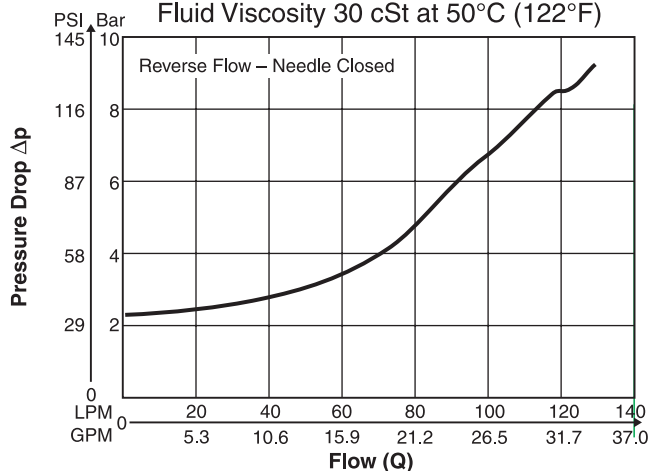
FC05/FC5H, FD05/FD5H

Pressure Differential vs. Metered Flow
Fluid Viscosity 30 cSt at 50°C (122°F)



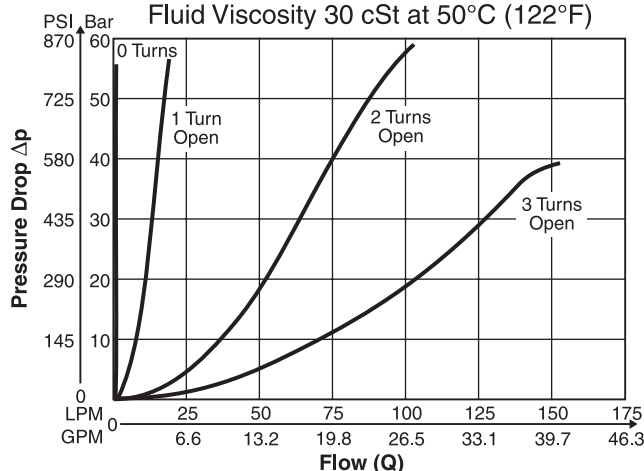
FC07, FD07

Pressure Differential vs. Free Flow
Fluid Viscosity 30 cSt at 50°C (122°F)



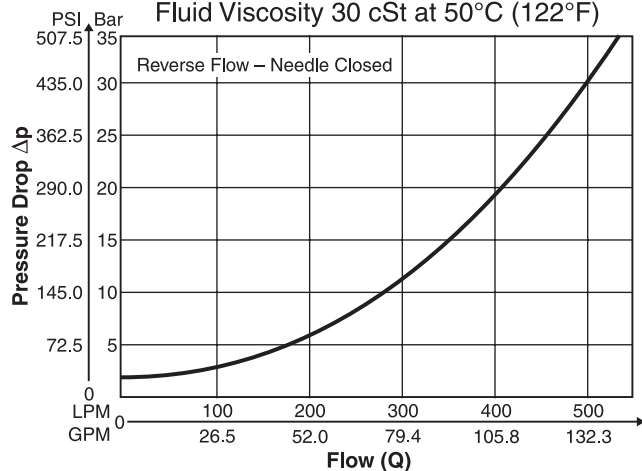
FC07, FD07

Pressure Differential vs. Metered Flow
Fluid Viscosity 30 cSt at 50°C (122°F)



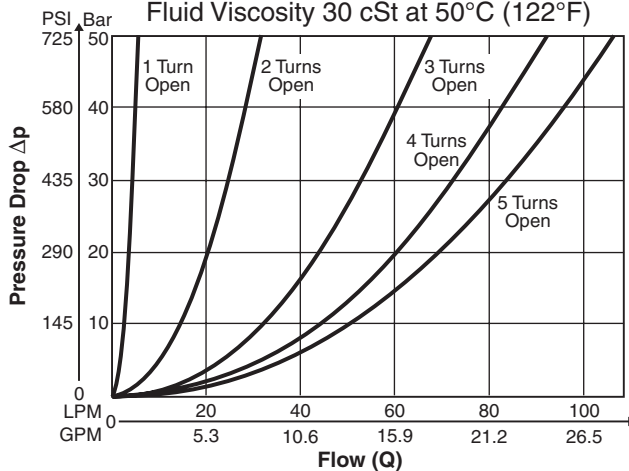
FC08, FD08

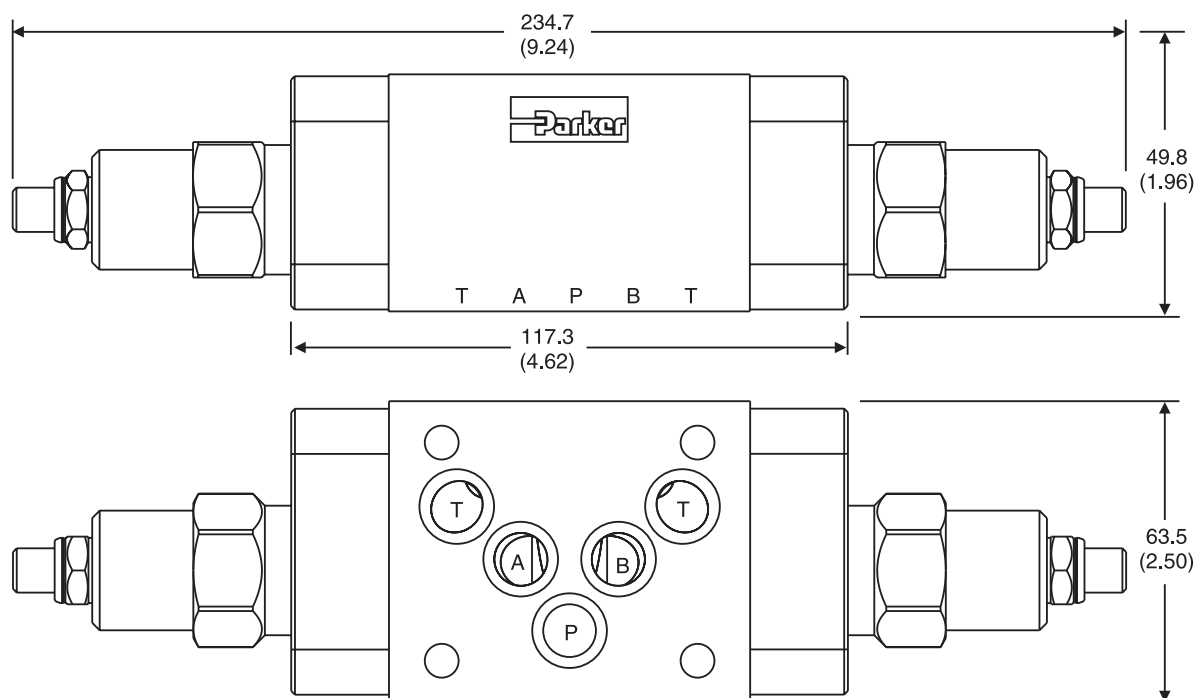
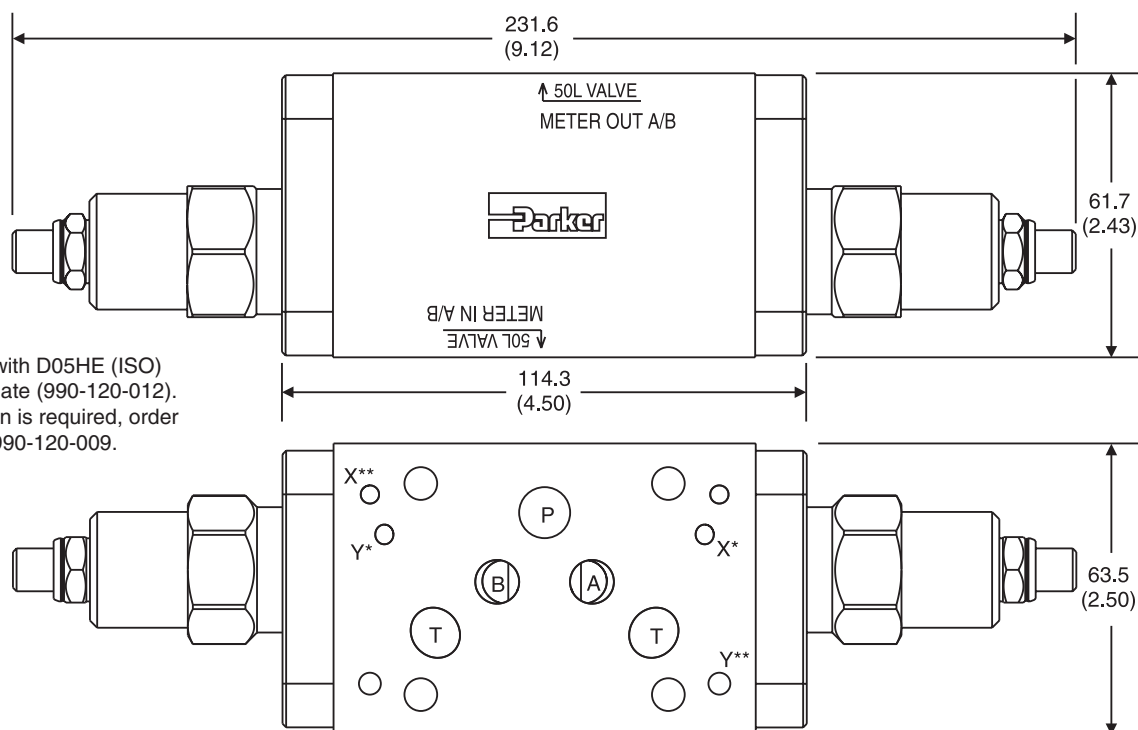
Pressure Differential vs. Free Flow
Fluid Viscosity 30 cSt at 50°C (122°F)



FC08, FD08

Pressure Differential vs. Metered Flow
Fluid Viscosity 30 cSt at 50°C (122°F)



FC05DD — Inch equivalents for millimeter dimensions are shown in (**)**FC5HDD** — Inch equivalents for millimeter dimensions are shown in (**)

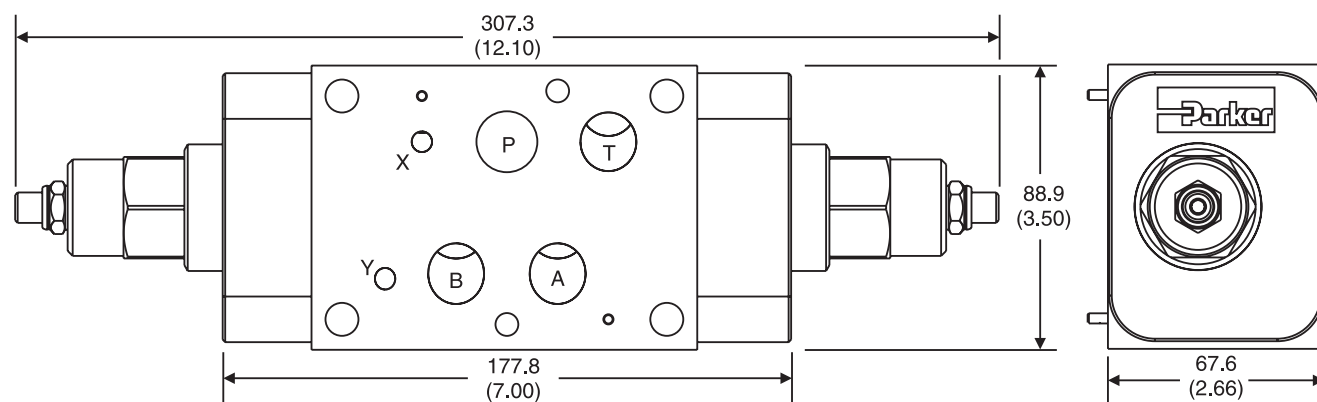
Valve comes with D05HE (ISO) pattern seal plate (990-120-012). If D05H pattern is required, order seal plate kit 990-120-009.

* D05HE (Standard)

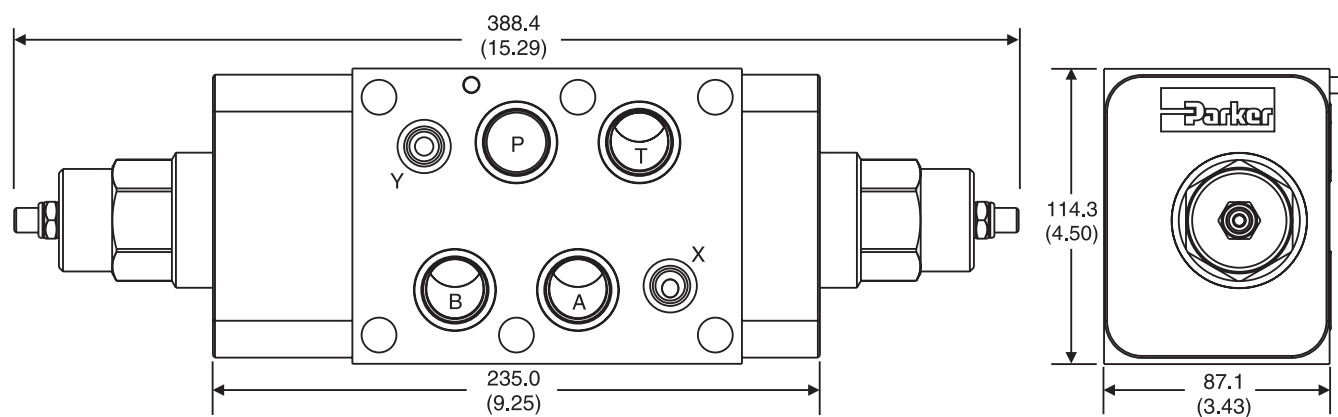
** D05H

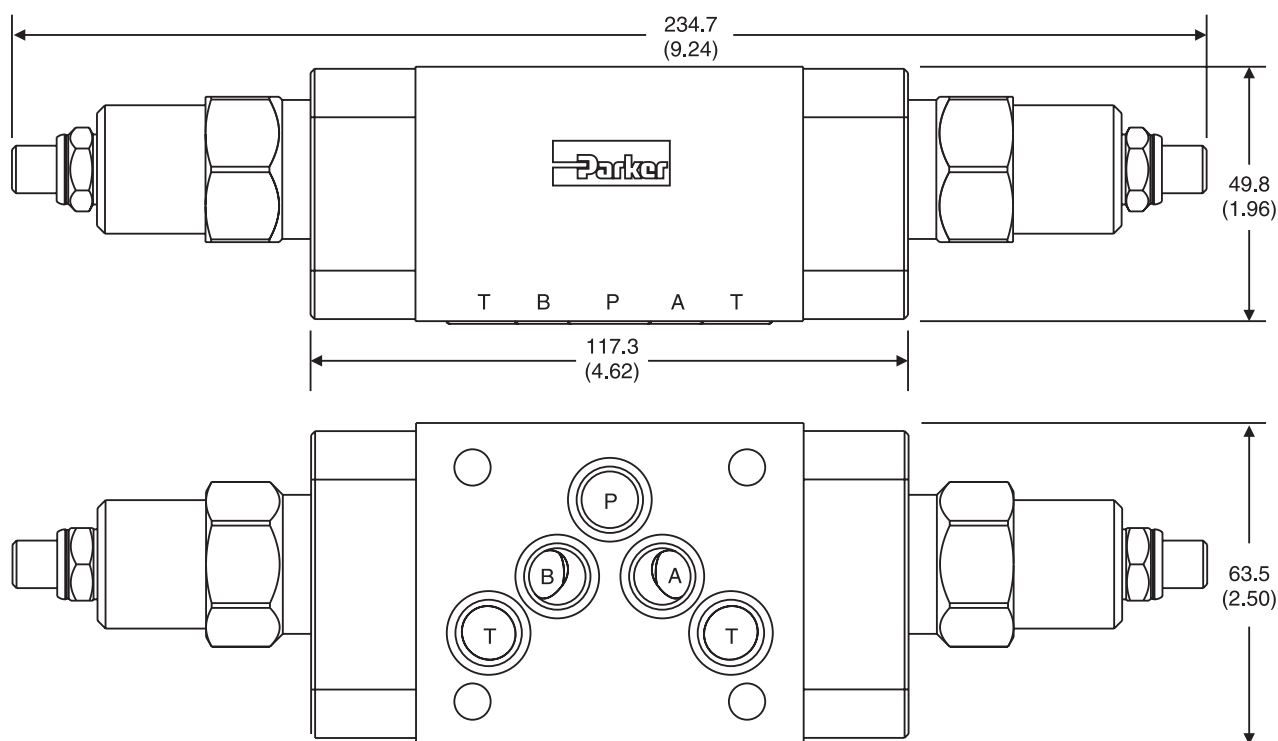
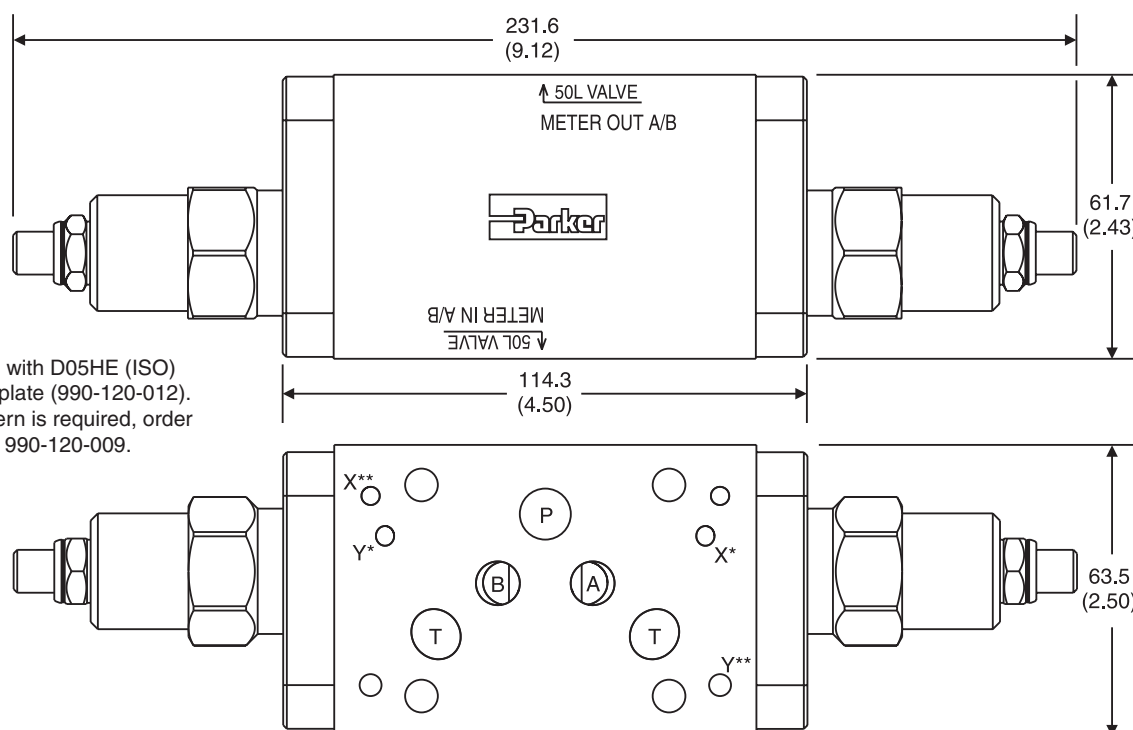


FC07DD — Inch equivalents for millimeter dimensions are shown in (**)



FC08DD — Inch equivalents for millimeter dimensions are shown in (**)



FD05DD — Inch equivalents for millimeter dimensions are shown in (**)**B****FD5HDD** — Inch equivalents for millimeter dimensions are shown in (**)

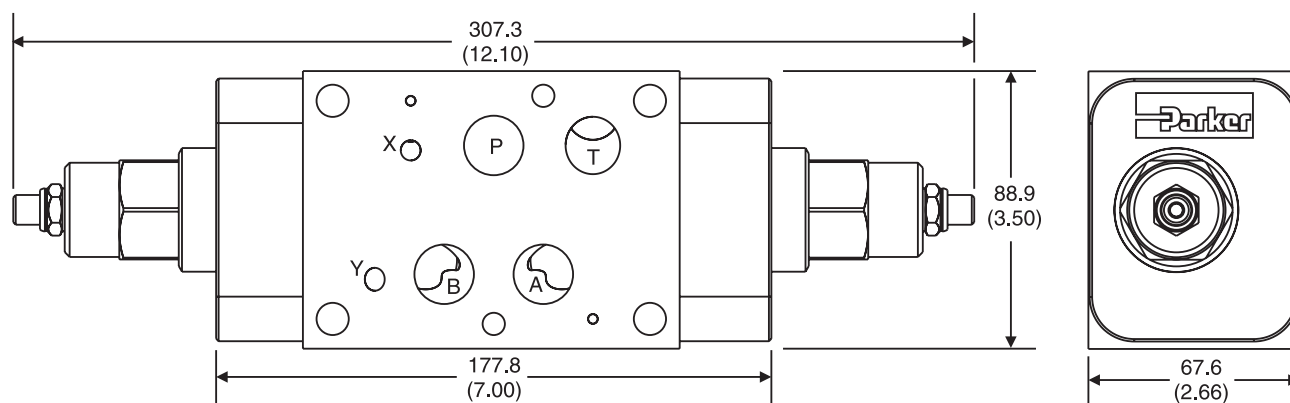
Valve comes with D05HE (ISO) pattern seal plate (990-120-012). If D05H pattern is required, order seal plate kit 990-120-009.

* D05HE (Standard)

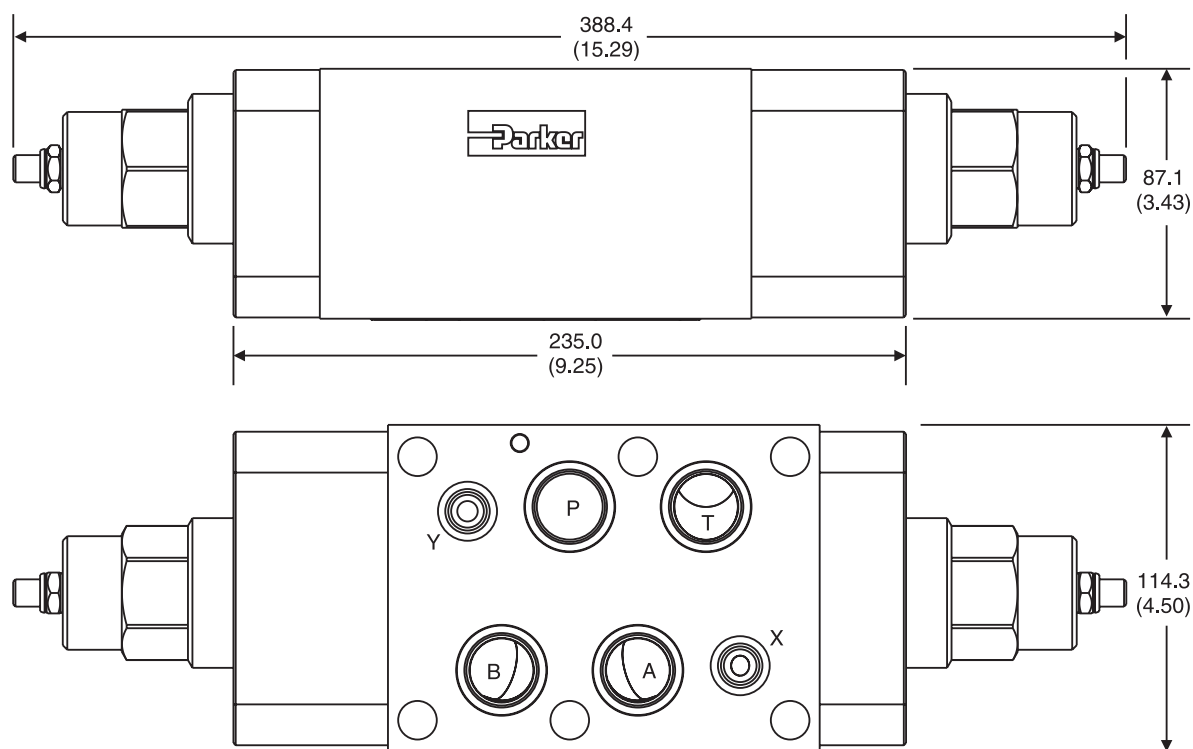
** D05H



FD07DD — Inch equivalents for millimeter dimensions are shown in (**)



FD08DD — Inch equivalents for millimeter dimensions are shown in (**)



General Description

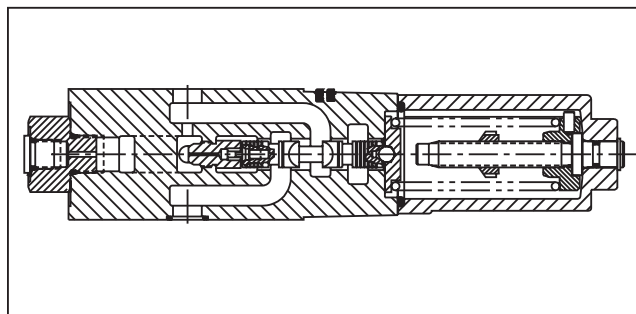
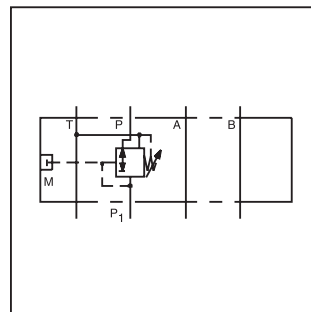
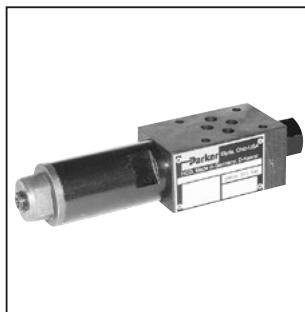
Series PRDM are direct operated pressure reducing valves that are used to regulate pressure in one area of a hydraulic circuit at a predetermined level below normal system pressure. Additionally, an integral pressure relieving function for the secondary reduced pressure circuit is incorporated into the design.

Operation

These valves are “normally open” devices that allow fluid to flow through the controlled port during their non-actuated or “at rest” condition. When downstream pressure exceeds the value set by the spring force, the control piston moves off its seat, closing off the flow path and thus reducing the fluid passing through from the main system. The cushioned piston modulates to maintain the preset pressure in this branch of the hydraulic circuit. If, due to external forces, the pressure continues to rise in this branch circuit, the piston will keep moving against the spring force allowing fluid to be drained to tank, thereby limiting maximum pressure to the valve’s setting.

Features

- PRDM sandwich valves may be selected to reduce pressure in the 'P' port, 'A' port or 'B' port.
- The direct operated, cushioned piston design results in fast response, low leakage and minimal hysteresis.
- Up to nine pressure adjustment ranges are available with maximum pressure settings.
- Adjustment options include: internal hex screw, hand knob or internal hex with keylock.
- Fluorocarbon seals are available.
- Available gage port connections include SAE, NPT, Metric and BSPP.



Specifications

	PRDM2	PRDM3																				
Mounting Pattern	NFPA D03, CETOP 3, NG6	NFPA D05, CETOP 5, NG10																				
Maximum Operating Pressure P, A, B	350 Bar (5000 PSI)	315 Bar (4560 PSI)																				
T	10 Bar (145 PSI)	10 Bar (145 PSI)																				
Max. Flow	40 LPM (10.5 GPM)	80 LPM (21 GPM)																				
Maximum Leakage P-A	15 ml/min (1.0 cu. in.)																					
Pressure Range	<table><tr><th>Code</th><th>Range</th></tr><tr><td>01</td><td>1.0 to 14 Bar (15 to 200 PSI)</td></tr><tr><td>02*</td><td>1.5 to 25 Bar (22 to 363 PSI)</td></tr><tr><td>05**</td><td>2 to 50 Bar (29 to 725 PSI)</td></tr><tr><td>06*</td><td>1.5 to 64 Bar (22 to 928 PSI)</td></tr><tr><td>10**</td><td>4 to 100 Bar (58 to 1450 PSI)</td></tr><tr><td>15**</td><td>6 to 150 Bar (87 to 2175 PSI)</td></tr><tr><td>16*</td><td>3 to 160 Bar (44 to 2320 PSI)</td></tr><tr><td>21</td><td>8 to 210 Bar (116 to 3045 PSI)</td></tr><tr><td>35*</td><td>10 to 315 Bar (147 to 4560 PSI)</td></tr></table>		Code	Range	01	1.0 to 14 Bar (15 to 200 PSI)	02*	1.5 to 25 Bar (22 to 363 PSI)	05**	2 to 50 Bar (29 to 725 PSI)	06*	1.5 to 64 Bar (22 to 928 PSI)	10**	4 to 100 Bar (58 to 1450 PSI)	15**	6 to 150 Bar (87 to 2175 PSI)	16*	3 to 160 Bar (44 to 2320 PSI)	21	8 to 210 Bar (116 to 3045 PSI)	35*	10 to 315 Bar (147 to 4560 PSI)
Code	Range																					
01	1.0 to 14 Bar (15 to 200 PSI)																					
02*	1.5 to 25 Bar (22 to 363 PSI)																					
05**	2 to 50 Bar (29 to 725 PSI)																					
06*	1.5 to 64 Bar (22 to 928 PSI)																					
10**	4 to 100 Bar (58 to 1450 PSI)																					
15**	6 to 150 Bar (87 to 2175 PSI)																					
16*	3 to 160 Bar (44 to 2320 PSI)																					
21	8 to 210 Bar (116 to 3045 PSI)																					
35*	10 to 315 Bar (147 to 4560 PSI)																					
Viscosity Range	12 to 230 cSt / mm ² /s (56 to 1066 SSU)																					
Filtration	ISO Code 18/16/13 or Better																					

* PRDM2 only

** PRDM3 only.

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

B

PRDM Pressure Reducing/Relieving	Size	Port Reduction	Pressure Range	Adjustment	Seal	Gage Port	Design Series NOTE: Not required when ordering.
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Code	Description
2	NFPA D03 Subplate Mounting
3	NFPA D05 Subplate Mounting

Code	Description
PP	P Port Only
AA	A Port Only
BB	B Port Only

Code	Type
N	Nitrile
V	Fluorocarbon

Code	Type
L	Hex w/Key Lock
S	Internal Hex Screw Adj.
K	Knob

Code	Type
N	1/4" NPT
S	SAE #4 (UNF-2B 7/16-20) Adapter in PRDM3
M	Metric
G	1/4" BSPP

Code	Description
01	1.0 to 14 Bar (15 to 200 PSI)
02*	1.5 to 25 Bar (22 to 363 PSI)
05**	2.0 to 50 Bar (29 to 714 PSI)
06*	1.5 to 64 Bar (22 to 928 PSI)
10**	4 to 100 Bar (57 to 1429 PSI)
15**	6 to 150 Bar (86 to 2147 PSI)
16*	3 to 160 Bar (44 to 2320 PSI)
21	8 to 210 Bar (114 to 3000 PSI)
35*	10 to 315 Bar (147 to 4560 PSI)

* PRDM2 only.
 ** PRDM3 only.

Bold: Designates Tier I products and options.
Non-Bold: Designates Tier II products and options.
These products will have longer lead times.

Sandwich Bolt Kits

Size "2"				Size "3"			
No. of Sandwich	Sandwich & Valve Combination	Bolt Kit	Bolt Length mm (in)	No. of Sandwich	Sandwich & Valve Combination	D3W-30 D3DW & D31*W*	Bolt Length mm (in)
1	Sandwich & D1	BK243	73.2 (2.88)	1	Sandwich & D3	BK141	88.9 (3.50)
2	Sandwich & D1	BK225	111.3 (4.38)	2	Sandwich & D3	BK142	139.7 (5.50)
3	Sandwich & D1	BK244	152.4 (6.00)	3	Sandwich & D3	BK143	190.5 (7.50)
4	Sandwich & D1	BK245	190.5 (7.50)	* D31VW with internal pilot and internal drain only.			

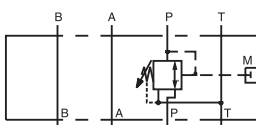
Bolt Kits must be ordered separately.

Weights:

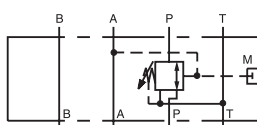
PRDM2 1.3 kg (2.9 lbs.)

PRDM3 2.6 kg (5.8 lbs.)

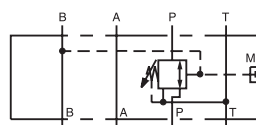
Schematics



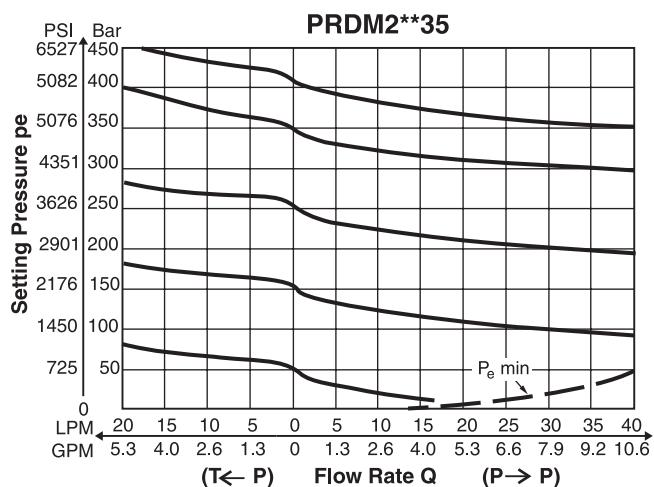
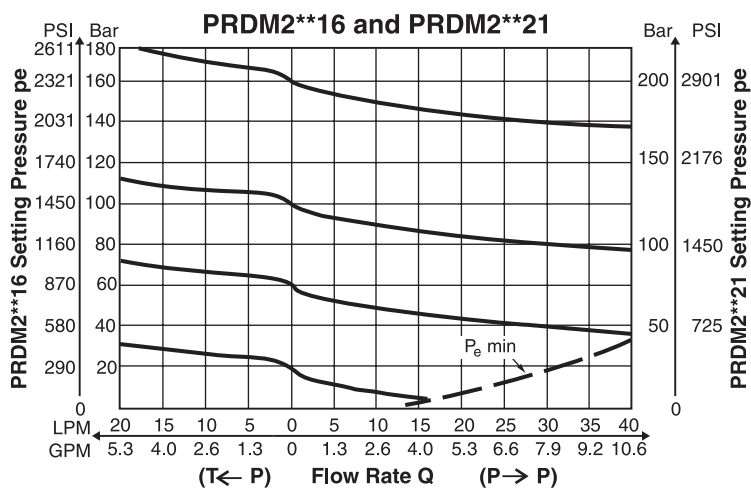
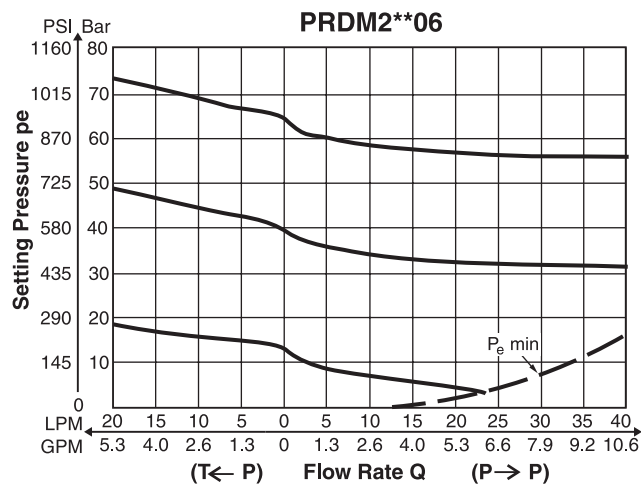
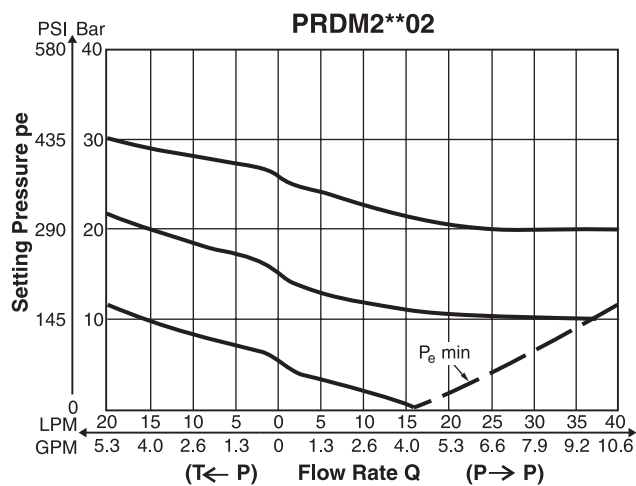
PP Option



AA Option

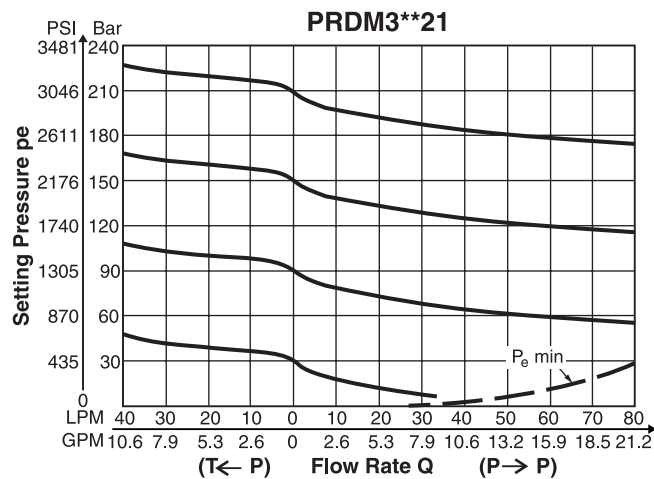
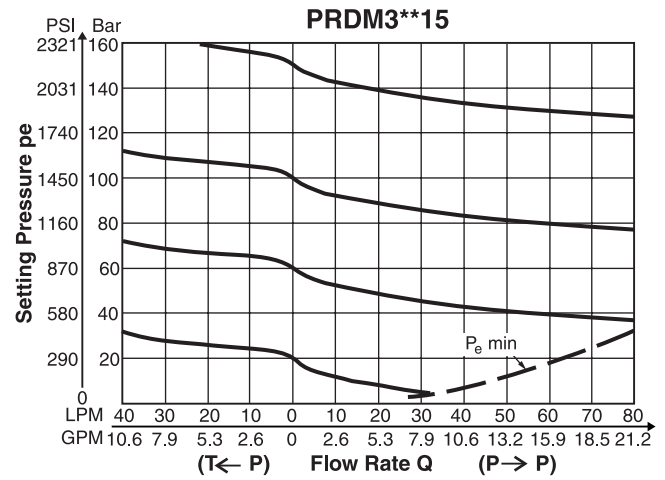
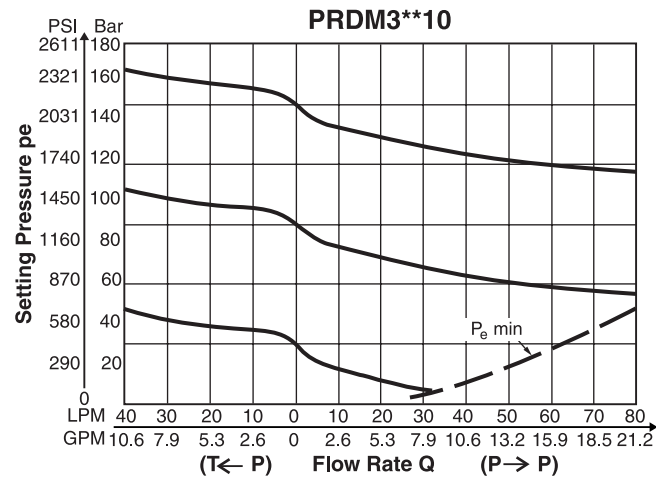
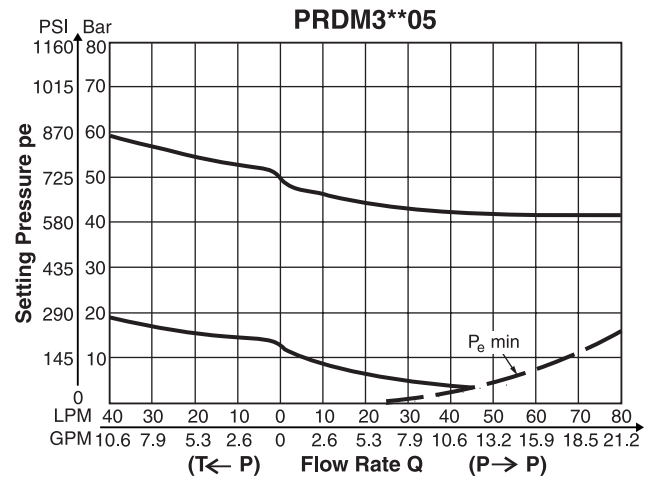
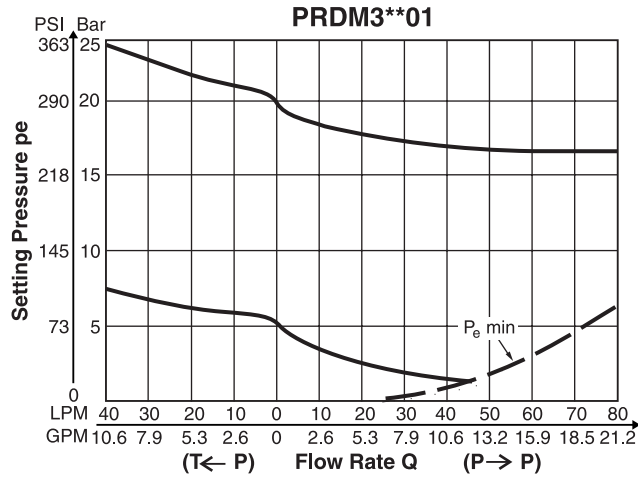


BB Option



NOTE: Lowest pressure setting dependent upon system resistance.

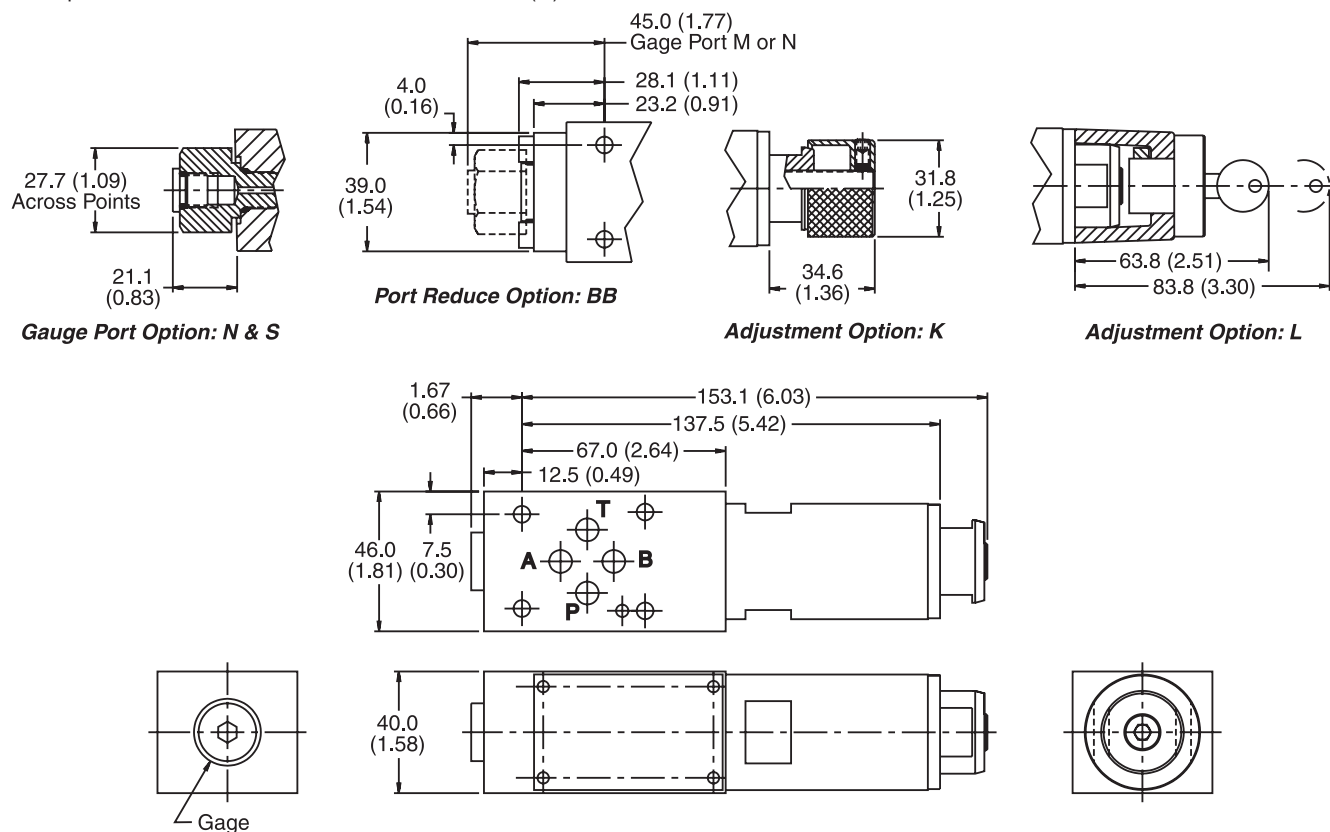
B



NOTE: Lowest pressure setting dependent upon system resistance.

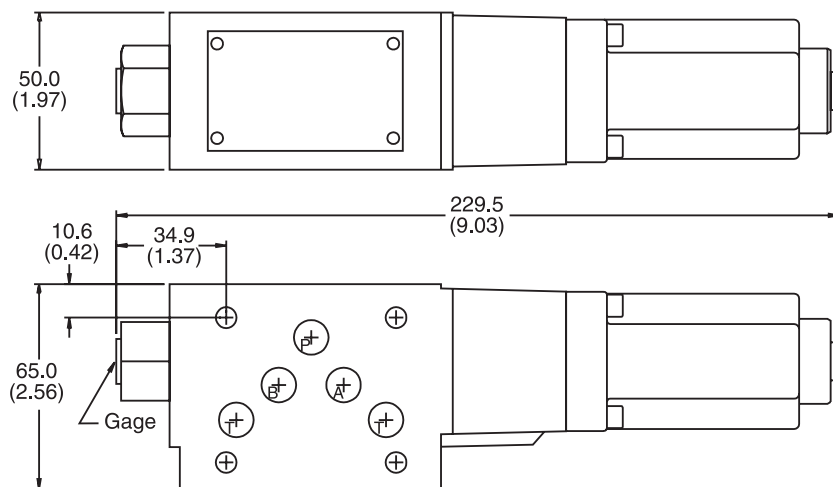
PRDM2

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



PRDM3

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

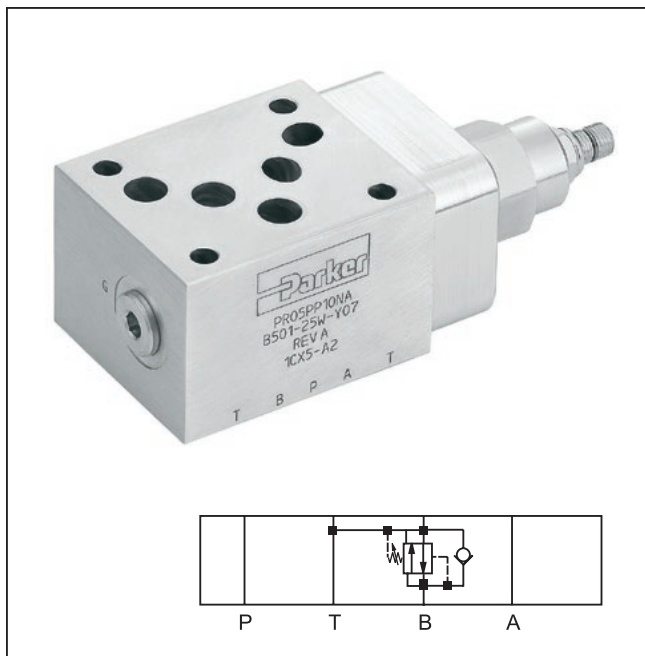


General Description

Series PR pilot operated pressure reducing/relieving valves are used to regulate pressure in one area of a circuit at a set pressure below the normal system pressure. An integral relieving function limits the secondary circuit pressure. Options are A port control, B port control and P port control. The A & B valves feature a reverse flow check.

Features

- High flow capacity.
- Sizes:
 - PR05 – NFPA D05 / NG10 / CETOP 5
 - PR5H – NFPA D05HE / NG10 / CETOP 5H
 - PR07 – NFPA D07 / NG16 / CETOP 7
 - PR08 – NFPA D08 / NG25 / CETOP 8
- With integral return flow check valve on A & B port models.



Specifications

General				
Size	D05 / NG10	D05HE / NG10	D07 / NG16	D08 / NG25
Mounting Position	Unrestricted			
Ambient Temperature Range	-20°C to +50°C (-4°F to +122°F)			
Hydraulic				
Maximum Operating Pressure	Aluminum Body – up to 207 Bar (3000 PSI); Ductile Iron Body – up to 345 Bar (5000 PSI)			
Nominal Flow	76 LPM (20 GPM)	76 LPM (20 GPM)	303 LPM (80 GPM)	303 LPM (80 GPM)
Adjustment Screw Hex Size	5/32	5/32	5/32	5/32
Fluid Temperature	-20°C to +80°C (-4°F to +176°F)			
Viscosity	Permitted Recommended	10 to 650 cSt / mm ² /s (46 to 3013 SSU) 30 cSt / mm ² /s (139 SSU)		
Filtration	ISO Class 4406 (1999) 18/16/13 (acc. NAS 1638: 7)			

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

PR

Pressure Reducing/Relieving Valve

Size

Style

Pressure Range

Seal

Body Material

Code	Description
03	See PRDM2
05	NFPA D05 / NG10
5H*	NFPA D05HE / NG10
07	NFPA D07 / NG16
08	NFPA D08 / NG25

* Valve comes with D05HE (ISO) Pattern seal plate (990-120-012). If D05H pattern is required, order seal plate kit 990-120-009.

Code	Description
10	13.8 Bar (200 PSI)**
	6.9 to 207 Bar (100 to 3000 PSI)
20*	13.8 Bar (200 PSI)**
	10.4 to 310 Bar (150 to 4500 PSI)

* Ductile iron body only.
** Standard setting.

Code	Description
A	Aluminum
D	Ductile Iron

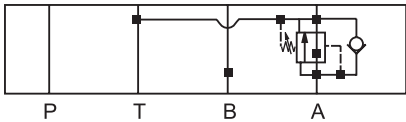
Code	Description
AA	Pressure reducing in A with check valve
BB	Pressure reducing in B with check valve
PP	Pressure reducing in P

Code	Description
N	Nitrile
V*	Fluorocarbon

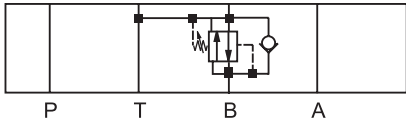
* Upon request.



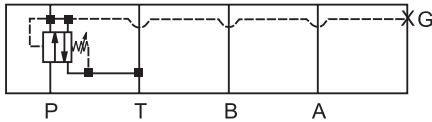
PR**AA



PR**BB



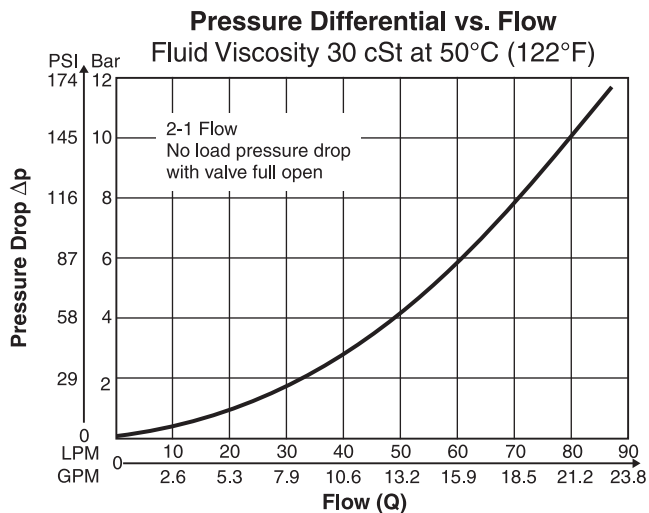
PR**PP



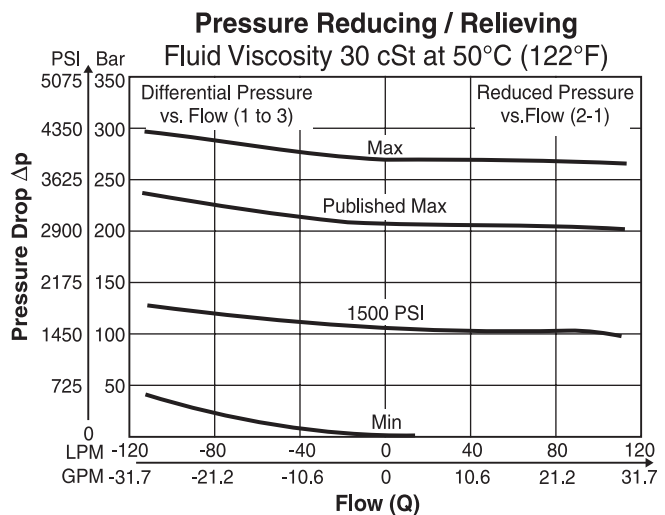
Weight:

Size	PR**AA30NA	PR**AA30ND	PR**BB30NA	PR**BB30ND	PR**PP30NA	PR**PP30ND
PR05, PR5H	1.4 kg (3.1 lbs.)	2.8 kg (6.2 lbs.)	1.4 kg (3.1 lbs.)	2.8 kg (6.2 lbs.)	0.9 kg (2.1 lbs.)	2.0 kg (4.4 lbs.)
PR07	2.9 kg (6.4 lbs.)	5.8 kg (12.9 lbs.)	2.9 kg (6.4 lbs.)	5.7 kg (12.6 lbs.)	3.9 kg (8.5 lbs.)	7.8 kg (17.1 lbs.)
PR08	4.9 kg (10.8 lbs.)	9.2 kg (20.4 lbs.)	4.9 kg (10.8 lbs.)	11.2 kg (24.7 lbs.)	5.3 kg (11.6 lbs.)	11.7 kg (25.7 lbs.)

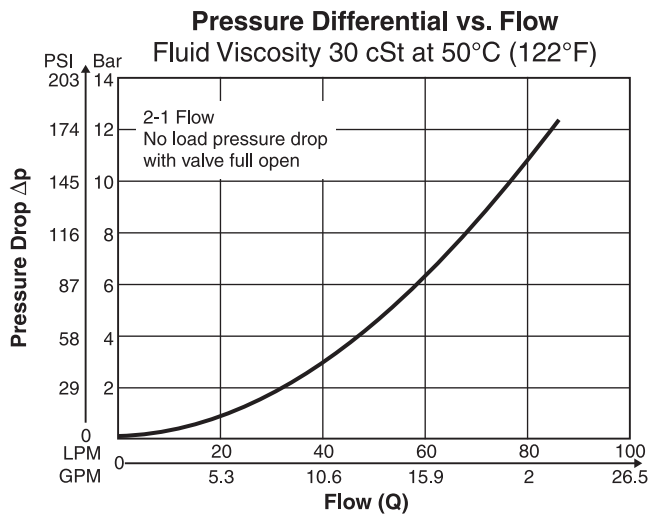
PR05*10*A and PR5H*10*A



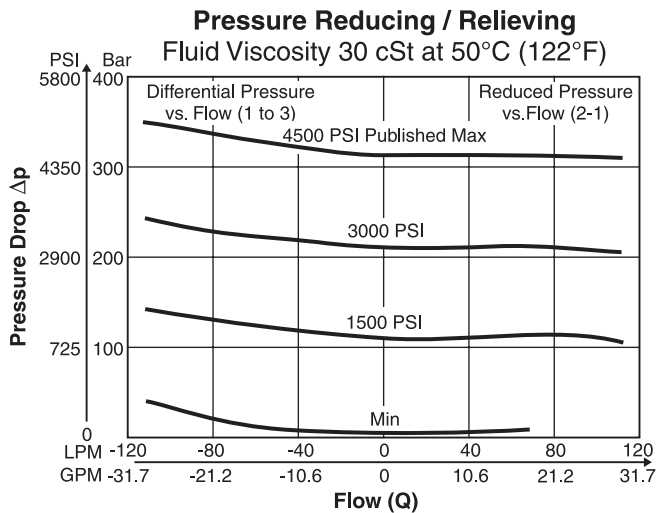
PR05*10*A and PR5H*10A



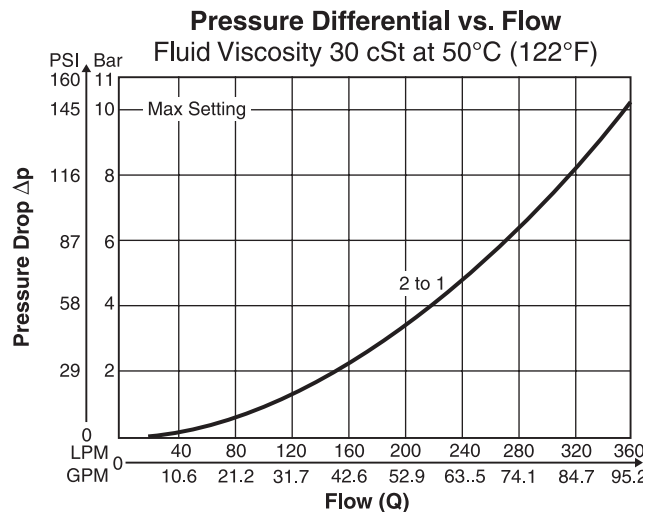
PR05*20*D and PR5H*20*D



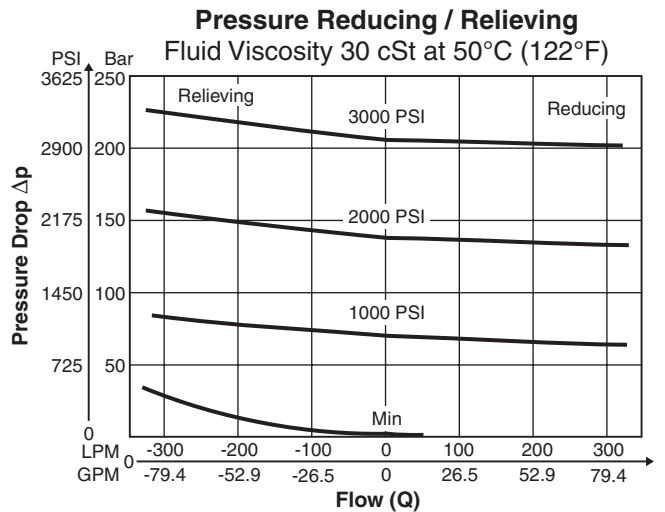
PR05*20*D and PR5H*20*D



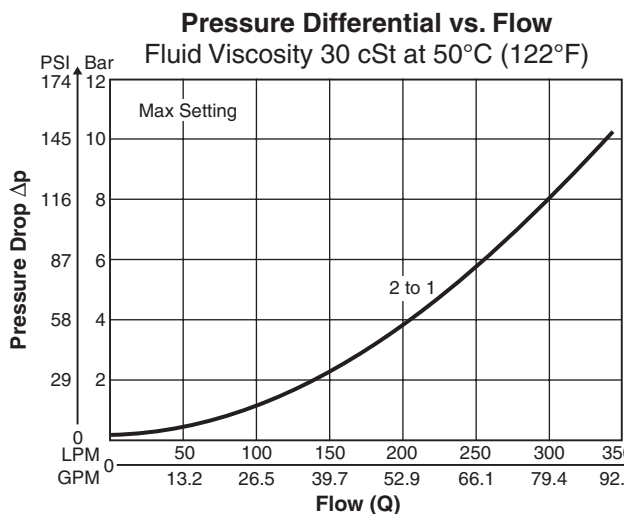
PR07*10*A



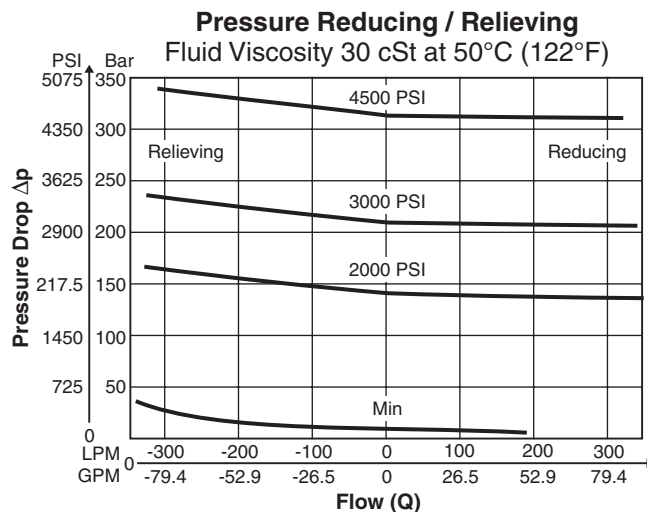
PR07*10*A



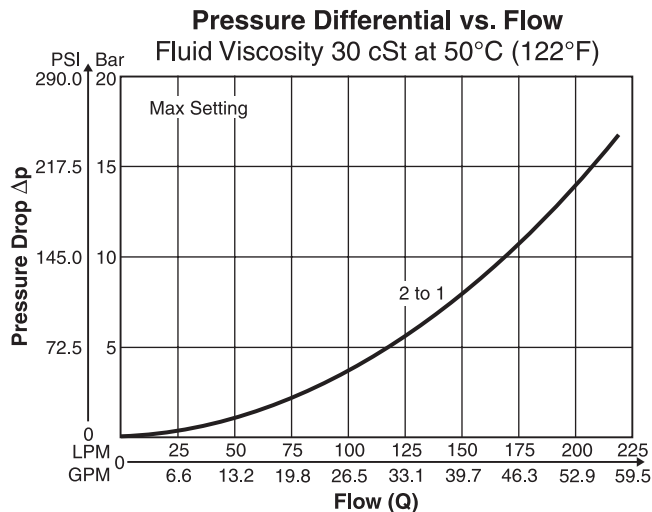
PR07*20*D



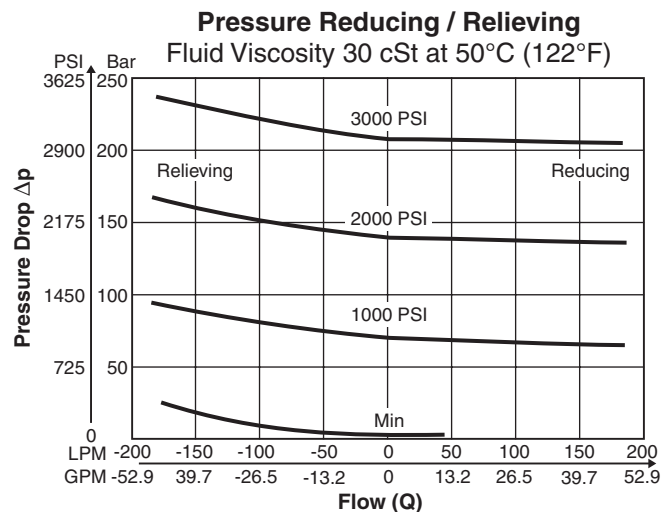
PR07*20*D



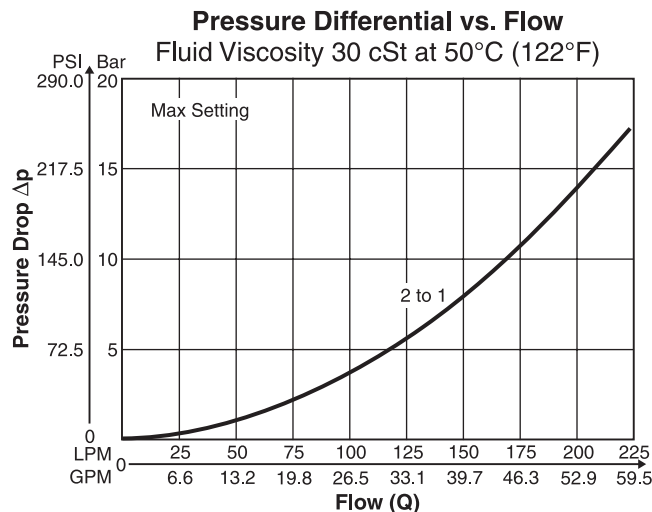
PR08*10*A



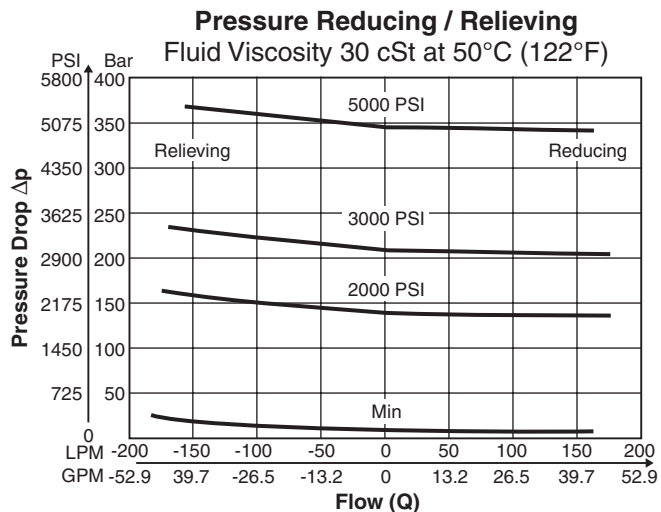
PR08*10*A



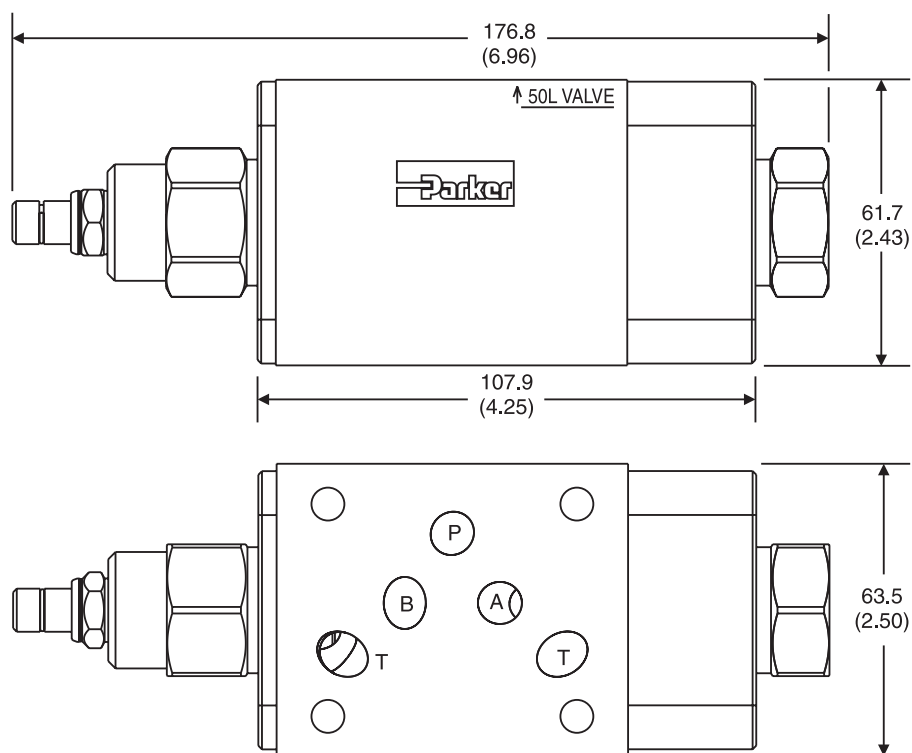
PR08*20*D



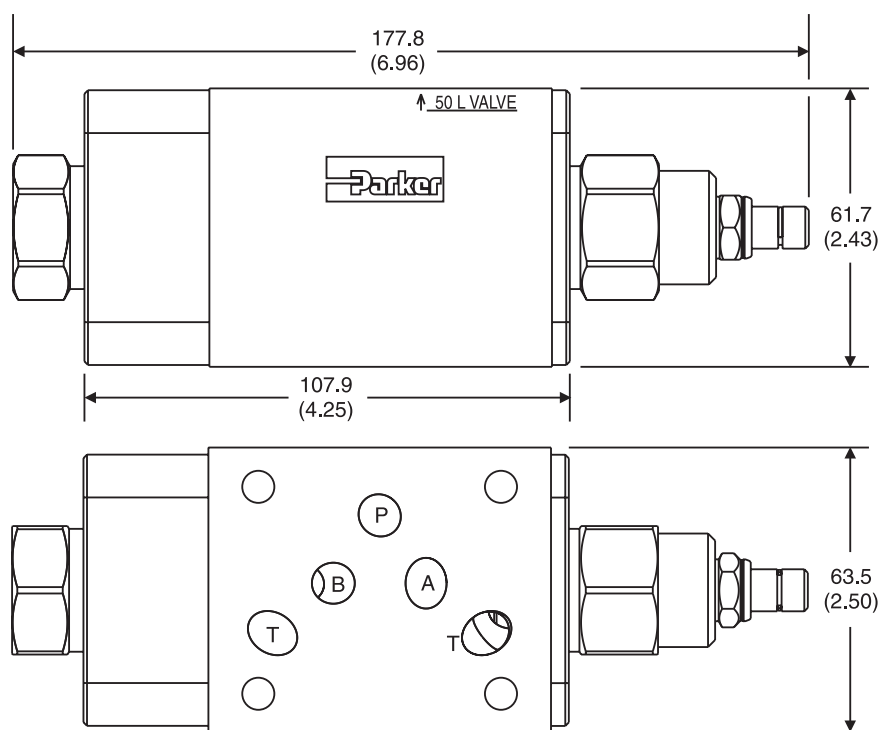
PR08*20*D

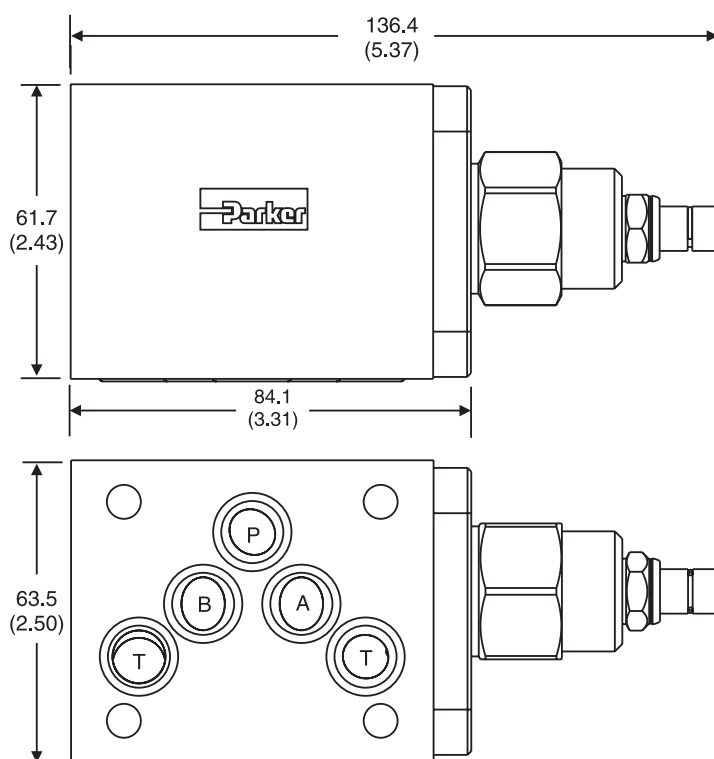
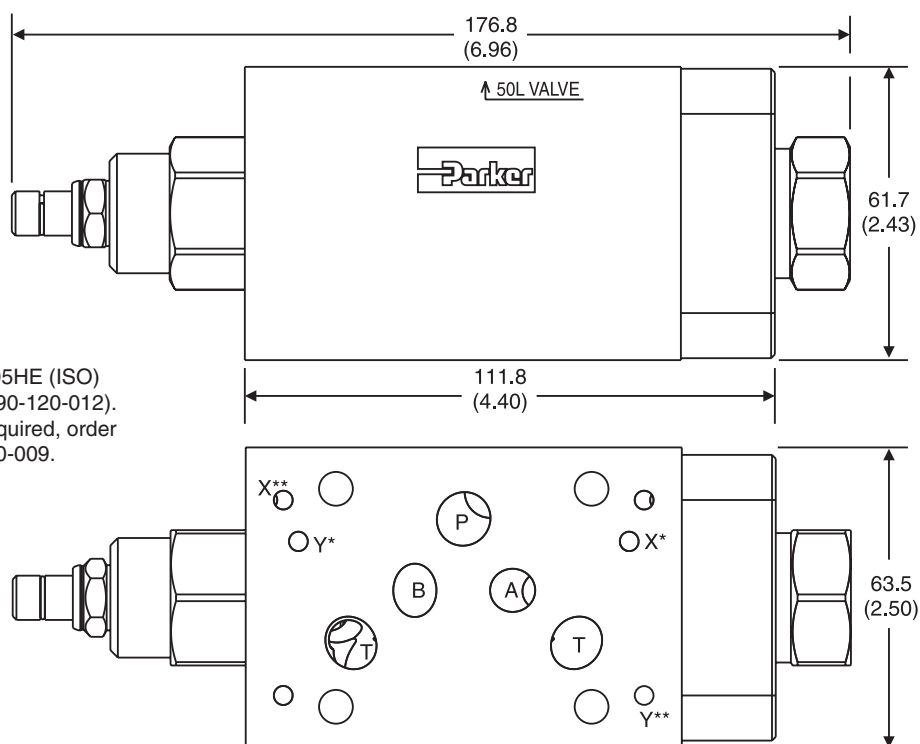


PR05AA — Inch equivalents for millimeter dimensions are shown in (**)



PR05BB — Inch equivalents for millimeter dimensions are shown in (**)



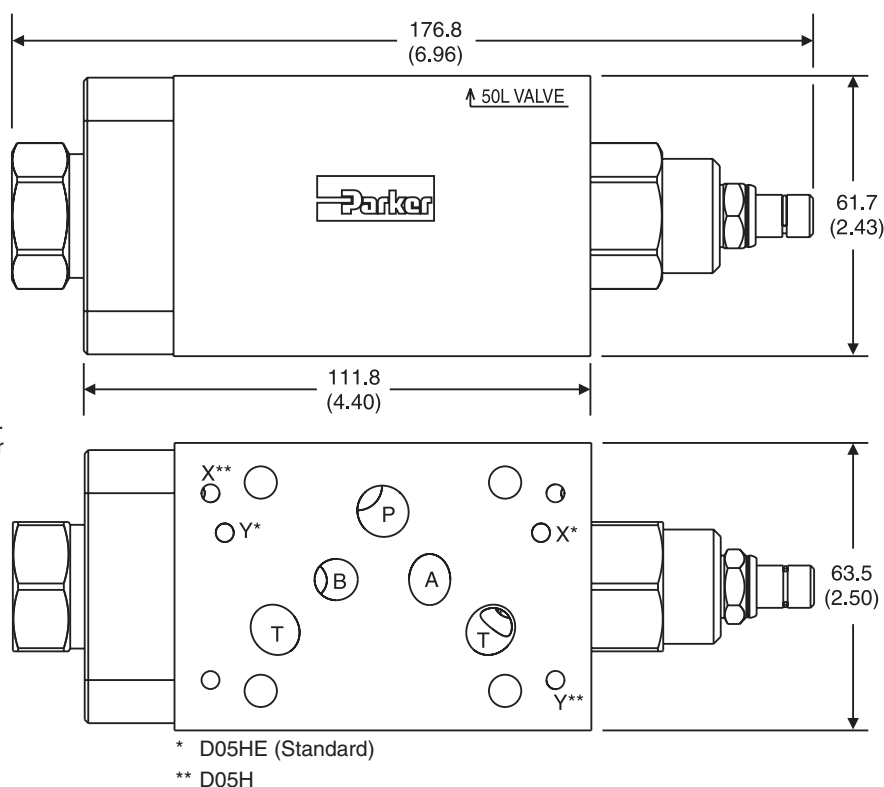
PR05PP — Inch equivalents for millimeter dimensions are shown in (**)**B****PR5HAA** — Inch equivalents for millimeter dimensions are shown in (**)

Valve comes with D05HE (ISO)
Pattern seal plate (990-120-012).
If D05H pattern is required, order
seal plate kit 990-120-009.

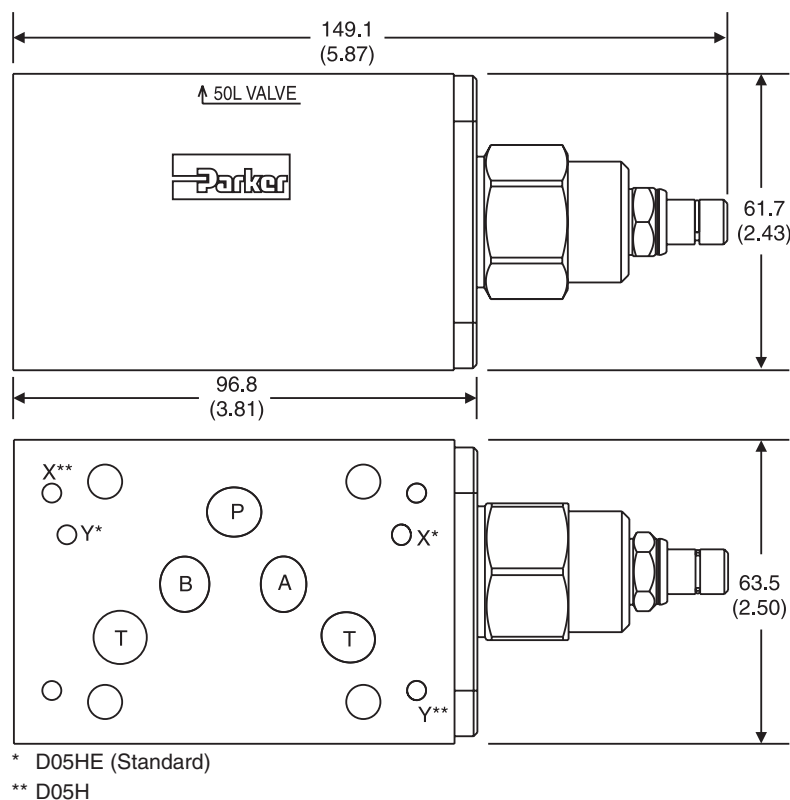
* D05HE (Standard)

** D05H



PR5HBB — Inch equivalents for millimeter dimensions are shown in (**)

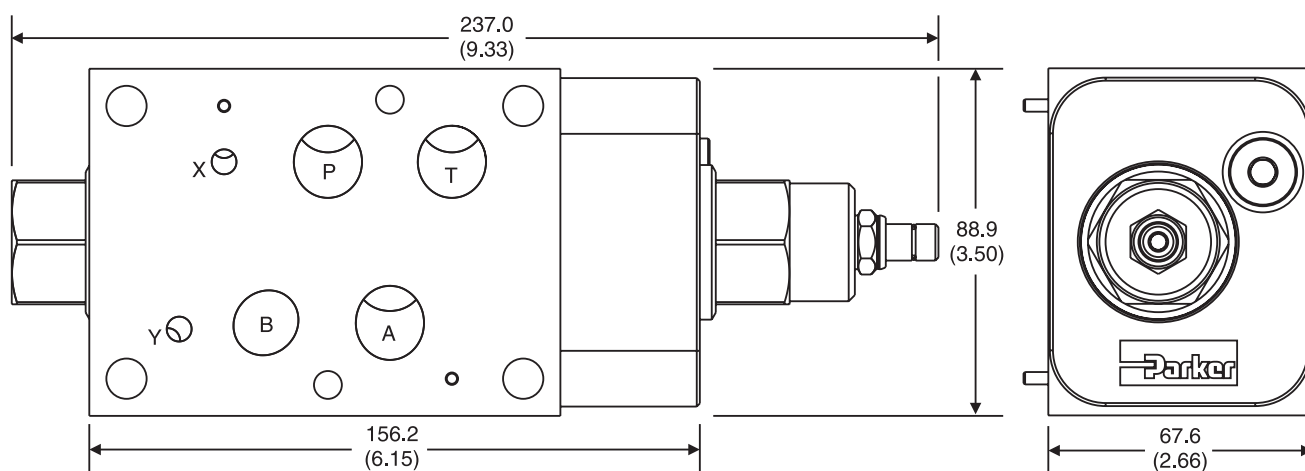
Valve comes with D05HE (ISO)
Pattern seal plate (990-120-012).
If D05H pattern is required, order
seal plate kit 990-120-009.

PR5HPP — Inch equivalents for millimeter dimensions are shown in (**)

Valve comes with D05HE (ISO)
Pattern seal plate (990-120-012).
If D05H pattern is required, order
seal plate kit 990-120-009.

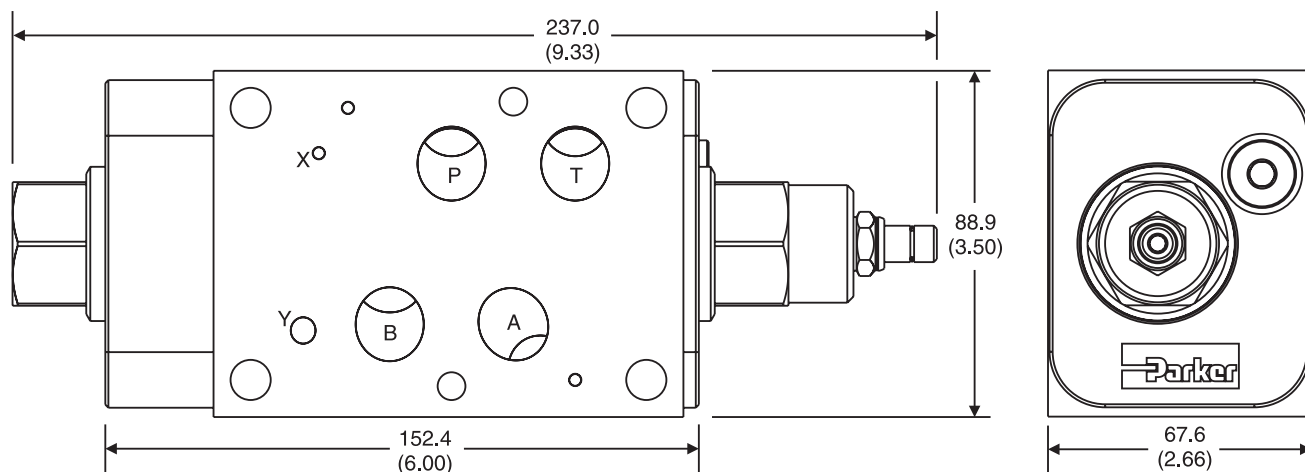


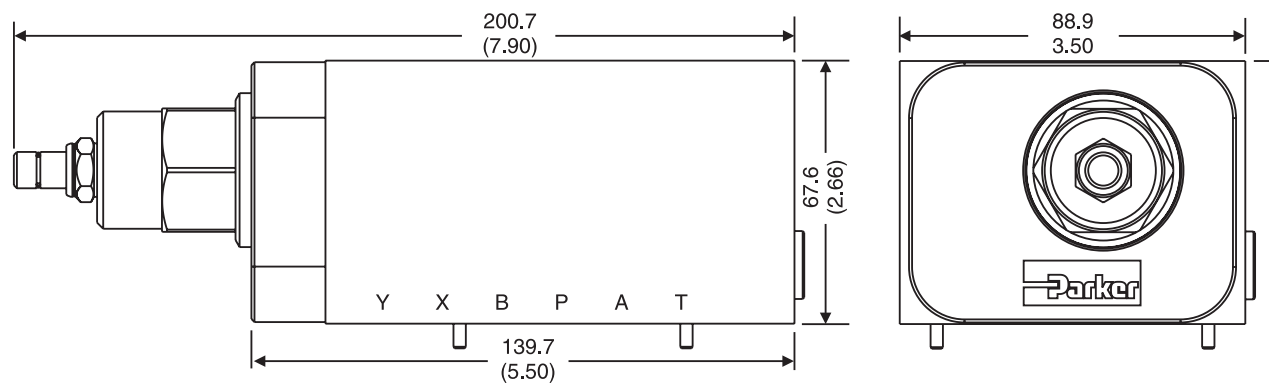
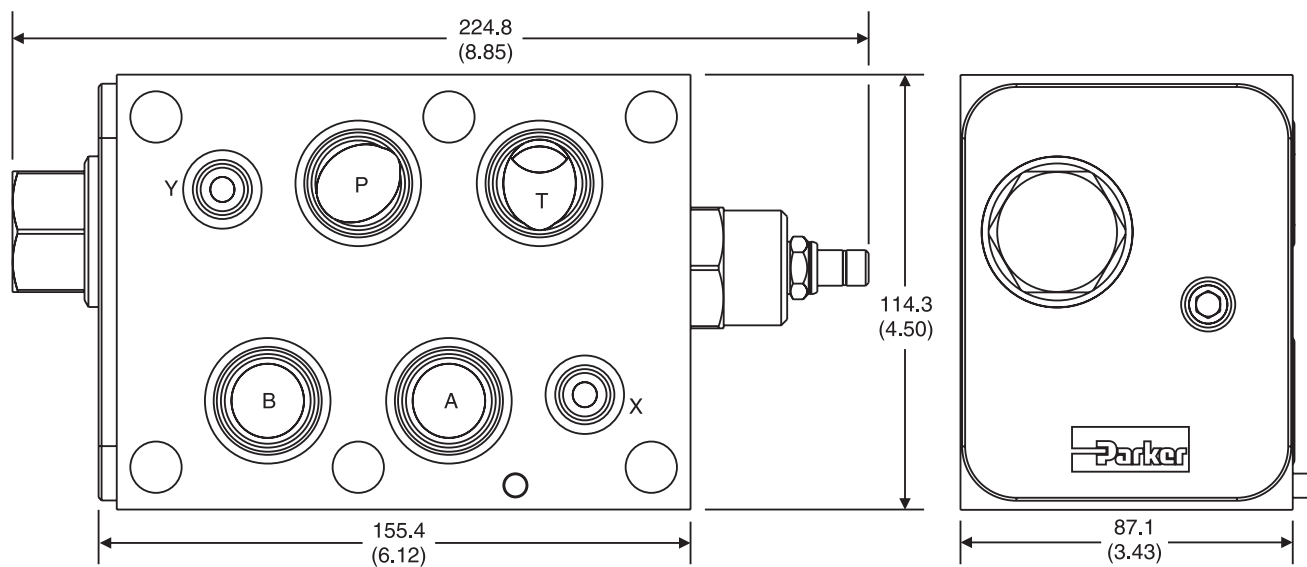
PR07AA – Inch equivalents for millimeter dimensions are shown in (**)



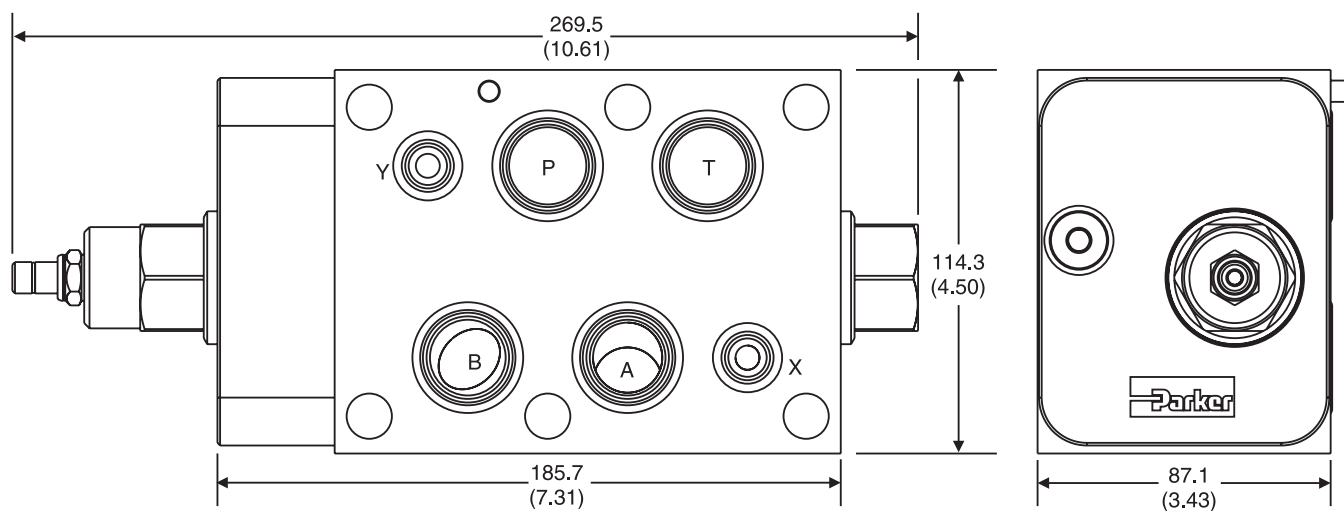
B

PR07BB – Inch equivalents for millimeter dimensions are shown in (**)



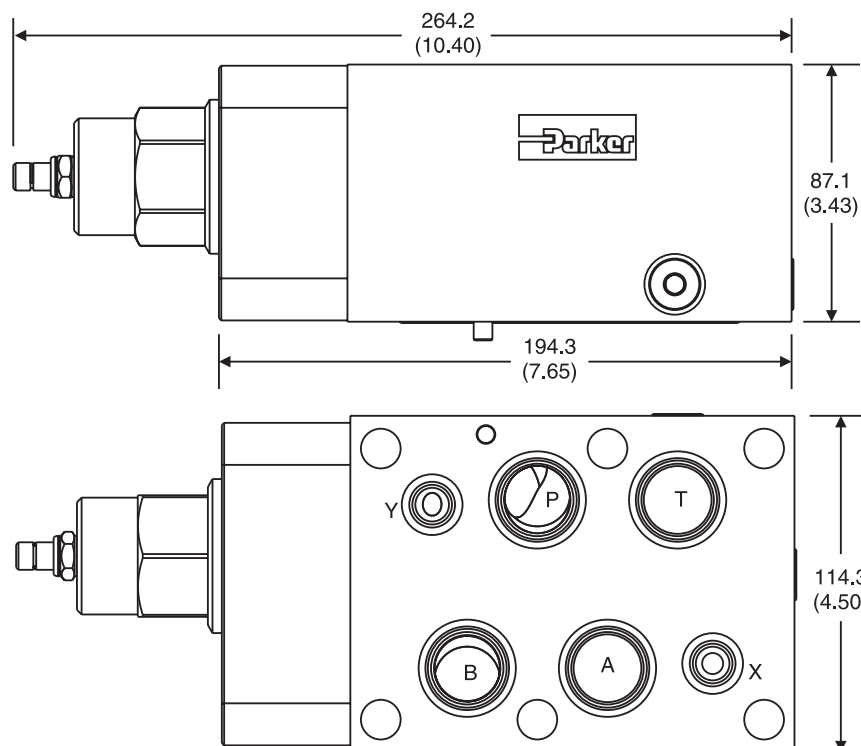
PR07PP — Inch equivalents for millimeter dimensions are shown in (**)**PR08AA** — Inch equivalents for millimeter dimensions are shown in (**)

PR08BB — Inch equivalents for millimeter dimensions are shown in (**)



B

PR08PP — Inch equivalents for millimeter dimensions are shown in (**)



General Description

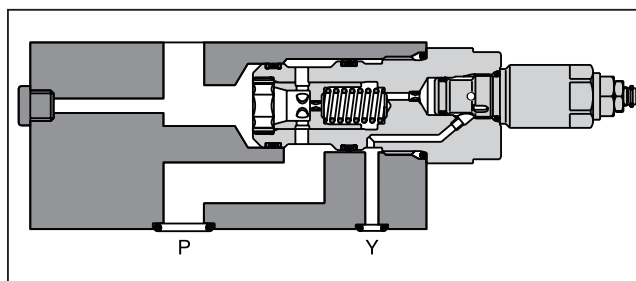
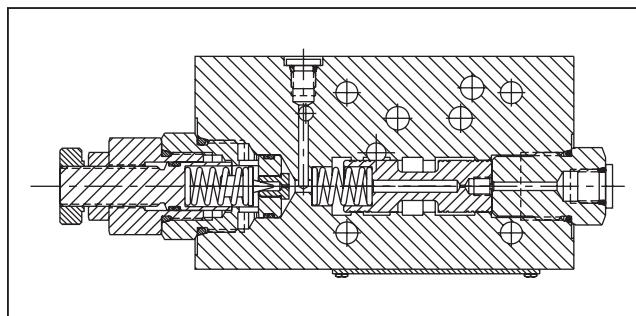
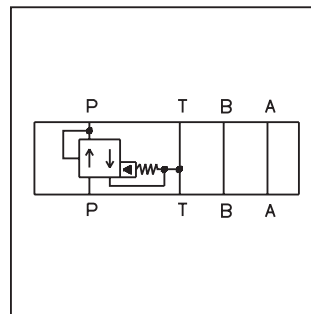
Series PRM reducing valves are used to regulate pressure in one area of a circuit below normal system pressure. This style valve is well suited to perform this function as it mounts directly below the directional control valve.

Operation

These are "normally open" valves that allow fluid to pass through the controlled port during typical operation. When downstream pressure rises above the value set by an adjustable spring force, the control pilot opens and allows the main spool to move from a full open position. The main spool modulates to maintain the desired "reduced pressure" downstream of the valve. The PRM3 also has a relieving mode.

Features

- PRM sandwich style pressure reducing valves allow for easy configuration of stack systems and can be used to reduce pressure on the 'P' port, the 'A' port, or the 'B' port.
- Four pressure adjustment options are available: slotted screw, hexagon socket screw (PRM4), knob and locking knob. (PRM6 only)
- Valve bodies are manufactured from steel which provide extra strength and durability for longer life. Internal hardened steel components also provide longer life.



Specifications

	PRM3	PRM4	PRM6		PRM3 / PRM4 / PRM6
Mounting Pattern	NFPA D05, CETOP 5, NG 10	CETOP 07, NG 16	NFPA D08, CETOP 8, NG 25	Filtration	ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)
Minimum Pressure	10 Bar (150 PSI) with rated flow, 150 SSU oil, and fluid temperature of 38°C (100°F). ¹			Venting	Connecting the vent port to tank allows the reducing valve to divert flow at minimum pressure.
Maximum Pressure	345 Bar (5000 PSI)	345 Bar (5000 PSI)	345 Bar (5000 PSI)	Remote Control	Remote control valve connected to the vent port can be used to control the pressure. ²
Minimum Flow	3.78 LPM (1 GPM)		3.78 LPM (1 GPM)	Drain Line	Drain line from pilot valve is internally connected to the tank port. Tank line pressure is thus added to the valve setting. ³
Maximum Flow	64 LPM (17 GPM)		189 LPM (50 GPM)		
Pressure Range	Code 07 17 25 35	Pressure Range 10 to 70 Bar (150 - 1000 PSI) 10 to 175 Bar (150-2500 PSI) 10 to 250 Bar (150 - 3500 PSI) 10 to 350 Bar (150 - 5000 PSI)			

¹ Change in flow, temperature or fluid (SSU) rating will affect valve minimum pressure.

² Set main valve pressure 10 Bar (150 PSI) higher than remote pilot.

³ It is important that the drain line connection be taken into consideration when determining the minimum valve setting.

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

PRM
Pressure Reducing Valve

Code	Description
3	NFPA D05
4	NFPA D07
6	NFPA D08

Size

Pressure Reducing

Pressure Range

Adjustment

Seal

Gauge Port

Drain

Design Series
NOTE: Not required when ordering.

Code		Description	Available Models		
			PRM3	PRM4	PRM6
AA	A Port Only		✓		
AP	Connection A				✓
PA	Connection P				✓
PA	Function in P, Reduced Pressure in A			✓	
PB	Function in P, Reduced Pressure in B			✓	
PP	P Port Only		✓		
PP	Function in P, Reduced Pressure in P			✓	

Code	Description
07	10 to 70 Bar (150 to 1000 PSI)
17*	10 to 175 Bar (150 to 2500 PSI)
25	10 to 250 Bar (150 to 3500 PSI)
35**	10 to 345 Bar (150 to 5000 PSI)

* PRM3 and PRM6. ** PRM3 and PRM4.

Code	Type
N*	Nitrile
V	Fluorocarbon

* PRM3 only.

Code	Type
K*	Turning Knob
L**	Cylinder Lock
S†	Screw Adj.

* PRM3 and PRM6 only.
 ** PRM6 only.
 † PRM3 and PRM4 only.

Code	Type
Omit*	SAE
S**	SAE
N**	NPT
M**	Metric
G†	1/4 BSPP

* PRM4 only.
 ** PRM3 only.
 † PRM6 only.

Code	Type
Omit	Internal
Y*	External

* PRM3 only.

Unit Weight:

PRM3 3.0 kg (6.6 lbs.)

PRM4 5.0 kg (11.0 lbs.)

PRM6 5.6 kg (12.5 lbs.)

Bold: Designates Tier I products and options.

Non-Bold: Designates Tier II products and options.

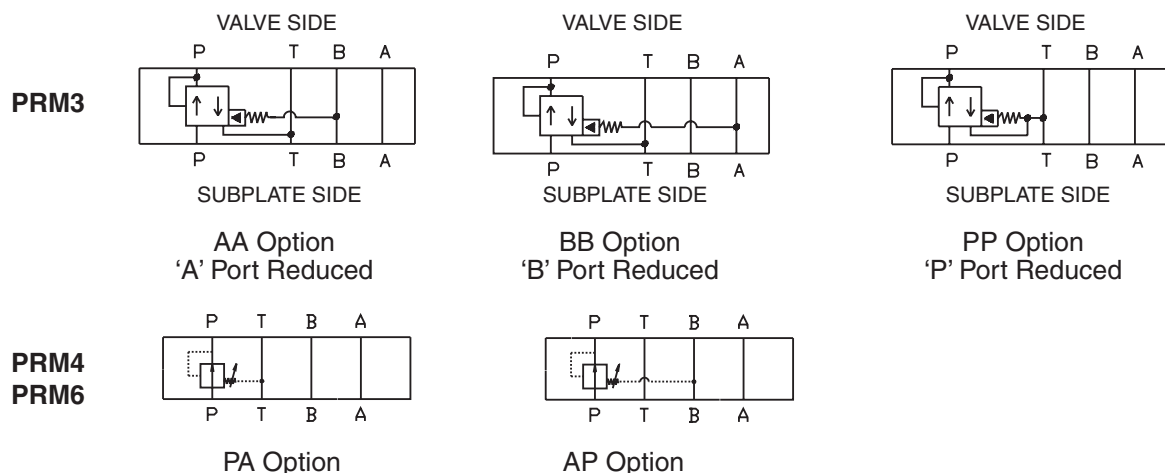
These products will have longer lead times.

Bolt Kits

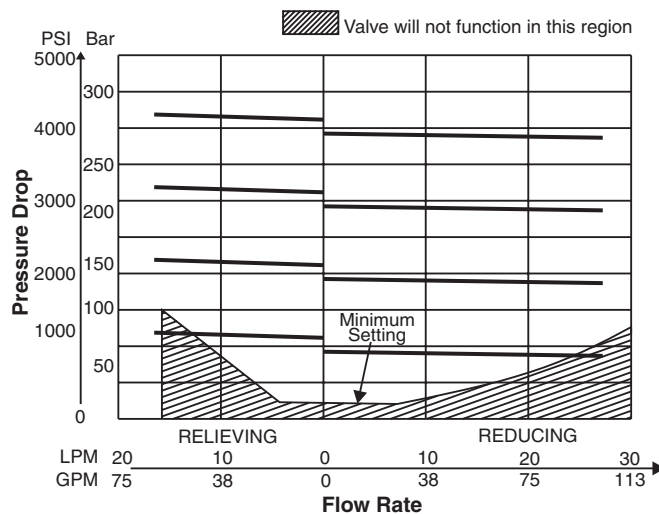
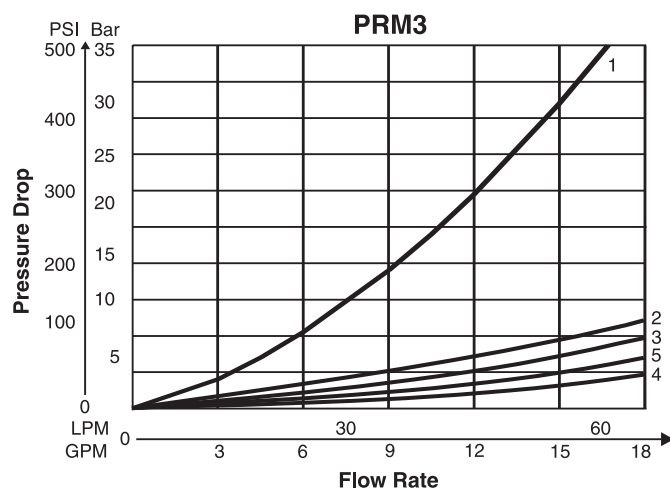
Size 3				Size 4				Size 6			
No. of Sand-wich	Sandwich & Valve Combination	D3W-30 D3DW & D31*W*	Bolt Length mm (in)	No. of Sand-wich	Sandwich & Valve Combination	Bolt Length mm		No. of Sand-wich	Sandwich & Valve Combination	D3W-30 D3DW & D31*W*	Bolt Length mm (in)
1	Sandwich & D3	BK141	88.9 (3.50)	1	Sandwich & D4	4x M10 x 140 2x M6 x 135		1	Sandwich & D6	BK121	133.4 (5.25)
2	Sandwich & D3	BK142	139.7 (5.50)	2	Sandwich & D4	4x M10 x 220 2x M6 x 215		2	Sandwich & D6	BK122	203.2 (8.00)
3	Sandwich & D3	BK143	190.5 (7.50)	3	Sandwich & D4	4x M10 x 300 2x M10 x 295		3	Sandwich & D6	BK123	273.1 (10.75)
* D31VW with internal pilot and internal drain only.								4	Sandwich & D6	BK124	342.9 (13.5)
								Bolt Kits must be ordered separately.			

Schematics

Bolt Kits must be ordered separately.



B

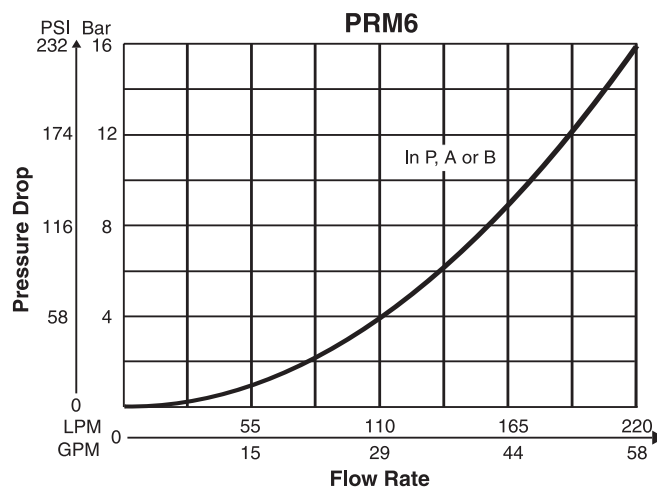
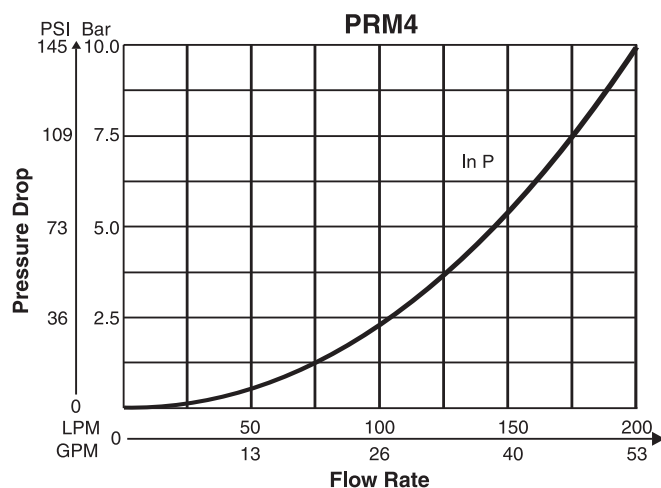


Mode	Flow Path			
	P → P	A → A	B → B	T → T
PP	1	2	3	4
AA	1	2	3	5
BB	1	2	3	5

Viscosity Correction Factor							
Viscosity (SSU)	75	150	200	250	300	350	400
% of ΔP (approx.)	93	111	119	126	132	137	141

Curves were generated using 100 SSU hydraulic oil.
 For any other viscosity, pressure drop will change per chart.

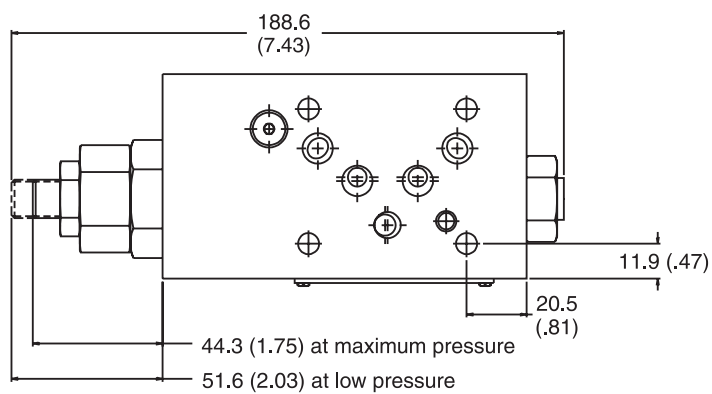
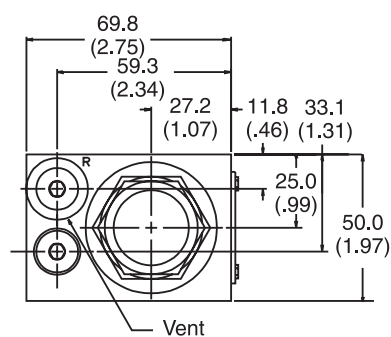
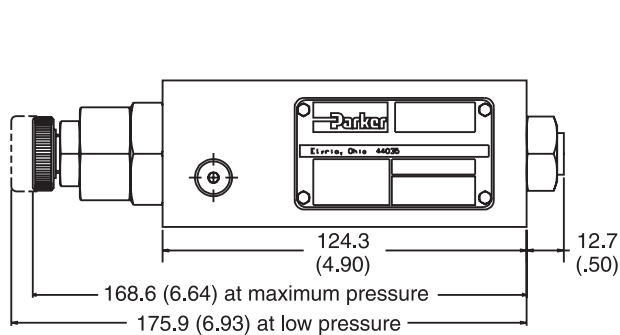
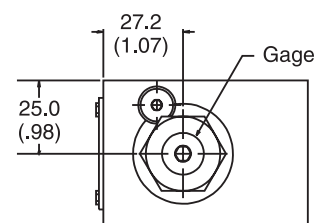
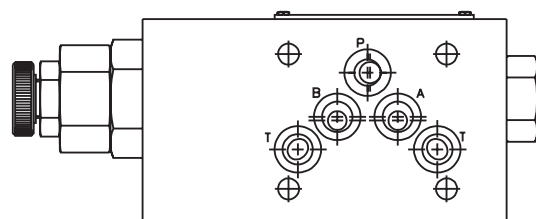
NOTE: Lowest pressure setting dependent upon system resistance.



All characteristic curves measured with HLP46 at 50°C (122°F).

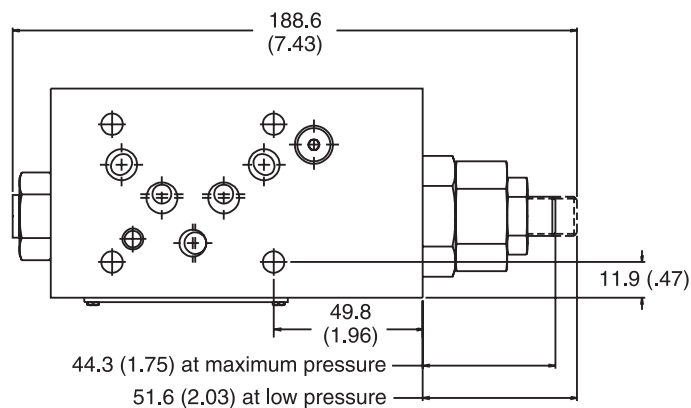
PRM3AA

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

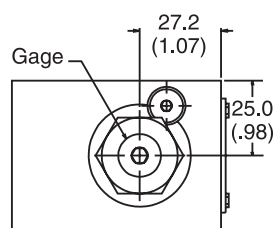
**Top View****End View****Face View****End View****Bottom View**

PRM3BB

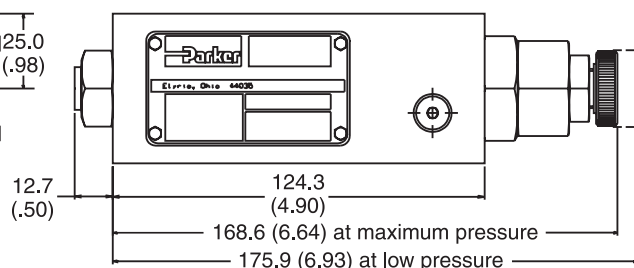
Inch equivalents for millimeter dimensions are shown in (**)

B

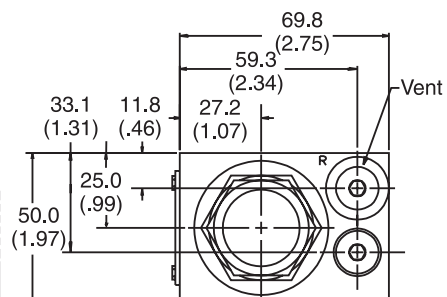
Top View



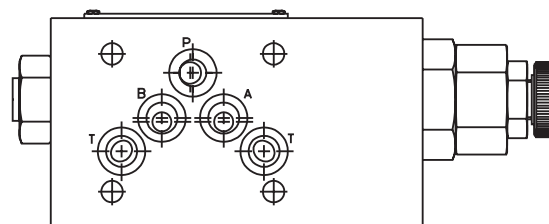
End View



Face View



End View

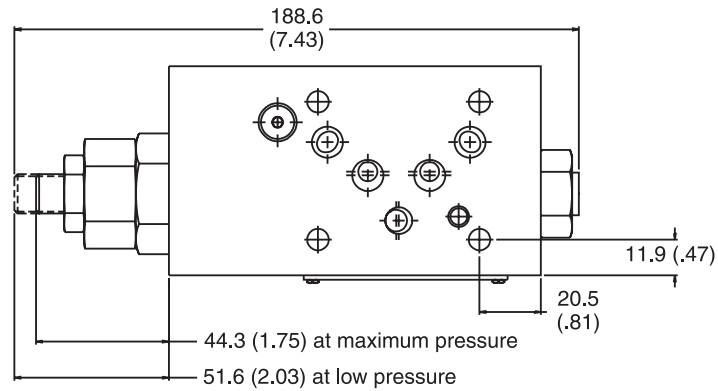


Bottom View

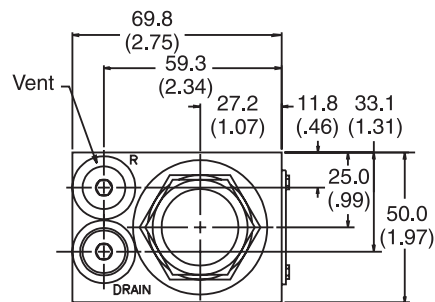


PRM3PP

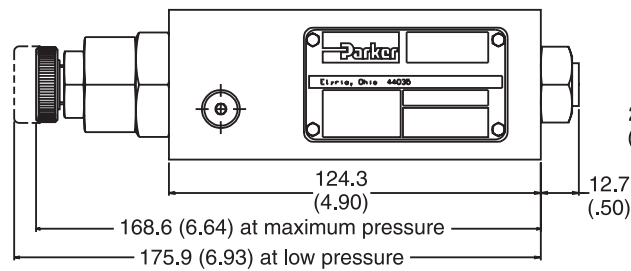
Inch equivalents for millimeter dimensions are shown in (**)



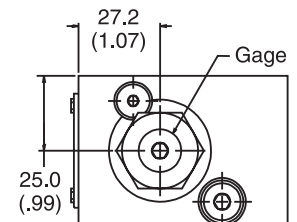
Top View



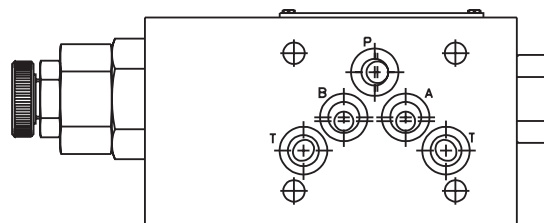
End View



Face View



End View

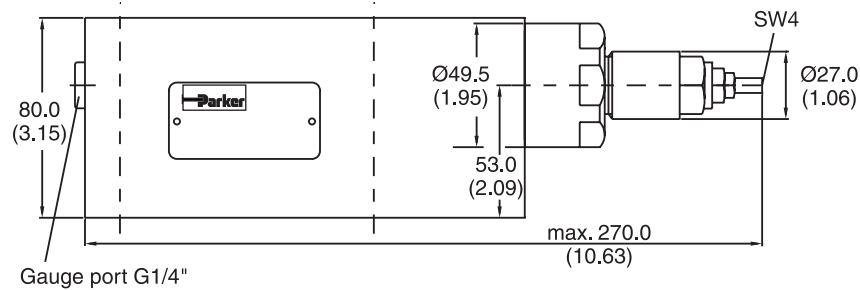


Bottom View

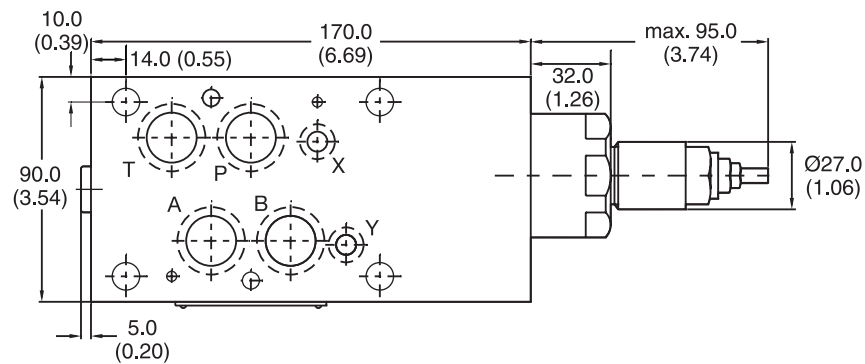


PRM4

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

B

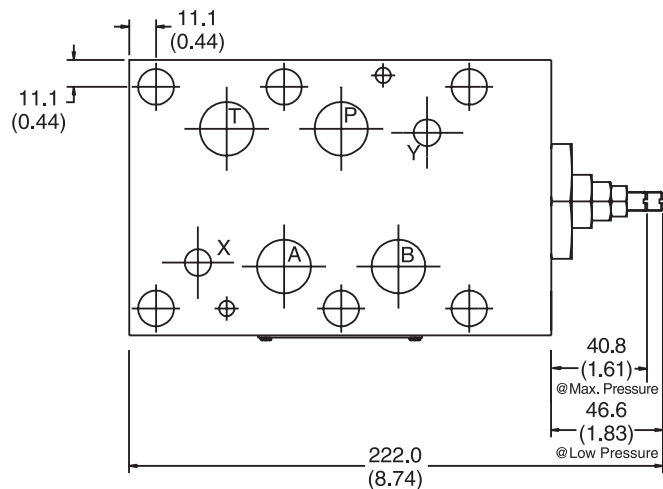
Face View



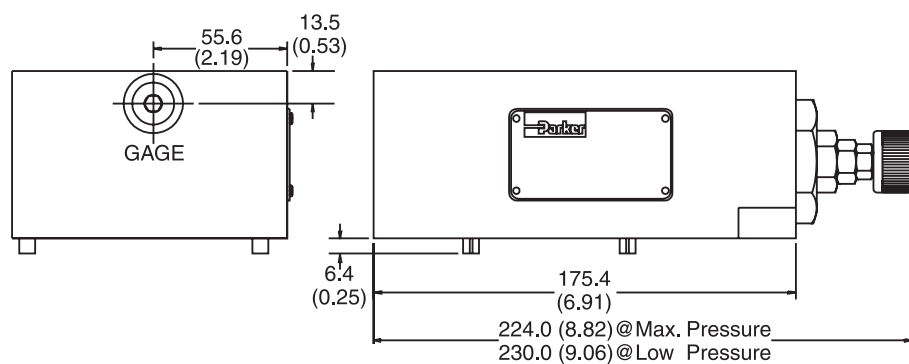
Top View

PRM6

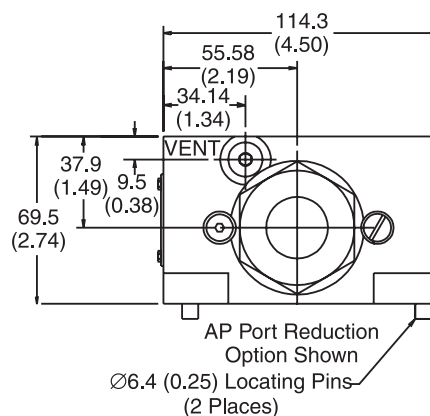
Inch equivalents for millimeter dimensions are shown in (**)



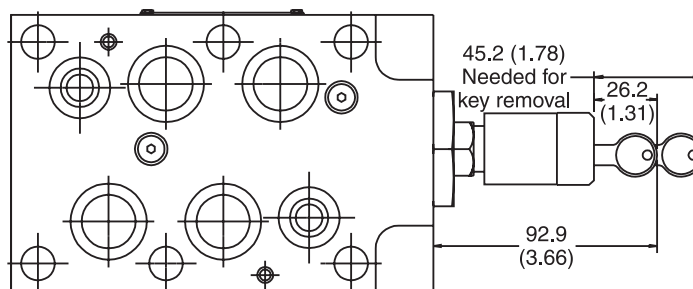
Top View



Face View



End View



Bottom View



General Description

Series RDM pressure relief valves are direct operated piston type valves with low hysteresis. They can be used as P-T relief or as T-T controlled counter balance valve. The valve body is equipped with a pressure gauge port.

B

Function

For PT, pressure is relieved from P to T at the adjusted value.

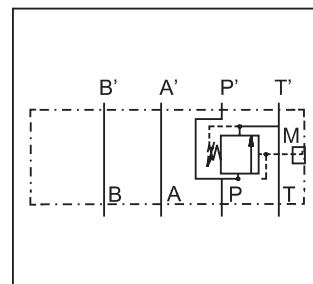
For TT, pressure is relieved from T to T at the adjusted pressure.

Features

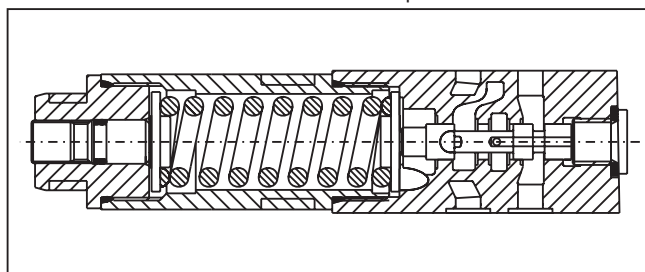
- The direct operated, cushioned piston design results in fast response, low leakage and minimal hysteresis.
- Up to 5 pressure adjustment ranges are available with maximum pressure settings of:
 - For RDM2 – 25, 64, 160, 210, 350 Bar (363, 928, 2320, 3045, 5075 PSI)
 - For RDM3 – 19, 50, 100, 150, 210 Bar (276, 725, 1450, 2175, 3045 PSI)
- Adjustment modes:
 - Slotted head with lock nut
 - Key lock
 - Knob
- RDM2 – NG06 (CETOP3)
- RDM3 – NG10 (CETOP5)



RDM2



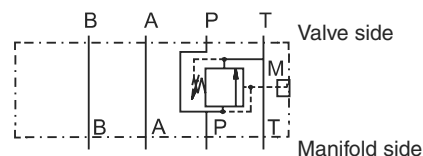
Example PT



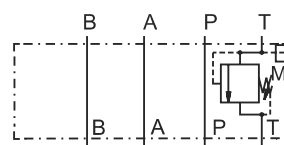
RDM2

Schematics

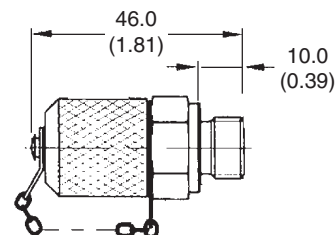
RDM*PT



RDM*TT



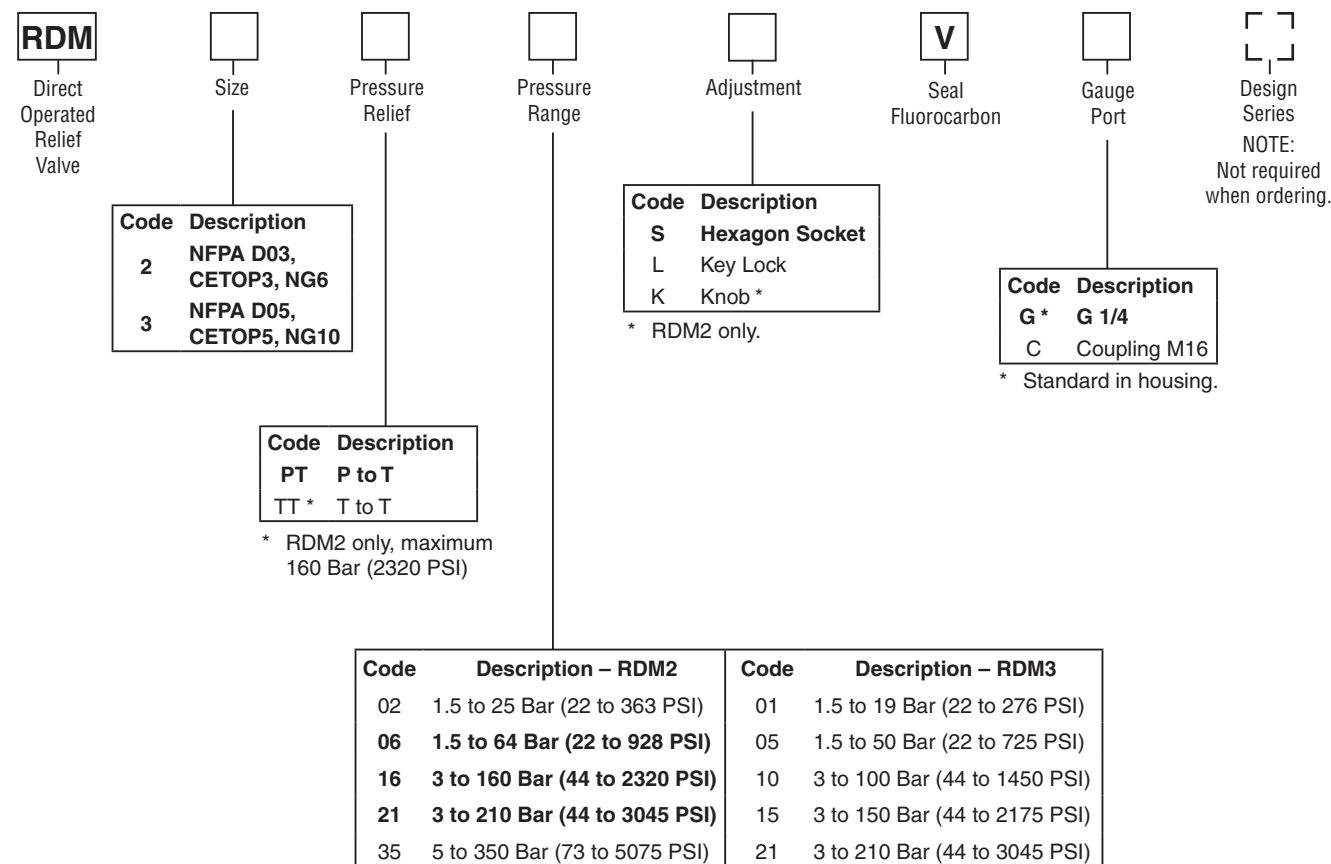
Gauge Port Option C



Specifications

General		
Series	RDM2	RDM3
Size	D03, CETOP3, NG6	D05, CETOP5, NG10
Mounting	NFPA, CETOP RP121, DIN 24340, ISO 4401	
MTTF _D Value	150 years	
Ambient Temperature	-20°C ... +50°C (-4°F...+122°F)	
Hydraulic		
Maximum Operating Pressure	Port P, A, B: 350 Bar (5075 PSI) Port T: 50 Bar (725 PSI)	Port P, A, B: 315 Bar (4495 PSI) Port T: 10 Bar (145 PSI)
Fluid	Hydraulic oil according to DIN 51524...525	
Fluid Temperature	-20°C ... +80°C (-4°F...+176°F)	
Viscosity Range	12...230 cSt / mm²/s (13...1854 SSU)	
Filtration	ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)	
Max. Flow – Maximum Leakage P - A 5ml/min (0.001 GPM)	40 LPM (11 GPM)	80 LPM (21 GPM)

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.



Weight:

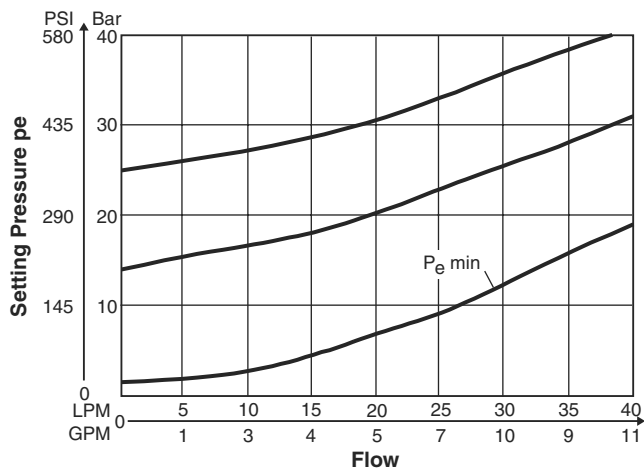
RDM2 1.3 kg (2.9 lbs.)

RDM3 2.6 kg (5.8 lbs.)

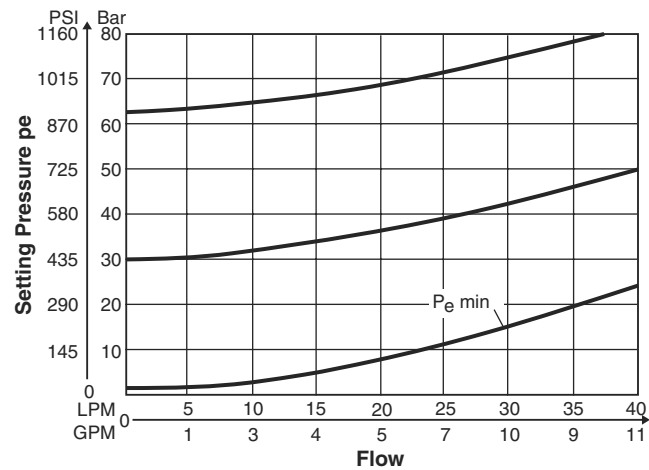
Bold: Designates Tier I products and options.

Non-Bold: Designates Tier II products and options. These products will have longer lead times.

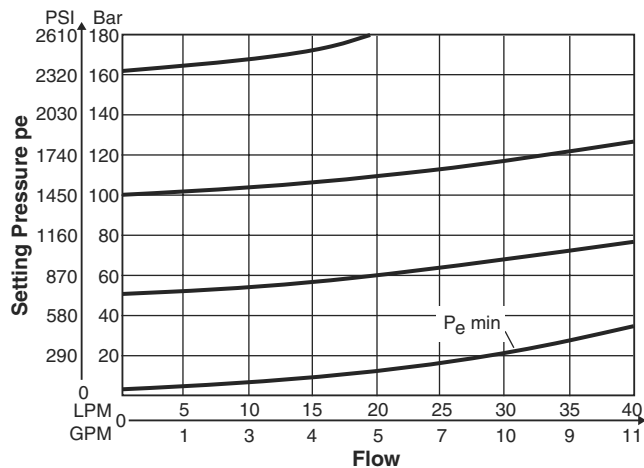
RDM2 02



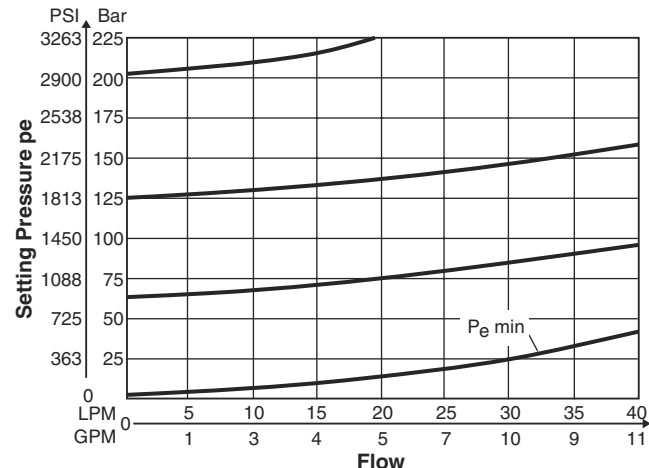
RDM2 06



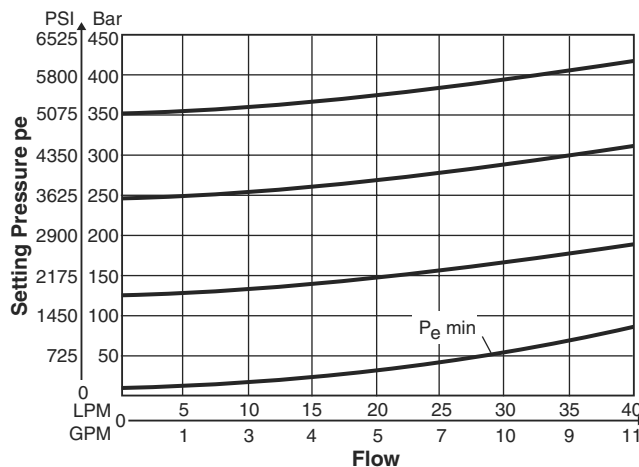
RDM2 16



RDM2 21

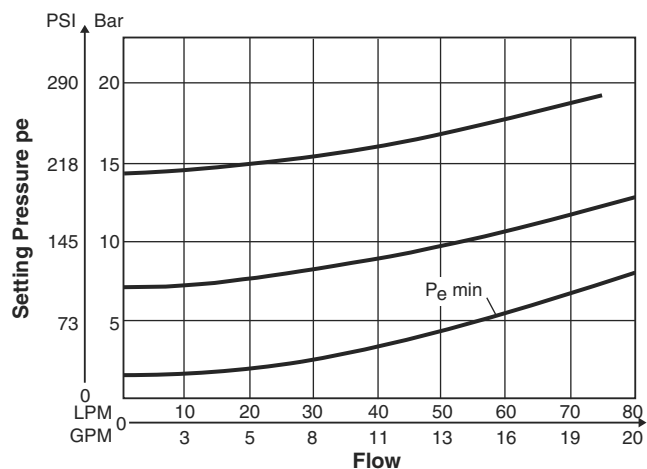


RDM2 35

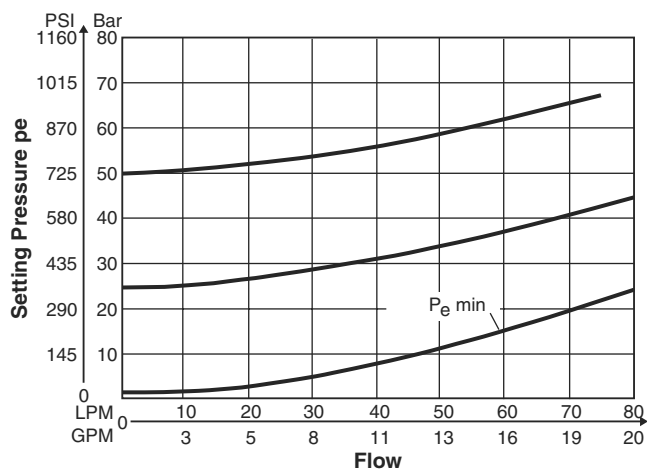


All performance curves measured with HLP46 at 50°C (122°F).

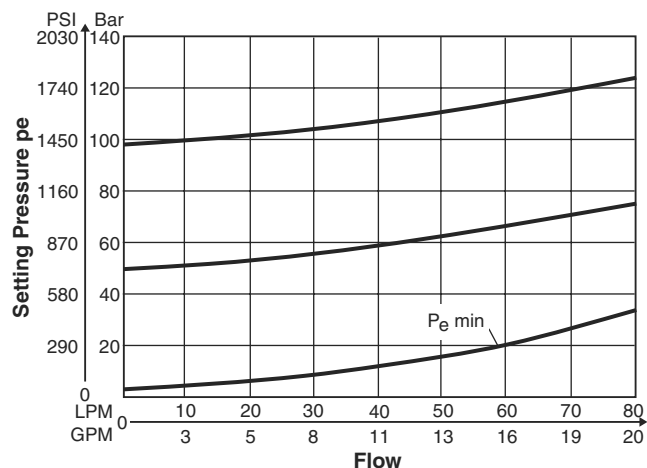
RDM3 01



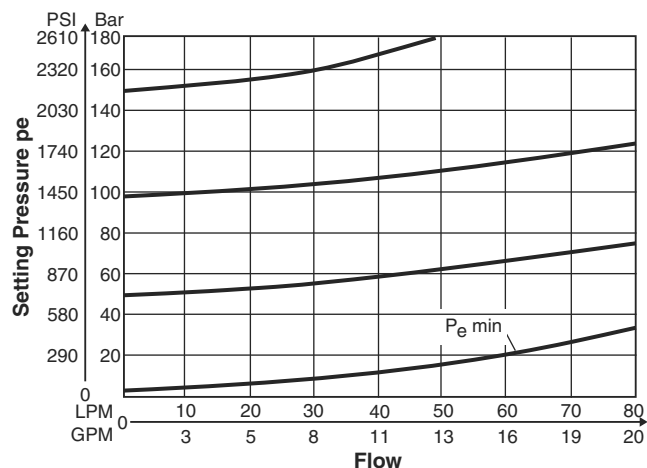
RDM3 05



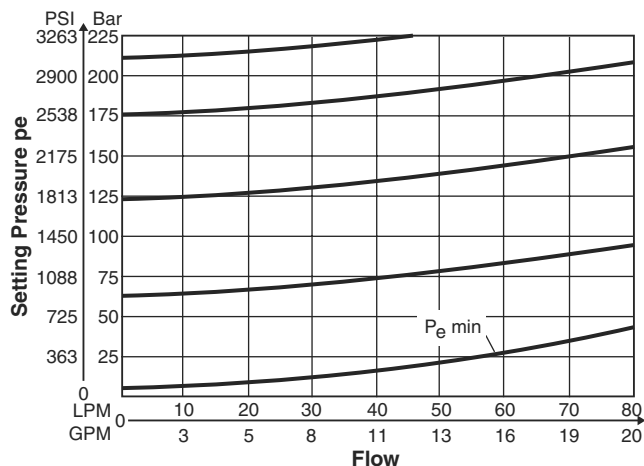
RDM3 10



RDM3 15



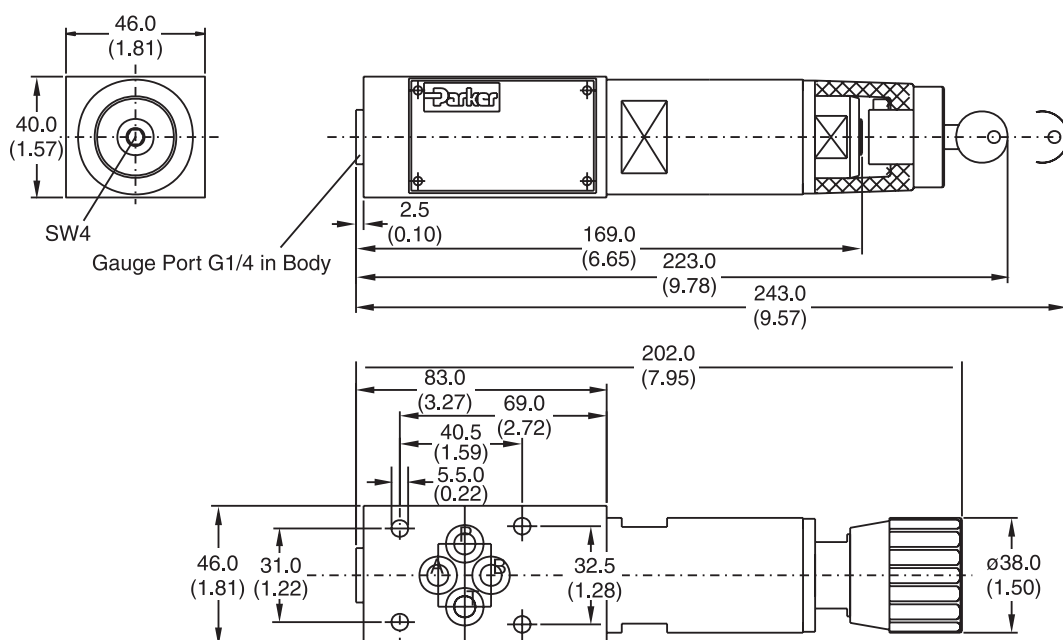
RDM3 21



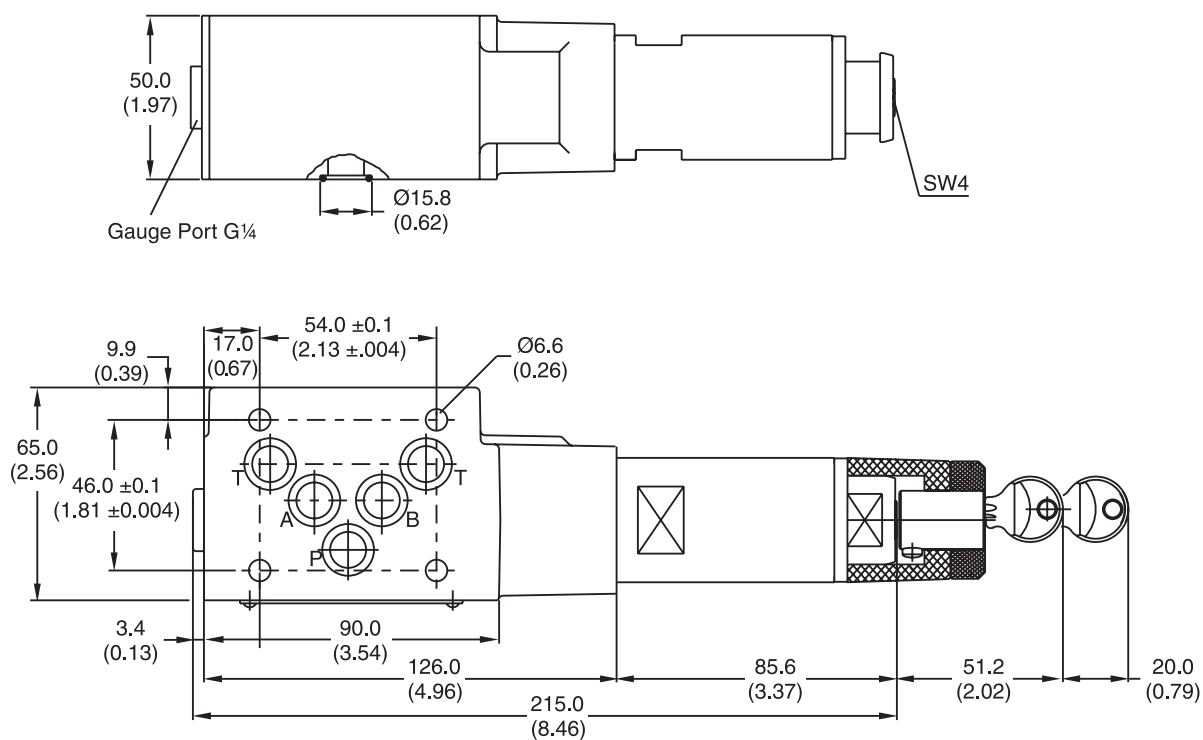
All performance curves measured with HLP46 at 50°C (122°F).

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

RDM2



RDM3



Seal Kit		
Seal	RDM2	RDM3
V	SK-RDM2-V	SK-RDM3-V



General Description

Series RM relief valves limit system pressure by opening to tank when system pressure reaches the valve setting. With D03 size, they can also be configured to limit the 'A' or 'B' work port pressures independently.

Features

- RM sandwich style relief valves can be used to limit pressure in the 'P' port, 'A' port, or 'B' port.
- Valve bodies are manufactured from steel which provide extra strength and durability for longer life. Internal hardened steel components also provide longer life.
- Three pressure adjustment options are available: slotted screw, knob and locking knob.
- SAE Gage Port

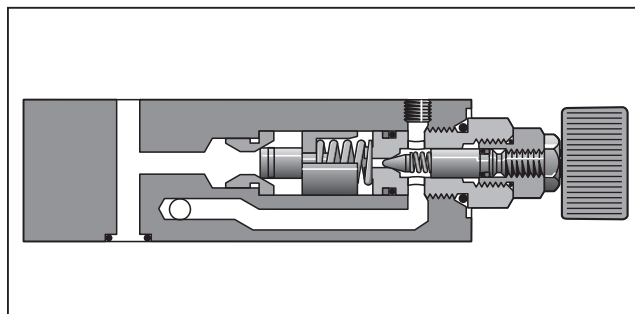
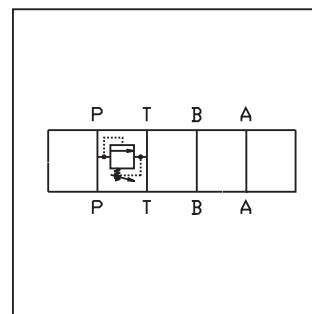
Specifications

	RM2	RM3	RM6										
Mounting Pattern	NFPA D03, CETOP 3, NG 6	NFPA D05, CETOP 5, NG 10	NFPA D08, CETOP 8, NG 25										
Minimum Pressure	10 Bar (150 PSI) with rated flow, 150 SSU oil, and fluid temperature of 38°C (100°F). ¹												
Maximum Pressure	350 Bar (5000 PSI)	350 Bar (5000 PSI)	350 Bar (5000 PSI)										
Minimum Flow	3.78 LPM (1 GPM)	3.78 LPM (1 GPM)	3.78 LPM (1 GPM)										
Maximum Flow	53 LPM (14 GPM)	76 LPM (20 GPM)	341 LPM (90 GPM)										
Pressure Range	<table><tr><td>Code</td><td>Pressure Range</td></tr><tr><td>07</td><td>10 to 70 Bar (150 - 1000 PSI)</td></tr><tr><td>17</td><td>10 to 175 Bar (150 - 2500 PSI)</td></tr><tr><td>25</td><td>10 to 250 Bar (150 - 3500 PSI)</td></tr><tr><td>35</td><td>10 to 350 Bar (150 - 5000 PSI)</td></tr></table>			Code	Pressure Range	07	10 to 70 Bar (150 - 1000 PSI)	17	10 to 175 Bar (150 - 2500 PSI)	25	10 to 250 Bar (150 - 3500 PSI)	35	10 to 350 Bar (150 - 5000 PSI)
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25	10 to 250 Bar (150 - 3500 PSI)												
35	10 to 350 Bar (150 - 5000 PSI)												
Filtration	ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)												
Venting	Connecting the vent port to tank allows the relief valve to divert flow at minimum pressure. ²												
Remote Control	Remote control valve connected to the vent port can be used to control the pressure. ³												

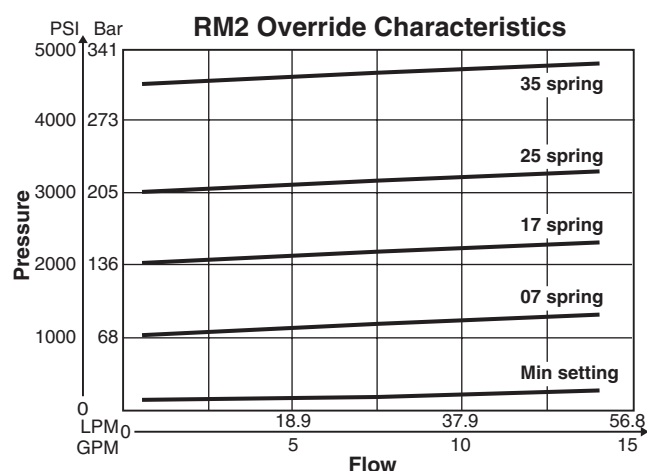
¹ Change in flow, temperature or fluid (SSU) rating will affect valve minimum pressure.

² Not available on Model RM2.

³ Set main valve pressure 10 Bar (150 PSI) higher than remote pilot.



Performance Curves



VISCOSITY CORRECTION FACTOR							
Viscosity (SSU)	75	150	200	250	300	350	400
% of ΔP (Approx.)	93	111	119	126	132	137	141

Curves were generated using 100 SSU hydraulic oil. For any other viscosity, pressure drop will change per chart.

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

B

RM Relief Valve	Size	Port Option	Pressure Range	Adjustment	Seal	* Design Series NOTE: Not required when ordering.
--	--	---	--	--	--	---

<table border="1" style="width: 180px;"> <thead> <tr> <th>Code</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>NFPA D03 Subplate Mounting</td> </tr> <tr> <td>3</td> <td>NFPA D05 Subplate Mounting</td> </tr> <tr> <td>6</td> <td>NFPA D08 Subplate Mounting</td> </tr> </tbody> </table>	Code	Description	2	NFPA D03 Subplate Mounting	3	NFPA D05 Subplate Mounting	6	NFPA D08 Subplate Mounting	<table border="1" style="width: 180px;"> <thead> <tr> <th>Code</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>PT</td> <td>Relief P to T</td> </tr> <tr> <td>AT*</td> <td>Relief A to T</td> </tr> <tr> <td>BT*</td> <td>Relief B to T</td> </tr> </tbody> </table> * RM2 only.	Code	Description	PT	Relief P to T	AT*	Relief A to T	BT*	Relief B to T	<table border="1" style="width: 260px;"> <thead> <tr> <th>Code</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>07</td> <td>10 to 70 Bar (150 to 1000 PSI)</td> </tr> <tr> <td>17</td> <td>10 to 175 Bar (150 to 2500 PSI)</td> </tr> <tr> <td>25</td> <td>10 to 250 Bar (150 to 3500 PSI)</td> </tr> <tr> <td>35</td> <td>10 to 350 Bar (150 to 5000 PSI)</td> </tr> </tbody> </table>	Code	Description	07	10 to 70 Bar (150 to 1000 PSI)	17	10 to 175 Bar (150 to 2500 PSI)	25	10 to 250 Bar (150 to 3500 PSI)	35	10 to 350 Bar (150 to 5000 PSI)	<table border="1" style="width: 180px;"> <thead> <tr> <th>Code</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>N</td> <td>Nitrile</td> </tr> <tr> <td>V</td> <td>Fluorocarbon</td> </tr> </tbody> </table>	Code	Type	N	Nitrile	V	Fluorocarbon	<table border="1" style="width: 180px;"> <thead> <tr> <th>Code</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>K</td> <td>Knob</td> </tr> <tr> <td>L</td> <td>Locking Knob</td> </tr> <tr> <td>S</td> <td>Slotted Screw with Jam Nut</td> </tr> </tbody> </table>	Code	Type	K	Knob	L	Locking Knob	S	Slotted Screw with Jam Nut
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Unit Weight: RM2 .95 kg (2.1 lbs.) RM3 3.0 kg (6.6 lbs.) RM6 5.9 kg (13.0 lbs.)
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Bold: Designates Tier I products and options.

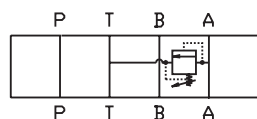
Non-Bold: Designates Tier II products and options. These products will have longer lead times.

Sandwich Bolt Kits

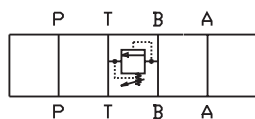
Size "2"				Size "3"			
No. of Sandwich	Sandwich & Valve Combination	Bolt Kit	Bolt Length mm (in)	No. of Sandwich	Sandwich & Valve Combination	D3W-30 D3DW & D31*W*	Bolt Length mm (in)
1	Sandwich & D1	BK243	73.2 (2.88)	1	Sandwich & D3	BK141	88.9 (3.50)
2	Sandwich & D1	BK225	111.3 (4.38)	2	Sandwich & D3	BK142	139.7 (5.50)
3	Sandwich & D1	BK244	152.4 (6.00)	3	Sandwich & D3	BK143	190.5 (7.50)
4	Sandwich & D1	BK245	190.5 (7.50)	* D31VW with internal pilot and internal drain only.			
Size "6"							
No. of Sandwich	Sandwich & Valve Combination	Bolt Kit	Bolt Length mm (in)				
1	Sandwich & D6	BK121	133.4 (5.25)				
2	Sandwich & D6	BK122	203.2 (8.00)				
3	Sandwich & D6	BK123	273.1 (10.75)				
4	Sandwich & D6	BK124	342.9 (13.5)				

Bolt Kits must be ordered separately.

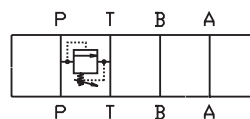
Schematics



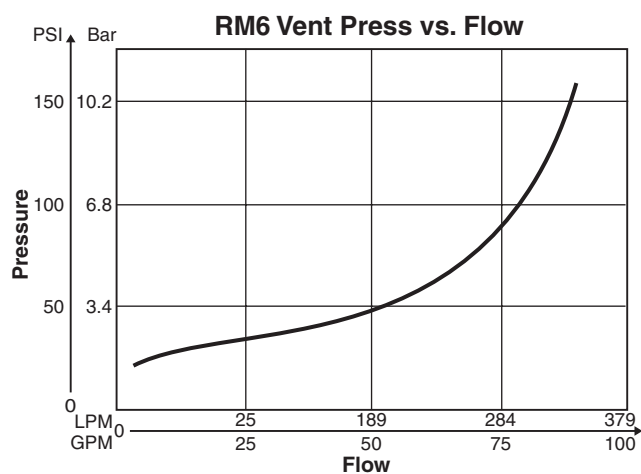
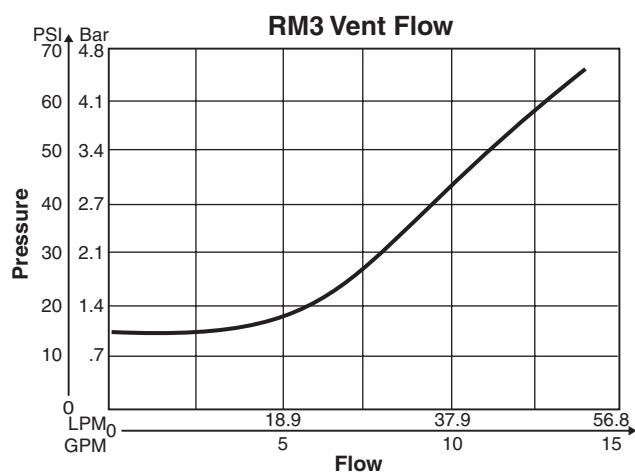
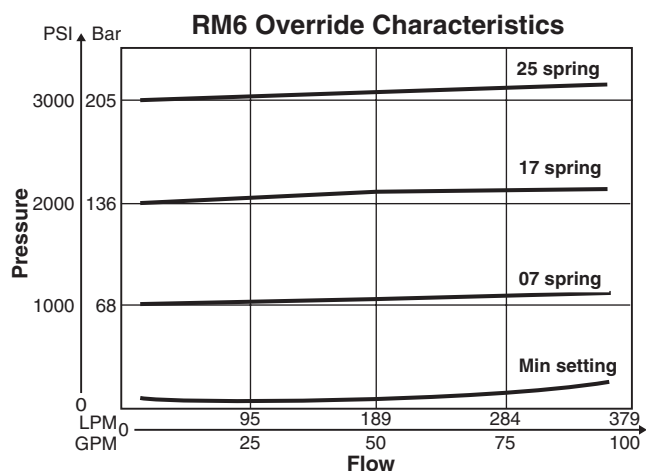
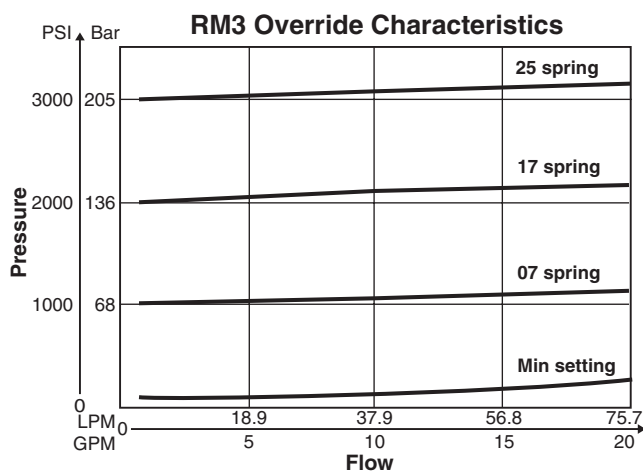
AT Option



SUBPLATE SIDE
 BT Option

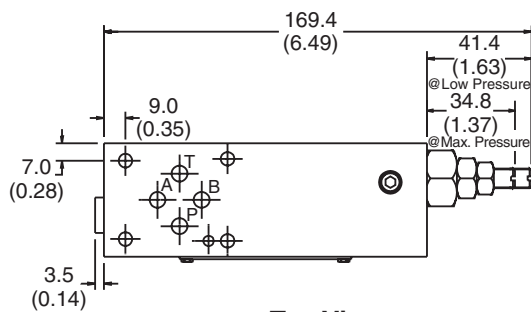
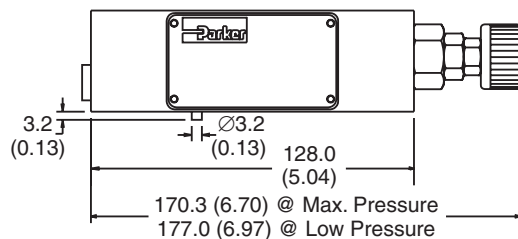
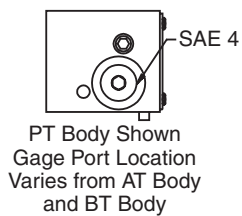
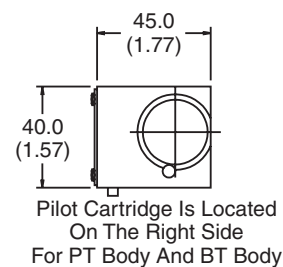
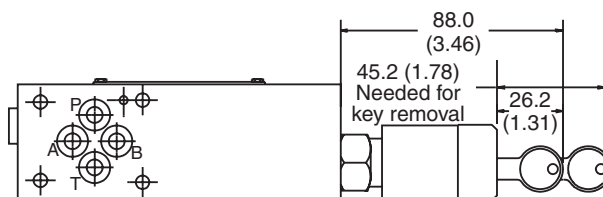


PT Option

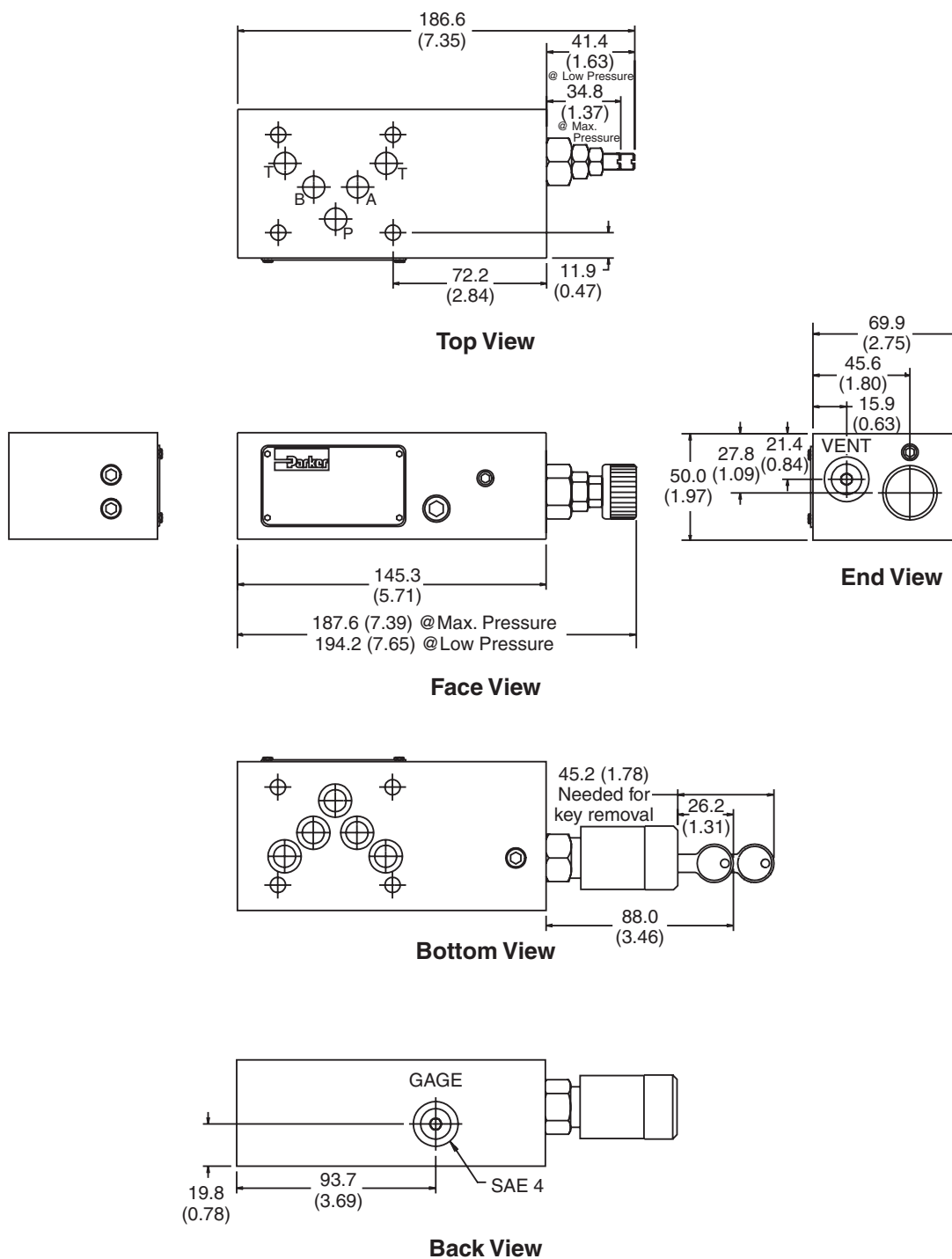


VISCOSITY CORRECTION FACTOR							
Viscosity (SSU)	75	150	200	250	300	350	400
% of ΔP (Approx.)	93	111	119	126	132	137	141
Curves were generated using 100 SSU hydraulic oil. For any other viscosity, pressure drop will change per chart.							

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

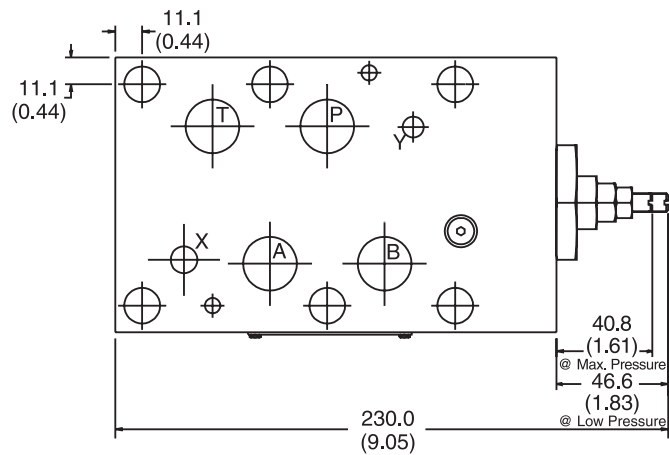
**Top View****Face View****End View****Bottom View**

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

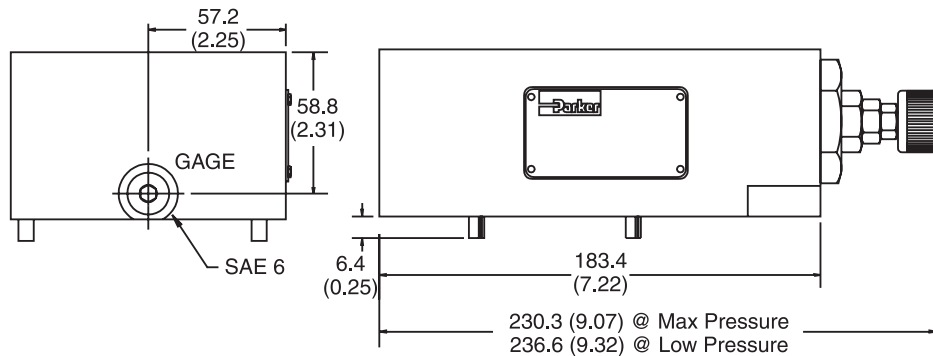


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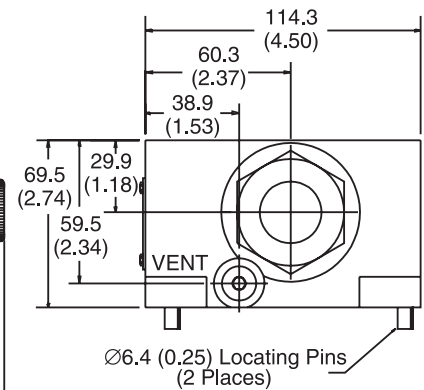
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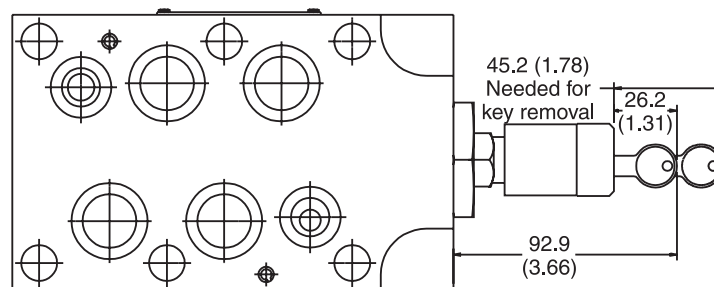
Top View



Face View



End View



Bottom View

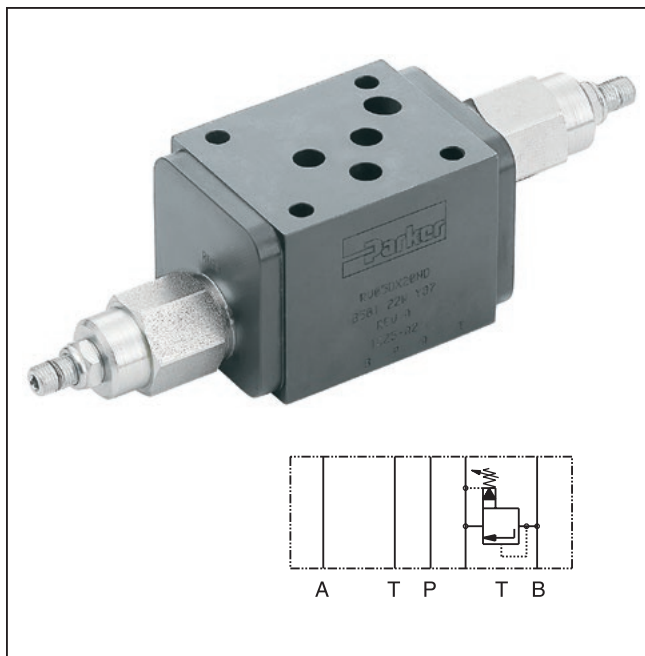


General Description

Series RV direct acting, pressure relief valves are designed to limit pressure in various parts of a hydraulic circuit. The relief valve function options are P to T, A to T, B to T or A & B to T. Another option is for A to B & B to A crossover relief functions.

Features

- High flow capacity.
- Pressure function in P, A, B or A + B.
- Sizes:
 - RV05 – NFPA D05 / NG10 / CETOP 5
 - RV5H – NFPA D05HE / NG10 / CETOP 5H
 - RV07 – NFPA D07 / NG16 / CETOP 7
 - RV08 – NFPA D08 / NG25 / CETOP 8



B

Specifications

General				
Size	D05 / NG10	D05HE / NG10	D07 / NG16	D08 / NG25
Mounting Position	Unrestricted			
Ambient Temperature Range	-20°C to +50°C (-4°F to +122°F)			
Hydraulic				
Maximum Operating Pressure	Aluminum Body – up to 207 Bar (3000 PSI); Ductile Iron Body – up to 345 Bar (5000 PSI)			
Nominal Flow	189 LPM (50 GPM)	189 LPM (50 GPM)	189 LPM (50 GPM)	378 LPM (100 GPM)
Leakage	10 DPM	10 DPM	10 DPM	10 DPM
Reseat Pressure	> 90% Setting			
Adjustment Screw Hex Size	5/32	5/32	5/32	5/32
Fluid Temperature	-20°C to +80°C (-4°F to +176°F)			
Viscosity	Permitted Recommended	10 to 650 cSt / mm ² /s (46 to 3013 SSU) 30 cSt / mm ² /s (139 SSU)		
Filtration	ISO Class 4406 (1999) 18/16/13 (acc. NAS 1638: 7)			

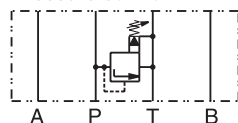
WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

B

RV Pressure Relief Valve	Size	Style	Pressure Range	Seal	Body Material																												
<table border="0" style="width: 100%;"> <tr> <th style="text-align: left;">Code</th> <th style="text-align: left;">Description</th> </tr> <tr> <td>03</td> <td>See RM2</td> </tr> <tr> <td>05</td> <td>NFPA D05 / NG10</td> </tr> <tr> <td>5H*</td> <td>NFPA D05HE / NG10</td> </tr> <tr> <td>07</td> <td>NFPA D07 / NG16</td> </tr> <tr> <td>08</td> <td>NFPA D08 / NG25</td> </tr> </table> * Valve comes with D05HE (ISO) pattern seal plate (990-120-012). If D05H pattern is required, order seal plate kit 990-120-009.		Code	Description	03	See RM2	05	NFPA D05 / NG10	5H*	NFPA D05HE / NG10	07	NFPA D07 / NG16	08	NFPA D08 / NG25	<table border="0" style="width: 100%;"> <tr> <th style="text-align: left;">Code</th> <th style="text-align: left;">Description</th> </tr> <tr> <td>10</td> <td>69 Bar (1000 PSI)**</td> </tr> <tr> <td></td> <td>34.5 to 207 Bar (500 to 3000 PSI)</td> </tr> <tr> <td>20*</td> <td>69 Bar (1000 PSI)**</td> </tr> <tr> <td></td> <td>69 to 414 Bar (1000 to 6000 PSI)</td> </tr> </table> * Ductile iron body only. ** Standard setting.		Code	Description	10	69 Bar (1000 PSI)**		34.5 to 207 Bar (500 to 3000 PSI)	20*	69 Bar (1000 PSI)**		69 to 414 Bar (1000 to 6000 PSI)	<table border="0" style="width: 100%;"> <tr> <th style="text-align: left;">Code</th> <th style="text-align: left;">Description</th> </tr> <tr> <td>A</td> <td>Aluminum</td> </tr> <tr> <td>D</td> <td>Ductile Iron</td> </tr> </table>		Code	Description	A	Aluminum	D	Ductile Iron
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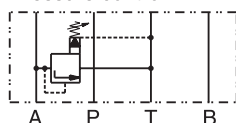
RVPT**

Pressure control P-T



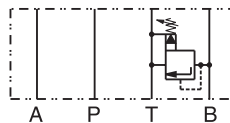
RVAT**

Pressure control A-T



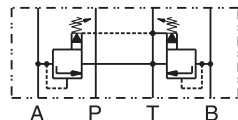
RVBT**

Pressure control B-T



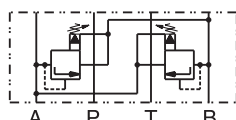
RVDT**

Pressure control A-T & B-T



RVDX**

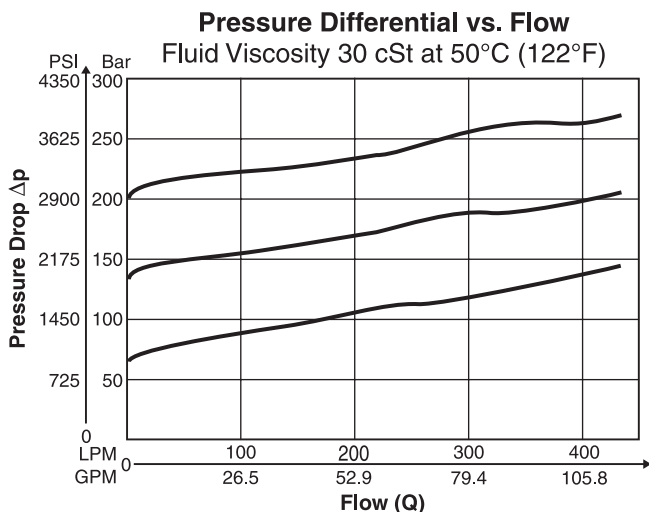
Pressure control A-B & B-A



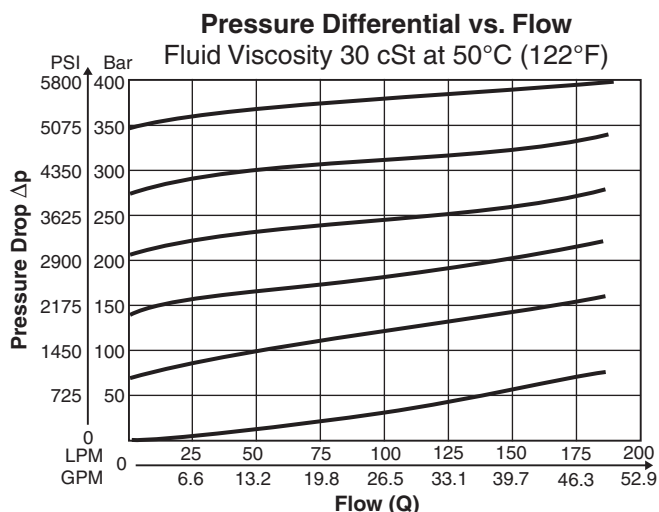
Weight:

Size	RV**AT30NA	RV**AT30ND	RV**BT30NA	RV**BT30ND	RV**DT30NA	RV**DT30ND	RV**DX30NA	RV**DX30ND	RV**PT30NA	RV**PT30ND
RV05, RV5H	1.0 kg (2.2 lbs.)	2.2 kg (4.8 lbs.)	1.0 kg (2.2 lbs.)	2.2 kg (4.8 lbs.)	1.2 kg (2.6 lbs.)	2.1 kg (4.7 lbs.)	1.4 kg (3 lbs.)	2.6 kg (5.7 lbs.)	1.0 kg (2.2 lbs.)	2.2 kg (4.8 lbs.)
RV07	1.7 kg (3.7 lbs.)	3.6 kg (7.9 lbs.)	1.5 kg (3.3 lbs.)	3.2 kg (7.2 lbs.)	2.6 kg (5.7 lbs.)	5.6 kg (12.3 lbs.)	2.1 kg (4.7 lbs.)	4.5 kg (10.0 lbs.)	1.5 kg (3.3 lbs.)	3.3 kg (7.2 lbs.)
RV08	3.9 kg (8.6 lbs.)	9.1 kg (20 lbs.)	3.8 kg (8.5 lbs.)	9 kg (19.7 lbs.)	5.6 kg (12.3 lbs.)	12.4 kg (27.4 lbs.)	4.4 kg (9.6 lbs.)	9.2 kg (20.3 lbs.)	3.9 kg (8.6 lbs.)	9.1 kg (20 lbs.)

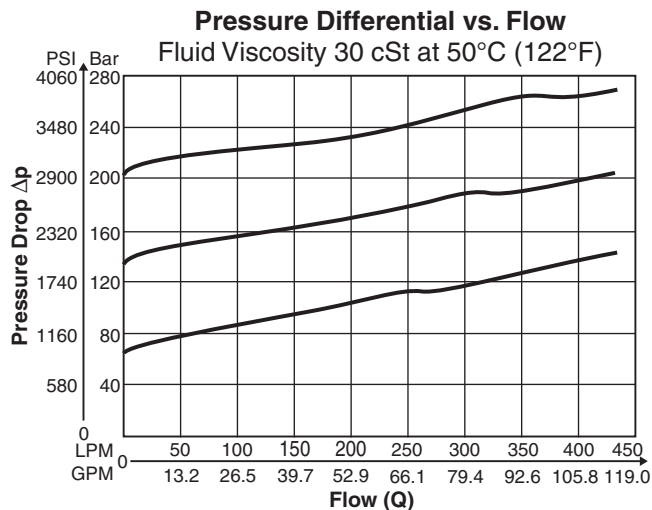
RV05*10*A, RV5H*10*A, RV07*10*A



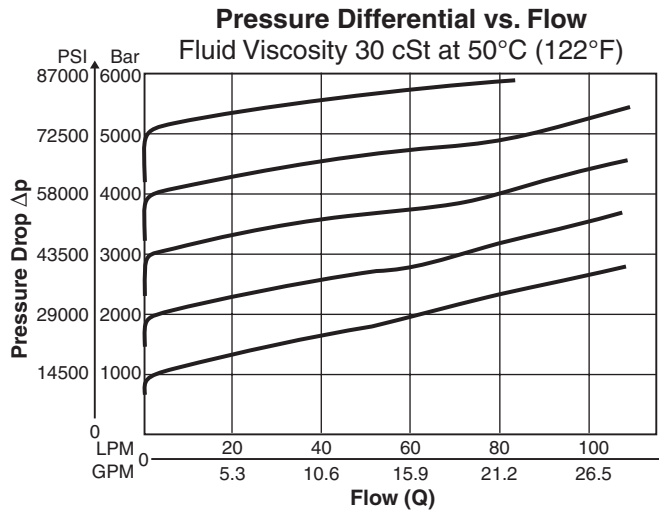
RV05*20*D, RV5H*20*D, RV07*20*D



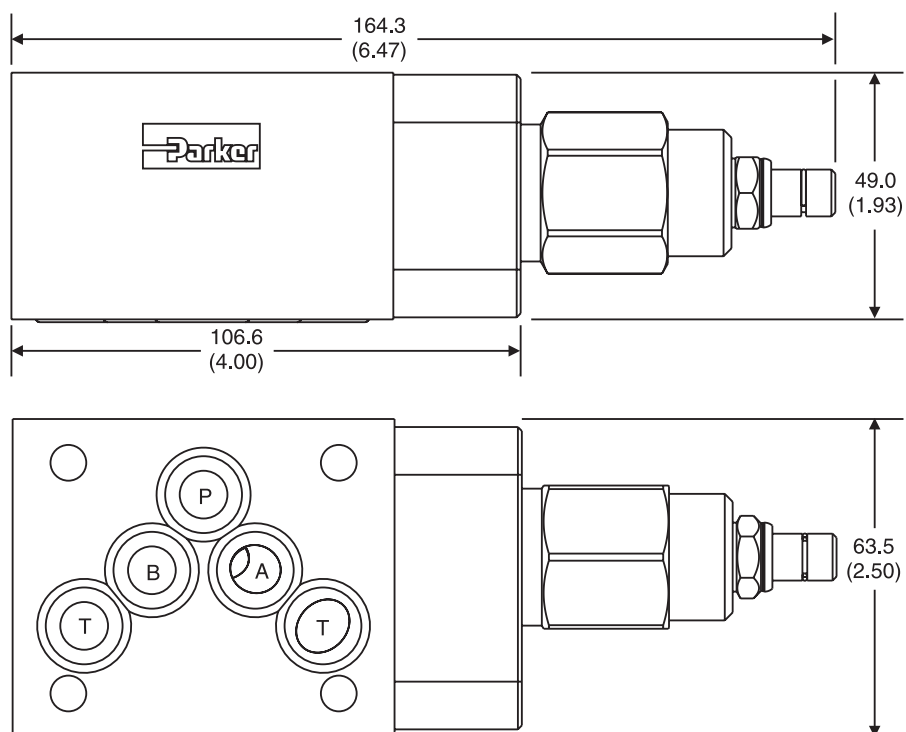
RV08*10*A



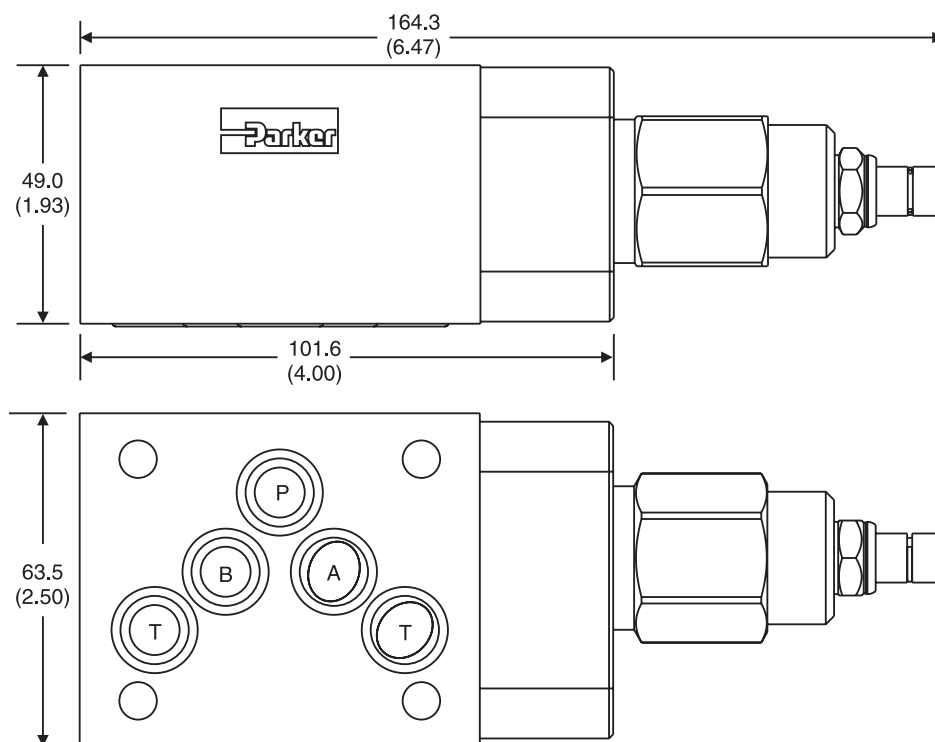
RV08*20*D

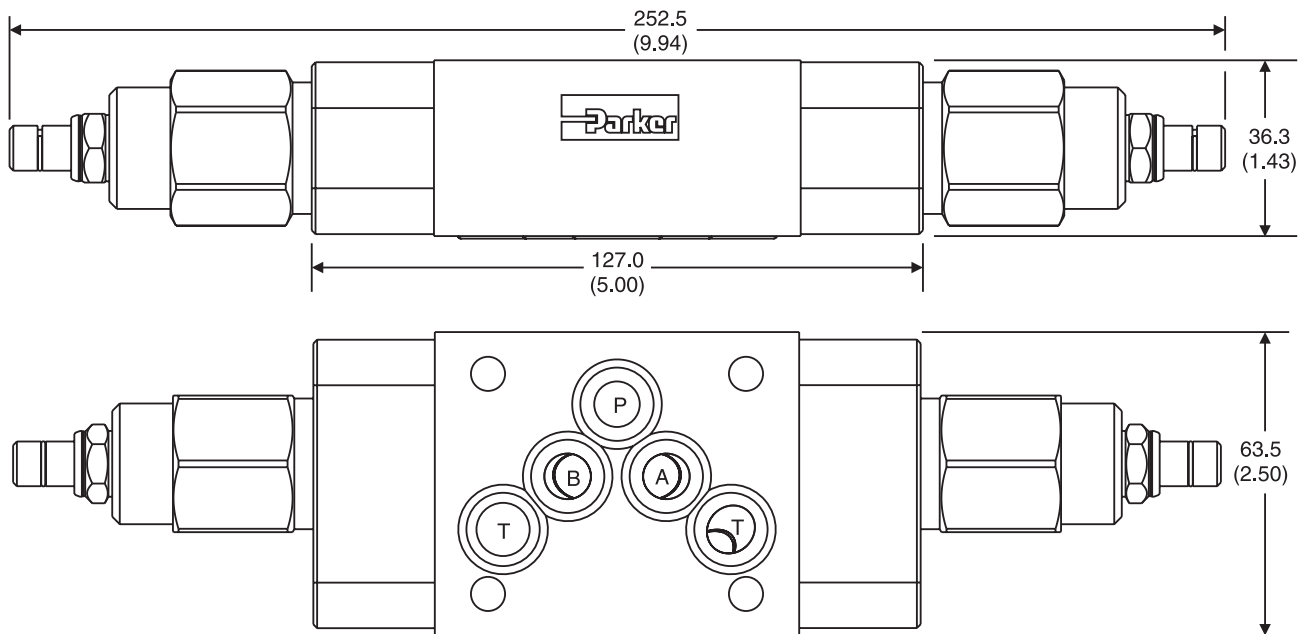
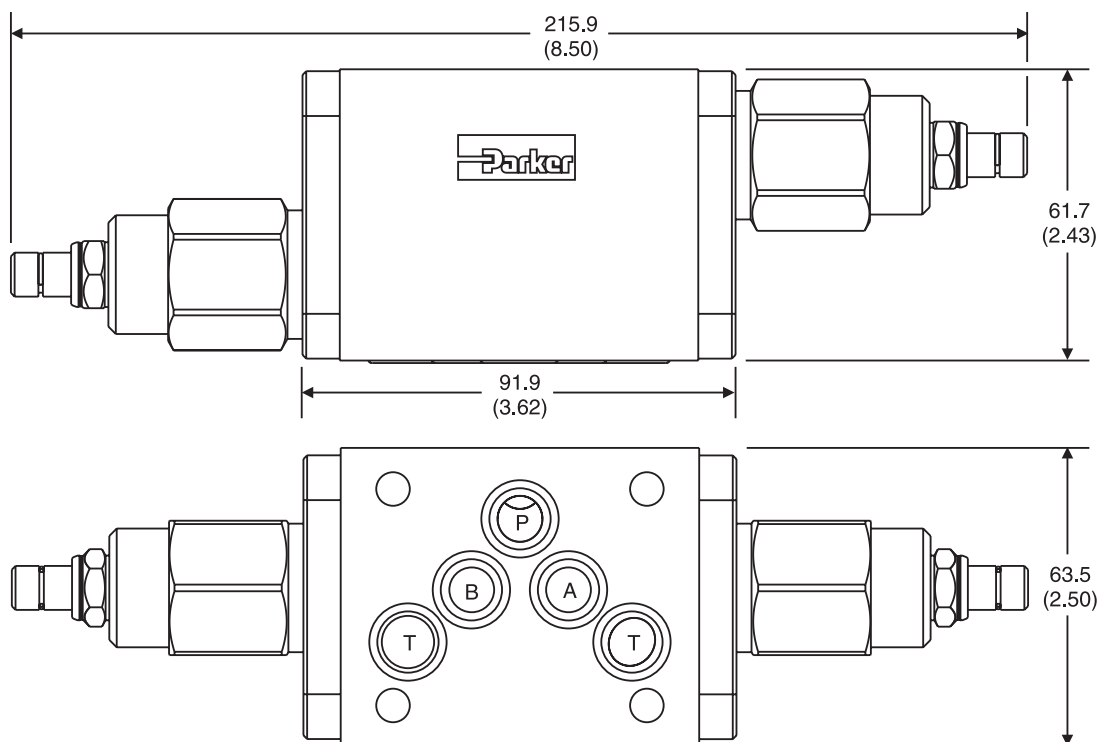


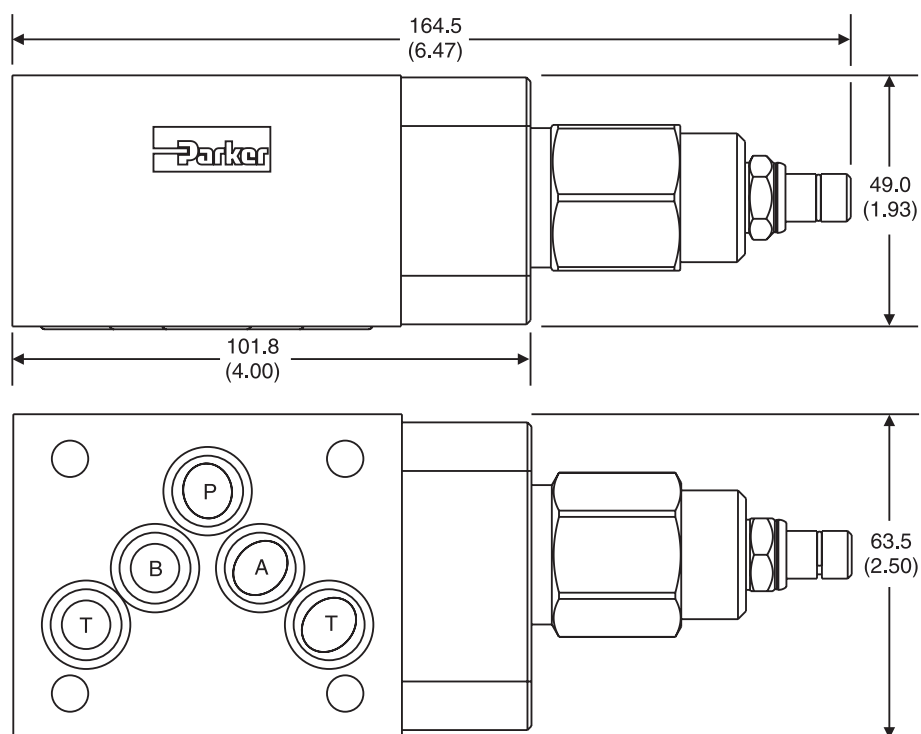
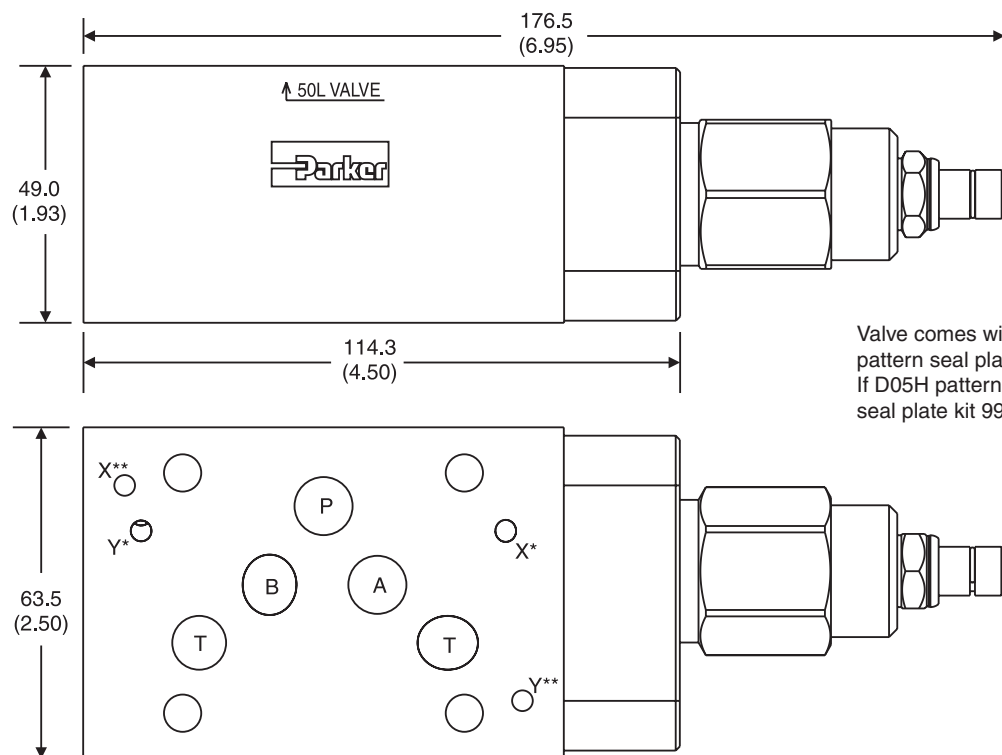
RV05AT — Inch equivalents for millimeter dimensions are shown in (**)



RV05BT — Inch equivalents for millimeter dimensions are shown in (**)



RV05DT — Inch equivalents for millimeter dimensions are shown in (**)**RV05DX** — Inch equivalents for millimeter dimensions are shown in (**)

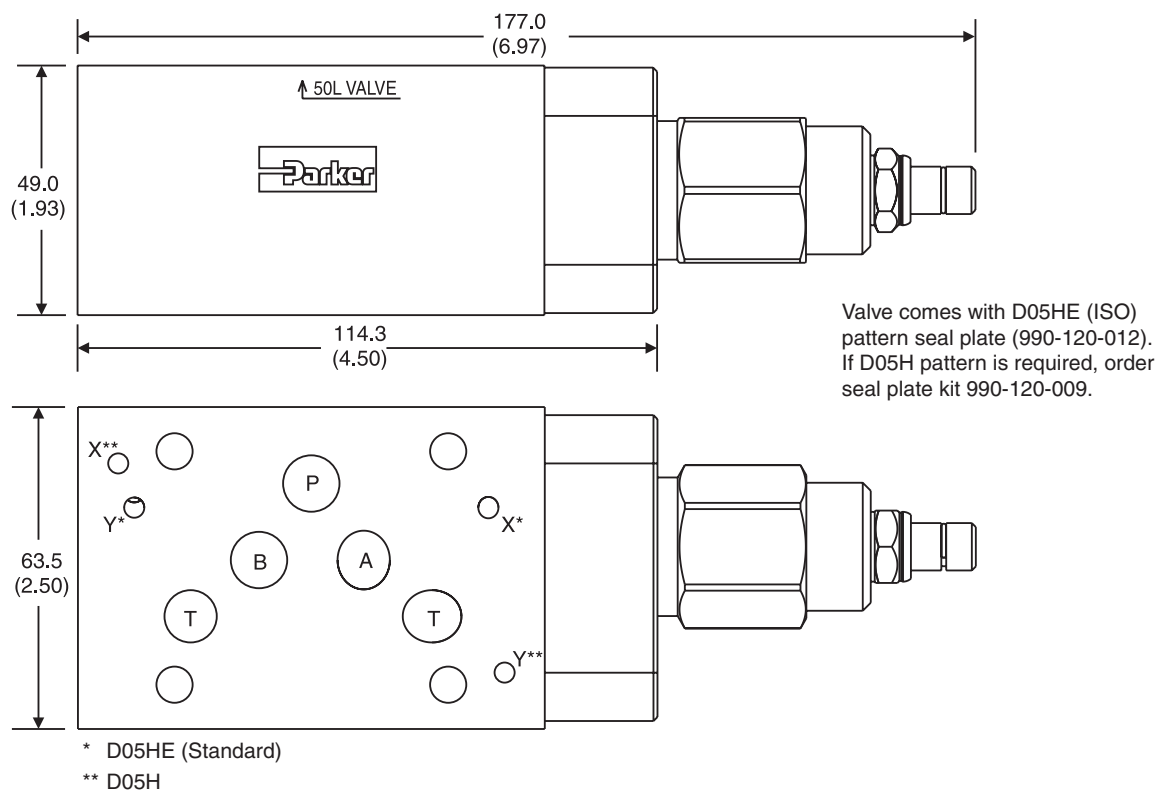
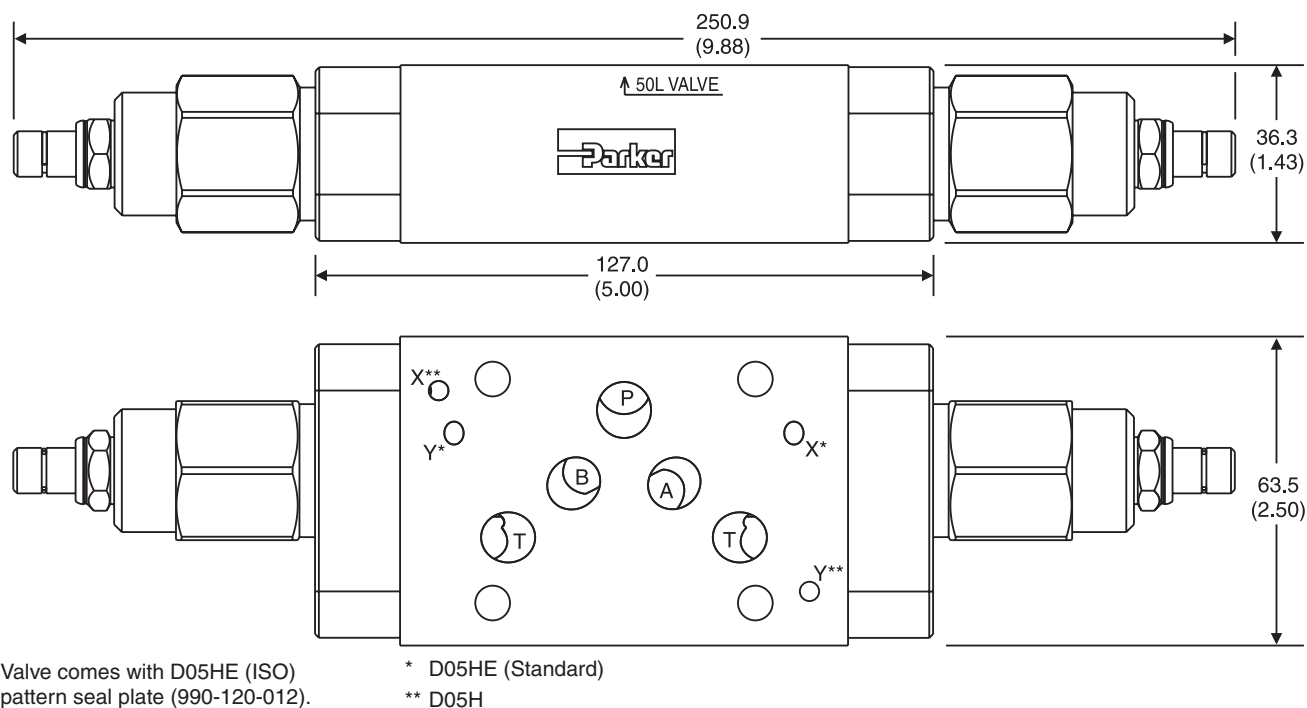
RV05PT — Inch equivalents for millimeter dimensions are shown in (**)**RV5HAT** — Inch equivalents for millimeter dimensions are shown in (**)

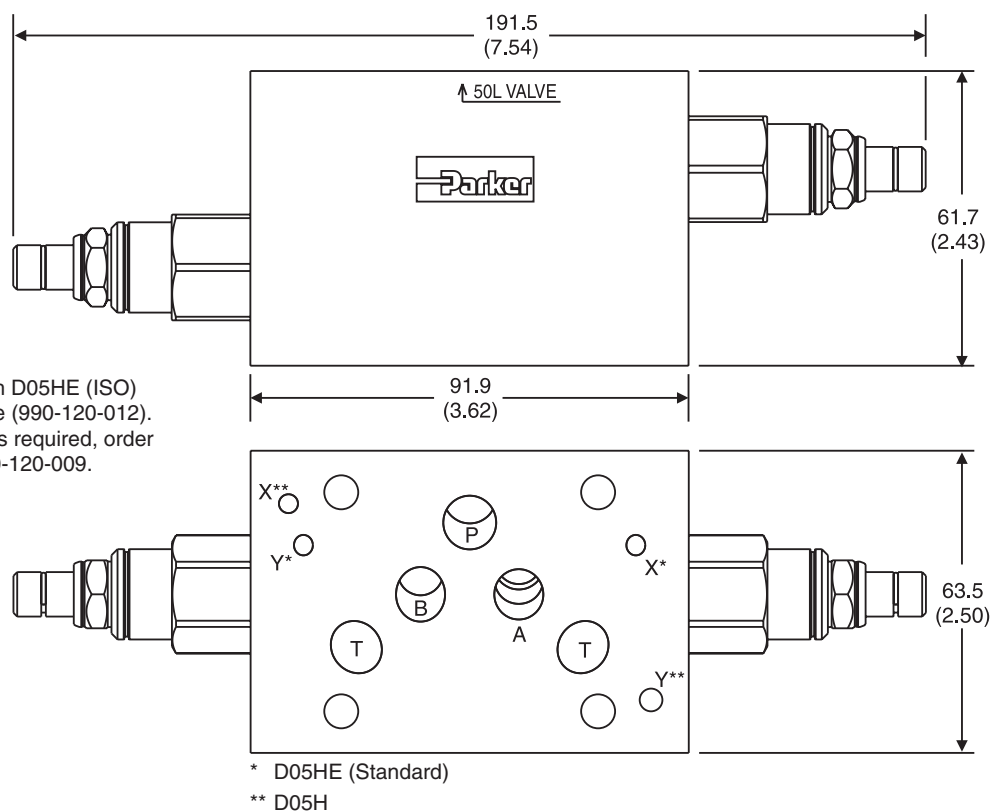
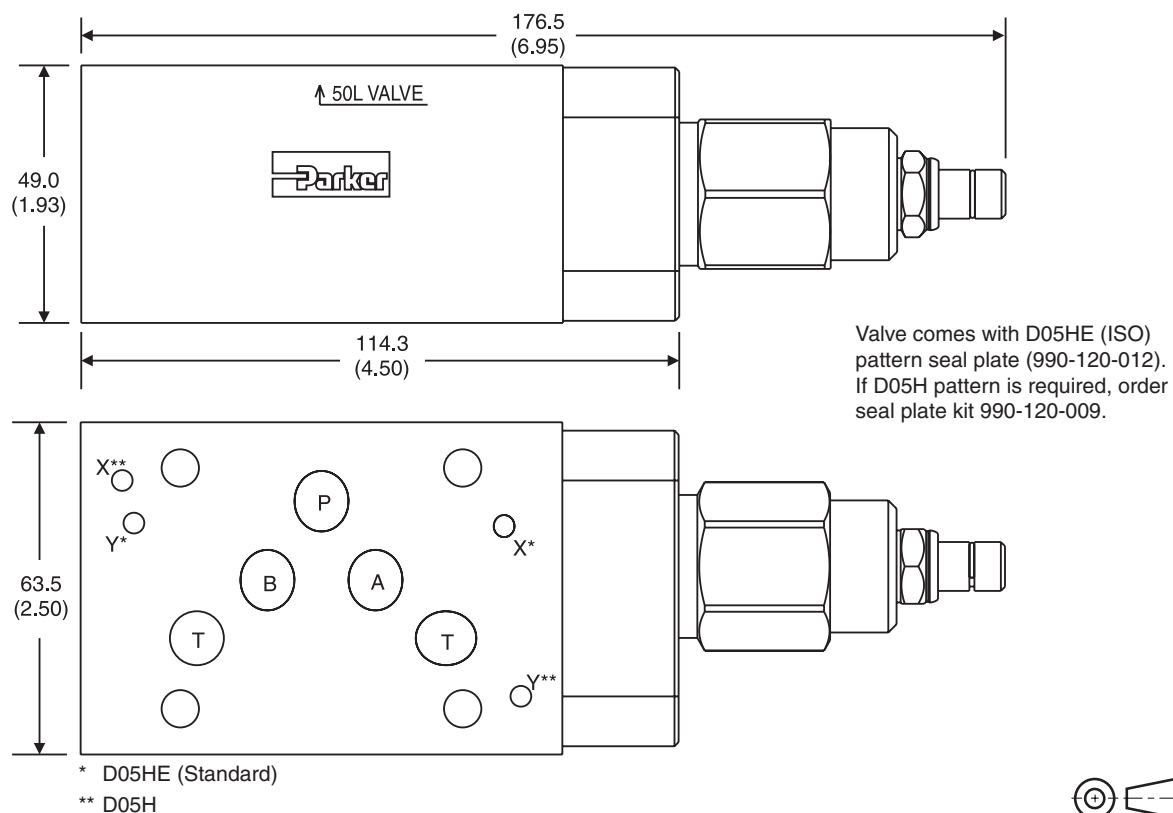
Valve comes with D05HE (ISO)
pattern seal plate (990-120-012).
If D05H pattern is required, order
seal plate kit 990-120-009.

* D05HE (Standard)

** D05H

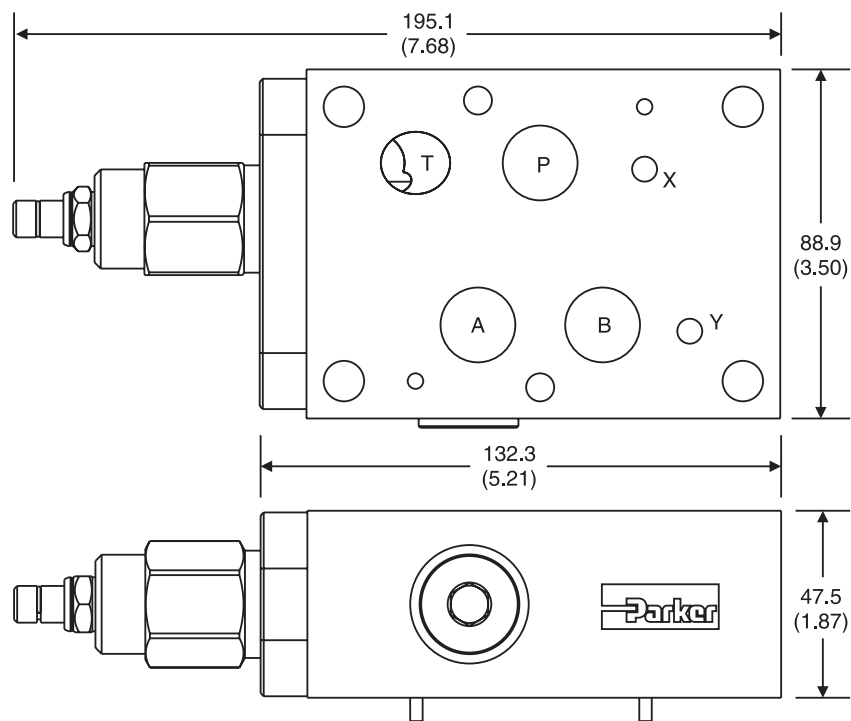


RV5HBT – Inch equivalents for millimeter dimensions are shown in (**)**RV5HDT** – Inch equivalents for millimeter dimensions are shown in (**)

RV5HDX — Inch equivalents for millimeter dimensions are shown in (**)**RV5HPT** — Inch equivalents for millimeter dimensions are shown in (**)

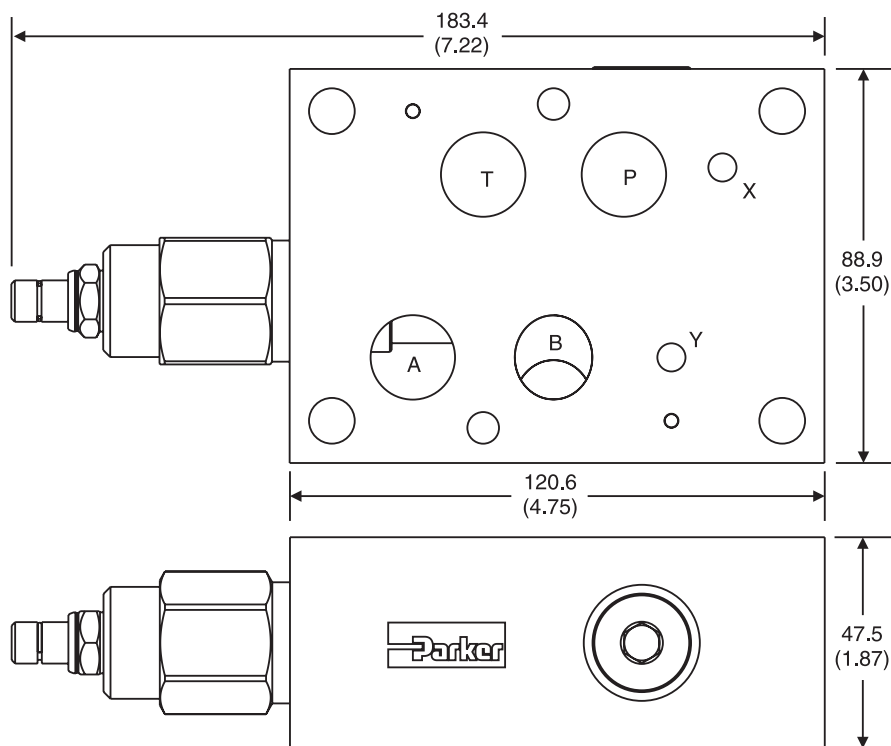
RV07AT — Inch equivalents for millimeter dimensions are shown in (**)

Note: This is a top view.



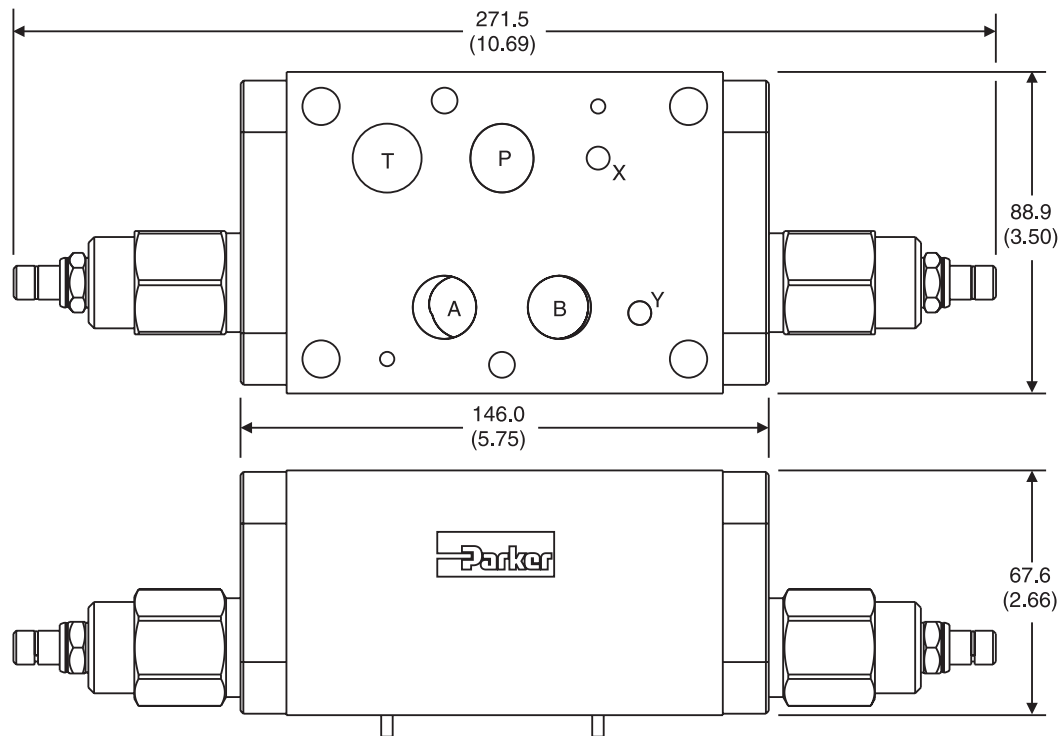
RV07BT — Inch equivalents for millimeter dimensions are shown in (**)

Note: This is a top view.

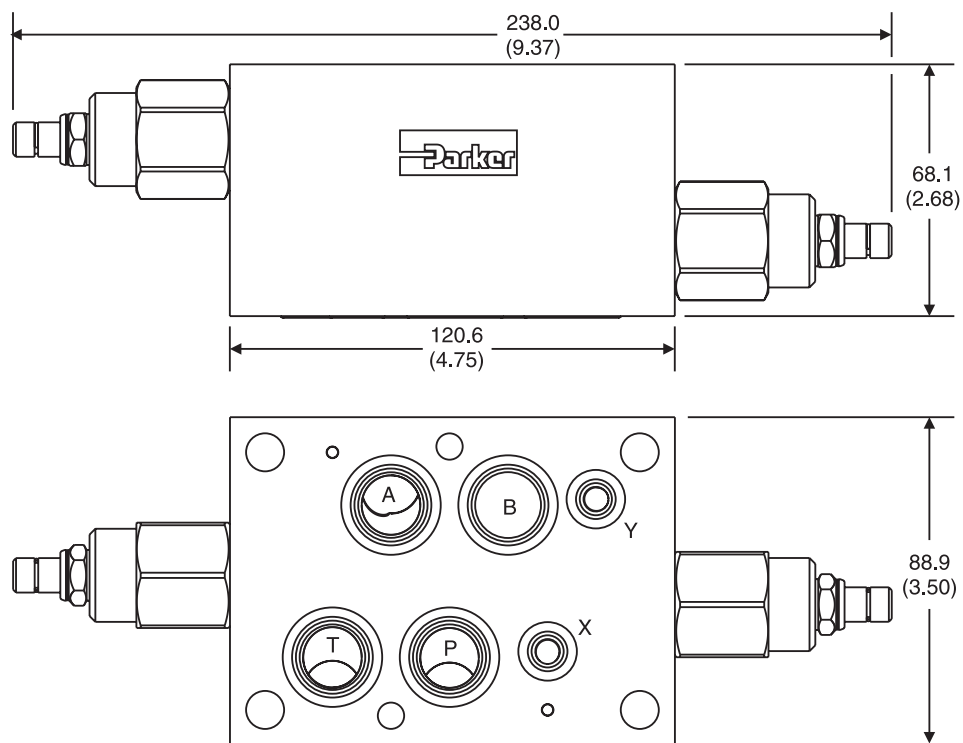


RV07DT — Inch equivalents for millimeter dimensions are shown in (**)

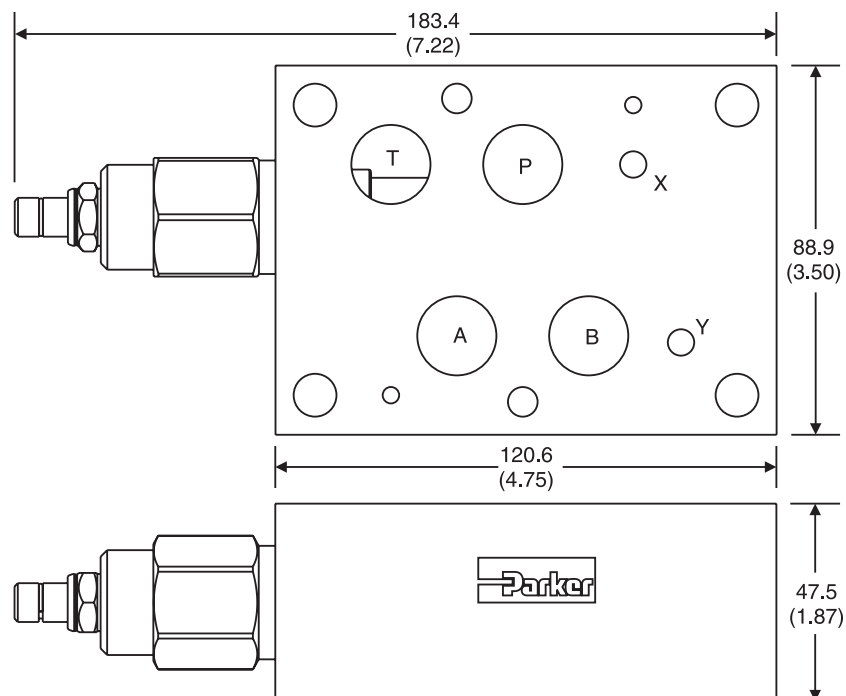
Note: This is a top view.



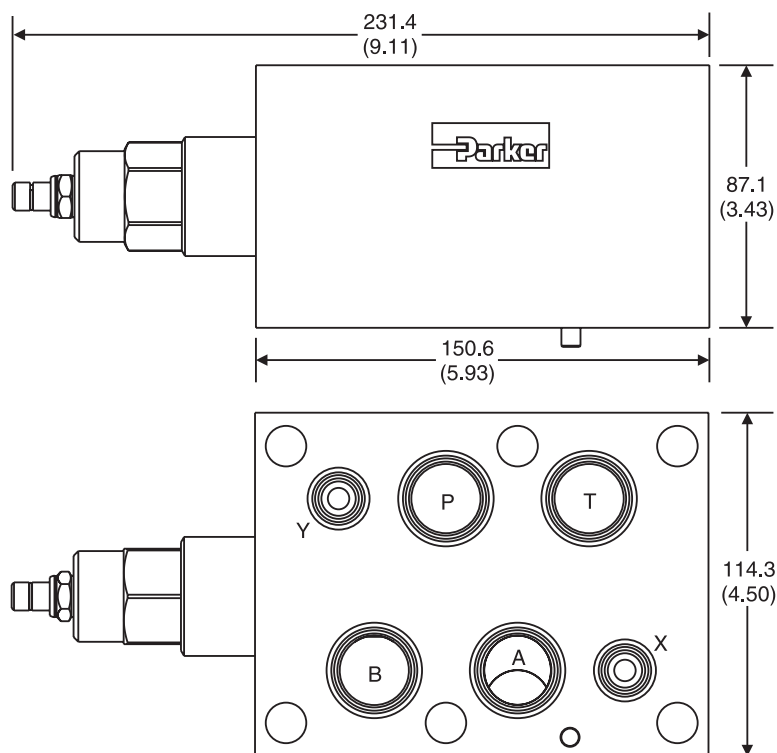
RV07DX — Inch equivalents for millimeter dimensions are shown in (**)



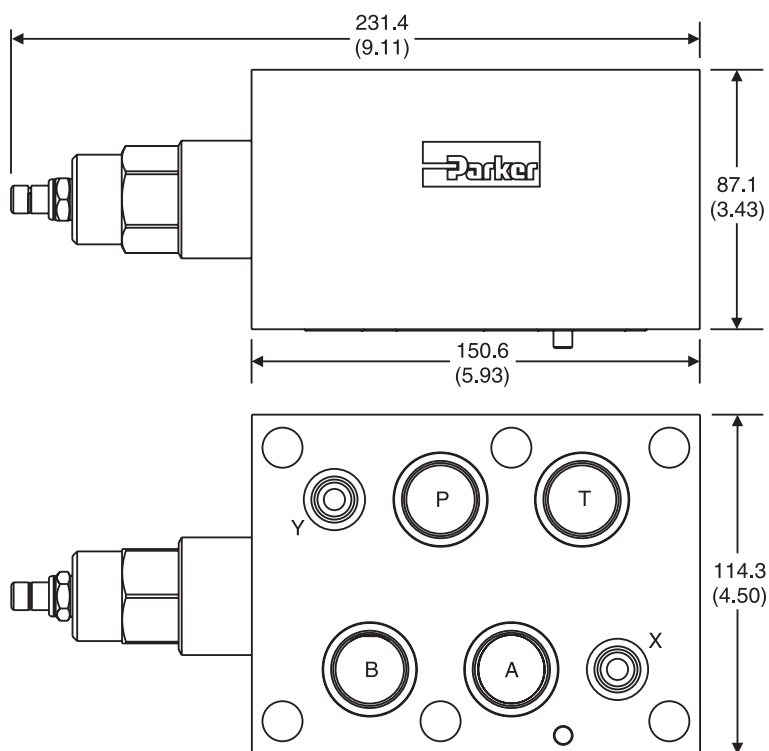
RV07PT — Inch equivalents for millimeter dimensions are shown in (**)

Note: This is a top view.

RV08AT — Inch equivalents for millimeter dimensions are shown in (**)

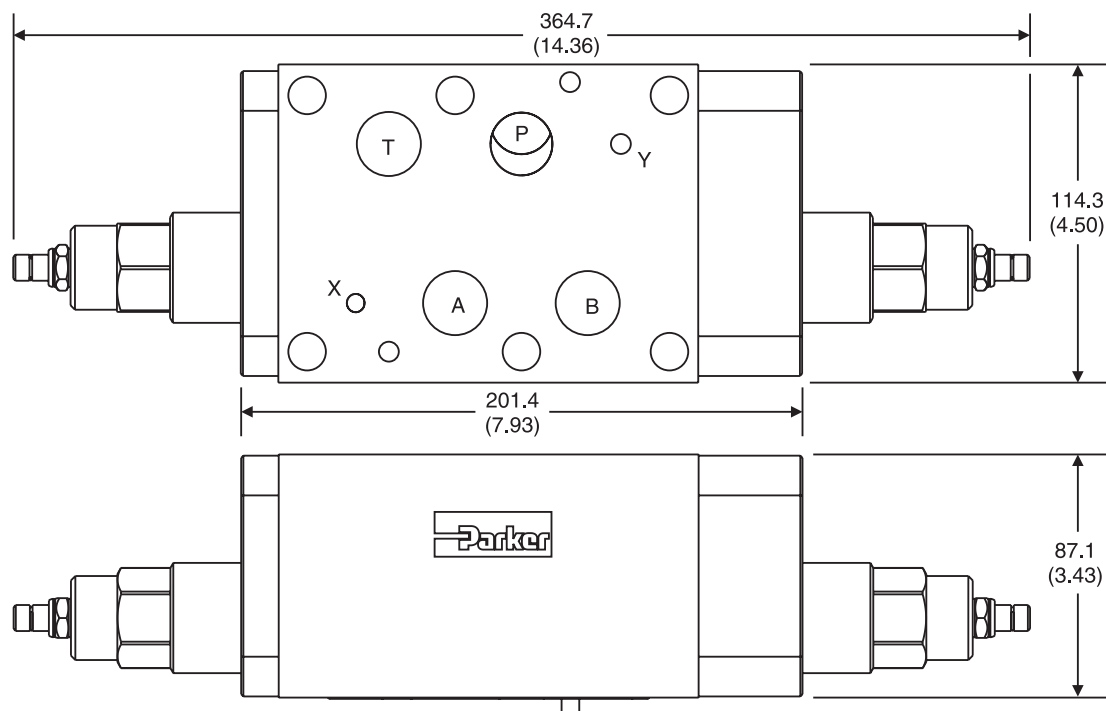


RV08BT — Inch equivalents for millimeter dimensions are shown in (**)

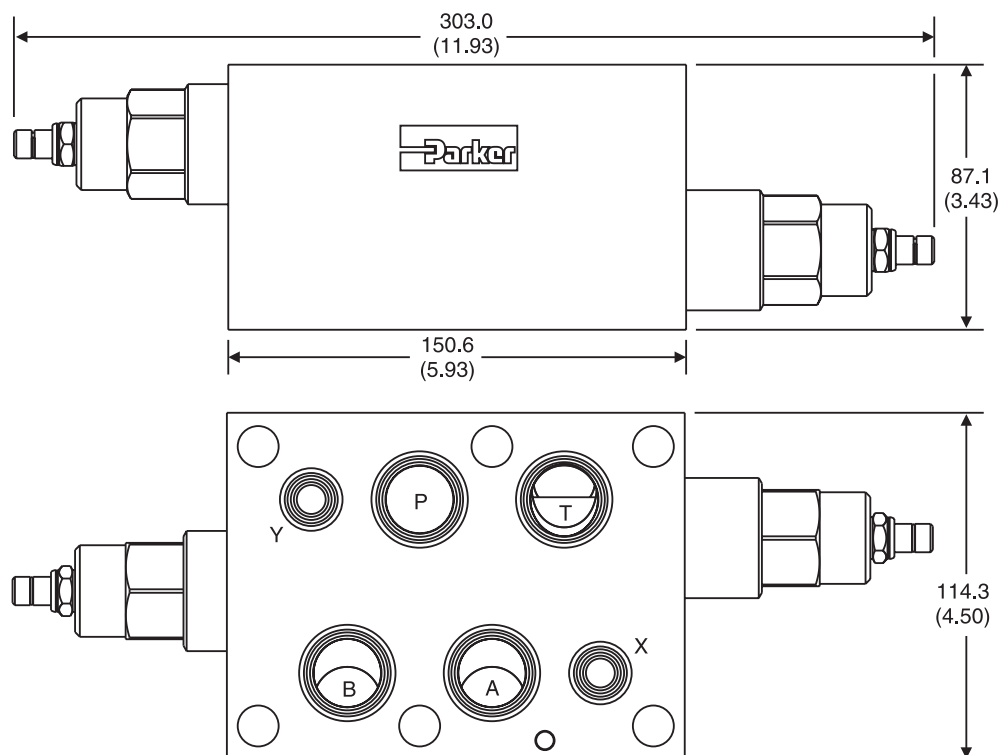


RV08DT — Inch equivalents for millimeter dimensions are shown in (**)

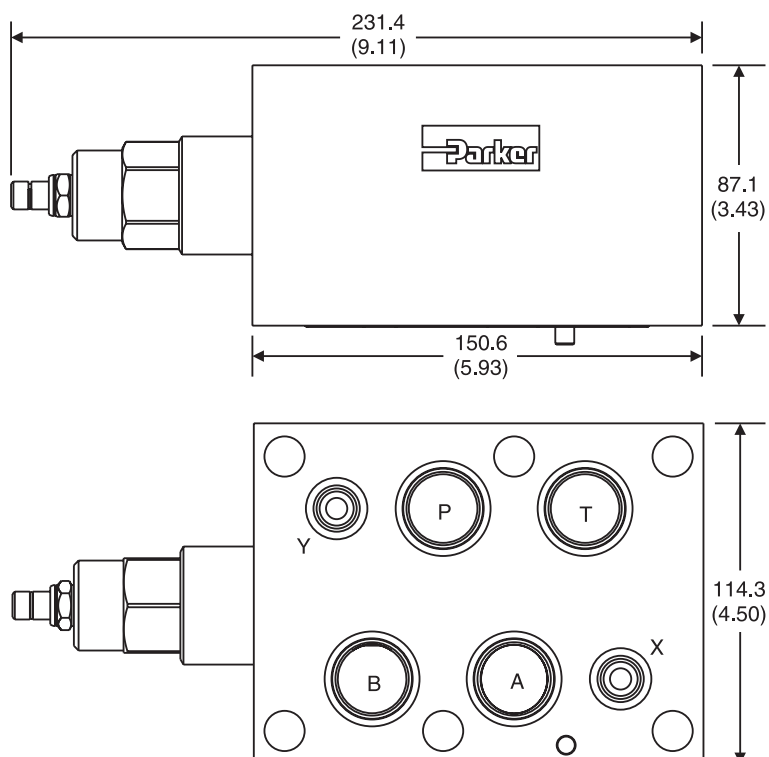
Note: This is a top view.



RV08DX — Inch equivalents for millimeter dimensions are shown in (**)



RV08PT — Inch equivalents for millimeter dimensions are shown in (**)



General Description

Series ZDR pilot operated pressure reducing valves are designed for maximum flow rates.

The reducing function can be located in the ports P, A or B. The sizes NG06 and NG10 are equipped with an integral return flow check valve (reducing function in A or B).

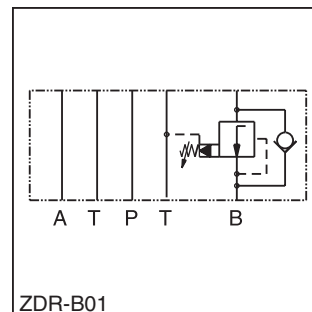
B

Features

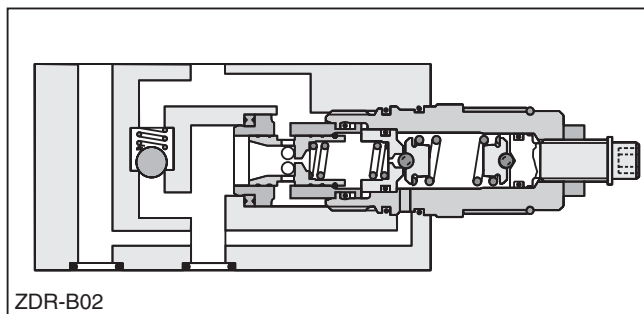
- High flow capacity.
- Sizes::
 - ZDR01 – NFPA D03 / NG6 / CETOP 3
 - ZDR02 – NFPA D05 / NG10 / CETOP 5
- With integral return flow check valve.



ZDR-P01



ZDR-B01



ZDR-B02

Specifications

General		
Size	NG6	NG10
Mounting Interface	DIN 24340 A6 ISO 4401 NFPA D03 CETOP RP 121	DIN 24340 A10 ISO 4401 NFPA D05 CETOP RP 121
Mounting Position	Unrestricted	
Ambient Temperature Range	-20°C to +50°C (-4°F to +122°F)	
Hydraulic		
Maximum Operating Pressure	up to 350 Bar (5075 PSI); ZDR-AR / BR up to 315 Bar (4568 PSI)	
Nominal Flow	80 LPM (21.2 GPM)	120 LPM (31.7 GPM)
Pilot Oil	0.2 LPM (0.1 GPM)	0.3 LPM (0.1 GPM)
Fluid	Hydraulic oil as per DIN 51524 ... 51525	
Fluid Temperature	-20°C to +80°C (-4°F to +176°F)	
Viscosity	Permitted Recommended	10 to 650 cSt / mm ² /s (46 to 3013 SSU) 30 cSt / mm ² /s (139 SSU)
Filtration	ISO Class 4406 (1999) 18/16/13 (acc. NAS 1638: 7)	

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Ordering Information

Code	Size	Description
P	01/02	Pressure reducing in P with pressure gauge port M
AR	01/02	Pressure reducing in A with check valve
BR	01/02	Pressure reducing in B with check valve

Code	Description
01	NFPA D03 / NG6
02	NFPA D05 / NG10

Code	Description
1	up to 100 Bar (1450 PSI)
5*	up to 350 Bar (5075 PSI)

* AR/BR 315 Bar (4568 PSI)

Code	Description
1	Nitrile
5	Fluorocarbon

Weight: ZDR-P
ZDR*01 1.6 kg (3.5 lbs.)
ZDR*02 2.9 kg (6.4 lbs.)

ZDR-AR/BR
1.8 kg (4.0 lbs.)
3.0 kg (6.6 lbs.)

ZDR01

Pressure reducing in P with pressure gauge port M

Series
ZDRP011S0D1
ZDRP015S0D1

Pressure reducing in A with check valve

Series
ZDRAR011S0-D1
ZDRAR015S0-D1

Pressure reducing in B with check valve

Series
ZDRBR011S0D1
ZDRBR015S0D1

1 = 7 ... 140 Bar (102 ... 1450 PSI)
5 = 7 ... 315 Bar (102 ... 4568 PSI)

ZDR02

Pressure reducing at P with pressure gauge port M

Series
ZDRP021S0D1
ZDRP025S0D1

Pressure reducing at A (with check valve)

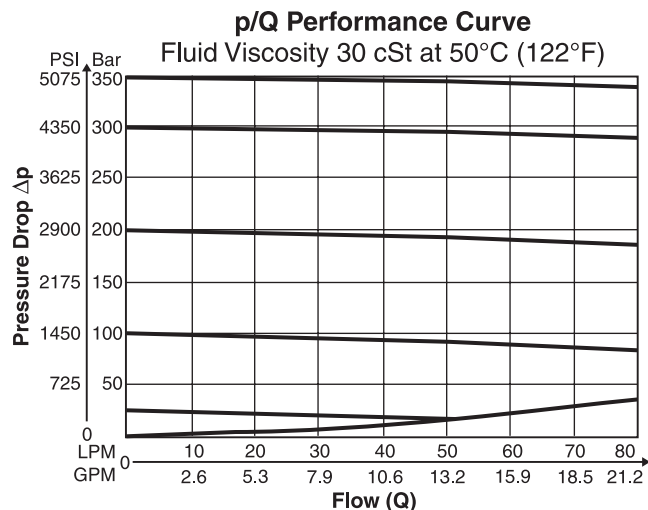
Series
ZDRAR021S0D1
ZDRAR025S0D1

Pressure reducing at B (with check valve)

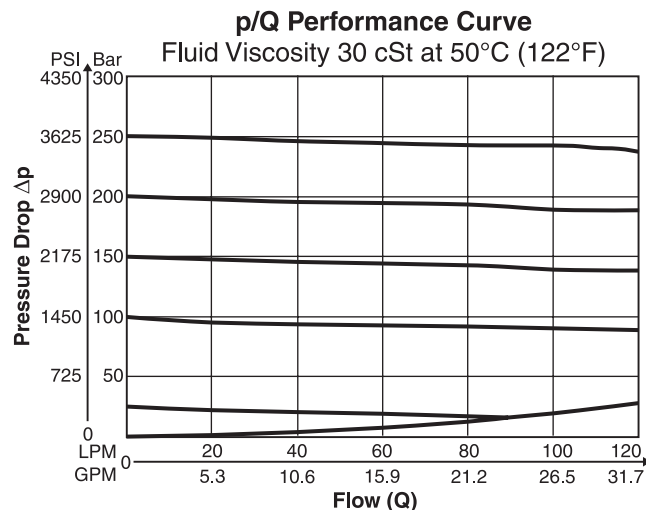
Series
ZDRBR021S0D1
ZDRBR025S0D1

Performance Curves

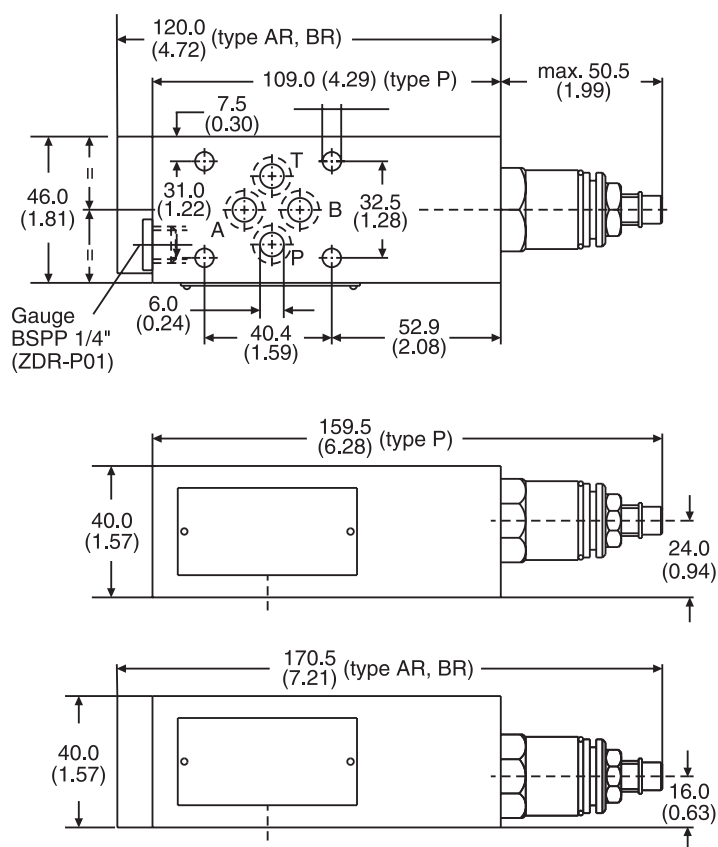
ZDR-P/AR/BR01



ZDR-P/AR/BR02

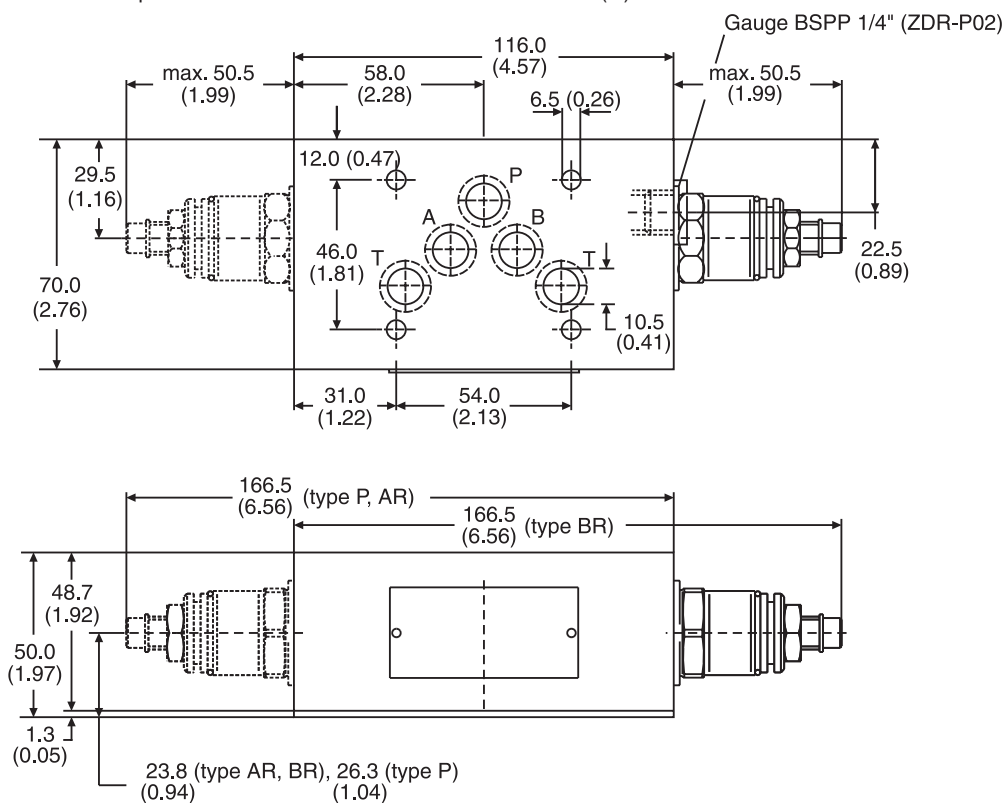


ZDR01 — Inch equivalents for millimeter dimensions are shown in (**)



Seal Kit	
Seal	Order Code
1	098-91184-0
5	098-91185-0
Complete Cartridge	
Seal	Order Code
1	098-91102-0
5	098-91103-0

ZDR02 — Inch equivalents for millimeter dimensions are shown in (**)



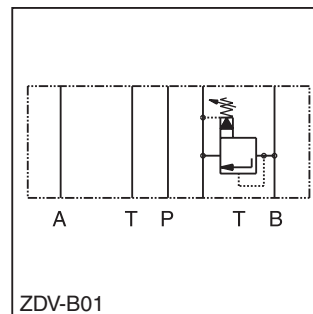
Seal Kit	
Seal	Order Code
1	098-91182-0
5	098-91183-0
Complete Cartridge	
Seal	Order Code
1	098-91102-0
5	098-91103-0

General Description

Series ZDV pilot operated pressure relief valves are designed for maximum flow rates.

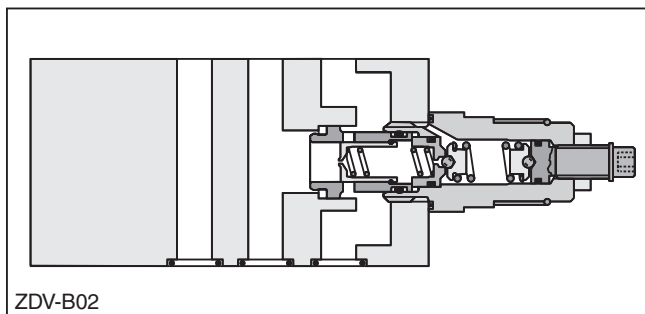
The relief function can be located between P and T, A and T, B and T or A and T + B and T for typical pressure relief functions.

For a pre-charge function the ZDV can be ordered with pressure function between A and B + B and A.



Features

- High flow capacity.
- Pressure function in P, A, B or A + B.
- Sizes:
 - ZDV01 – NFPA D03 / NG6 / CETOP 3
 - ZDV02 – NFPA D05 / NG10 / CETOP 5



Ordering Information

ZDV

Pressure Relief Valve

Port Option

Size

Pressure Range

S0

Hexagon Screw with Lock Nut

D

Design Series

Seal

Code	Description
01	NFPA D03 / NG6
02	NFPA D05 / NG10

Code	Description
1	up to 70 Bar (1015 PSI)
5	*Size Code 01: up to 350 Bar (5075 PSI) Size Code 02: up to 315 Bar (4568 PSI)

* Size Code 01, Port Code ABS – 315 Bar (4568 PSI)

Code	Description
1	Nitrile
5	Fluorocarbon

Code	Size	Description
P	01/02	P – T
A	01/02	A – T
B	01/02	B – T
AB	01/02	A – T & B – T
ABS	01/02	A – B & B – A

Weight: One Cartridge

ZDV*01 1.6 kg (3.5 lbs.)

ZDV*02 3.0 kg (6.6 lbs.)

Two Cartridges

2.5 kg (5.5 lbs.)

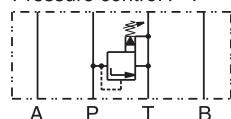
3.7 kg (8.2 lbs.)

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Ordering Information

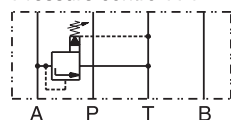
ZDV01

Pressure control P-T



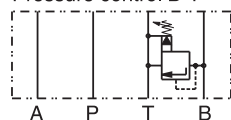
Series
 ZDVP011S0D1
 ZDVP015S0D1

Pressure control A-T



Series
 ZDVA011S0D1
 ZDVA015S0D1

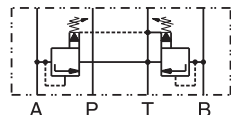
Pressure control B-T



Series
 ZDVB011S0D1
 ZDVB015S0D1

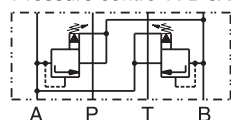
1 = 7 ... 70 Bar (102 ... 1015 PSI)
 5 = 7 ... 350 Bar (102 ... 5075 PSI)

Pressure control A-T & B-T



Series
 ZDVAB011S0D1
 ZDVAB015S0D1

Pressure control A-B & B-A



Series
 ZDVABS011S0D1
 ZDVABS015S0D1

1 = 7 ... 70 Bar (102 ... 1015 PSI)
 5 = 7 ... 315 Bar (102 ... 4568 PSI)

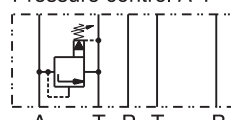
ZDV02

Pressure control P-T



Series
 ZDVP021S0D1
 ZDVP025S0D1

Pressure control A-T



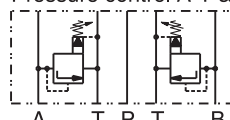
Series
 ZDVA021S0D1
 ZDVA025S0D1

Pressure control B-T



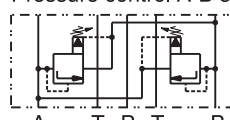
Series
 ZDVB021S0D1
 ZDVB025S0D1

Pressure control A-T & B-T



Series
 ZDVAB021S0D1
 ZDVAB025S0D1

Pressure control A-B & B-A

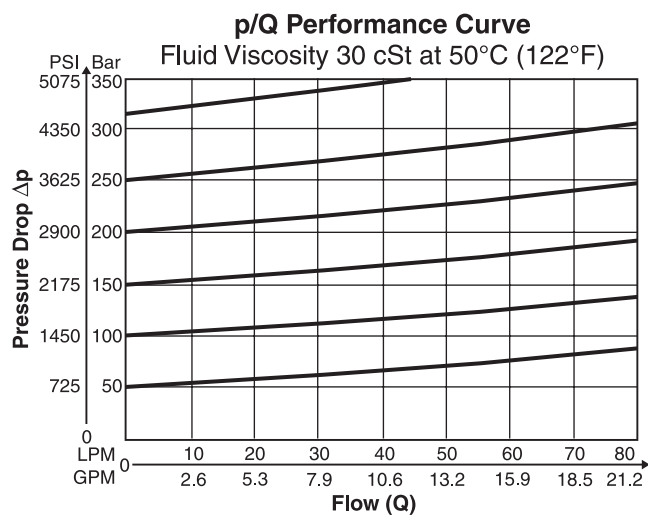


Series
 ZDVABS021S0D1
 ZDVABS025S0D1

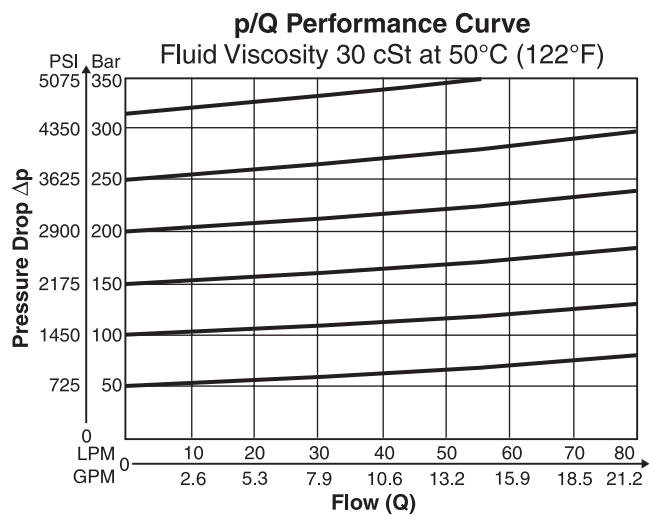
Specifications

General		
Size	NG6	NG10
Mounting	DIN 24340 A6 ISO 4401 NFFA D03 CETOP RP 121	DIN 24340 A10 ISO 4401 NFFA D05 CETOP RP 121
Mounting Position	Unrestricted	
Ambient Temperature Range	-20° to +50°C (-4°F to +122°F)	
Hydraulic		
Maximum Operating Pressure	up to 350 Bar (5075 PSI); ZDV*ABS up to 315 Bar (4568 PSI)	
Nominal Flow	80 LPM (21.2 GPM)	140 LPM (37.0 GPM)
Fluid	Hydraulic oil as per DIN 51524 ... 51525	
Fluid Temperature	-20° to +80°C (-4°F to +176°F)	
Viscosity	Permitted Recommended	10 to 650 cSt / mm ² /s (46 to 3013 SSU) 30 cSt / mm ² /s (139 SSU)
Filtration	ISO Class 4406 (1999) 18/16/13 (acc. NAS 1638: 7)	

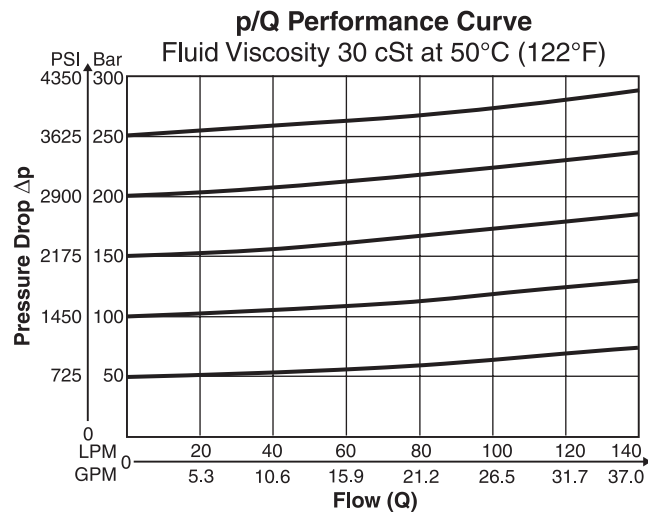
ZDV-P/A/B/ABS01



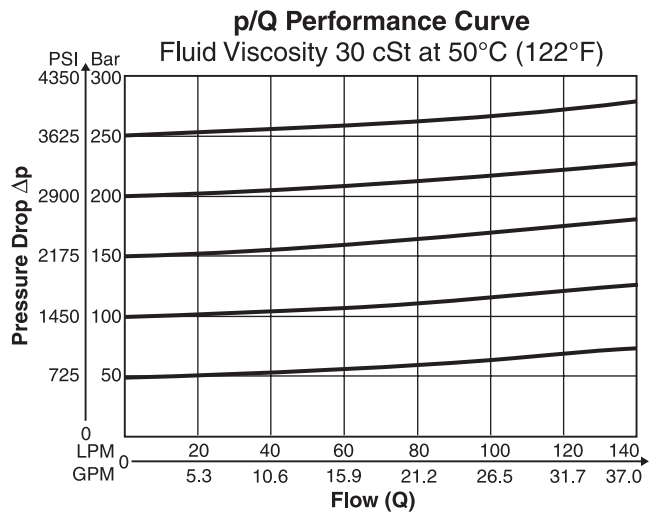
ZDV-AB01



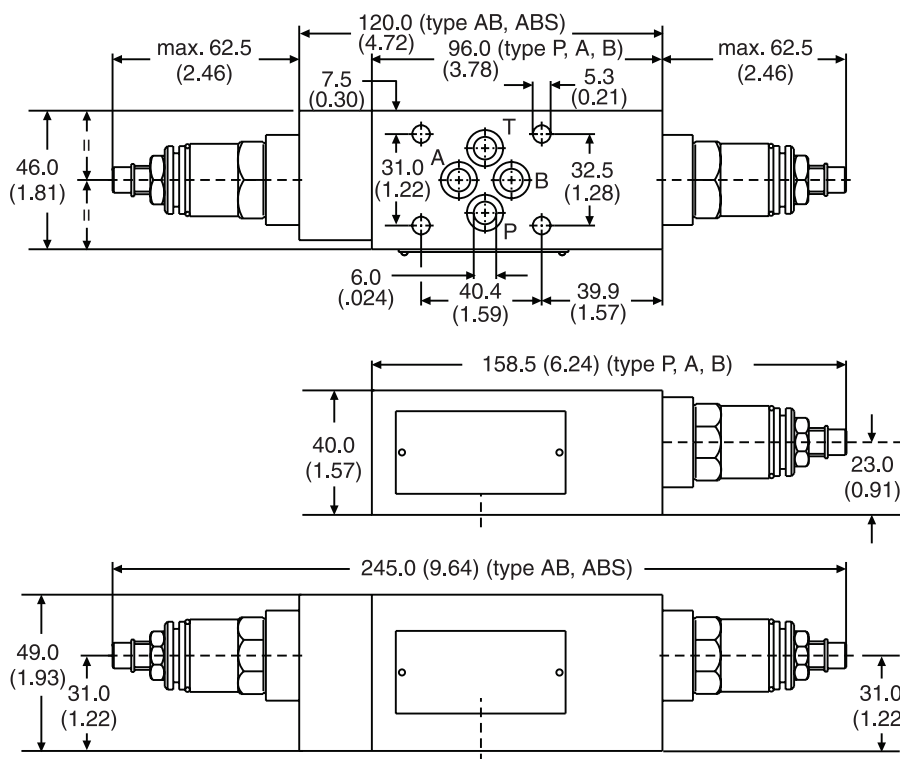
ZDV-P/A/B/AB02



ZDV-ASB02

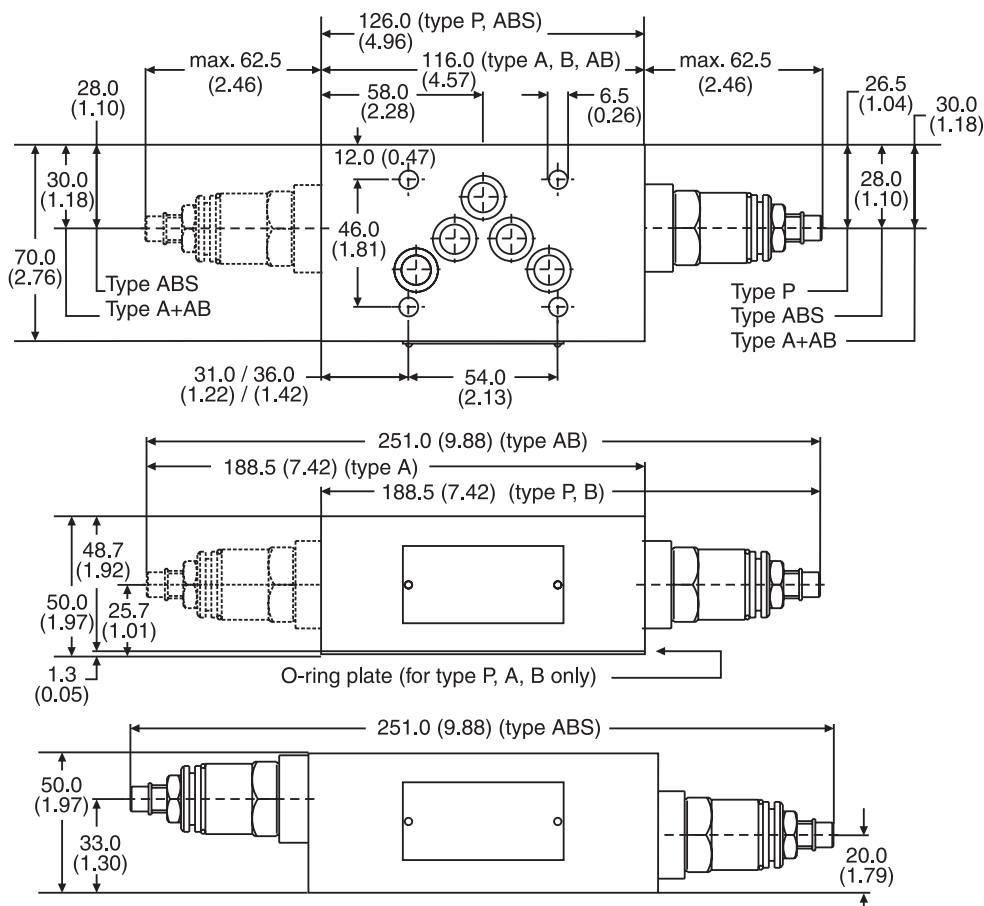


ZDV01 – Inch equivalents for millimeter dimensions are shown in (**)



Seal Kit	
Seal	Order Code
1	098-91182-0
5	098-91183-0
Complete Cartridge	
Seal	Order Code
1	098-91116-0
5	098-91117-0

ZDV02 — Inch equivalents for millimeter dimensions are shown in (**)



Seal Kit	
Seal	Order Code
1	098-91076-0
5	098-91077-0
Complete Cartridge	
Seal	Order Code
1	098-91116-0
5	098-91117-0

General Description

Series ZNS counterbalance valve controls the actuator movement at overrunning loads.

The return flow from the actuator is piloted and controlled by the inlet flow to the actuator, ensuring a cavitation-free lowering of the load.

The counterbalance valve operates as a pressure relief valve. The setting pressure is lowered by the pressure in the inlet line. To ensure safe load holding the setting pressure should be approximately 30% higher than the max. load pressure.

Features

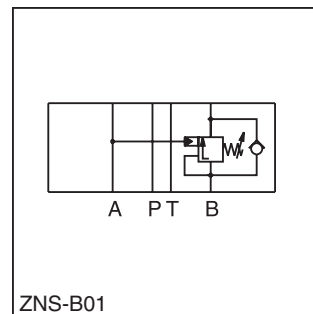
- Controlled movement loads.
- Load holding via leak-free poppet valve.
- Secondary relief protection for the actuator.
- Sizes:

ZNS*01 – NFPA D03 / NG6 / CETOP 3

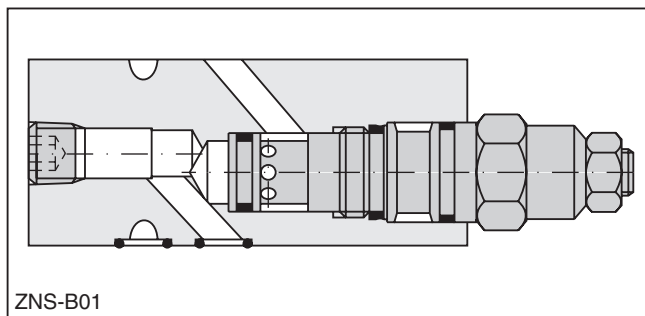
ZNS*02 – NFPA D05 / NG10 / CETOP 5



ZNS-AB01



ZNS-B01

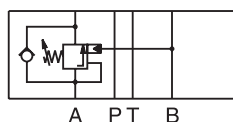


ZNS-B01

Ordering Information

ZNS					S0	D	
Counterbalance Valve		Port Option	Size	Pressure Range	Hexagon Screw with Lock Nut	Design Series	Seal
Code	Description	Code	Description	Code	Description	Code	Description
A	in A	01	NFPA D03 / NG6	2	70 to 175 Bar (1015 to 2538 PSI)		
B	in B	02	NFPA D05 / NG10	5*	140 to 350 Bar (2030 to 5075 PSI)		
AB	in A and B						
				* ZNS02 to 315 Bar (4568 PSI)			
				Weight: 1 cartridge		2 cartridges	
				ZNS*01 1.3 kg (2.9 lbs.)		3.0 kg (6.6 lbs.)	
				ZNS*02 1.6 kg (3.5 lbs.)		3.9 kg (8.6 lbs.)	

Counterbalance in A

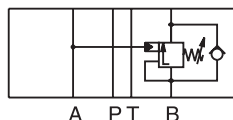


A PT B

ZNS01

Series
 ZNSA012S0D1
 ZNSA015S0D1

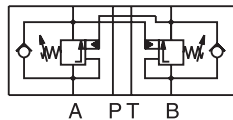
Counterbalance in B



A PT B

Series
 ZNSB011S0D1
 ZNSB015S0D1

Counterbalance in A and B



A PT B

Series
 ZNSAB011S0D1
 ZNSAB015S0D1

2 = 70 ... 175 Bar (1015 ... 2538 PSI)
 5 = 140 ... 350 Bar (2030 ... 5075 PSI)

ZNS02

Series
 ZNSA022S0D1
 ZNSA025S0D1

Series
 ZNSB021S0D1
 ZNSB025S0D1

Series
 ZNSAB021S0D1
 ZNSAB025S0D1

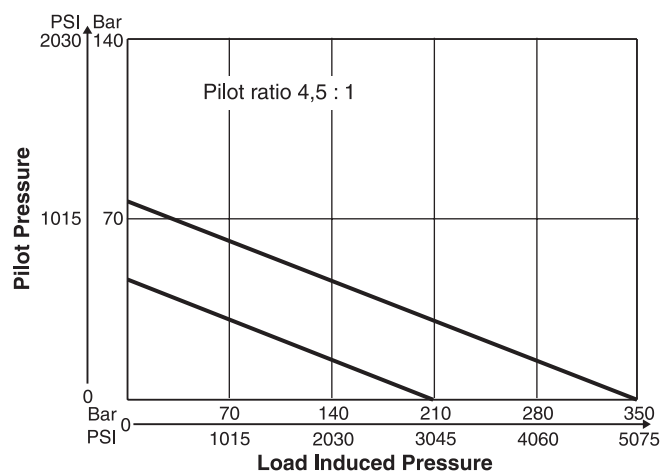
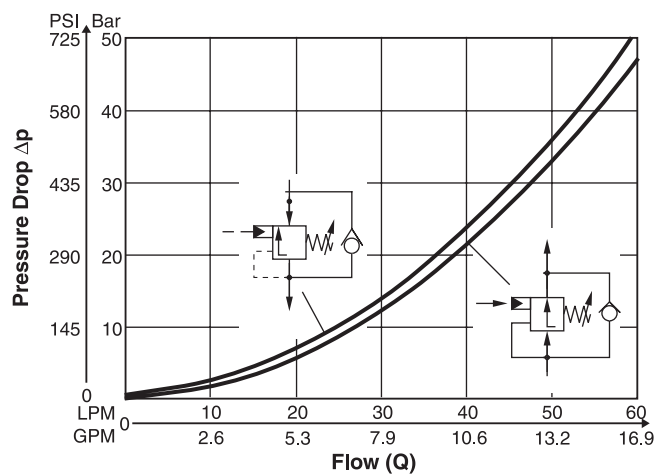
2 = 70 ... 175 Bar (1015 ... 2538 PSI)
 5 = 140 ... 315 Bar (2030 ... 4568 PSI)

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

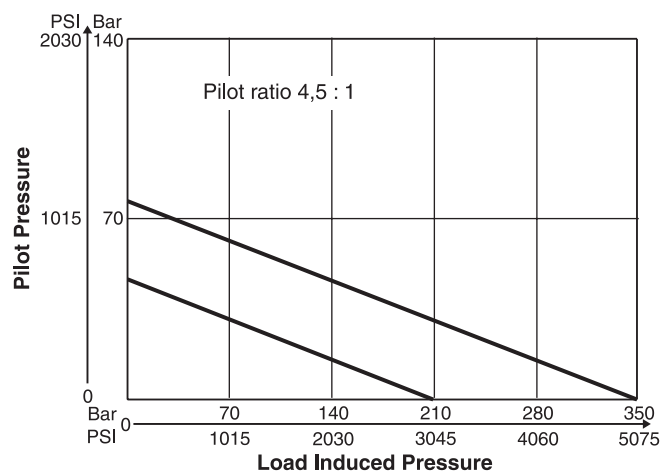
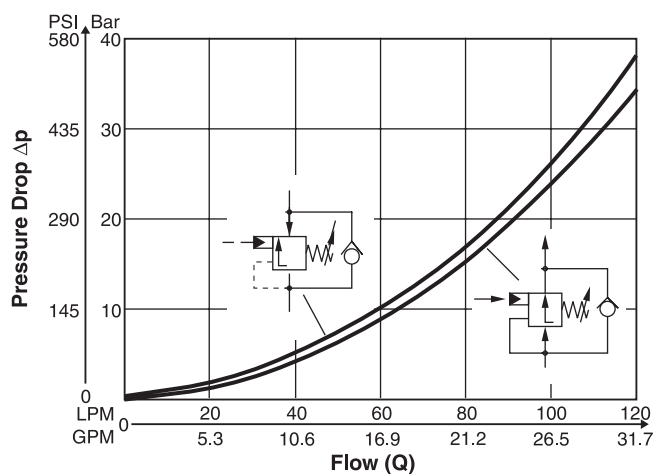
Specifications

General		
Size	NG6	NG10
Mounting Interface	DIN 24340 A6 ISO 4401 NFPA D03	DIN 24340 A10 ISO 4401 NFPA D05
Mounting Position	Unrestricted	
Ambient Temperature Range	-20°C to +50°C (-4°F to +122°F)	
Hydraulic		
Maximum Operating Pressure	350 Bar (5075 PSI)	315 Bar (4568 PSI)
Pressure Range	175 Bar (2538 PSI), 350 Bar (5075 PSI)	
Pilot Ratio	4.5 : 1	
Leakage	On request	
Nominal Flow	60 LPM (15.9 GPM)	120 LPM (31.7 GPM)
Opening Pressure	0.3 LPM (0.1 GPM)	0.3 LPM (0.1 GPM)
Fluid	Hydraulic oil as per DIN 51524 ... 51525	
Fluid Temperature	-20°C to +80°C (-4°F to +176°F)	
Viscosity	Permitted Recommended	10 to 650 cSt / mm ² /s (46 to 3013 SSU) 30 cSt / mm ² /s (139 SSU)
Filtration	ISO Class 4406 (1999) 18/16/13 (acc. NAS 1638: 7)	

ZNS01

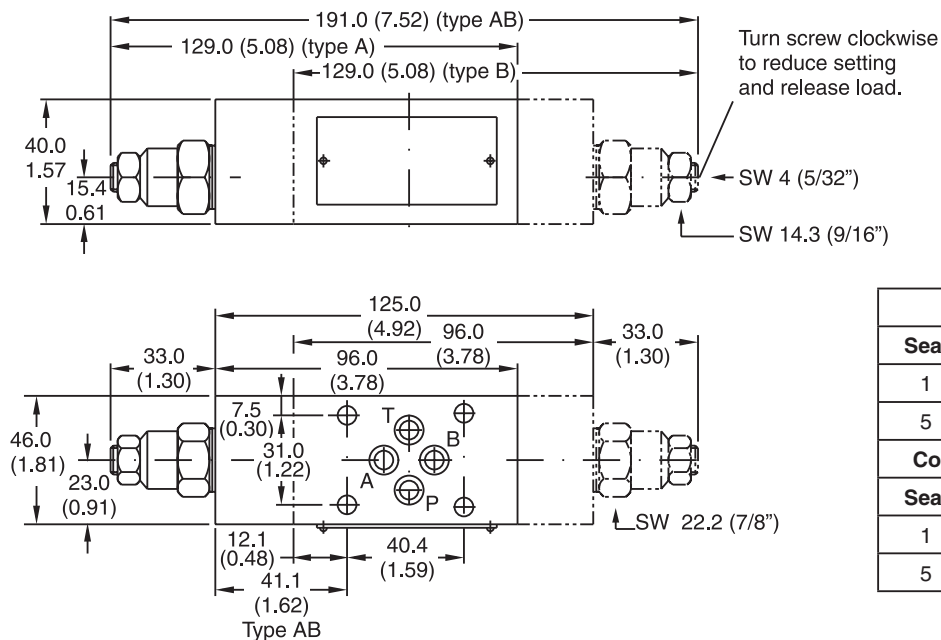


ZNS02



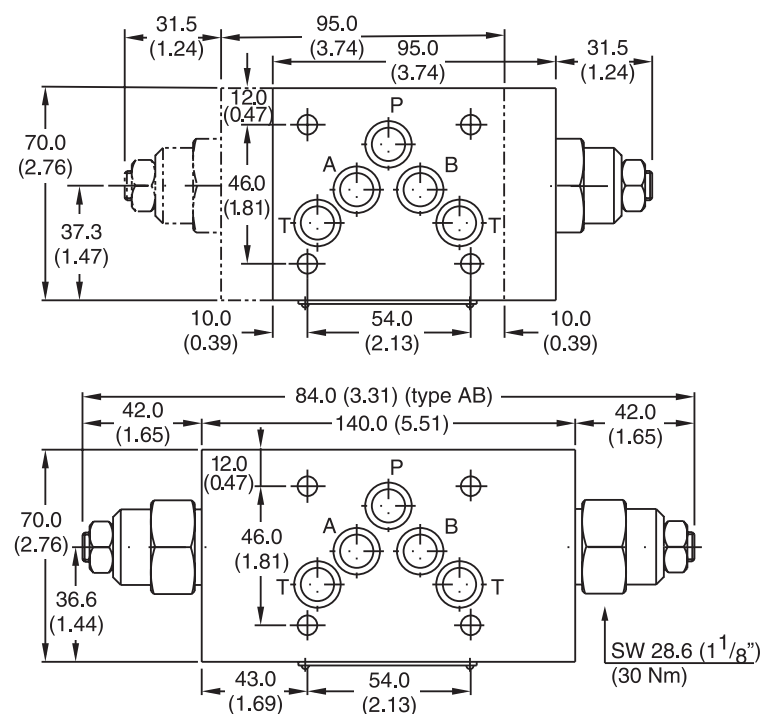
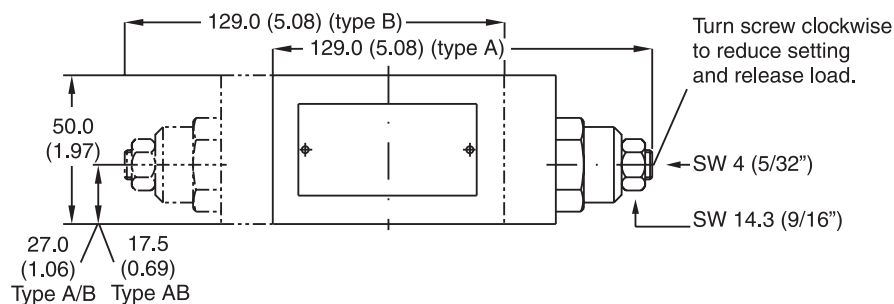
All characteristic curves measured with HLP46 at 50°C (122°F).

ZNS01 — Inch equivalents for millimeter dimensions are shown in (**)



Seal Kit	
Seal	Order Code
1	098-91153-0
5	098-91154-0
Complete Cartridge	
Seal	Order Code
1	517-01017-2
5	517-00448-8

ZNS02 — Inch equivalents for millimeter dimensions are shown in (**)



Seal Kit	
Seal	Order Code
1	098-91155-0
5	098-91183-0
Complete Cartridge	
Seal	Order Code
1	517-00449-8
5	517-00450-8

General Description

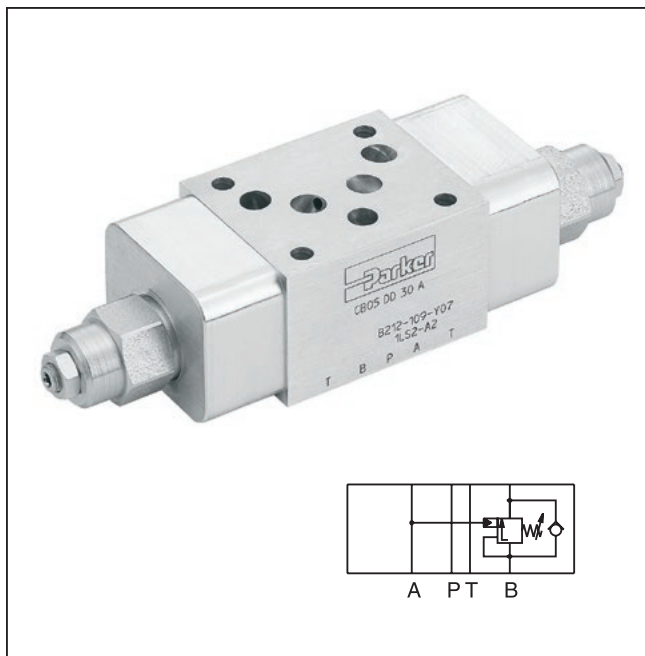
Series CB counterbalance valve controls the actuator movement with overrunning loads.

The return flow from the actuator is piloted and controlled by the inlet flow to the actuator, ensuring a cavitation-free lowering of the load.

The counterbalance valve operates as a pressure relief valve. The setting pressure is lowered by the pressure in the inlet line. To ensure safe load holding the setting pressure should be approximately 30% higher than the max. load pressure.

Features

- Controlled movement loads.
- Load holding via leak-free poppet valve.
- Secondary relief protection for the actuator.
- Sizes:
 - CB03 – NFPA D03 / NG6 / CETOP 3
 - CB05 – NFPA D05 / NG10 / CETOP 5
 - CB5H – NFPA D05HE / NG10 / CETOP 5H
 - CB07 – NFPA D07 / NG16 / CETOP 7
 - CB08 – NFPA D08 / NG25 / CETOP 8



B

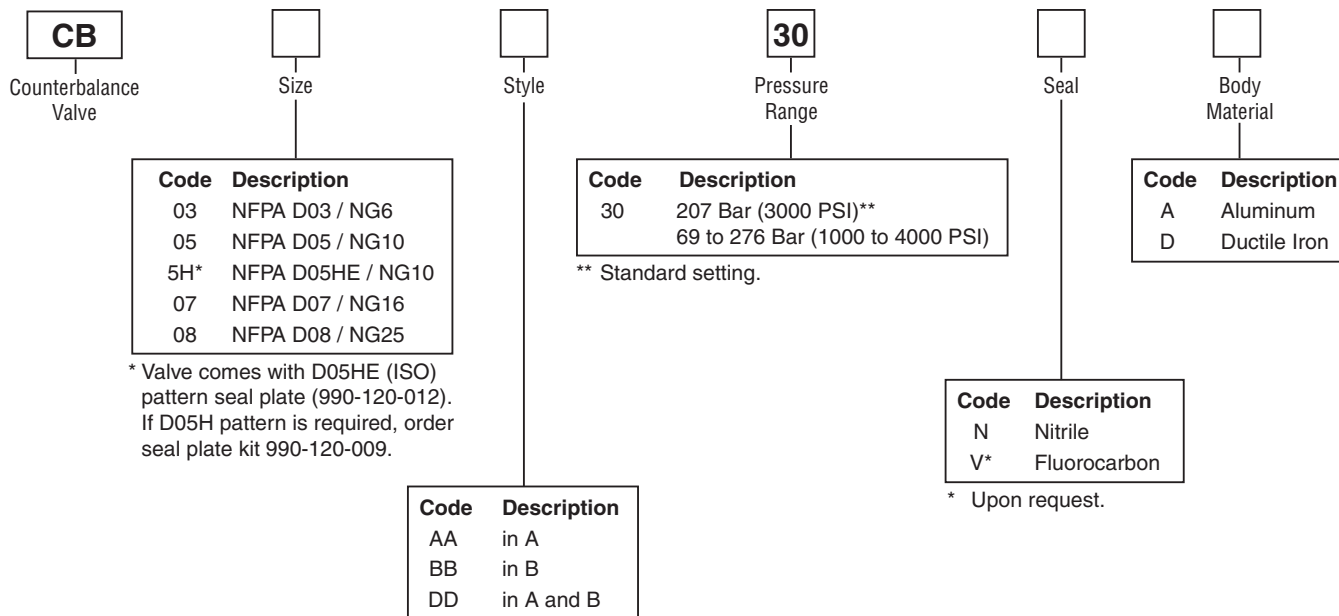
Specifications

General					
Size	D03 / NG6	D05 / NG10	D05HE / NG10	D07 / NG16	D08 / NG25
Mounting Position	Unrestricted				
Ambient Temperature Range	-20°C to +50°C (-4°F to +122°F)				
Hydraulic					
Maximum Operating Pressure*	Aluminum Body – up to 207 Bar (3000 PSI); Ductile Iron Body – up to 345 Bar (5000 PSI)				
Nominal Flow	57 LPM (15 GPM)	114 LPM (30 GPM)	114 LPM (30 GPM)	227 LPM (60 GPM)	454 LPM (120 GPM)
Leakage	5 DPM	5 DPM	5 DPM	5 DPM	5 DPM
Reseat Pressure	85% of set pressure				
Pilot Ratio	3:1	3:1	3:1	3:1	3:1
Adjustment Screw Hex Size	5/32	5/32	5/32	5/32	5/32
Fluid Temperature	-20°C to +80°C (-4°F to +176°F)				
Viscosity	Permitted Recommended	10 to 650 cSt / mm²/s (46 to 3013 SSU) 30 cSt / mm²/s (139 SSU)			
Filtration	ISO Class 4406 (1999) 18/16/13 (acc. NAS 1638: 7)				

* Counterbalance valves should be set at least 1.3 times the maximum load induced pressure.

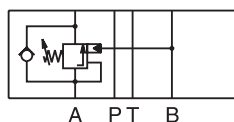
WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

B



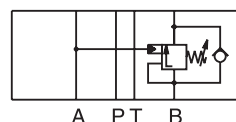
CBAA**

Counterbalance in A



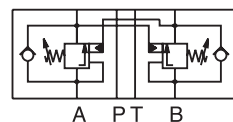
CBBB**

Counterbalance in B



CBDD**

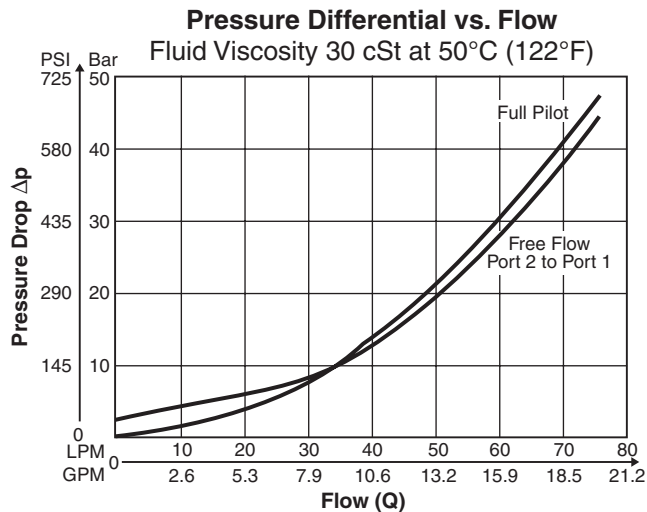
Counterbalance in A and B



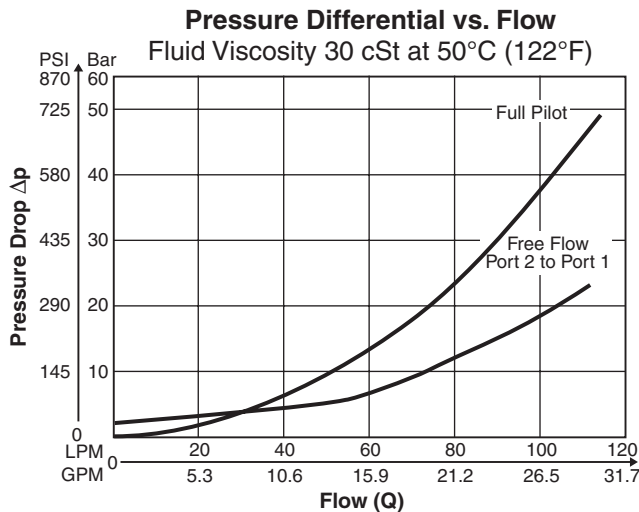
Weight:

Size	CB**AA30NA	CB**AA30ND	CB**BB30NA	CB**BB30ND	CB**DD30NA	CB**DD30ND
CB03	0.3 kg (0.8 lbs.)	1.1 kg (2.4 lbs.)	0.5 kg (1.1 lbs.)	1.1 kg (2.4 lbs.)	0.8 kg (1.7 lbs.)	1.5 kg (3.2 lbs.)
CB05, CB5H	1.0 kg (2.3 lbs.)	2.2 kg (4.9 lbs.)	1.0 kg (2.3 lbs.)	2.2 kg (4.9 lbs.)	1.5 kg (3.2 lbs.)	2.9 kg (6.4 lbs.)
CB07	2.5 kg (5.6 lbs.)	4.8 kg (10.6 lbs.)	2.5 kg (5.5 lbs.)	5.3 kg (11.8 lbs.)	3.6 kg (8 lbs.)	7.3 kg (16.2 lbs.)
CB08	5.3 kg (11.7 lbs.)	11.8 kg (25.9 lbs.)	5.9 kg (13.1 lbs.)	13.3 kg (29.3 lbs.)	7.9 kg (17.4 lbs.)	16.2 kg (35.8 lbs.)

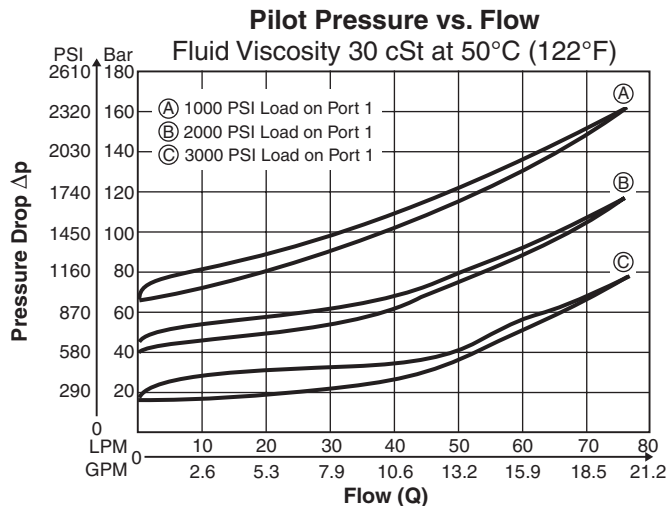
CB03*



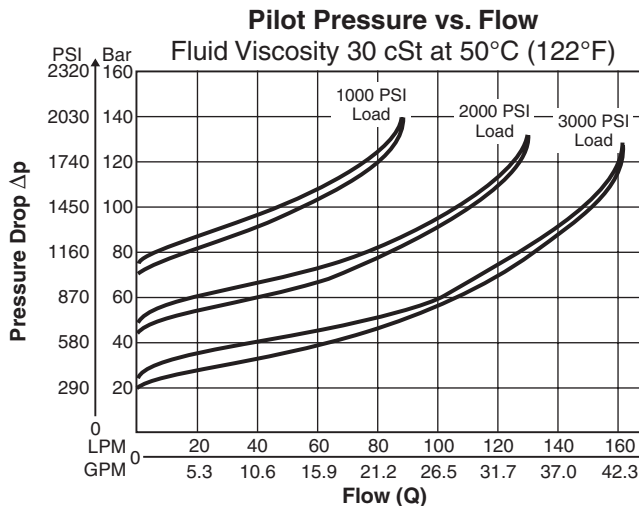
CB05/CB5H



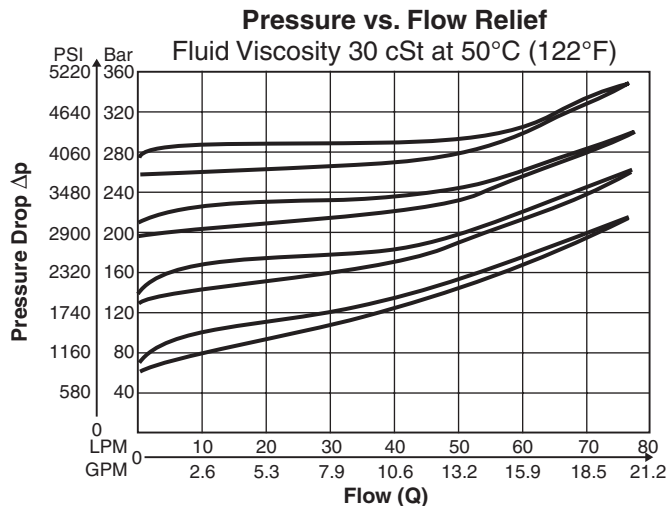
CB03*



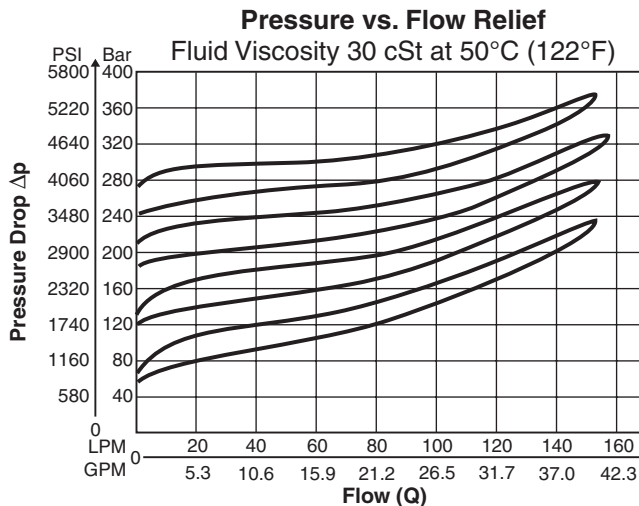
CB05/CB5H



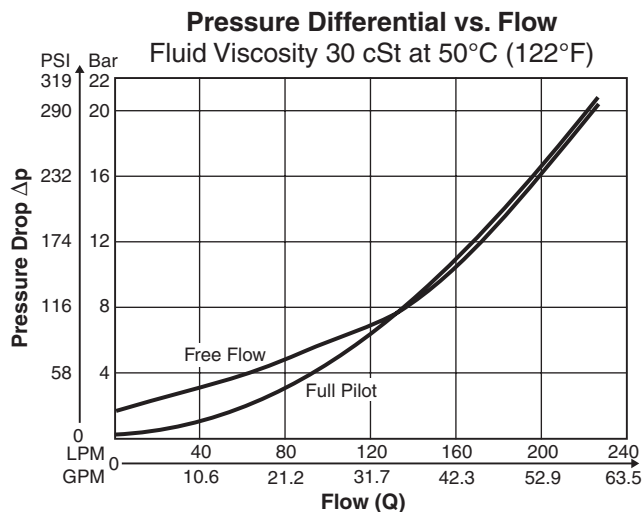
CB03*



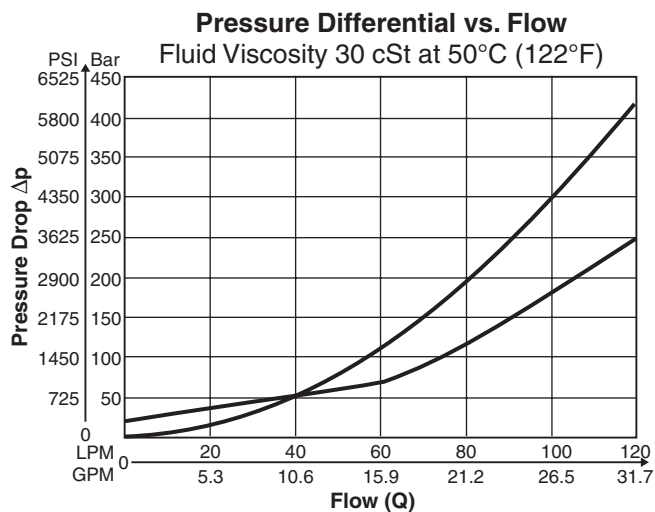
CB05/CB5H



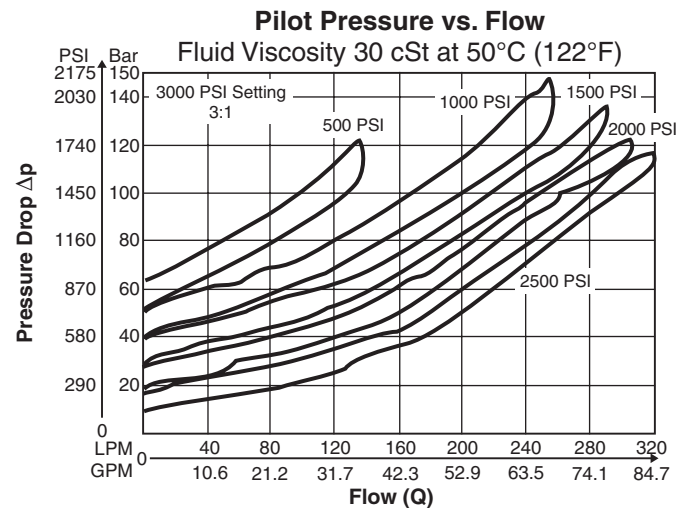
CB07*



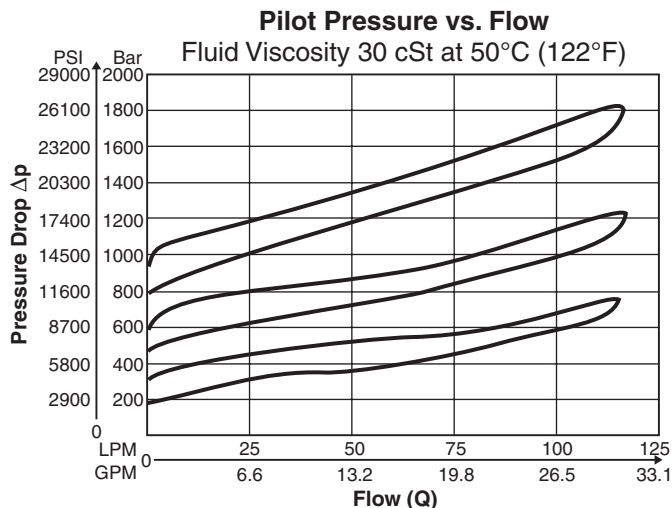
CB08*



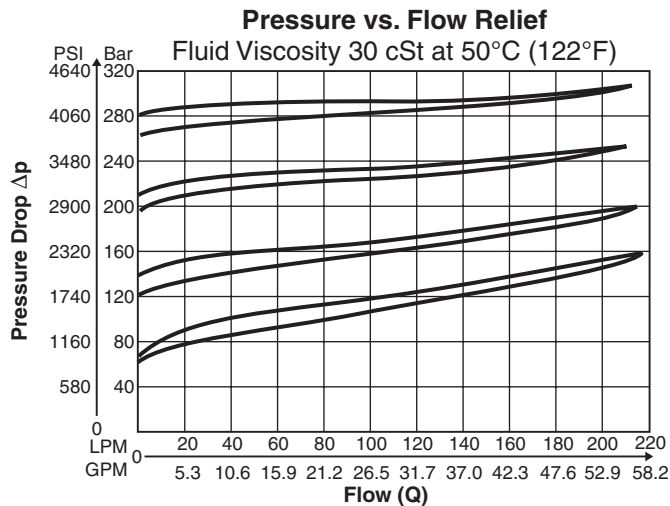
CB07*



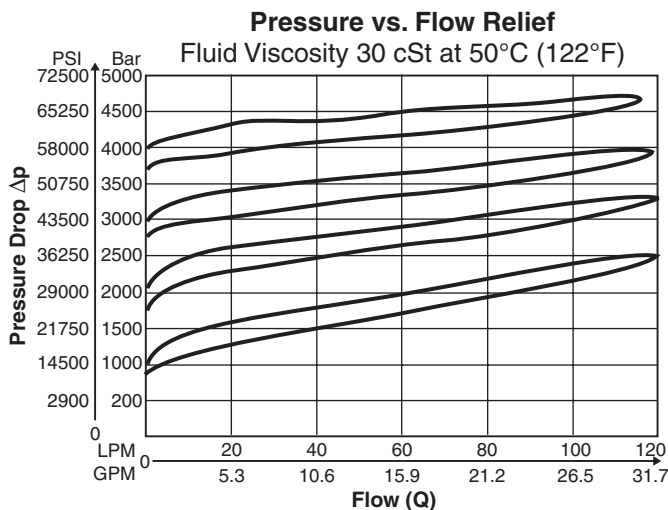
CB08*

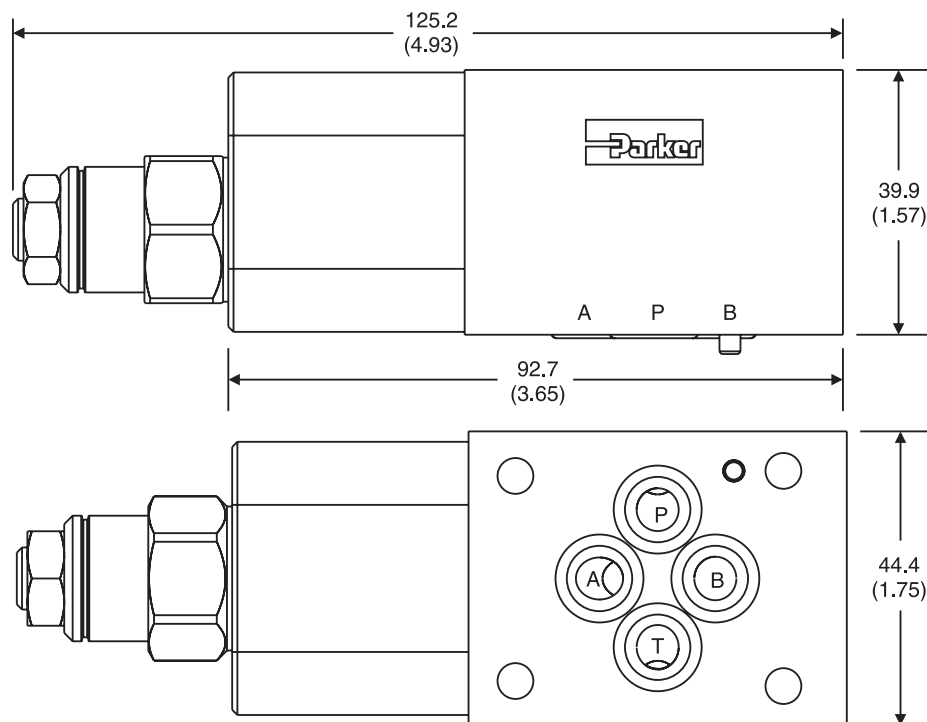
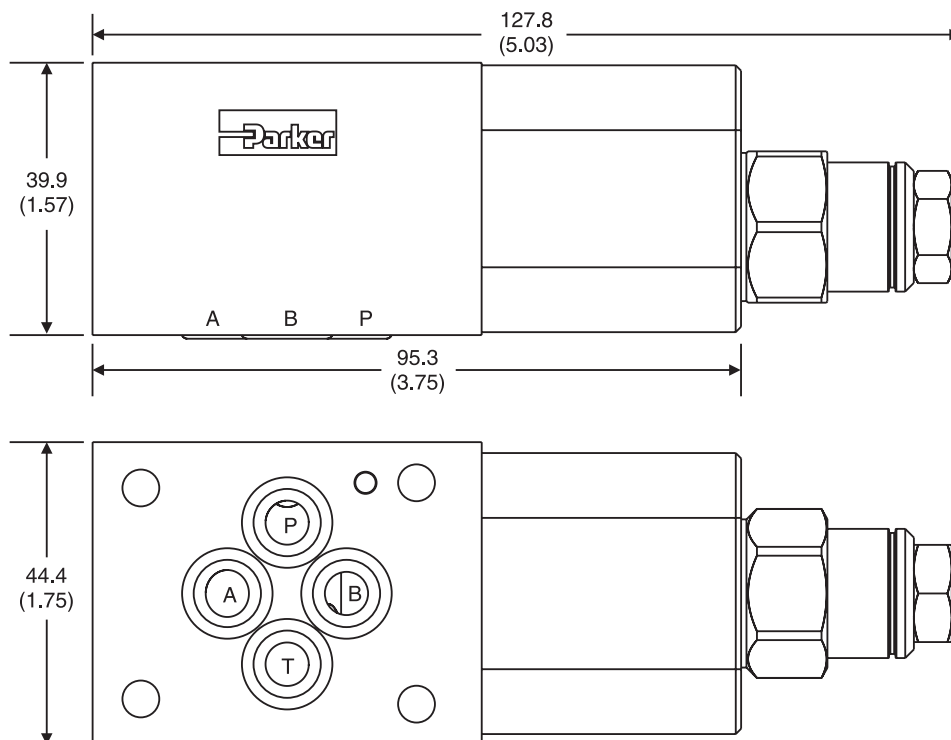


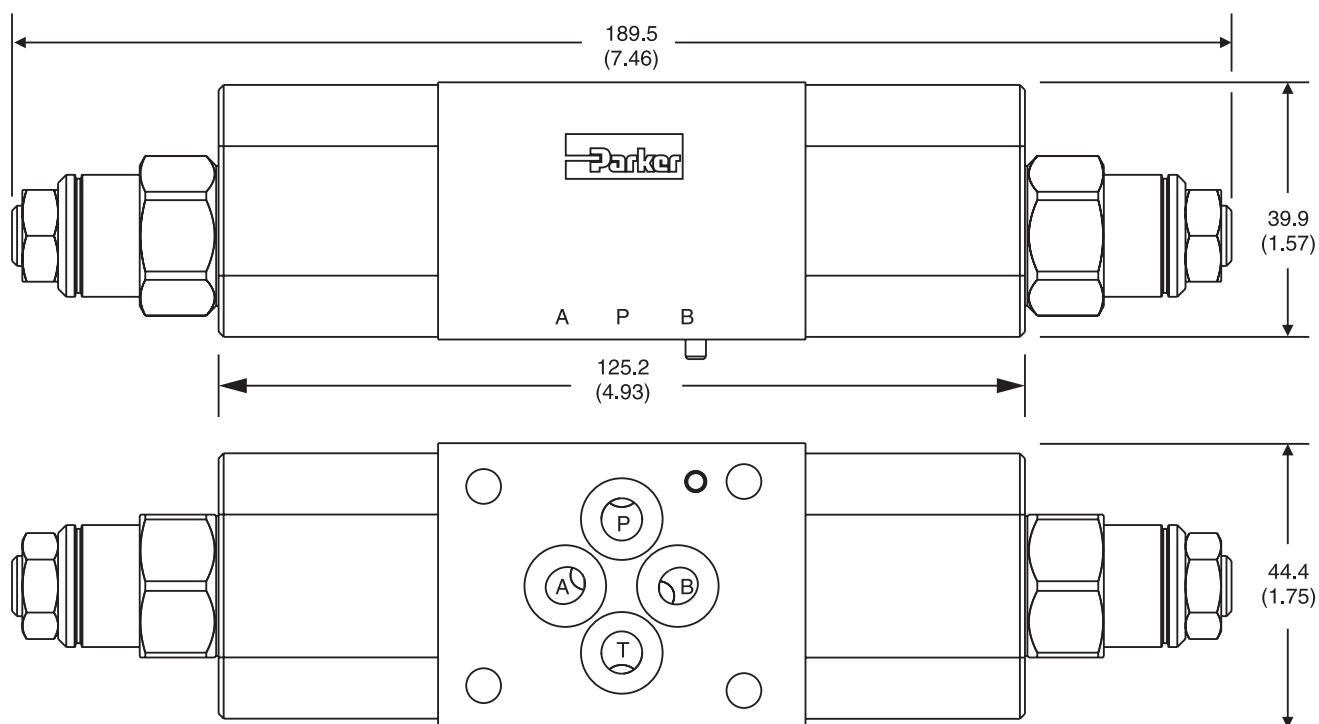
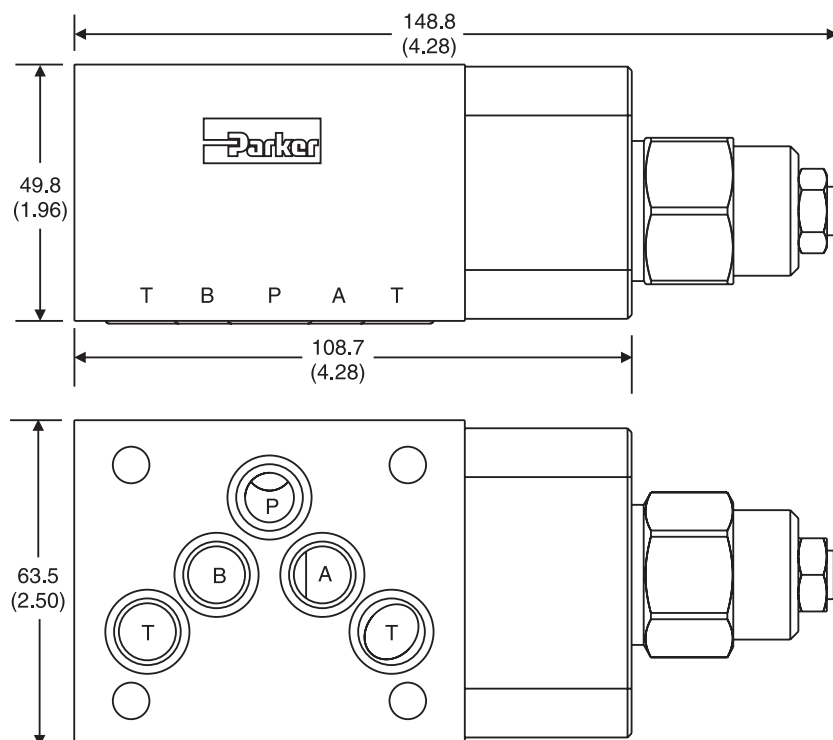
CB07*



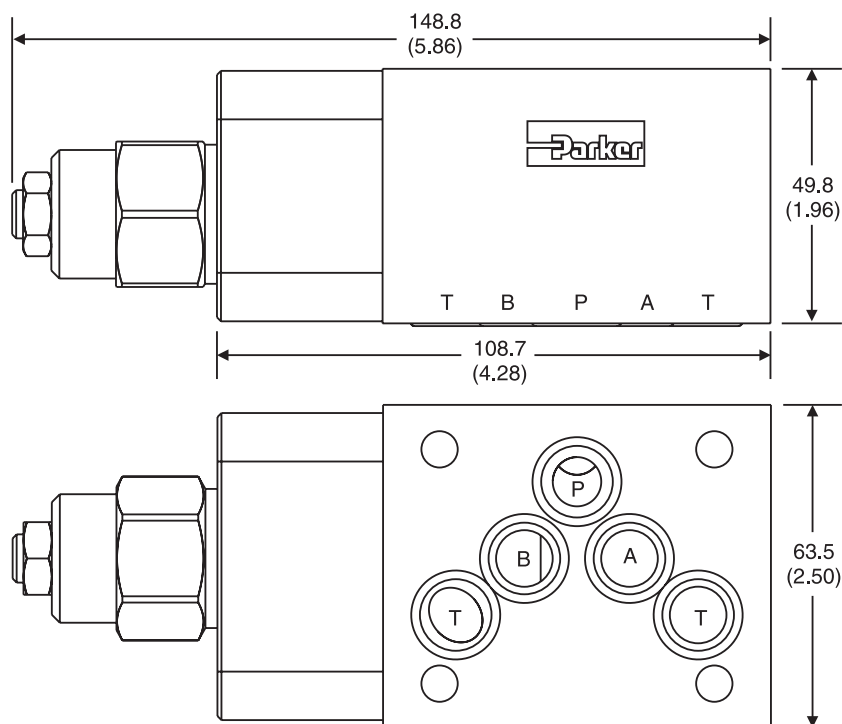
CB08*



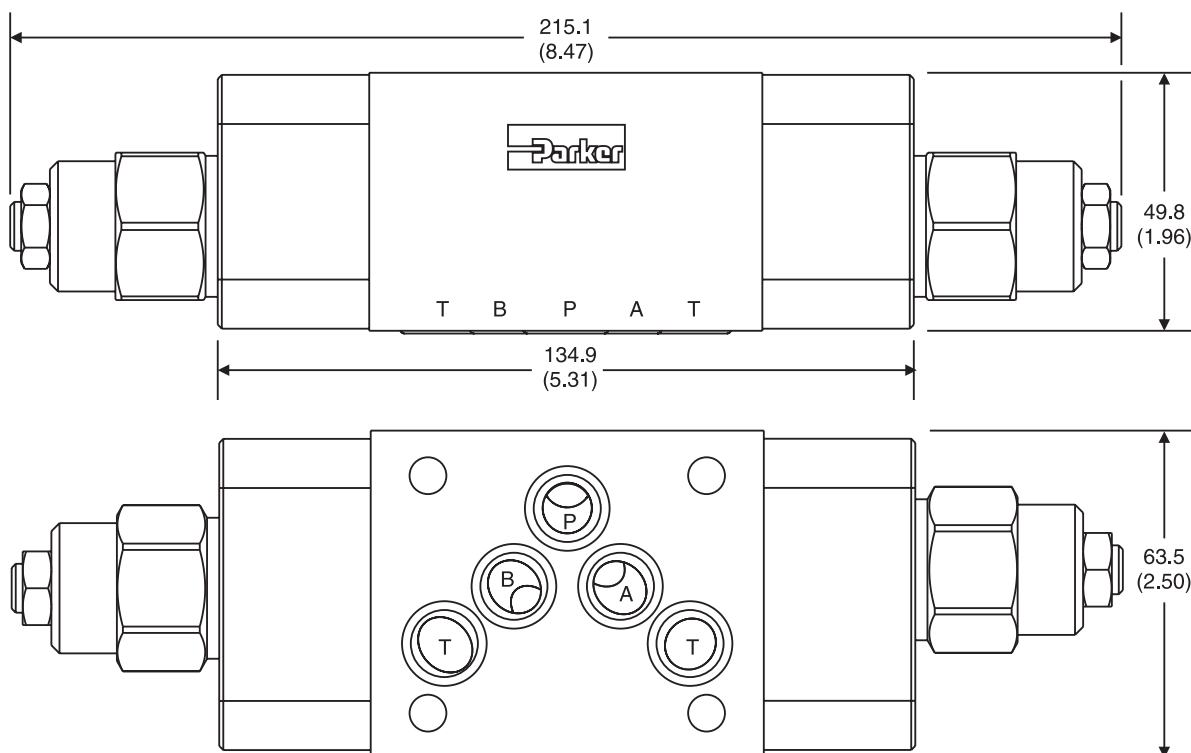
CB03AA — Inch equivalents for millimeter dimensions are shown in (**)**CB03BB** — Inch equivalents for millimeter dimensions are shown in (**)

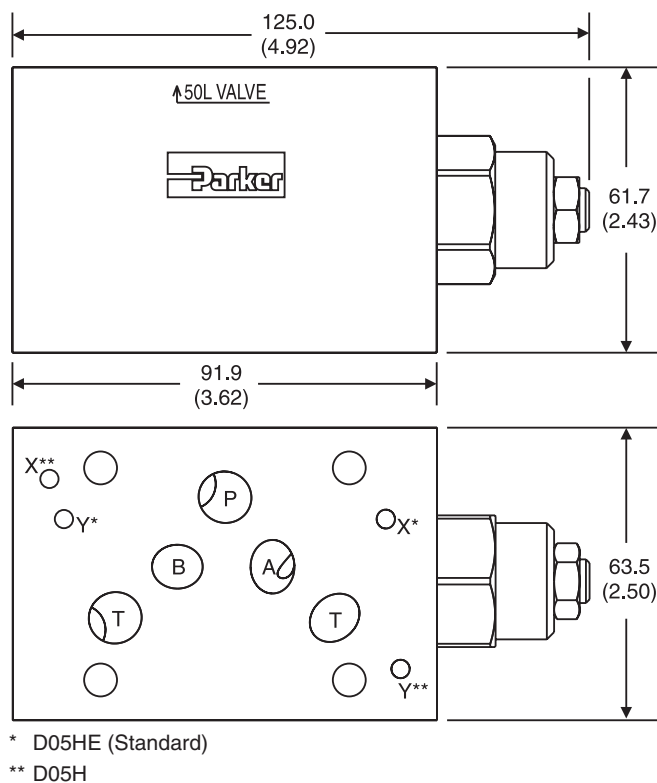
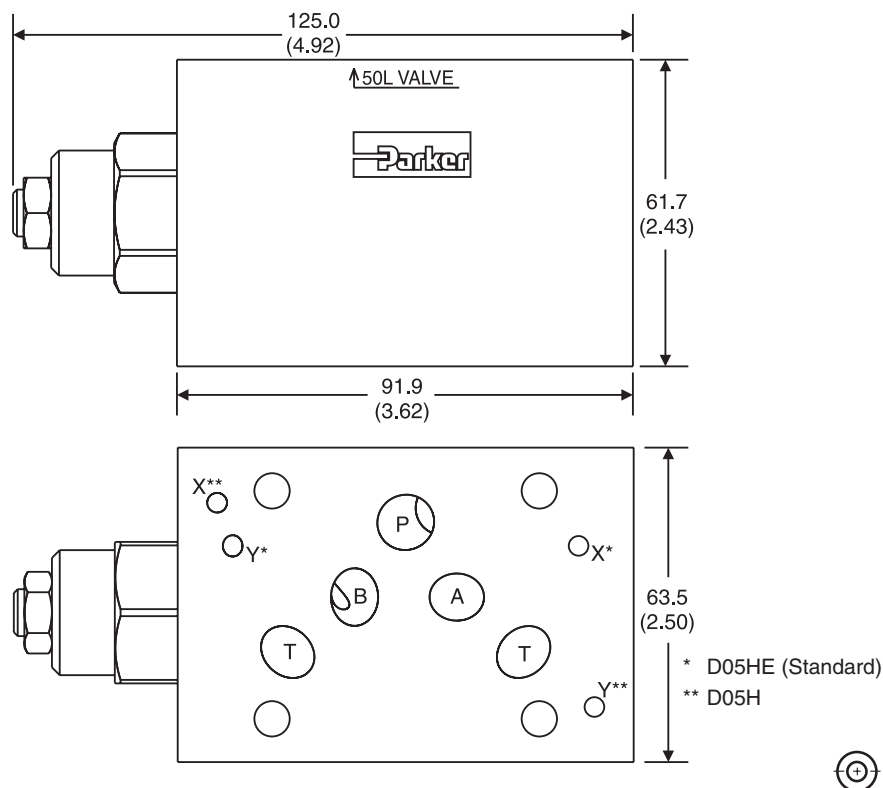
CB03DD – Inch equivalents for millimeter dimensions are shown in (**)**CB05AA** – Inch equivalents for millimeter dimensions are shown in (**)

CB05BB — Inch equivalents for millimeter dimensions are shown in (**)



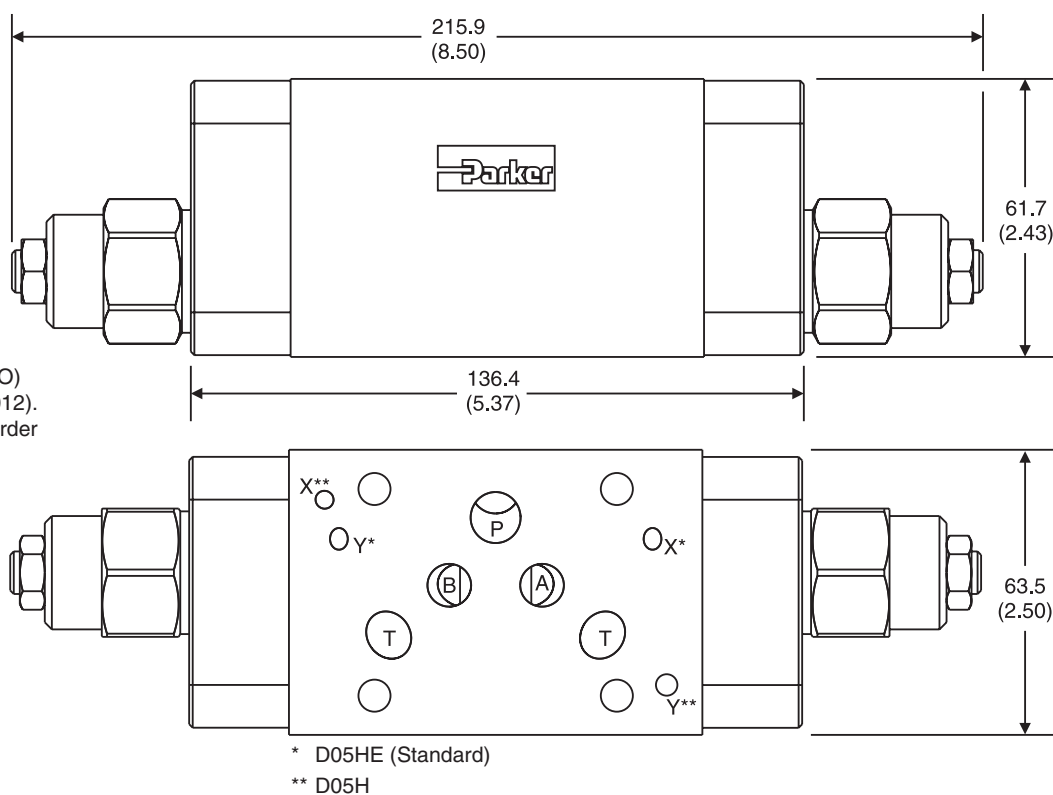
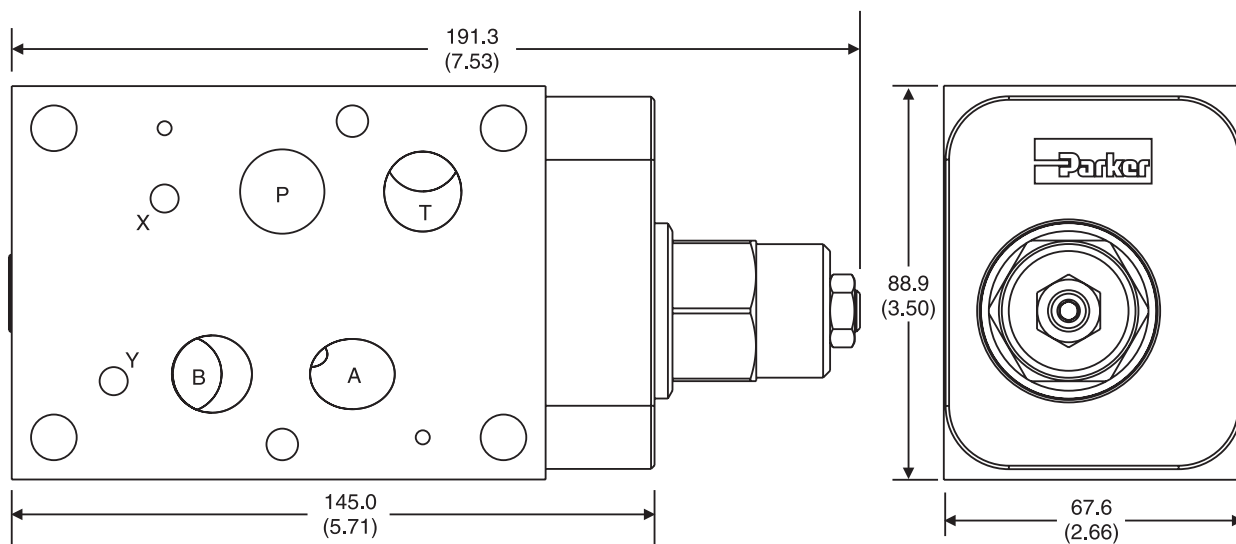
CB05DD — Inch equivalents for millimeter dimensions are shown in (**)



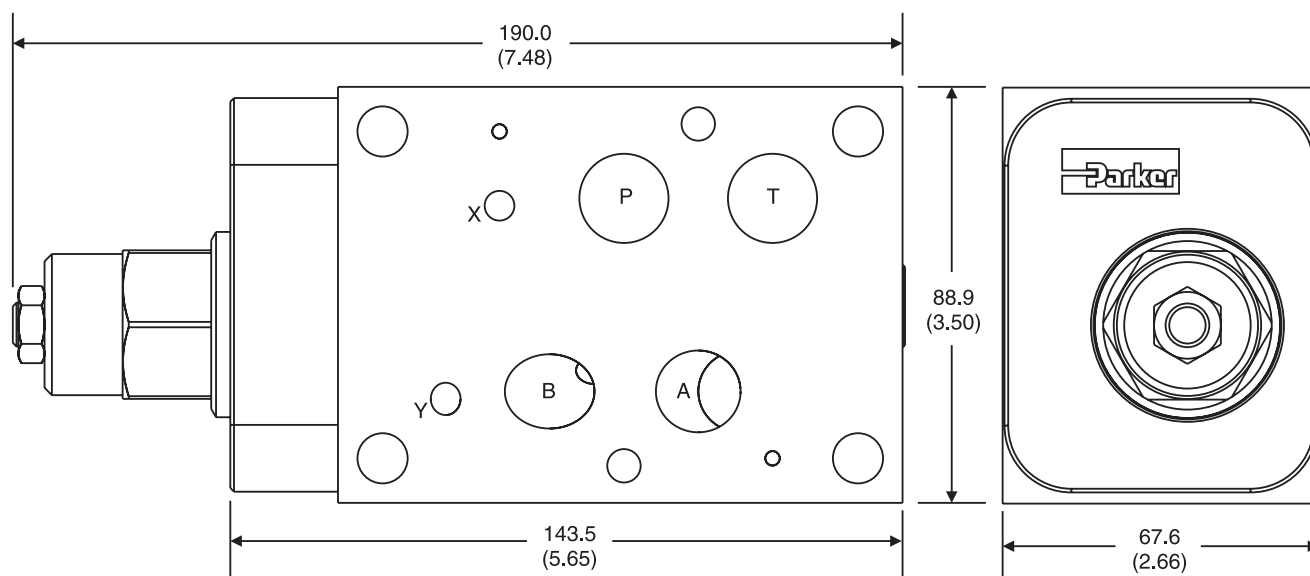
CB5HAA — Inch equivalents for millimeter dimensions are shown in (**)**CB5HBB** — Inch equivalents for millimeter dimensions are shown in (**)

CB5HDD — Inch equivalents for millimeter dimensions are shown in (**)

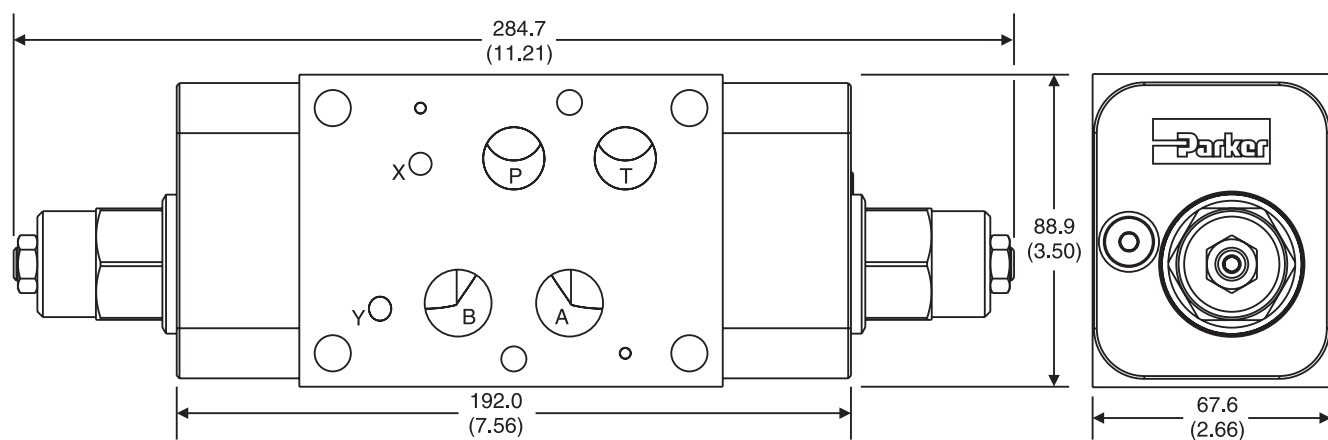
Valve comes with D05HE (ISO)
Pattern seal plate (990-120-012).
If D05H pattern is required, order
seal plate kit 990-120-009.

**B****CB07AA** — Inch equivalents for millimeter dimensions are shown in (**)

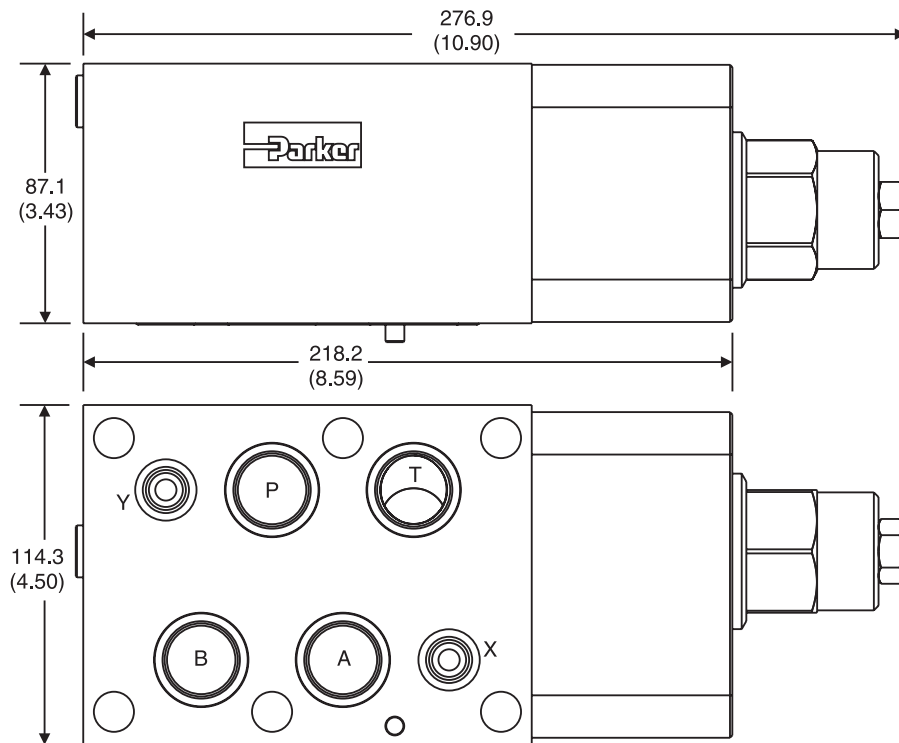
CB07BB – Inch equivalents for millimeter dimensions are shown in (**)



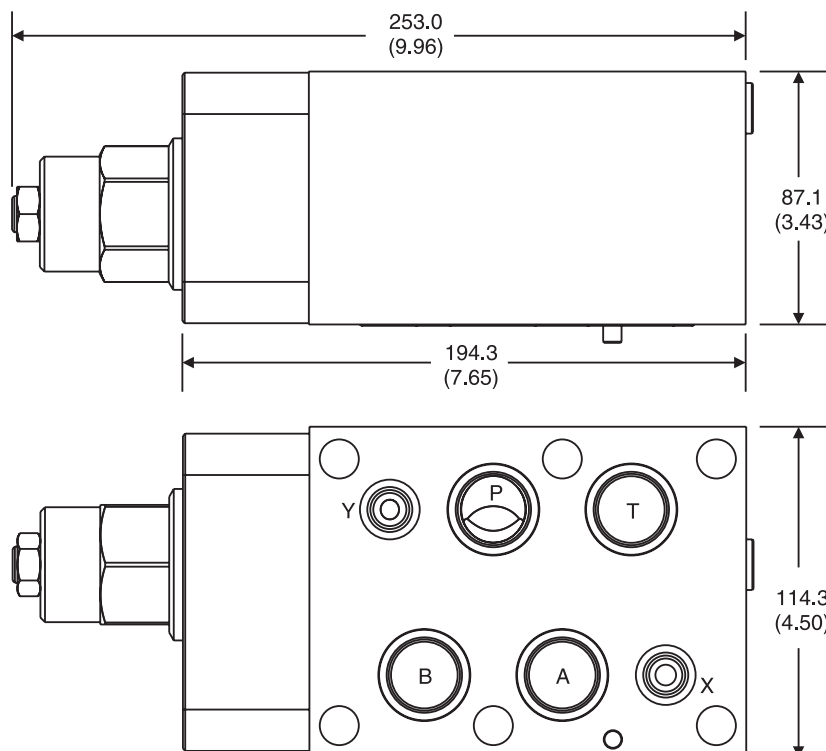
CB07DD – Inch equivalents for millimeter dimensions are shown in (**)



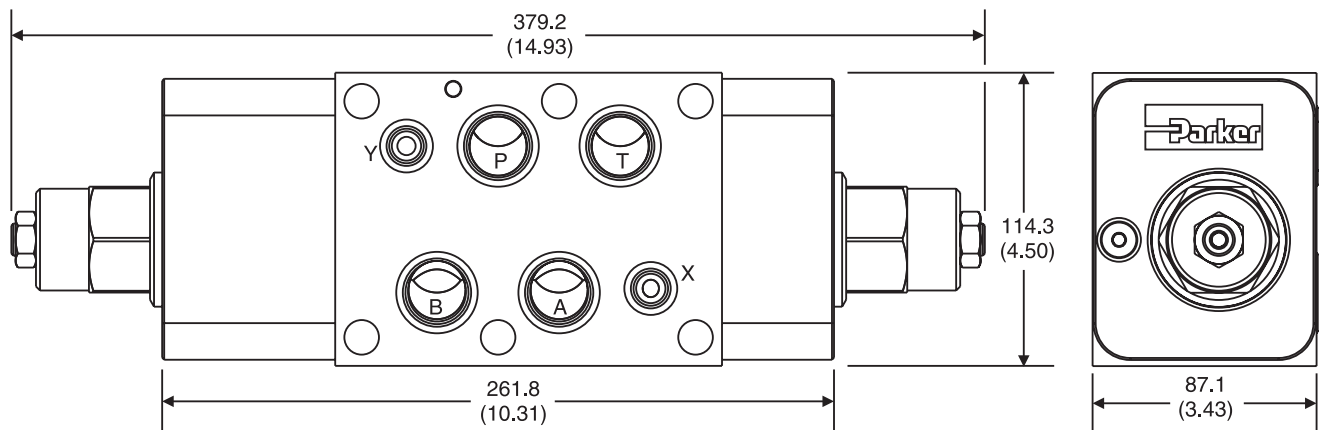
CB08AA — Inch equivalents for millimeter dimensions are shown in (**)



CB08BB — Inch equivalents for millimeter dimensions are shown in (**)



CB08DD — Inch equivalents for millimeter dimensions are shown in (**)

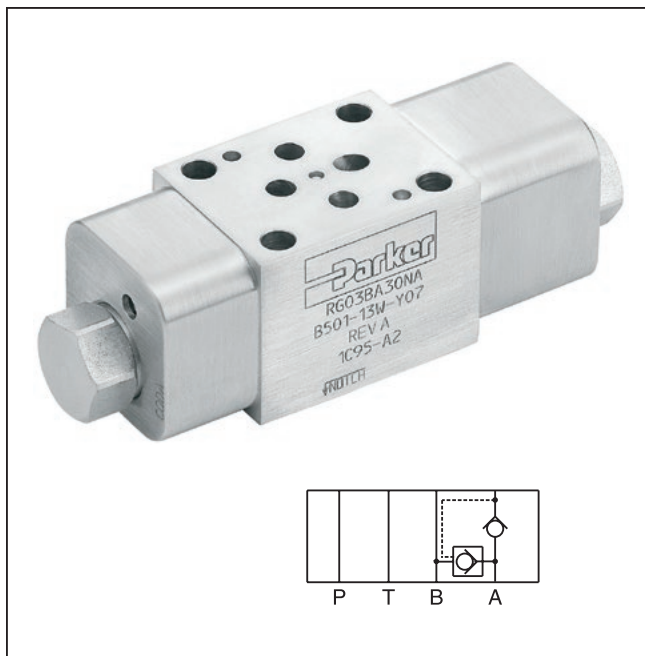


General Description

Series RG is a full time regenerative valve assembly that allows a double-acting, single rod cylinder to be extended more rapidly using the same pump flow. To achieve this, oil from the rod end of the cylinder is added to the flow to the cap end, increasing the rate of extension.

Features

- High life time.
- Cracking pressure 2.0 Bar (30 PSI).
- Sizes:
 - RG03 – NFPA D03 / NG6 / CETOP 3
 - RG05 – NFPA D05 / NG10 / CETOP 5
 - RG07 – NFPA D07 / NG16 / CETOP 7
 - RG08 – NFPA D08 / NG25 / CETOP 8



B

Specifications

General					
Size	D03 / NG6		D05 / NG10	D07 / NG16	D08 / NG25
Mounting Position	Unrestricted				
Ambient Temperature Range	-20°C to +50°C (-4°F to +122°F)				
Hydraulic					
Maximum Operating Pressure	Aluminum Body – up to 207 Bar (3000 PSI); Ductile Iron Body – up to 345 Bar (5000 PSI)				
Nominal Flow*	38 LPM (10 GPM)	95 LPM (25 GPM)	189 LPM (50 GPM)	303 LPM (80 GPM)	
Leakage	< 1 DPM	< 1 DPM	< 1 DPM	< 1 DPM	
Fluid Temperature	-20°C to +80°C (-4°F to +176°F)				
Viscosity	Permitted Recommended	10 to 650 cSt / mm ² /s (46 to 3013 SSU) 30 cSt / mm ² /s (139 SSU)			
Filtration	ISO Class 4406 (1999) 18/16/13 (acc. NAS 1638: 7)				

* Nominal flow value refers to pump flow or regeneration flow from rod side, whichever is larger.

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Ordering Information

RG

Full Time
Regeneration
Valve

Size

Code	Description
03	NFPA D03 / NG6
05*	NFPA D05 / NG10
07	NFPA D07 / NG16
08	NFPA D08 / NG25

* D05HE (ISO) pattern is not available.

BA

Style

Code	Description
BA	Regeneration flow from B to A

30

Cracking
Pressure

Code	Description
30	2 Bar (30 PSI)

Seal

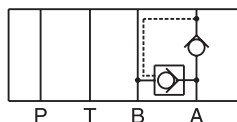
Code	Description
N	Nitrile
V*	Fluorocarbon

* Upon request.

Body Material

Code	Description
A	Aluminum
D	Ductile Iron

RG**BA

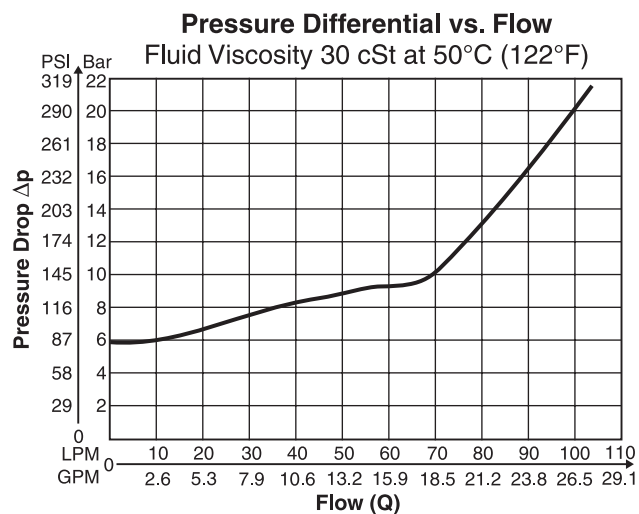


Weight:

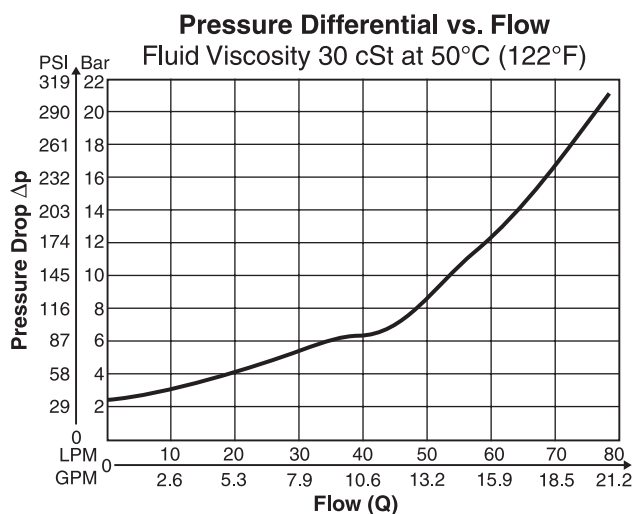
Size	RG*****NA	RG*****ND
RG03	0.8 kg (1.7 lbs)	1.6 kg (3.5 lbs)
RG05, RG5H	1.5 kg (3.3 lbs)	3.1 kg (6.9 lbs)
RG07	2.9 kg (6.5 lbs)	5.9 kg (13.1 lbs)
RG08	6.4 kg (14.1 lbs)	13.1 kg (28.8 lbs)

Performance Curves

RG03*30*A



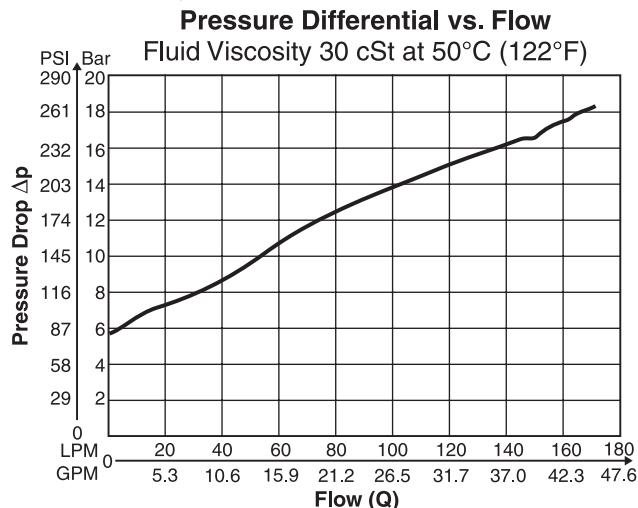
RG03*30*D



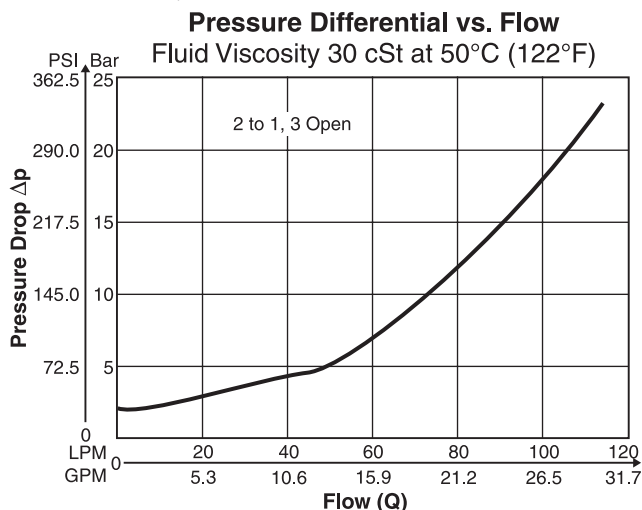
(Continued on next page.)

(Continued from previous page.)

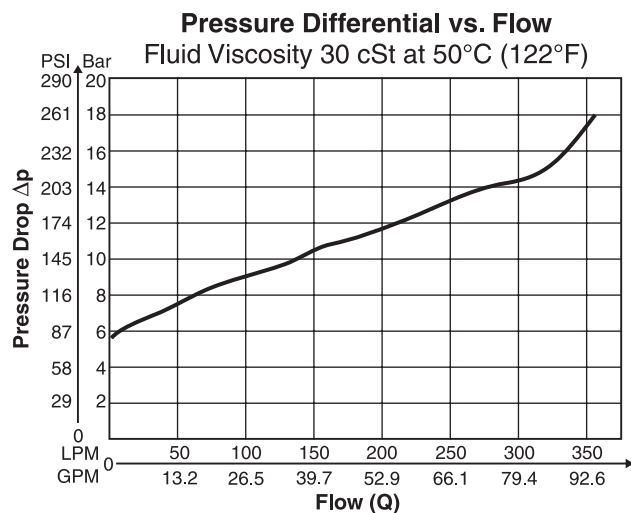
RG05*30*A, RG5H*30*A



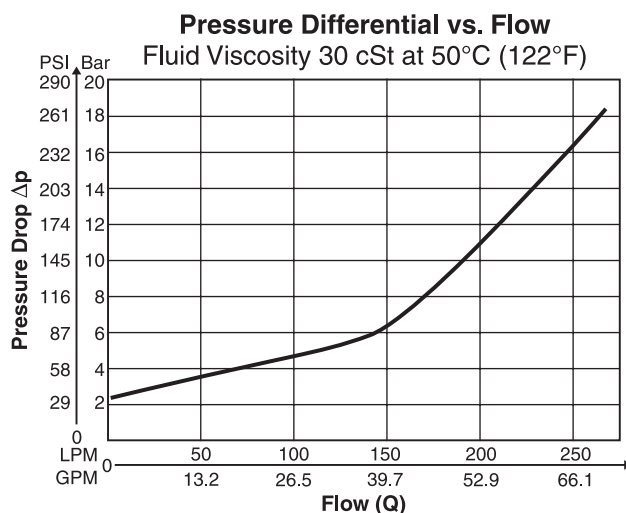
RG05*30*D, RG5H*30*D



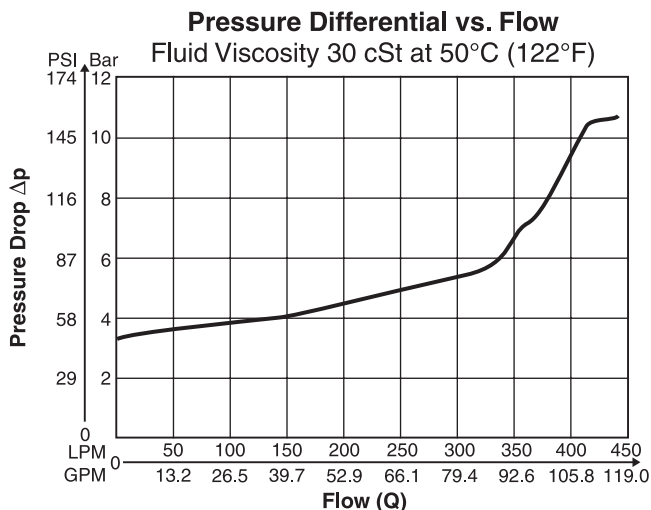
RG07*30*A



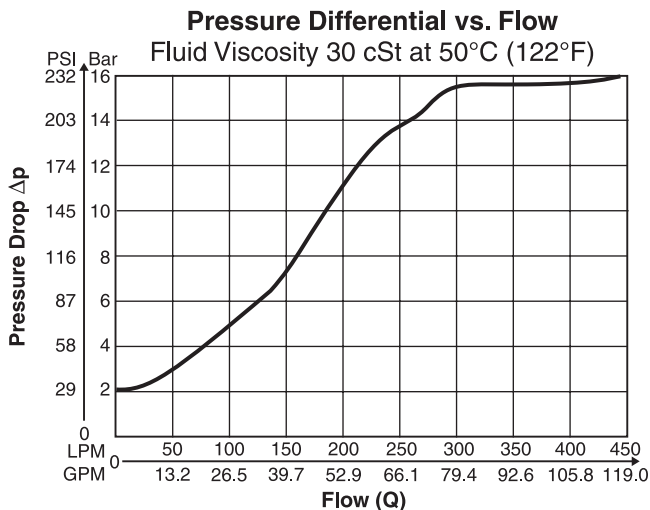
RG07*30*D

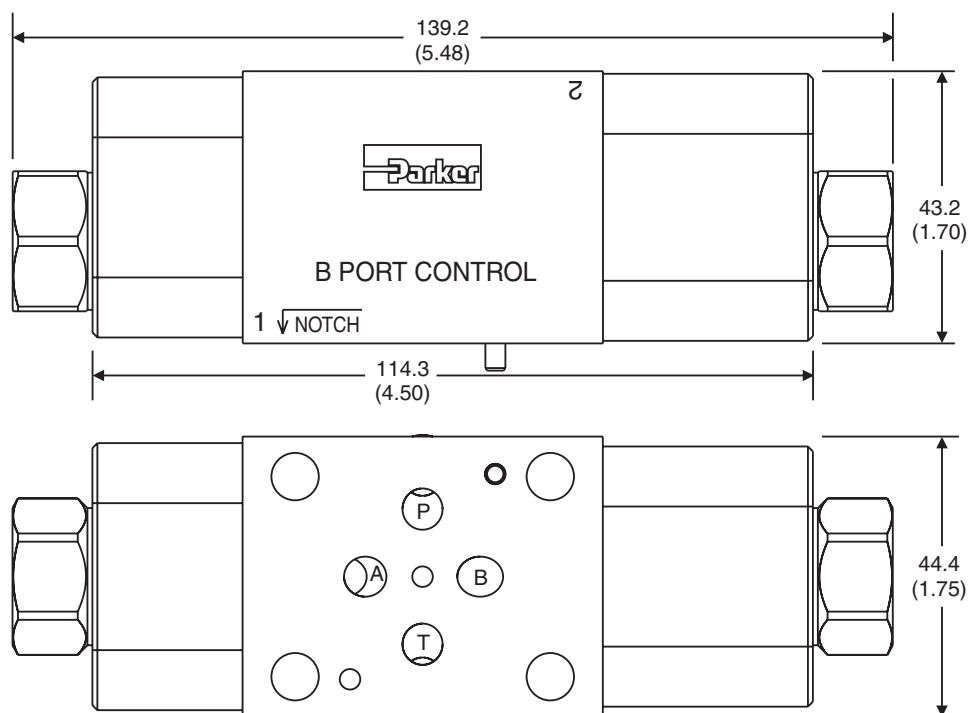
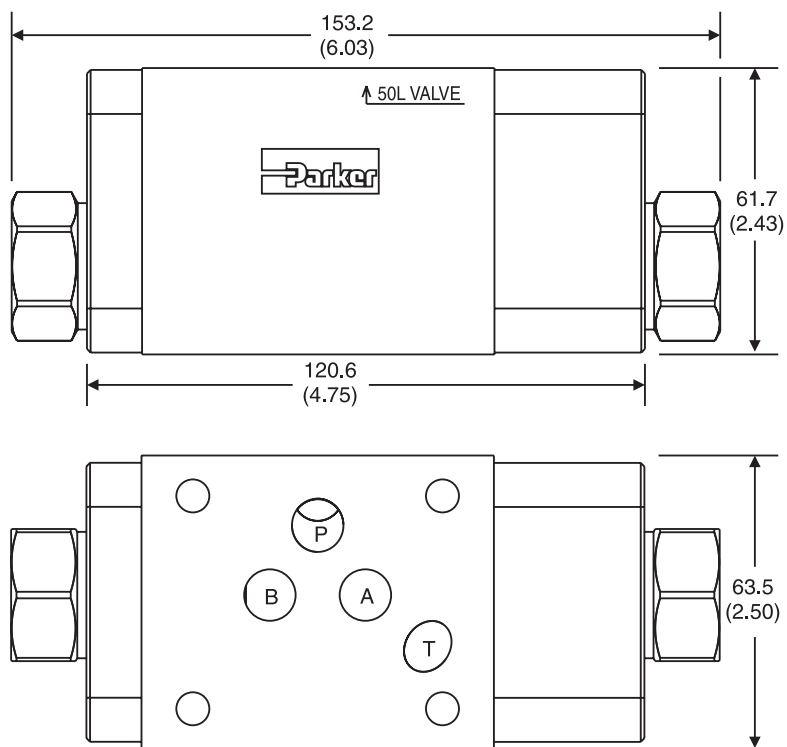


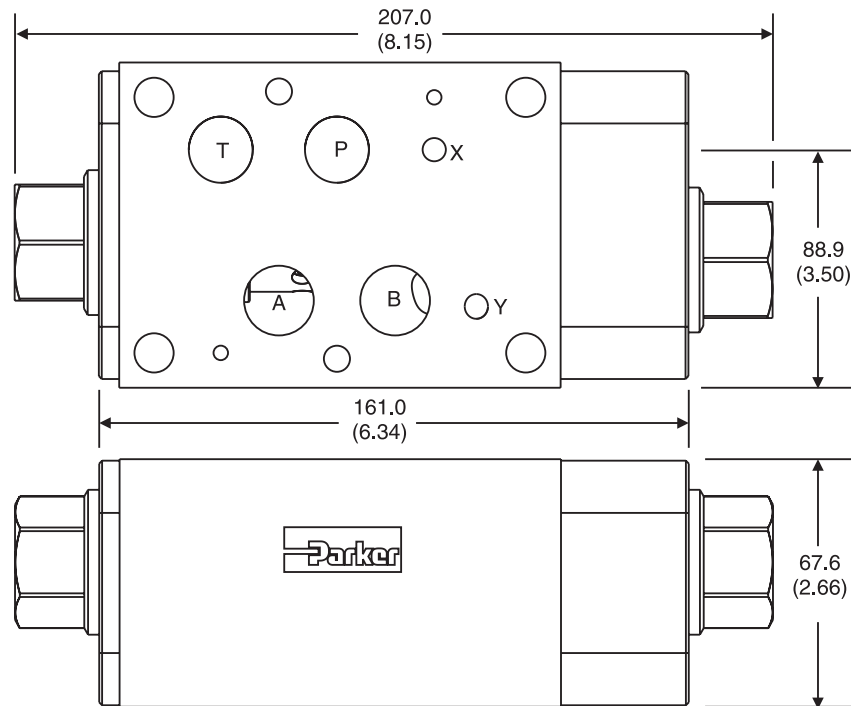
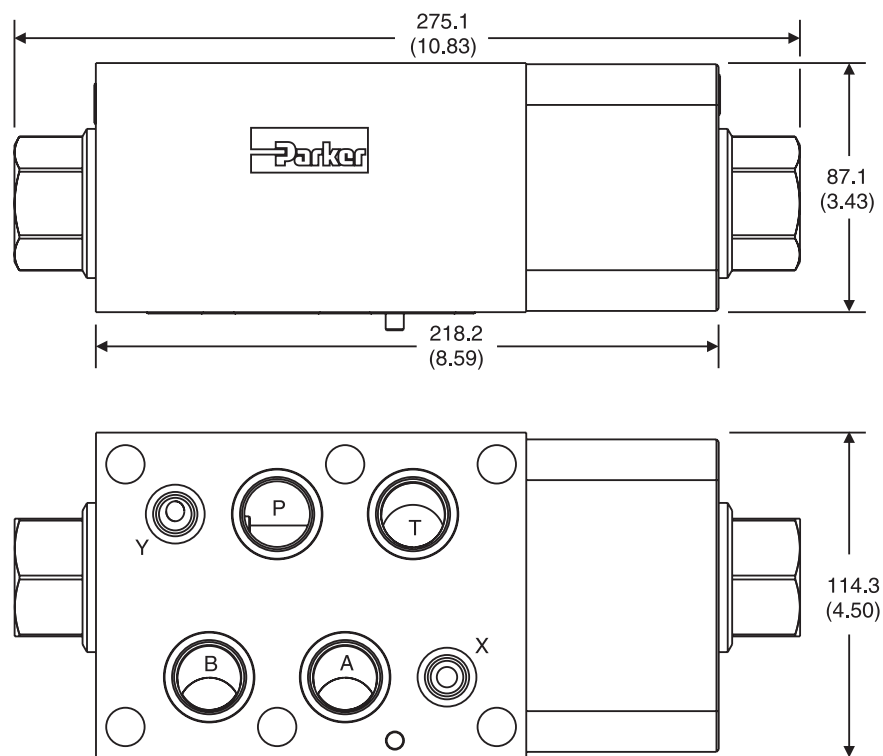
RG08*30*A



RG08*30*D



RG03BA — Inch equivalents for millimeter dimensions are shown in (**)**RG05BA** — Inch equivalents for millimeter dimensions are shown in (**)

RG07BA – Inch equivalents for millimeter dimensions are shown in (**)**Note:** This is a top view.**RG08BA** – Inch equivalents for millimeter dimensions are shown in (**)

General Description

Series ZRD throttle check valves are designed for maximum flow rates.

The throttle check function can be located in port A or B as well as in A + B. Meter-in or meter-out functionality can be selected by model code.

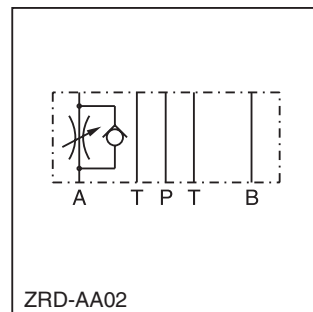
A low flow / high resolution version in NFPA 03 / NG6 for sensitive shifting time adjustment of pilot operated directional control valves is available on request.

Features

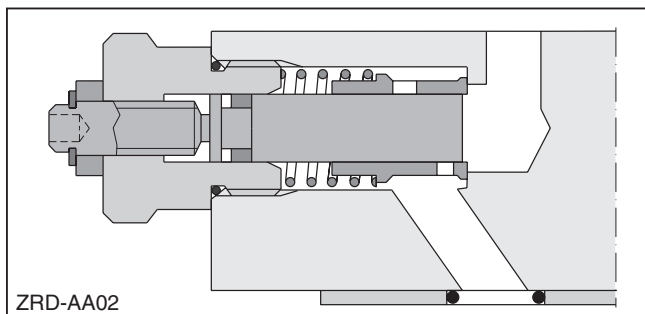
- High flow capacity.
- Various functional arrangements.
- Sizes:
 - ZRD01 – NFPA D03 / NG6 / CETOP 3
 - ZRD02 – NFPA D05 / NG10 / CETOP 5



ZRD-ABZ01



ZRD-AA02



ZRD-AA02

Specifications

General		
Size	NG6	NG10
Mounting	DIN 24340 A6 ISO 4401 NFPA D03 CETOP RP 121	DIN 24340 A10 ISO 4401 NFPA D05 CETOP RP 121 5
Mounting Position	Unrestricted	
Ambient Temperature	-20°C to +50°C (-4°F to +122°F)	
Hydraulic		
Max. Operating Pressure	350 Bar (5075 PSI)	
Nominal Flow	80 LPM (21.2 GPM)	160 LPM (42.3 GPM)
Leakage	—	—
Cracking Pressure	—	—
Fluid	Hydraulic oil as per DIN 51524 ... 51525	
Fluid Temperature	-20°C to +80°C (-4°F to +176°F)	
Viscosity Permitted Recommended	10 to 650 cSt / mm ² /s (46 to 3013 SSU) 30 cSt / mm ² /s (139 SSU)	
Filtration	ISO 4406 (1999) 18/16/13 (acc. NAS 1638: 7)	

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

ZRD
 Throttle Valve
 with Check

□
 Meter
 Option

□
 Size

S0
 Hexagon
 Screw with
 Lock Nut

D
 Design
 Series

□
 Seal

Code	Description
AA	Meter-out Control in A
AZ	Meter-in Control in A
BA	Meter-out Control in B
BZ	Meter-in Control in B
ABA	Meter-out Control in A and B
ABZ	Meter-in Control in A and B

Code	Description
01	NFPA D03 / NG6
02	NFPA D05 / NG10

Code	Description
1	Nitrile
5	Fluorocarbon

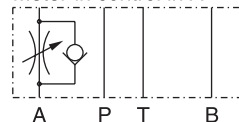
B

Weight: 1 Cartridge
 ZRD*01 1.2 kg (2.6 lbs)
 ZRD*02 2.8 kg (6.2 lbs.)

2 Cartridges
 1.3 kg (2.9 lbs)
 2.9 kg (6.4 lbs.)

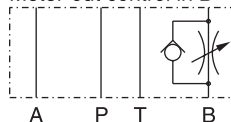
ZRD01

Meter-in control in A



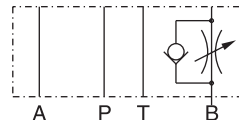
Series
 ZRDAZ01S0D1

Meter-out control in B



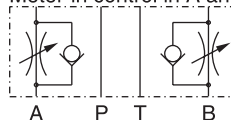
Series
 ZRDBA01S0D1

Meter-in control in B



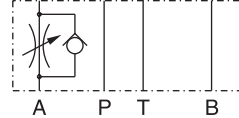
Series
 ZRDBZ01S0D1

Meter-in control in A and B



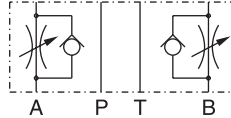
Series
 ZRDABZ01S0D1

Meter-out control in A



Series
 ZRDAA01S0D1

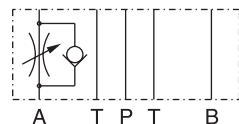
Meter-out control in A and B



Series
 ZRDABA01S0D1

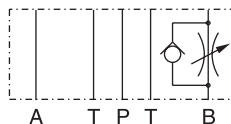
ZRD02

Meter-in control in A



Series
 ZRDAZ02S0D1

Meter-out control in B



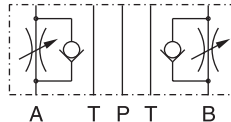
Series
 ZRDBA02S0D1

Meter-in control in B



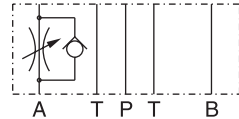
Series
 ZRDBZ02S0D1

Meter-in control in A and B



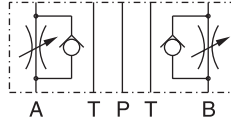
Series
 ZRDABZ02S0D1

Meter-out control in A



Series
 ZRDAA02S0D1

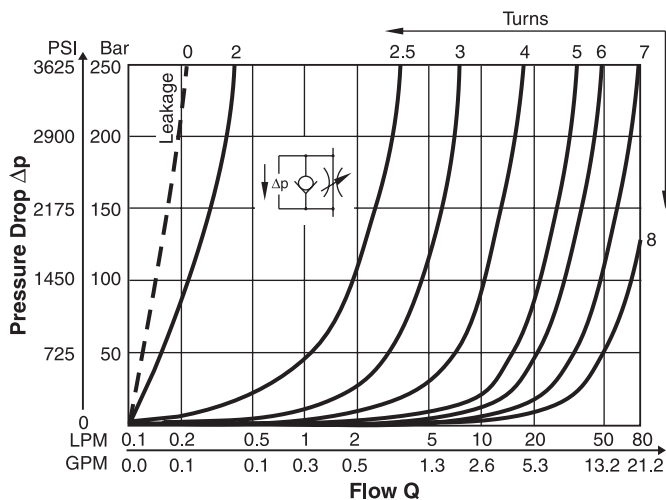
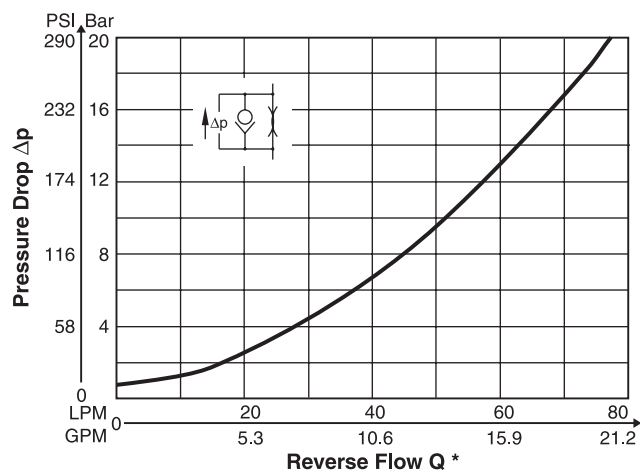
Meter-out control in A and B



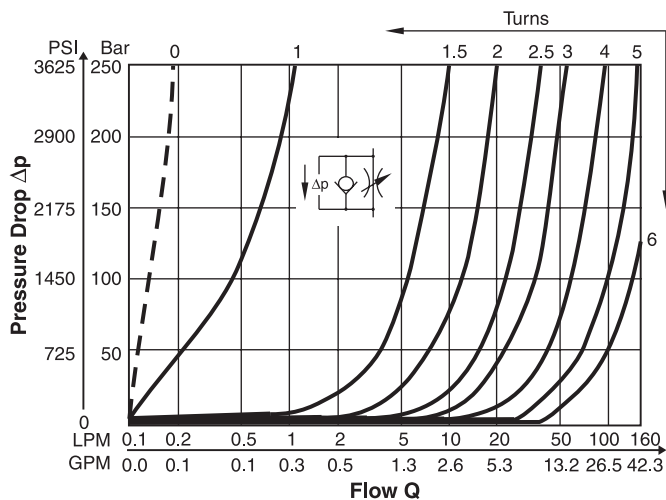
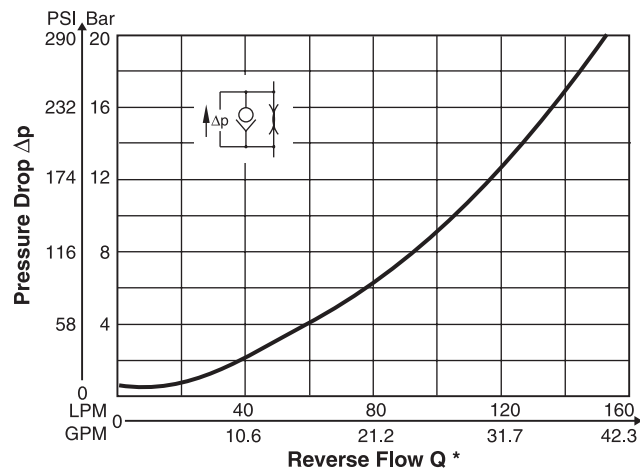
Series
 ZRDABA02S0D1

p/Q Performance Curves

ZRD01



ZRD02

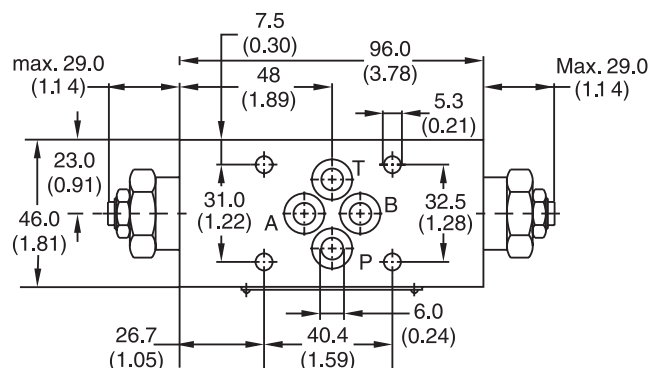


* Throttle closed

Fluid Viscosity 30 cSt @ 50°C (122°F)

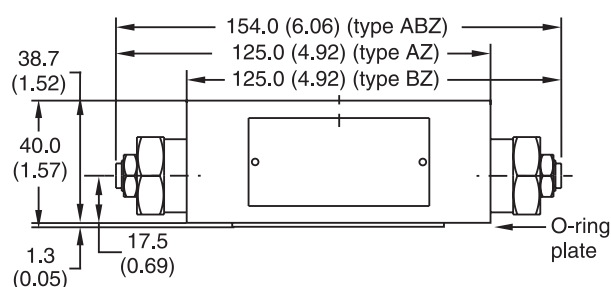
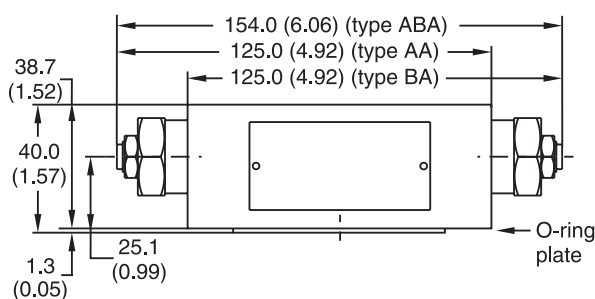
ZRD01

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



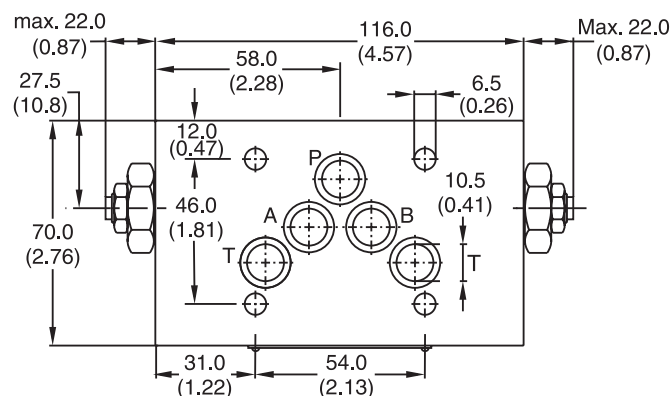
Seal Kit	
Seal	Order Code
1	098-91096-0
5	098-91097-0
Complete Cartridge	
Order Code	
098-91119-0	
O-ring Plate	
Order Code	
S26-27553-0	

B

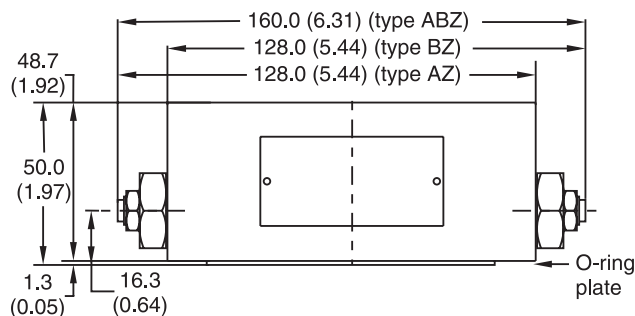
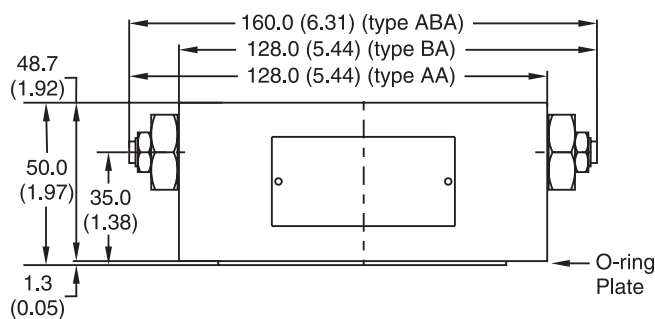


ZRD02

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



Seal Kit	
Seal	Order Code
1	098-91098-0
5	098-91099-0
Complete Cartridge	
Order Code	
098-91120-0	
O-ring Plate	
Order Code	
S16-85742-0	



General Description.

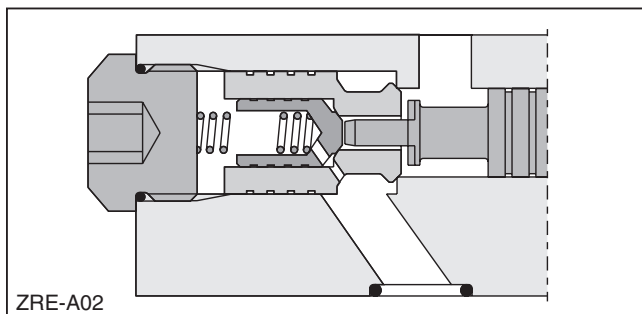
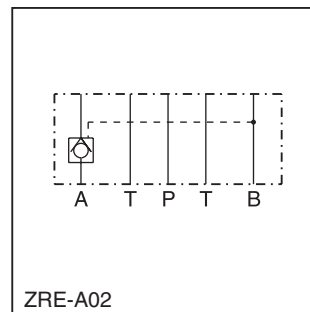
Series ZRE pilot operated check valves are designed for maximum flow rates and long life time.

The valves are typically used in combination with spool type directional control valves to ensure leak free positioning of the actuator.

The inlet flow is free while the outlet flow is blocked. Pressure in the inlet line opens the check valve and allows free outlet flow.

Features

- High life time.
- Check function in A, B or A + B.
- Sizes:
 - ZRE01 – NFPA D03 / NG6 / CETOP 3
 - ZRE02 – NFPA D05 / NG10 / CETOP 5



Ordering Information

ZRE
 Pilot Operated
 Check Valve

Port
 Option

Size

Design
 Series

Seal

Code	Description
A	Blocked in A
B	Blocked in B
AB	Blocked in A and B

Code	Description
01	NFPA D03 / NG6
02	NFPA D05 / NG10

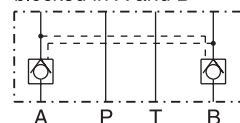
Code	Description
D	Size 01
E	Size 02

Code	Description
1	Nitrile
5	Fluorocarbon

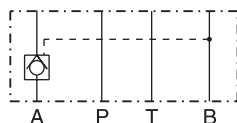
Weight:
 ZRE*01 1.2 kg (2.6 lbs)
 ZRE*02 3.1 kg (6.8 lbs.)

ZRE01

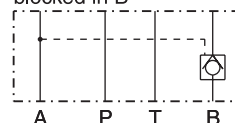
blocked in A and B



blocked in A



blocked in B

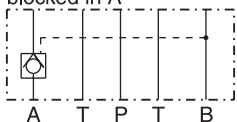


ZRE02

blocked in A and B



blocked in A



blocked in B



WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

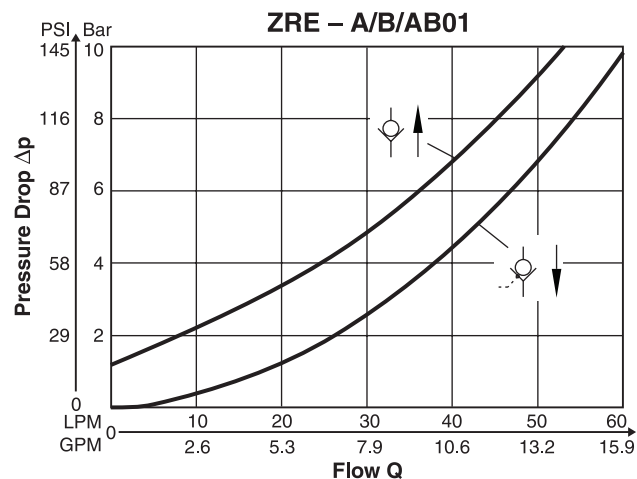
Specifications

General		
Size	NG6	NG10
Mounting Interface	DIN 24340 A6 ISO 4401 NFFA D03 CETOP RP 121	DIN 24340 A10 ISO 4401 NFFA D05 CETOP RP 121 5
Mounting Position	Unrestricted	
Ambient Temperature	-20°C to +50°C (-4°F to +122°F)	
Hydraulic		
Max. Operating Pressure	350 Bar (5075 PSI)	
Nominal Flow	60 LPM (15.9 GPM)	120 LPM (31.7 GPM)
Opening Ratio (Pilot Cone/Main Cone)	1:6	1:6
Cracking Pressure	1.2 Bar (17.4 PSI)	2.0 Bar (29.0 PSI)
Fluid	Hydraulic oil in accordance with DIN 51524 ... 51525	
Fluid Temperature	-20°C to +80°C (-4°F to +176°F)	
Viscosity Permitted Recommended	10 to 650 cSt / mm²/s (46 to 3013 SSU) 30 cSt / mm²/s (139 SSU)	
Filtration	ISO 4406 (1999) 18/16/13 (acc. NAS 1638: 7)	

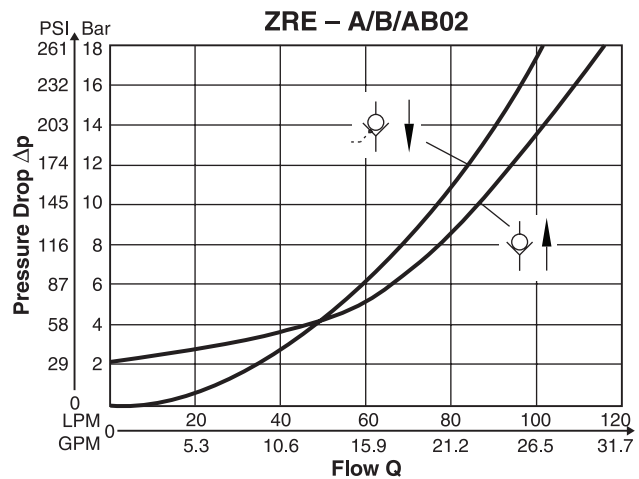
Performance Curves

p/Q

ZRE01



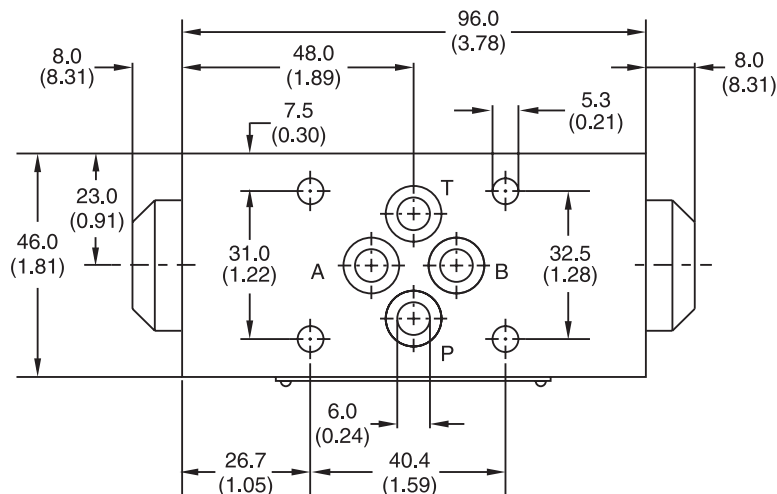
ZRE02



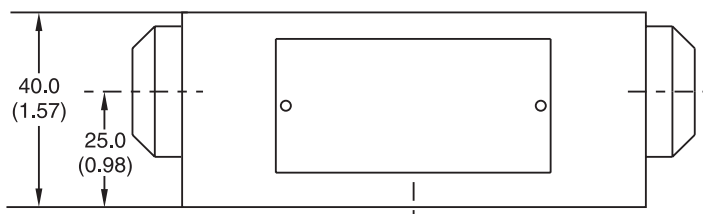
Fluid Viscosity 30 cSt at 50°C (122°F).

ZRE01

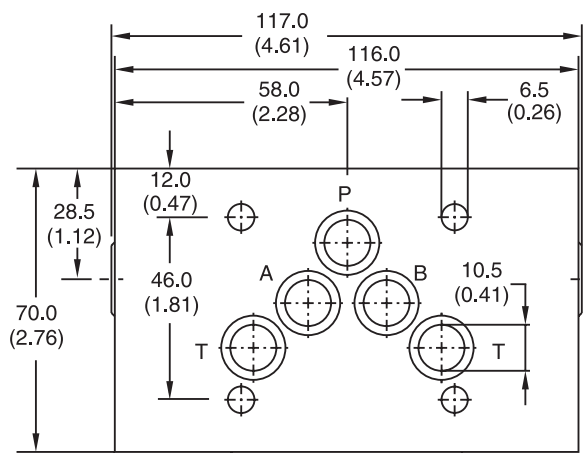
Inch equivalents for millimeter dimensions are shown in (**)



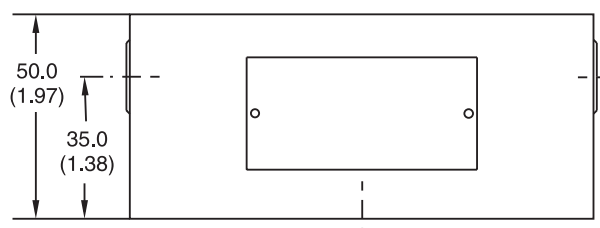
Seal Kit	
Seal	Order Code
1	098-91088-0
5	098-91089-0

**ZRE02**

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



Seal Kit	
Seal	Order Code
1	098-91090-0
5	098-91091-0



General Description

Series ZRV direct operated check valves have a cartridge type insert to provide zero leakage and high life time.

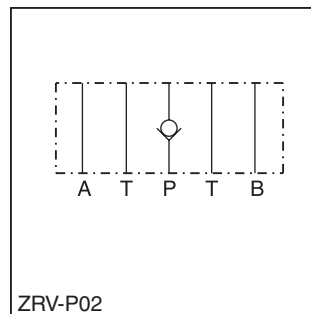
The check function can be located in the P-port or in the T-port.

Features

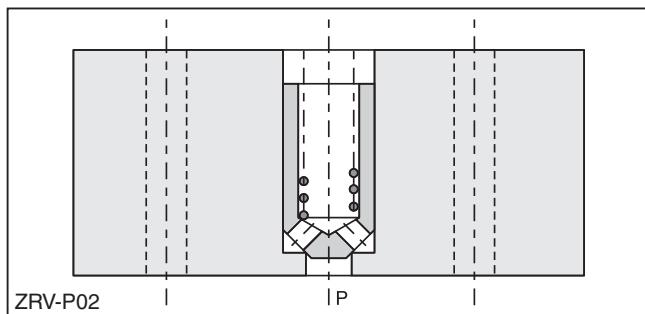
- Leakage-free seat.
- High life time.
- Cracking pressure 0.5 Bar (7.25 PSI).
- Sizes:
 - ZRV01 – NFPA D03 / NG6 / CETOP 3
 - ZRV02 – NFPA D05 / NG10 / CETOP 5



ZRV-P02



ZRV-P02



ZRV-P02

Ordering Information

ZRV
 Direct Operated
 Check Valve

Port
 Option

Size

Code	Description
P	Blocked in P
T	Blocked in T

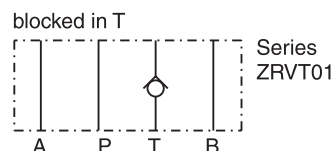
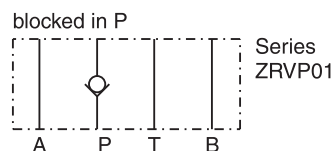
Code	Description
01	NFPA D03 / NG6
02	NFPA D05 / NG10

Weight:

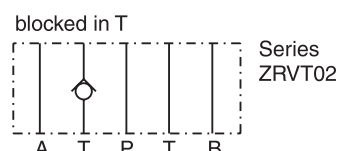
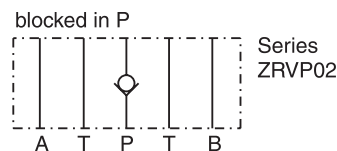
ZRV*01 0.7 kg (1.5 lbs)

ZRV*02 2.0 kg (4.4 lbs.)

ZRV01



ZRV02



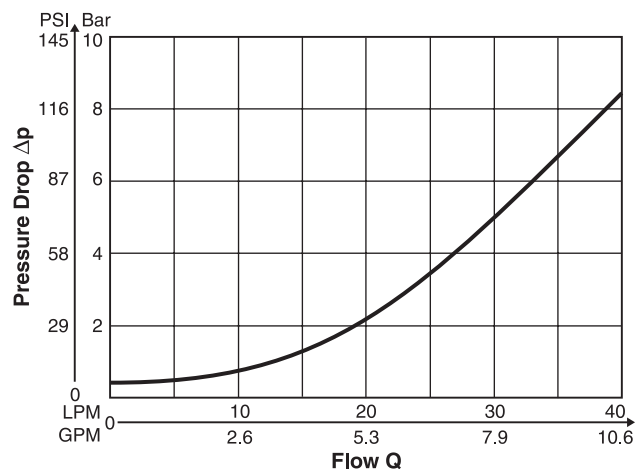
WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Specifications

General		
Size	NG6	NG10
Mounting Interface	DIN 24340 A6 ISO 4401 NFFPA D03 CETOP RP 121	DIN 24340 A10 ISO 4401 NFFPA D05 CETOP RP 121 5
Mounting Position	Unrestricted	
Ambient Temprature	-20°C to +50°C (-4°F to +122°F)	
Hydraulic		
Max. Operating Pressure	350 Bar (5075 PSI)	
Nominal Flow	40 LPM (10.6 GPM)	100 LPM (26.5 GPM)
Cracking Pressure	0.5 Bar (7.25 PSI)	0.5 Bar (7.25 PSI)
Fluid	Hydraulic oil as per DIN 51524 ... 51525	
Fluid Temperature	-20°C to +80°C (-4°F to +176°F)	
Viscosity Permitted Recommended	10 to 650 cSt / mm²/s (46 to 3013 SSU) 30 cSt / mm²/s (139 SSU)	
Filtration	ISO 4406 (1999) 18/16/13 (acc. NAS 1638: 7)	

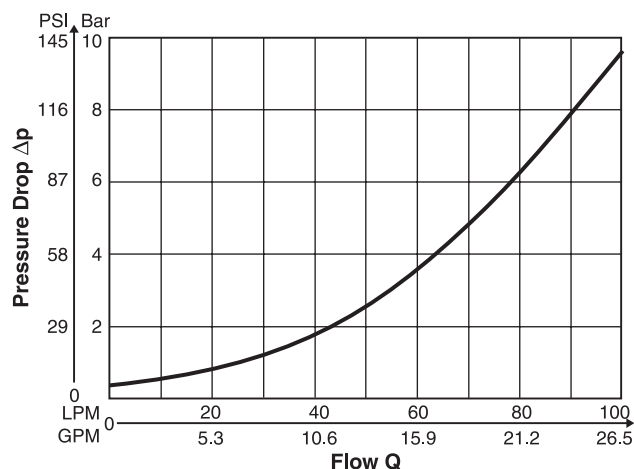
p/Q Performance Curves

ZRV P/T01

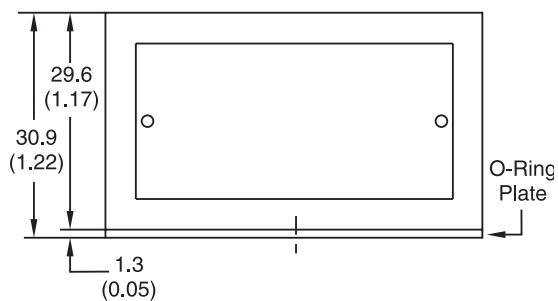
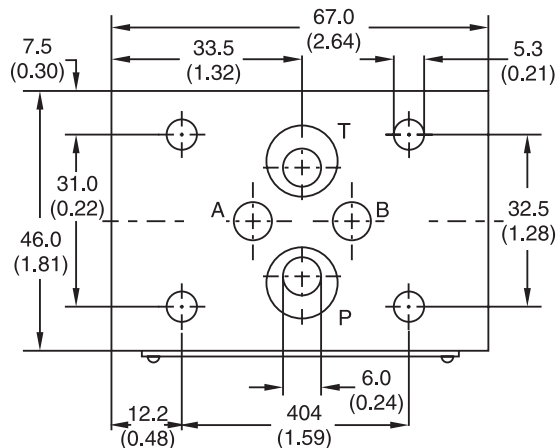
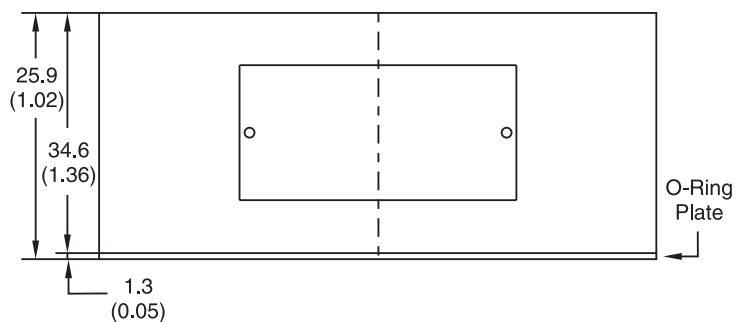
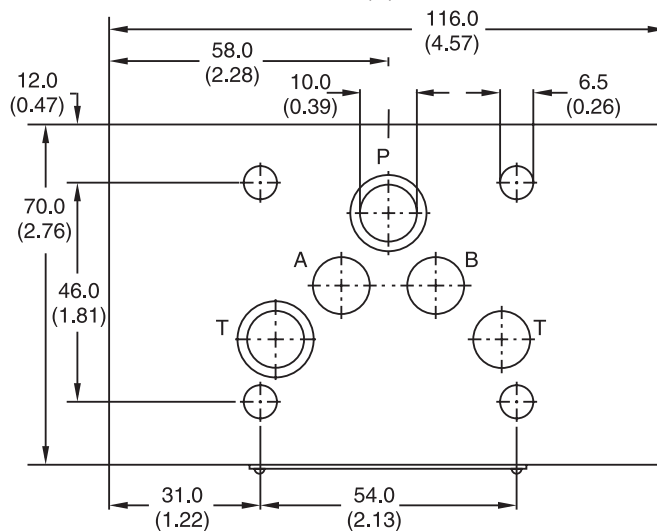


Fluid Viscosity 30 cSt at 50°C (122°F)

ZRV P/T02

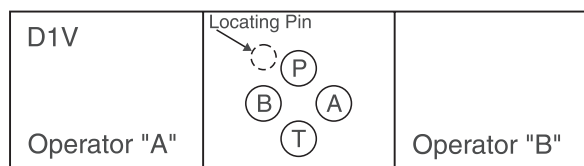


Fluid Viscosity 30 cSt at 50°C (122°F)

ZRV01 — Inch equivalents for millimeter dimensions are shown in (**)**ZRV02** — Inch equivalents for millimeter dimensions are shown in (**)

CAUTION: **Sandwich Installation**

Prior to installation of Sandwich valves, please review flow paths. Due to the reversibility of the DO3 size, incorrect installation will alter the hydraulic circuit. Care must be taken during installation to insure that the Sandwich is installed in compliance with the hydraulic schematic. Please consult with your Parker representative with any questions that may arise.



Pressure Ratings

Unless otherwise specified, all Parker Sandwich valves have continuous duty pressure rating as shown in this catalog.

Special Requirements

Consult your Parker representative for factory recommendations on such situations as:

- Installations that will operate at pressures higher than published catalog ratings.
- Use of hydraulic fluids which do not meet our recommended specifications.
- Operations where fluid temperature will exceed 121°C (250°F).

Recommended Mounting Surface

Surface must be flat within .0004 inch T.I.R. and smooth with 32 micro-inch.

System Cleanliness

Any hydraulic system that includes Parker valves should be carefully protected against dirt and fluid contamination. Life of the valves, as well as of all other components, will be greatly lengthened. Operation will be smoother and more precise. Maintenance and repairs will be reduced. Lost production because of low pressure and flow will be minimized. Fluid contamination should be maintained to less than 500 particles larger than 10 micrometers per milliliter of fluid (SAE class 4 or better/ISO Code 16/13).

Hydraulic Fluids

Parker recommends using top-quality hydraulic fluids having a viscosity range of 32 to 54 cSt (150 to 250 SSU) at 38°C (100°F). The absolute viscosity range should be 16 to 220 cSt (80 to 1000 SSU). Fluids should have highest anti-wear characteristics and be treated to avoid rust and oxidation.

Seals

When used with water-glycol, water/oil emulsions, and high-grade petroleum base hydraulic fluids, Parker standard nitrile seals are suitable.

When using phosphate ester fluids or their blends, specify Parker optional seals made of fluorocarbon. Synthetic fire-resistant fluids require special seal materials which your Parker representative can recommend.

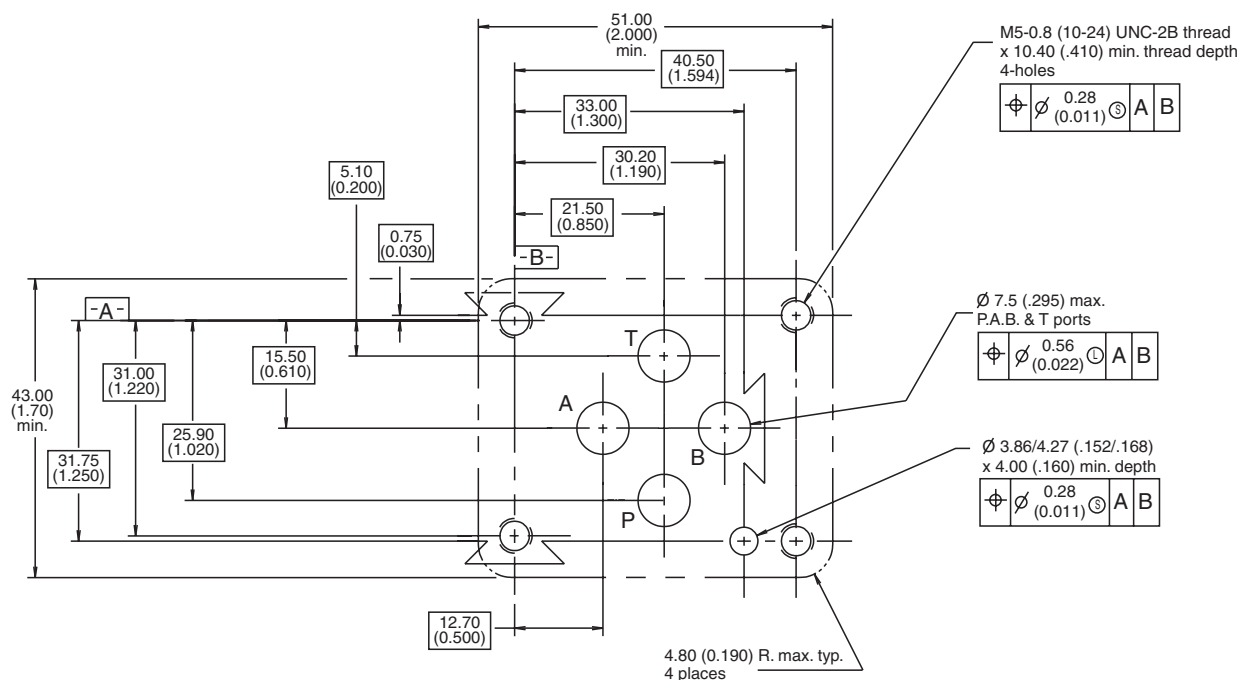
Torque Specifications

The recommended torque values for the bolts which mount the valve to the manifold or subplate are as follows:

Size	Torque Valve
D03	5.7 N.m. (50 in.-lbs.)
D05	16.3 N.m. (12 ft.-lbs.)
D07	63.0 N.m. (46.5 ft.-lbs.)
D08	108.5 N.m. (80 ft.-lbs.)

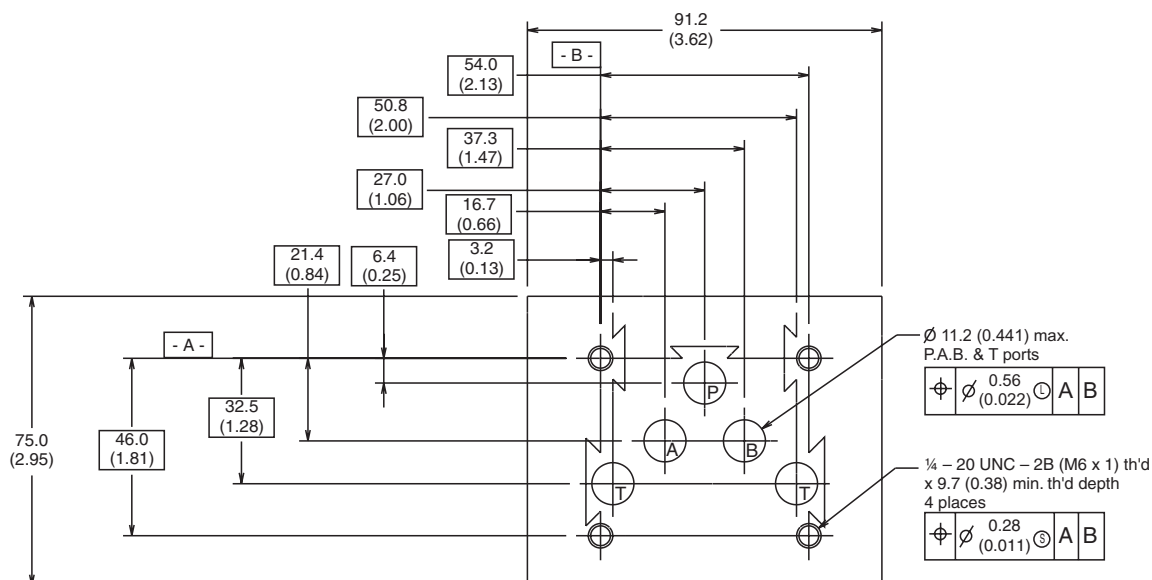
Mounting Pattern – NFPA D03, CETOP 3 & NG6

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



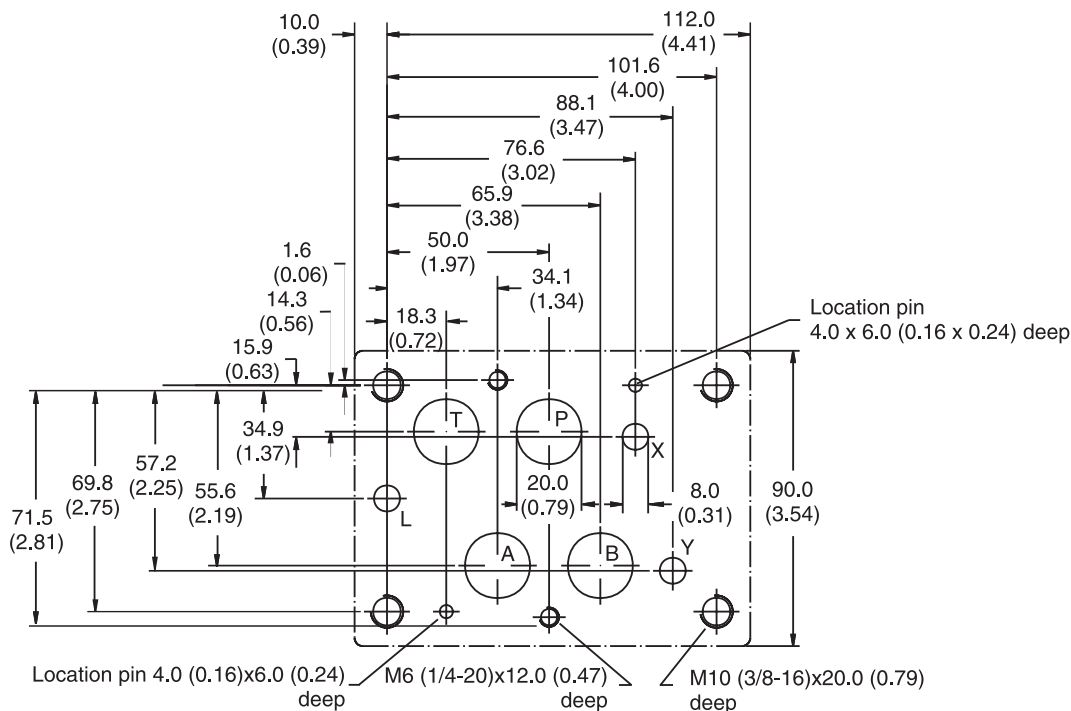
Mounting Pattern – NFPA D05, CETOP 5 & NG10

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



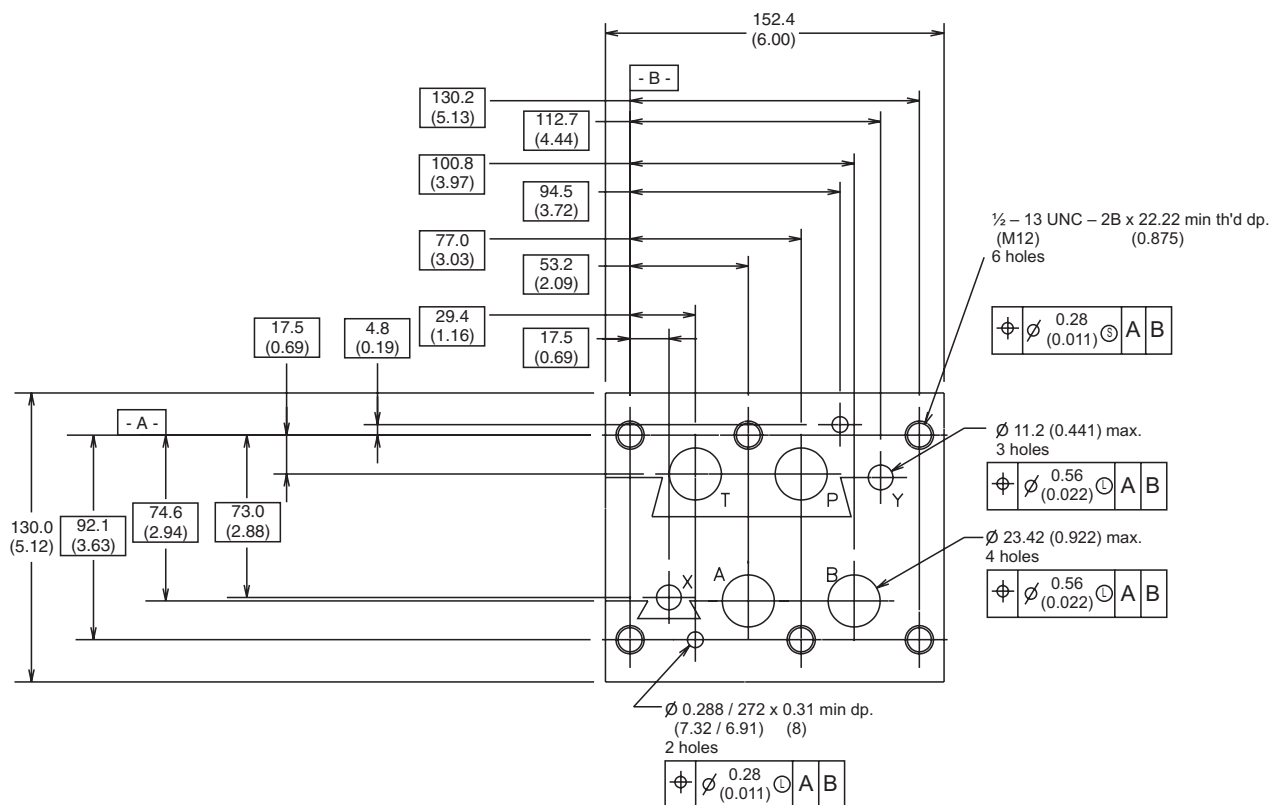
Mounting Pattern – NFPA D07, CETOP 7 & NG16

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



Mounting Pattern – NFPA D08, CETOP 8 & NG25

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



Contents**Series D1V**

General Description, Features, Operation	C2
Dimensions	
Side Ported Subplate – NFPA D03	C2
Bottom Ported Subplate – NFPA D03	C3
Manifold – NFPA D03	C4
Ordering Information	
Subplates	C5
Manifolds	C6

Series D3A, D3DW, D3L and D3W

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Dimensions	
Side Ported Subplate – NFPA D05	C7
Bottom Ported Subplate – NFPA D05	C7
Manifold – NFPA D05	C8

Series D31, D3P and High Flow

Features	C9
Dimensions	
Side Ported Subplate – NFPA D05H (E)	C10
Bottom Ported Subplate – NFPA D05H (E)	C10
Manifold – NFPA D05H (E)	C11
Ordering Information	
D3 and D31 Subplates	C9
D3 Manifolds	C12
D3P and D31 High Flow Manifolds	C13

Series D6 and D8

Features	C14
Dimensions	
Side Ported Subplate – NFPA D08	C14
Bottom Ported Subplate – NFPA D08	C15
Manifold – NFPA D08	C16
Ordering Information	
Subplates	C17
Manifolds	C18

Accessories

Dimensions	
Cover and Crossover Plates – NFPA D03, D05, D05H and D08	C19 - C22
Tapping Plates – NFPA D03, D05, D05H and D08	C23 - C26
Ordering Information	
Tapping and Cover Plates – D1V, D3, D31, D6 and D8	C27 - C30

Installation Information

Mounting Patterns – NFPA D03, D05, D05H, D05HE and D08	C31 - C33
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Series PSB

General Description, Operation, Features, Specifications	C34
Ordering Information	C35
Mounting Pattern	C35
Performance Curves	C36
Electrical Connection	C36
Dimensions	
F1	C37
U1	C38
U2	C39

General Description

Series D1V directional control valve subplates provide easy transition from NFPA and CETOP mounting patterns to common plumbing connections. Five different thread types are available for use in any application.

Manifolds provide a single location to mount several valves in a compact and manageable array for operating multiple machines or functions.

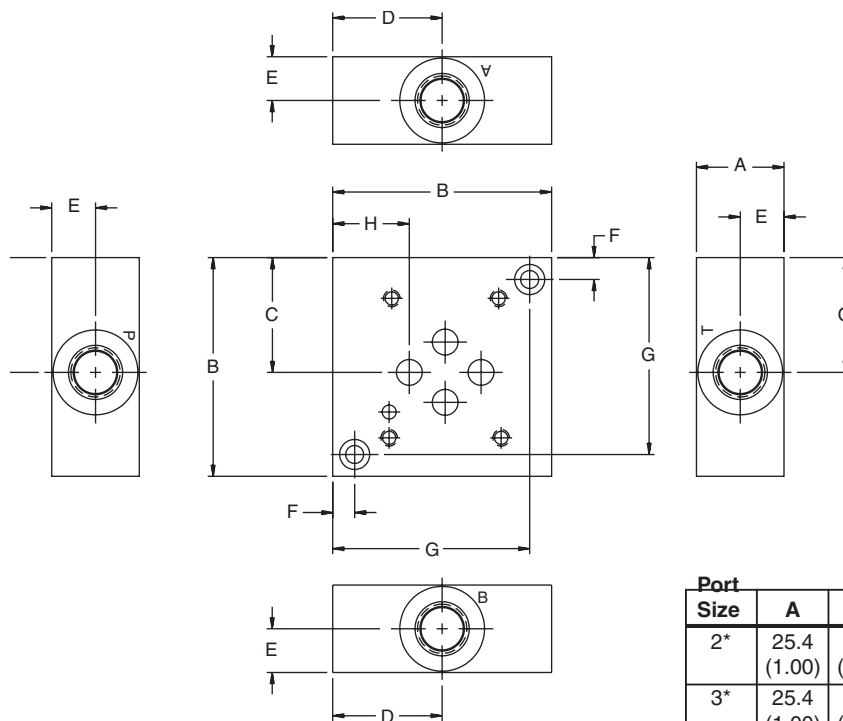
C

Features

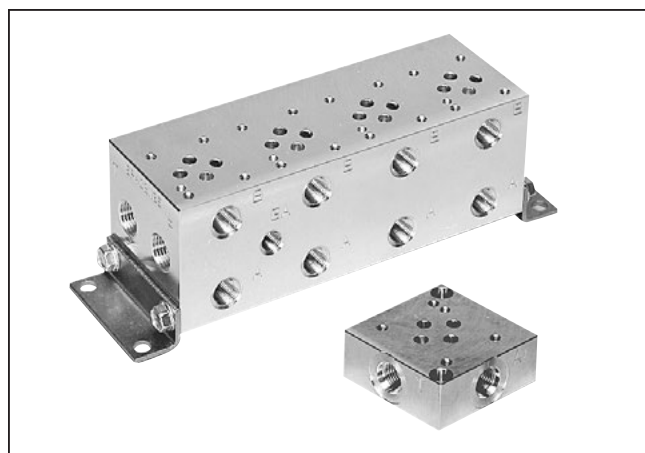
- **Aluminum or steel available** — Flexibility for applying to different system pressures
- **NPT and SAE thread options available** — Flexibility to plumb into existing systems
- **Multiple port sizes available** — Eliminates need for reducers and expanders at subplate connection

Side Ported Subplate — NFPA D03

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



See Mounting Bolt Kits for bolt information.



Operation

Series D1V subplates and manifolds consist of an NFPA valve mounting surface and corresponding connections for each valve port. Various port sizes and thread type are available. Cover plates, crossover and tapping plates are also available.

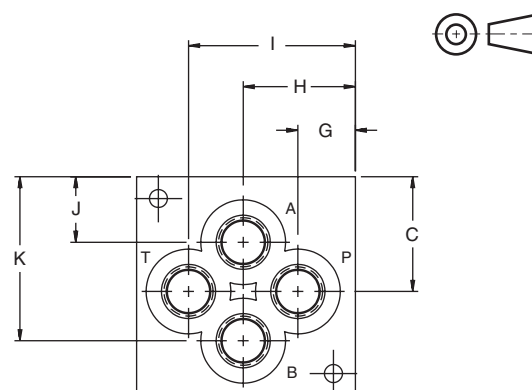
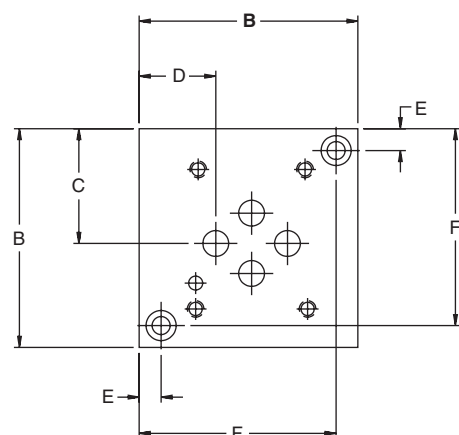
Port Size	A	B	C	D	E	F	G	H
2*	25.4 (1.00)	63.5 (2.50)	33.3 (1.31)	31.8 (1.25)	12.7 (.50)	6.4 (.25)	57.2 (2.25)	22.4 (.88)
3*	25.4 (1.00)	63.5 (2.50)	33.3 (1.31)	31.8 (1.25)	12.7 (.50)	6.4 (.25)	57.2 (2.25)	22.4 (.88)
4*	38 (1.50)	88.9 (3.50)	46.0 (1.81)	45.2 (1.78)	19.1 (.75)	6.4 (.25)	82.5 (3.25)	35.1 (1.38)
6*	44.5 (1.75)	101.6 (4.00)	52.3 (2.06)	51.6 (2.03)	22.4 (.88)	9.7 (.38)	92.2 (3.63)	41.4 (1.63)

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Series D1V

Bottom Ported Subplate — NFPA D03

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



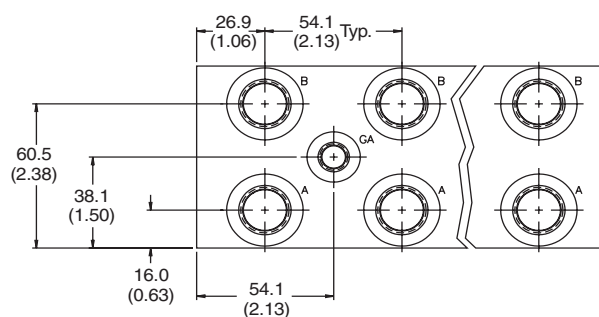
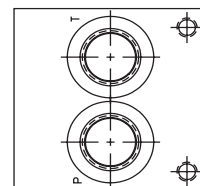
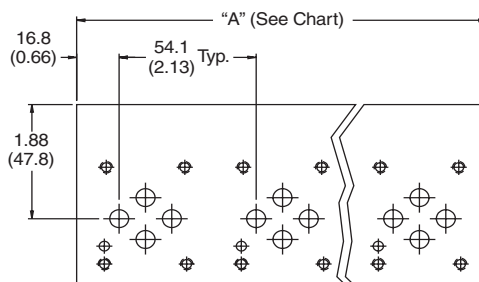
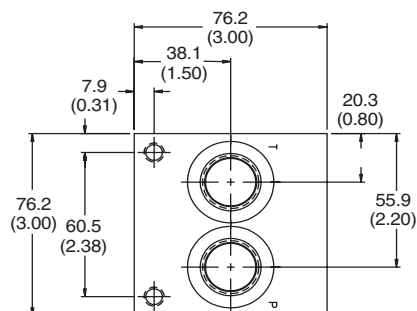
Port Size	A	B	C	D	E	F	G	H	I	J	K
2*	25.4 (1.00)	63.5 (2.50)	33.3 (1.31)	22.4 (.88)	6.4 (.25)	57.2 (2.25)	16.8 (.66)	32.5 (1.28)	48.5 (1.91)	19.1 (.75)	47.8 (1.88)
3*	25.4 (1.00)	63.5 (2.50)	33.3 (1.31)	22.4 (.88)	6.4 (.25)	57.2 (2.25)	15.0 (.59)	32.5 (1.28)	50.0 (1.97)	17.5 (.69)	49.3 (1.94)
4*	38.1 (1.50)	88.9 (3.50)	46.0 (1.81)	35.1 (1.38)	6.4 (.25)	82.6 (3.25)	17.5 (.69)	45.2 (1.78)	71.4 (2.81)	19.1 (.75)	71.4 (2.81)
6*	38.1 (1.50)	114.3 (4.50)	58.7 (2.31)	47.8 (1.88)	9.7 (.38)	104.9 (4.13)	23.9 (.94)	57.9 (2.28)	90.4 (3.56)	23.9 (.94)	90.4 (3.56)

See Mounting Bolt Kits for bolt information.

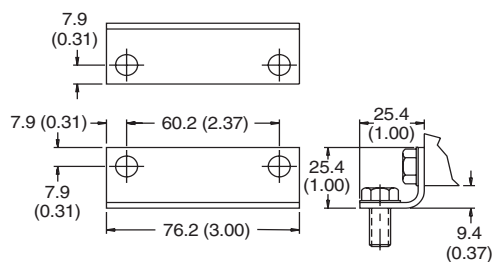
Series D1V

Manifold — NFPA D03

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



Note: Gage port not available on single station manifold.

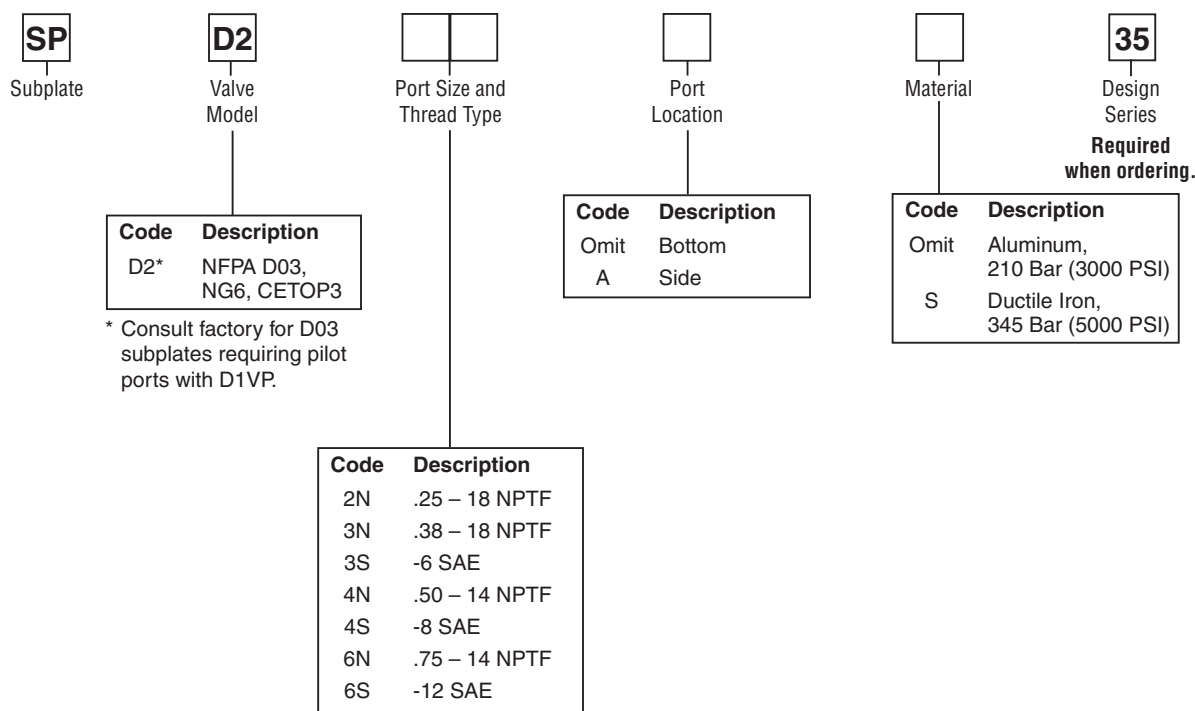


Mounting Hardware
(See Ordering Information for Mounting Hardware details)

No. Stations	1	2	3	4	5	6	7	8
"A" Length mm (inch)	54.1 (2.13)	108.0 (4.25)	162.1 (6.38)	215.9 (8.50)	270.0 (10.63)	323.9 (12.75)	378.0 (14.88)	431.8 (17.00)
Wgt., Alum, kg (lbs.)	1.4 (3)	1.8 (4)	2.7 (6)	3.6 (8)	4.1 (9)	5.0 (11)	5.4 (12)	6.4 (14)
Wgt., Iron, kg (lbs.)	2.3 (5)	4.1 (9)	5.9 (13)	7.7 (17)	9.5 (21)	11.8 (26)	13.6 (30)	15.4 (34)

See Mounting Bolt Kits for bolt information.

Series D1V Subplates



Note: 35 Design Series subplates conform to NFPA mounting pattern specifications, but may be dimensionally different from previous design series.

Mounting Bolt Kits

UNC Bolt Kits for use with D1V Directional Control Valves & Sandwich Valves (D1V*-91 Design, Solenoid Operated)					
	Number of Sandwich Valves @ 1.58" (40mm) thickness				
	0	1	2	3	4
	BK209 1.25"	BK243 2.88"	BK225 4.38"	BK244 6.00"	BK245 7.50"
D1V-91					
D1V-91 Plus Tapping Plate	BK176 2.25"	BK56 3.81"	BK212 5.38"	BK107 7.00"	BK106 8.50"

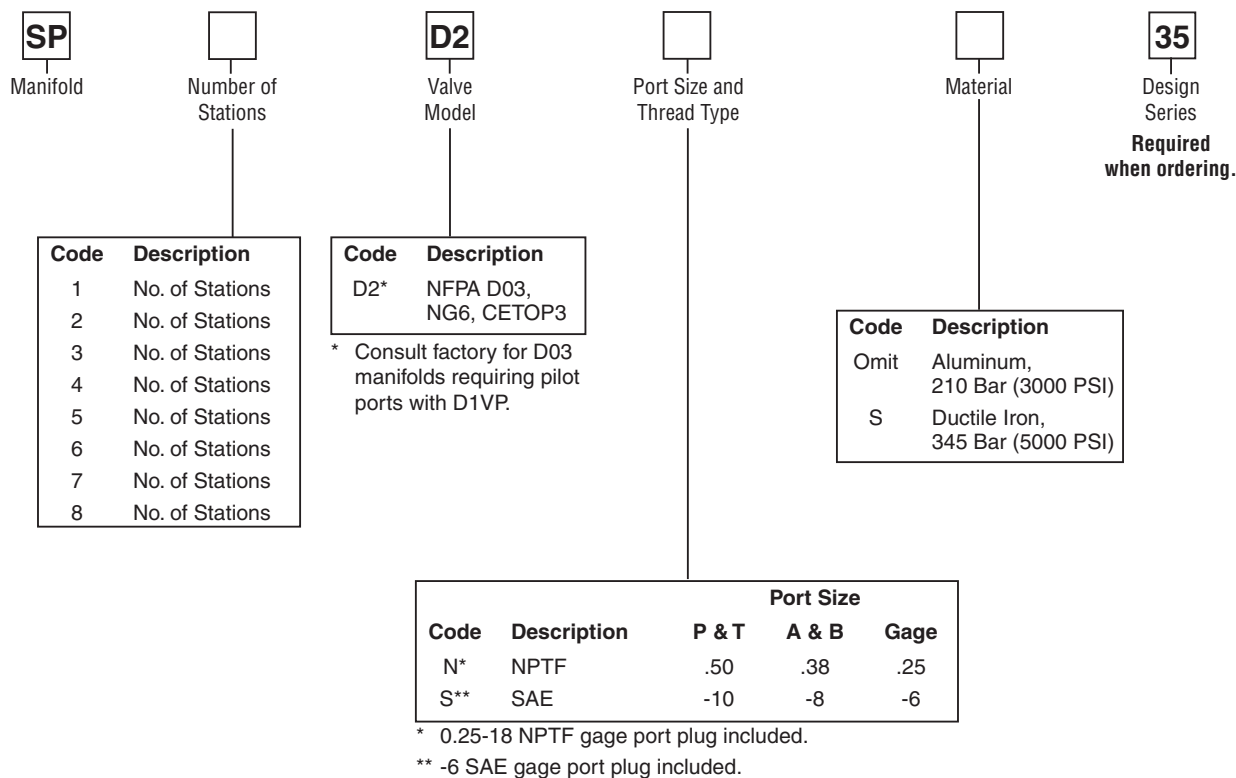
Note: All bolts are SAE grade 8, 10-24 UNC-2A thread, torque to 5.6 N.m. (50 in.-lbs.)

Mounting Hardware supplied with subplate includes:

Subplates	Mounting Hardware	Qty.
SPD22N**	.25-20 UNC x	2
SPD23N**	.88 LG. SHCS	
SPD23S**		
SPD24N**	.25-20 UNC x	2
SPD24S**	1.5 LG. SHCS	
SPD26N*	.38-16 UNC x	2
SPD26S*	1.50 LG. SHCS	
SPD26NA*	.38-16 UNC x	2
SPD26SA*	1.75 LG. SHCS	

Valve mounting threads:
 #10-24 UNC x 0.63 DP.
 Used for SAE and NPTF ports.
 Metric M5-0.8mm ISO 6H x 16 DP.
 Used for BSPP, BSPT and ISO ports.

Series D1V Manifolds



Note: 35 Design Series manifolds conform to NFPA mounting pattern specifications, but may be dimensionally different from previous design series.

Mounting Bolt Kits

UNC Bolt Kits for use with D1V Directional Control Valves & Sandwich (D1V*-91 Design, Solenoid Operated)					
	Number of Sandwich @ 1.58" (40mm) thickness				
	0	1	2	3	4
D1V-91	BK209 1.25"	BK243 2.88"	BK225 4.38"	BK244 6.00"	BK245 7.50"
D1V-91 Plus Tapping Plate	BK176 2.25"	BK56 3.81"	BK212 5.38"	BK107 7.00"	BK106 8.50"

Note: All bolts are SAE grade 8, 10-24 UNC-2A thread, torque to 5.6 N.m. (50 in.-lbs.)

Mounting hardware supplied with manifold includes:

(2) steel brackets

For SAE and NPTF ports: (8) 5/16-18 UNC x .63 hex washer cap screws.

Valve mounting threads:

#10-24 UNC x 0.63 DP. Used for SAE and NPTF ports.

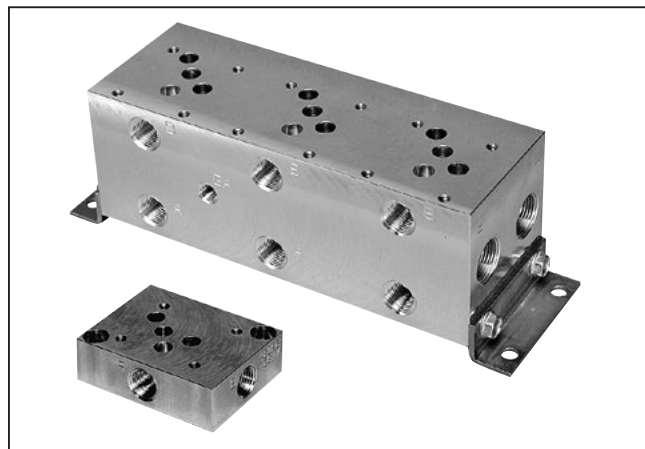
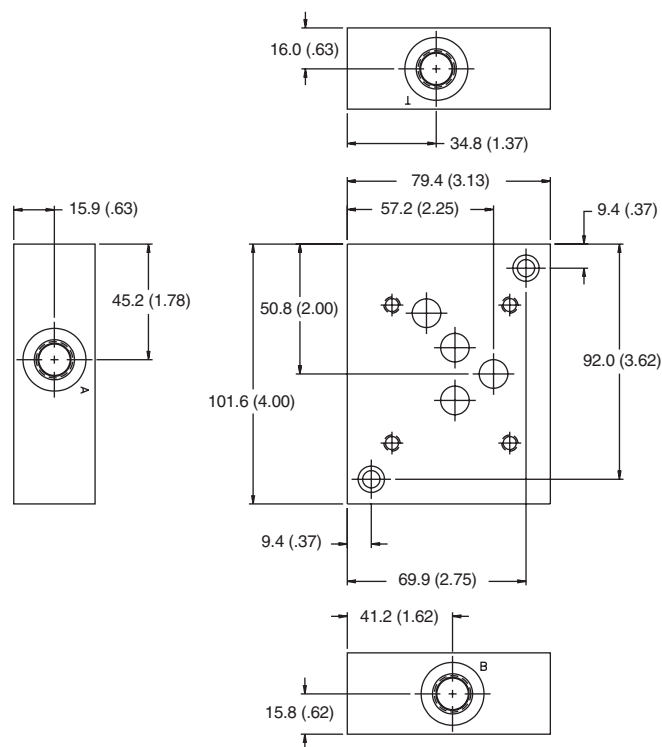
No. Stations	1	2	3	4	5	6	7	8
Wgt., Alum, kg (lbs.)	1.4 (3)	1.8 (4)	2.7 (6)	3.6 (8)	4.1 (9)	5.0 (11)	5.4 (12)	6.4 (14)
Wgt., Iron, kg (lbs.)	2.3 (5)	4.1 (9)	5.9 (13)	7.7 (17)	9.5 (21)	11.8 (26)	13.6 (30)	15.4 (34)

Features

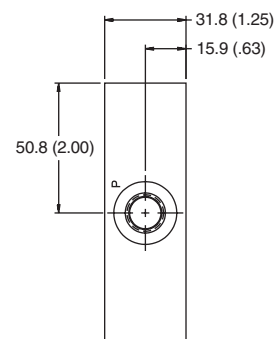
- **Aluminum or steel available** — Flexibility for applying to different system pressures
- **NPT and SAE thread options available** — Flexibility to plumb into existing systems
- **Multiple port sizes available** — Eliminates need for reducers and expander at subplate connection

Side Ported Subplate — NFPA D05

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



C

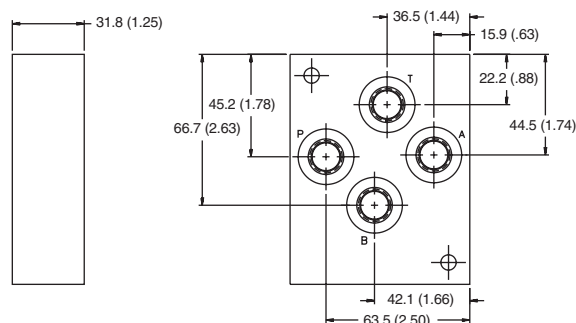
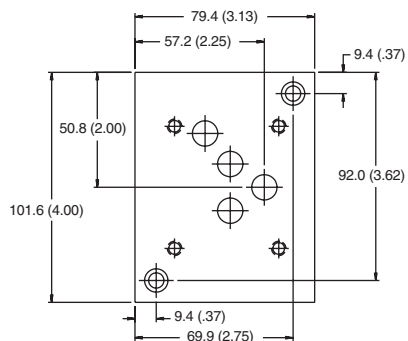


See Mounting Bolt Kits for bolt information.



Bottom Ported Subplate — NFPA D05

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



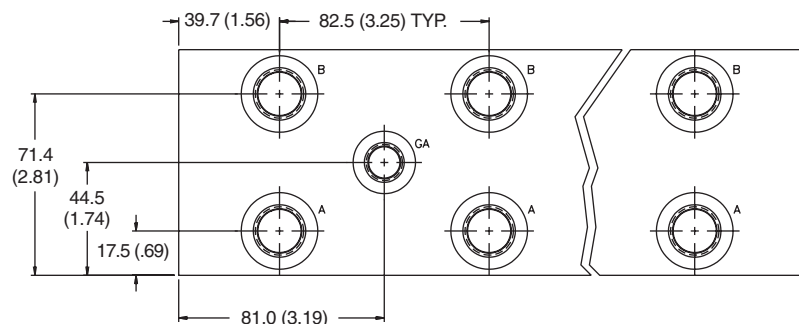
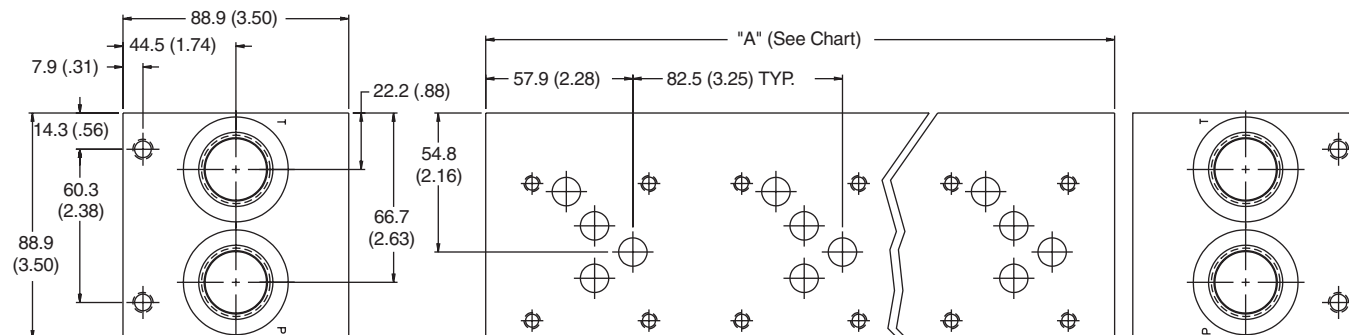
See Mounting Bolt Kits for bolt information.

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

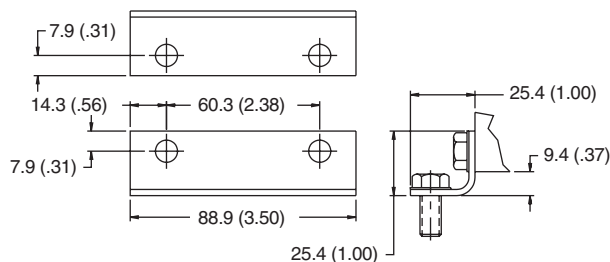
Series D3A, D3DW, D3L and D3W

Manifold — NFPA D05

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



Note: Gage port not available on single station manifold.



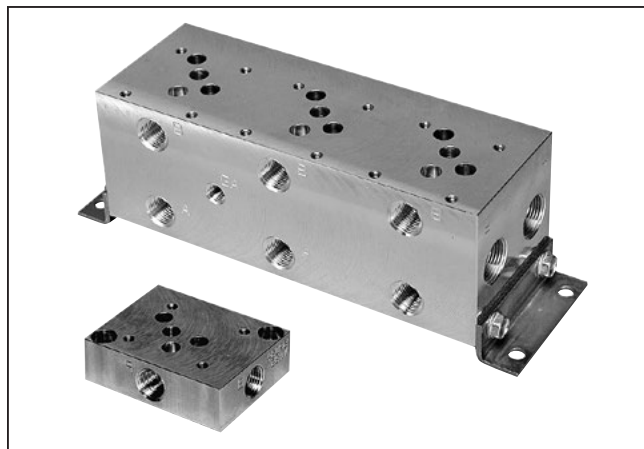
Mounting Hardware
(See Ordering Information for Mounting Hardware details)

No. Stations	1	2	3	4	5	6
"A" Length, mm (in)	82.6 (3.25)	165.1 (6.50)	247.7 (9.75)	330.2 (13.00)	412.8 (16.25)	495.3 (19.50)
Weight, Alum. kg (lbs.)	1.8 (4)	3.6 (8)	5.0 (11)	6.4 (14)	7.9 (17)	9.6 (21)
Weight, Iron kg (lbs.)	4.1 (9)	7.7 (17)	11.8 (26)	15.4 (34)	20.1 (43)	23.3 (51)

See Mounting Bolt Kits for bolt information.

Features

- **Aluminum or steel available** — Flexibility for applying to different system pressures
- **NPT and SAE thread options available** — Flexibility to plumb into existing systems
- **Multiple port sizes available** — Eliminates need for reducers and expander at subplate connection
- **Parallel or series circuit applications** — Flexibility for different circuits



C

Series D3 and D31 Subplates

Subplate		Valve Model		Port Size and Thread Type		Port Location		Material		Design Series Required when ordering.	
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
D3	NFPA D05, CETOP5			3N#	.38 – 18 NPTF	Omit	Bottom		Aluminum, 210 Bar (3000 PSI)		
D31V	NFPA D05H			4N#	.50 – 14 NPTF	A	Side				
D31D	NFPA D05HE, NG10, CETPOP5H			4S#	-8 SAE			S	Ductile Iron, 345 Bar (5000 PSI)		
				6N*	.75 – 14 NPTF						
				6S*	-12 SAE						

D31 manifolds come standard with high flow capability. For flows over 20 GPM use D31V or D31D subplate. It will have X and Y ports.

Sizes 3* and 4* ports available on SPD3 (NFPA D05) only.

* Size 6* port available on SPD31 (NFPA D05H and D05HE) only.

Mounting Hardware supplied with subplate includes:

Subplates	Mounting Hardware	Qty.
SPD33N**	.38-16 UNC x	2
SPD34N**	1.25 LG. SHCS	
SPD34S**		
SPD31*6N**	.38-16 UNC x	2
SPD31*6S**	1.75 LG. SHCS	
SPD3H6N**		
SPD3H6S**		

Valve mounting threads:
0.25-20 UNC x 0.75 DP.
Used for SAE and NPTF ports.

Note: 35 Design Series subplates conform to NFPA mounting pattern specifications, but may be dimensionally different from previous design series.

Mounting Bolt Kits

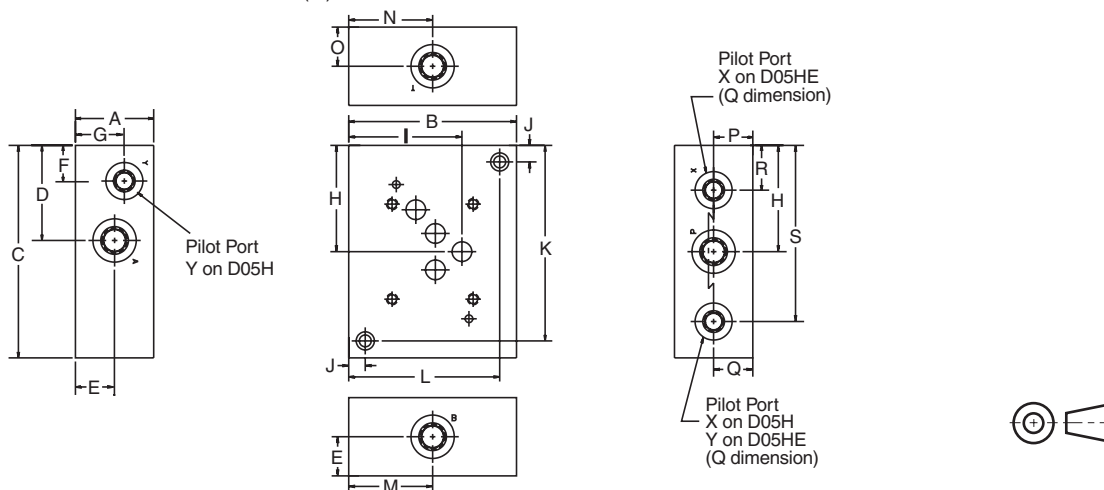
UNC Bolt Kits for use with D3W, D3, D31VW, D31DW Directional Control Valves & Sandwich Valves				
	Number of Sandwich Valves @2.00" (50mm) thickness			
	0	1	2	3
D3-32, D31VW-91, D31DW-91, D3P	BK98 1.625"	BK141 3.50"	BK142 5.50"	BK143 7.50"
D3-32, D31VW-91, D31DW-91, D3P plus tapping plate	BK166 2.50"	BK167 4.50"	BK168 6.50"	BK169 8.50"

Note: All bolts are SAE grade 8, 1/4-20 UNC-2A thread, torque to 16 N.m. (12 ft.-lbs.)

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Side Ported Subplate — NFPA D05, D05H and D05HE

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



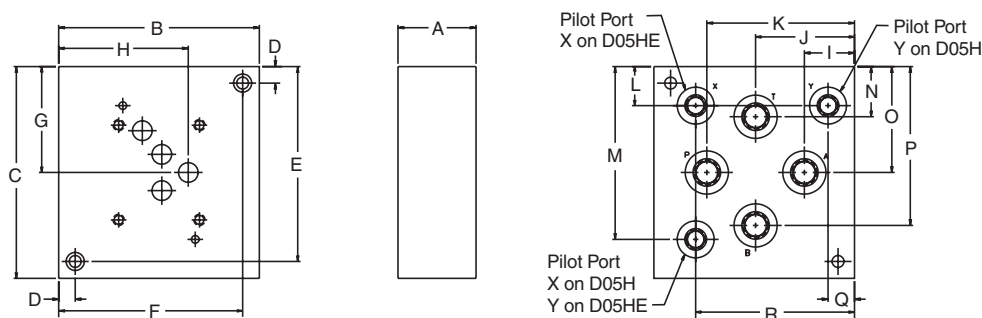
Dimensions	A	B	C	D	E	F*	G*	H	I	J	K	L	M	N	O	P	Q*	R*	S*
SPD31V**A*	44.5 (1.75)	95.3 (3.75)	120.7 (4.75)	54.1 (2.13)	22.4 (0.88)	20.6 (0.81)	22.4 (0.88)	60.2 (2.37)	64.3 (2.53)	9.7 (0.38)	111.0 (4.37)	85.9 (3.38)	47.8 (1.88)	47.8 (1.88)	22.4 (0.88)	22.4 (0.88)	22.4 (0.88)	—	100.1 (3.94)
SPD31D**A*	44.5 (1.75)	95.3 (3.75)	120.7 (4.75)	54.1 (2.13)	22.4 (0.88)	—	—	60.2 (2.37)	64.3 (2.53)	9.7 (0.38)	111.0 (4.37)	85.9 (3.38)	47.8 (1.88)	47.8 (1.88)	22.4 (0.88)	22.4 (0.88)	11.2 (0.44)	25.4 (1.00)	100.1 (3.94)

See Mounting Bolt Kits for bolt information.

* Not available with high flow option.

Bottom Ported Subplate — NFPA D05, D05H and D05HE

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



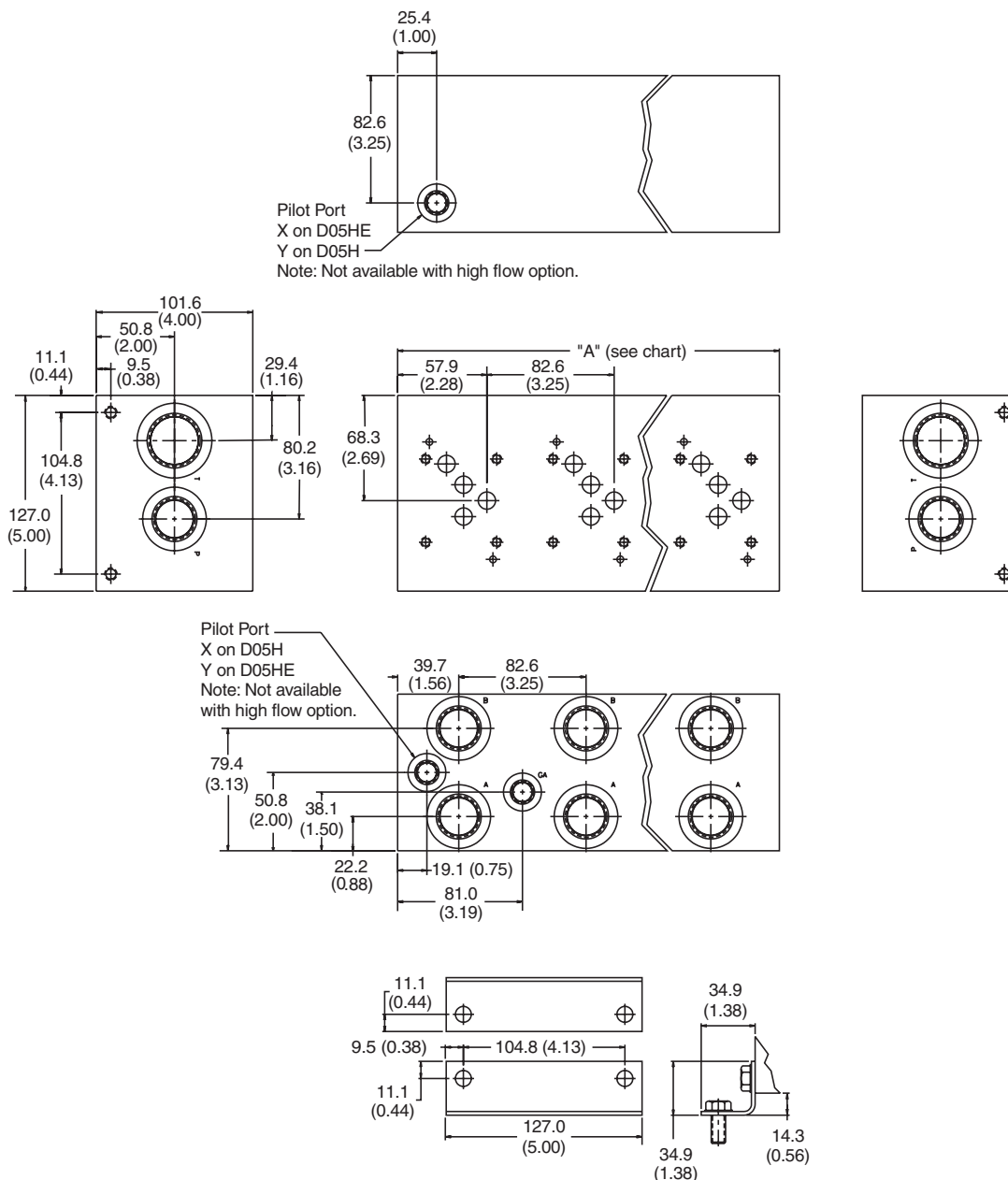
Dimension	A	B	C	D	E	F	G	H	I	J	K	L*	M*	N	O	P	Q*	R*
SPD31V***	44.5 (1.75)	114.3 (4.50)	120.7 (4.75)	9.7 (0.38)	111.3 (4.38)	104.9 (4.13)	60.2 (2.37)	73.9 (2.91)	28.4 (1.12)	56.4 (2.22)	84.1 (3.31)	22.4 (0.88)	98.6 (3.88)	28.7 (1.13)	60.5 (2.38)	90.4 (3.56)	15.0 (0.59)	90.4 (3.56)
SPD31D***	44.5 (1.75)	114.3 (4.50)	120.7 (4.75)	9.7 (0.38)	111.3 (4.38)	104.9 (4.13)	60.2 (2.37)	73.9 (2.91)	28.4 (1.12)	56.4 (2.22)	84.1 (3.31)	20.6 (0.81)	100.1 (3.94)	28.7 (1.13)	60.5 (2.38)	90.4 (3.56)	—	88.9 (3.50)

See Mounting Bolt Kits for bolt information.

* Not available with high flow option.

Series D3P and High Flow
Manifold — NFPA D05, D05H and D05HE

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

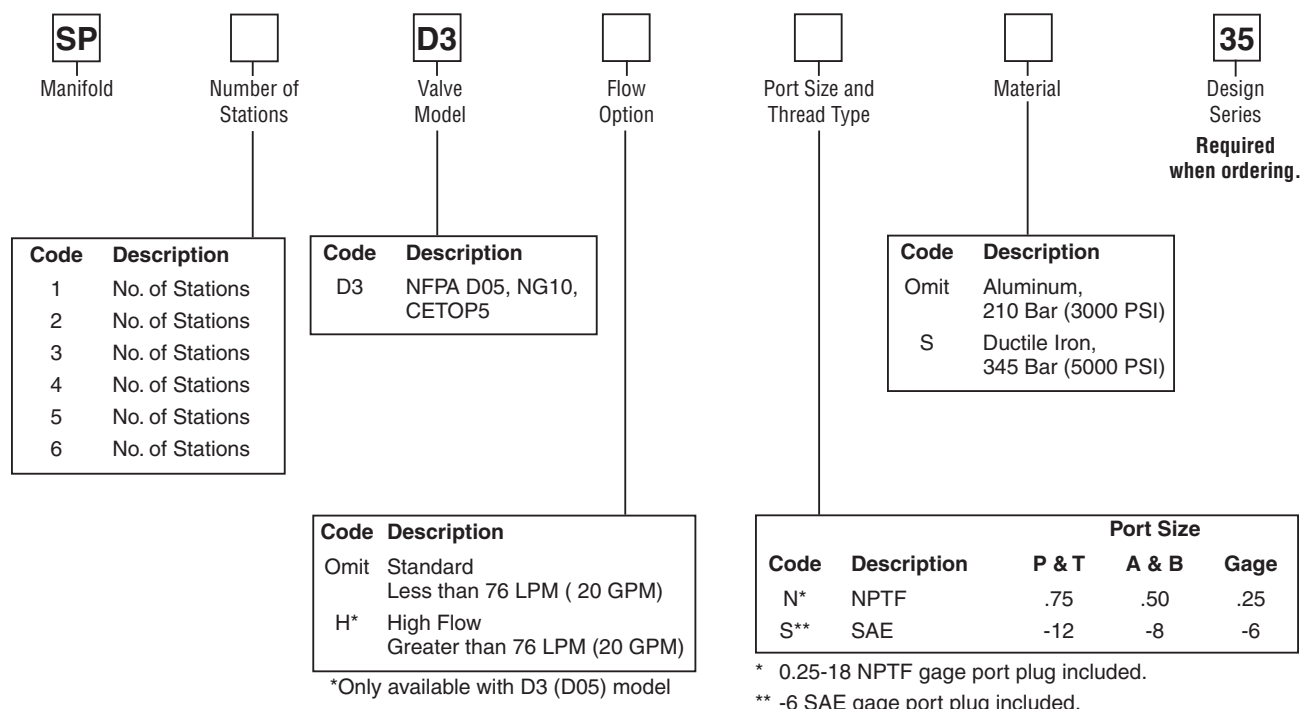


Mounting Hardware
(See Ordering Information for Mounting Hardware details)

No. of Stations	1	2	3	4	5	6
"A" Length mm (inch)	82.6 (3.25)	165.1 (6.50)	247.7 (9.75)	330.2 (13.00)	412.8 (16.25)	495.3 (19.50)
Weight Alum. kg (lbs.)	15.4 (7.00)	26.5 (12.00)	37.5 (17.00)	48.5 (22.00)	59.5 (27.00)	72.8 (33.00)
Weight Iron kg (lbs.)	41.9 (19.00)	83.8 (38.00)	125.7 (57.00)	165.4 (75.00)	187.4 (85.00)	249.2 (113.00)

See Mounting Bolt Kits for bolt information.

Series D3 Manifolds



Mounting hardware supplied with manifold includes:

- (2) steel brackets
- For SAE and NPTF ports:
- (8) 5/16-18 UNC x .63 hex washer cap screws

Valve mounting threads:

- 0.25-20 UNC x 0.75 DP.
- Used for SAE and NPTF ports.

Note: 35 Design Series manifolds conform to NFPA mounting pattern specifications, but may be dimensionally different from previous design series.

No. Stations	1	2	3	4	5	6
Wgt., Alum, kg (lbs.)	1.8 (4)	3.7 (8)	5.0 (11)	6.4 (14)	7.8 (17)	9.6 (21)
Wgt., Iron, kg (lbs.)	4.1 (9)	7.8 (17)	11.9 (26)	15.6 (34)	19.7 (43)	23.3 (51)

Mounting Bolt Kits

UNC Bolt Kits for use with D3W and D3 Directional Control Valves & Sandwich Valves				
	Number of Sandwich Valves @2.00" (50mm) thickness			
	0	1	2	3
D3-32	BK98 1.625"	BK141 3.50"	BK142 5.50"	BK143 7.50"
D3-32 plus tapping plate	BK166 2.50"	BK167 4.50"	BK168 6.50"	BK169 8.50"

Note: All bolts are SAE grade 8, 1/4-20 UNC-2A thread, torque to 16 N.m. (12 ft.-lbs.)

Series D31 and D3P Manifolds

SP Manifold	Number of Stations	Valve Model	Port Size and Thread Type	Material	35 Design Series Required when ordering.
--	--	---	---	--	---

Code	Description
1	No. of Stations
2	No. of Stations
3	No. of Stations
4	No. of Stations
5	No. of Stations
6	No. of Stations

Code	Description
Omit	Aluminum, 210 Bar (3000 PSI)
S	Ductile Iron, 345 Bar (5000 PSI)

Code	Description	Port Size			
		P, A, B	T	X, Y	Gage
N*	NPTF	.75	1.00	.38	.25
S**	SAE	-12	-16	-6	-6

Code	Description
D31V	NFPA D05H, D3P
D31D	NFPA D05HE, NG10, CETOP5H

D31 manifolds come standard with high flow capability.

* 0.25-18 NPTF gage port plug included.
 ** -6 SAE gage port plug included.

Mounting hardware supplied with manifold includes:

- (2) steel brackets
- For SAE and NPTF ports:
- (8) 3/8-16 UNC x .88 HHCS
- and (8) .38 SAE N series washers

Valve mounting threads:
 0.25-20 UNC x 0.75 DP.
 Used for SAE and NPTF ports.

Note: 35 Design Series manifolds conform to NFPA mounting pattern specifications, but may be dimensionally different from previous design series.

No. Stations	1	2	3	4	5	6
Wgt., Alum, kg (lbs.)	3.2 (7)	5.5 (12)	7.8 (17)	10.1 (22)	12.3 (27)	15.1 (33)
Wgt., Iron, kg (lbs.)	8.7 (19)	17.4 (38)	26.1 (57)	34.3 (75)	38.9 (85)	51.7 (113)

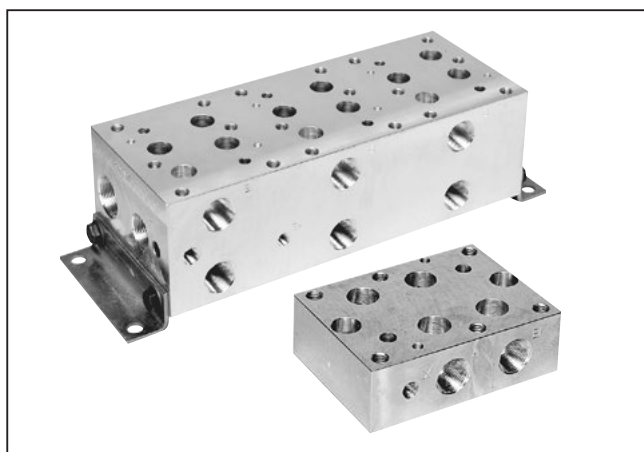
Mounting Bolt Kits

UNC Bolt Kits for use with D3P, D31VW and D31DW Directional Control Valves & Sandwich Valves (D31V*-91 Design, Solenoid Operated)				
	Number of Sandwich Valves @ 2.00" (50mm) thickness			
	0	1	2	3
D31VW-91, D3P D31DW-91	BK98 1.625"	BK141 3.50"	BK142 5.50"	BK143 7.50"
D31VW-91, D3P D31DW-91 plus tapping plate	BK166 2.50"	BK167 4.50"	BK168 6.50"	BK169 8.50"

Note: All bolts are SAE grade 8, 1/4-20 UNC-2A thread, torque to 16 N.m. (12 ft.-lbs.)

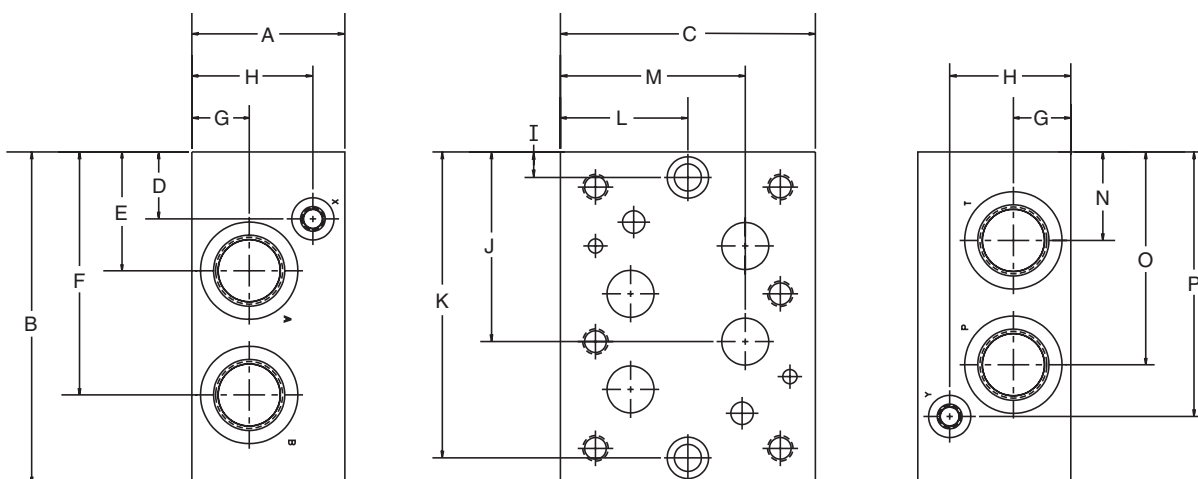
Features

- **Aluminum or steel available** — Flexibility for applying to different system pressures
- **NPT and SAE thread options available** — Flexibility to plumb into existing systems
- **Multiple port sizes available** — Eliminates need for reducers and expander at subplate connection



Side Ported Subplate — NFPA D08

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



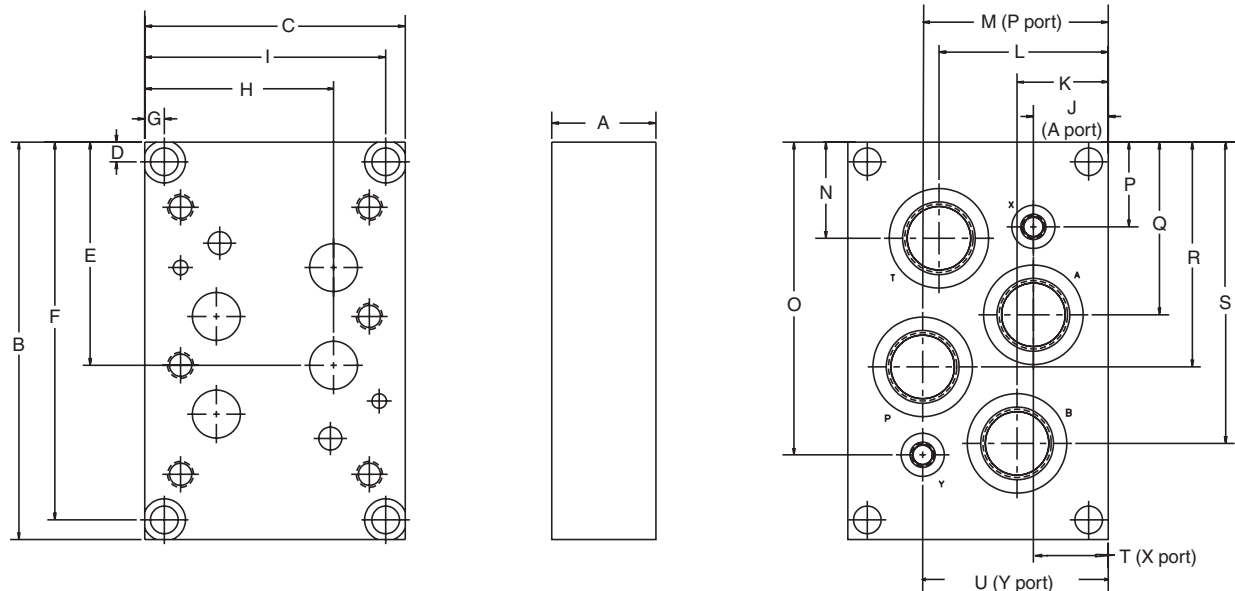
Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
SPD68*A*	50.8	155.7	114.3	30.2	64.3	115.1	25.4	25.4	12.7	89.7	142.7	57.2	85.9	40.4	91.2	125.5
SPD66NA*	(2.00)	(6.13)	(4.50)	(1.19)	(2.53)	(4.53)	(1.00)	(1.00)	(0.50)	(3.53)	(5.62)	(2.25)	(3.38)	(1.59)	(3.59)	(4.94)
SPD610*A*	76.2	165.1	127.0	33.3	59.2	121.2	28.7	60.5	12.7	94.5	152.4	63.5	92.2	43.9	105.9	131.8
	(3.00)	(6.50)	(5.00)	(1.31)	(2.33)	(4.77)	(1.13)	(2.38)	(0.50)	(3.72)	(6.00)	(2.50)	(3.63)	(1.73)	(4.17)	(5.19)

See Mounting Bolt Kits for bolt information.

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Series D6 and D8
Bottom Ported Subplate — NFPA D08

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



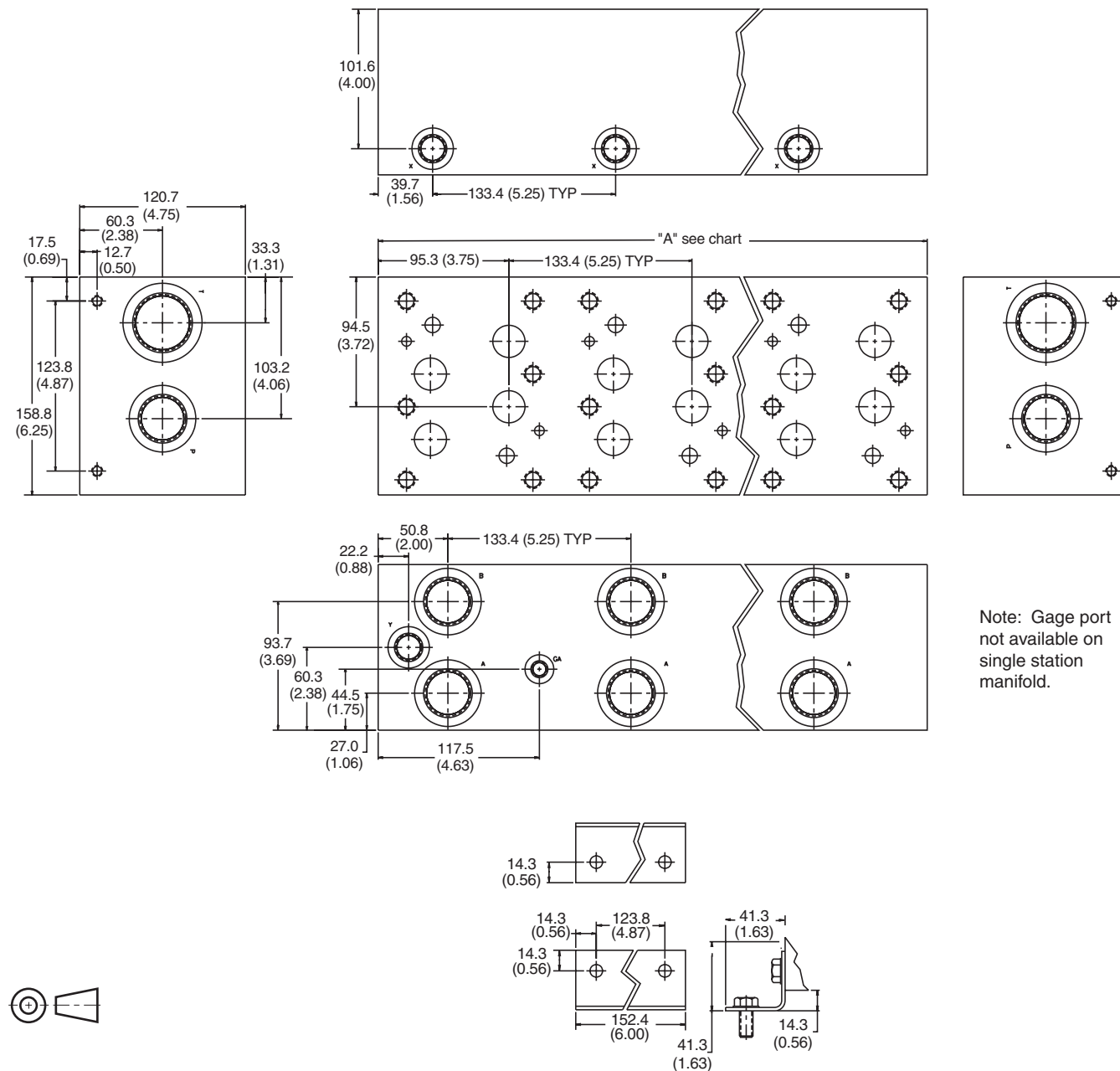
Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
SPD68**	38.1	155.7	117.6	12.7	89.7	142.7	58.7	87.4	—	30.2	30.2	87.4	87.4	42.2	125.5	30.2	65.8	89.7	113.5	31.8	85.9
SPD66N*	(1.50)	(6.13)	(4.63)	(0.50)	(3.53)	(5.62)	(2.31)	(3.44)	—	(1.19)	(1.19)	(3.44)	(3.44)	(1.66)	(4.94)	(1.19)	(2.59)	(3.53)	(4.47)	(1.25)	(3.38)
SPD610**	50.8	193.8	127.0	9.7	108.7	184.2	9.7	92.2	117.6	36.6	44.5	82.6	90.4	46.7	152.4	41.4	84.1	109.5	146.8	36.6	90.4
	(2.00)	(7.63)	(5.00)	(0.38)	(4.28)	(7.25)	(0.38)	(3.63)	(4.63)	(1.44)	(1.75)	(3.25)	(3.56)	(1.84)	(6.00)	(1.63)	(3.31)	(4.31)	(5.78)	(1.44)	(3.56)

See Mounting Bolt Kits for bolt information.

Series D6 and D8

Manifold — NFPA D08

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



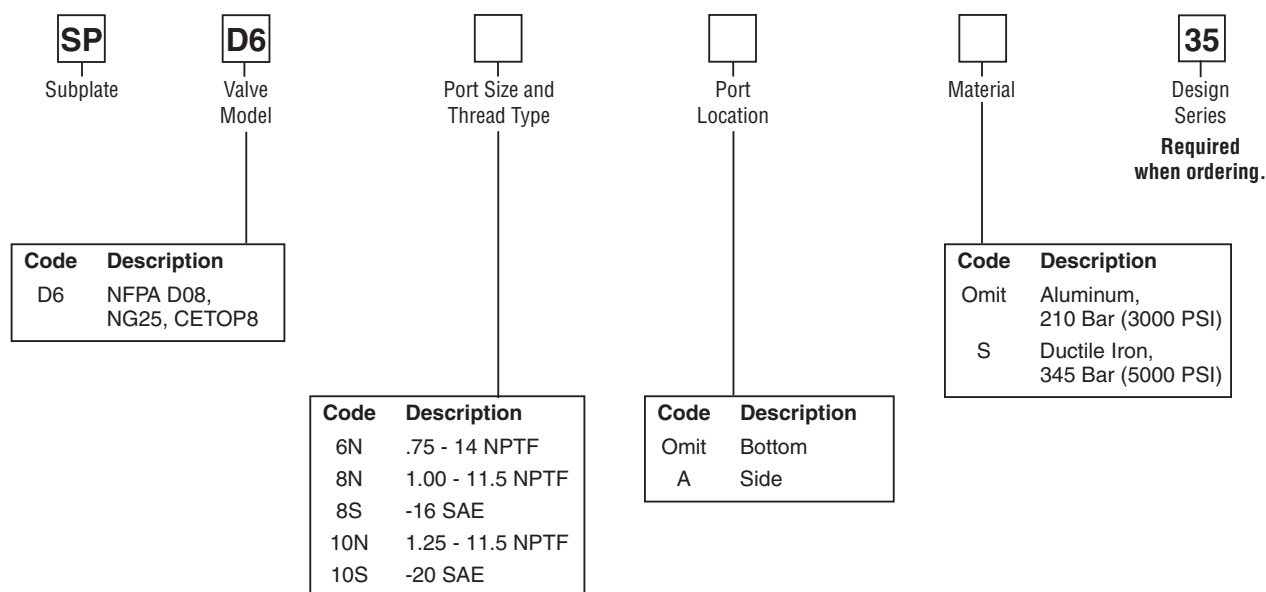
Note: Gage port
not available on
single station
manifold.

Mounting Hardware
(See Ordering Information for Mounting Hardware details)

No. of Stations	1	2	3	4	5
"A" Length mm (inch)	133.35 (5.25)	266.7 (10.50)	400.05 (15.75)	533.4 (21.00)	666.75 (26.25)
Weight Alum. kg (lbs.)	5 (12)	11 (24)	16 (35)	22 (49)	28 (61)
Weight Iron kg (lbs.)	20 (45)	41 (90)	62 (136)	82 (181)	103 (226)

See Mounting Bolt Kits for bolt information.

Series D6 and D8 Subplates



Mounting Hardware supplied with subplate includes:

Subplates	Mounting Hardware	Qty.
SPD66NA*	.50-13 UNC x	2
SPD68NA*	1.75 LG. SHCS	
SPD68SA*		
SPD610NA*	.50-13 UNC x	2
SPD610SA*	3.00 LG. SHCS	
SPD66N*	.50-13 UNC x	2
SPD68N*	1.50 LG. SHCS	
SPD68S*		
SPD610N*	.38-16 UNC x	4
SPD610S*	2.00 LG. SHCS	

Valve mounting threads:
0.50-13 UNC x 1.19 DP.
Used for SAE and NPTF ports.

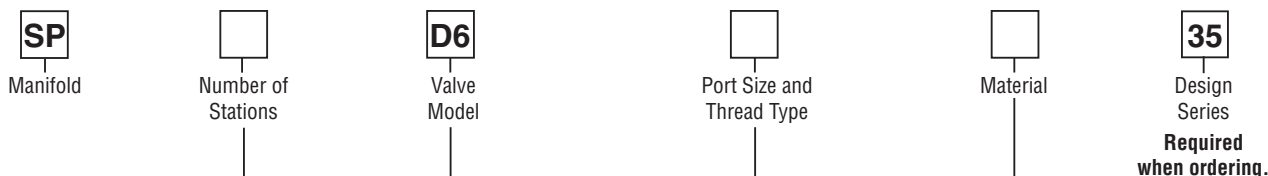
Note: 35 Design Series subplates conform to NFPA mounting pattern specifications, but may be dimensionally different from previous design series.

Mounting Bolt Kits

UNC Bolt Kits for use with D6 and D8 Directional Control Valves & Sandwich Valves				
	Number of Sandwich Valves @ 2.75" (70mm) thickness			
	0	1	2	3
D6	BK227 2.50"	BK121 5.25"	BK122 8.00"	BK123 10.75"
D6 plus tapping plate	BK161 3.50"	BK170 6.25"	BK171 9.00"	BK172 11.75"
D8	BK228 3.00"	BK131 5.75"	BK132 8.50"	BK133 11.25"
D8 plus tapping plate	BK173 4.00"	BK174 6.75"	BK175 9.50"	BK114 12.125"

Note: All bolts are SAE grade 8, 1/2-13 UNC-3A thread, torque to 133 N.m. (100 ft.-lbs.)

Series D6 and D8 Manifolds



Code	Description
1	No. of Stations
2	No. of Stations
3	No. of Stations
4	No. of Stations
5	No. of Stations

Code	Description
D6	NFPA D08, NG25, CETOP8

Code	Description
Omit	Aluminum, 210 Bar (3000 PSI)
S	Ductile Iron, 345 Bar (5000 PSI)

Port Size						
Code	Description	P, A, B	T	Y	X (opt.)	Gage
N*	NPTF	1.00	1.25	.38	.25	.25
S**	SAE	-16	-20	-8	-4	-6

Mounting hardware supplied with manifold includes:
 (2) steel brackets
 For SAE and NPTF ports:
 (8) 1/2-13 UNC x 1.00 HHCS
 (8) .50 SAE N Series washers

Valve mounting threads:
 0.50-13 UNC x 1.19 DP.
 Used for SAE and NPTF ports.

* 0.25-18 NPT gage port plug included.
 ** -6 SAE gage port plug included.

Note: 35 Design Series manifolds conform to NFPA mounting pattern specifications, but may be dimensionally different from previous design series.

No. Stations	1	2	3	4	5
Wgt., Alum, kg (lbs.)	5.5 (12)	11.0 (24)	16.0 (35)	22.4 (49)	27.9 (61)
Wgt., Iron, kg (lbs.)	20.6 (45)	41.1 (90)	62.2 (136)	82.7 (181)	103.3 (226)

Mounting Bolt Kits

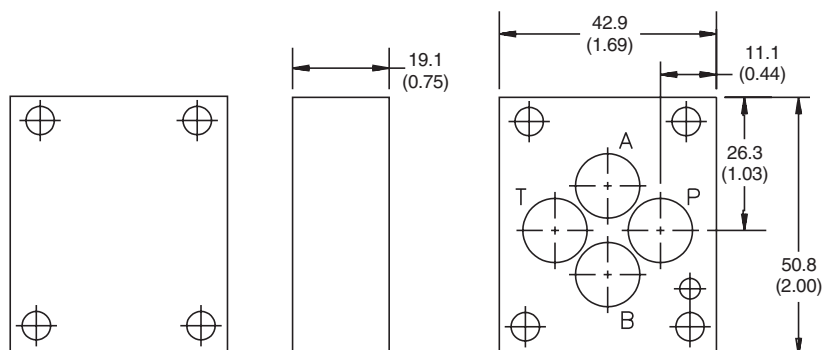
UNC Bolt Kits for use with D6 and D8 Directional Control Valves & Sandwich				
	Number of Sandwich @ 2.75" (70mm) thickness			
	0	1	2	3
D6	BK227 2.50"	BK121 5.25"	BK122 8.00"	BK123 10.75"
D6 plus tapping plate	BK161 3.50"	BK170 6.25"	BK171 9.00"	BK172 11.75"
D8	BK228 3.00"	BK131 5.75"	BK132 8.50"	BK133 11.25"
D8 plus tapping plate	BK173 4.00"	BK174 6.75"	BK175 9.50"	BK114 12.125"

Note: All bolts are SAE grade 8, 1/2-13 UNC-3A thread, torque to 133 N.m. (100 ft.-lbs.)

Dimensions

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

Cover Plate — NFPA D03



Note:

Mounting hardware supplied with cover plate.

Includes:

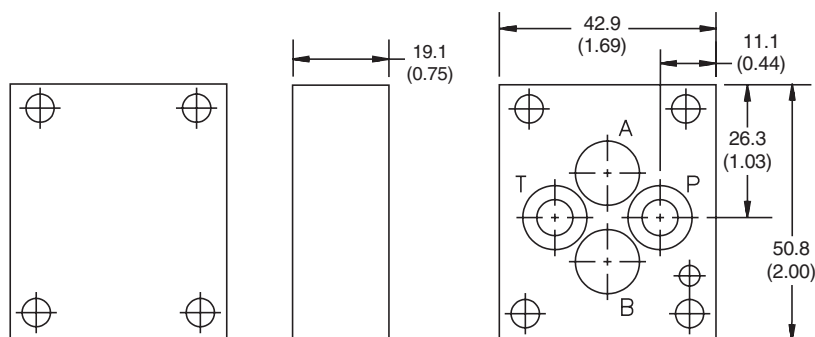
2-012V-7 O-ring, Qty. 4

Ø0.12 x .25 long locating pin, Qty. 1

10-24 UNC x 1.00 long SHCS, Qty. 4 (SPD2C1EN) or

M5-0.8 x 25 mm long SHCS, Qty. 4 (SPD2C1MN)

Crossover Plate, P→T ports — NFPA D03



Note:

Mounting hardware supplied with crossover plate.

Includes:

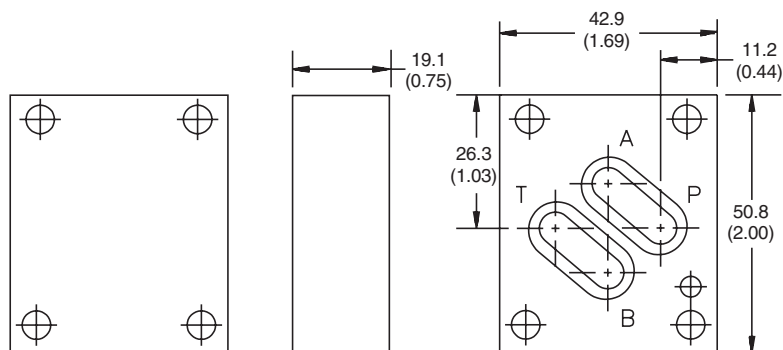
2-012V-7 O-ring, Qty. 4

Ø0.12 x .25 long locating pin, Qty. 1

10-24 UNC x 1.00 long SHCS, Qty. 4 (SPD2D1EN) or

M5-0.8 x 25 mm long SHCS, Qty. 4 (SPD2D1MN)

Crossover Plate, P→A and B→T ports — NFPA D03



Note:

Mounting hardware supplied with cover plate.

Includes:

2-016V-7 O-ring, Qty. 2

Ø0.12 x .25 long locating pin, Qty. 1

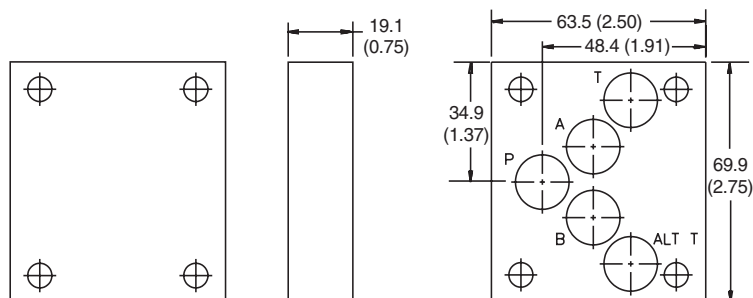
10-24 UNC x 1.00 long SHCS, Qty. 4 (SPD2A1EN) or

M5-0.8 x 25 mm long SHCS, Qty. 4 (SPD2A1MN)

Dimensions

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

Cover Plate — NFPA D05



Note:

Mounting hardware supplied with cover plate.

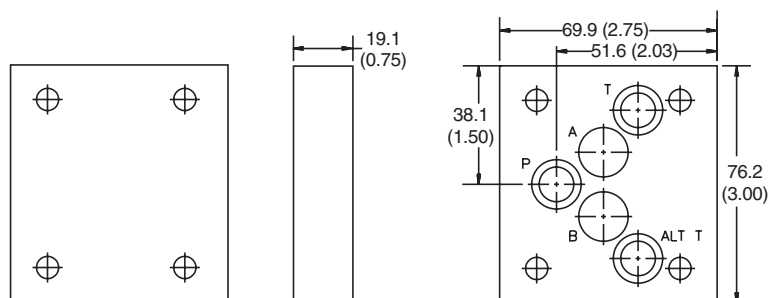
Includes:

2-014V-7 O-ring, Qty. 5

0.25-20 UNC x 1.25 long SHCS, Qty. 4 (SPD3C1EN) or

M6-1.0 x 30 mm long SHCS, Qty. 4 (SPD3C1MN)

Crossover Plate, P→T ports — NFPA D05



Note:

Mounting hardware supplied with crossover plate.

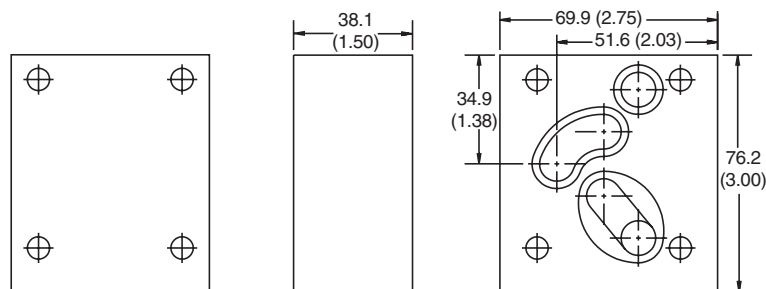
Includes:

2-014V-7 O-ring, Qty. 5

0.25-20 UNC x 1.25 long SHCS, Qty. 4 (SPD3D1EN) or

M6-1.0 x 30 mm long SHCS, Qty. 4 (SPD3D1MN)

Crossover Plate, P→A and B→T ports — NFPA D05



Note:

Mounting hardware supplied with crossover plate.

Includes:

2-014V-7 O-ring, Qty. 1

2-022V-7 +O-ring, Qty. 2

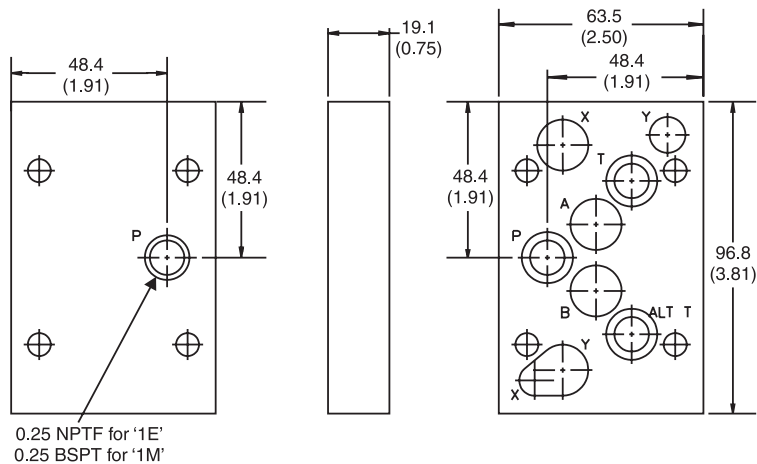
0.25-20 UNC x 2.00 long SHCS, Qty. 4 (SPD3A1EN) or

M6-1.0 x 50 mm long SHCS, Qty. 4 (SPD3A1MN)

Dimensions

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

Cover Plate — NFPA D05H



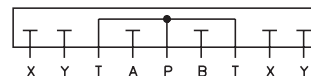
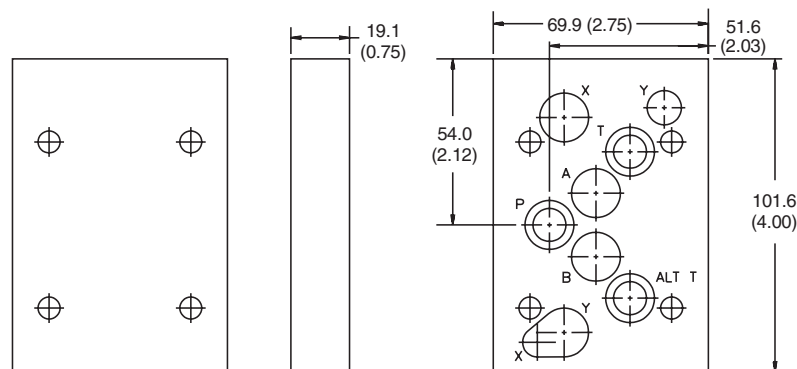
Note:

Mounting hardware supplied with cover plate.

Includes:

- 2-011V-7 O-ring, Qty. 1
- 2-014V-7 O-ring, Qty. 6
- 2-016V-7 O-ring, Qty. 1
- 0.25-18 NPTF plug, Qty. 1 (SPD31VC1EN only)
- 0.25-20 UNC x 1.25 long SHCS, Qty. 4 (SPD31VC1EN) or
- M6-1.0 x 30 mm long SHCS, Qty. 4 (SPD31VC1MN)

Crossover Plate, P→T ports — NFPA D05H



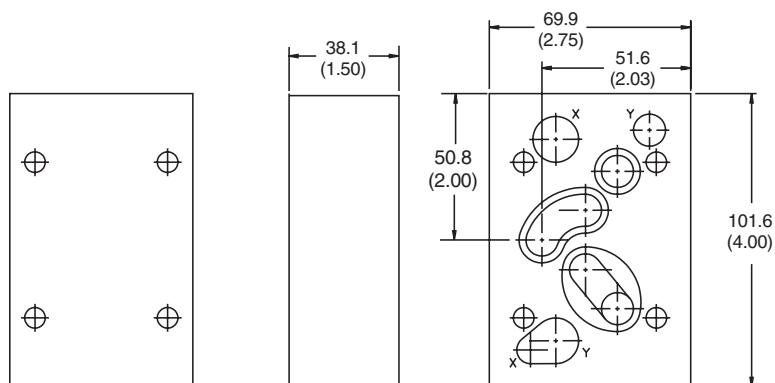
Note:

Mounting hardware supplied with crossover plate.

Includes:

- 2-011V-7 O-ring, Qty. 1
- 2-014V-7 O-ring, Qty. 6
- 2-016V-7 O-ring, Qty. 1
- 0.25-20 UNC x 1.25 long SHCS, Qty. 4 (SPD31VD1EN) or
- M6-1.0 x 30 mm long SHCS, Qty. 4 (SPD31VD1MN)

Crossover Plate, P→A and B→T ports — NFPA D05H



Note:

Mounting hardware supplied with crossover plate.

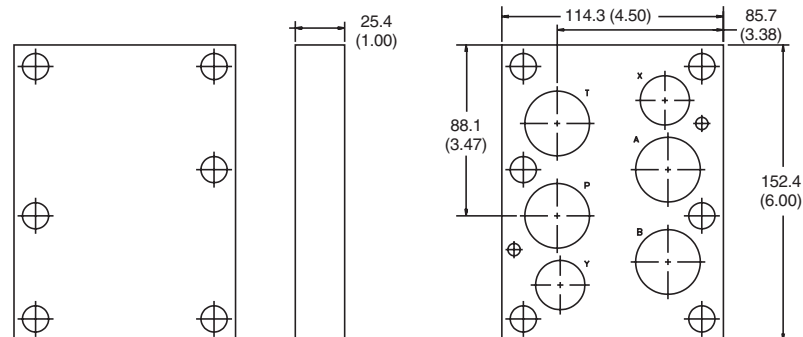
Includes:

- 2-011V-7 O-ring, Qty. 1
- 2-014V-7 O-ring, Qty. 2
- 2-016V-7 O-ring, Qty. 1
- 2-022V-7 O-ring, Qty. 2
- 0.25-20 UNC x 2.00 long SHCS, Qty. 4 (SPD31VA1EN) or
- M6-1.0 x 50 mm long SHCS, Qty. 4 (SPD31VA1MN)

Dimensions

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

Cover Plate — NFPA D08



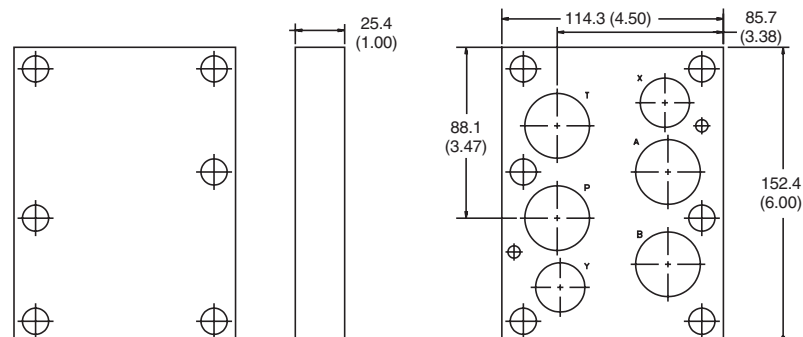
Note:

Mounting hardware supplied with cover plate.

Includes:

- 2-210V-7 O-ring, Qty. 2
- 2-215V-7 O-ring, Qty. 4
- 0.50-13 UNC x 1.75 long SHCS, Qty. 6 (SPD6C1EN) or M12-1.75 x 45 mm long SHCS, Qty. 6 (SPD6C1MN)
- 0.25 x 0.50 long locating pins, Qty. 2

Crossover Plate, P→T ports — NFPA D08



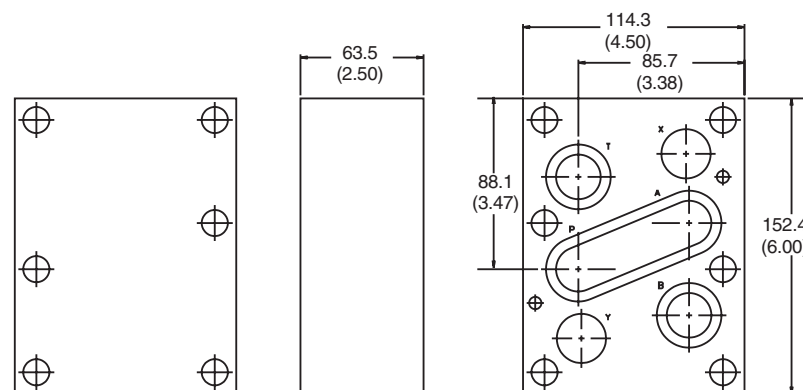
Note:

Mounting hardware supplied with cover plate.

Includes:

- 2-210V-7 O-ring, Qty. 2
- 2-215V-7 O-ring, Qty. 4
- 0.50-13 UNC x 1.75 long SHCS, Qty. 6 (SPD6C1EN) or M12-1.75 x 45 mm long SHCS, Qty. 6 (SPD6C1MN)
- 0.25 x 0.50 long locating pins, Qty. 2

Crossover Plate, P→A and B→T ports — NFPA D08



Note:

Mounting hardware supplied with crossover plate.

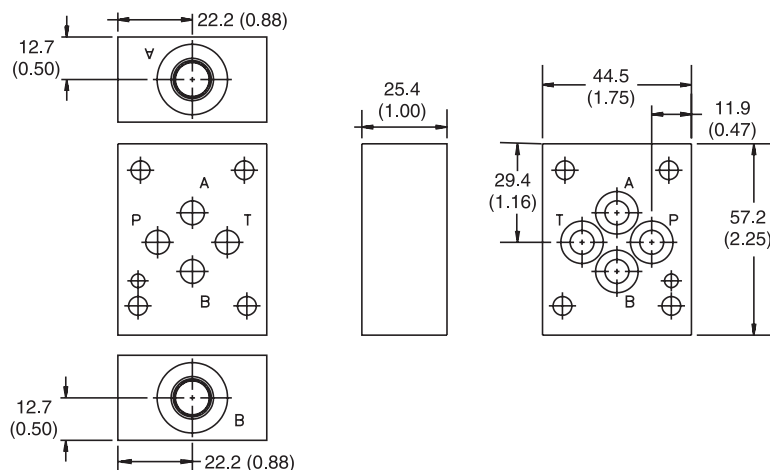
Includes:

- 2-210V-7 O-ring, Qty. 2
- 2-215V-7 O-ring, Qty. 2
- 2-231V-7 O-ring, Qty. 1
- 0.50-13 UNC x 3.50 long SHCS, Qty. 6 (SPD6A1EN) or M12-1.75 x 90 mm long SHCS, Qty. 6 (SPD6A1MN)
- 0.25 x 0.50 long locating pins, Qty. 2

Dimensions

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

Tapping Plate, A and B ports — NFPA D03



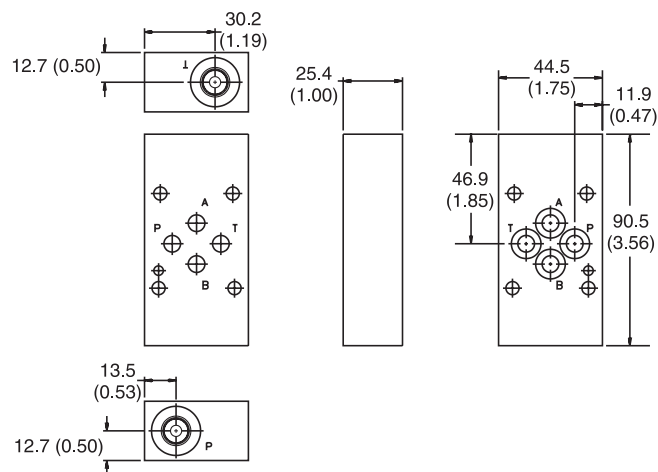
Note:

Interface seal kit provided with tapping plate.

Includes:

- 2-012V-7 O-ring, Qty. 4
- Ø0.12 x .25 long locating pin, Qty. 1
- 0.25-18 NPTF Plug, Qty. 1 (NPTF port only)
- 4 SAE Hex Socket Plug, Qty., 1 (SAE port only)

Tapping Plate, P and T ports — NFPA D03



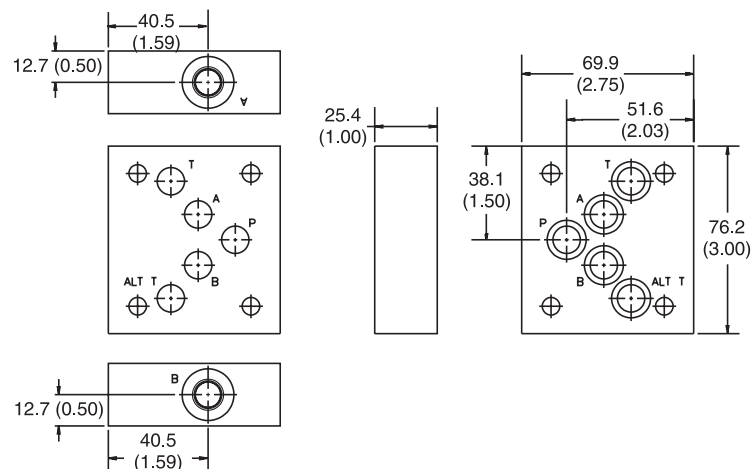
Note:

Interface seal kit provided with tapping plate.

Includes:

- 2-012V-7 O-ring, Qty. 4
- Ø0.12 x .25 long locating pin, Qty. 1
- 0.25-18 NPTF Plug, Qty. 1 (NPTF port only)
- 4 SAE Hex Socket Plug, Qty., 1 (SAE port only)

Tapping Plate, A and B ports — NFPA D05



Note:

Interface seal kit provided with tapping plate.

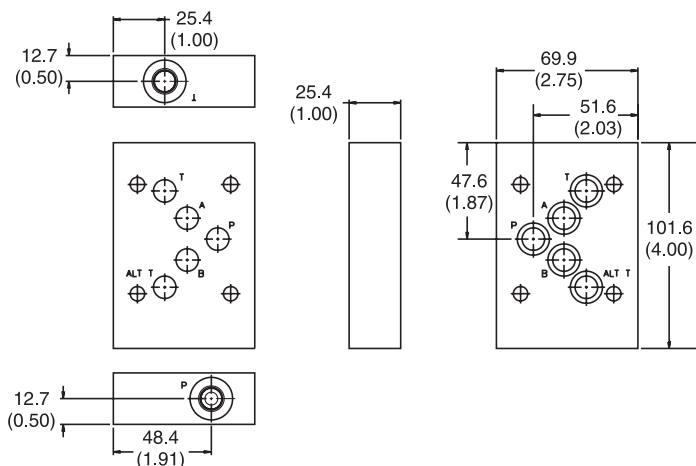
Includes:

- 2-014V-7 O-ring, Qty. 5
- 0.25-18 NPTF Plug, Qty. 1 (NPTF port only)
- 4 SAE Hex Socket Plug, Qty., 1 (SAE port only)

Dimensions

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

Tapping Plate, P and T ports — NFPA D05

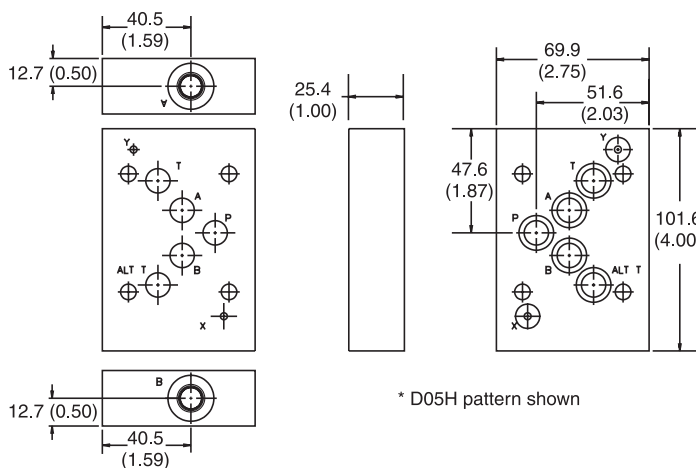
**Note:**

Interface seal kit provided with tapping plate.

Includes:

- 2-014V-7 O-ring, Qty. 5
- 0.25-18 NPTF Plug, Qty. 1 (NPTF port only)
- 4 SAE Hex Socket Plug, Qty., 1 (SAE port only)

Tapping Plate, A and B ports — NFPA D05H and D05HE (E)



* D05H pattern shown

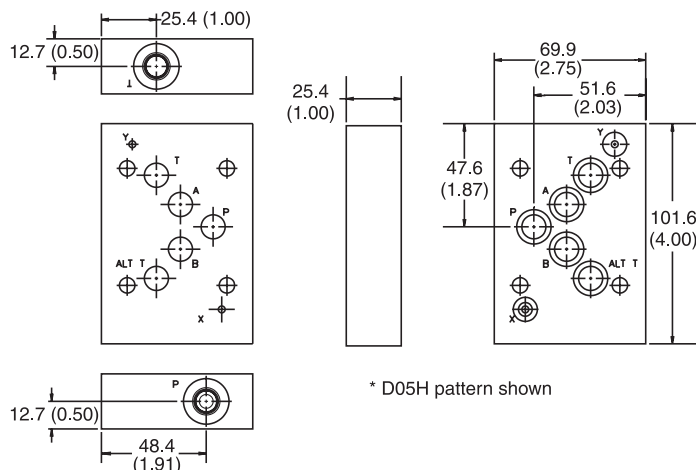
Note:

Interface seal kit provided with tapping plate.

Includes:

- SPD31VT2*W* :
 - 2-011V-7 O-ring, Qty. 2
 - 2-014V-7 O-ring, Qty. 5
- SPD31DT2*W*:
 - 2-014V-7 O-ring, Qty. 7
 - 0.25-18 NPTF Plug, Qty. 1 (NPTF port only)
 - 4 SAE Hex Socket Plug, Qty., 1 (SAE port only)

Tapping Plate, P and T ports — NFPA D05H and D05HE



* D05H pattern shown

Note:

Interface seal kit provided with tapping plate.

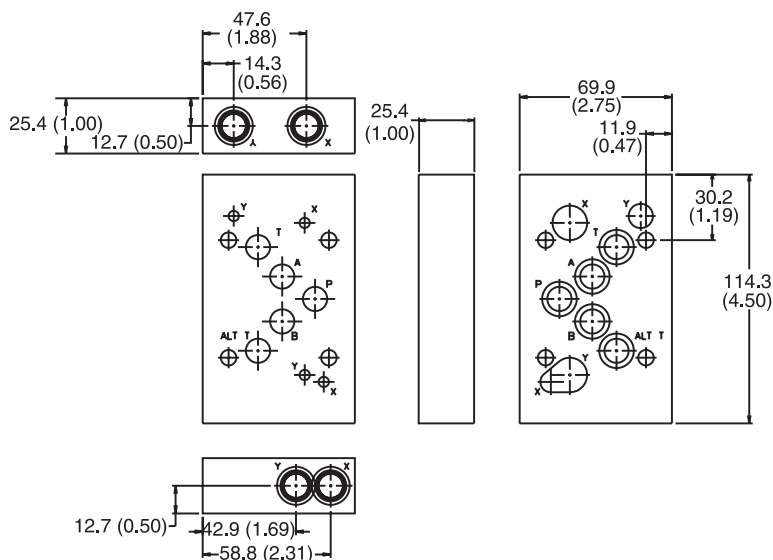
Includes:

- SPD31VT2*P*:
 - 2-011V-7 O-ring, Qty. 2
 - 2-014V-7 O-ring, Qty. 5
- SPD31DT2*P*:
 - 2-014V-7 O-ring, Qty. 7
 - 0.25-18 NPTF Plug, Qty. 1 (NPTF port only)
 - 4 SAE Hex Socket Plug, Qty., 1 (SAE port only)

Dimensions

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

Tapping Plate, X and Y ports — NFPA D05H and D05HE

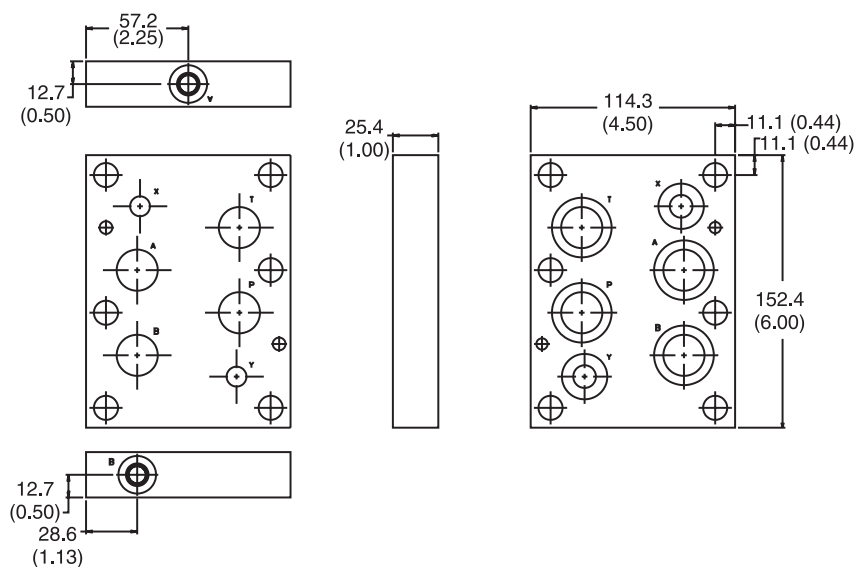
**Note:**

Interface seal kit provided with tapping plate.

Includes:

- 2-011V-7 O-ring, Qty. 1
- 2-014V-7 O-ring, Qty. 6
- 2-016V-7 O-ring, Qty. 1
- 0.25-18 NPTF Plug, Qty. 3 (NPTF port only)
- 4 SAE Hex Socket Plug, Qty. 3 (SAE port only)

Tapping Plate, A and B ports — NFPA D08

**Note:**

Interface seal kit provided with tapping plate.

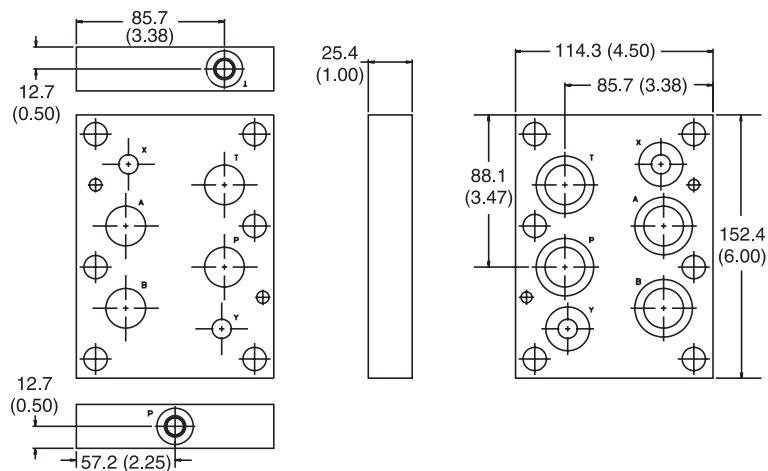
Includes:

- 2-210V-7 O-ring, Qty. 2
- 2-215V-7 O-ring, Qty. 4
- Ø.25 x .50 long locating pin, Qty. 2
- 0.25-18 NPTF Plug, Qty. 1 (NPTF port only)
- 4 SAE Hex Socket Plug, Qty. 1 (SAE port only)

Dimensions

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

Tapping Plate, P and T ports — NFPA D08



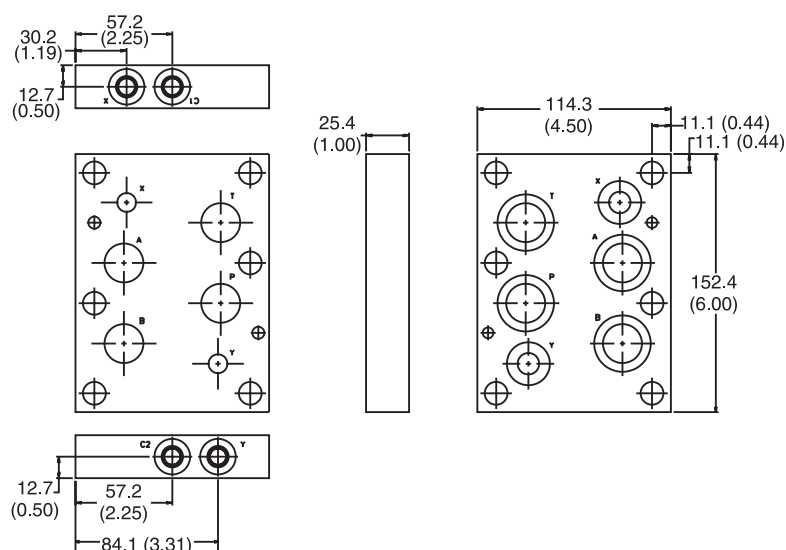
Note:

Interface seal kit provided with tapping plate.

Includes:

- 2-210V-7 O-ring, Qty. 2
- 2-215V-7 O-ring, Qty. 4
- Ø.25 x .50 long locating pin, Qty. 2
- 0.25-18 NPTF Plug, Qty. 1 (NPTF port only)
- 4 SAE Hex Socket Plug, Qty. 1 (SAE port only)

Tapping Plate, X and Y ports — NFPA D08



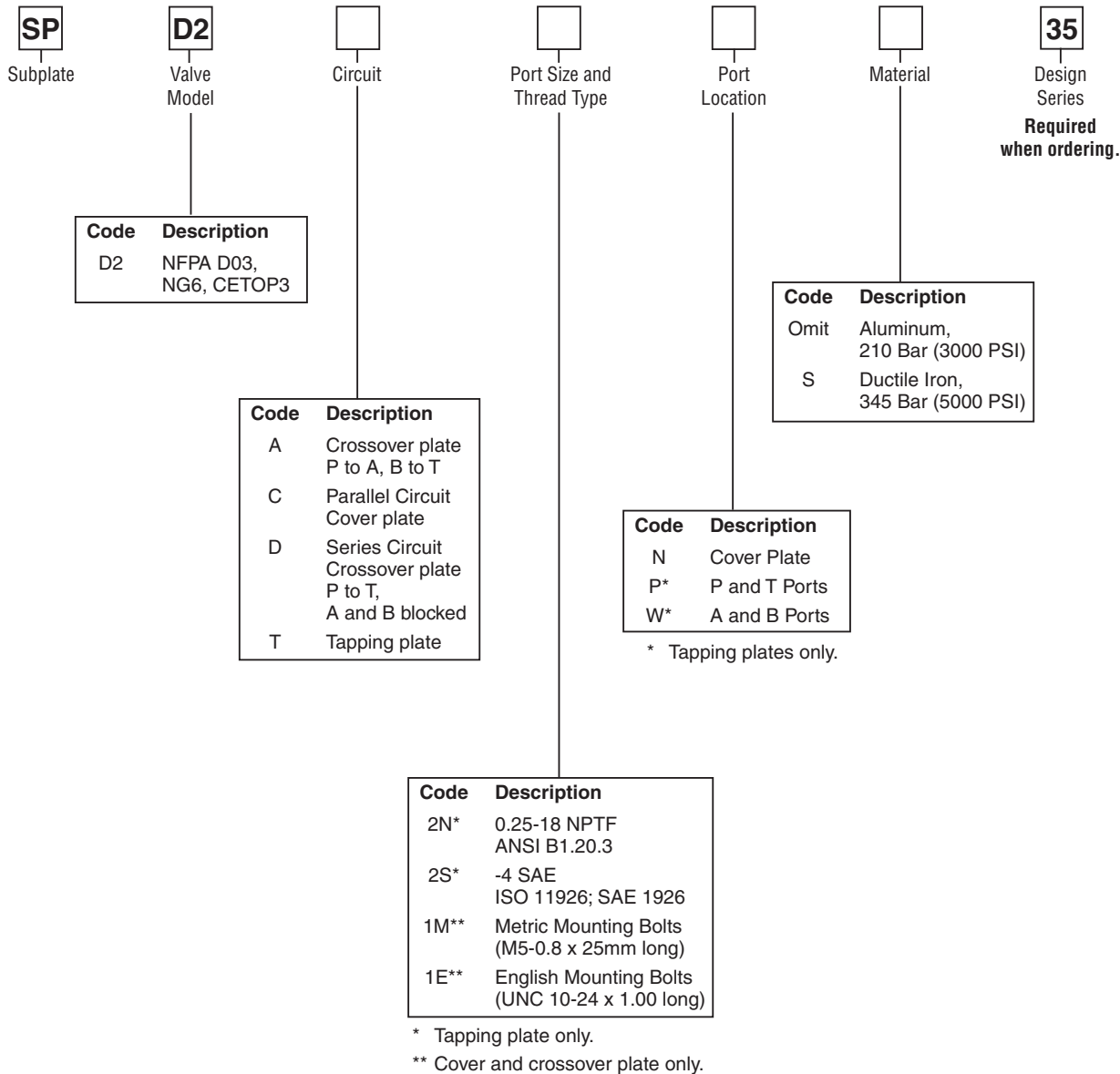
Note:

Interface seal kit provided with tapping plate.

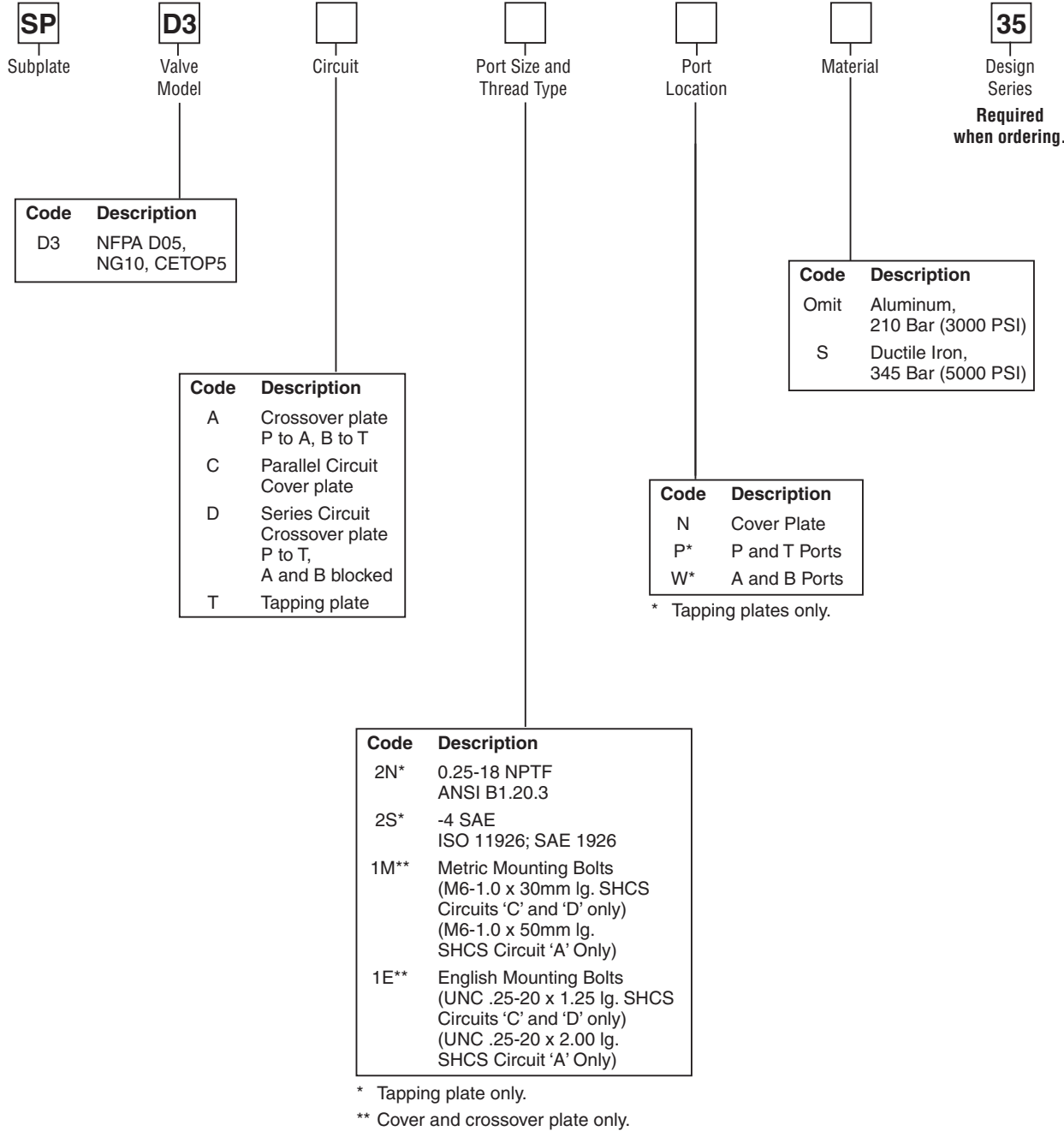
Includes:

- 2-210V-7 O-ring, Qty. 2
- 2-215V-7 O-ring, Qty. 4
- Ø.25 x .50 long locating pin, Qty. 2
- 0.25-18 NPTF Plug, Qty. 3 (NPTF port only)
- 4 SAE Hex Socket Plug, Qty. 3 (SAE port only)

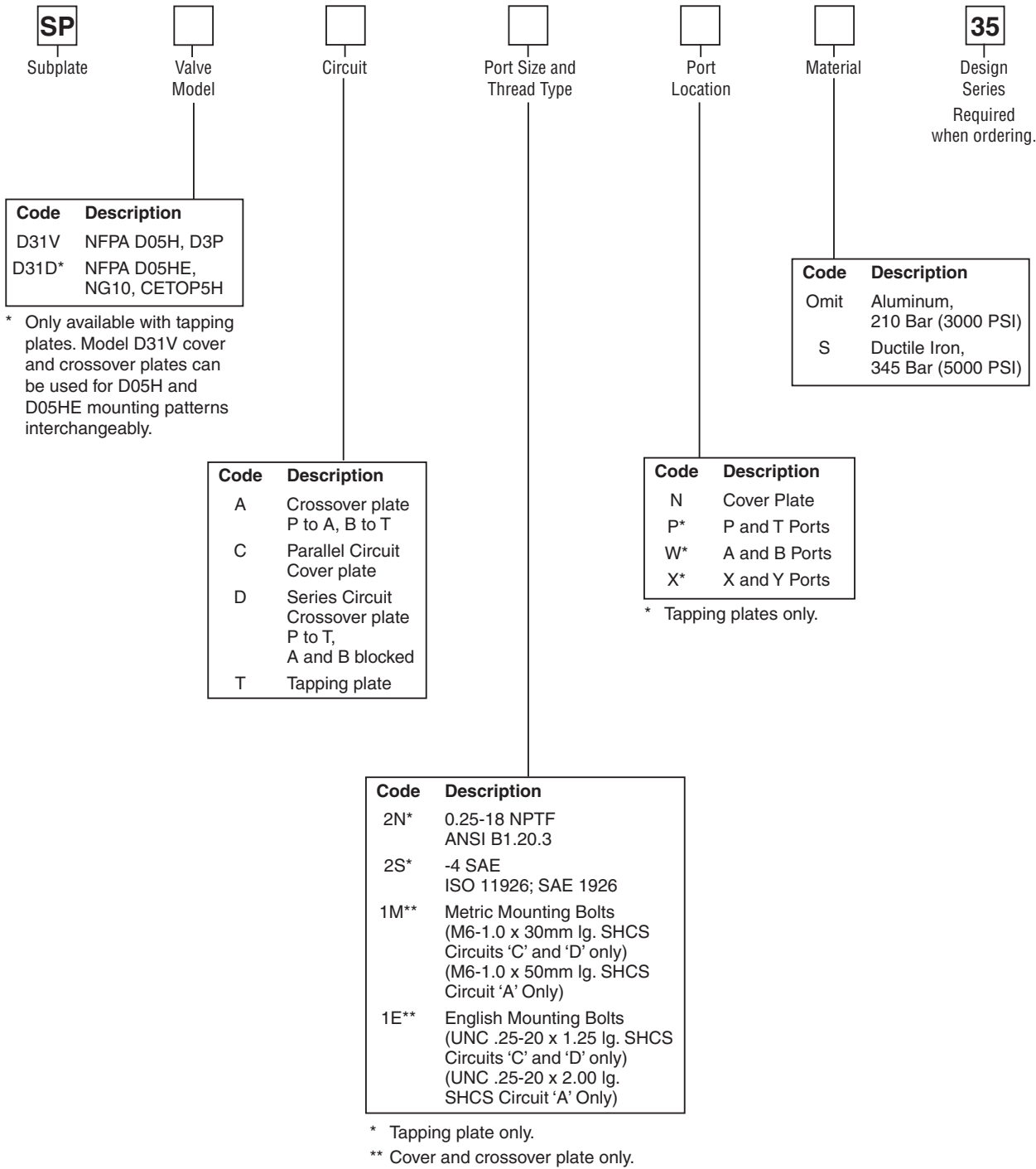
Ordering Information
Series D1V Tapping and Cover Plates



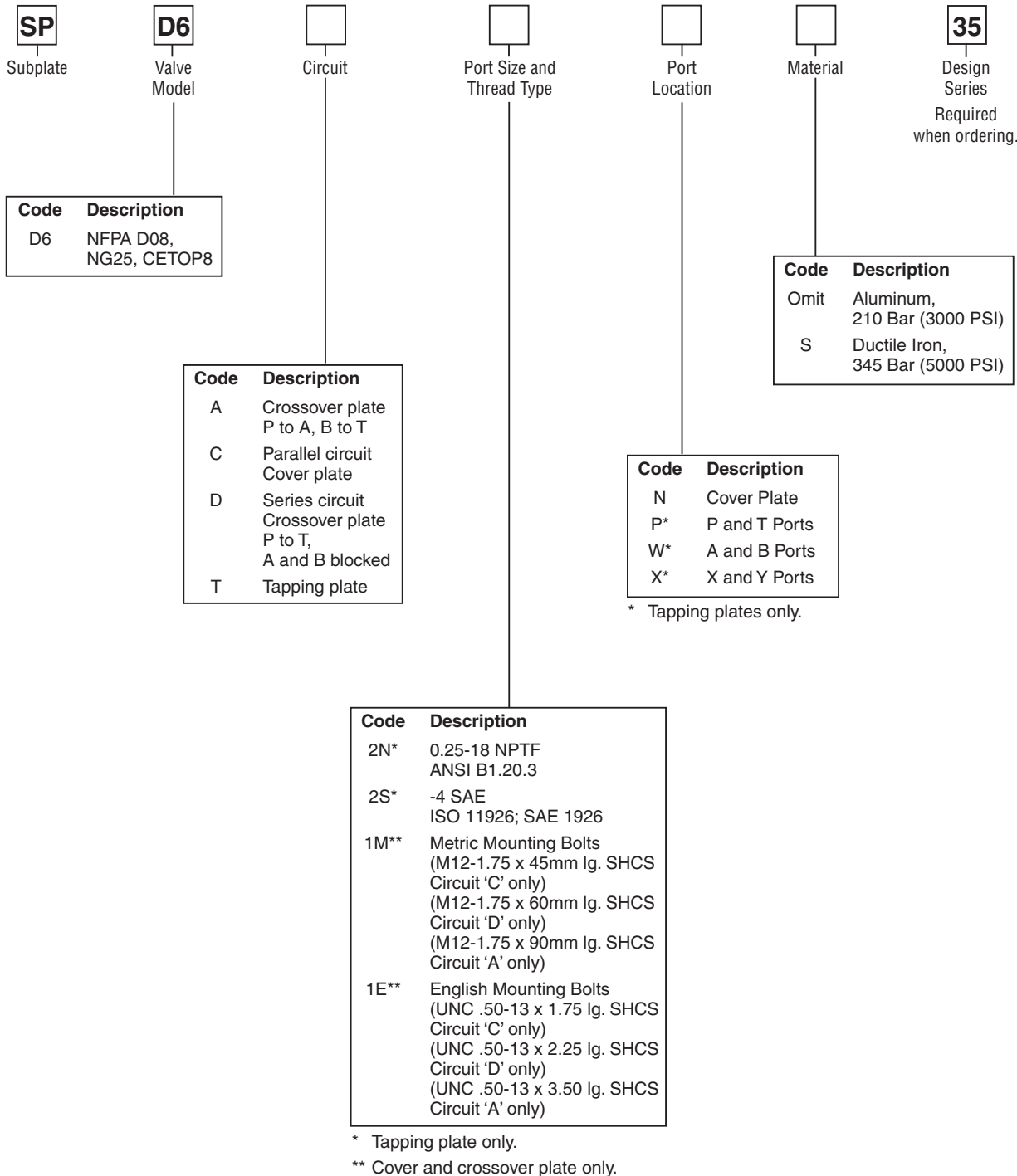
Ordering Information
Series D3 Tapping and Cover Plates



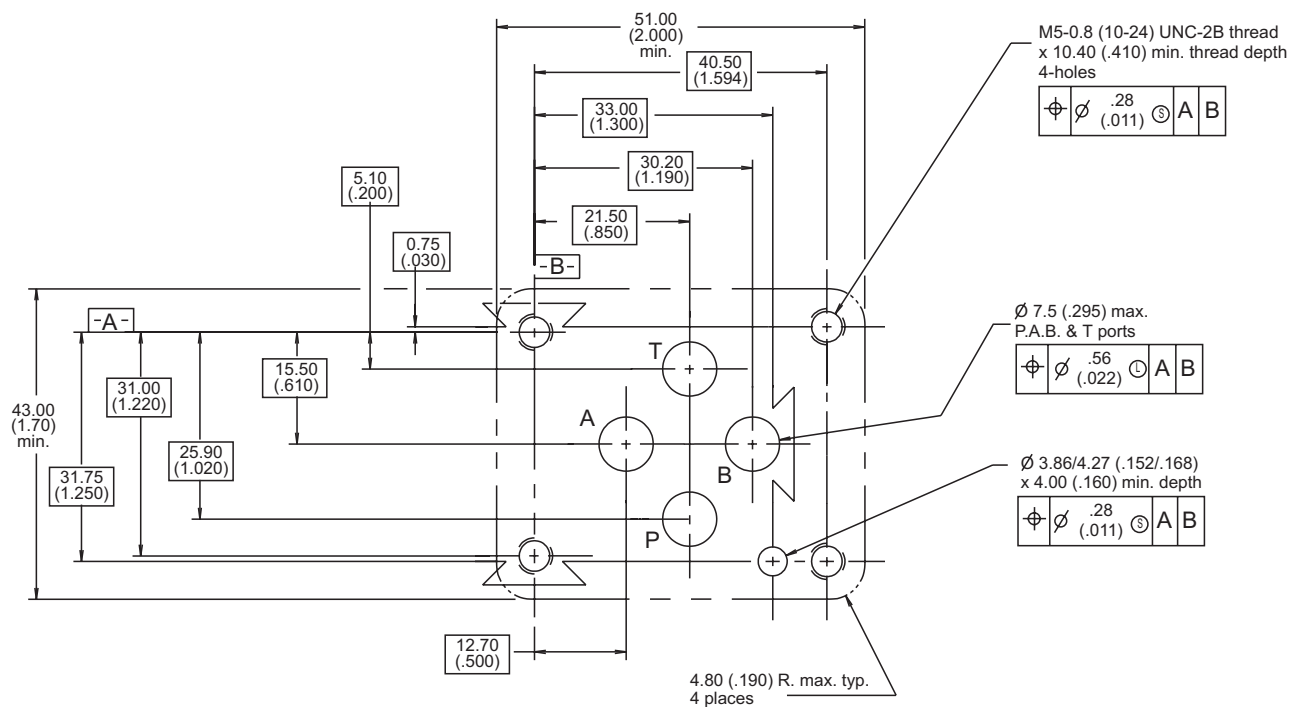
Ordering Information
Series D31 Tapping and Cover Plates



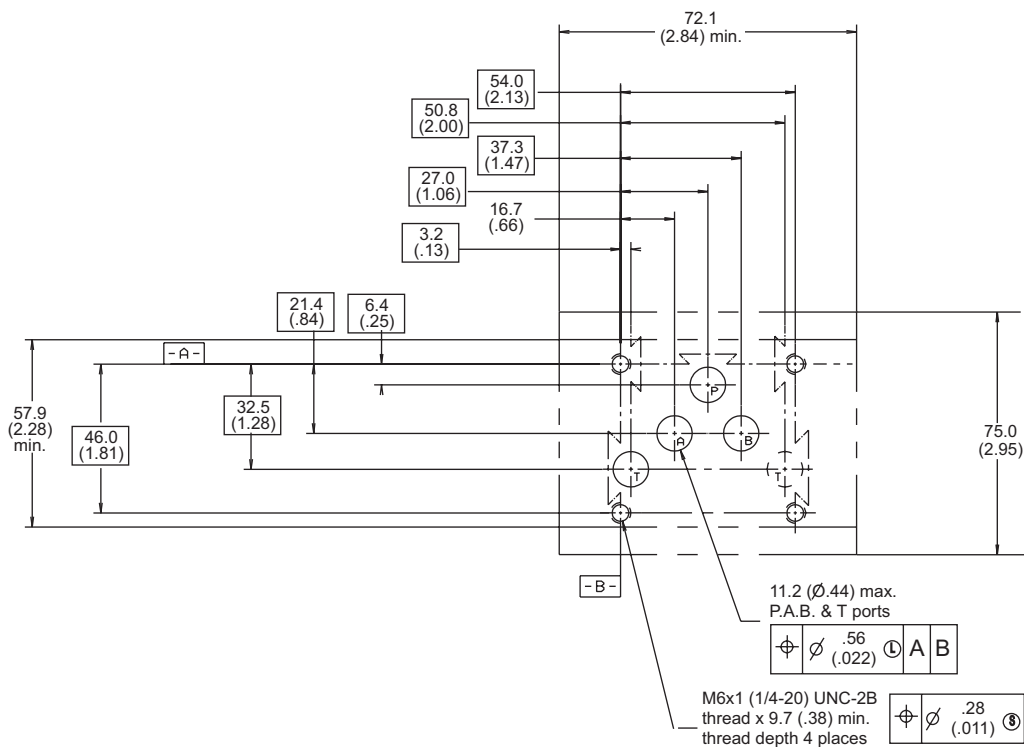
Ordering Information
Series D6 and D8 Tapping and Cover Plates



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

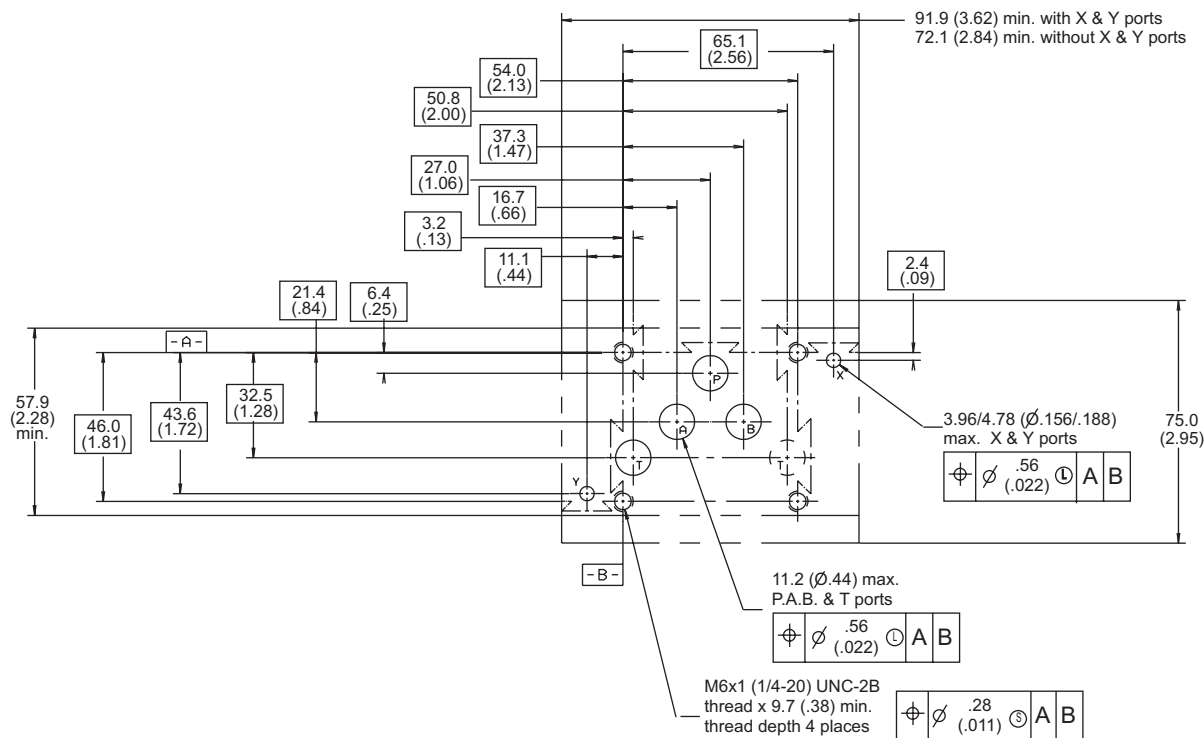


Inch equivalents for millimeter dimensions are shown in (**)



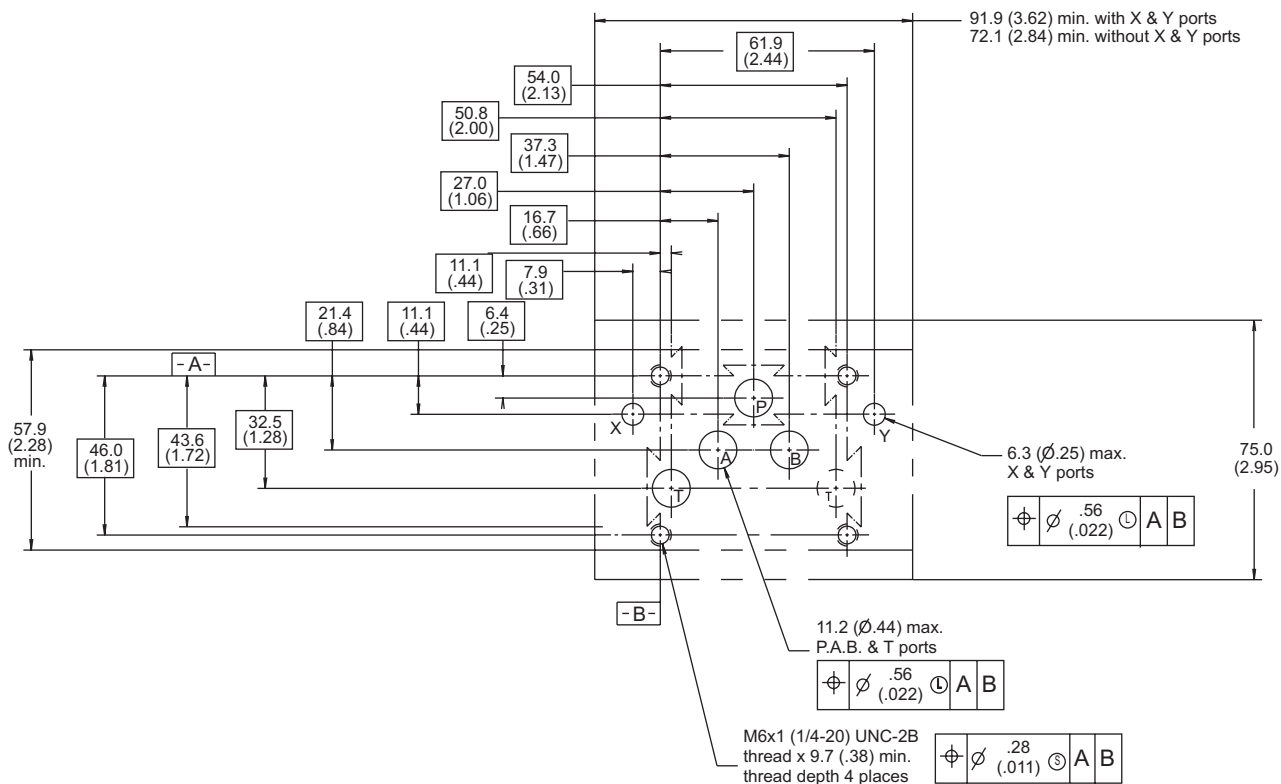
Mounting Pattern — NFPA D05H, NG10, CETOP 5H

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



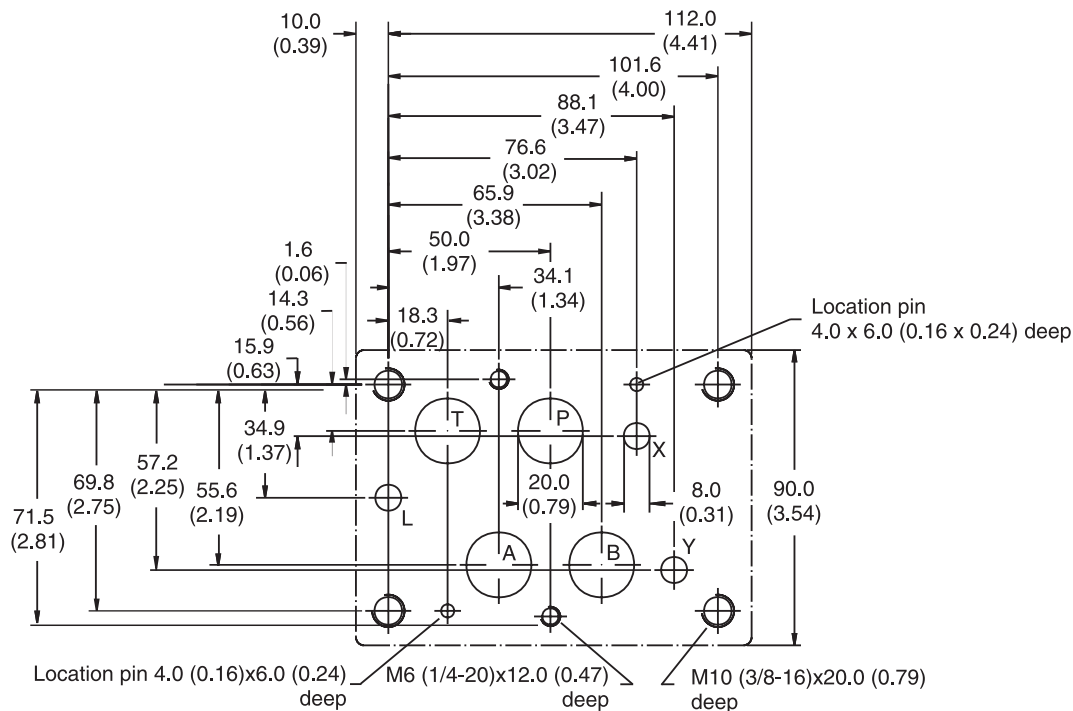
Mounting Pattern — NFPA D05HE, NG10, CETOP 5H

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



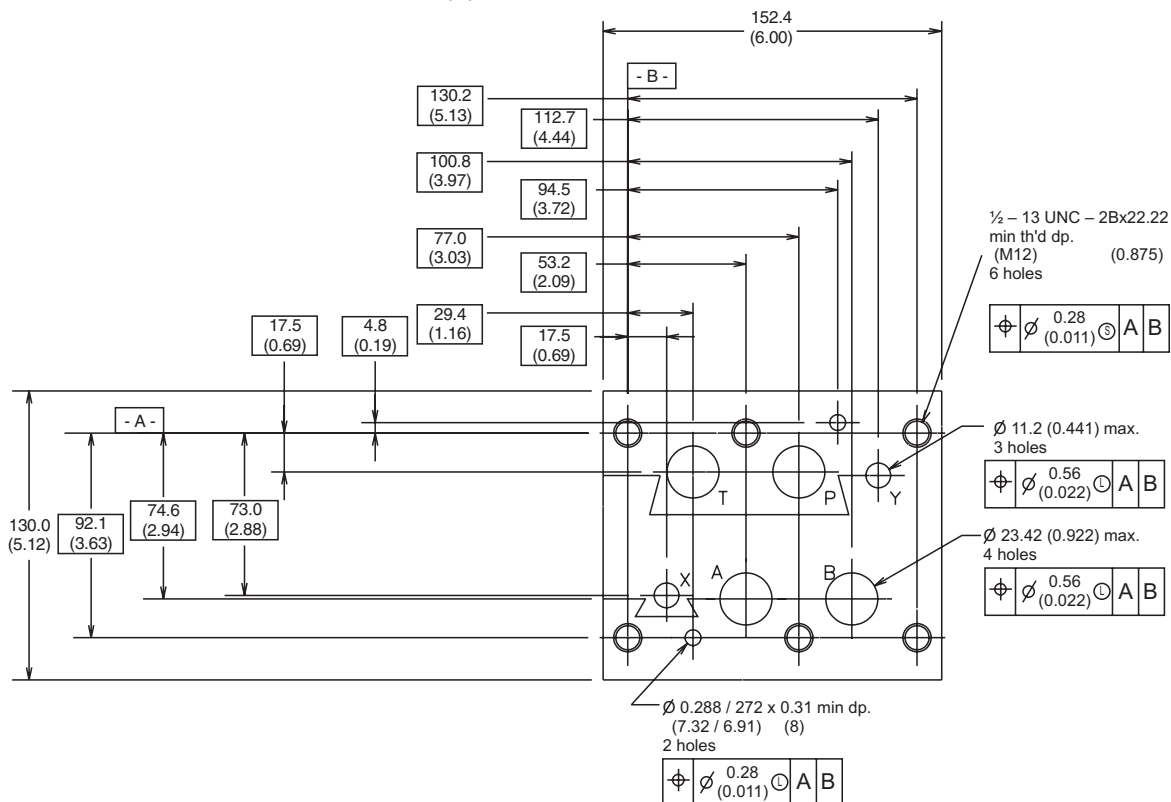
Mounting Pattern — NFPA D07, NG16, CETOP 7

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



Mounting Pattern — NFPA D08, NG25, CETOP 8

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



General Description

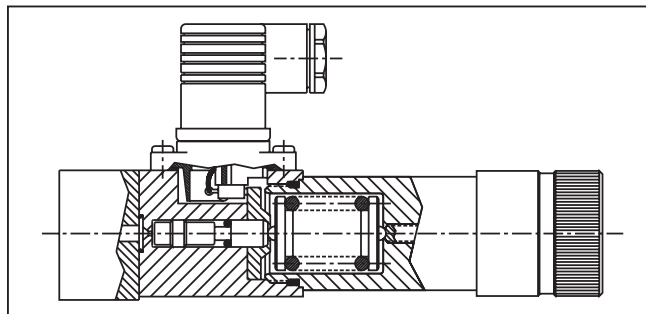
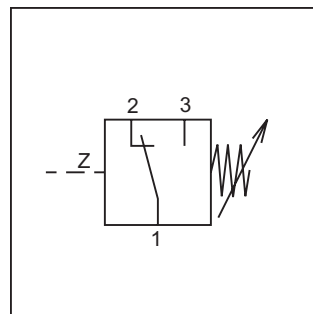
Series PSB electrohydraulic pressure switches are high performance devices that provide an electrical signal when sensed pressure rises above or falls below the selected setting. Maximum operating pressure is 315 Bar (4560 PSI) for all models.

Operation

Sensed pressure acts against a piston and spring plate assembly that is opposed by an adjustable spring force. When the pressure against the piston exceeds that of the adjustable spring, the plate moves and actuates a microswitch. The desired operating pressure is adjusted via a setscrew or hand knob. A tamper resistant keylock option is also available with the setscrew type adjuster. The electric element is a high quality micro switch with snap-action contact. Three terminals permit application as "on", "off" or "change-over" switch. The electric connection is made with a 3-pole plug-in connector to DIN 43650 with ground. The plug-in connector is also available with an indicator light.

Features

- **Four Separate Adjustable Pressure Range Options** — Enables operator to precisely select the desired pressure setting.
- **Hydraulically Dampened Piston** — Provides accurate response and extended service life.
- **Flange Type Mounting Style** — Provides great flexibility for mounting with manifolds, sandwich plates or direct line connections.
- **Optional Keylock Adjustment** — Prevents tampering or unauthorized adjustments in critical applications.
- **Robust Cast Iron Construction** — A rugged, yet compact, product designed to provide long service life in demanding applications.
- **IP 65 (Nema 4) Class Electrical Protection** — Maintains integrity against moisture in spray or splashdown situations.

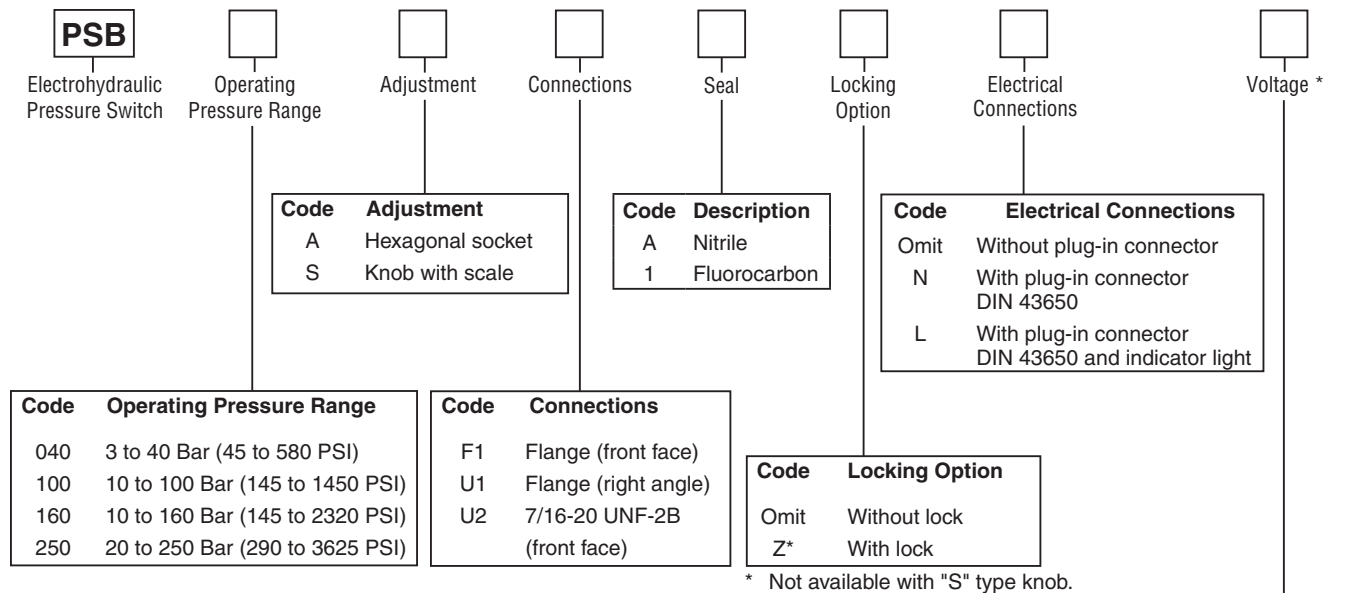


Specifications

Type	Plunger type switch
Mounting	Flange mounting or fitted to a level face
Mounting Position	No restrictions
Operating Pressure	Maximum 315 Bar (4560 PSI)
Actuating Pressure Differential	See performance curves
Duty Cycle	Maximum 1/s
Operating Temp. Range (Ambient)	0 to 80° C (32 to 176° F)
Viscosity Range	12 to 400 cSt / mm ² /s (56 to 1854 SSU)
Filtration	Recommend ISO 4406 Code, 18/16/13 or better
Electrical Connection	Plug-in connector to DIN 43650
Insulation	IP 65 (Nema 4)
Contact Load Carrying Capacity	5 A at 250 VAC; 1 A at 50 VDC; .02 A at 250 VDC

Note: For inductive DC loads a diode should be used to increase service life.

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.



Weight: 1.0 kg (2.2 lbs.)

Mounting Bolts (2 each required)

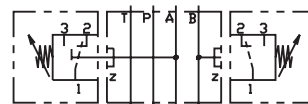
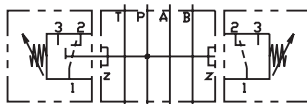
	F1	U1/U2
Inch	10 x 353 (10-24 x 2.50)	10 x 218 (10-24 x 2.00)
Metric	M5 x 60	M5 x 50

Code	Voltage
G024	Plug-in connector w/light, 24VDC
W115	Plug-in connector w/light, 115VAC
W230	Plug-in connector w/light, 230VAC

* Only for the Code "L" Models.

Sandwich Plate to NG6, NFPA D03 Pattern

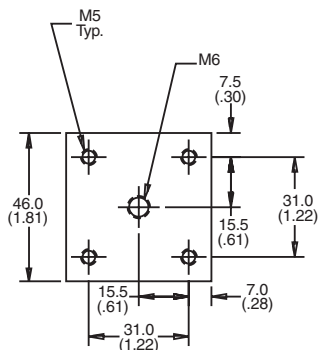
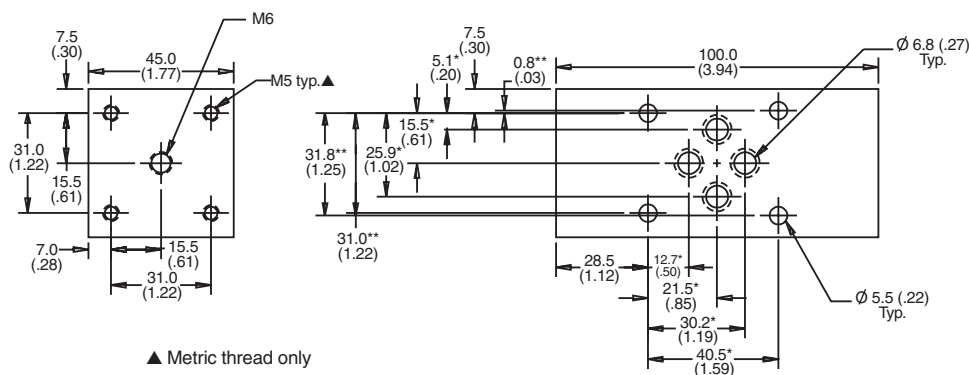
Allows PSB switches to be used in stacking assemblies with Sandwich style valves.



H06PSB-993 -- Pressure switch to P connection

H06PSB-994 -- Pressure switch to A or B or A and B connection

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

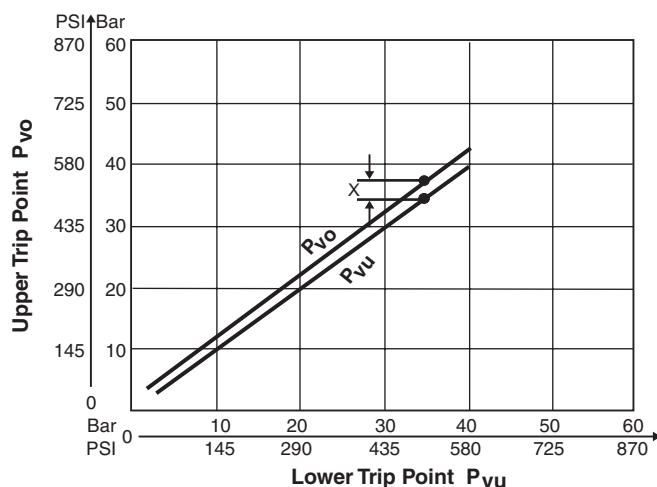


Note:
 * Tolerance on these dimensions +/- 0.2
 ** Tolerance on these dimensions +/- 0.1

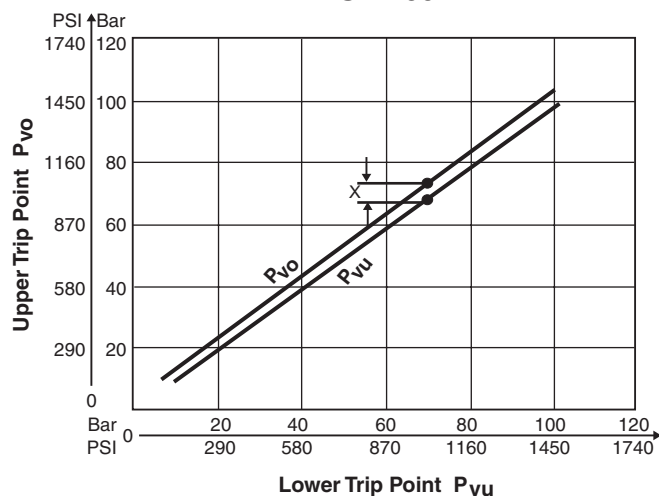


Performance Curves

PSB 040

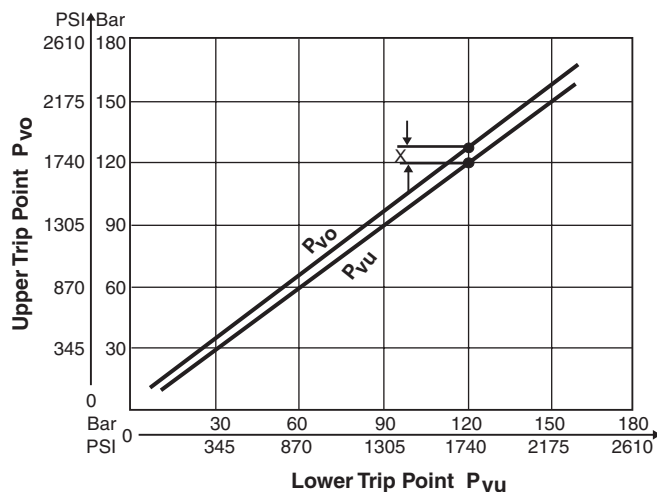


PSB 100

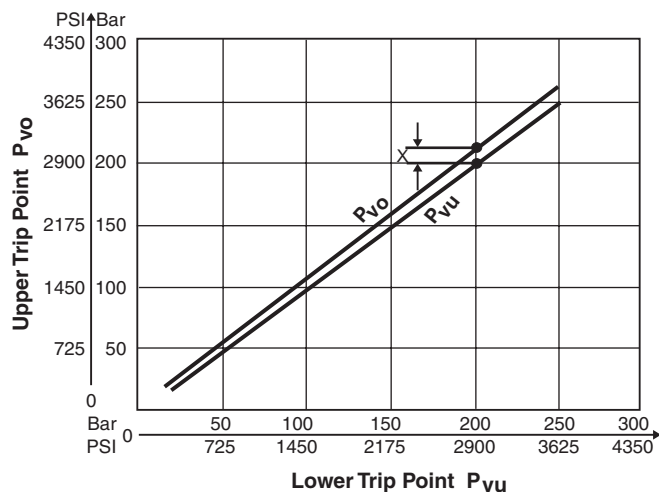


X = Switching Pressure Difference

PSB 160

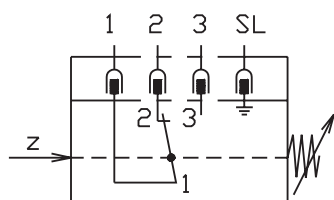


PSB 250

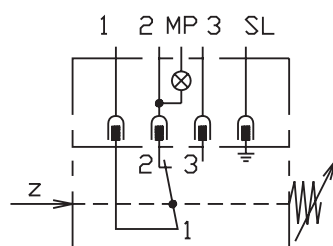


X = Switching Pressure Difference

Electrical Connections



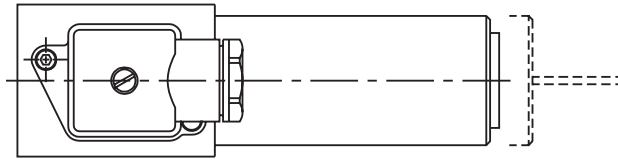
Connection 'N'



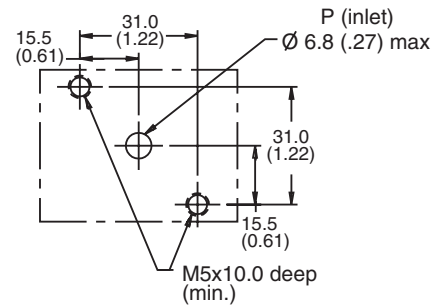
Connection 'L'

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

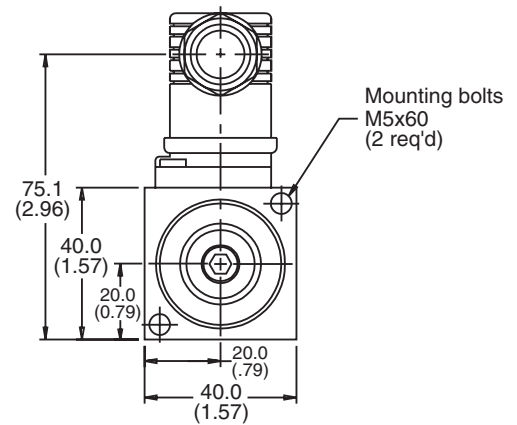
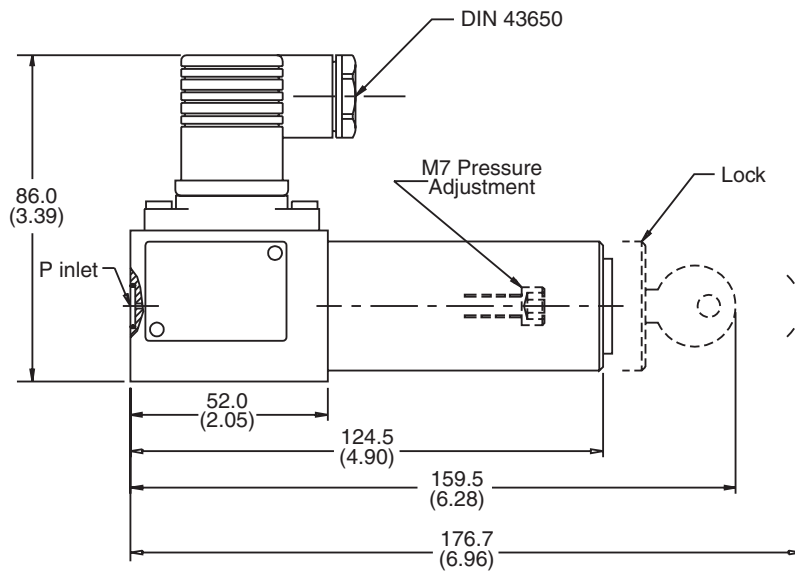
F1



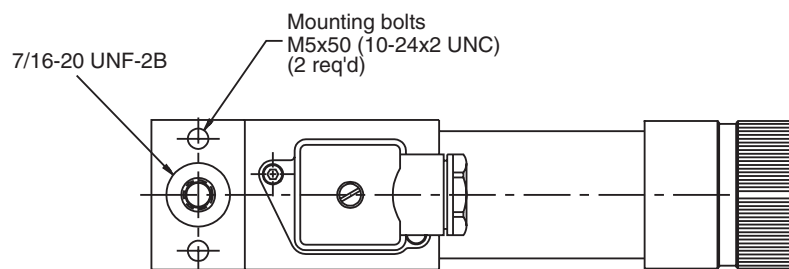
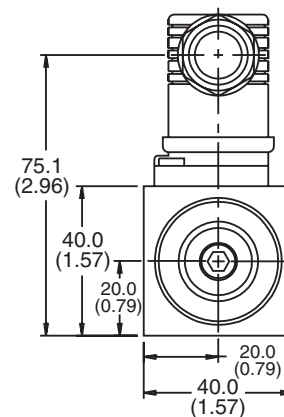
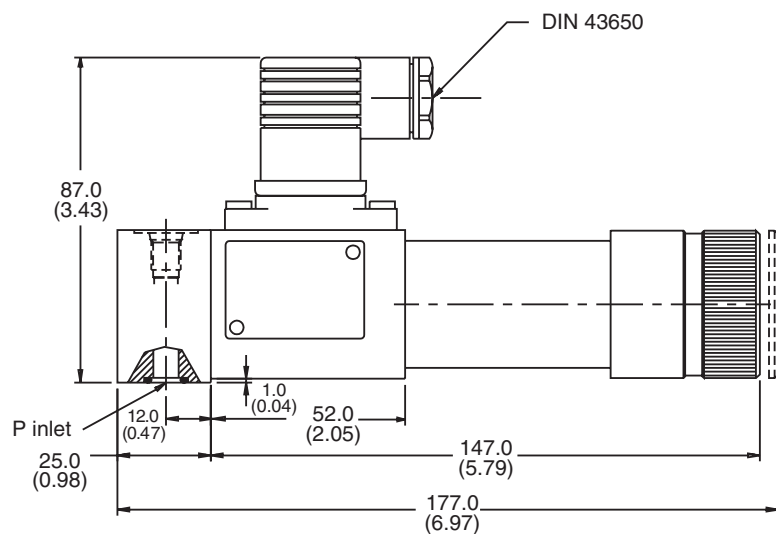
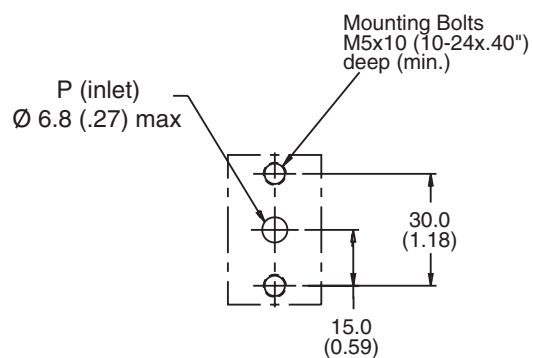
Mounting Pattern



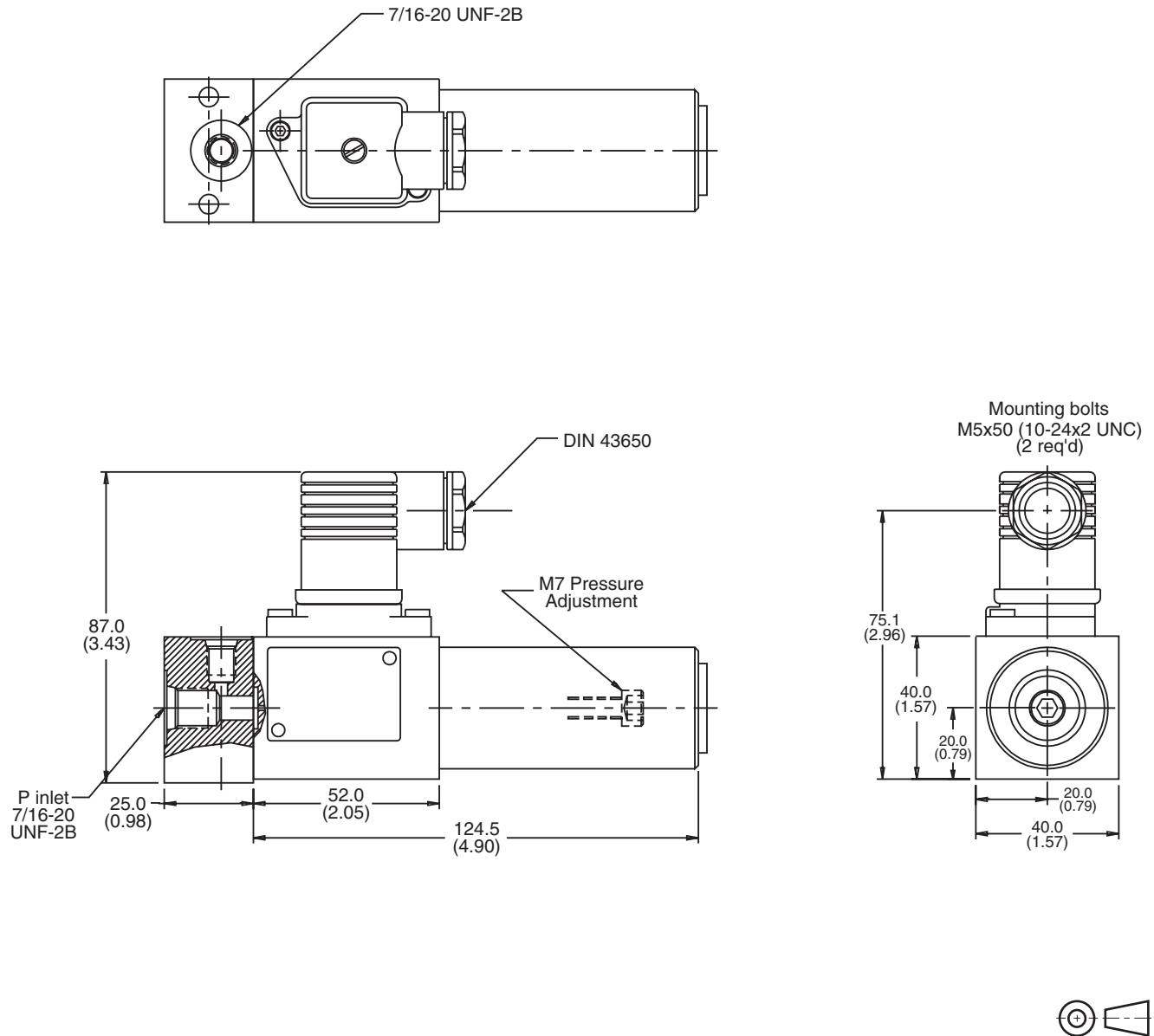
C



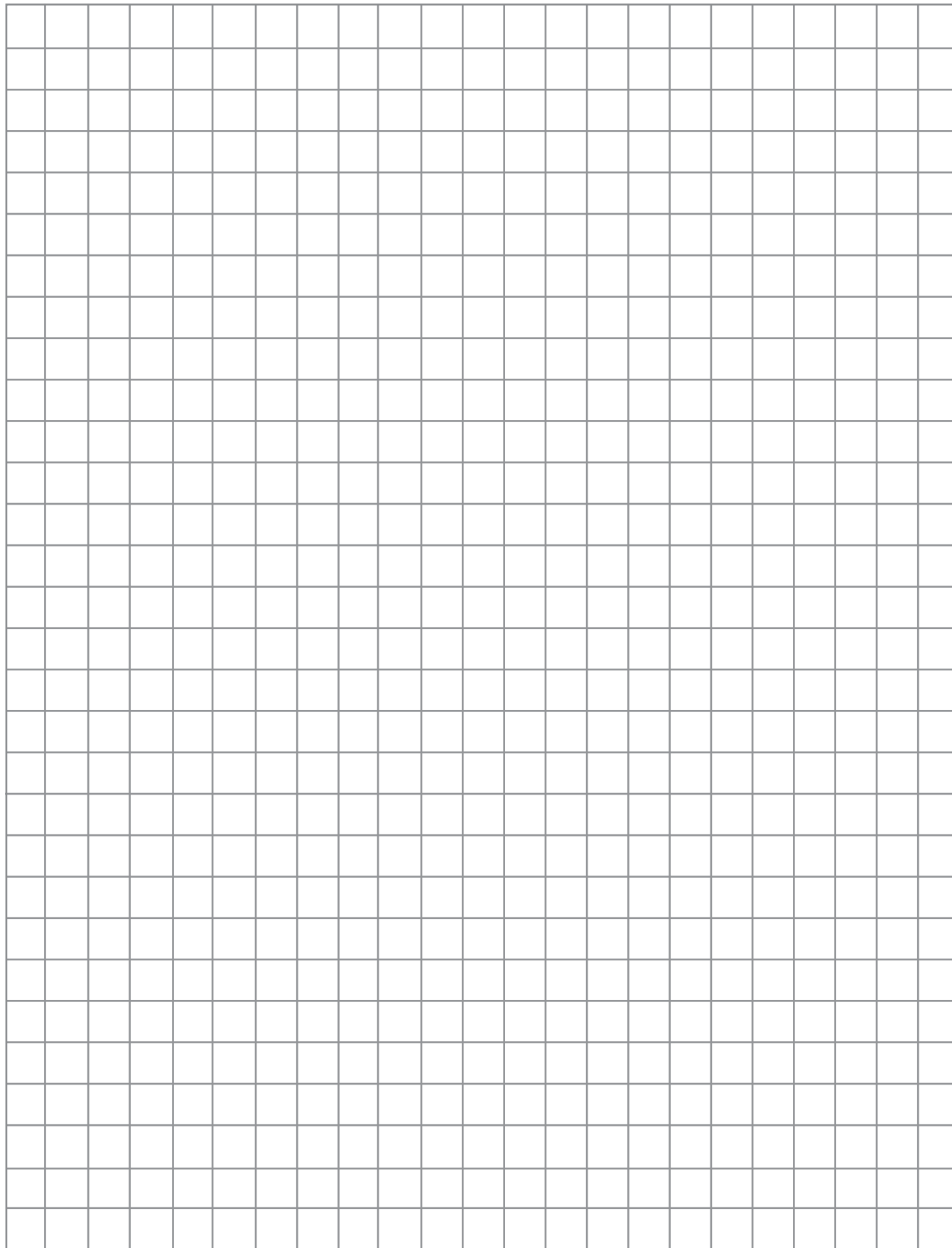
Inch equivalents for millimeter dimensions are shown in (**)

U1**Mounting Pattern**

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

U2**C**

C



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	Replaces Series RS*R, RS*M	PHASE OUT
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	Replaces Series US*M	PHASE OUT
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D

Phase Out
2-part bodies

General Description

Series R4V*5 and R6V*5 pressure relief valves feature a manual adjustment pilot stage which controls a seated type main stage.

A vent function with a solenoid operated directional valve is available for circulation at minimum pressure.

Features

- Pilot operated with manual adjustment
- 2 interfaces:
 - Subplate, ISO 6264 (DIN 24340 Form D) with VV01 vent valve (R4V)
 - Subplate, ISO 6264 (DIN 24340 Form E) with CETOP 03 vent valve (R6V)
- 3 pressure ranges
- 3 adjustment modes:
 - Hand knob
 - Acorn nut with lead seal
 - Key lock
- Remote control via port X

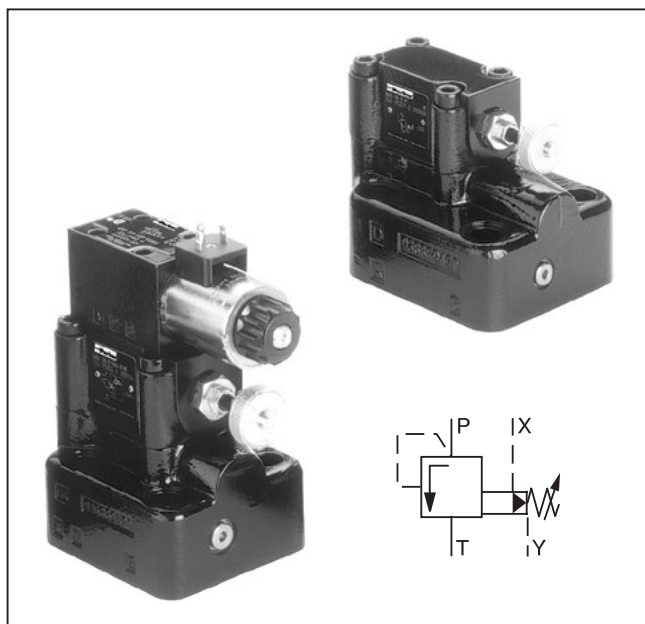
Function

System pressure in port P is applied via the X gallery to the spring loaded cone in the pilot head. The pilot head controls the pressure in the Z area on top of the main cartridge which is additionally kept close by the main spring.

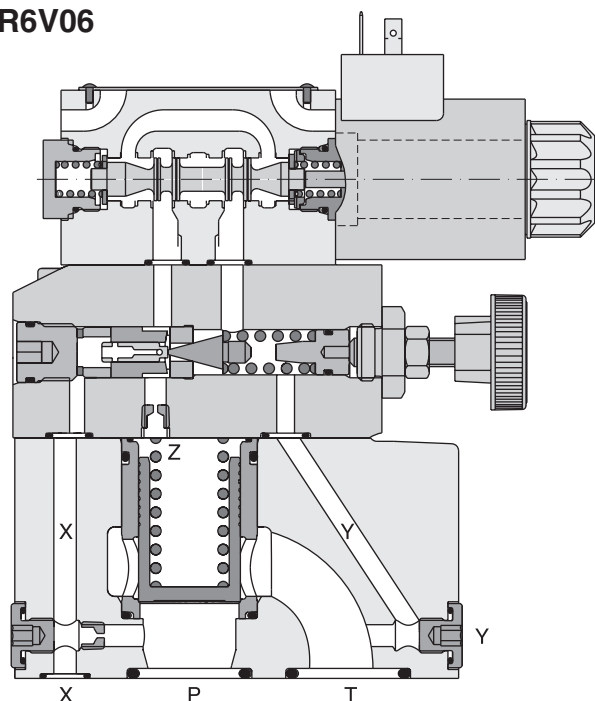
If the pilot pressure exceeds the setting pressure the pilot cone opens and thus limits the pilot pressure.

When the system pressure exceeds the pilot pressure plus the spring force, the main cartridge opens to port T and limits the pressure in port P to the adjusted level.

Additionally to the relief function, a solenoid operated vent valve connects the Z area to tank. This allows oil circulation from P to T at minimum pressure drop. The vent valve can either be a standard CETOP 03 valves (mounting form E) or a sandwich unit (mounting form D). For both types the vent position can be either at the energized or de-energized solenoid.

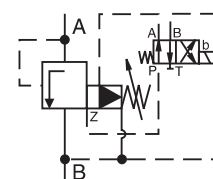
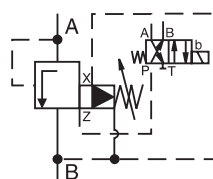


R6V06



Code 1

Code 9



WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

R

Pressure Relief Valve

Interface

V

Relief Function

Size

5

Maximum Pressure
350 Bar
(5075 PSI)

Drain Port

Pressure Range

Adjustment

Pilot Oil Drain Line

Vent Valve Function

Solenoid Voltage

Design Series

Seal

Modifications

Code	Description
03	NG10
06	NG25
10	NG32

Code	Interface	Drain	Aux Port
3	R4V	Y-port	NPT
9	R4V	Y-port	BSP
9	R6V	Y-port	BSP

Code	Description
1	up to 105 Bar (1523 PSI)
3	up to 210 Bar (3045 PSI)
5	up to 350 Bar (5075 PSI)

Code	Description
031 ²⁾	Vent Function w/ Slow Unloading
VFM ³⁾	Vent Function w/ Slow Unloading

2) R4V only
3) R6V only

Code	Description
1	Nitrile
5	Fluorocarbon

Code	Description
A	R4V
B	R6V

Code	Description
4	Subplate Mounting ISO 6264
6	

NG 10 and 25

NG 32

NG 10; 25; 32

Code	Description
1	Hand Knob (Standard)
3	Acorn Nut with Lead Seal
4	Key Lock

Code	Description
G0R	12V
G0Q	24V
GAR	98V
GAG	205V
W30	110V / 50 Hz 120V / 60 Hz
W31	230V / 50 Hz 240V / 60 Hz

Code	Description
09	Solenoid not activated unpress. circulation
11	Solenoid activated unpress. circulation

Code	Description
0*	Internal
1*	External from Subplate
2	External from Valve Body (Y-port)

* Only with drain port 3.

Weight:

R4V03	4.4 kg (9.7 lbs.)
R4V06	6.2 kg 13.7 (lbs.)
R4V10	7.7 kg (17.0 lbs.)
R6V03	5.9 kg (13.0 lbs.)
R6V06	7.2 kg (15.9 lbs.)
R6V10	9.2 kg (20.3 lbs.)

R Pressure Relief Valve	Interface	V Relief Function	Size	5 Maximum Pressure 350 Bar (5075 PSI)	Drain Port	Pressure Range	Adjustment	Pilot Oil Drain Line	Design Series	Seal	Options Check with Factory
--	---	--	--	--	--	--	--	--	---	--	--

Code	Description
03	NG10
06	NG25
10	NG32

Code	Interface	Drain	Aux Port
3	R4V	Y-port	NPT
9	R4V	Y-port	BSP
9	R6V	Y-port	BSP

Code	Description
1	up to 105 Bar (1523 PSI)
3	up to 210 Bar (3045 PSI)
5	up to 350 Bar (5075 PSI)

Code	Description
1	Hand Knob 32mm dia. (Standard)
3	Acorn Nut with Lead Seal
4	Key Lock

Code	Description
1	Nitrile
5	Fluorocarbon

Code	Description
A	R4V
B	R6V

Code	Description
4	Subplate Mounting
6	ISO 6264

Code	Description
0 ¹⁾	Internal
1 ¹⁾	External from Subplate
2	External from Valve Body (Y-port)

1) Only with drain port 3

D

Weight:

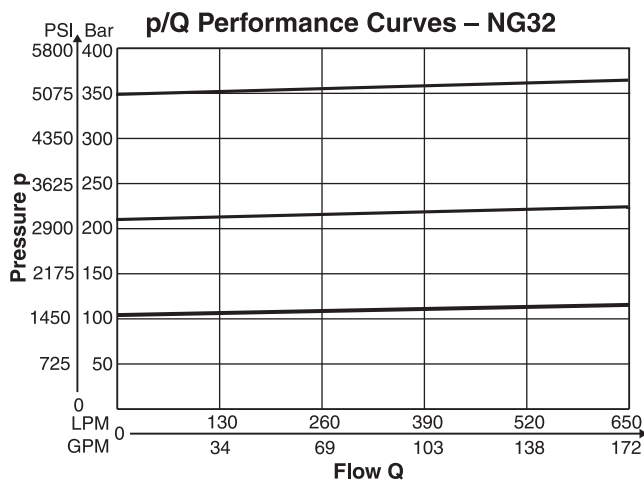
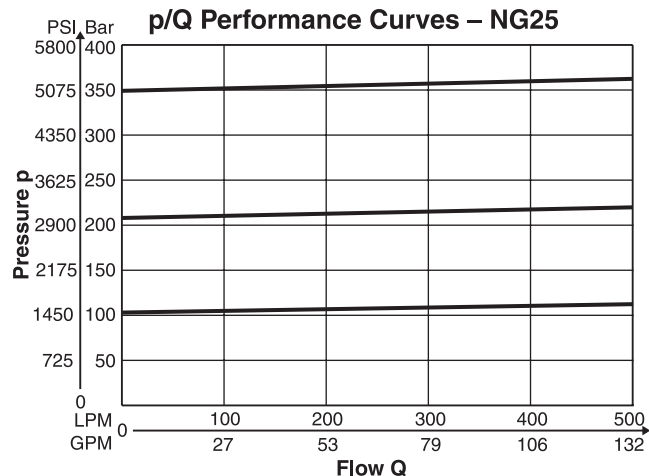
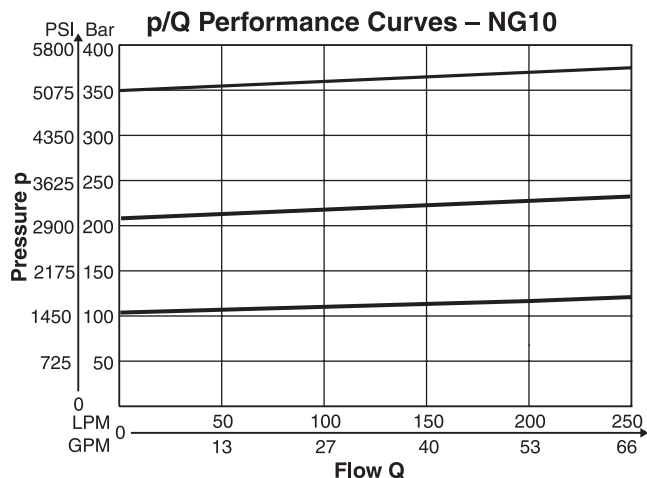
R4V03	2.7 kg (6.0 lbs.)
R4V06	4.5 kg (9.9 lbs.)
R4V10	6.0 kg (13.2 lbs.)
R6V03	4.5 kg (9.9 lbs.)
R6V06	5.8 kg (12.8 lbs.)
R6V10	7.8 kg (17.2 lbs.)

R4V and R6V

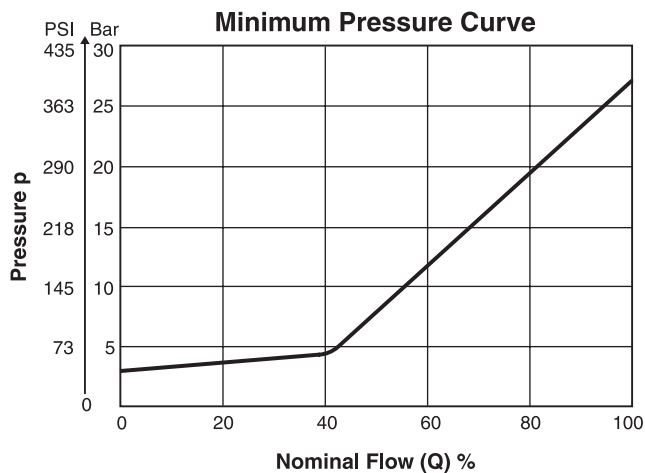
General				
Size		NG10	NG25	NG32
Interface		Subplate mounting acc. ISO 6264 (DIN 24340)		
Mounting Position		As desired, horizontal mounting preferred		
Ambient Temperature		-20°C to +80°C (-4°F to +176°F)		
Hydraulic				
Operating Pressure		Ports P or A and X up to 350 Bar (5075 PSI), Port T or B and Y depressurized		
Pressure Range		105, 210, 350 Bar (1523, 3045, 5075 PSI)		
Nominal Flow	Series R4V	150 LPM (39.7 GPM)	350 LPM (92.6 GPM)	650 LPM (172.0 GPM)
	Series R6V	250 LPM (66.1 GPM)	500 LPM (132.3 GPM)	650 LPM (172.0 GPM)
Fluid		Hydraulic oil according to DIN 51524 ... 51525		
Viscosity	Recommended Permitted	30 to 50 cSt / mm²/s (139 to 232 SSU) 20 to 380 cSt / mm²/s (93 to 1761 SSU)		
Fluid Temperature		+30°C to +50°C (+86°F to +122°F) -20°C to +70° (-4°F to +158°F)		
Recommended Maximum				
Filtration		ISO 4406 (1999), 18/16/13		

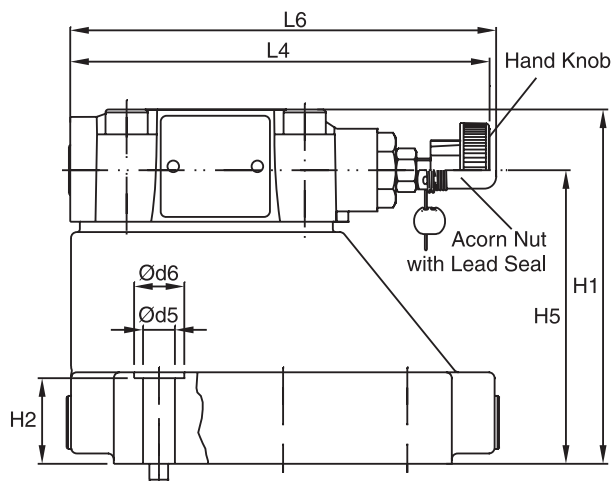
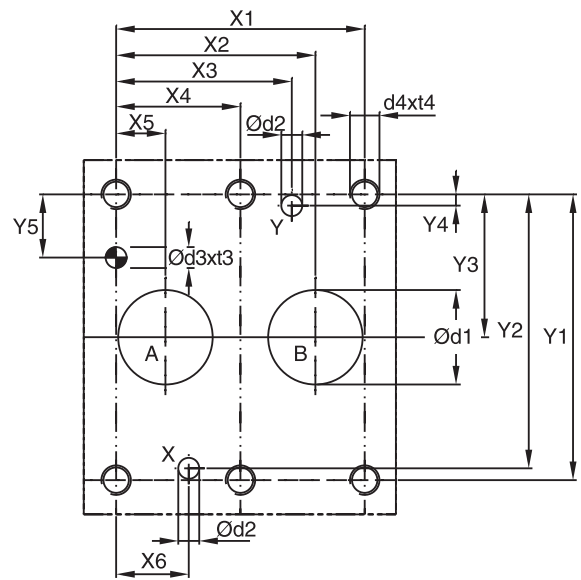
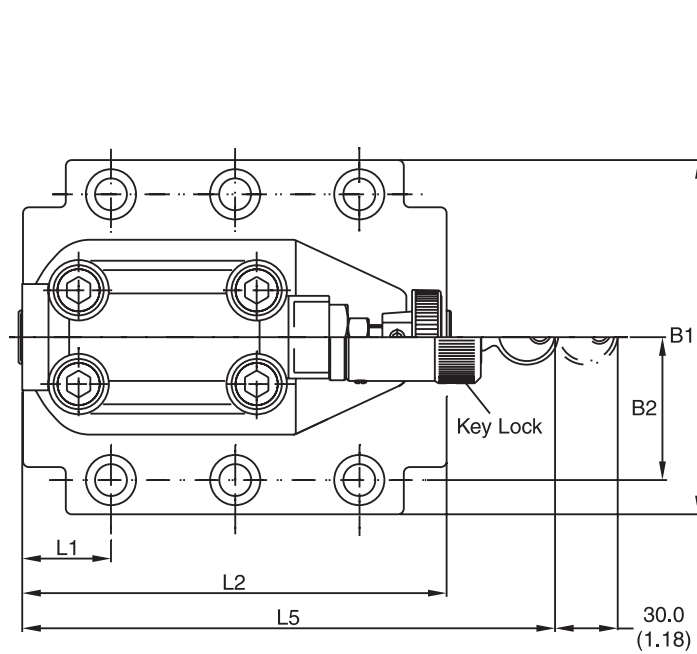
R4V and R6V with Vent Function

General							
Size		NG10		NG25		NG32	
Interface		Subplate mounting acc. ISO 6264 (DIN 24340)					
Mounting Position		As desired, horizontal mounting preferred					
Ambient Temperature		-20°C to +80°C (-4°F to +176°F)					
Hydraulic							
Operating Pressure		Ports P or A and X up to 350 Bar (5075 PSI), Port T or B and Y depressurized					
Pressure Range		105, 210, 350 Bar (1523, 3045, 5075 PSI)					
Nominal Flow	Series R4V	150 LPM (39.7 GPM)	350 LPM (92.6 GPM)		650 LPM (172.0 GPM)		
	Series R6V	250 LPM (66.1 GPM)	500 LPM (132.3 GPM)		650 LPM (172.0 GPM)		
Fluid		Hydraulic oil according to DIN 51524 ... 51525					
Viscosity	Recommended Permitted	30 to 50 cSt /mm²/s (139 to 232 SSU) 20 to 380 cSt / mm²/s (93 to 1761 SSU)					
Fluid Temperature		-20°C to +70° (-4°F to +158°F)					
Filtration		ISO 4406 (1999), 18/16/13					
Electrical (solenoid)							
Duty Cycle		100% ED CAUTION: Coil temperature up to 180°C (356°F)					
Solenoid Connector		Connector acc. to EN 175301-803					
Protection Class		IP65 in accordance with EN 60529 (plugged and mounted)					
	Code	G0R	G0Q	GAR	GAG	W30	W31
Supply Voltage		12V	24V	98V	205V	110 at 50Hz 120 at 60Hz	230 at 50Hz 240 at 60Hz
Supply Tolerance		+5...-10	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10
Power Consumption	Hold	31W	31W	31W	31W	78W	78W
	In Rush	31W	31W	31W	31W	264W	264W
Switching Frequency		16,000 (DC), 7200 (AC) switchings/hour maximum					
Wiring Minimum		3 x 1.5 mm² Recommended					
Wiring Length Maximum		50 m (164 ft.) Recommended					



The performance curves are measured with external drain.
 For internal drain the tank pressure has to be added to curve.



D

Dimensions

Pressure Control Valves
Series R4V (Pilot Operated)

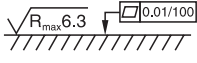
Inch equivalents for millimeter dimensions are shown in (**)

NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	6264-06-07-*-97	42.9 (1.69)	35.8 (1.41)	21.5 (0.85)	—	7.2 (0.28)	21.5 (0.85)	0.0 (0.00)	66.7 (2.63)	58.8 (2.31)	33.4 (1.31)	7.9 (0.31)	14.3 (0.56)	—
25	6264-08-11-*-97	60.3 (2.37)	49.2 (1.94)	39.7 (1.56)	—	11.1 (0.44)	20.6 (0.81)	0.0 (0.00)	79.4 (3.13)	73.0 (2.87)	39.7 (1.56)	6.4 (0.25)	15.9 (0.63)	—
32	6264-10-15-*-97	84.2 (3.31)	67.5 (2.66)	59.5 (2.34)	42.1 (1.66)	16.7 (0.66)	24.6 (0.97)	0.0 (0.00)	96.8 (3.81)	92.8 (3.65)	48.4 (1.91)	3.8 (0.15)	21.4 (0.84)	—

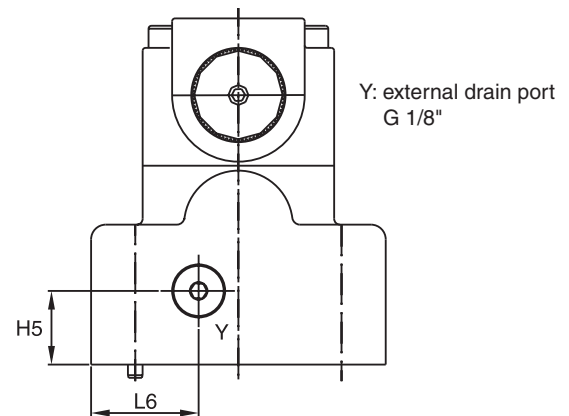
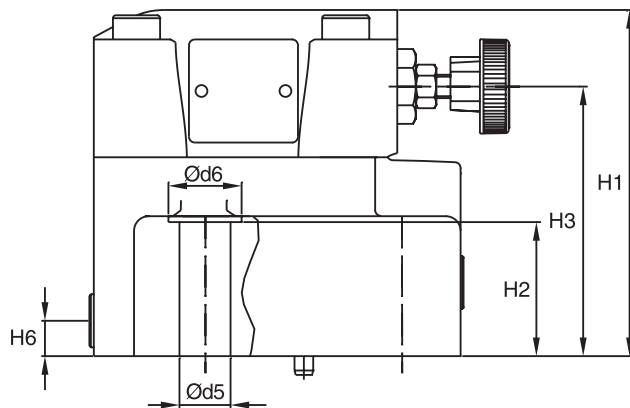
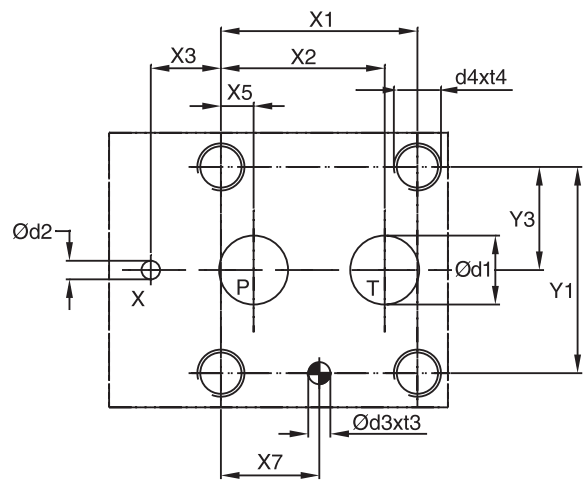
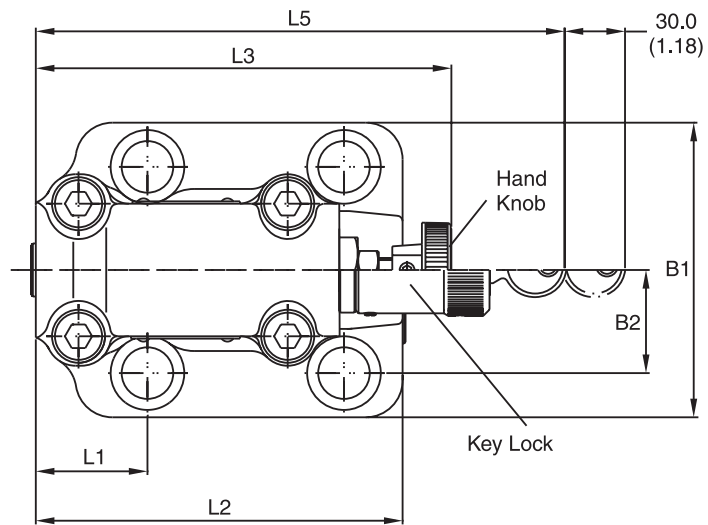
Tolerance at X and Y pin holes and screw holes ± 0.1 , at port holes ± 0.2 .

NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
10	6264-06-07-*-97	87.3 (3.44)	33.4 (1.31)	83.0 (3.27)	21.0 (0.83)	—	—	62.5 (2.46)	—	29.0 (1.14)	94.8 (3.73)	—	143.0 (5.63)	181.0 (7.13)	144.8 (5.76)
25	6264-08-11-*-97	105.0 (4.13)	39.7 (1.56)	109.5 (4.31)	29.0 (1.14)	—	—	89.0 (3.50)	—	34.7 (1.37)	126.8 (4.99)	—	143.0 (5.63)	181.0 (7.13)	144.8 (5.76)
32	6264-10-15-*-97	120.0 (4.72)	48.4 (1.91)	120.0 (4.72)	29.0 (1.14)	—	—	99.5 (3.92)	—	30.6 (1.20)	144.3 (5.68)	—	143.0 (5.63)	181.0 (7.13)	144.8 (5.76)

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6
10	6264-06-07-*-97	15.0 (0.59)	7.0 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	16.0 (0.63)	10.8 (0.43)	17.0 (0.67)
25	6264-08-11-*-97	23.4 (0.92)	7.1 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	18.0 (0.71)	10.8 (0.43)	17.0 (0.67)
32	6264-10-15-*-97	32.0 (1.26)	7.1 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	20.0 (0.79)	10.8 (0.43)	17.0 (0.67)

NG	ISO-code	Bolt Kit			Seal Nitrile	Kit Fluorocarbon	Surface Finish
10	6264-06-07-*-97	BK505	4xM10 x 35-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58507-0	S26-58507-5	
25	6264-08-11-*-97	BK485	4xM10 x 45-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58475-0	S26-58475-5	
32	6264-10-15-*-97	BK506	6xM10 x 45-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58508-0	S26-58508-5	

NG	ISO-code	Subplate	Size
10	6264-06-07-*-97	SPP3M6B910	A, B = 3/4" BSPP x, y = 1/4" BSPP
25	6264-08-11-*-97	SPP6M8B910	A, B = 1" BSPP x, y = 1/4" BSPP
32	6264-10-15-*-97	SPP10M12B910	A, B = 1 1/2" BSPP x, y = 1/4" BSPP

D

Dimensions

Pressure Control Valves
Series R6V (Pilot Operated)

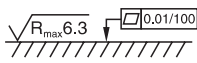
Inch equivalents for millimeter dimensions are shown in (**)

NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	6264-06-09-*-97	53.8 (2.12)	47.5 (1.87)	0.0 (0.00)	— —	22.1 (0.87)	— —	22.1 (0.87)	53.8 (2.12)	— —	26.9 (1.06)	— —	— —	—
25	6264-08-13-*-97	66.7 (2.63)	55.6 (2.19)	23.8 (0.94)	— —	11.1 (0.44)	— —	33.4 (1.31)	70.0 (2.76)	— —	35.0 (1.38)	— —	— —	—
32	6264-10-17-*-97	88.9 (3.50)	76.2 (3.00)	31.8 (1.25)	— —	12.7 (0.50)	— —	44.5 (1.75)	82.6 (3.25)	— —	41.3 (1.63)	— —	— —	—

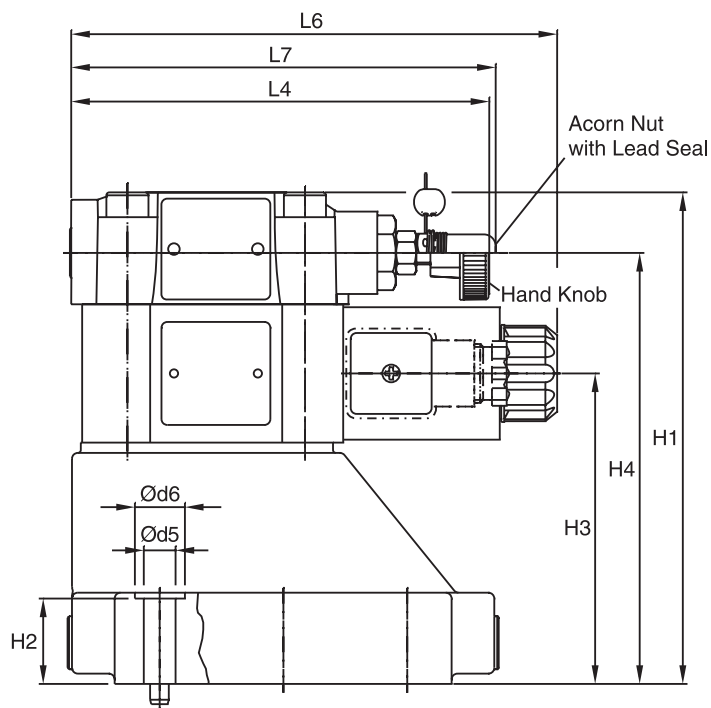
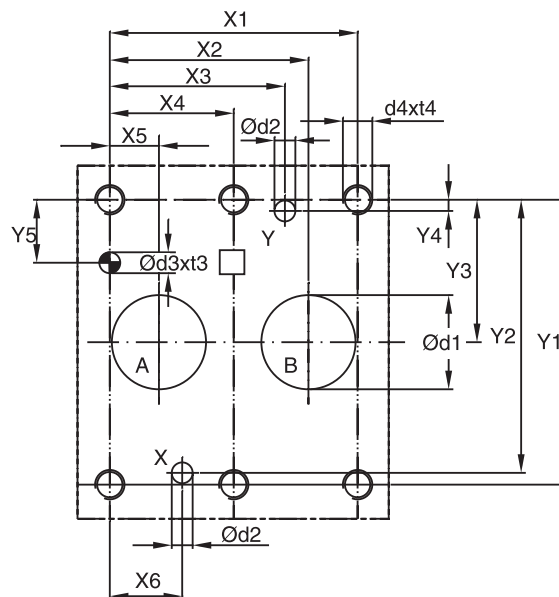
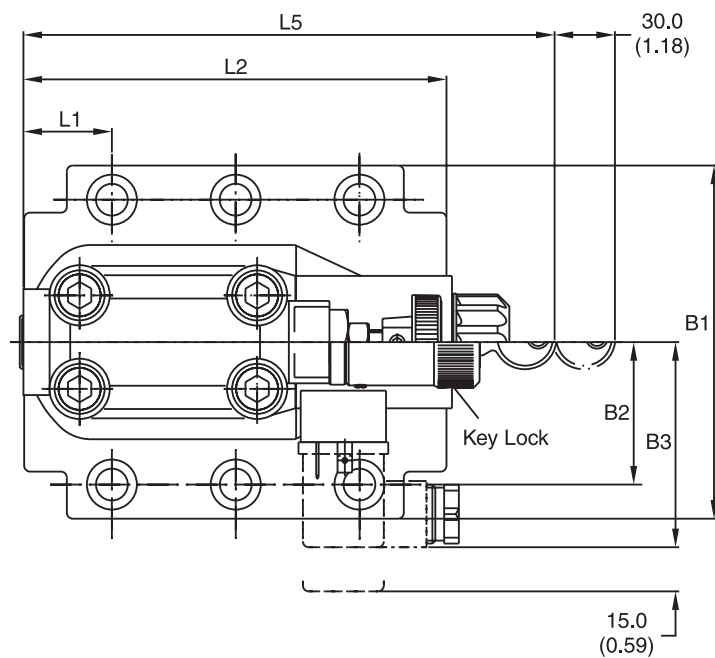
Tolerance at X and Y pin holes and screw holes ± 0.1 , at port holes ± 0.2 .

NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
10	6264-06-09-*-97	80.0 (3.15)	26.9 (1.06)	114.0 (4.49)	27.0 (1.06)	88.0 (3.46)	— —	25.0 (0.98)	25.0 (0.98)	52.5 (2.07)	118.5 (4.67)	141.0 (5.55)	— —	180.0 (7.09)	29.5 (1.16)
25	6264-08-13-*-97	100.0 (3.94)	35.0 (1.38)	117.5 (4.63)	45.5 (1.79)	91.5 (3.60)	— —	25.0 (0.98)	12.0 (0.47)	37.9 (1.49)	124.5 (4.90)	141.0 (5.55)	— —	180.0 (7.09)	36.5 (1.44)
32	6264-10-17-*-97	120.0 (4.72)	41.3 (1.63)	123.0 (4.83)	52.0 (2.05)	97.0 (3.82)	— —	25.0 (0.98)	13.5 (0.53)	45.0 (1.77)	153.0 (6.02)	141.0 (5.55)	— —	180.0 (7.09)	36.5 (1.83)

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6
10	6264-06-09-*-97	14.7 (0.58)	4.8 (0.19)	7.5 (0.30)	10.0 (0.39)	M12	20.0 (0.79)	13.5 (0.53)	20.0 (0.79)
25	6264-08-13-*-97	23.4 (0.92)	6.3 (0.25)	7.5 (0.30)	10.0 (0.39)	M16	27.0 (1.06)	17.5 (0.69)	25.0 (0.98)
32	6264-10-17-*-97	32.0 (1.26)	6.3 (0.25)	7.5 (0.30)	10.0 (0.39)	M18	28.0 (1.10)	20.0 (0.79)	30.0 (1.18)

NG	ISO-code	Bolt Kit			Seal Nitrile	 Kit Fluorocarbon	Surface Finish
10	6264-06-09-*-97	BK494	4xM12 x 45-DIN 912 12.9	108 Nm (79.6 lb.-ft.) $\pm 15\%$	S26-96396-0	S26-96396-5	
25	6264-08-13-*-97	BK366	4xM16 x 70-DIN 912 12.9	264 Nm (194.7 lb.-ft.) $\pm 15\%$	S26-96589-0	S26-96589-5	
32	6264-10-17-*-97	BK507	4xM18 x 75-DIN 912 12.9	398 Nm (293.5 lb.-ft.) $\pm 15\%$	S26-96392-0	S26-96392-5	

NG	ISO-code	Subplate	Size
10	6264-06-09-*-97	SPP3R6B910	P, T = 3/4" BSPP x = 1/4" BSPP
25	6264-08-13-*-97	SPP6R8B910	P, T = 1 1/4" BSPP x = 1/4" BSPP
32	6264-10-17-*-97	SPP10R12B910	P, T = 1 1/2" BSPP x, y = 1/4" BSPP

D

Dimensions

Pressure Control Valves
Series R4V with Vent Function

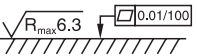
Inch equivalents for millimeter dimensions are shown in (**)

NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	6264-06-07-*-97	42.9 (1.69)	35.8 (1.41)	21.5 (0.85)	— —	7.2 (0.28)	21.5 (0.85)	0.0 (0.00)	66.7 (2.63)	58.8 (2.31)	33.4 (1.31)	7.9 (0.31)	14.3 (0.56)	— —
25	6264-08-11-*-97	60.3 (2.37)	49.2 (1.94)	39.7 (1.56)	— —	11.1 (0.44)	20.6 (0.81)	0.0 (0.00)	79.4 (3.13)	73.0 (2.87)	39.7 (1.56)	6.4 (0.25)	15.9 (0.63)	— —
32	6264-10-15-*-97	84.2 (3.31)	67.5 (2.66)	59.5 (2.34)	42.1 (1.66)	16.7 (0.66)	24.6 (0.97)	0.0 (0.00)	96.8 (3.81)	92.8 (3.65)	48.4 (1.91)	3.8 (0.15)	21.4 (0.84)	— —

Tolerance at X and Y pin holes and screw holes ± 0.1 , at port holes ± 0.2 .

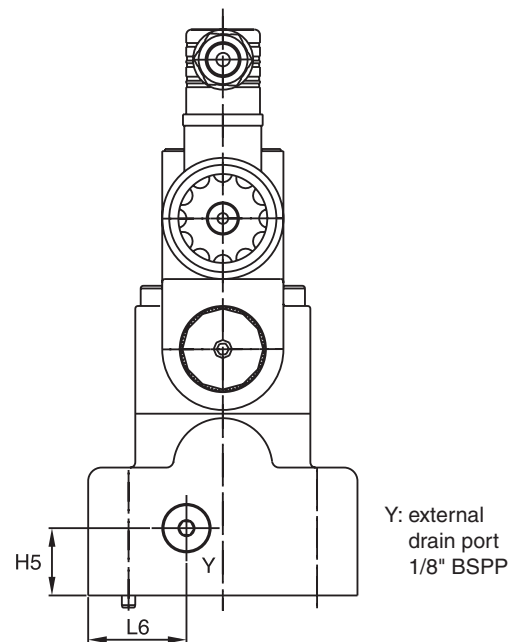
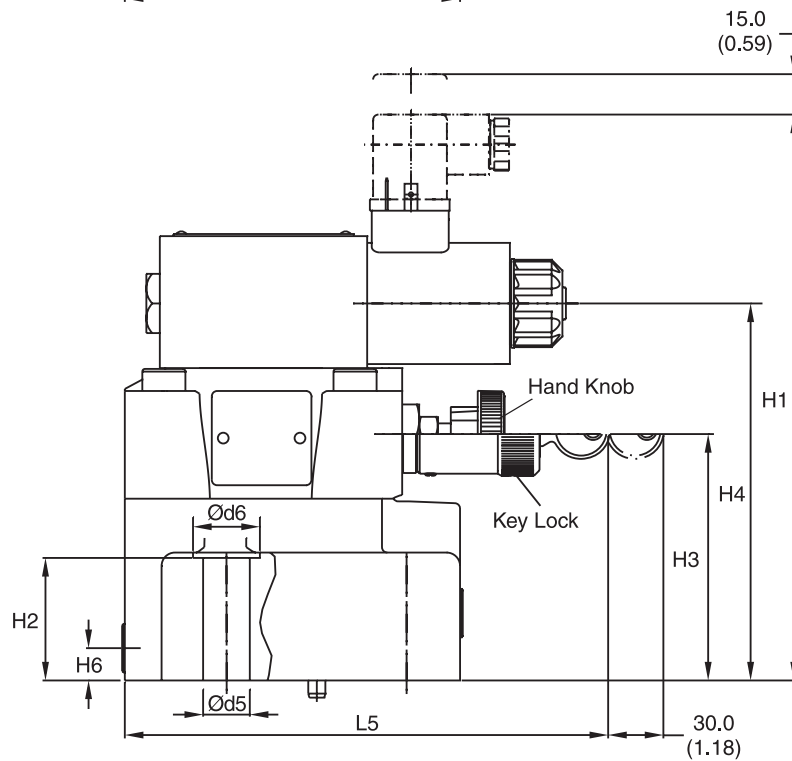
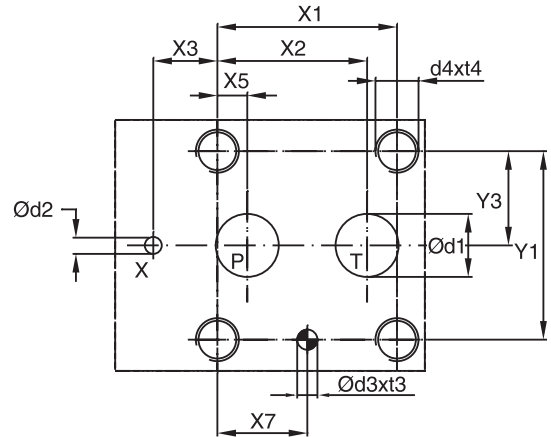
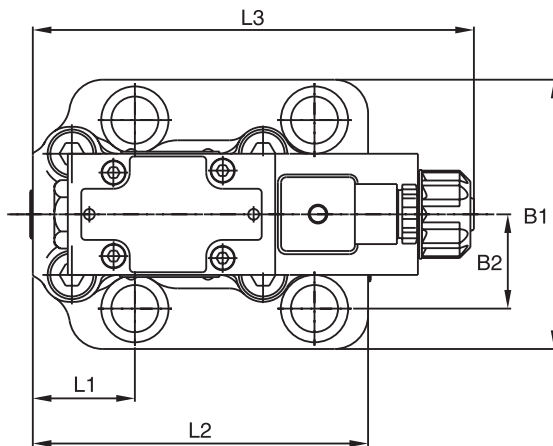
NG	ISO-code	B1	B2	B3	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7
10	6264-06-07-*-97	87.3 (3.44)	33.4 (1.31)	70.0 (2.76)	130.0 (5.12)	21.0 (0.83)	68.5 (2.70)	109.5 (4.31)	29.0 (1.14)	94.8 (3.73)	— —	143.0 (5.63)	181.0 (7.13)	165.6 (6.52)	144.8 (5.70)
25	6264-08-11-*-97	105.0 (4.13)	39.7 (1.59)	70.0 (2.76)	156.5 (6.16)	29.0 (1.14)	95.0 (3.74)	136.0 (5.35)	34.7 (1.37)	126.8 (4.99)	— —	143.0 (5.63)	181.0 (7.13)	165.6 (6.52)	144.8 (5.70)
32	6264-10-15-*-97	120.0 (4.72)	48.4 (1.91)	70.0 (2.76)	167.0 (6.57)	29.0 (1.14)	105.5 (4.15)	146.5 (5.77)	30.6 (1.20)	144.3 (5.68)	— —	143.0 (5.63)	181.0 (7.13)	165.6 (6.52)	144.8 (5.70)

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6
10	6264-06-07-*-97	15.0 (0.59)	7.0 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	16.0 (0.63)	10.8 (0.43)	17.0 (0.67)
25	6264-08-11-*-97	23.4 (0.92)	7.1 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	18.0 (0.71)	10.8 (0.43)	17.0 (0.67)
32	6264-10-15-*-97	32.0 (1.26)	7.1 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	20.0 (0.79)	10.8 (0.43)	17.0 (0.67)

NG	ISO-code	Bolt Kit			Seal Nitrile	Kit Fluorocarbon	Surface Finish
10	6264-06-07-*-97	BK505	4xM10 x 35-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58507-0	S26-58507-5	
25	6264-08-11-*-97	BK485	4xM10 x 45-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58475-0	S26-58475-5	
32	6264-10-15-*-97	BK506	6xM10 x 45-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58508-0	S26-58508-5	
VV01*					S56-40609-0	S56-40609-5	

* Please combine seal kit of one size with seal kit of VV01 solenoid for complete seal kit.

NG	ISO-code	Subplate	Size
10	6264-06-07-*-97	SPP3M6B910	A, B = 3/4" BSPP x, y = 1/4" BSPP
25	6264-08-11-*-97	SPP6M8B910	A, B = 1" BSPP x, y = 1/4" BSPP
32	6264-10-15-*-97	SPP10M12B910	A, B = 1 1/2" BSPP x, y = 1/4" BSPP

Dimensions**Pressure Control Valves
Series R6V with Vent Function****D**

Dimensions

Pressure Control Valves
Series R6V with Vent Function

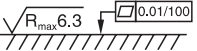
Inch equivalents for millimeter dimensions are shown in (**)

NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	6264-06-09-*-97	53.8 (2.12)	47.5 (1.87)	0.0 (0.00)	— —	22.1 (0.87)	— —	22.1 (0.87)	53.8 (2.12)	— —	26.9 (1.06)	— —	— —	— —
25	6264-08-13-*-97	66.7 (2.63)	55.6 (2.19)	23.8 (0.91)	— —	11.1 (0.44)	— —	33.4 (1.31)	70.0 (2.76)	— —	35.0 (1.38)	— —	— —	— —
32	6264-10-17-*-97	88.9 (3.50)	76.2 (3.00)	31.8 (1.25)	— —	12.7 (0.50)	— —	44.5 (1.75)	82.6 (3.25)	— —	41.3 (1.63)	— —	— —	— —

Tolerance at X and Y pin holes and screw holes ± 0.1 , at port holes ± 0.2 .

NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
10	6264-06-09-*-97	80.0 (3.15)	26.9 (1.06)	206.0 (8.11)	27.0 (1.06)	88.0 (3.46)	136.5 (5.37)	25.0 (0.98)	12.0 (0.47)	52.5 (2.07)	118.5 (4.67)	163.8 (6.45)	— —	180.0 (7.09)	36.5 (1.44)
25	6264-08-13-*-97	100.0 (3.94)	35.0 (1.38)	210.0 (8.27)	45.5 (1.79)	91.5 (3.60)	140.0 (5.51)	25.0 (0.98)	12.0 (0.47)	37.9 (1.49)	124.5 (4.90)	163.8 (6.45)	— —	180.0 (7.09)	36.5 (1.44)
32	6264-10-17-*-97	120.0 (4.72)	41.3 (1.63)	215.5 (8.48)	52.0 (2.05)	97.0 (3.82)	145.5 (5.73)	25.0 (0.98)	12.0 (0.47)	45.0 (1.77)	153 (6.02)	163.8 (6.45)	— —	180.0 (7.09)	36.5 (1.44)

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6
10	6264-06-09-*-97	14.7 (0.58)	4.8 (0.19)	7.5 (0.30)	10.0 (0.39)	M12	20.0 (0.79)	13.5 (0.53)	20.0 (0.79)
25	6264-08-13-*-97	23.4 (0.92)	6.3 (0.25)	7.5 (0.30)	10.0 (0.39)	M16	27.0 (1.06)	17.5 (0.69)	25.0 (0.98)
32	6264-10-17-*-97	32.0 (1.26)	6.3 (0.25)	7.5 (0.30)	10.0 (0.39)	M18	28.0 (1.10)	20.0 (0.79)	30.0 (1.18)

NG	ISO-code	Bolt Kit			Seal Nitrile	Kit Fluorocarbon	Surface Finish
10	6264-06-09-*-97	BK494	4xM12 x 45-DIN 912 12.9	108 Nm (79.6 lb.-ft.) $\pm 15\%$	S26-96395-0	S26-96395-5	
25	6264-08-13-*-97	BK366	4xM16 x 70-DIN 912 12.9	264 Nm (194.7 lb.-ft.) $\pm 15\%$	S26-96589-0	S26-96589-5	
32	6264-10-17-*-97	BK507	4xM18 x 75-DIN 912 12.9	398 Nm (293.5 lb.-ft.) $\pm 15\%$	S26-96392-0	S26-96392-5	

NG	ISO-code	Subplate	Size
10	6264-06-09-*-97	SPP3R6B910	P, T = 3/4" BSPP x = 1/4" BSPP
25	6264-08-13-*-97	SPP6R8B910	P, T = 1 1/4" BSPP x = 1/4" BSPP
32	6264-10-17-*-97	SPP10R12B910	P, T = 1 1/2" BSPP x, y = 1/4" BSPP

D

General Description

Series R4V (TÜV) (DIN 24340 Form D) and R6V (TÜV) (DIN 24340 Form E) pilot operated pressure relief valves include a certification according to directive 97/23/EG for safety-related applications.

The valve is set and sealed by the German technical inspection association TÜV. The valve delivery includes the TÜV certificate of conformity.

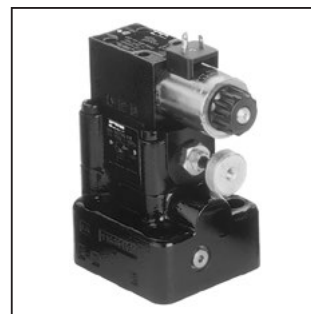
For Series R6V, a vent function with a solenoid operated directional valve is available for circulation at minimum pressure.

Features

- TÜV certificate
- Pilot operated with manual adjustment
- 2 interfaces:
 - Subplate, ISO 6264 (DIN 24340 Form D) with VV01 vent valve (R4V)
 - Subplate, ISO 6264 (DIN 24340 Form E) with CETOP 03 vent valve (R6V)
- Adjustment leaded (code W)
- Adjustment leaded to maximum pressure, lower pressure possible (code V)



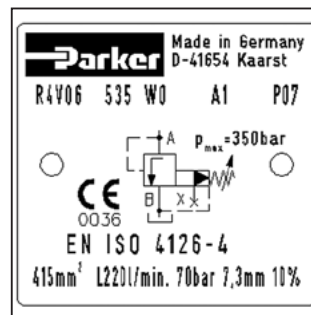
R6V06



R6V06 with Vent Valve

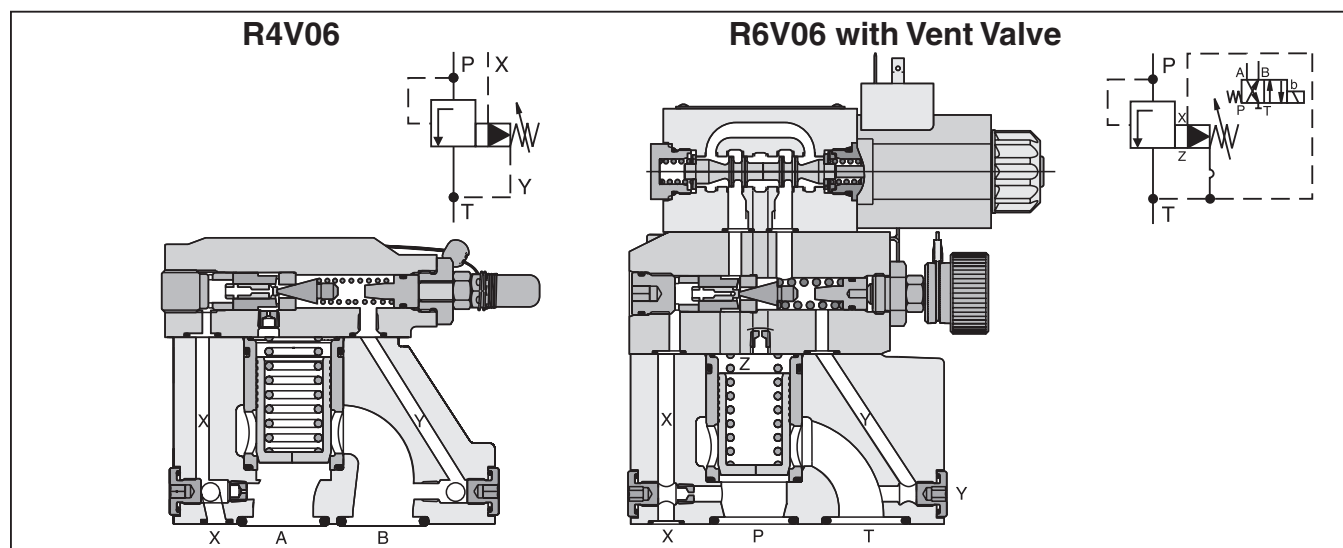


R4V06



Name Plate Data R4V06

415 mm²:	minimum opening width
L220 LPM:	maximum flow
70 Bar:	set pressure (compare p/Q curves)
7.3 mm:	cartridge stroke
10%:	permitted pressure increase of the flow range



WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

R4V and R6V

R Pressure Relief Valve

V Relief Function

5 Maximum Pressure 350 Bar (5075 PSI)

5 Pressure Setting up to 350 Bar (5075 PSI) Maximum

0 Pilot Oil Internal

0 Design Series

1 Nitrile

5 Fluorocarbon

3 R4V

9 R6V

V Hand Knob Ledged (lower pressure adjustment possible)

W Acorn Nut Ledged

P10 100 Bar (1450 PSI)

P20 200 Bar (2900 PSI)

P30 300 Bar (4350 PSI)

P35 350 Bar (5075 PSI)

Code Description

Code	Description
03*	NG10
06	NG25
10	NG32

* Not for R6V.

Code Description

Code	Description
1	Nitrile
5	Fluorocarbon

Code Description

Code	Description
3	R4V
9	R6V

Code Description

Code	Description
V	Hand Knob Ledged (lower pressure adjustment possible)
W	Acorn Nut Ledged

Code Description

Code	Description
P10	100 Bar (1450 PSI)
P20	200 Bar (2900 PSI)
P30	300 Bar (4350 PSI)
P35	350 Bar (5075 PSI)

* Further pressure ranges on request in 10 Bar (145 PSI) steps

Weight:

R4V03	2.7 kg (6.0 lbs.)
R4V06	4.5 kg (9.9 lbs.)
R4V10	6.0 kg (13.2 lbs.)
R6V06	5.8 kg (12.8 lbs.)
R6V10	7.8 kg (17.2 lbs.)

R6V with Vent Valve

R Pressure Relief Valve

6 Interface

V Relief Function

5 Maximum Pressure 350 Bar (5075 PSI)

9 Body Y Port = G 1/8"

5 Pressure Setting up to 350 Bar (5075 PSI) Maximum

V Adjustment Ledged (TÜV)

0 Pilot Oil Internal

09 Vent Valve Function

09 Solenoid Voltage

B Design Series

1 Nitrile

5 Fluorocarbon

P10 100 Bar (1450 PSI)

P20 200 Bar (2900 PSI)

P30 300 Bar (4350 PSI)

P35 350 Bar (5075 PSI)

Code Description

Code	Description
06	NG25
10	NG32

Code Description

Code	Description
V	Hand Knob Ledged (lower pressure adjustment possible)

Code Description

Code	Description
09	Solenoid not activated, unpressured circulation

Code Description

Code	Description
G0R	12VDC
G0Q	24VDC

Code Description

Code	Description
1	Nitrile
5	Fluorocarbon

Code Description

Code	Description
P10	100 Bar (1450 PSI)
P20	200 Bar (2900 PSI)
P30	300 Bar (4350 PSI)
P35	350 Bar (5075 PSI)

* Further pressure ranges on request in 10 Bar (145 PSI) steps

Weight:

R6V06	7.2 kg (15.9 lbs.)
R6V10	9.2 kg (20.3 lbs.)

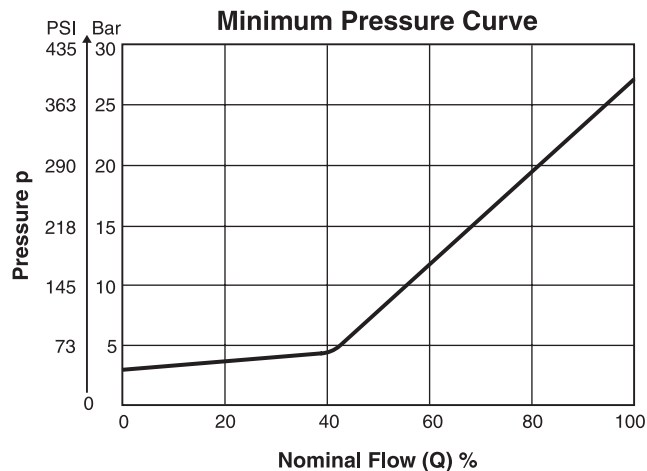
R4V and R6V

General				
Size	NG10		NG25	NG32
Interface	Subplate mounting acc. ISO 6264 (DIN 24340)			
Mounting Position	As desired, horizontal mounting preferred			
Ambient Temperature	-20°C to +80°C (-4°F to +176°F)			
MTTF _D Value	75 years			
Hydraulic				
Operating Pressure	Ports P or A up to 350 Bar (5075 PSI), Port T or B 30 Bar (435 PSI)			
Pressure Range	100, 200, 300, 350 Bar (1450, 2900, 4350, 5075 PSI)			
Nominal Flow	Series R4V	110 LPM (29.1 GPM)	450 LPM (119.0 GPM)	500 LPM (132.3 GPM)
	Series R6V	250 LPM (66.1 GPM)	500 LPM (132.3 GPM)	500 LPM (132.3 GPM)
Fluid	Hydraulic oil according to DIN 51524 ... 51525			
Viscosity	Recommended Permitted	30 to 50 cSt / mm²/s (139 to 232 SSU) 20 to 380 cSt / mm²/s (93 to 1761 SSU)		
Fluid Temperature	-20°C to +70° (-4°F to +158°F)			
Filtration	ISO 4406 (1999), 18/16/13			

R6V with Vent Function

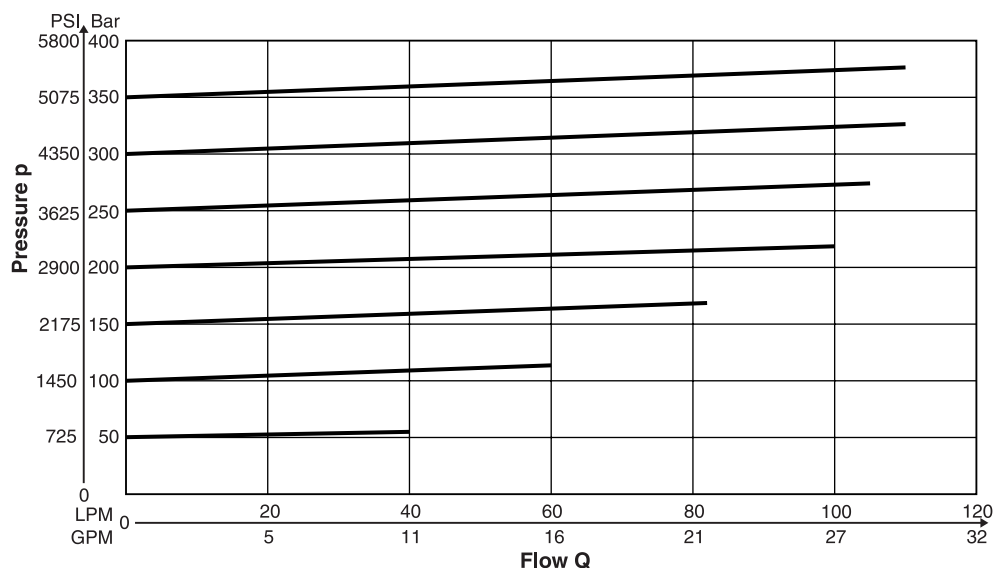
General				
Size	NG10		NG25	NG32
Interface	Subplate mounting acc. ISO 6264 (DIN 24340)			
Mounting Position	As desired, horizontal mounting preferred			
Ambient Temperature	-20°C to +80°C (-4°F to +176°F)			
MTTF _D Value	75 years			
Hydraulic				
Operating Pressure	Ports P or A up to 350 Bar (5075 PSI), Port T or B 30 Bar (435 PSI)			
Pressure Range	100, 200, 300, 350 Bar (1450, 2900, 4350, 5075 PSI)			
Nominal Flow	250 LPM (66.1 GPM)		500 LPM (132.3 GPM)	650 LPM (172.0 GPM)
Fluid	Hydraulic oil according to DIN 51524 ... 51525			
Viscosity	Recommended Permitted	30 to 50 cSt /mm²/s (139 to 232 SSU) 20 to 380 cSt / mm²/s (93 to 1761 SSU)		
Fluid Temperature	-20°C to +70° (-4°F to +158°F)			
Filtration	ISO 4406 (1999), 18/16/13 according to NAS 1638:7)			
Electrical (Solenoid)				
Duty Ratio	100% ED; CAUTION: Coil temperature up to 180°C (356°F)			
Solenoid Connector	Connector acc. to EN 175301-803			
Protection Class	IP65 in accordance with EN 60529 (plugged and mounted)			
Code	G0R		G0Q	
Supply Voltage	12V		24V	
Supply Tolerance	+5...-10		+5...-10	
Power Consumption	Hold	31W		31W
	In Rush	31W		31W
Switching Frequency	16,000 (DC), 7200 (AC) switchings/hour maximum			
Wiring Minimum	3 x 1.5 mm² Recommended			
Wiring Length Maximum	50 m (164 ft.) Recommended			

Minimum Pressure Curve R4V and R6V



The performance curves are measured with external drain.
For internal drain the tank pressure has to be added to curve.
All performance curves measured with HLP46 at 50°C (122°F).

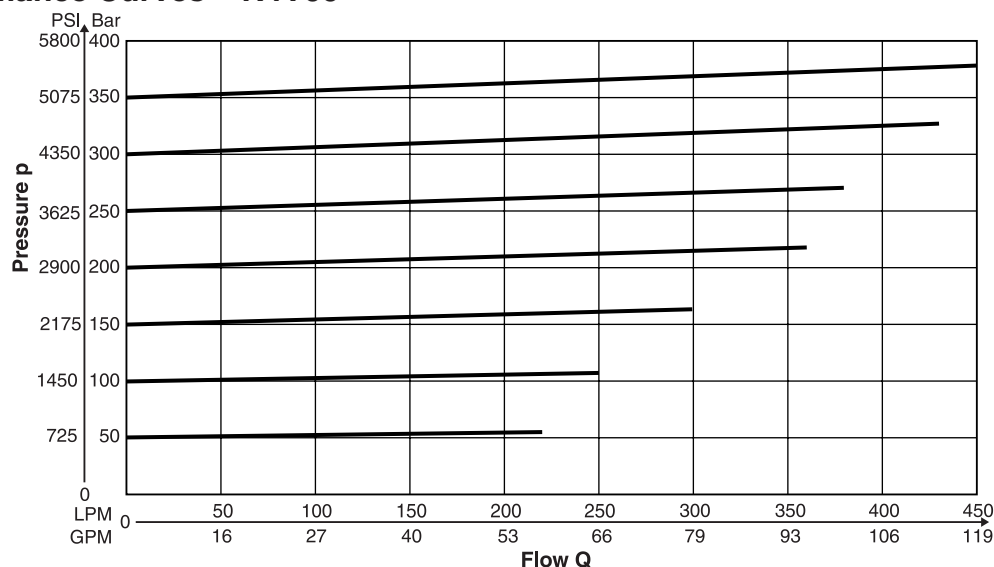
p/Q Performance Curves – R4V03



R4V03

Pressure Range	Q _{max}	Minimum Opening Width	Cartridge Stroke	Permitted Pressure Increase
50 - 70 Bar (725 - 1015 PSI)	40 LPM (11 GPM)	154mm ² (0.24 in. ²)	4.4mm (0.17")	10%
80 - 120 Bar (1160 - 1740 PSI)	60 LPM (16 GPM)	154mm ² (0.24 in. ²)	4.4mm (0.17")	10%
130 - 170 Bar (1885 - 2465 PSI)	82 LPM (22 GPM)	154mm ² (0.24 in. ²)	4.4mm (0.17")	10%
180 - 200 Bar (2610 - 2900 PSI)	100 LPM (27 GPM)	154mm ² (0.24 in. ²)	4.4mm (0.17")	10%
210 - 250 Bar (3015 - 3625 PSI)	105 LPM (28 GPM)	154mm ² (0.24 in. ²)	4.4mm (0.17")	10%
260 - 300 Bar (3770 - 4350 PSI)	110 LPM (29 GPM)	154mm ² (0.24 in. ²)	4.4mm (0.17")	10%
310 - 350 Bar (4495 - 5075 PSI)	110 LPM (29 GPM)	154mm ² (0.24 in. ²)	4.4mm (0.17")	10%

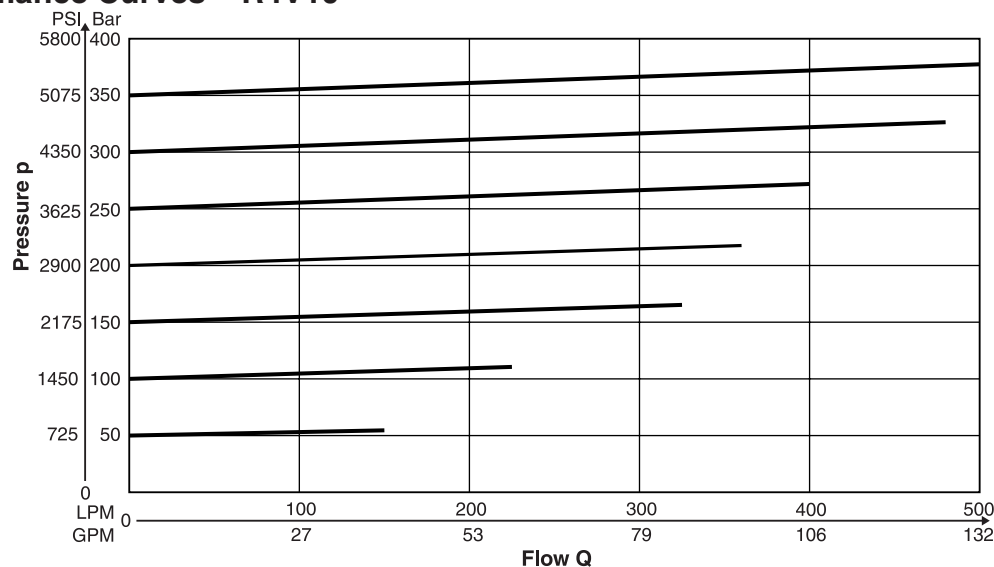
p/Q Performance Curves – R4V06



R4V06

Pressure Range	Q _{max}	Minimum Opening Width	Cartridge Stroke	Permitted Pressure Increase
50 - 70 Bar (725 - 1015 PSI)	220 LPM (58 GPM)	415mm ² (0.64 in. ²)	7.3mm (0.29")	10%
80 - 120 Bar (1160 - 1740 PSI)	250 LPM (66 GPM)	415mm ² (0.64 in. ²)	7.3mm (0.29")	10%
130 - 170 Bar (1885 - 2465 PSI)	300 LPM (79 GPM)	415mm ² (0.64 in. ²)	7.3mm (0.29")	10%
180 - 200 Bar (2610 - 2900 PSI)	360 LPM (95 GPM)	415mm ² (0.64 in. ²)	7.3mm (0.29")	10%
210 - 250 Bar (3015 - 3625 PSI)	380 LPM (101 GPM)	415mm ² (0.64 in. ²)	7.3mm (0.29")	10%
260 - 300 Bar (3770 - 4350 PSI)	430 LPM (114 GPM)	415mm ² (0.64 in. ²)	7.3mm (0.29")	10%
310 - 350 Bar (4495 - 5075 PSI)	450 LPM (120 GPM)	415mm ² (0.64 in. ²)	7.3mm (0.29")	10%

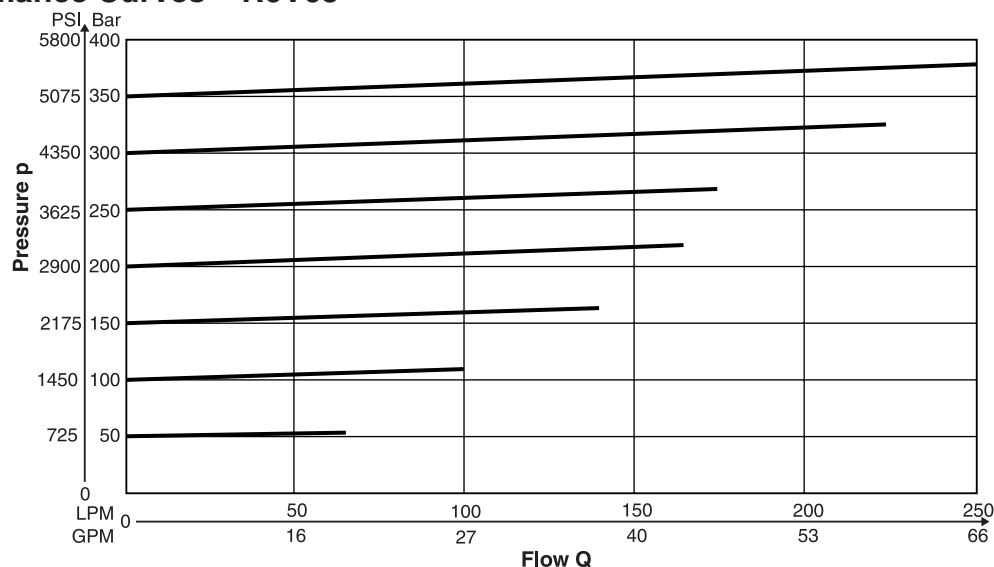
p/Q Performance Curves – R4V10



R4V10

Pressure Range	Q _{max}	Minimum Opening Width	Cartridge Stroke	Permitted Pressure Increase
50 - 70 Bar (725 - 1015 PSI)	150 LPM (40 GPM)	607mm ² (0.94 in. ²)	7.3mm (0.29")	10%
80 - 120 Bar (1160 - 1740 PSI)	225 LPM (60 GPM)	607mm ² (0.94 in. ²)	7.3mm (0.29")	10%
130 - 170 Bar (1885 - 2465 PSI)	325 LPM (86 GPM)	607mm ² (0.94 in. ²)	7.3mm (0.29")	10%
180 - 200 Bar (2610 - 2900 PSI)	360 LPM (95 GPM)	607mm ² (0.94 in. ²)	7.3mm (0.29")	10%
210 - 250 Bar (3015 - 3625 PSI)	400 LPM (106 GPM)	607mm ² (0.94 in. ²)	7.3mm (0.29")	10%
260 - 300 Bar (3770 - 4350 PSI)	480 LPM (127 GPM)	607mm ² (0.94 in. ²)	7.3mm (0.29")	10%
310 - 350 Bar (4495 - 5075 PSI)	500 LPM (132 GPM)	607mm ² (0.94 in. ²)	7.3mm (0.29")	10%

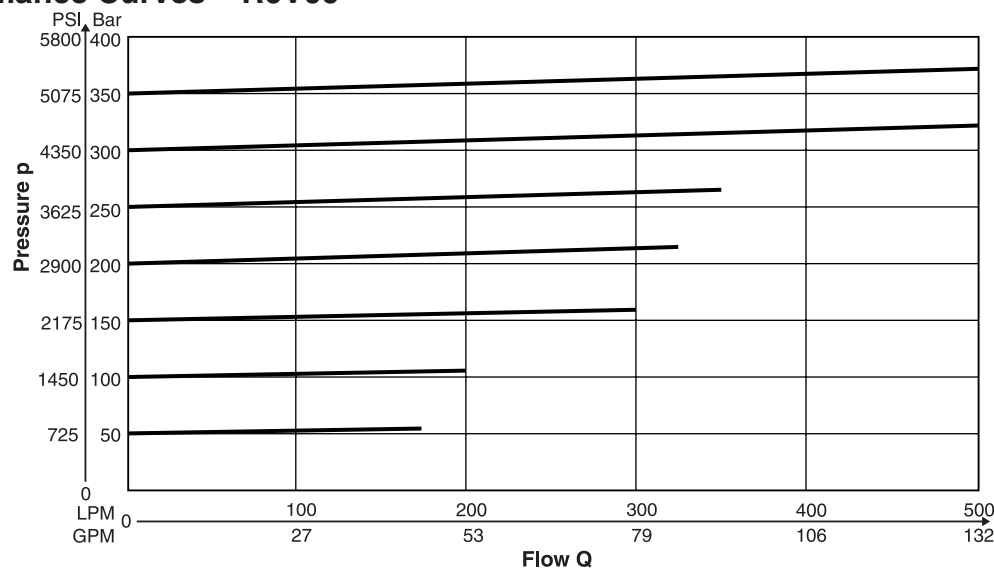
p/Q Performance Curves – R6V03



R6V03

Pressure Range	Q _{max}	Minimum Opening Width	Cartridge Stroke	Permitted Pressure Increase
50 - 70 Bar (725 - 1015 PSI)	65 LPM (17 GPM)	154mm ² (0.24 in. ²)	4.4mm (0.17")	10%
80 - 120 Bar (1160 - 1740 PSI)	100 LPM (27 GPM)	154mm ² (0.24 in. ²)	4.4mm (0.17")	10%
130 - 170 Bar (1885 - 2465 PSI)	140 LPM (37 GPM)	154mm ² (0.24 in. ²)	4.4mm (0.17")	10%
180 - 200 Bar (2610 - 2900 PSI)	165 LPM (44 GPM)	154mm ² (0.24 in. ²)	4.4mm (0.17")	10%
210 - 250 Bar (3015 - 3625 PSI)	170 LPM (46 GPM)	154mm ² (0.24 in. ²)	4.4mm (0.17")	10%
260 - 300 Bar (3770 - 4350 PSI)	225 LPM (60 GPM)	154mm ² (0.24 in. ²)	4.4mm (0.17")	10%
310 - 350 Bar (4495 - 5075 PSI)	250 LPM (66 GPM)	154mm ² (0.24 in. ²)	4.4mm (0.17")	10%

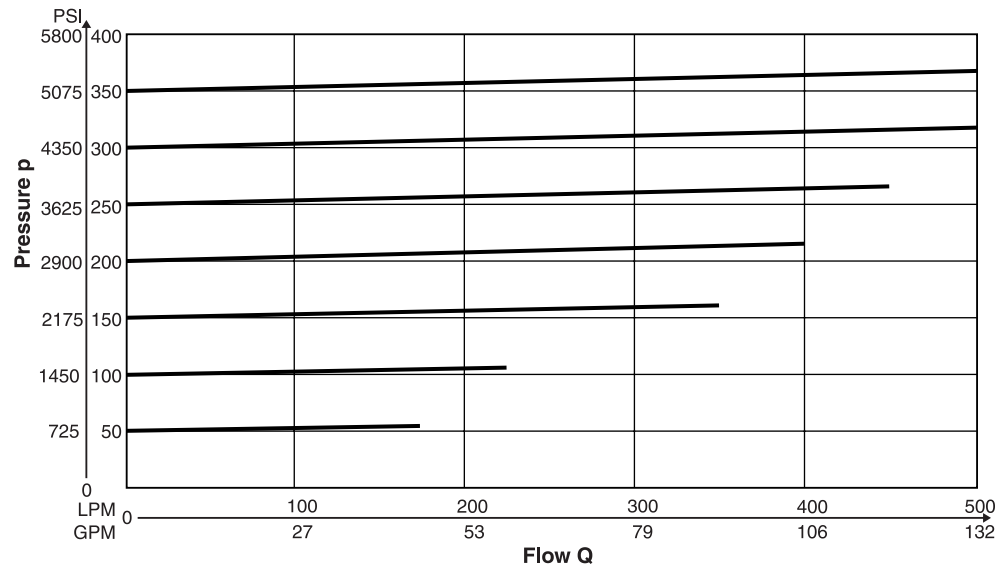
p/Q Performance Curves – R6V06



R6V06

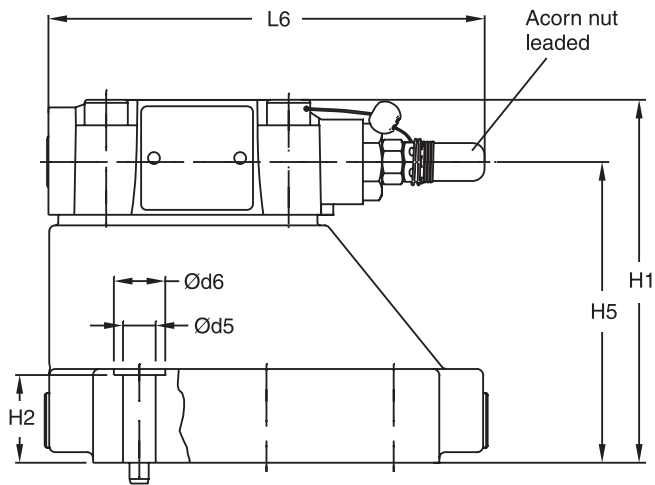
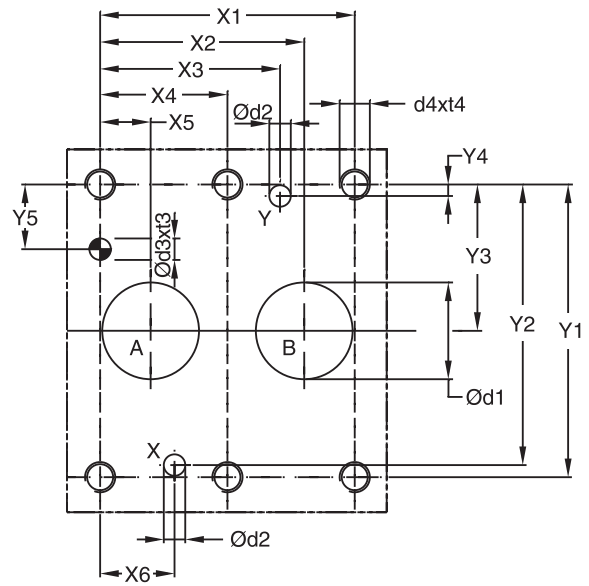
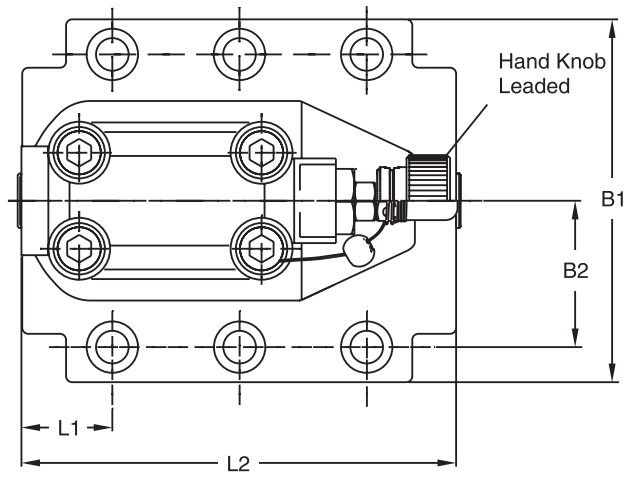
Pressure Range	Q _{max}	Minimum Opening Width	Cartridge Stroke	Permitted Pressure Increase
50 - 70 Bar (725 - 1015 PSI)	170 LPM (45 GPM)	415mm ² (0.64 in. ²)	7.3mm (0.29")	10%
80 - 120 Bar (1160 - 1740 PSI)	200 LPM (53 GPM)	415mm ² (0.64 in. ²)	7.3mm (0.29")	10%
130 - 170 Bar (1885 - 2465 PSI)	300 LPM (80 GPM)	415mm ² (0.64 in. ²)	7.3mm (0.29")	10%
180 - 200 Bar (2610 - 2900 PSI)	325 LPM (86 GPM)	415mm ² (0.64 in. ²)	7.3mm (0.29")	10%
210 - 250 Bar (3015 - 3625 PSI)	350 LPM (93 GPM)	415mm ² (0.64 in. ²)	7.3mm (0.29")	10%
260 - 300 Bar (3770 - 4350 PSI)	500 LPM (132 GPM)	415mm ² (0.64 in. ²)	7.3mm (0.29")	10%
310 - 350 Bar (4495 - 5075 PSI)	500 LPM (132 GPM)	415mm ² (0.64 in. ²)	7.3mm (0.29")	10%

p/Q Performance Curves – R6V10



R6V10

Pressure Range	Q _{max}	Minimum Opening Width	Cartridge Stroke	Permitted Pressure Increase
50 - 70 Bar (725 - 1015 PSI)	170 LPM (45 GPM)	607mm ² (0.94 in. ²)	7.3mm (0.29")	10%
80 - 120 Bar (1160 - 1740 PSI)	200 LPM (53 GPM)	607mm ² (0.94 in. ²)	7.3mm (0.29")	10%
130 - 170 Bar (1885 - 2465 PSI)	300 LPM (80 GPM)	607mm ² (0.94 in. ²)	7.3mm (0.29")	10%
180 - 200 Bar (2610 - 2900 PSI)	325 LPM (86 GPM)	607mm ² (0.94 in. ²)	7.3mm (0.29")	10%
210 - 250 Bar (3015 - 3625 PSI)	350 LPM (93 GPM)	607mm ² (0.94 in. ²)	7.3mm (0.29")	10%
260 - 300 Bar (3770 - 4350 PSI)	500 LPM (132 GPM)	607mm ² (0.94 in. ²)	7.3mm (0.29")	10%
310 - 350 Bar (4495 - 5075 PSI)	500 LPM (132 GPM)	607mm ² (0.94 in. ²)	7.3mm (0.29")	10%

D

Dimensions**Pilot Operated Pressure Relief Valves
Series R4V (TÜV)**

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

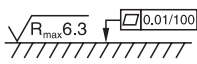
Size	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	6264-06-07-*-97	42.9 (1.69)	35.8 (1.41)	21.5 (0.85)	— —	7.2 (0.28)	21.5 (0.85)	0.0 (0.00)	66.7 (2.63)	58.8 (2.31)	33.4 (1.31)	7.9 (0.31)	14.3 (0.56)	— —
25	6264-08-11-*-97	60.3 (2.37)	49.2 (1.94)	39.7 (1.56)	— —	11.1 (0.44)	20.6 (0.81)	0.0 (0.00)	79.4 (3.13)	73.0 (2.87)	39.7 (1.56)	6.4 (0.25)	15.9 (0.63)	— —
32	6264-10-15-*-97	84.2 (3.31)	67.5 (2.66)	59.5 (2.34)	42.1 (1.66)	16.7 (0.66)	24.6 (0.97)	0.0 (0.00)	96.8 (3.81)	92.8 (3.65)	48.4 (1.91)	3.8 (0.15)	21.4 (0.84)	— —

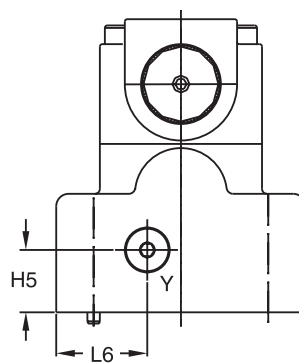
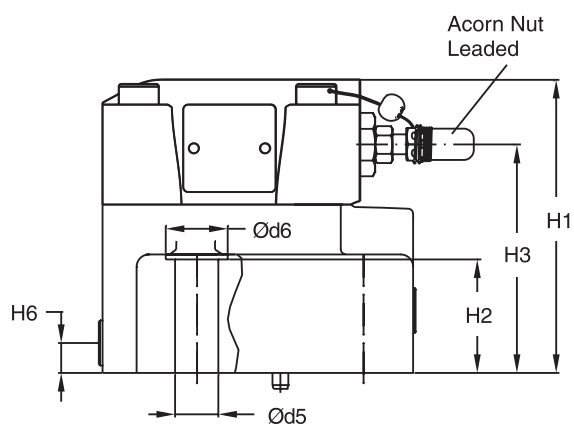
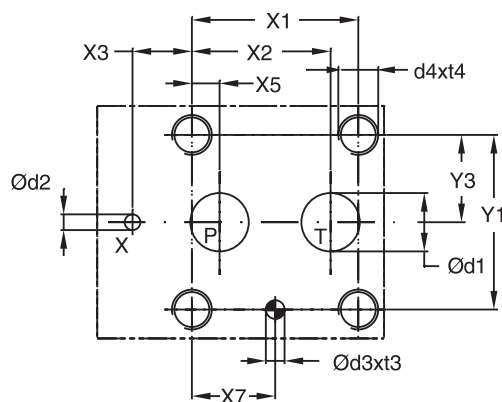
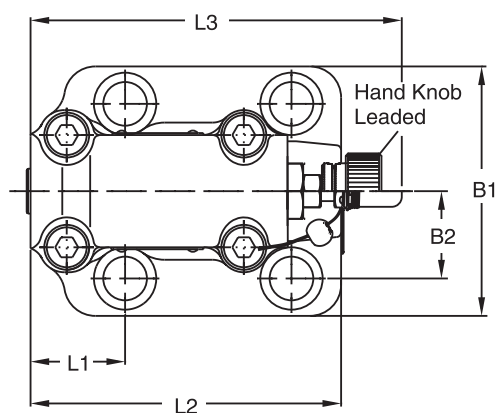
Tolerance at X and Y pin holes and screw holes ± 0.1 , at port holes ± 0.2 .

Size	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L6
10	6264-06-07-*-97	87.3 (3.44)	33.4 (1.31)	83.0 (3.27)	21.0 (0.83)	— —	— —	62.5 (2.46)	— —	29.0 (1.14)	94.8 (3.73)	— —	144.8 (5.76)
25	6264-08-11-*-97	105.0 (4.13)	39.7 (1.56)	109.5 (4.31)	29.0 (1.14)	— —	— —	89.0 (3.50)	— —	34.7 (1.37)	126.8 (4.99)	— —	144.8 (5.76)
32	6264-10-15-*-97	120.0 (4.72)	48.4 (1.91)	120.0 (4.72)	29.0 (1.14)	— —	— —	99.5 (3.92)	— —	30.6 (1.20)	144.3 (5.68)	— —	144.8 (5.76)

Size	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6
10	6264-06-07-*-97	15.0 (0.59)	7.0 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	16.0 (0.63)	10.8 (0.43)	17.0 (0.67)
25	6264-08-11-*-97	23.4 (0.92)	7.1 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	18.0 (0.71)	10.8 (0.43)	17.0 (0.67)
32	6264-10-15-*-97	32.0 (1.26)	7.1 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	20.0 (0.79)	10.8 (0.43)	17.0 (0.67)

Size	ISO-code	Subplate	Size
10	6264-06-07-*-97	SPP3M6B910	A, B = 3/4" BSPP x,y = 1/4" BSPP
25	6264-08-11-*-97	SPP6M8B910	A, B = 1" BSPP x,y = 1/4" BSPP
32	6264-10-15-*-97	SPP10M12B910	A, B = 1 1/2" BSPP x,y = 1/4" BSPP

Size	ISO-code	Bolt Kit			Seal Nitrile	Kit Fluorocarbon	Surface Finish
10	6264-06-07-*-97	BK505	4xM10 x 35-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58507-0	S26-58507-5	
25	6264-08-11-*-97	BK485	4xM10 x 45-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58475-0	S26-58475-5	
32	6264-10-15-*-97	BK506	6xM10 x 45-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58508-0	S26-58508-5	

D

Y: external drain port G 1/8"



Dimensions**Pilot Operated Pressure Relief Valves
Series R6V (TÜV)**

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

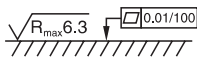
Size	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	6264-06-09-*-97	53.8 (2.12)	47.5 (1.87)	0.0 (0.00)	— —	22.1 (0.87)	— —	22.1 (0.87)	53.8 (2.12)	— —	26.9 (1.06)	— —	— —	— —
25	6264-08-13-*-97	66.7 (2.63)	55.6 (2.19)	23.8 (0.94)	— —	11.1 (0.44)	— —	33.4 (1.31)	70.0 (2.76)	— —	35.0 (1.38)	— —	— —	— —
32	6264-10-17-*-97	88.9 (3.50)	76.2 (3.00)	31.8 (1.25)	— —	12.7 (0.50)	— —	44.5 (1.75)	82.6 (3.25)	— —	41.3 (1.63)	— —	— —	— —

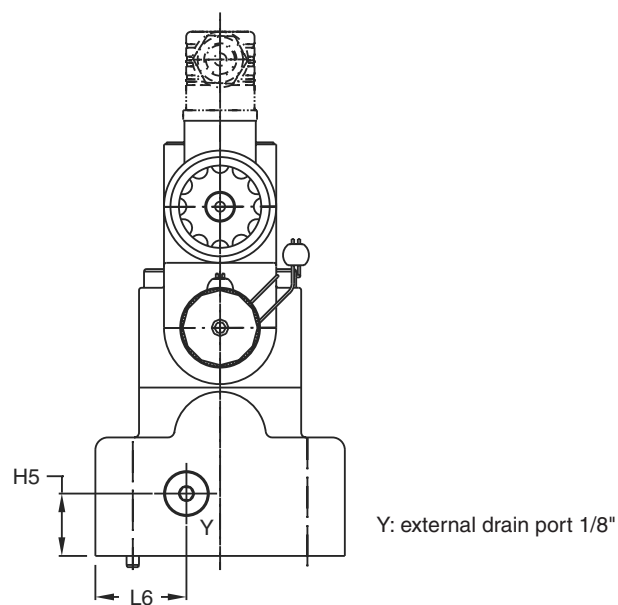
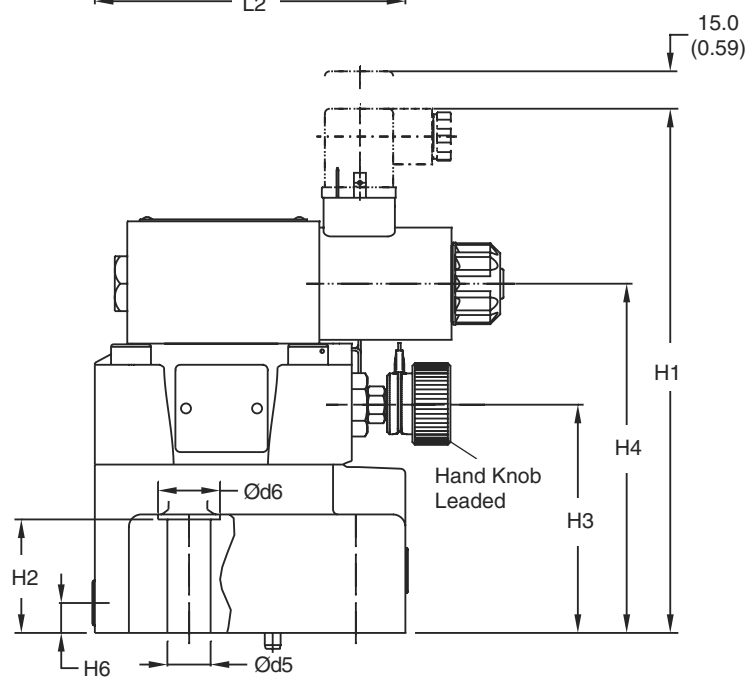
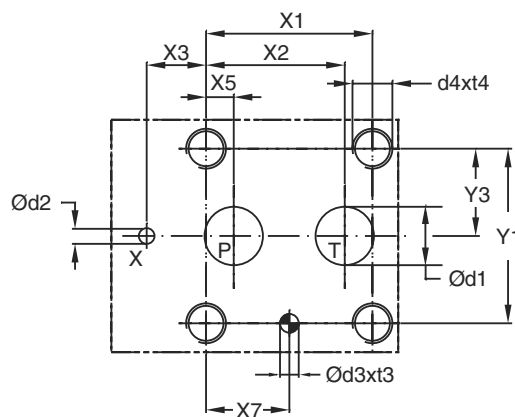
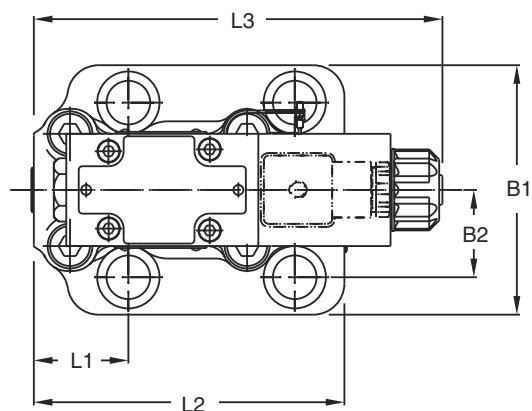
Tolerance at X and Y pin holes and screw holes ± 0.1 , at port holes ± 0.2 .

Size	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L6
10	6264-06-09-*-97	80.0 (3.15)	26.9 (1.06)	114.0 (4.49)	27.0 (1.06)	88.0 (3.46)	—	20.5 (0.81)	25.0 (0.98)	52.5 (2.07)	118.5 (4.67)	148.3 (5.84)	—	29.5 (1.16)
25	6264-08-13-*-97	100.0 (3.94)	35.0 (1.38)	117.5 (4.63)	45.5 (1.79)	91.5 (3.60)	—	25.0 (0.98)	12.0 (0.47)	37.9 (1.49)	124.5 (4.90)	148.3 (5.84)	—	36.5 (1.44)
32	6264-10-17-*-97	120.0 (4.72)	41.3 (1.63)	123.0 (4.83)	52.0 (2.05)	97.0 (3.82)	—	26.5 (1.04)	13.5 (0.53)	45.0 (1.77)	153.0 (6.02)	148.3 (5.84)	—	46.5 (1.83)

Size	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6
10	6264-06-09-*-97	14.7 (0.58)	4.8 (0.19)	7.5 (0.30)	10.0 (0.39)	M12	20.0 (0.79)	13.5 (0.53)	20.0 (0.79)
25	6264-08-13-*-97	23.4 (0.92)	6.3 (0.25)	7.5 (0.30)	10.0 (0.39)	M16	27.0 (1.06)	17.5 (0.69)	25.0 (0.98)
32	6264-10-17-*-97	32.0 (1.26)	6.3 (0.25)	7.5 (0.30)	10.0 (0.39)	M18	28.0 (1.10)	20.0 (0.79)	30.0 (1.18)

Size	ISO-code	Subplate	Size
10	6264-06-09-*-97	SPP3R6B910	P, T = 3/4" BSPP x = 1/4" BSPP
25	6264-08-13-*-97	SPP6R8B910	P, T = 1 1/4" BSPP x = 1/4" BSPP
32	6264-10-17-*-97	SPP10R12B910	P, T = 1 1/2" BSPP x,y = 1/4" BSPP

Size	ISO-code	Bolt Kit			Seal Nitrile	Kit Fluorocarbon	Surface Finish
10	6264-06-09-*-97	BK494	4xM12 x 45-DIN 912 12.9	108 Nm (79.6 lb.-ft.) $\pm 15\%$	S26-96396-0	S26-96396-5	
25	6264-08-13-*-97	BK366	4xM16 x 70-DIN 912 12.9	264 Nm (194.7 lb.-ft.) $\pm 15\%$	S26-96589-0	S26-96589-5	
32	6264-10-17-*-97	BK507	4xM18 x 75-DIN 912 12.9	398 Nm (293.5 lb.-ft.) $\pm 15\%$	S26-96392-0	S26-96392-5	

D

Y: external drain port 1/8"



Dimensions**Pilot Operated Pressure Relief Valves
Series R6V (TÜV) with Vent Function**

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

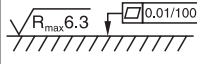
Size	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	6264-06-09-*-97	53.8 (2.12)	47.5 (1.87)	0.0 (0.00)	— —	22.1 (0.87)	— —	22.1 (0.87)	53.8 (2.12)	— —	26.9 (1.06)	— —	— —	— —
25	6264-08-13-*-97	66.7 (2.63)	55.6 (2.19)	23.8 (0.91)	— —	11.1 (0.44)	— —	33.4 (1.31)	70.0 (2.76)	— —	35.0 (1.38)	— —	— —	— —
32	6264-10-17-*-97	88.9 (3.50)	76.2 (3.00)	31.8 (1.25)	— —	12.7 (0.50)	— —	44.5 (1.75)	82.6 (3.25)	— —	41.3 (1.63)	— —	— —	— —

Tolerance at X and Y pin holes and screw holes ± 0.1 , at port holes ± 0.2 .

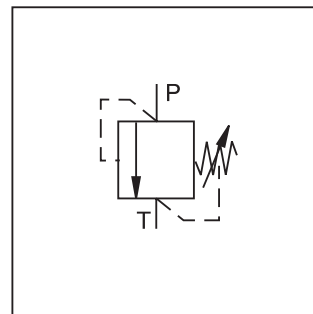
Size	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L6
10	6264-06-09-*-97	80.0 (3.15)	26.9 (1.06)	206.0 (8.11)	27.0 (1.06)	88.0 (3.46)	136.5 (5.37)	25.0 (0.98)	12.0 (0.47)	52.5 (2.07)	118.5 (4.67)	163.8 (6.45)	— —	36.5 (1.44)
25	6264-08-13-*-97	100.0 (3.94)	35.0 (1.38)	210.0 (8.27)	45.5 (1.79)	91.5 (3.60)	140.0 (5.51)	25.0 (0.98)	12.0 (0.47)	37.9 (1.49)	124.5 (4.90)	163.8 (6.45)	— —	36.5 (1.44)
32	6264-10-17-*-97	120.0 (4.72)	41.3 (1.63)	215.5 (8.48)	52.0 (2.05)	97.0 (3.82)	145.5 (5.73)	25.0 (0.98)	12.0 (0.47)	45.0 (1.77)	153 (6.02)	163.8 (6.45)	— —	36.5 (1.44)

Size	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6
10	6264-06-09-*-97	14.7 (0.58)	4.8 (0.19)	7.5 (0.30)	10.0 (0.39)	M12	20.0 (0.79)	13.5 (0.53)	20.0 (0.79)
25	6264-08-13-*-97	23.4 (0.92)	6.3 (0.25)	7.5 (0.30)	10.0 (0.39)	M16	27.0 (1.06)	17.5 (0.69)	25.0 (0.98)
32	6264-10-17-*-97	32.0 (1.26)	6.3 (0.25)	7.5 (0.30)	10.0 (0.39)	M18	28.0 (1.10)	20.0 (0.79)	30.0 (1.18)

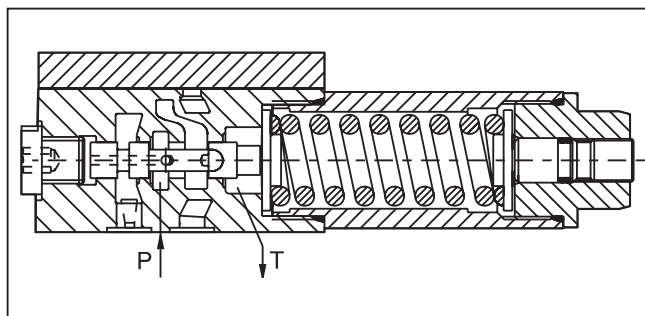
Size	ISO-code	Subplate	Size
10	6264-06-09-*-97	SPP3R6B910	P, T = 3/4" BSPP x = 1/4" BSPP
25	6264-08-13-*-97	SPP6R8B910	P, T = 1 1/4" BSPP x = 1/4" BSPP
32	6264-10-17-*-97	SPP10R12B910	P, T = 1 1/2" BSPP x,y = 1/4" BSPP

Size	ISO-code	Bolt Kit			Seal Nitrile	 Kit Fluorocarbon	Surface Finish
10	6264-06-09-*-97	BK494	4xM12 x 45-DIN 912 12.9	108 Nm (79.6 lb.-ft.) $\pm 15\%$	S26-96395-0	S26-96395-5	
25	6264-08-13-*-97	BK366	4xM16 x 70-DIN 912 12.9	264 Nm (194.7 lb.-ft.) $\pm 15\%$	S26-96589-0	S26-96589-5	
32	6264-10-17-*-97	BK507	4xM18 x 75-DIN 912 12.9	398 Nm (293.5 lb.-ft.) $\pm 15\%$	S26-96392-0	S26-96392-5	

Series VS pressure relief valve is a direct operated spool valve for subplate mounting with internal drain to port T. The connection and function is according to ISO 6264.



Size	NFPA D03 / NG6
Mounting Interface	ISO 6264
Mounting Position	Unrestricted
Ambient Temperature Range	-20°C to +70°C (-4°F to +158°F)
Working Pressure	Port P: 350 Bar (5075 PSI) Port T: depressurized
Pressure Range	25 Bar (363 PSI) 64 Bar (928 PSI) 160 Bar (2320 PSI) 210 Bar (3045 PSI) 350 Bar (5075 PSI)
Nominal Flow	25 LPM (6.6 GPM)
Pressure Fluid	Hydraulic oil as per DIN 51524 ... 525
Fluid Temperature Recommended Permitted	+30°C to +50°C (+86°F to +122°F) -20°C to +70°C (-4°F to +158°F)
Viscosity Recommended Permitted	30 to 50 cSt/mm ² /s (139 to 232 SSU) 20 to 380 cSt / mm ² /s (93 to 1761 SSU)
Filtration	ISO 4406 (1999), 18/16/13



- Spool type valve
- Manifold mounting
- 5 pressure ranges
- 2 adjustment modes

1/2" NPT x 1/2" NPT 316 Stainless Steel Ball Valve

VS Pressure Relief Valve

A Adjustment Screw with Hexagon Socket

06 Size

V Seal Fluorcarbon

Gage Port

Lock

Design Series
NOTE:
Not required when ordering.

Code	Description
025	25 Bar (363 PSI)
064	64 Bar (928 PSI)
160	160 Bar (2320 PSI)
210	210 Bar (3045 PSI)
350	350 Bar (5075 PSI)

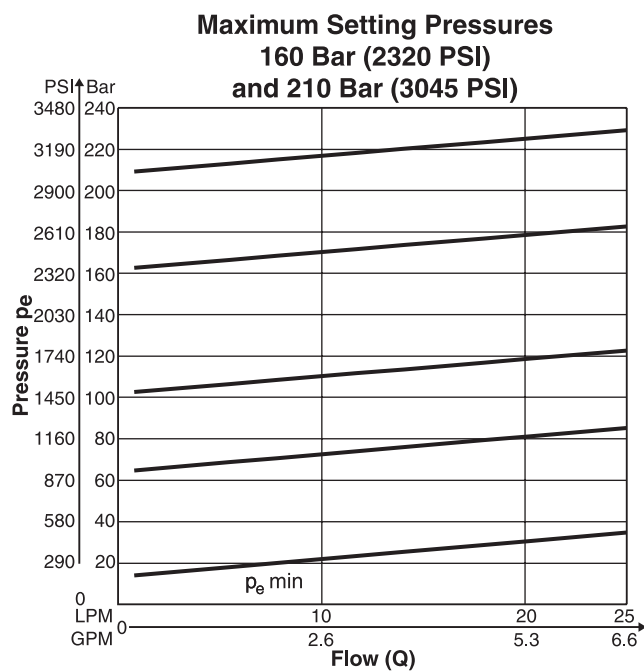
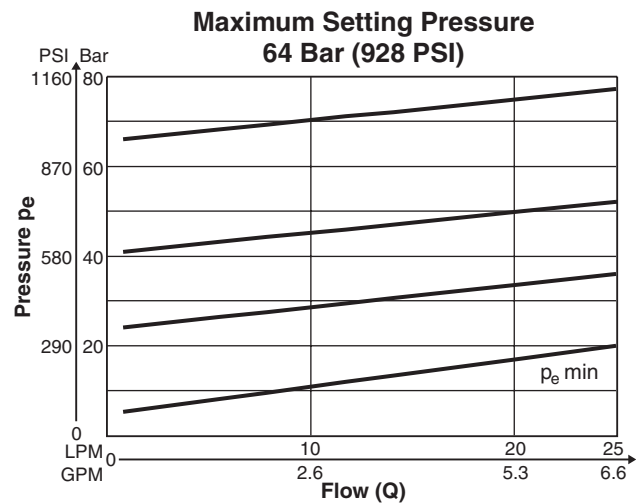
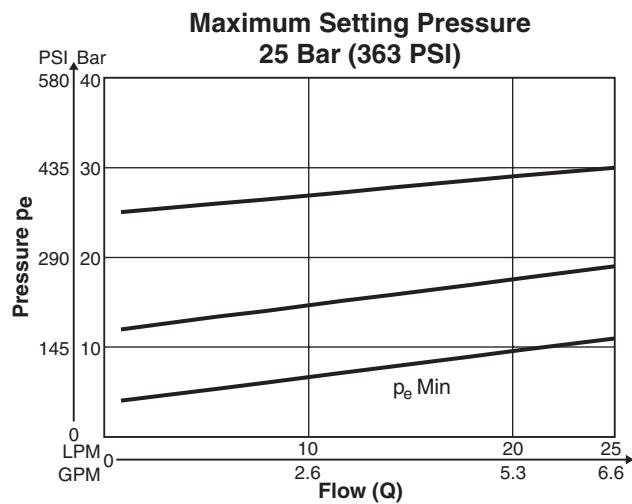
Code	Description
06	NFPA D03 / NG6

Code	Description
G	BSPP 1/4"
M	M 12x1.5

Code	Description
Omit	Normal
Z	Cylinder Lock

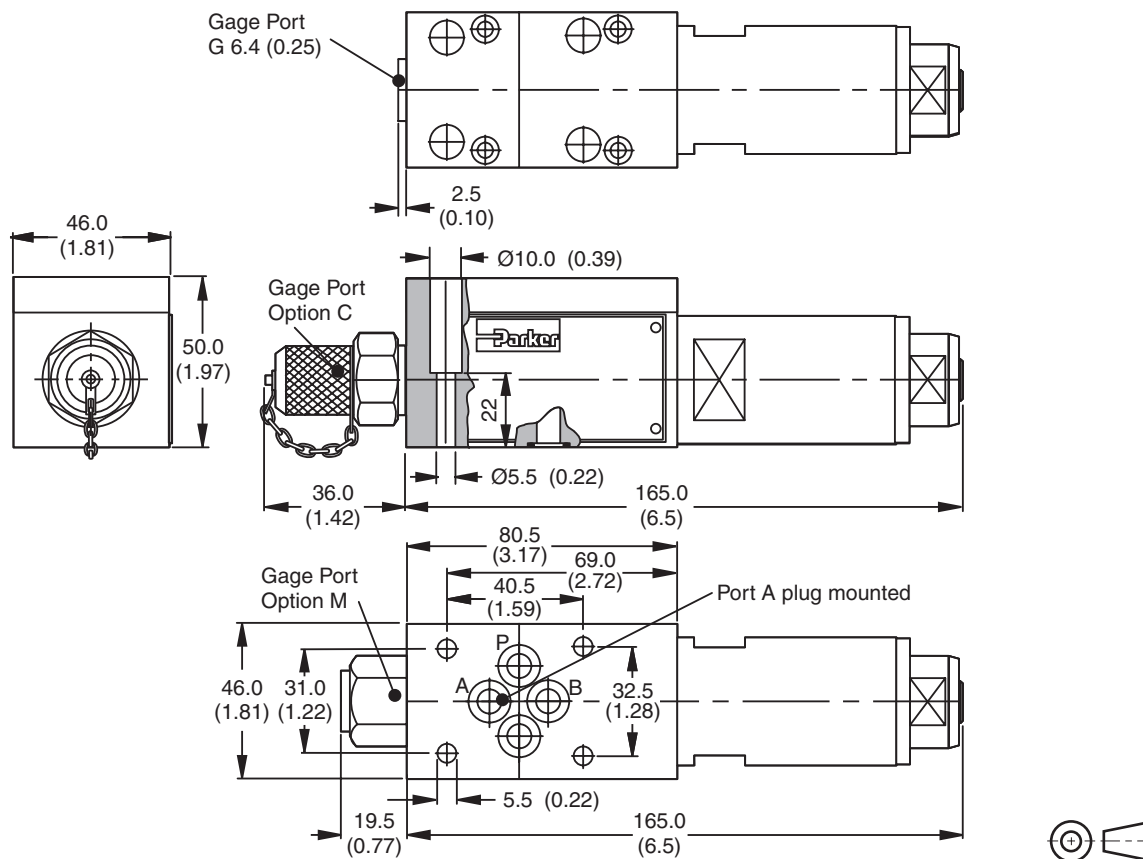
⚠️ WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

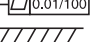
Performance Curves

Pressure Relief Valves
Series VS

D

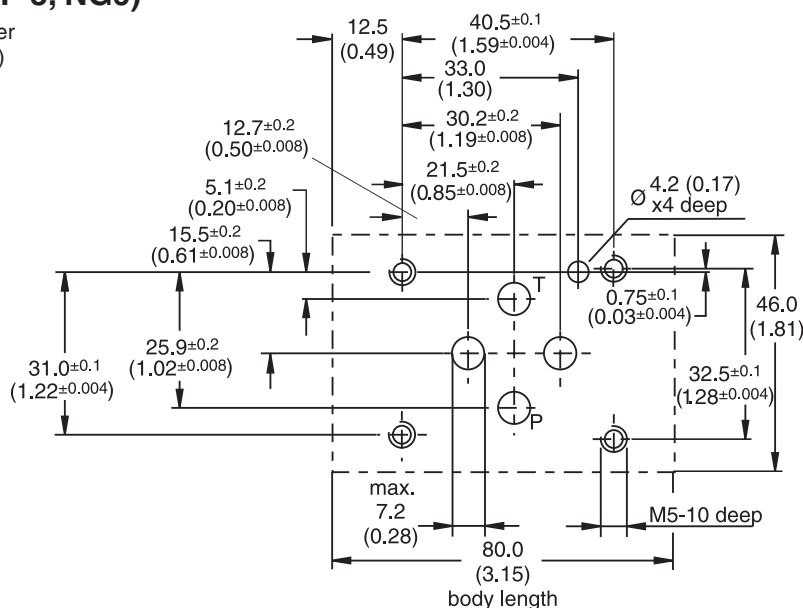
Inch equivalents for millimeter dimensions are shown in (**)



Surface Finish	Bolt kit  DIN912 12.9		Seal  Kit Fluorocarbon
 $\sqrt{R_{max}6.3}$  0.01/100	M5x30-4pcs	8.1Nm (6.0 lb.-ft.)	SK-VB/VM/VS V

Mounting Pattern ISO 6264-03-04-*-97 (NFPA D03, CETOP 3, NG6)

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



General Description

Series R4U subplate mounted unloading valves are used to unload a circuit at low pressure. The mechanically adjustable pressure signal to unload the main stage has to be applied to port X. The pressure differential between opening and closing is nominal 15% or 28% of the setting pressure:

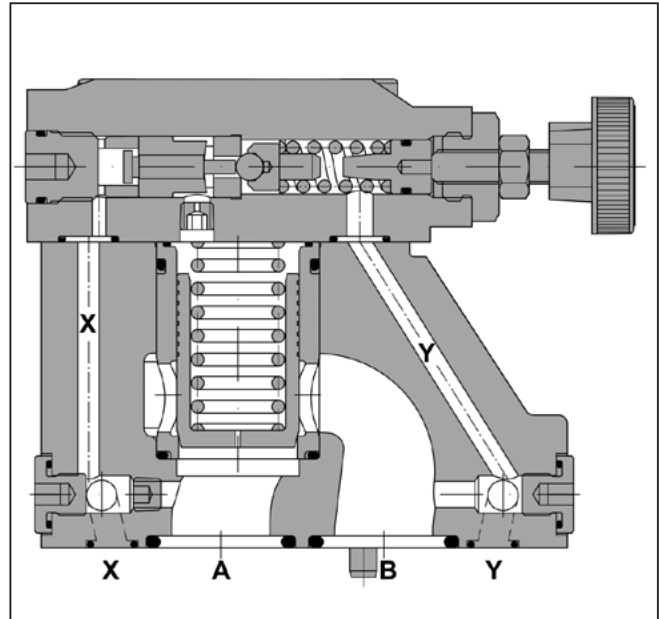
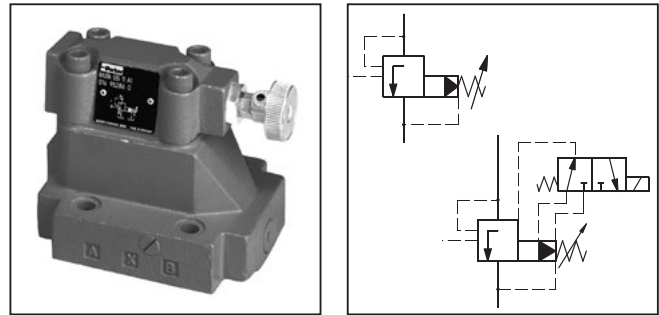
15% for pressure ranges 350 Bar (5075 PSI) and
 28% for 105 Bar (1523 PSI) and 210 Bar (3045 PSI).

Typical applications are to unload the pumps in an accumulator circuit and to unload the low pressure stage of a double pump.

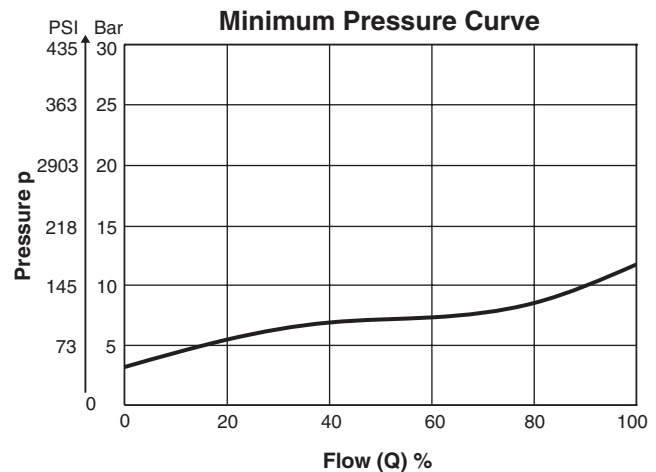
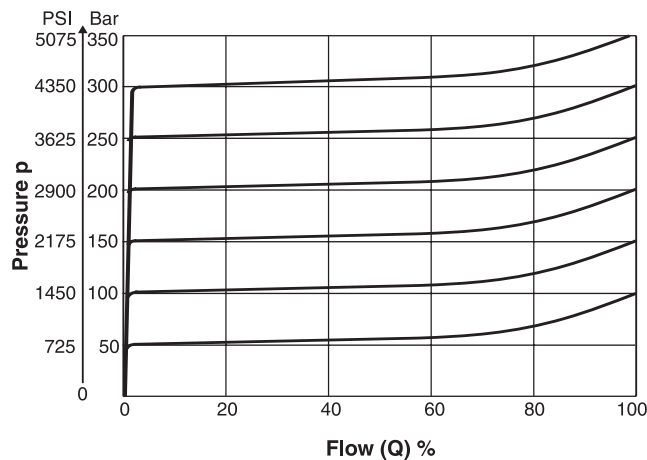
In addition, Series R4U with vent function is vented by electrical operation.

Features

- Pilot operated unloading valve
- 3 pressure ranges
- 2 switching types (series R4U with vent function)
- 3 adjustment modes:
 - Hand knob
 - Screw with locknut
 - Key lock



Performance Curves



The performance curves are measured with external drain.
 For internal drain the tank pressure has to be added to curve.

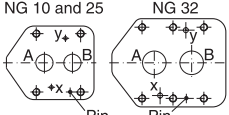
WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

[R]	[4]	[U]	[]	— [5]	[3]	[]	[]	[]	[]	[]	[A]	[]	[]
Pressure Valve	Interface	Unloading Function	Valve Size	Maximum Pressure 350 Bar (5075 PSI)	Body Mounting	Pressure Range	Adjustment	Pilot Oil Drain Line	Vent Valve Function	Solenoid Voltage	Design Series	Seal	Options Check with Factory

Code	Description
03	NG10
06	NG25
10	NG32

Code	Description
1	up to 105 Bar (1523 PSI)
3	up to 210 Bar (3045 PSI)
5	up to 350 Bar (5075 PSI)

Code	Description
1	Nitrile
5	Fluorocarbon

Code	Interface Subplate Mounting ISO 5781
4	

Code	Description
1	Hand Knob 32mm dia. Std.
3	Acorn Nut with Lead Seal
4	Key Lock

Code	Description
Omit	Standard without Vent Option
G0R	12 VDC
G0Q	24 VDC
GAR	98 VDC
GAG	205 VDC
W30	110V 50Hz/120V 60Hz
W31	230V 50Hz/240V 60Hz

Code	Description
0	Internal
1	External from Subplate

Code	Description
Omit	Standard without Vent Option
09	Solenoid not active unpress. circulation
11	Solenoid activated unpress. circulation

Weight:

R4U03: 2.7 kg (6.0 lbs.)
R4U06: 4.5 kg (9.9 lbs.)
R4U10: 6.0 kg (13.2 lbs.)

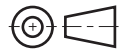
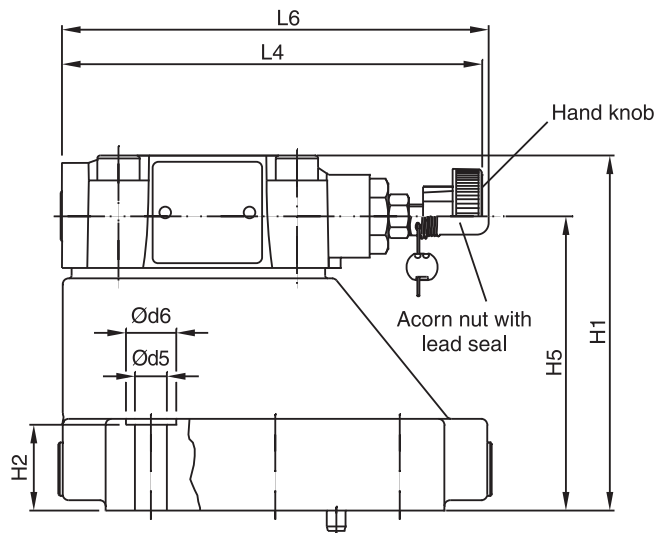
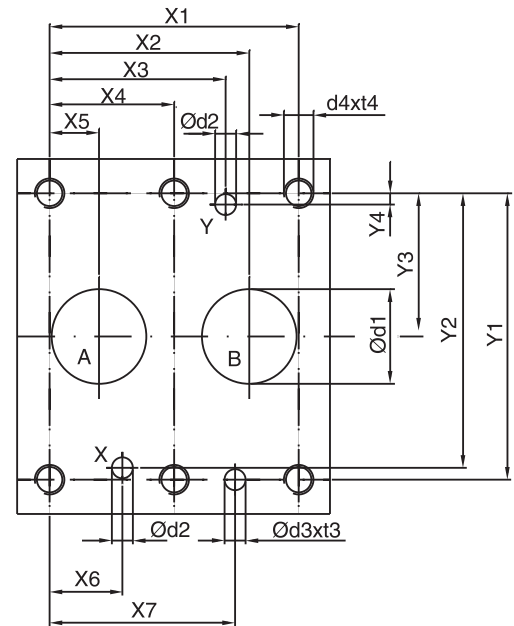
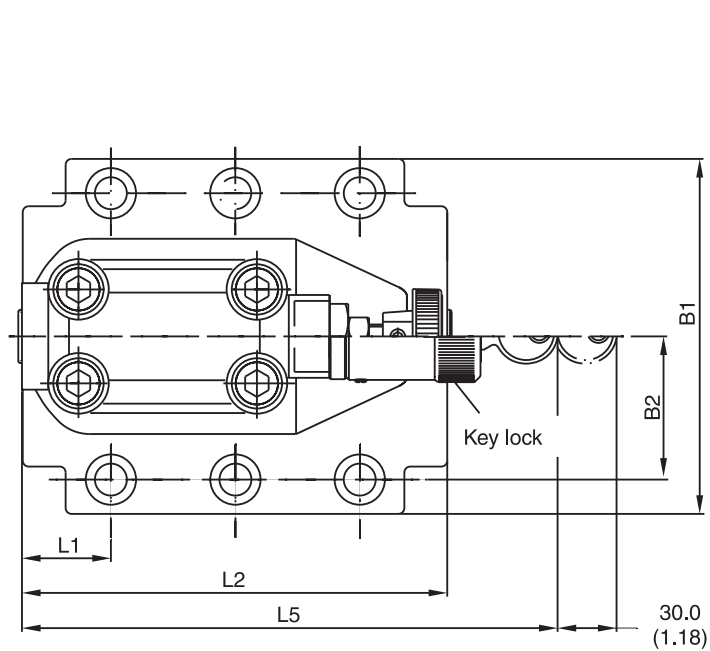
Weight: with Vent

R4U03: 4.4 kg (9.7 lbs.)
R4U06: 6.2 kg (13.7 lbs.)
R4U10: 7.7 kg (17.0 lbs.)

General				
Size	NG10		NG25	NG32
Interface	Subplate mounting acc. ISO 5781			
Mounting Position	As desired, horizontal mounting preferred			
Ambient Temperature	-20°C to +80°C (-4°F to +176°F)			
Hydraulic				
Operating Pressure	Ports A and X up to 350 Bar (5075 PSI), Ports B and Y depressurized			
Pressure Range	105, 210, 350 Bar (1523, 3045, 5075 PSI)			
Pressure Differential	15% for pressure range 350 Bar (2538 PSI) 28% for pressure ranges 105 Bar (1523 PSI) and 250 Bar (3625 PSI)			
Nominal Flow	150 LPM (39.7 GPM)	350 LPM (92.6 GPM)	650 LPM (172.0 GPM)	
Pressure Fluid	Hydraulic oil according to DIN 51524 ... 525			
Viscosity Recommended Maximum	30 to 50 cSt / mm²/s (139 to 232 SSU) 20 to 380 cSt / mm²/s (93 to 1761 SSU)			
Pressure Fluid Temperature Recommended Maximum	+30°C to +50°C (+86°F to +122°F) -20°C to +70°C (-4°F to +158°F)			
Filtration	ISO 4406 (1999), 18/16/13			

With Vent Function

General						
Size	NG10		NG25		NG32	
Interface	Subplate mounting acc. ISO 5781					
Mounting Position	As desired, horizontal mounting preferred					
Ambient Temperature	-20°C to +80°C (-4°F to +176°F)					
Hydraulic						
Operating Pressure	Ports A and X up to 350 Bar (5075 PSI), Ports B and Y depressurized					
Pressure Range	105, 210, 350 Bar (1523, 3045, 5075 PSI)					
Pressure Differential	15% for pressure range 350 Bar (5075 PSI) 28% for pressure ranges 105 Bar (1523 PSI) and 250 Bar (3625 PSI)					
Nominal Flow	150 LPM (39.7 GPM)		350 LPM (92.6 GPM)		650 LPM (172.0 GPM)	
Pressure Fluid	Hydraulic oil according to DIN 51524 ... 525					
Viscosity Recommended Maximum	30 to 50 cSt / mm²/s (139 to 232 SSU) 20 to 380 cSt / mm²/s (93 to 1761 SSU)					
Pressure Fluid Temperature Recommended Maximum	+30°C to +50°C (+86°F to +122°F) -20°C to +70°C (-4°F to +158°F)					
Filtration	ISO 4406 (1999), 18/16/13					
Electrical (solenoid)						
Duty Cycle	100% ED CAUTION: Coil temperature up to 180°C (356°F) possible					
Max. Switching Frequency	16,000 (DC), 7200 (AC)					
Protection Class	IP65 in accordance with EN 60529 (plugged and mounted)					
Code	G0R	G0Q	GAR	GAG	W30	W31
Supply Voltage	12V	24V	98V	205V	110 at 50Hz 120 at 60Hz	230 at 50Hz 240 at 60Hz
Supply Tolerance	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10
Power Consumption Hold	31W	31W	31W	31W	78W	78W
In Rush	31W	31W	31W	31W	264W	264W
Solenoid Connection	Connector as per EN 175301-803					
Wiring Minimum	3 x 1.5 mm² recommended					
Wiring Length Maximum	50 m (164 ft.) recommended					

D

Dimensions

Pressure Unloading Valves

Series R4U

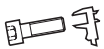
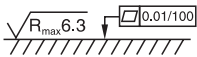
Inch equivalents for millimeter dimensions are shown in (**)

NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	5781-06-07-0-00	42.9 (1.69)	35.8 (1.41)	21.5 (0.85)	—	7.2 (0.28)	21.5 (0.85)	31.8 (1.25)	66.7 (2.63)	58.8 (2.31)	33.4 (1.31)	7.9 (0.31)	—	—
25	5781-08-10-0-00	60.3 (2.37)	49.2 (1.94)	39.7 (1.56)	—	11.1 (0.44)	20.6 (0.81)	44.5 (1.75)	79.4 (3.13)	73.0 (2.87)	39.7 (1.56)	6.4 (0.25)	—	—
32	5781-10-13-0-00	84.2 (3.31)	67.5 (2.66)	59.5 (2.34)	42.1 (1.66)	16.7 (0.66)	24.6 (0.97)	62.7 (2.47)	96.8 (3.81)	92.8 (3.65)	48.4 (1.91)	3.8 (0.15)	—	—

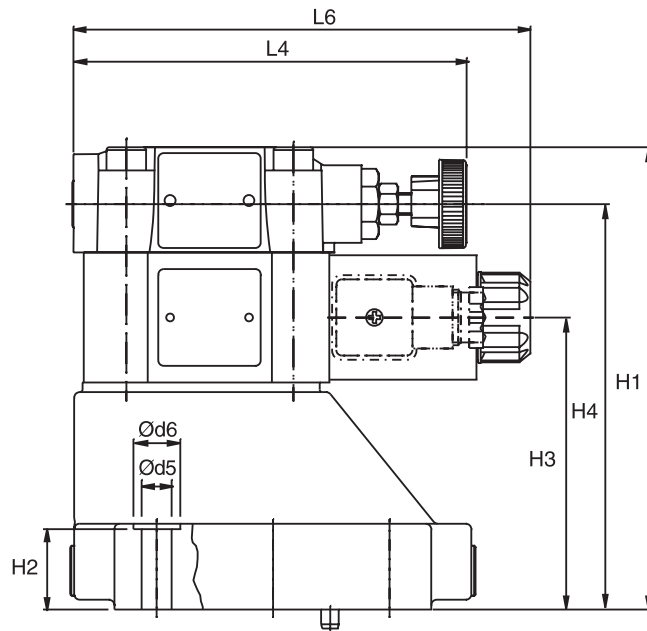
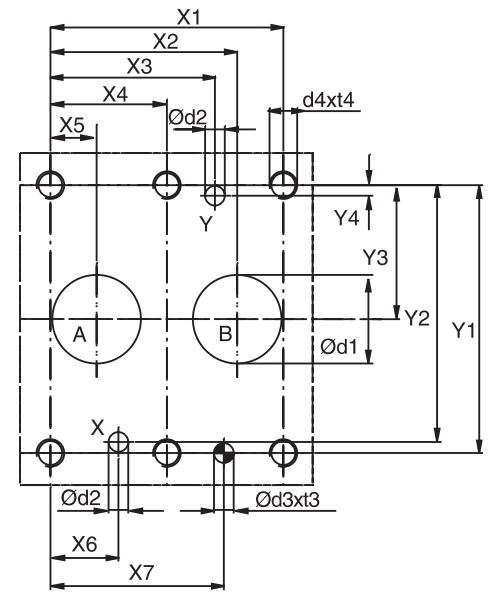
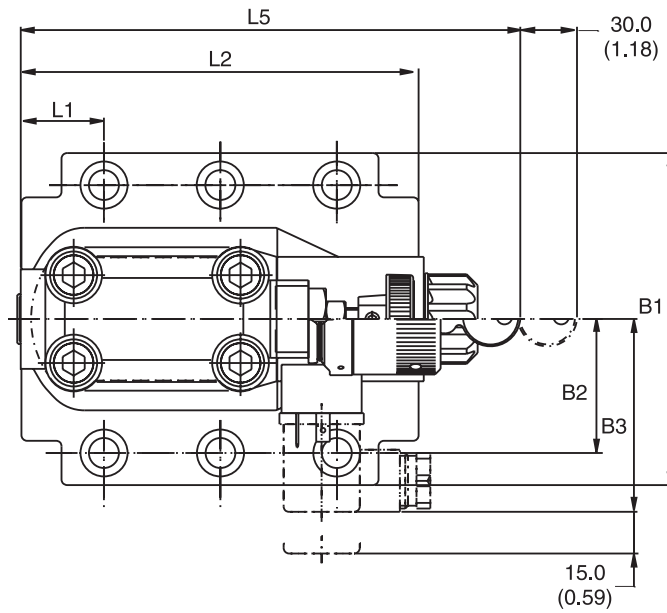
Tolerance at X and Y pin holes and screw holes ± 0.1 , at port holes ± 0.2 .

NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
10	5781-06-07-0-00	87.3 (3.44)	33.4 (1.31)	83.0 (3.27)	21.0 (0.83)	62.5 (2.46)	—	—	—	29.0 (1.14)	94.8 (3.73)	—	141.0 (5.55)	181.0 (7.13)	—
25	5781-08-10-0-00	105.0 (4.13)	39.7 (1.56)	109.5 (4.31)	29.0 (1.14)	89.0 (3.50)	—	—	—	34.7 (1.37)	126.8 (4.99)	—	141.0 (5.55)	181.0 (7.13)	—
32	5781-10-13-0-00	120.0 (4.72)	48.4 (1.91)	120.0 (4.72)	29.0 (1.14)	99.5 (3.92)	—	—	—	30.6 (1.20)	144.3 (5.68)	—	141.0 (5.55)	181.0 (7.13)	—

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6
10	5781-06-07-0-00	15.0 (0.59)	7.0 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	16.0 (0.63)	10.8 (0.43)	17.0 (0.67)
25	5781-08-10-0-00	23.4 (0.92)	7.1 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	18.0 (0.71)	10.8 (0.43)	17.0 (0.67)
32	5781-10-13-0-00	32.0 (1.26)	7.1 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	20.0 (0.79)	10.8 (0.43)	17.0 (0.67)

NG	ISO-code	Bolt Kit			Seal Nitrile	Kit Fluorocarbon	Surface Finish
10	5781-06-07-0-00	BK505	4xM10 x 35-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58507-0	S26-58507-5	
25	5781-08-10-0-00	BK485	4xM10 x 45-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58475-0	S26-58475-5	
32	5781-10-13-0-00	BK506	6xM10 x 45-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58508-0	S26-58508-5	

NG	ISO-code	Subplate	Size
10	5781-06-07-0-00	SPP3M6B910	A, B = 3/4" BSPP x, y = 1/4" BSPP
25	5781-08-10-0-00	SPP6M8B910	A, B = 1" BSPP x, y = 1/4" BSPP
32	5781-10-13-0-00	SPP10M12B910	A, B = 1 1/2" BSPP x, y = 1/4" BSPP

D

Dimensions

Pressure Unloading Valves
Series R4U with Vent Function

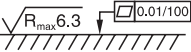
Inch equivalents for millimeter dimensions are shown in (**)

NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	5781-06-07-0-00	42.9 (1.69)	35.8 (1.41)	21.5 (0.85)	—	7.2 (0.28)	21.5 (0.85)	31.8 (1.25)	66.7 (2.63)	58.8 (2.31)	33.4 (1.31)	7.9 (0.31)	—	—
25	5781-08-10-0-00	60.3 (2.37)	49.2 (1.94)	39.7 (1.56)	—	11.1 (0.44)	20.6 (0.81)	44.5 (1.75)	79.4 (3.13)	73.0 (2.87)	39.7 (1.56)	6.4 (0.25)	—	—
32	5781-10-13-0-00	84.2 (3.31)	67.5 (2.66)	59.5 (2.34)	42.1 (1.66)	16.7 (0.66)	24.6 (0.97)	62.7 (2.47)	96.8 (3.81)	92.8 (3.65)	48.4 (1.91)	3.8 (0.15)	—	—

Tolerance at X and Y pin holes and screw holes ± 0.1 , at port holes ± 0.2 .

NG	ISO-code	B1	B2	B3	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
10	5781-06-07-0-00	87.3 (3.44)	33.4 (1.31)	70.0 (2.76)	130.0 (5.12)	21.0 (0.83)	68.5 (2.70)	109.5 (4.13)	—	—	29.0 (1.14)	94.8 (3.73)	—	141.0 (5.55)	181.0 (7.13)	165.6 (6.52)
25	5781-08-10-0-00	105.0 (4.13)	39.7 (1.56)	70.0 (2.76)	156.5 (6.16)	29.0 (1.14)	95.0 (3.74)	136.0 (5.35)	—	—	34.7 (1.37)	126.8 (4.99)	—	141.0 (5.55)	181.0 (7.13)	165.6 (6.52)
32	5781-10-13-0-00	120.0 (4.72)	48.4 (1.91)	70.0 (2.76)	167.0 (6.57)	29.0 (1.14)	105.5 (4.15)	146.5 (5.77)	—	—	30.6 (1.20)	144.3 (5.68)	—	141.0 (5.55)	181.0 (7.13)	165.6 (6.52)

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6
10	5781-06-07-0-00	15.0 (0.59)	7.0 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	16.0 (0.63)	10.8 (0.43)	17.0 (0.67)
25	5781-08-10-0-00	23.4 (0.92)	7.1 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	18.0 (0.71)	10.8 (0.43)	17.0 (0.67)
32	5781-10-13-0-00	32.0 (1.26)	7.1 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	20.0 (0.79)	10.8 (0.43)	17.0 (0.67)

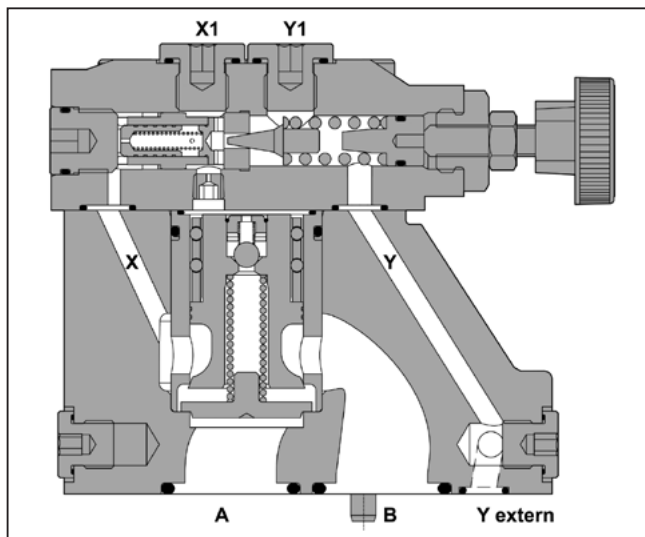
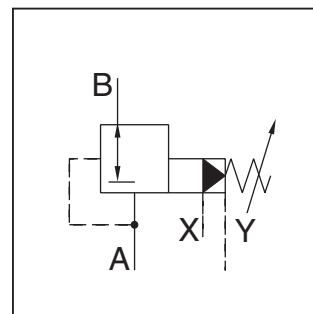
NG	ISO-code	Bolt Kit			Seal Nitrile	 Ki Fluorocarbon	Surface Finish
10	5781-06-07-0-00	BK505	4xM10 x 35-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58507-0*	S26-58507-5*	
25	5781-08-10-0-00	BK485	4xM10 x 45-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58475-0*	S26-58475-5*	
32	5781-10-13-0-00	BK506	6xM10 x 45-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58508-0*	S26-58508-5*	
VV01					S56-40609-0	S56-40609-5	

*Please combine seal kit of one size with seal kit of VV01 DC / AC solenoid for complete seal kit.

NG	ISO-code	Subplate	Size
10	5781-06-07-0-00	SPP3M6B910	A, B = 3/4" BSPP x, y = 1/4" BSPP
25	5781-08-10-0-00	SPP6M8B910	A, B = 1" BSPP x, y = 1/4" BSPP
32	5781-10-13-0-00	SPP10M12B910	A, B = 1 1/2" BSPP x, y = 1/4" BSPP

Specifications

Size	NG10, NG25, NG32
Interface	Subplate mounting acc. ISO 5781
Mounting Pos.	As desired, horizontal mounting preferred
Ambient Temp.	-20°C to +80°C (-4°F to +176°F)
Max. Oper. Pressure	Ports A, B and X: 350 Bar (5075 PSI), Port Y: depressurized
Pressure Range	up to 105, 210, 350 Bar (1523, 3045, 5075 PSI)
Nominal Flow	Size NG10: 150 LPM (39.7 GPM) Size NG25: 350 LPM (92.6 GPM) Size NG32: 500 LPM (132.3 GPM)
Pressure Fluid	Hydraulic oil according to DIN 51524... 51525
Pressure Fluid Temperature	Recommended: +30C to +50°C (86°F to +122°F) Maximum: -20°C to +70°C (-4°F to +158°F)
Viscosity	Recommended: 30 to 50 cSt (mm²/s) Maximum: 20 to 380 cSt (mm²/s)
Filtration	ISO 4406 (1999), 18/16/13



- Subplate mounting acc. to ISO 5781
- Normally closed to avoid unintended motion
- 3 pressure ranges
- Three adjustment modes: Hand knob, acorn nut with lead seal, or key lock

Diagram illustrating the options for the R4R03 pressure washer. The options are categorized by their location on the unit:

- Pressure Reducing Valve:** R
- Interface:** 4
- Reducing Function:** R
- Size:** (Empty box)
- Maximum Pressure:** 5 (350 Bar / 5075 PSI)
- Body Mounting:** (Empty box)
- Pressure Range:** (Empty box)
- Adjustment:** (Empty box)
- Pilot Oil:** (Empty box)
- Design Series:** B
- Seal:** (Empty box)
- Options:** (Empty box)

Options Table:

Code	Description
03	NG10
06	NG25
10	NG32

Mounting: Subplate mounting

Code	Description
3	NPT
7	SAE

Code	Description
1	Hand Knob 32mm dia. Std.
3	Acorn Nut with Lead Seal
4	Key Lock

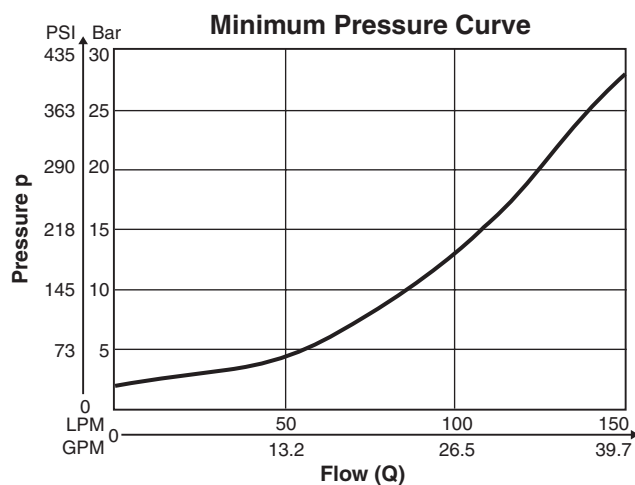
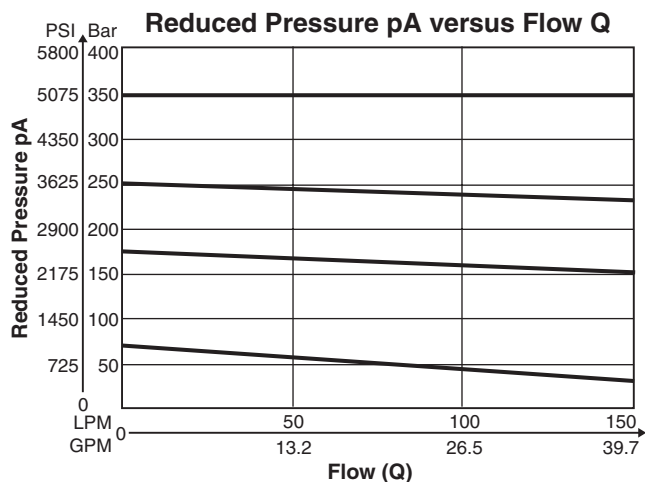
Code	Description
1	Nitrile
5	Fluorocarbon

Code	Description
1	Internal
2	Internal

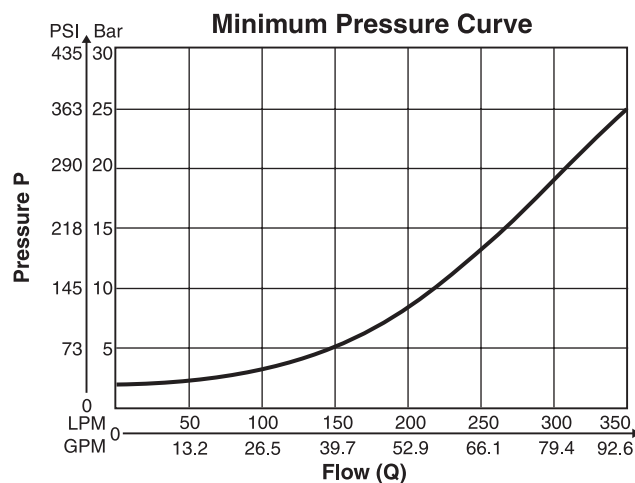
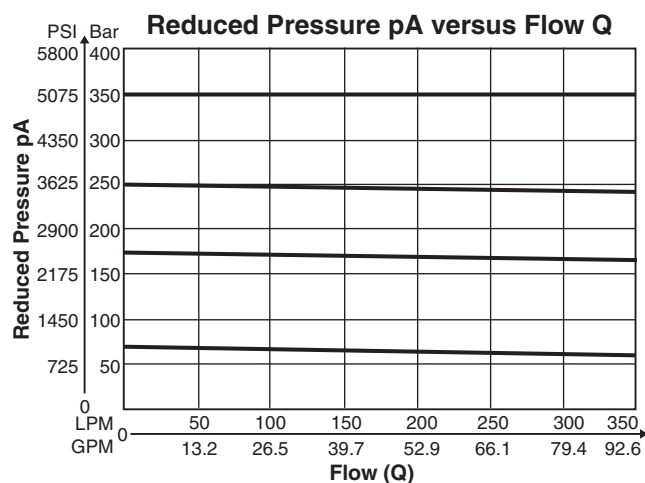
Weight:
R4R03: 4.8 kg (10.6 lbs.)

! WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

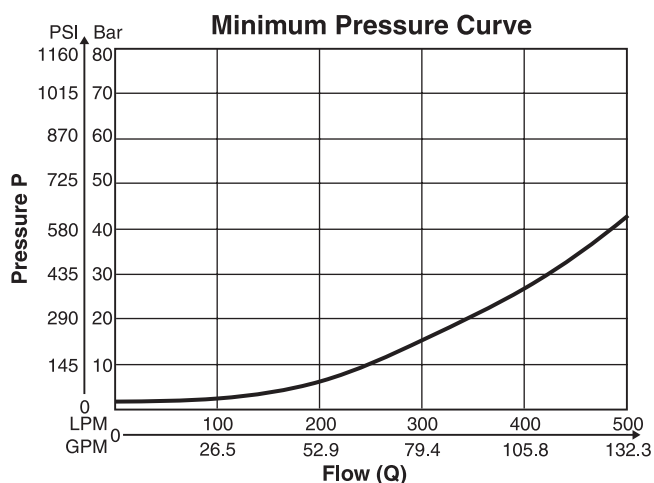
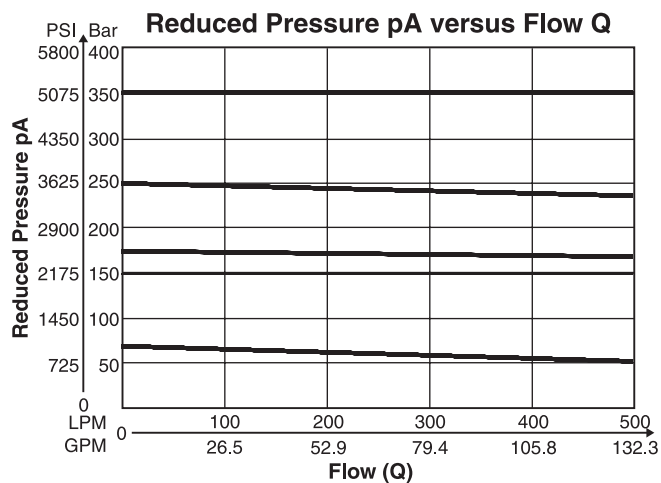
R4R03 ¹⁾



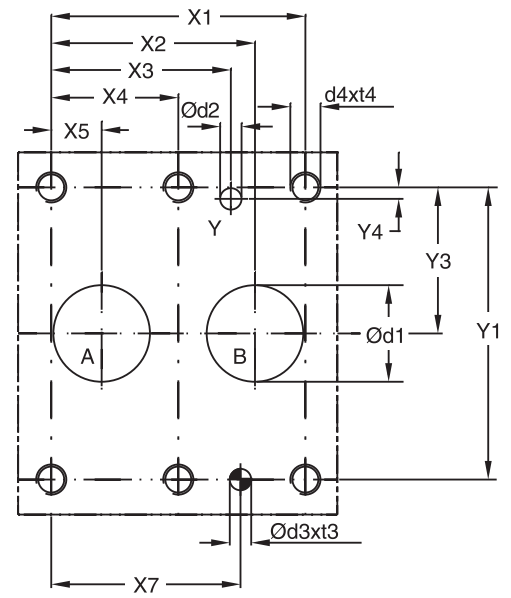
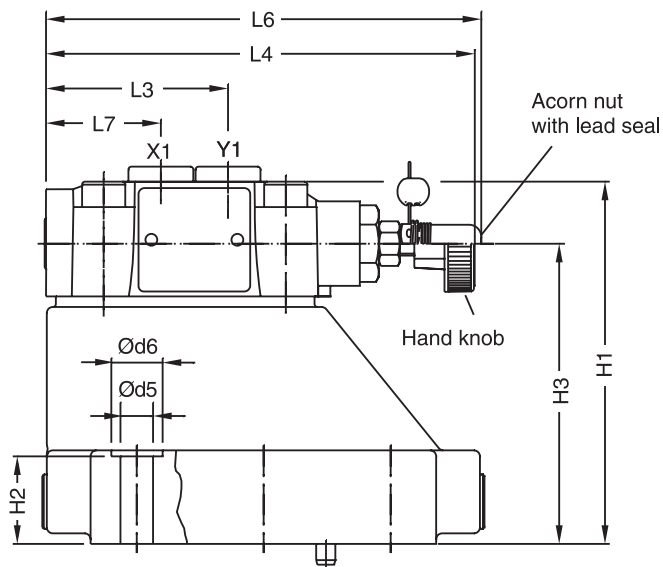
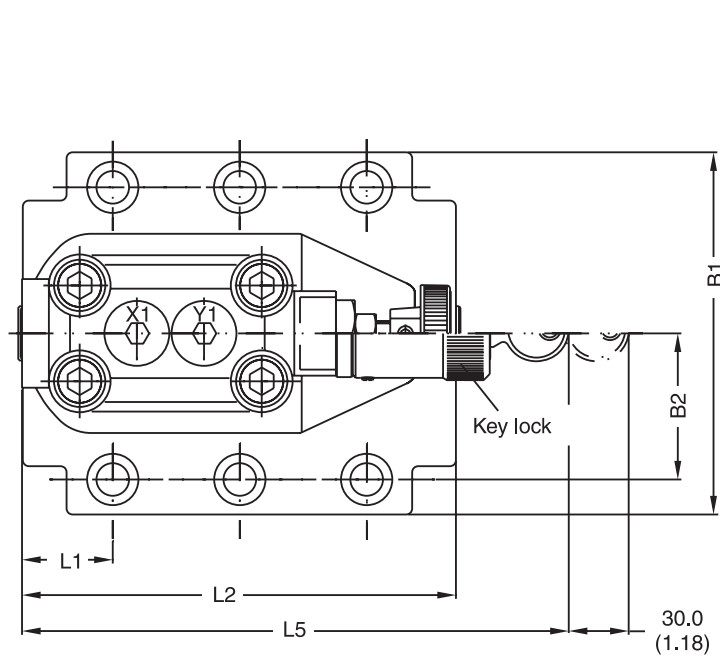
R4R06 ¹⁾



R4R10 ¹⁾



¹⁾ Measured at 350 Bar (5075 PSI) primary pressure pB.

D

Dimensions

Pressure Reducing Valves
Series R4R

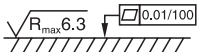
Inch equivalents for millimeter dimensions are shown in (**)

NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	5781-06-07-0-00	42.9 (1.69)	35.8 (1.41)	21.5 (0.85)	— —	7.2 (0.28)	— —	31.8 (1.25)	66.7 (2.63)	— —	33.4 (1.31)	7.9 (0.31)	— —	— —
25	5781-08-10-0-00	60.3 (2.37)	49.2 (1.94)	39.7 (1.56)	— —	11.1 (0.44)	— —	44.5 (1.75)	79.4 (3.13)	— —	39.7 (1.56)	6.4 (0.25)	— —	— —
32	5781-10-13-0-00	84.2 (3.31)	67.5 (2.66)	59.5 (2.34)	42.1 (1.66)	16.7 (0.66)	— —	62.7 (2.47)	96.8 (3.81)	— —	48.4 (1.92)	3.8 (0.15)	— —	— —

Tolerance for all dimensions ± 0.2

NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L7
10	5781-06-07-0-00	87.3 (3.44)	33.4 (1.31)	83.0 (3.27)	21.0 (0.83)	62.5 (2.46)	— —	— —	— —	29.0 (1.14)	94.8 (3.73)	60.8 (2.39)	141.0 (5.55)	181.0 (7.13)	38.6 (1.52)
25	5781-08-10-0-00	105.0 (4.13)	39.7 (1.56)	109.5 (4.31)	29.0 (1.14)	89.0 (3.50)	— —	— —	— —	34.7 (1.37)	126.8 (4.99)	60.8 (2.39)	141.0 (5.55)	181.0 (7.13)	38.6 (1.52)
32	5781-10-13-0-00	120.0 (4.72)	48.4 (1.91)	120.0 (4.72)	29.0 (1.14)	99.5 (3.92)	— —	— —	— —	30.6 (1.20)	144.3 (5.68)	60.8 (2.39)	141.0 (5.55)	181.0 (7.13)	38.6 (1.52)

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6
10	5781-06-07-0-00	15.0 (0.59)	7.0 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	16.0 (0.63)	10.8 (0.43)	17.0 (0.67)
25	5781-08-10-0-00	23.4 (0.92)	7.1 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	18.0 (0.71)	10.8 (0.43)	17.0 (0.67)
32	5781-10-13-0-00	32.0 (1.26)	7.1 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	20.0 (0.79)	10.8 (0.43)	17.0 (0.67)

NG	ISO-code	Bolt Kit			Seal Nitrile	Kit Fluorocarbon	Surface Finish
10	5781-06-07-0-00	BK505	4xM10 x 35-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58507-0	S26-58507-5	
25	5781-08-10-0-00	BK485	4xM10 x 45-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58475-0	S26-58475-5	
32	5781-10-13-0-00	BK506	6xM10 x 45-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58508-0	S26-58508-5	

NG	ISO-code	Subplate	Size
10	5781-06-07-0-00	SPP3M6B910	A, B = 3/4" BSPP x, y = 1/4" BSPP
25	5781-08-10-0-00	SPP6M8B910	A, B = 1" BSPP x, y = 1/4" BSPP
32	5781-10-13-0-00	SPP10M12B910	A, B = 1 1/2" BSPP x, y = 1/4" BSPP

General Description

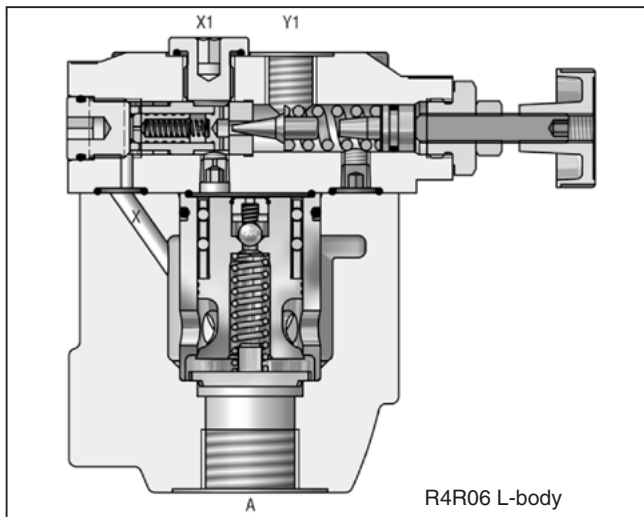
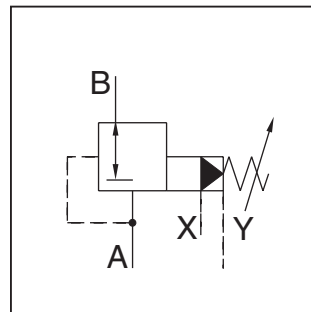
Series R4R pressure reducing valves are pilot operated and have a similar design to the subplate mounted R4R Series. For single vunctions (where no manifold blocks are used), the valves can be directly placed in the pipe-work. The valves are available with 2 ports (L-body) or with 3 ports (T-body).

Features

- Pilot operated with manual adjustment
- Normally closed to avoid unintended motion
- 2 interfaces:
 - L-body (R4R06-G3/4", R4R10-G1-1/4")
 - T-body (R4R03-G1/2", R4R06-G1")
- 3 pressure ranges
- Three adjustment modes:
 - Hand knob
 - Acorn nut with lead seal
 - Cylinder lock
- With optional vent function



R4R10 L-body



R4R06 L-body

Ordering Information

Code	Description
R4R	Pressure Reducing Valve
Size	
5	Max. Pressure 350 Bar (5075 PSI)
Body Mounting	
Pressure Range	
Adjustment	
2	Drain Line ext. from Pilot Head (Y1)
Switching Type	
Solenoid Voltage	
B	Design Series
Seal	
Options Check with Factory	

Code	Description
03	NG10 (G1/2")
06	NG25 (G1" - T-body, G3/4" - L-body)
10	NG32 (G1-1/4")

Mounting: Inline mounting

Code	Description
6*	T-Body
D**	L-Body

* Size codes 03 and 06 only.
 ** Size codes 06 and 10 only.

Code	Description
1	Hand Knob 32mm dia. Std.
3	Acorn Nut with Lead Seal
4	Cylinder Lock

Code	Description
Omit	Standard w/o Vent Function
09	Solenoid not Activated Unpressure Circulation
11	Solenoid Activated Unpressure Circulation

Code	Description
1	up to 105 Bar (1523 PSI)
3	up to 210 Bar (3045 PSI)
5	up to 350 Bar (5075 PSI)

Code	Description
1	Nitrile
5	Fluorocarbon

Code	Description
Omit	Standard w/o Vent Function
G0R	12V =
G0Q	24V =
GAR*	98V =
GAG*	205V =
W30	110V / 50 Hz
	120V / 60 Hz
W31	230V / 50 Hz
	240V / 60 Hz

* To be used in combination with rectifier plugs at 120 VAC / 230 VAC power supply.

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

R4R

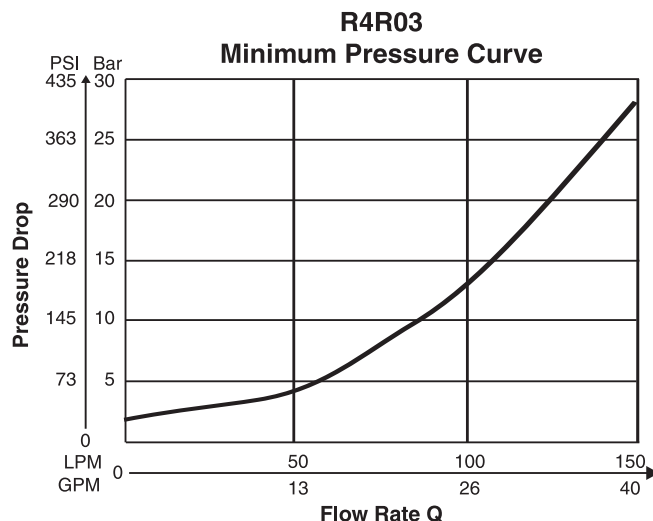
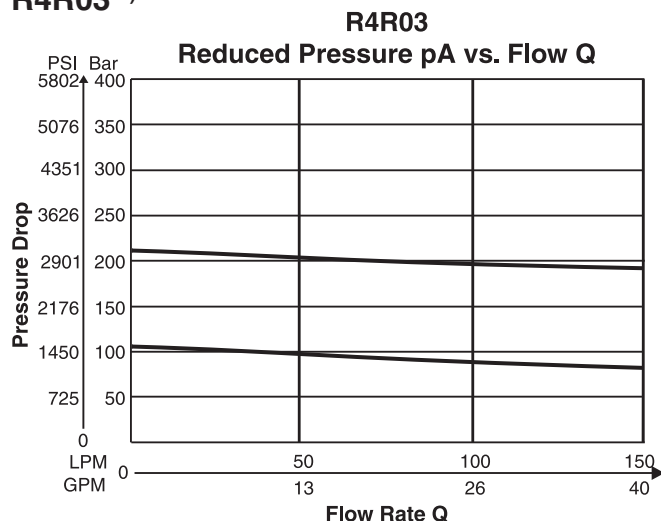
General				
Design	T-body		L-body	
Size	03 (1/2")	06 (1")	06 (3/4")	10 (1-1/4")
Mounting	Threaded body			
Mounting Position	Unrestricted			
Ambient Temperature	°C (°F)	-20 to +60 (-4 to +140)		
MTTF _D Value	years	75		
Weight	kg (lbs)	3.2 (7.05)	3.3 (7.28)	5.6 (12.35) 6.6 (14.55)
Hydraulic				
Max. Oper. Pressure	bar (PSI)	Ports A, B and X: 350 (5076); Port Y depressurized		
Pressure Stages	bar (PSI)	105 (1523), 210 (3046), 350 (5076)		
Nominal Flow	LPM (GPM)	60 (15.85)	200 (52.83)	200 (52.83) 450 (118.88)
Fluid	Hydraulic oil according to DIN 51524			
Fluid Temperature	°C (°F)	-20...+70 (-4...+158) (NBR: -25...+70) (-13...+158)		
Viscosity	Recommended	30 to 80 cSt / mm ² /s (139 to 371 SSU)		
Viscosity	Maximum	20 to 400 cSt / mm ² /s (98 to 1853 SSU)		
Filtration	LPM (GPM)	ISO 4406 (1999); 18/16/13		

D

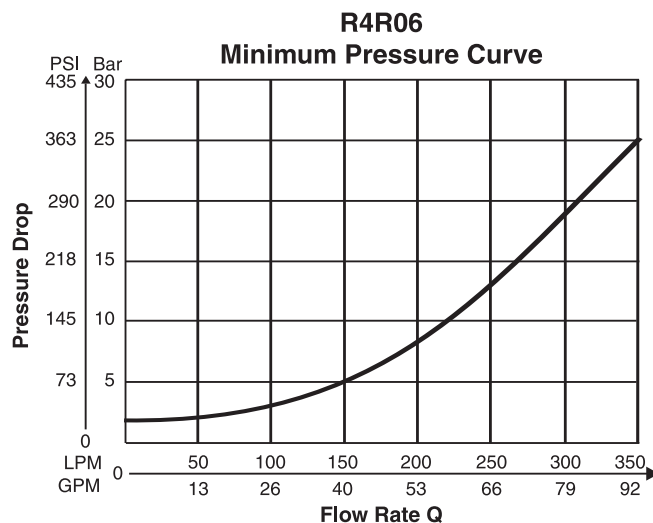
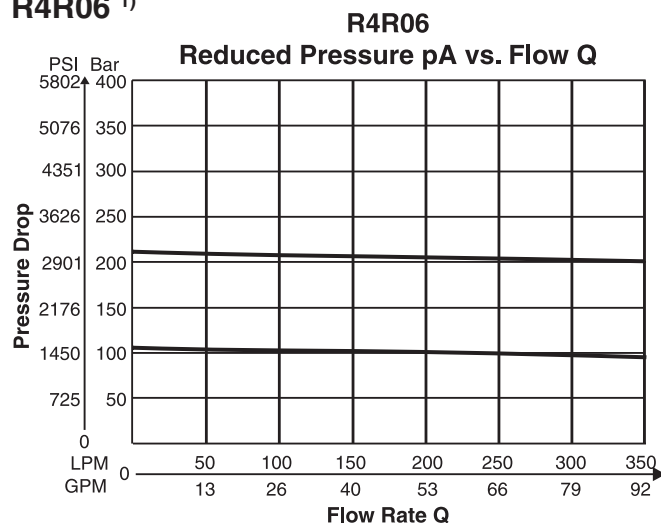
R4R with Vent Function

General								
Design		T-body				L-body		
Size		03 (1/2")		06 (3/4")		06 (1")	10 (1-1/4")	
Mounting		Threaded body						
Mounting Position		Unrestricted						
Ambient Temperature		°C (°F)	-20 to +60 (-4 to +140)					
MTTF _D Value		years	75					
Weight		kg (lbs)	4.9 (10.80)		5.0 (11.02)	7.3 (16.09)	8.3 (18.30)	
Hydraulic								
Max. Oper. Pressure		bar (PSI)	Ports A, B and X: 350 (5076); Port Y depressurized					
Pressure Stages		bar (PSI)	105 (1523), 210 (3046), 350 (5076)					
Nominal Flow		LPM (GPM)	60 (15.85)		200 (52.83)	200 (52.83)	450 (118.88)	
Fluid		Hydraulic oil according to DIN 51524						
Fluid Temperature		°C (°F)	-20...+70 (-4...+158) (NBR: -25...+70) (-13...+158)					
Viscosity		Recommended	30 to 80 cSt / mm²/s (139 to 371 SSU)					
Viscosity		Maximum	20 to 400 cSt / mm²/s (98 to 1853 SSU)					
Filtration		LPM (GPM)	ISO 4406 (1999); 18/16/13					
Electrical (Solenoid)								
Duty Ratio		100% ED; CAUTION: coil temperature up to 150°C (302°F) possible						
Protection Class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)						
Code		G0R	G0Q	GAR	GAG	W30	W31	
Supply Voltage		V	12 V =	24 V =	90 V =	205 V =	110 at 50 Hz 120 at 60 Hz	230 at 50 Hz 240 at 60 Hz
Tolerance Supply Voltage		%	±10	±10	±10	±10	±5	±5
Current Consumption		Hold	2.72	1.29	0.33	0.13	0.6 / 0.55	0.3 / 0.27
		In Rush	2.72	1.29	0.33	0.13	2.5 / 2.4	1.25 / 1.2
Power Consumption		Hold	32.7	31	31.9	28.2	70 / 70 VA	70 / 70 VA
		In Rush	32.7	31	31.9	28.2	280 / 290 VA	280 / 290 VA
Solenoid Connection		Connector as per EN175301-803, solenoid identification as per ISO 9461						
Wiring Minimum		3 x 1.5 mm² recommended						
Wiring Length Maximum		50 m (164 ft.) recommended						

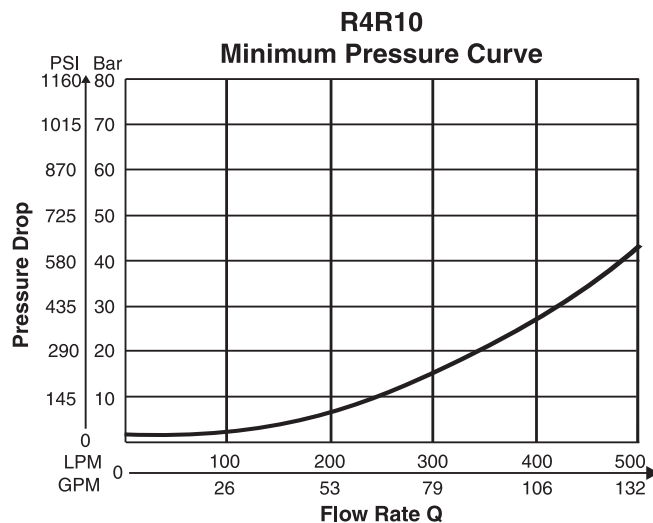
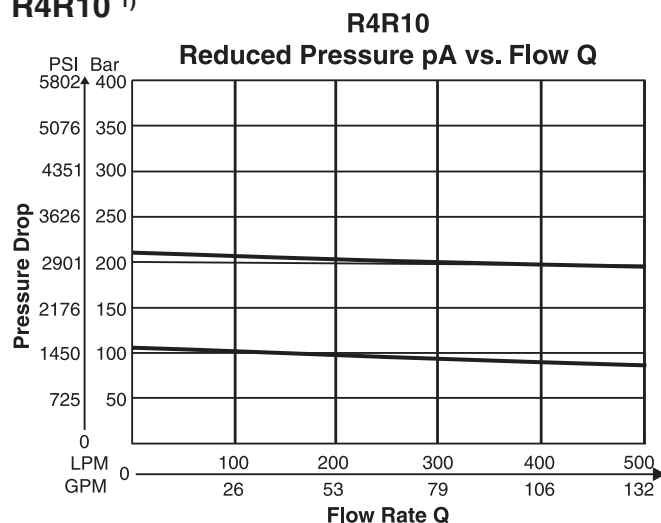
R4R03 ¹⁾



R4R06 ¹⁾



R4R10 ¹⁾



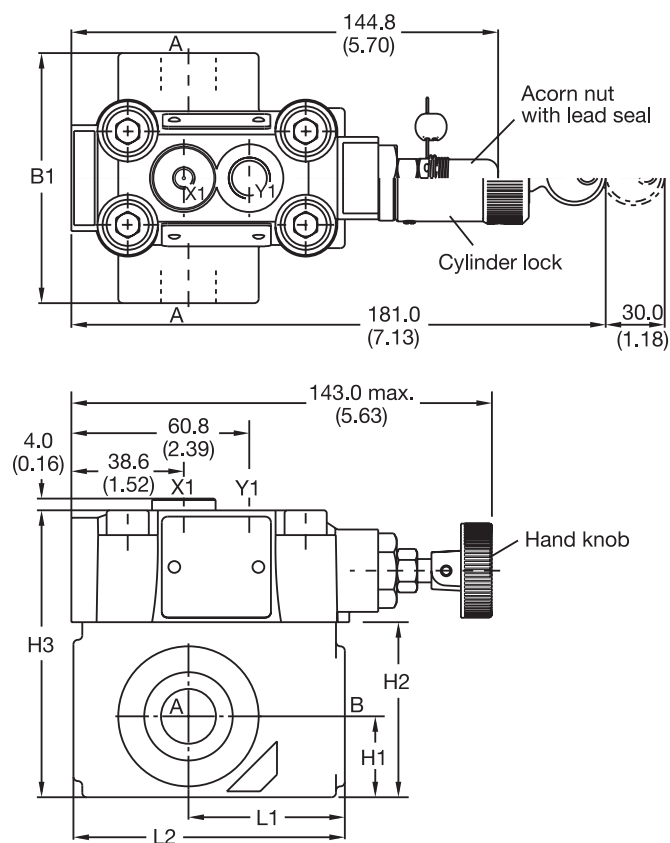
All characteristic curves measured with HLP46 at 50°C (122°F).

¹⁾ Measured at 350 Bar (5075 PSI) primary pressure pB.

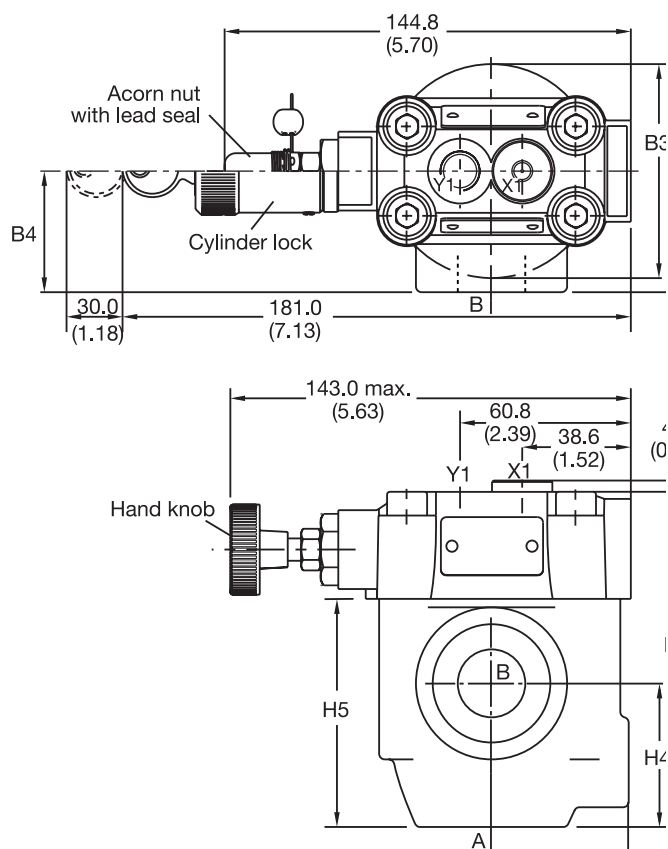
R4R

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

T-body



L-body



Seal Kits

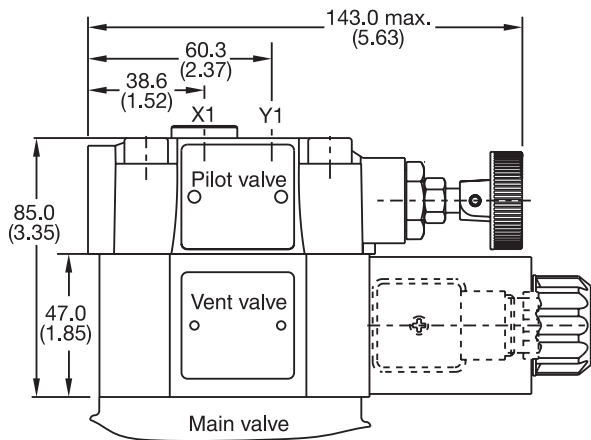
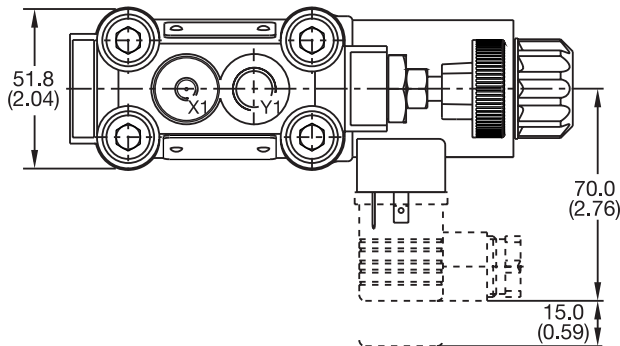
NG	NBR	FPM
03	S26-58507-0	S26-58507-0
06	S26-58475-0	S26-58475-0
10	S26-58508-0	S26-58508-0

NG	Body	B1	B2	B3	B4	H1	H2	H3	H4	H5	H6	L1	L2	L3
03	T-body	85.0 (3.35)	—	—	—	27.5 (1.08)	59.5 (2.34)	97.5 (3.84)	—	—	—	53.0 (2.09)	92.0 (3.62)	—
06	T-body	136.0 (5.35)	—	—	—	38.0 (1.50)	93.0 (3.66)	131.0 (5.16)	—	—	—	66.5 (2.62)	117.5 (4.63)	—
06	L-body	—	81.0 (3.19)	76.0 (2.99)	43.0 (1.69)	—	—	—	51.0 (2.01)	81.0 (3.19)	119.0 (4.69)	—	—	49.0 (1.93)
10	L-body	—	120.7 (4.75)	85.8 (3.38)	77.8 (3.06)	—	—	—	50.8 (2.00)	96.0 (3.78)	134.0 (5.28)	—	—	49.8 (1.96)

Ports	Function	Port Size			
		R4V03 T-body	R4V06 L-body	R4V06 T-body	R410 L-body
B	Pressure (inlet)	G1/2"	G3/4"	G1"	G1-1/4"
A	Pressure (outlet)	G1/2"	G3/4"	G1"	G1-1/4"
X1	External remote control or vent connection	G1/4"	G1/4"	G1/4"	G1/4"
Y1	External Drain	G1/4"	G1/4"	G1/4"	G1/4"

R4R with Vent Function

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



Seal Kits	
NBR	FPM
DC Solenoid	
S56-40609-0	S56-40609-5
AC Solenoid	
S26-35237-0	S26-35237-5

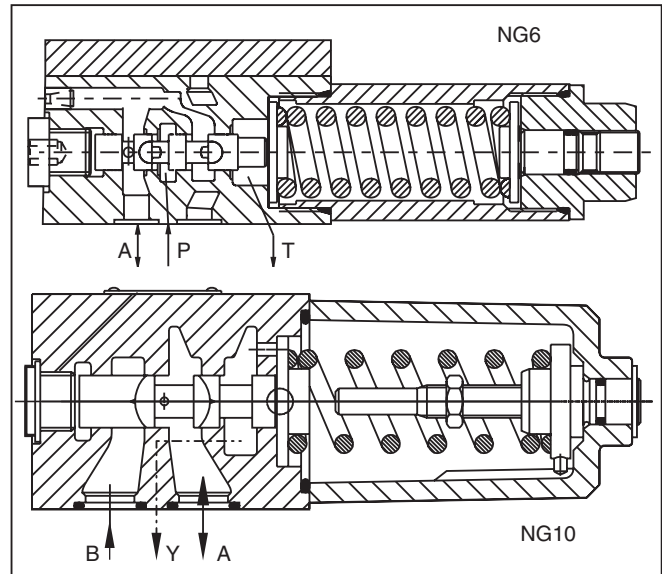
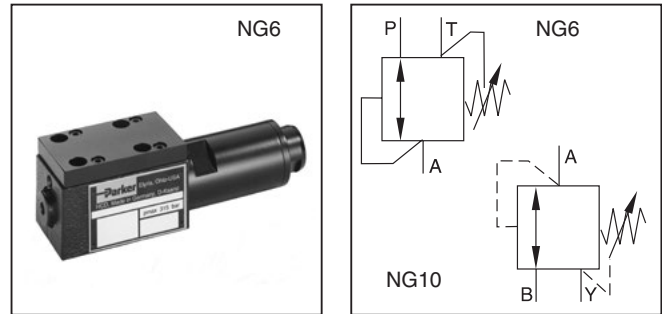


Code	External Drain
11	
09	

General Description

Series VM direct operated, pressure reducing valve with manual adjustment. Series VM is a direct-controlled, spring loaded 3-way pressure reducing valve, that is open in neutral position. The valve closes the connection from P to A (NG6) or B to A (NG10) when the pre-set pressure is exceeded.

If the pressure increases due to an external influence in connection A, the spool moves and opens the connection from A to T (NG6) or A to Y (NG10) until the pre-set pressure is reached.



D

Features

- Spool type valve
- Manifold mounting acc. to ISO 5871
- 5 pressure ranges at NG6
- 3 pressure ranges at NG10
- 2 adjustment modes

Ordering Information

V	M		A		V																																				
Pressure Reducing Valve	Maximum Pressure Setting		Adjustment Screw with Hexagon Socket	Size	Seal Fluorocarbon	Gage Port	Lock	Design Series																																	
								NOTE: Not required when ordering.																																	
<table><tr><th>Code</th><th>Description</th></tr><tr><td>025*</td><td>25 Bar (363 PSI)</td></tr><tr><td>064</td><td>64 Bar (928 PSI)</td></tr><tr><td>125**</td><td>125 Bar (1813 PSI)</td></tr><tr><td>160*</td><td>160 Bar (2320 PSI)</td></tr><tr><td>210</td><td>210 Bar (3045 PSI)</td></tr><tr><td>350*</td><td>350 Bar (5075 PSI)</td></tr></table>		Code	Description	025*	25 Bar (363 PSI)	064	64 Bar (928 PSI)	125**	125 Bar (1813 PSI)	160*	160 Bar (2320 PSI)	210	210 Bar (3045 PSI)	350*	350 Bar (5075 PSI)	<table><tr><th>Code</th><th>Description</th></tr><tr><td>06</td><td>NG6</td></tr><tr><td>10</td><td>NG10</td></tr></table>		Code	Description	06	NG6	10	NG10	<table><tr><th>Code</th><th>Description</th></tr><tr><td>G*</td><td>1/4" BSPP</td></tr><tr><td>M</td><td>M18x1.5**</td></tr><tr><td></td><td>M12x1.5*</td></tr></table>		Code	Description	G*	1/4" BSPP	M	M18x1.5**		M12x1.5*	<table><tr><th>Code</th><th>Description</th></tr><tr><td>Omit</td><td>No Lock</td></tr><tr><td>Z</td><td>Cylinder Lock</td></tr></table>		Code	Description	Omit	No Lock	Z	Cylinder Lock
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* NG6 only																																									
** NG10 only																																									
						Weight:																																			
						VM*A06		1.3 kg (2.9 lbs.)																																	

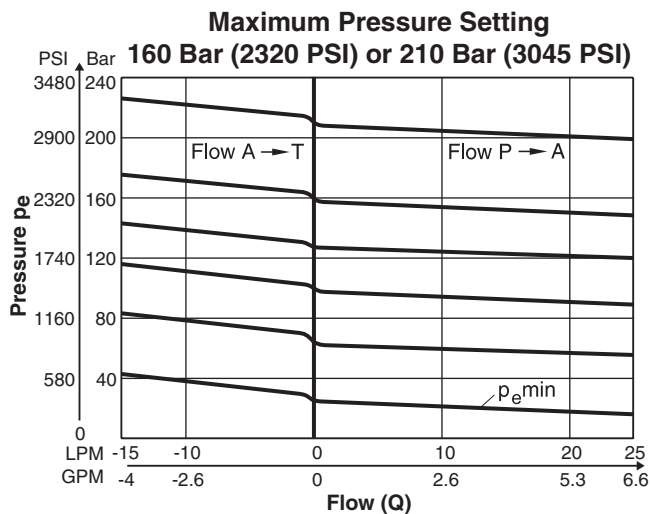
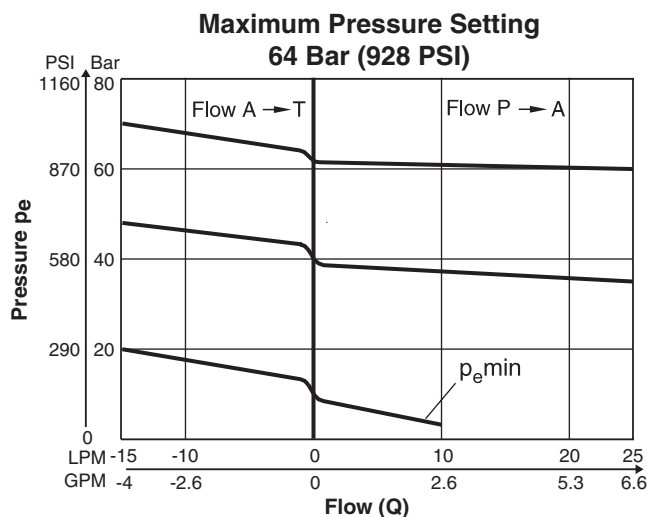
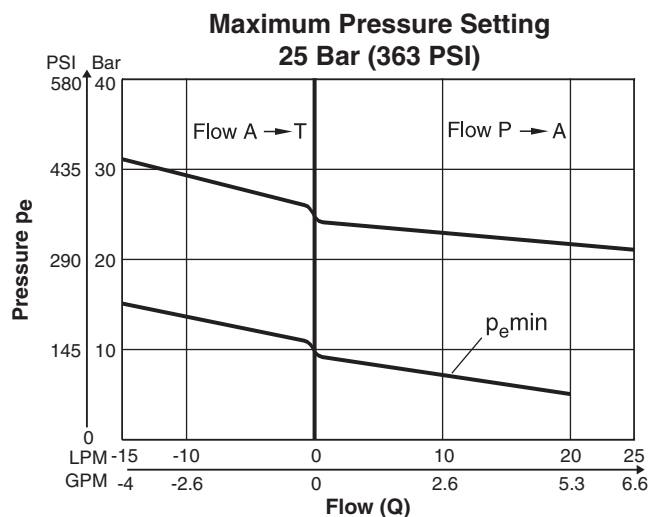
WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Specifications**Pressure Reducing Valves****Series VM**

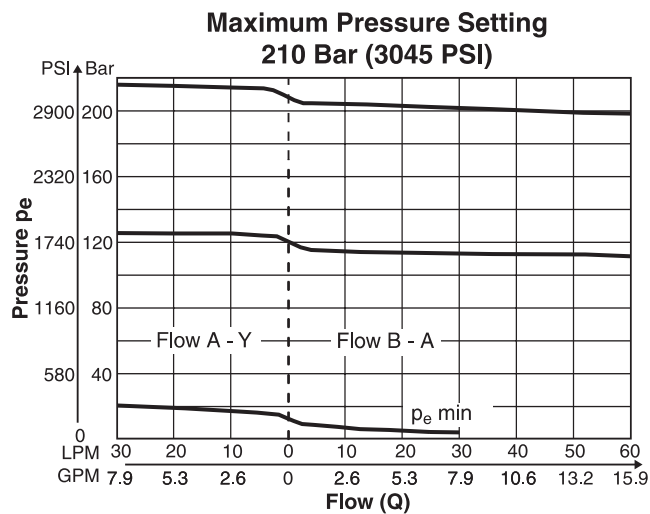
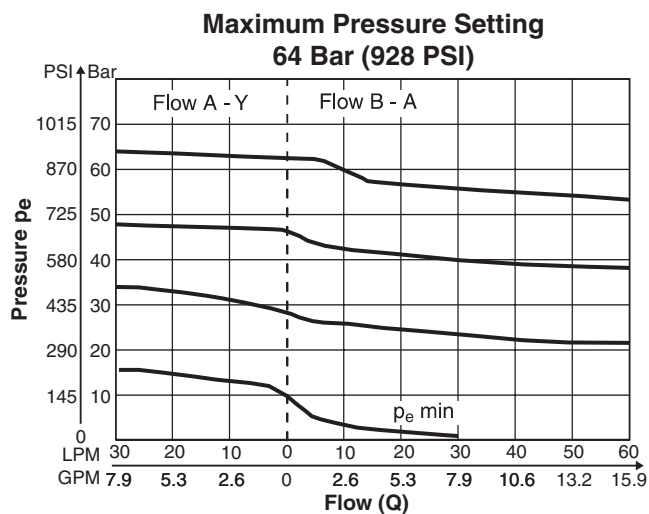
General		
Size	NG6	NG10
Interface	Subplate mounting acc. ISO 5781	
Mounting Position	Unrestricted	
Ambient Temperature	-20°C to +70° (-4°F to +158°F)	
Hydraulic		
Working Pressure	Ports P and A 350 Bar (5075 PSI) Port T depressurized	Ports A and B 210 Bar (3045 PSI) Port Y depressurized
Pressure Range	25, 64, 160, 210, 350 Bar (363, 928, 2320, 3045, 5075 PSI)	64, 125, 210 Bar (928, 1813, 3045 PSI)
Nominal Flow	25 LPM (6.6 GPM)	60 LPM (15.9 GPM)
Pressure Fluid	Hydraulic oil according to DIN 51524 ... 525	
Viscosity	Recommended	30 to 50 cSt / mm²/s (139 to 232 SSU)
	Maximum	20 to 380 cSt / mm²/s (93 to 1761 SSU)
Pressure Fluid Temperature	Recommended	+30°C to +50°C (+86°F to +122°F)
	Permitted	-20°C to +70° (-4°F to +158°F)
Filtration	ISO 4406 (1999), 18/16/13	

D

VM*06

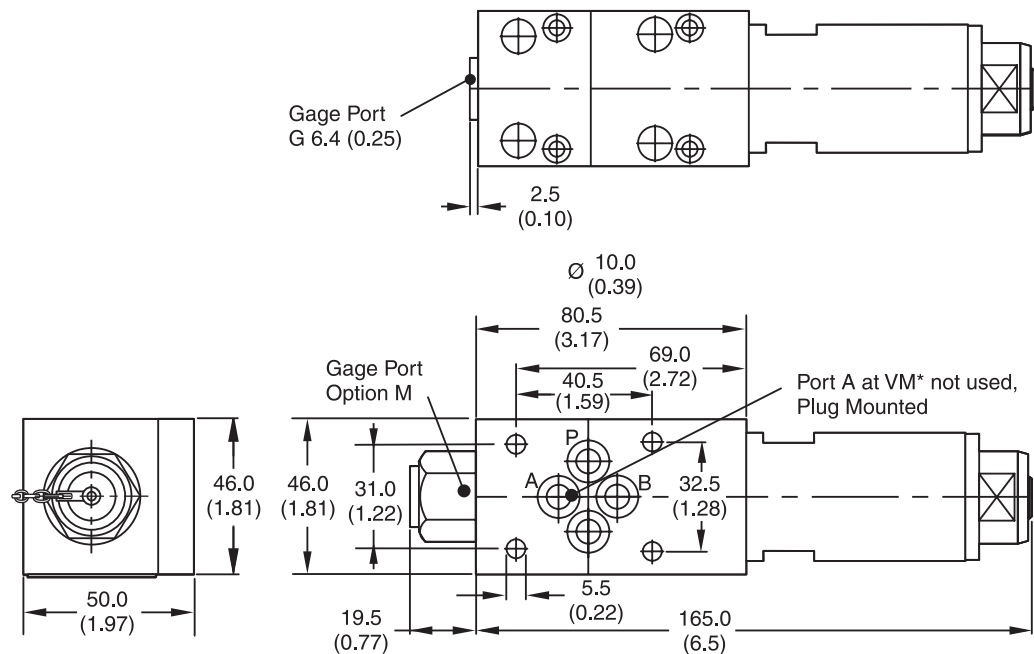


VM*10



VM*06

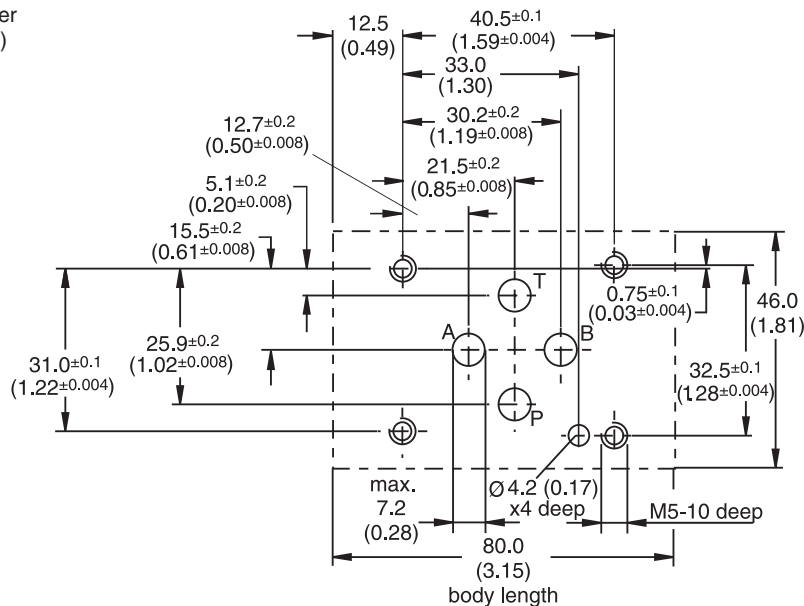
Inch equivalents for millimeter dimensions are shown in (**)



Surface Finish	Bolt Kit  DIN912 12.9		Seal  Kit Fluorocarbon
	BK375 4x M5x30	8.1 Nm (6.0 lb.-ft.)	SK-VB/VM/VS-V

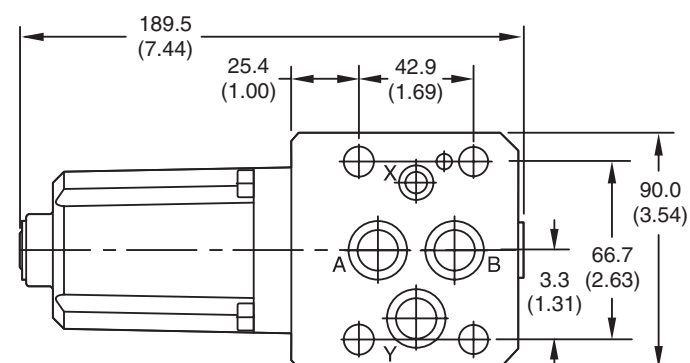
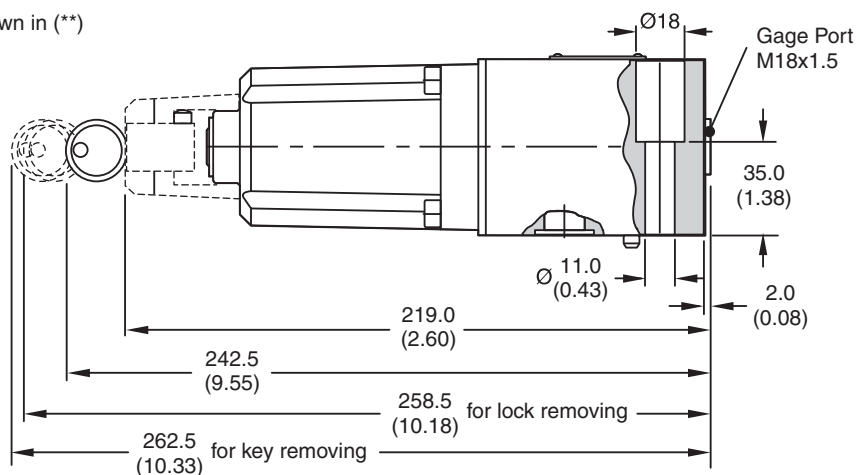
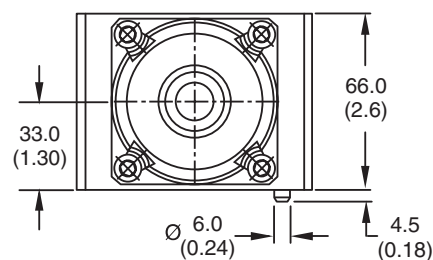
Mounting Pattern ISO 5871-03-04-0-00
(NFPA D03, CETOP 3, NG6)

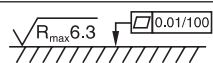
Inch equivalents for millimeter dimensions are shown in (**)



Dimensions**Pressure Reducing Valves****Series VM****VM*10**

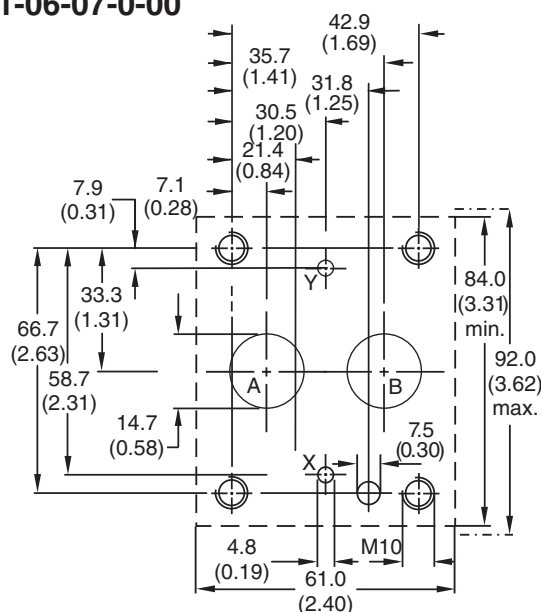
Inch equivalents for millimeter dimensions are shown in (**)



Surface Finish	Bolt Kit  DIN912 12.9		Seal  Kit Fluorocarbon
	BK389 4x M10x50	65 Nm (47.9 lb.-ft.)	SK-VB/VM-A10V

Mounting Pattern ISO 5871-06-07-0-00

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



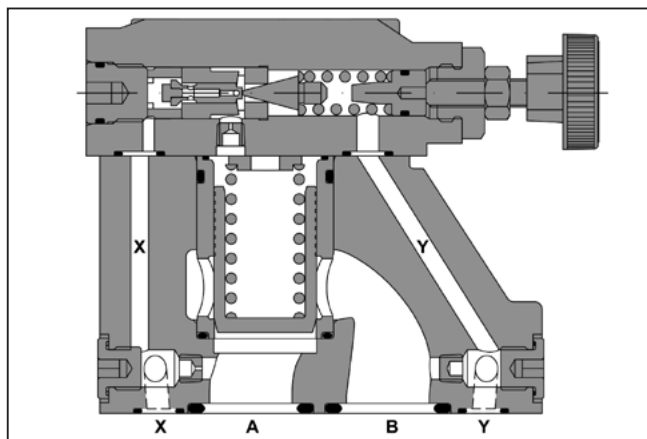
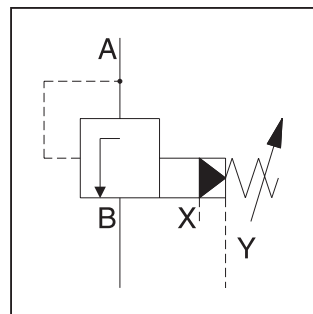
Subplate	Size
SPP3M6B910	A, B = 3/4" BSPP x, y = 1/4" BSPP

General Description

Series R4S pilot operated sequence valves enable a hydraulic system to operate in a pressure sequence. When the system pressure reaches the setting pressure the valve opens and permits flow to the secondary sub-system.

Features

- Pilot-operated sequence valve
- 3 pressure ranges
- 3 adjustment modes:
 - Hand knob
 - Acorn nut with lead seal
 - Key lock



Ordering Information

R Pressure Valve	4 Interface	S Relief Function	5 Maximum Pressure 350 Bar (5075 PSI)	7 Body Mounting	1 External Drain from Subplate	A Design Series	Seal																						
	<table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>03</td> <td>NG10</td> </tr> <tr> <td>06</td> <td>NG25</td> </tr> <tr> <td>10</td> <td>NG32</td> </tr> </tbody> </table>	Code	Description	03	NG10	06	NG25	10	NG32		<table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>up to 105 Bar (1523 PSI)</td> </tr> <tr> <td>3</td> <td>up to 210 Bar (3045 PSI)</td> </tr> <tr> <td>5</td> <td>up to 350 Bar (5075 PSI)</td> </tr> </tbody> </table>	Code	Description	1	up to 105 Bar (1523 PSI)	3	up to 210 Bar (3045 PSI)	5	up to 350 Bar (5075 PSI)			<table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Nitrile</td> </tr> <tr> <td>5</td> <td>Fluorocarbon</td> </tr> </tbody> </table>	Code	Description	1	Nitrile	5	Fluorocarbon	
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3	Acorn Nut with Lead Seal																												
4	Key Lock																												

Weight:

R4S03:	2.7 kg	(6.0 lbs.)
R4S06:	4.5 kg	(9.0 lbs.)
R4S10:	6.0 kg	(13.2 lbs.)

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Specifications

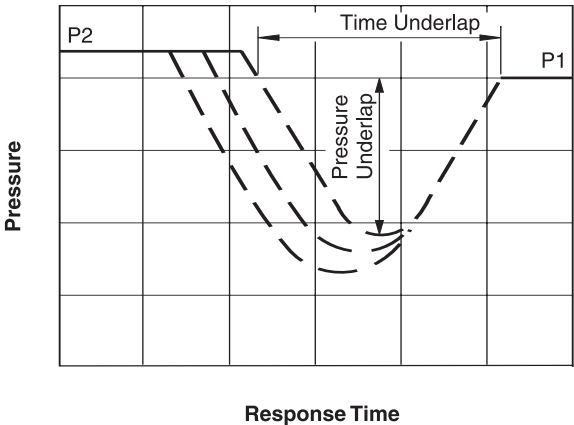
General				
Size	NG10		NG25	NG32
Interface	Subplate mounting acc. ISO 5781			
Mounting Position	As desired, horizontal mounting preferred			
Ambient Temperature	-20°C to +80°C (-4°F to +176°F)			
Hydraulic				
Operating Pressure	Ports A, B and X up to 350 Bar (5075 PSI), Port Y: depressurized			
Pressure Range	up to 105, 210, 350 Bar (1523, 3045, 5075 PSI)			
Nominal Flow	150 LPM (39.7 GPM)	350 LPM (92.6 GPM)	650 LPM (172.0 GPM)	
Pressure Fluid	Hydraulic oil according to DIN 51524 ... 51525			
Viscosity	Recommended Maximum	30 to 50 cSt / mm²/s (139 to 232 SSU) 20 to 380 cSt / mm²/s (93 to 1761 SSU)		
Pressure Fluid Temperature	Recommended Maximum	+30°C to +50°C (+86°F to +122°F) -20°C to +70° (-4°F to +158°F)		
Filtration	ISO 4406 (1999), 18/16/13			

Performance Curves

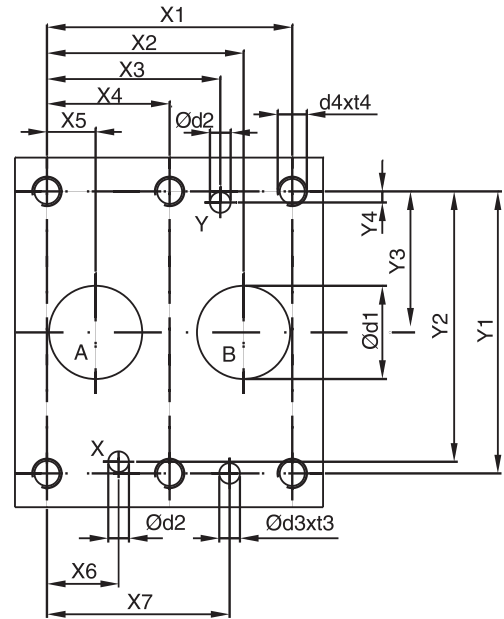
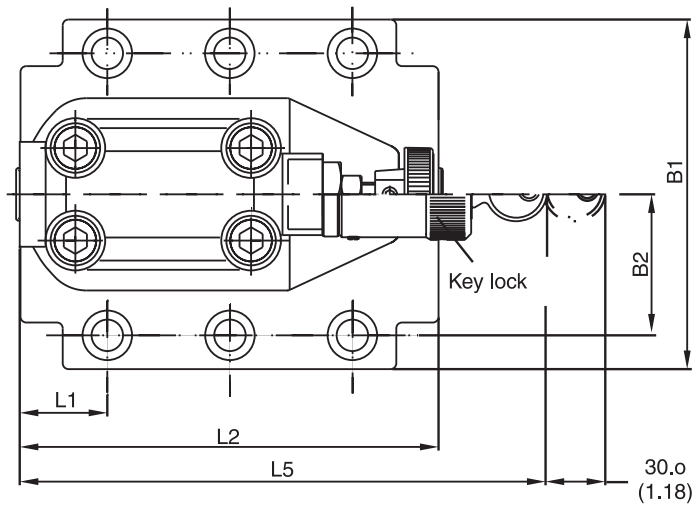
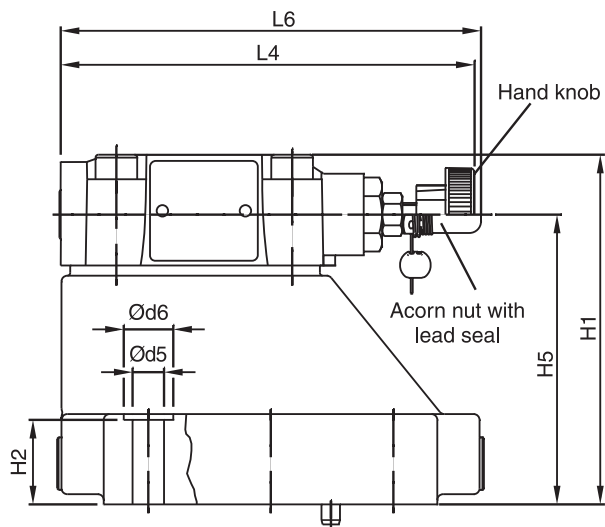
Typical pressure curves at closing point

P1 = setting pressure

P2 = operating pressure



Note:
Time and pressure underlap
depend on the characteristics
of a specific system.

**D**

Dimensions

Sequence Valves

Series R4S

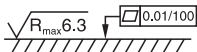
Inch equivalents for millimeter dimensions are shown in (**)

NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	5781-06-07-0-00	42.9 (1.69)	35.8 (1.41)	21.5 (0.85)	—	7.2 (0.28)	21.5 (0.85)	31.8 (1.25)	66.7 (2.63)	58.8 (2.31)	33.4 (1.31)	7.9 (0.31)	—	—
25	5781-08-10-0-00	60.3 (2.37)	49.2 (1.94)	39.7 (1.56)	—	11.1 (0.44)	20.6 (0.81)	44.5 (1.75)	79.4 (3.13)	73.0 (2.87)	39.7 (1.56)	6.4 (0.25)	—	—
32	5781-10-13-0-00	84.2 (3.31)	67.5 (2.66)	59.5 (2.34)	42.1 (1.66)	16.7 (0.66)	24.6 (0.97)	62.7 (2.47)	96.8 (3.81)	92.8 (3.65)	48.4 (1.91)	3.8 (0.15)	—	—

Tolerance at X and Y pin holes and screw holes ± 0.1 , at port holes ± 0.2 .

NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
10	5781-06-07-0-00	87.3 (3.44)	33.4 (1.31)	83.0 (3.27)	21.0 (0.83)	62.5 (2.46)	—	—	—	29.0 (1.14)	94.8 (3.73)	—	141.0 (5.55)	181.0 (7.13)	—
25	5781-08-10-0-00	105.0 (4.13)	39.7 (1.56)	109.5 (4.31)	29.0 (1.14)	89.0 (3.50)	—	—	—	34.7 (1.37)	126.8 (4.99)	—	141.0 (5.55)	181.0 (7.13)	—
32	5781-10-13-0-00	120.0 (4.72)	48.4 (1.91)	120.0 (4.72)	29.0 (1.14)	99.5 (3.92)	—	—	—	30.6 (1.20)	144.3 (5.68)	—	141.0 (5.55)	181.0 (7.13)	—

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6
10	5781-06-07-0-00	15.0 (0.59)	7.0 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	16.0 (0.63)	10.8 (0.43)	17.0 (0.67)
25	5781-08-10-0-00	23.4 (0.92)	7.1 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	18.0 (0.71)	10.8 (0.43)	17.0 (0.67)
32	5781-10-13-0-00	32.0 (1.26)	7.1 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	20.0 (0.79)	10.8 (0.43)	17.0 (0.67)

NG	ISO-code	Bolt Kit			Seal Nitrile	Kit Fluorocarbon	Surface Finish
10	5781-06-07-0-00	BK505	4xM10 x 35-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58507-0	S26-58507-5	
25	5781-08-10-0-00	BK485	4xM10 x 45-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58475-0	S26-58475-5	
32	5781-10-13-0-00	BK506	6xM10 x 45-DIN 912 12.9	63 Nm (46.5 lb.-ft.) $\pm 15\%$	S26-58508-0	S26-58508-5	

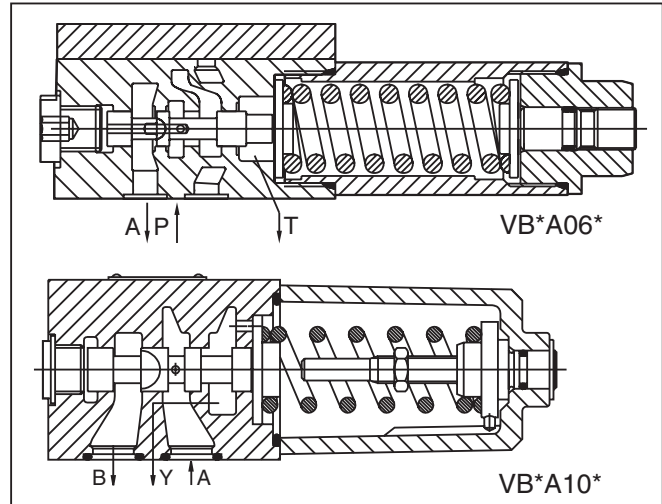
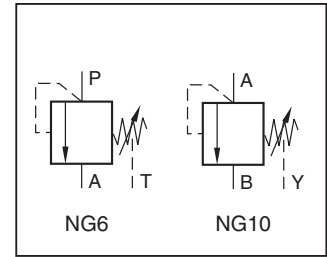
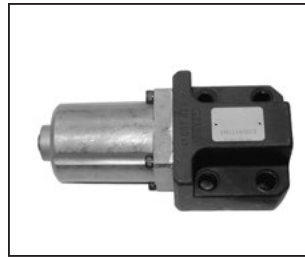
NG	ISO-code	Subplate	Size
10	5781-06-07-0-00	SPP3M6B910	A, B = 3/4" BSPP x, y = 1/4" BSPP
25	5781-08-10-0-00	SPP6M8B910	A, B = 1" BSPP x, y = 1/4" BSPP
32	5781-10-13-0-00	SPP10M12B910	A, B = 1 1/2" BSPP x, y = 1/4" BSPP

General Description

Series VB are direct operated pressure relief valves with manual adjustment. Series VB valves can also be used as pressure sequence valves because of the high pressure capability in the outlet port and the external drain port.

Specifications

Size	NG6, NG10
Interface	ISO 5791
Mounting Pos.	Unrestricted
Ambient Temp.	-20°C to +80°C (-4°F to +176°F)
Max. Operating Pressure	Size 6: Ports P and A 350 Bar (5075 PSI), Port T depressurized Size 10: Ports A and B 315 Bar (4568 PSI), Port Y depressurized
Pressure Range	Size 6: 25, 64, 160, 210, 350 Bar (363, 928, 2320, 3045, 5075 PSI) Size 10: 64, 125, 210 Bar (928, 1813, 3045 PSI)
Nominal Flow	Size 6: 25 LPM (6.6 GPM) Size 10: 60 LPM (15.9 GPM)
Pressure Fluid	Hydraulic oil according to DIN 51524 ... 525
Pressure Fluid Temperature	Recommended: +30°C to +50°C (+86°F to +122°F) Permitted: -20°C to +70°C (-4°F to +158°F)
Viscosity	Recommended: 30 to 50 cSt (mm²/s) Permitted: 20 to 380 cSt (mm²/s)
Filtration	ISO 4406 (1999), 18/16/13



Features

- Spool valve
- Manifold mounting
- Five pressure ranges at NG6
- Three pressure ranges at NG10
- Two adjustment modes

Ordering Information

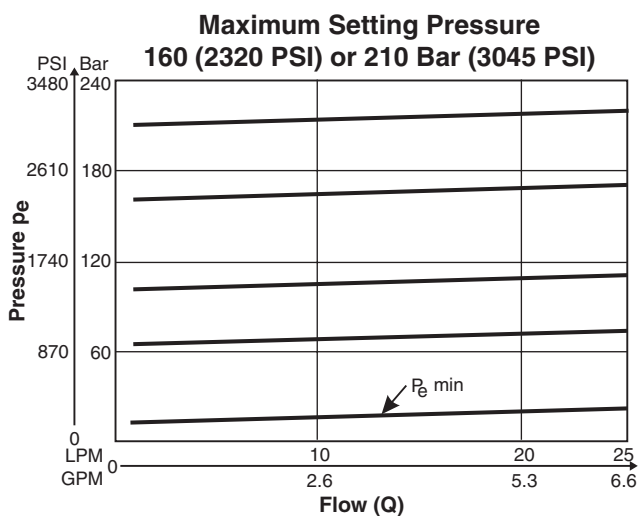
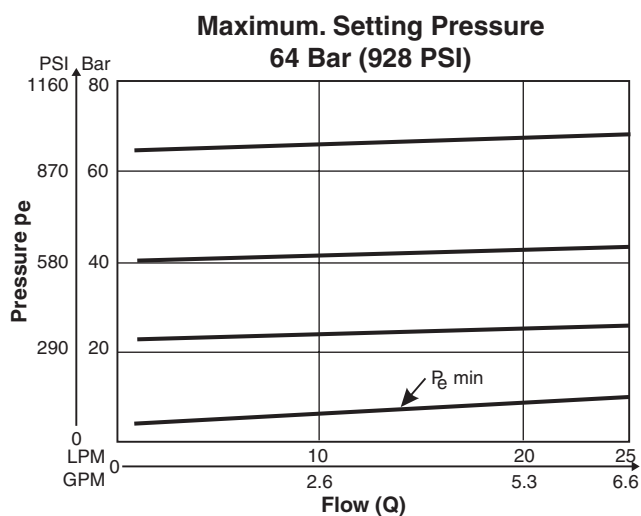
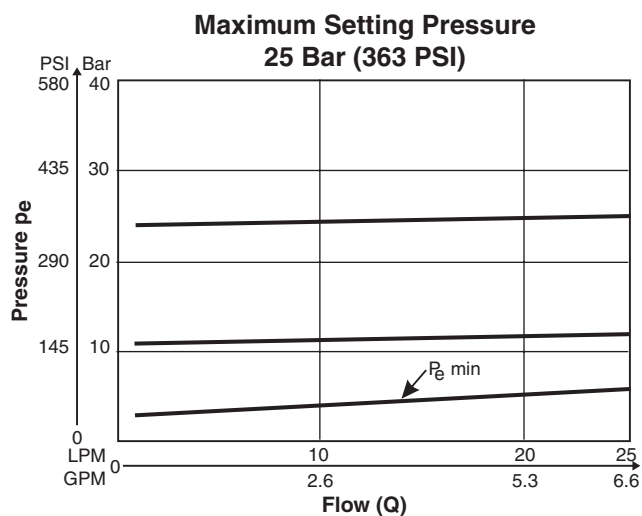
VB Sequence Valve	A Adjustment Screw with Hexagon Socket	V Seal Fluorocarbon	Design Series NOTE: Not required when ordering.
Code Description	Code Description	Code Description	Code Description
025* 25 Bar (363 PSI)	06 NG6	G* G 1/4"	Omit No Lock
064 64 Bar (938 PSI)	10 NG10	M M12x1.5	Z Cylinder Lock
125** 125 Bar (1813 PSI)			
160* 160 Bar (2320 PSI)			
210 210 Bar (3045 PSI)			
350* 350 Bar (5075 PSI)			

* only NG6.
 ** only NG10.

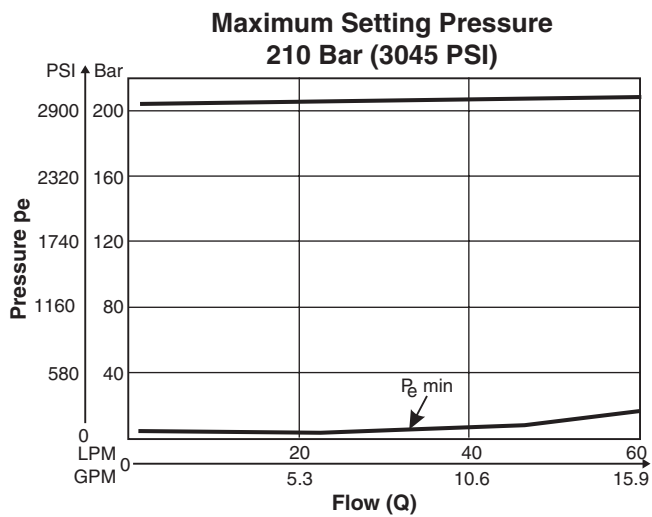
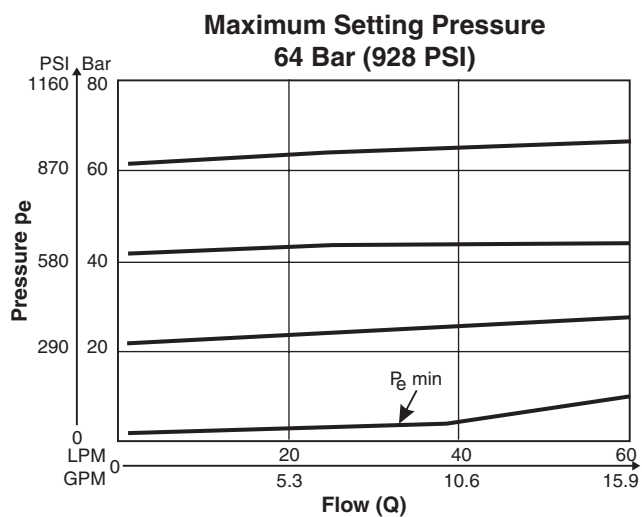
Weight:
 VB*A06 1.3 kg (2.9 lbs.)
 VB*A10 3.7 kg (8.2 lbs.)

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

VB*06

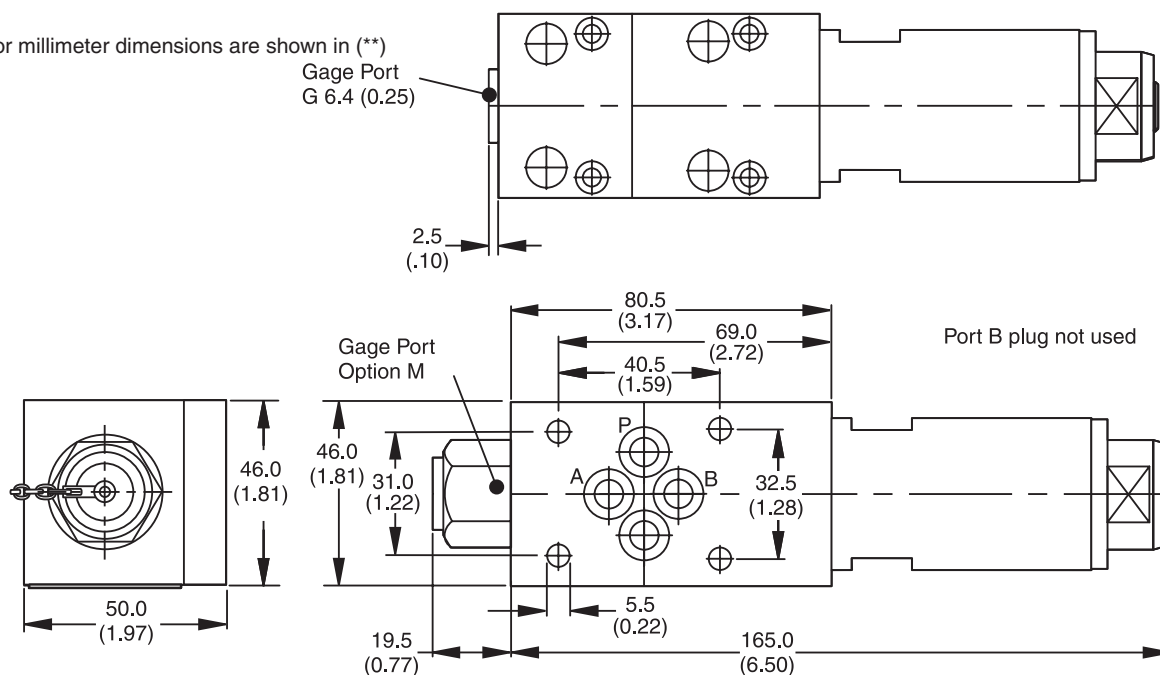


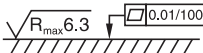
VB*10



VB*06

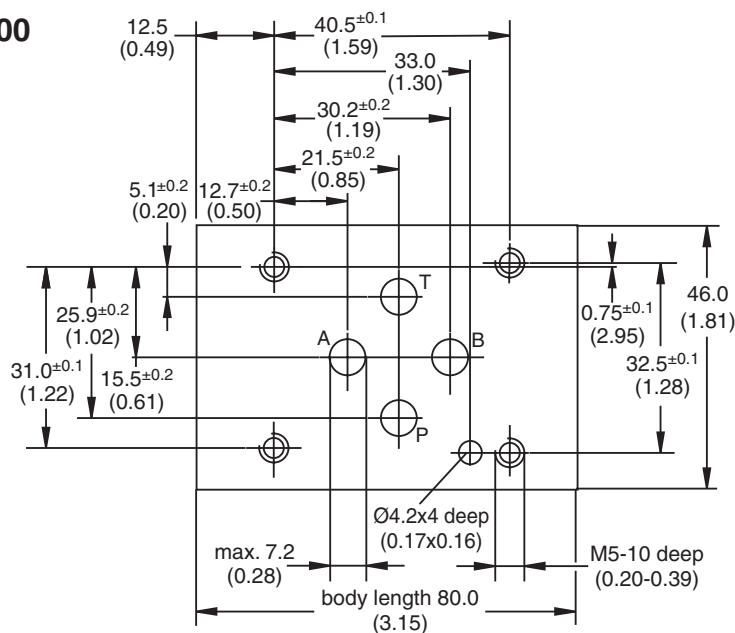
Inch equivalents for millimeter dimensions are shown in (**)



Surface Finish	
Bolt Kit  DIN912 12.9	BK375 4x M5x30
	7.6 Nm (5.6 lb.-ft.) ±15%
Seal Kit  Fluorocarbon	SK-VB/VM/VS V

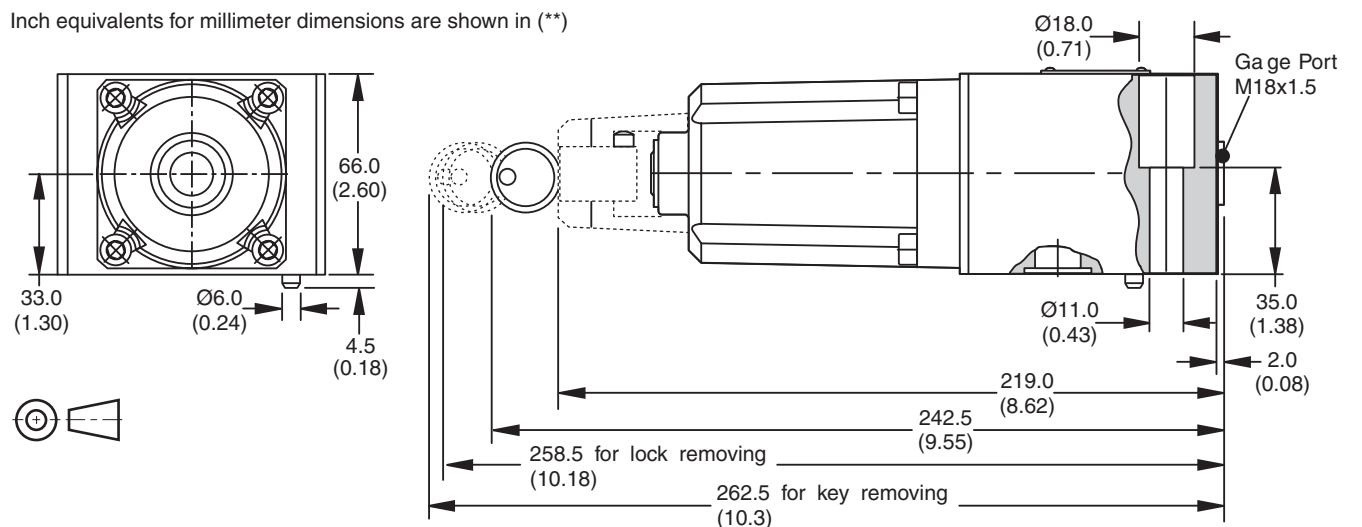
**Mounting Pattern ISO 5781-03-04-0-00
(NFPA D03, CETOP 3, NG6)**

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



VB*10

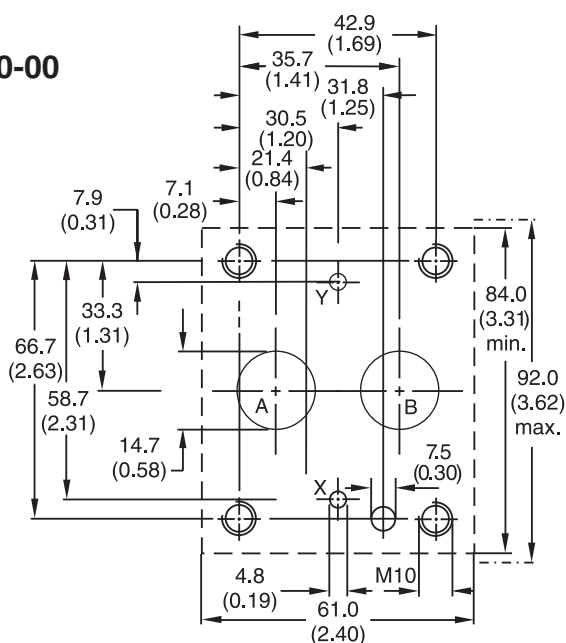
Inch equivalents for millimeter dimensions are shown in (**)



Surface Finish	$\sqrt{R_{\max} 6.3}$ $\square 0.01/100$
Bolt Kit DIN912 12.9	BK389 4x M10x50
Seal Kit Fluorocarbon	SK-VB/VM-A10V
Subplate	Size
SPP3M6B910	A, B = 3/4" BSPP x, y = 1/4" BSPP

Mounting Pattern ISO 5781-06-07-0-00

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



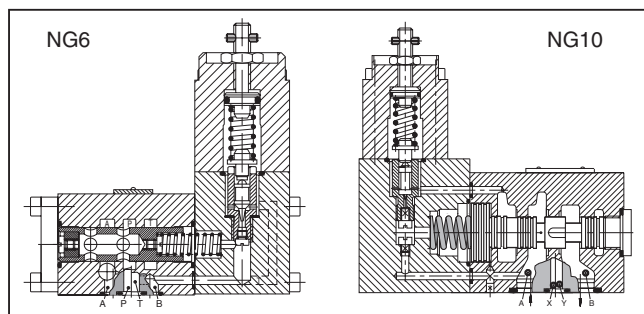
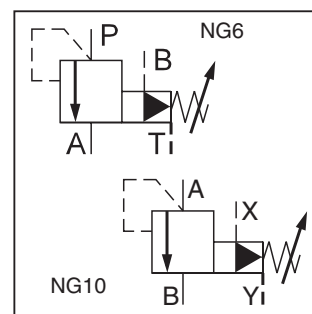
General Description

Series VBY pilot operated sequence valves consist of a pilot with manual adjustment and a main part with spool execution. The valve has an external drain.

This valve can also be used as a pressure relief valve. Please observe hydraulic connection.

Features

- Manifold mounting acc. to ISO 5781
- Type VBY with external drain
- Main stage spool type valve
- Pilot stage seated type valve
- 4 pressure ranges
- 2 adjustment modes
 - Screw with hexagon socket
 - DIN knob



Specifications

Size	NG6		NG10	
Mounting Pattern	ISO 5781			
Mounting Position	As desired			
Ambient Temperature	-20°C to +80°C (-4°F to +176°F)			
Operating Pressure, Ports External Drain Port Pressure	P, A, B up to 315 Bar (4568 PSI) T up to 100 Bar (1450 PSI)		A, B, X up to 315 Bar (4568 PSI) Y up to 100 Bar (1450 PSI)	
Pressure Range	64, 160, 210, 315 Bar (928, 2320, 3045, 4568 PSI)			
Pressure Fluid Temperature	-20°C to +70°C (-4°F to +158°F)			
Viscosity Range Recommended Permitted	30 to 50 cSt / mm²/s (139 to 232 SSU) 20 to 380 cSt / mm²/s (93 to 1761 SSU)			
Filtration	ISO 4406 (1999), 18/16/13			
Pilot Oil Flow	approx. 500 cm³/min		approx. 1000 cm³/min	

Ordering Information

VBY

Pressure Relief
Valve

Pressure
Range

Adjustment

Size

Seal

Design
Series

NOTE:

Not required
when ordering.

Code	Description
064	64 Bar (928 PSI)
160	160 Bar (2320 PSI)
210	210 Bar (3045 PSI)
315	315 Bar (4568 PSI)

Code	Description
A	Adjustment Screw with Hexagon Socket
H	Turning Knob with Cylinder Lock

Code	Description
06	NG6
10	NG10

Code	Description
N	Nitrile
V	Fluorocarbon

Weight:

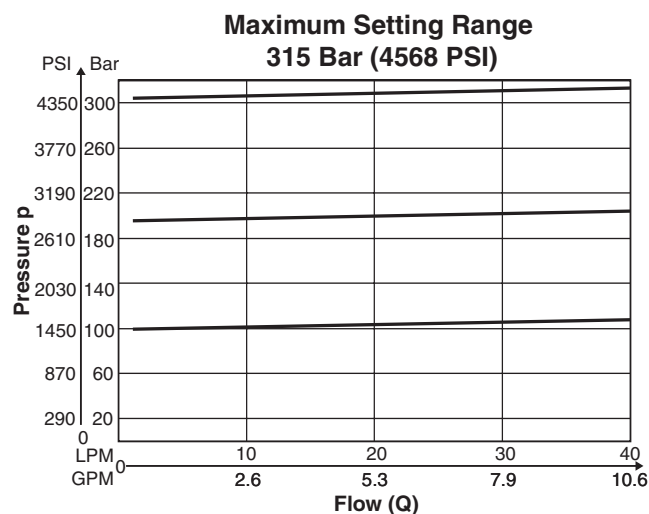
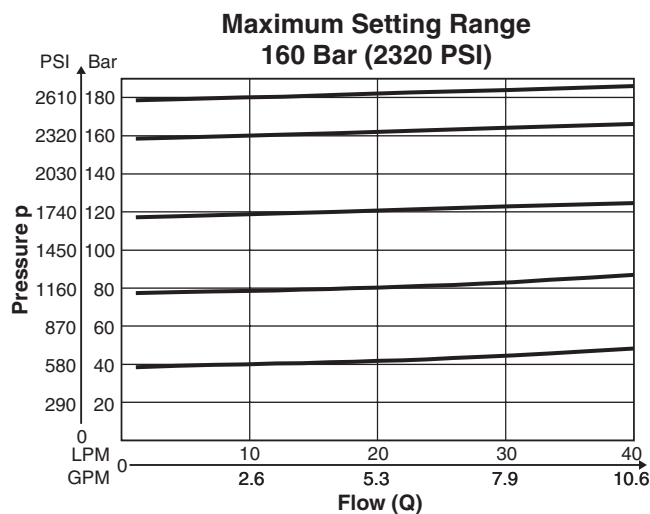
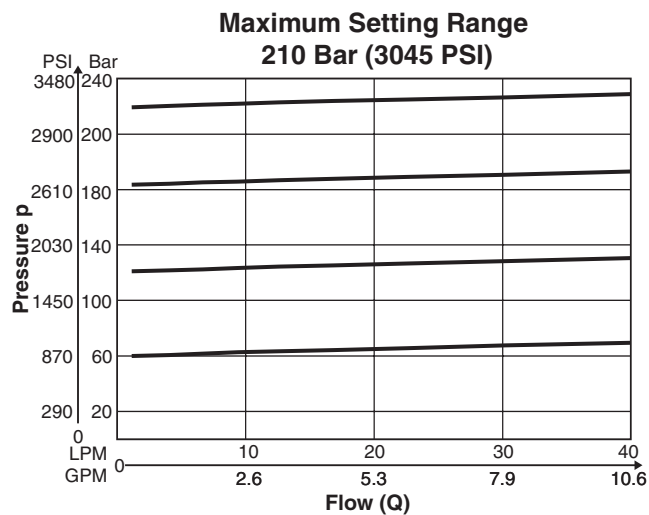
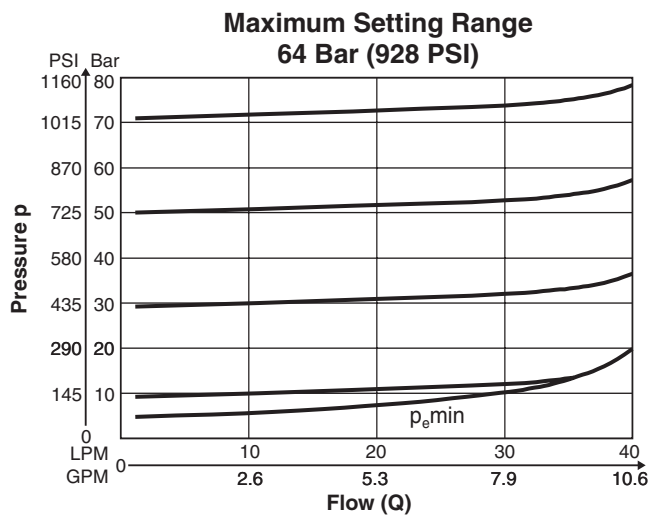
VBY*06 2.4 kg (5.29 lbs.)
 VBY*10 4.5 kg (9.92 lbs.)

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

VBY*06

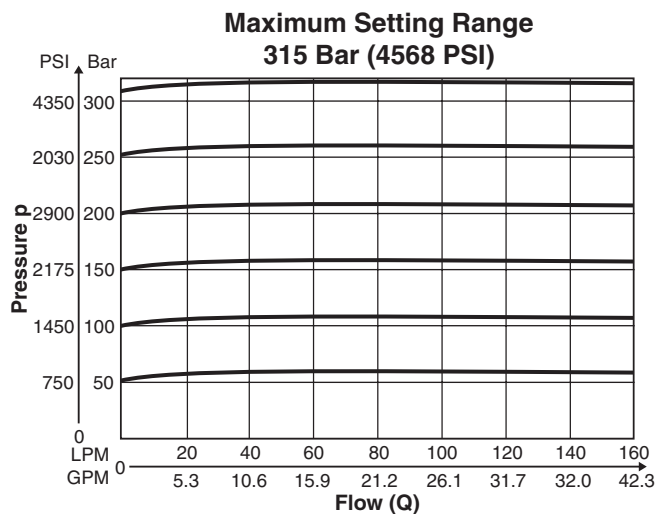
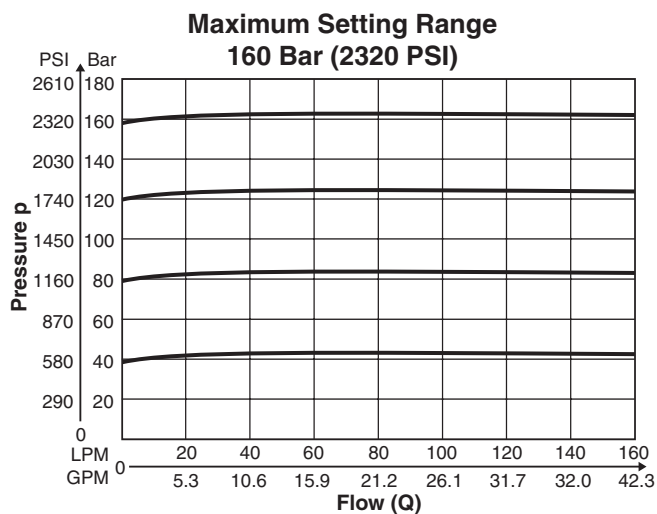
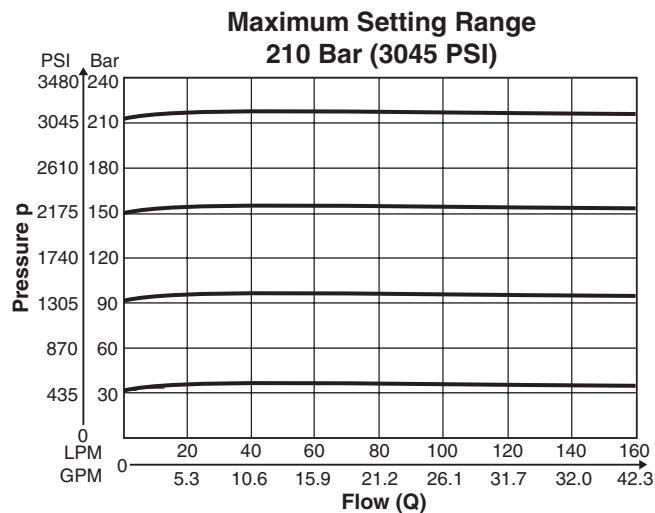
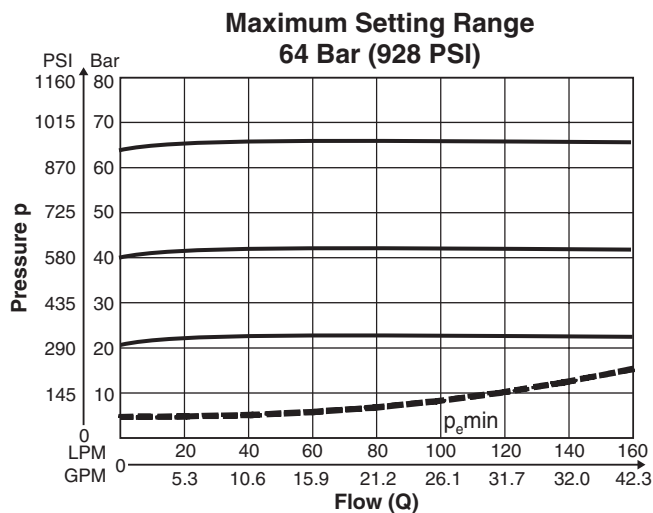
p/Q measured at $t = 50^{\circ}\text{C}$ (122°F) and $v = 36\text{mm}^2/\text{s}$

D



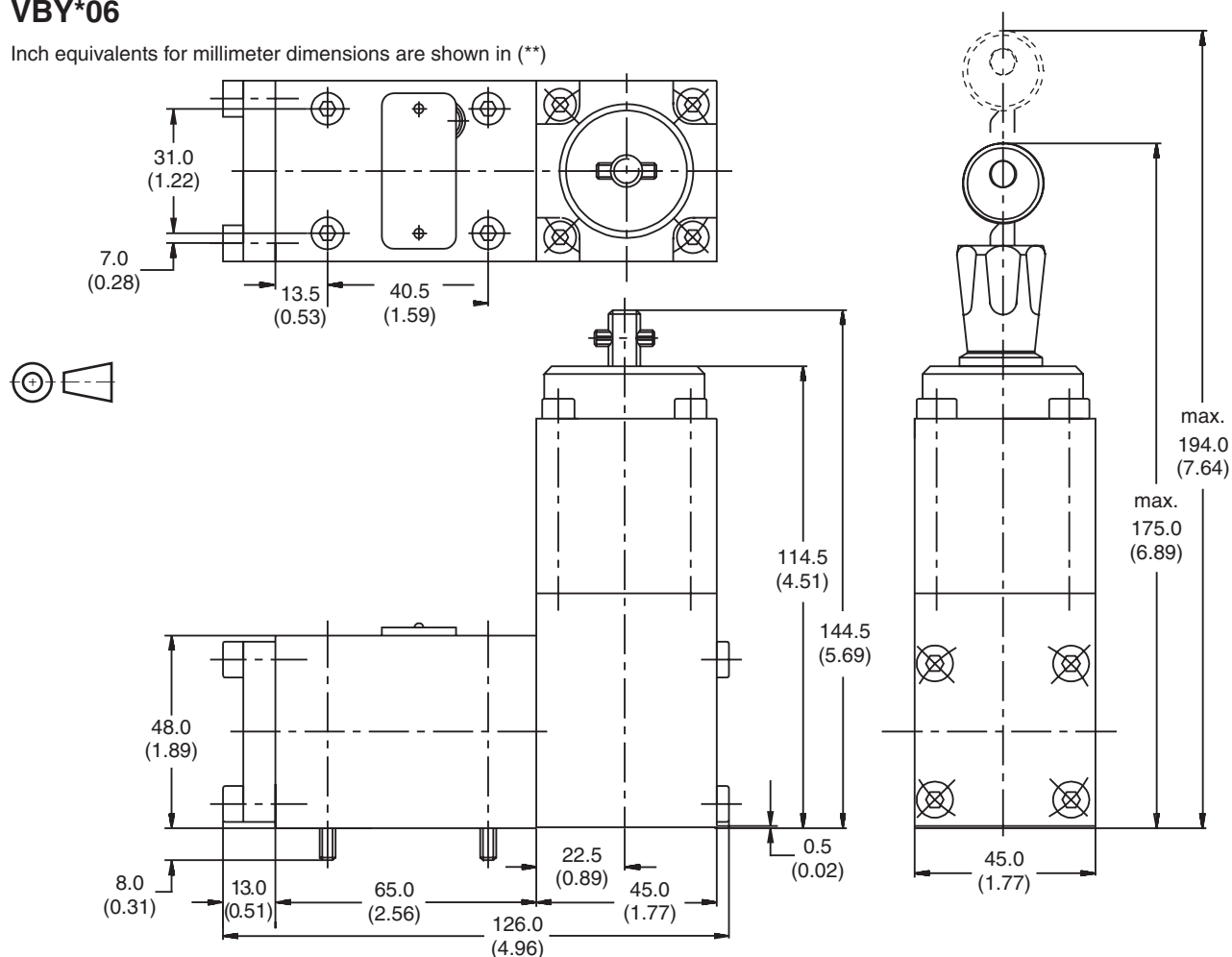
VBY*10

p/Q measured at $t = 50^{\circ}\text{C}$ (122°F) and $\nu = 36\text{mm}^2/\text{s}$



VBY*06

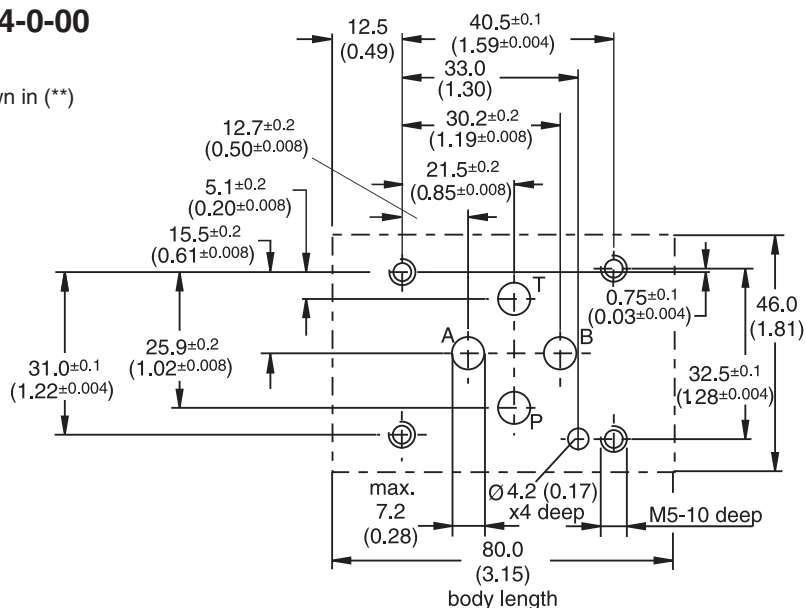
Inch equivalents for millimeter dimensions are shown in (**)



Surface Finish	Bolt Kit  DIN912 12.9		Seal  Kit
	BK375 4x M5x30	7.5 Nm (5.5 lb.-ft.)	Nitrile: SK-VB/VM/VS Fluorocarbon: SK-VB/VM/VS V

**Mounting Pattern ISO 5781-03-04-0-00
(NFPA D03, CETOP 3, NG6)**

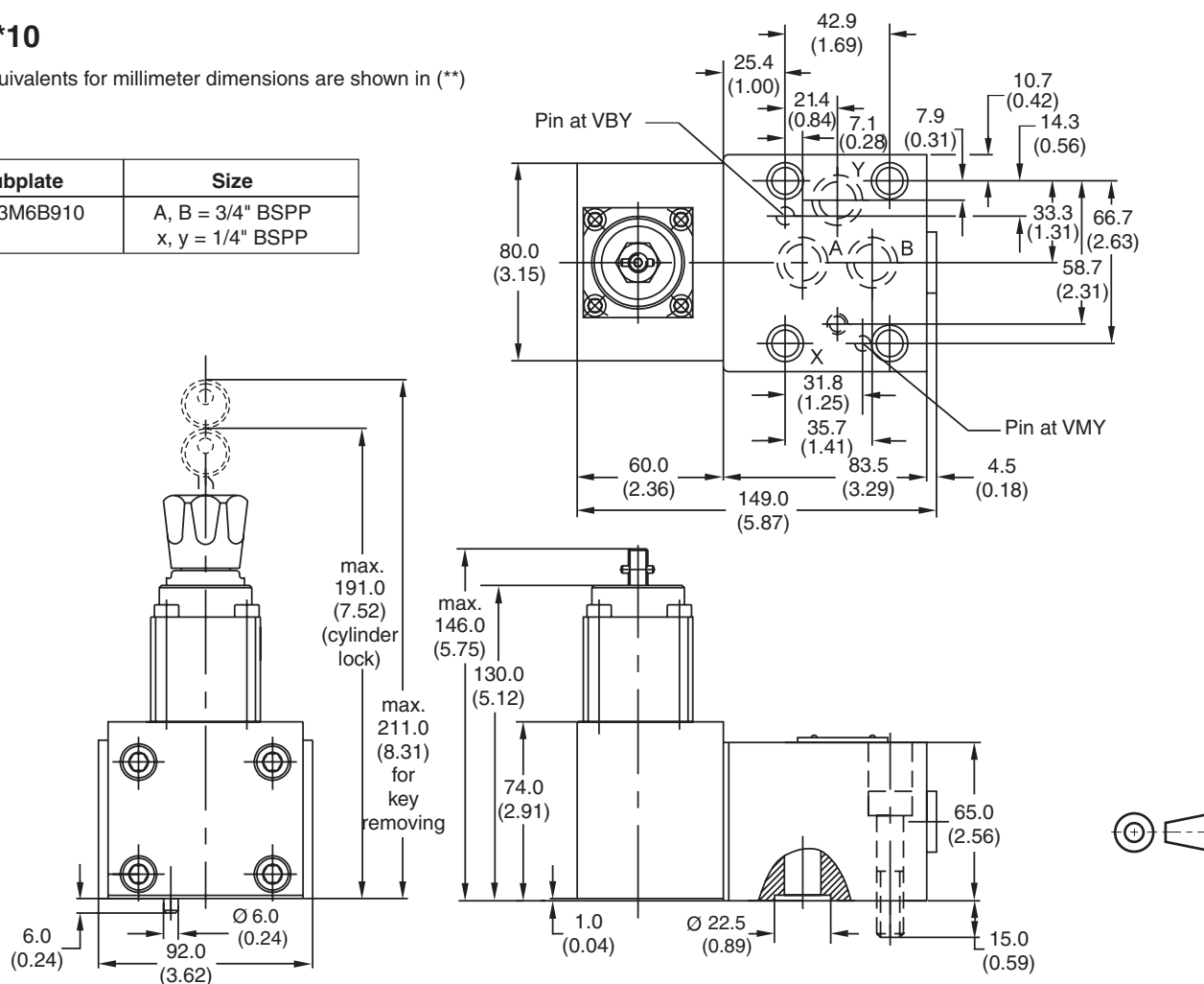
Inch equivalents for millimeter dimensions are shown in (**)

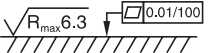


VBY*10

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

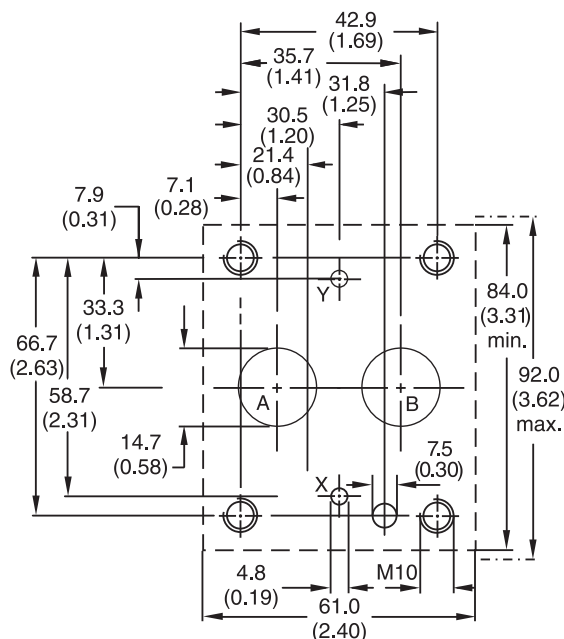
Subplate	Size
SPP3M6B910	A, B = 3/4" BSPP x, y = 1/4" BSPP



Surface Finish	Bolt Kit  DIN912 12.9		Seal  Kit
	BK389 4x M10x50	65 Nm (47.9 lb.-ft.)	Nitrile: SK-VB/VM-A10 Fluorocarbon: SK-VB/VM-A10V

Mounting Pattern ISO 5781-06-07-0-00

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



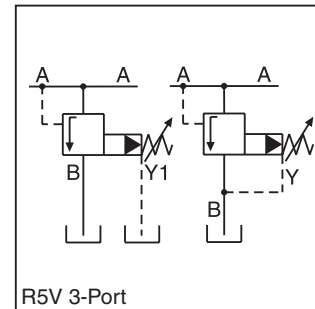
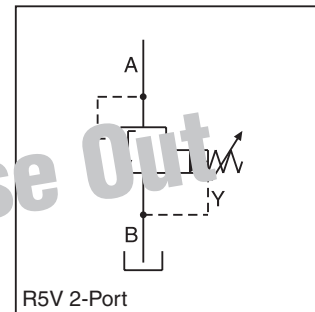
General Description

Series R5V pilot operated pressure relief valves have a similar design to the subplate mounted R4V series. The SAE flanges allow to mount the valves directly on the outlet flanges of pumps or inlet flanges of actuators to achieve a very compact design.

Valves with SAE flanges can also be bolted together to combine functions without the need of a manifold block.

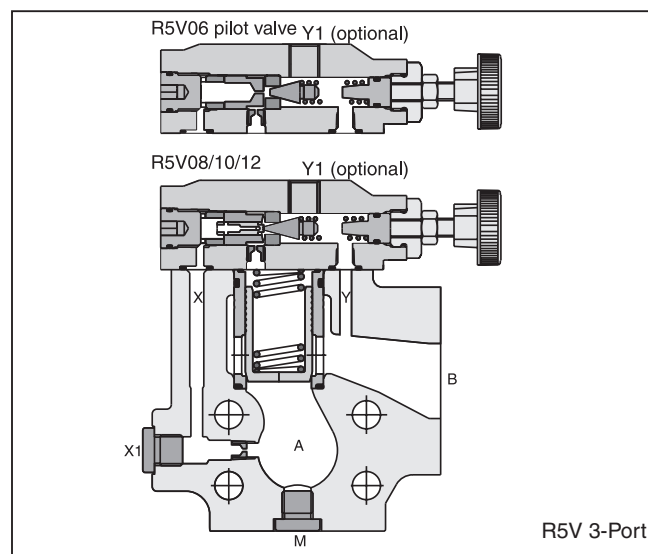
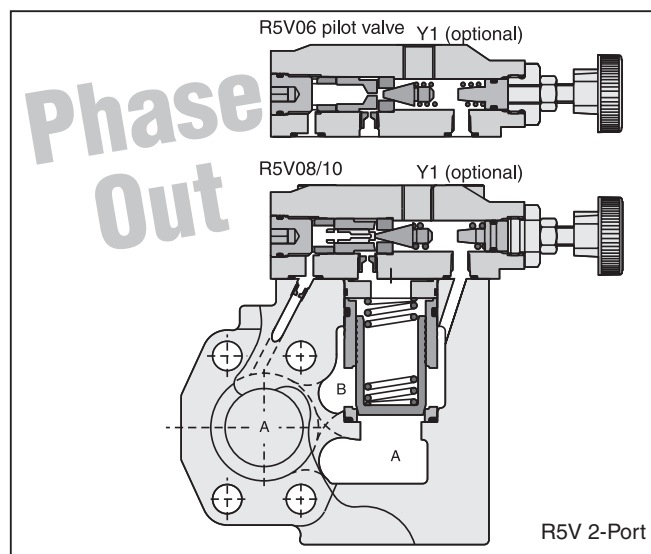
Operation

The system pressure in Port A is applied to the pilot valve and to the top surface of the main poppet via an orifice in X. The hydraulically balanced main poppet is held against the seat by the main spring. In this state there is no flow through the valve. The adjusted spring force acting on the pilot cone determines the relief pressure. If the pressure in Port A exceeds the set point, the pilot cone is lifted from its seat, releasing a small pilot flow to tank. The flow through the control orifice in X creates a pressure drop which limits the pressure at the top of the main poppet to the set point. The higher system pressure in Port A now lifts the main poppet off its seat and allows flow to Port B. In the resulting float position only enough flow is passed from Port A to Port B to maintain the inlet pressure in Port A at the set point. When the pressure in Port A falls below the set point, the hydraulic balance on the main poppet is restored. The main spring then forces the main poppet to close.



Features

- Pilot operated with manual adjustment
- R5V with 2-port body: **PHASE OUT**
 - 3 sizes (SAE 3/4", 1", 1-1/4")
 - SAE 61 flange
- R5V with 3-port body:
 - 4 sizes (SAE 3/4", 1", 1-1/4", 1-1/2")
 - SAE 61 and SAE 62 flange
- 3 pressure stages
- 3 adjustment modes: Hand knob, acorn nut with lead seal, or key lock
- With optional vent function



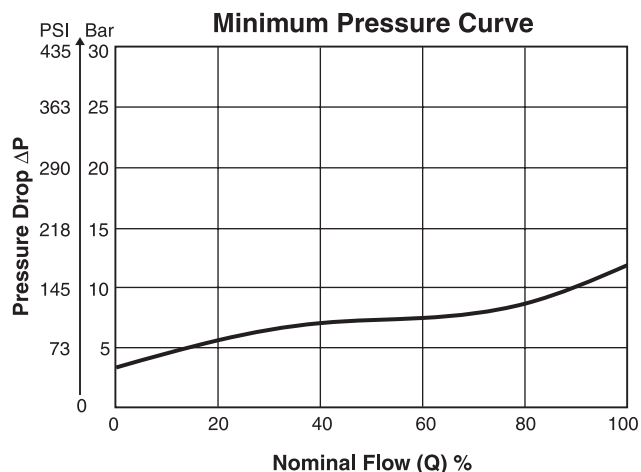
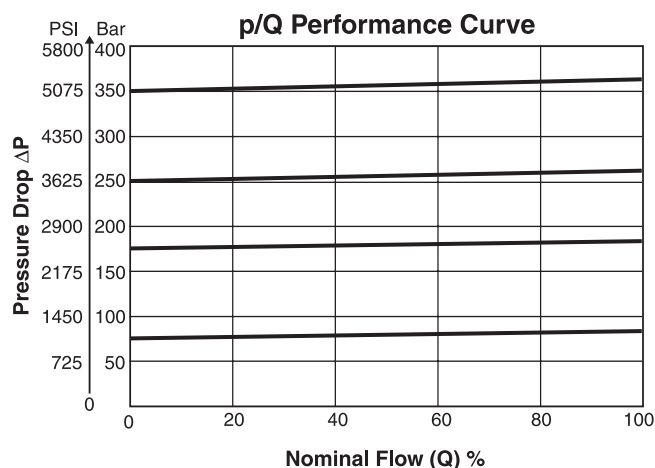
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R5V									A																																																																																																																										
Pressure Relief Valve	Size	SAE Interface	Pilot Ports	Pressure Range	Adjustment	Pilot Oil	Switching Type	Solenoid Voltage	Design Series	Seal	Options																																																																																																																								
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08	SAE 1"																																																																																																																																		
10	SAE 1-1/4"																																																																																																																																		
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Specifications

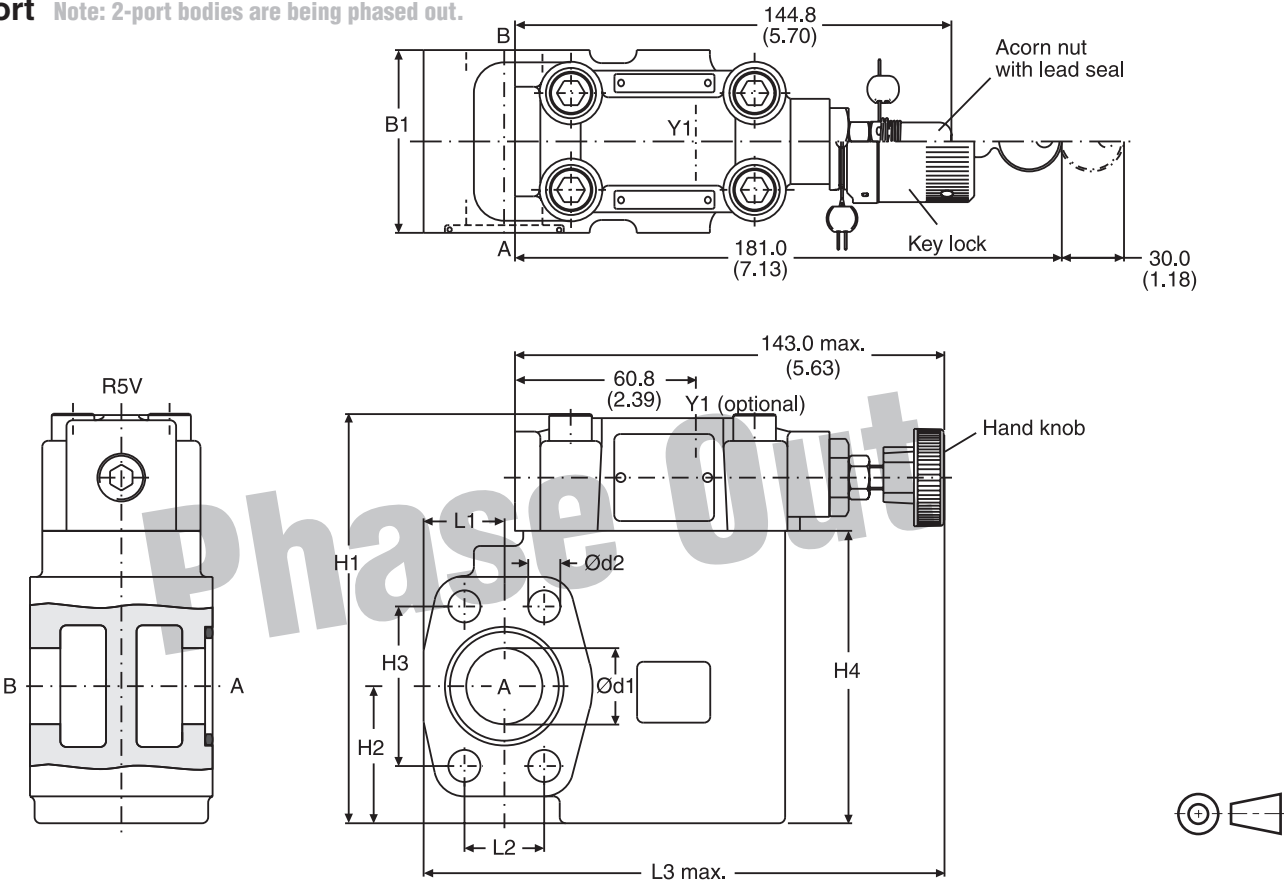
General															
Size		06		08		10		12							
Mounting		Flanged according to SAE 61 / SAE 62													
Mounting Position		Unrestricted													
Ambient Temperature Range		-20°C to +50°C (-4°F to +122°F)													
Hydraulic															
Maximum Operating Pressure		SAE 61 Ports A, B		350 Bar (5075 PSI)		350 Bar (5075 PSI)		280 Bar (4060 PSI)		210 Bar (3045 PSI)					
		SAE 61 Port Y1		30 Bar (435 PSI)		30 Bar (435 PSI)		30 Bar (435 PSI)		30 Bar (435 PSI)					
		SAE 62 Ports A, B		350 Bar (5075 PSI)		350 Bar (5075 PSI)		350 Bar (5075 PSI)		350 Bar (5075 PSI)					
		SAE 62 Port Y1		30 Bar (435 PSI)		30 Bar (435 PSI)		30 Bar (435 PSI)		30 Bar (435 PSI)					
Pressure Ranges		105 Bar (1523 PSI), 210 Bar (3045 PSI), 350 Bar (5075 PSI)													
Nominal Flow		90 LPM (23.8 GPM)		300 LPM (79.4 GPM)		600 LPM (158.7 GPM)		600 LPM (158.7 GPM)							
Fluid		Hydraulic oil as per DIN 51524 to 51525													
Fluid Temperature		-20°C to +80°C (-4°F to +176°F)													
Viscosity		Permitted Recommended		10 to 650 cSt / mm²/s (46 to 3013 SSU) 30 cSt / mm²/s (139 SSU)											
Filtration		ISO Class 4406 (1999) 18/16/13 (acc. NAS 1638: 7)													
Electrical (Solenoid)															
Duty Ratio		100%													
Solenoid Connection		Connector as per EN175301-803													
Protection Class		IP65 in accordance with EN60529 (plugged and mounted)													
Code		G0R		G0Q		GAR		GAG		W30		W31			
Supply Voltage		12V		24V		98V		205V		110V at 50Hz/ 120V at 60Hz		220V at 50Hz/ 240V at 60Hz			
Tolerance Supply Voltage		+5 to -10		+5 to -10		+5 to -10		+5 to -10		±5		±5			
Power Consumption		Hold		31W		31W		31W		31W		78W		78W	
		In Rush		31W		31W		31W		31W		264W		264W	
Response Time		Energized / De-energized AC 20/18ms, DC 46/27 ms													
Maximum Switching Frequency		AC up to 7200 switchings/hour; DC up to 16,000 switchings/hour													
Coil Insulation Class		H (180°C) (356°F)													

Performance Curves



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

2-Port Note: 2-port bodies are being phased out.



Seal Kits		
Size	Nitrile	Fluorocarbon
06	S16-91850-0	S16-91850-5
08	S16-91851-0	S16-91851-5
10	S16-91852-0	S16-91852-5

SAE 61

Size	B1	H1	H2	H3	H4	L1	L2	L3	d1	d2
06	60.0 (2.36)	131.6 (5.18)	37.0 (1.46)	47.6 (1.87)	90.0 (3.54)	24.6 (0.97)	22.2 (0.89)	152.0 (5.98)	19.0 (0.75)	10.5 (0.41)
08	60.0 (2.36)	137.6 (5.42)	45.0 (1.77)	52.4 (2.06)	96.0 (3.78)	26.5 (1.04)	26.2 (1.03)	171.0 (6.73)	25.0 (0.98)	10.5 (0.41)
10	75.0 (2.95)	150.6 (5.93)	48.0 (1.89)	58.7 (2.31)	109.0 (4.29)	34.0 (1.34)	30.2 (1.19)	179.0 (7.05)	32.0 (1.26)	12.5 (0.49)

Port	Function	Port Size		
		R5V06	R5V08	R5V10
A	Pressure	3/4" SAE 61	1" SAE 61	1-1/4" SAE 61
B	Tank	3/4" SAE 61	1" SAE 61	1-1/4" SAE 61
Y1	External Drain	SAE 4		

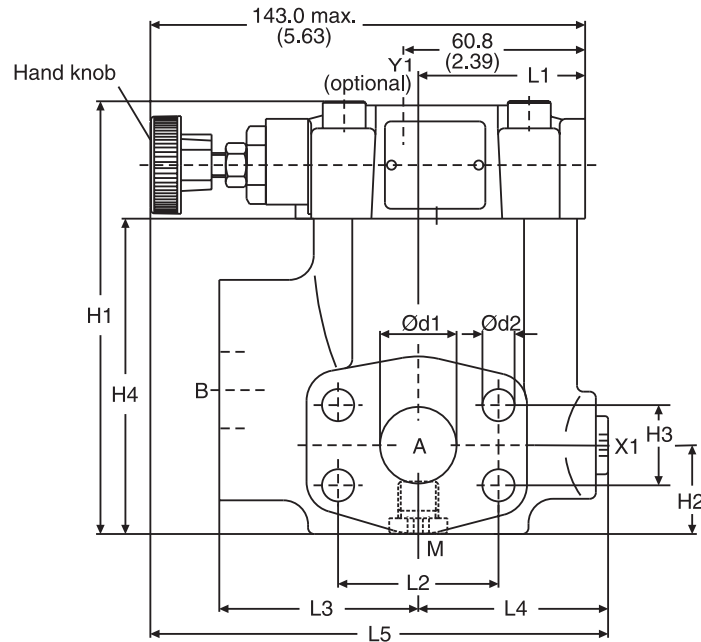
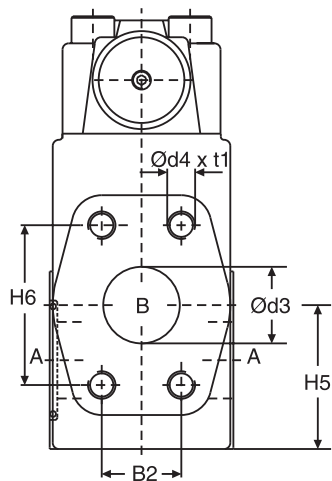
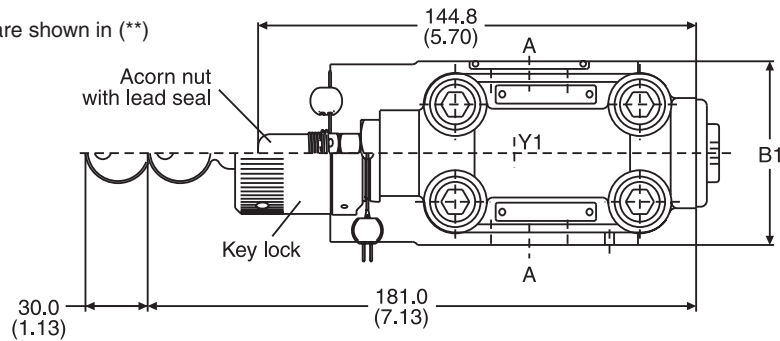
Dimensions

Pressure Relief Valves
Series R5V

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

3-Port

Seal Kits		
Size	Nitrile	Fluorocarbon
06	S16-91850-0	S16-91850-5
08	S16-91851-0	S16-91851-5
10	S16-91852-0	S16-91852-5
12	S26-27421-0	S26-27421-5



SAE 61

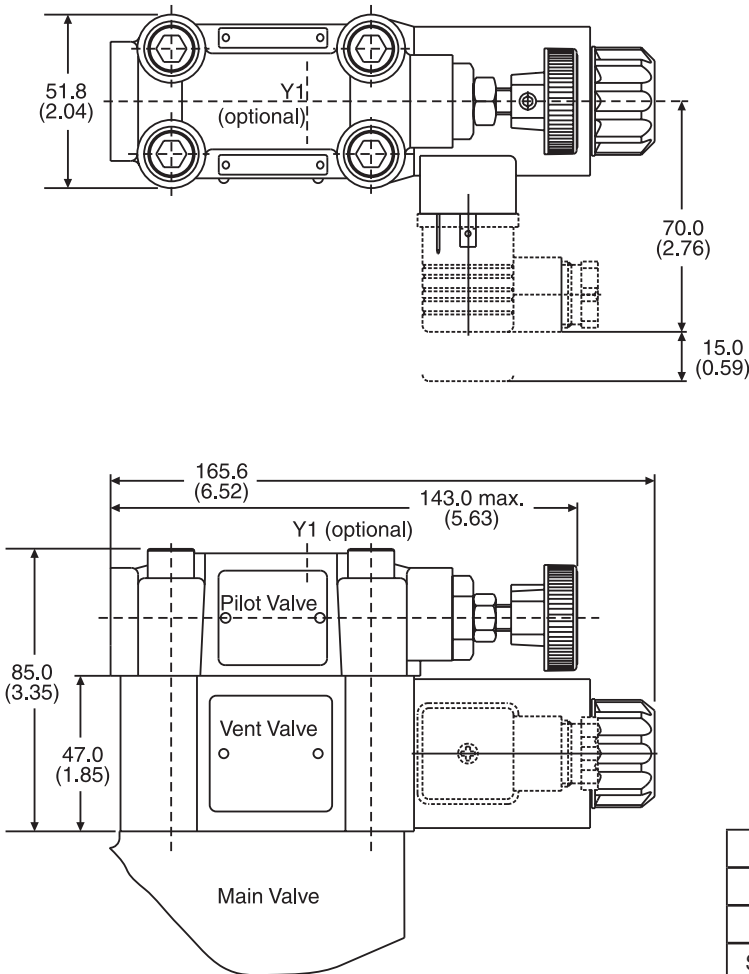
Size	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	d1	d2	d3	t1
06	60.0 (2.36)	22.2 (0.87)	119.0 (4.69)	28.0 (1.10)	22.2 (0.87)	81.0 (3.19)	41.6 (1.64)	47.6 (1.87)	50.3 (1.98)	47.6 (1.87)	63.0 (2.48)	56.0 (2.20)	152.0 (5.98)	19.0 (0.75)	10.5 (0.41)	19.0 (0.75)	20.0 (0.79)
08	60.0 (2.36)	26.2 (1.03)	141.0 (5.55)	29.0 (1.14)	26.2 (1.03)	103.0 (4.06)	47.0 (1.85)	52.4 (2.06)	55.8 (2.20)	52.4 (2.06)	65.0 (2.56)	58.0 (2.28)	149.0 (5.87)	25.0 (0.98)	10.5 (0.41)	25.0 (0.98)	23.0 (0.91)
10	75.0 (2.95)	30.2 (1.19)	151.0 (5.94)	34.5 (1.36)	30.2 (1.19)	113.0 (4.45)	64.0 (2.52)	58.7 (2.31)	57.8 (2.28)	58.7 (2.31)	61.0 (2.40)	62.0 (2.44)	150.5 (5.93)	32.0 (1.26)	12.5 (0.49)	32.0 (1.26)	22.0 (0.87)
12	80.0 (3.15)	35.7 (1.41)	178.0 (7.01)	34.0 (1.34)	35.7 (1.41)	140.0 (5.51)	73.0 (2.87)	69.8 (2.75)	37.3 (1.47)	69.8 (2.75)	92.5 (3.64)	55.2 (2.17)	171.2 (6.74)	38.0 (1.50)	13.5 (0.53)	38.0 (1.50)	27.0 (1.06)

SAE 62

Size	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	d1	d2	d3	t1
06	60.0 (2.36)	23.8 (0.94)	119.0 (4.69)	28.0 (1.10)	23.8 (0.94)	81.0 (3.19)	41.6 (1.64)	50.8 (2.00)	50.3 (1.98)	50.8 (2.00)	63.0 (2.48)	56.0 (2.20)	152.0 (5.98)	19.0 (0.75)	10.5 (0.41)	19.0 (0.75)	20.0 (0.79)
08	60.0 (2.36)	27.8 (1.09)	141.0 (5.55)	29.0 (1.14)	27.8 (1.09)	103.0 (4.06)	47.0 (1.85)	57.2 (2.25)	55.8 (2.20)	57.2 (2.25)	65.0 (2.56)	58.0 (2.28)	149.0 (5.87)	25.0 (0.98)	12.5 (0.49)	25.0 (0.98)	22.0 (0.87)
10	75.0 (2.95)	31.8 (1.25)	151.0 (5.94)	34.5 (1.36)	31.8 (1.25)	113.0 (4.45)	64.0 (2.52)	66.7 (2.63)	57.8 (2.28)	66.7 (2.63)	61.0 (2.40)	62.0 (2.44)	150.5 (5.93)	32.0 (1.26)	13.5 (0.53)	32.0 (1.26)	24.0 (0.94)
12	80.0 (3.15)	36.5 (1.44)	178.0 (7.01)	34.0 (1.34)	36.5 (1.44)	140.0 (5.51)	73.0 (2.87)	79.4 (3.13)	37.3 (1.47)	79.4 (3.13)	92.5 (3.64)	55.2 (2.17)	171.2 (6.74)	38.0 (1.50)	17.0 (0.67)	38.0 (1.50)	33.0 (1.30)

Port	Function	Port size			
		R5V06	R5V08	R5V10	R5V12
A (2)	Pressure	3/4" SAE 61/62	1" SAE 61/62	1-1/4" SAE 61/62	1-1/2" SAE 61/62
B	Tank	3/4" SAE 61/62	1" SAE 61/62	1-1/4" SAE 61/62	1-1/2" SAE 61/62
X1	External pilot port *	SAE 4			
Y1	External drain	SAE 4			
M	Pressure gauge	SAE 4			

Inch equivalents for millimeter dimensions are shown in (**)
with Vent Function



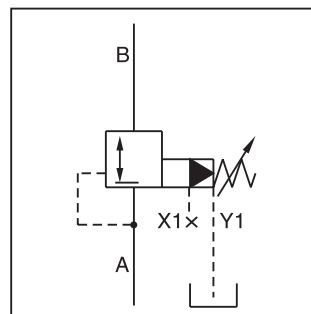
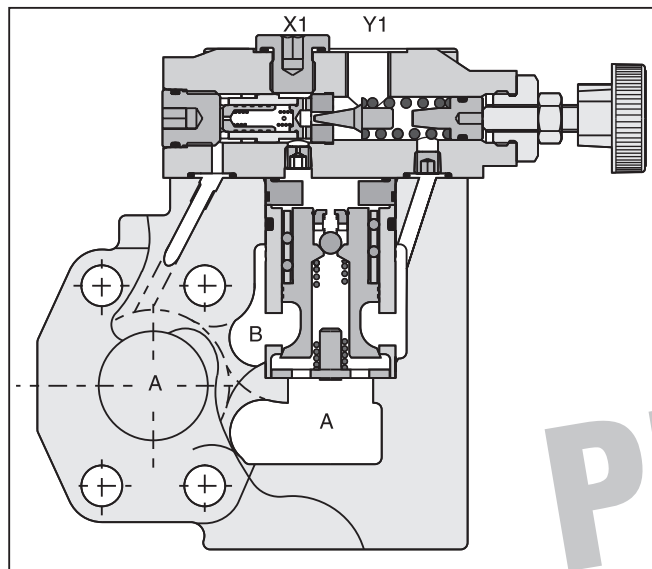
Vent Valve Seal Kits	
Nitrile	Fluorocarbon
DC Solenoid	
S26-58515-0	S26-58515-5
AC Solenoid	
S26-35237-0	S26-35237-5

Note: 2-port bodies are being phased out.

Code	R5V 2-Port		R5V 3-Port	
	Internal Drain	External Drain	Internal Drain	External Drain
11				
09				

General Description

Series R5R pilot operated pressure reducing valves have a similar design as the subplate mounted R4R series. The SAE flanges allow to mount the valves directly on the inlet flanges of actuators to achieve a very compact design.



Features

- Pilot operated with manual adjustment
- Normally closed to avoid unintended motion
- 2-port body with SAE61 flange
- 3 sizes (SAE 3/4", 1", 1-1/4")
- 3 pressure stages
- 3 adjustment modes:
 - Hand knob
 - Acorn nut with lead seal
 - Key lock
- With optional vent function
- Flow direction B → A

Ordering Information

R5R				2			6			A		
Pressure Reducing Valve		Size	SAE 61 Interface	2-Port Body X1, Y1 = SAE 4	Pressure Range	Adjustment	External Drain from Y1 Port	Switching Type	Solenoid Voltage	Design Series	Seal	Options Check with Factory
Code	Description					Code	Description				Code	Description
06	SAE 3/4"					1	Hand Knob				1	Nitrile
08	SAE 1"					3	Acorn Nut with Lead Seal				5	Fluorocarbon
10	SAE 1-1/4"					4	Key Lock					
Code	Size	Max. Pressure										
4	10	280 Bar (4060 PSI)										
5	06/08	350 Bar (5075 PSI)										
Code	Description											
Omit	Standard w/o vent function											
G0R	12V											
G0Q	24V											
GAR	98V											
GAG	205V											
W30	110V 50Hz/120V 60Hz											
W31	220V 50Hz/240V 60Hz											
Code	Description											
Omit	Standard w/o vent function											
09*	Solenoid not activ. unpress. circulation											
11**	Solenoid activated unpress. circulation											

Further options on request.

Weight:

R5R06	4.0 kg (8.8 lbs.)
R5R08	4.6 kg (10.1 lbs.)
R5R10	5.9 kg (13.0 lbs.)

Code	Description
1	up to 105 Bar (1523 PSI)
3	up to 210 Bar (3045 PSI)
5	up to 350 Bar (5075 Bar)

* Sol. de-energized: open to tank
 Sol. energized: vent line blocked.

** Sol. de-energized: vent line blocked
 Sol energized: open to tank.

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Specifications

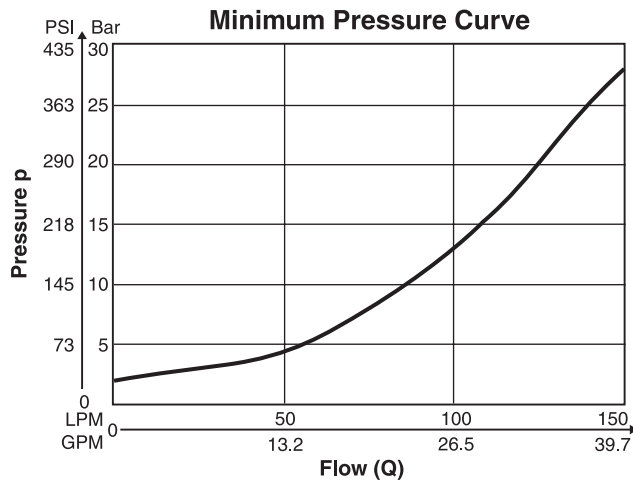
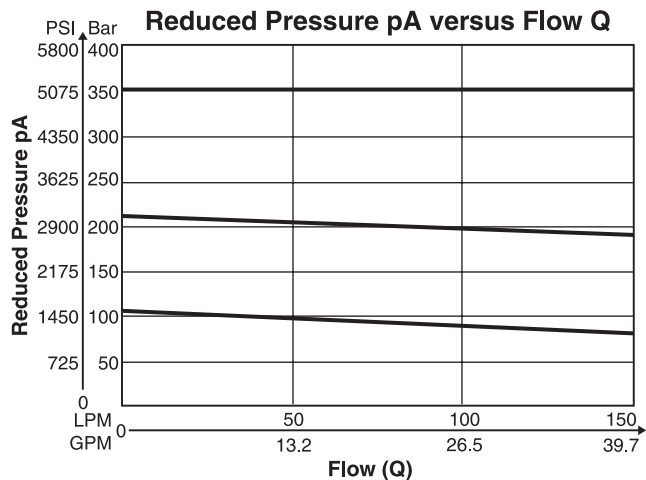
Pressure Relief Valves

Series R5R

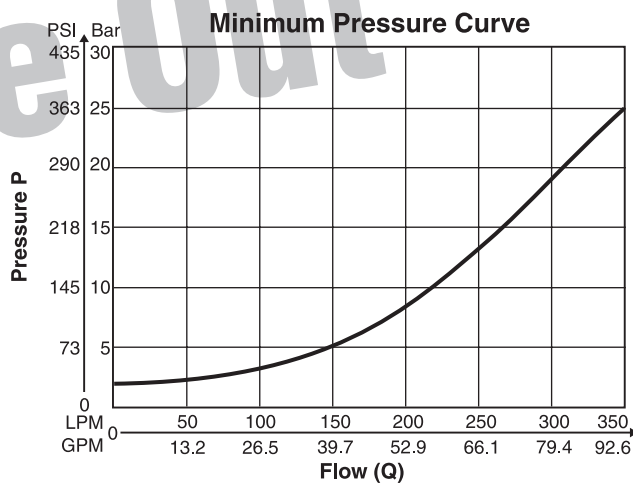
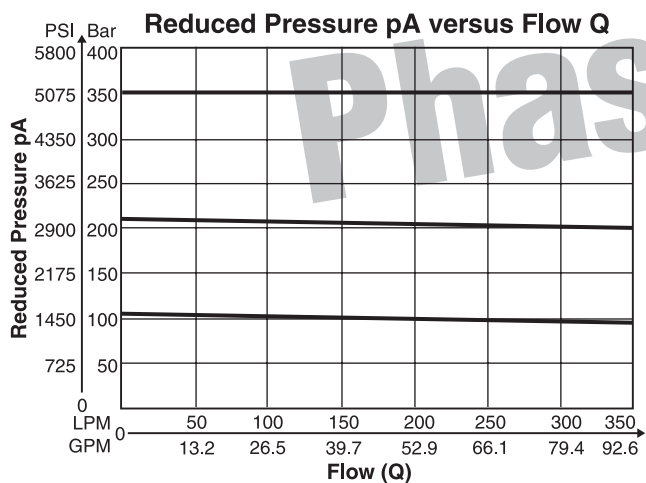
General							
Size		06		08		10	
Mounting		Flanged according to SAE 61					
Mounting Position		Unrestricted					
Ambient Temperature Range		-20°C to +50°C (-4°F to +122°F)					
Hydraulic							
Max. Operating Pressure	Ports A,B, X1	350 Bar (5075 PSI)		350 Bar (5075 PSI)		280 Bar (4060 PSI)	
	Port Y1	30 Bar (435 PSI)		30 Bar (435 PSI)		30 Bar (435 PSI)	
Pressure Ranges		105 Bar (1523 PSI), 210 Bar (3045 PSI), 350 Bar (5075 PSI)					
Nominal Flow		90 LPM (23.8 GPM)		300 LPM (79.4 GPM)		500 LPM (132.3 GPM)	
Fluid		Hydraulic oil as per DIN 51524 ... 51525					
Fluid Temperature		-20°C to +80°C (-4°F to +176°F)					
Viscosity	Permitted Recommended	10 to 650 cSt / mm²/s (46 to 3013 SSU) 30 cSt / mm²/s (139 SSU)					
Filtration		ISO Class 4406 (1999) 18/16/13 (acc. NAS 1638: 7)					
Electrical (Solenoid)							
Duty Ratio		100%					
Solenoid Connection		Connector as per EN175301-803					
Protection Class		IP65 in accordance with EN60529 (plugged and mounted)					
Code		G0R	G0Q	GAR	GAG	W30	W31
Supply Voltage		12V	24V	98V	205V	110V at 50Hz 120V at 60Hz	2200V at 50Hz 240V at 60Hz
Tolerance Supply Voltage		+5 to -10	+5 to -10	+5 to -10	+5 to -10	±5	±5
Power Consumption	Hold	31W	31W	31W	31W	78W	78W
	In Rush	31W	31W	31W	31W	264W	264W
Response Time		Energized / De-energized AC 20/18ms, DC 46/27 ms					
Max. Switching Frequency		AC up to 7200, DC 70 to 16,000 switchings/hour					
Coil Insulation Class		H (180°C) (356°F)					

D

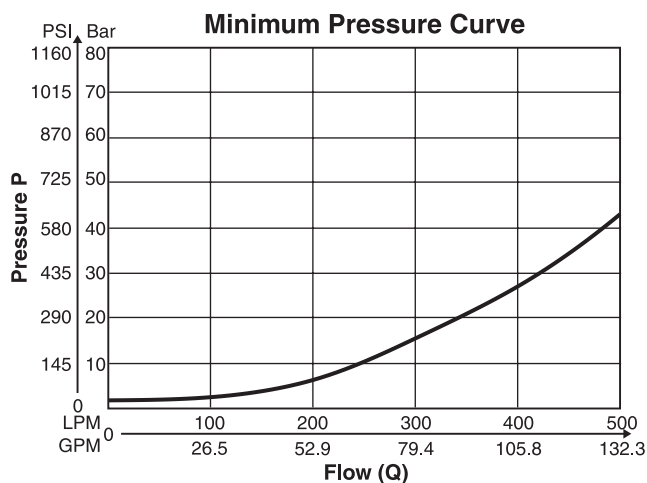
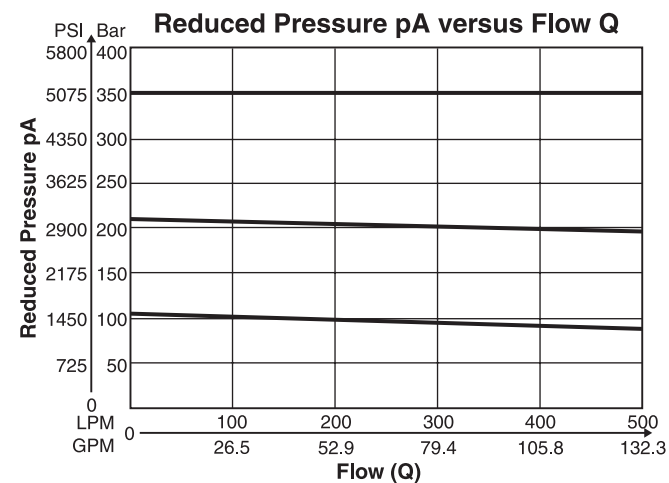
R5R06*



R5R08*



R5R10*

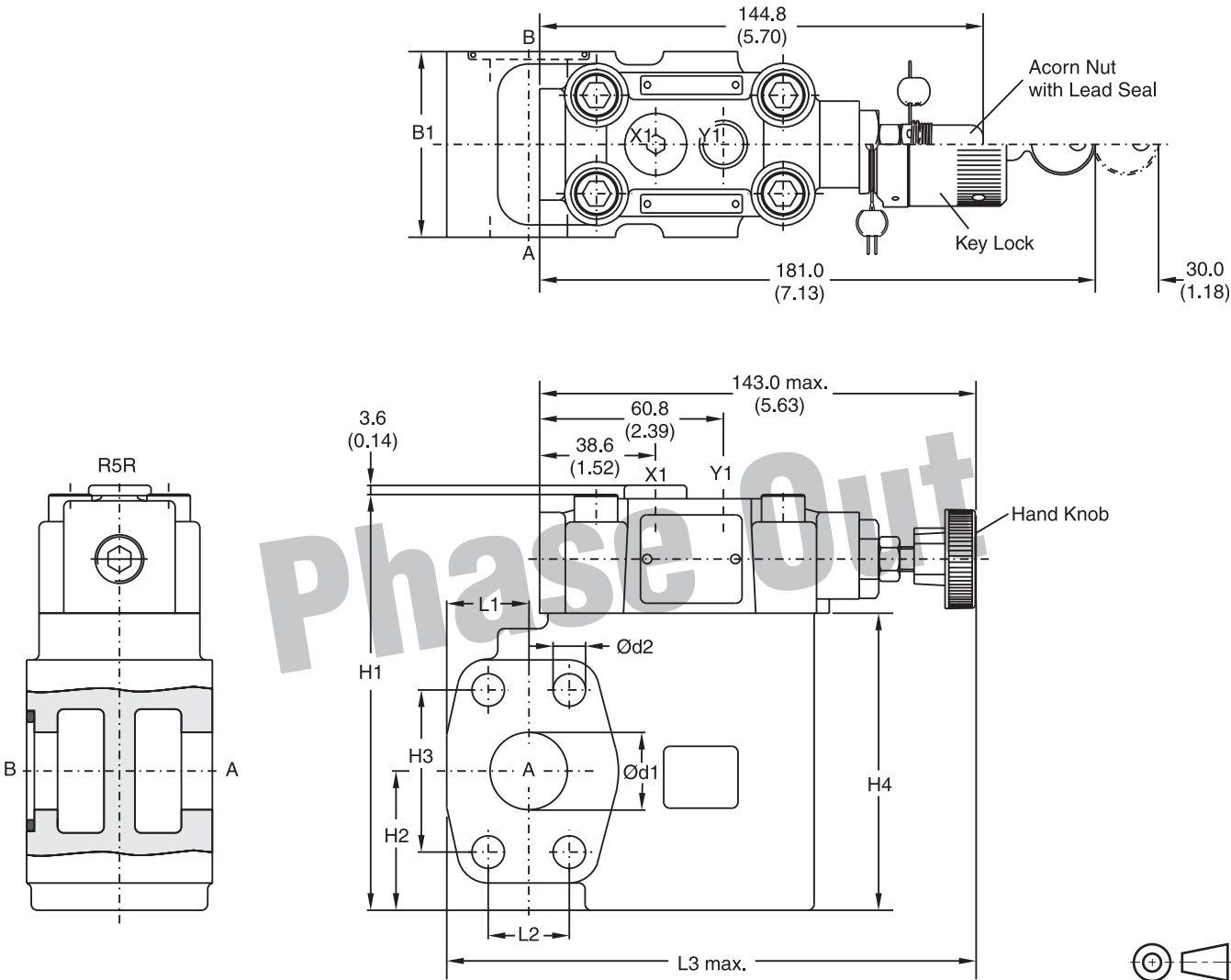


*Measured at 350 Bar (5075 PSI) primary pressure pB.

Dimensions

Pressure Relief Valves Series R5R

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



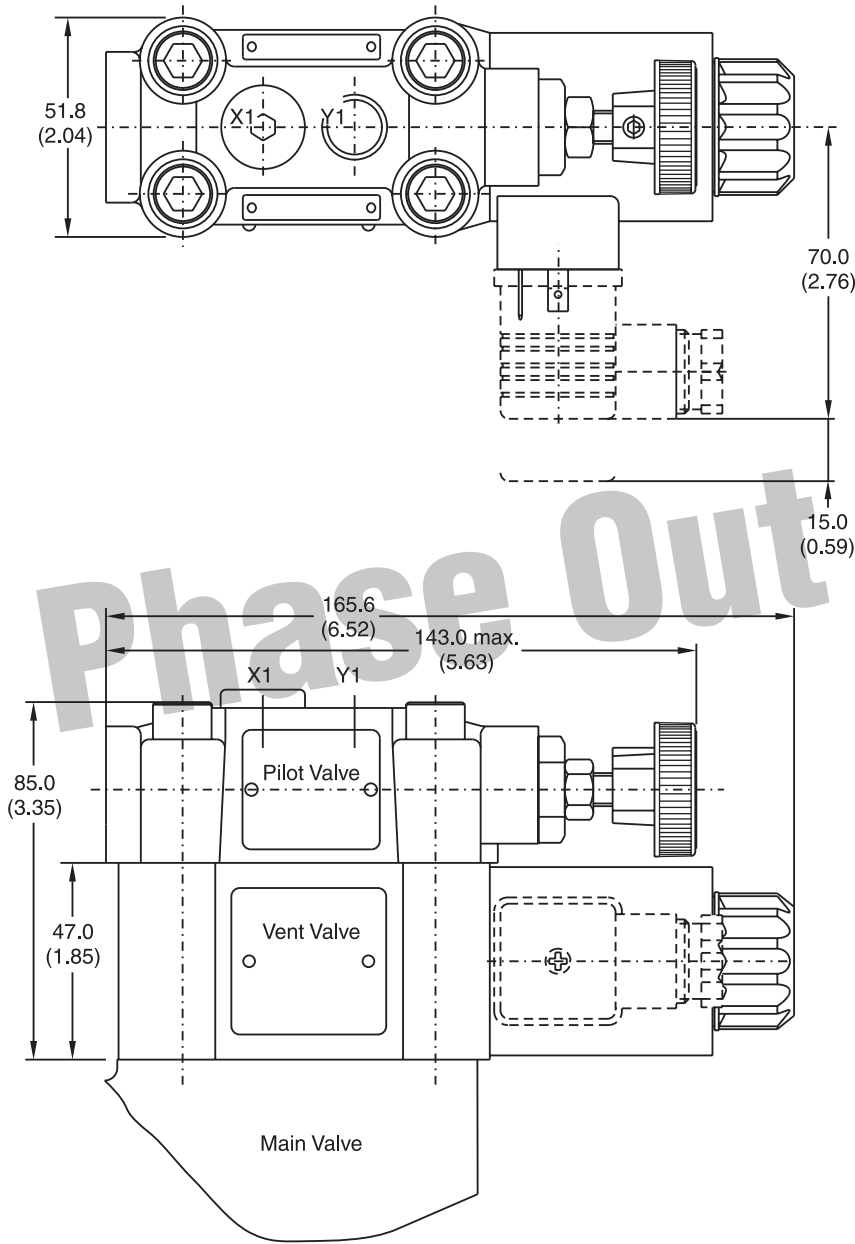
Seal Kits		
Size	Nitrile	Fluorocarbon
06	S16-91850-0	S16-91850-5
08	S16-91851-0	S16-91851-5
10	S16-91852-0	S16-91852-5

Size	B1	H1	H2	H3	H4	L1	L2	L3	d1	d2
06	60.0 (2.36)	131.6 (5.18)	37.0 (1.46)	47.6 (1.87)	90.0 (3.54)	24.6 (0.97)	22.2 (0.87)	152.0 (5.98)	19.0 (0.75)	10.5 (0.41)
08	60.0 (2.36)	137.6 (5.42)	45.0 (1.77)	52.4 (2.06)	96.0 (3.78)	26.5 (1.04)	26.2 (1.03)	171.0 (6.73)	25.0 (0.98)	10.5 (0.41)
10	75.0 (2.95)	150.6 (5.93)	48.0 (1.89)	58.7 (2.31)	109.0 (4.29)	34.0 (1.34)	30.2 (1.19)	179.0 (7.05)	32.0 (1.26)	12.5 (0.49)

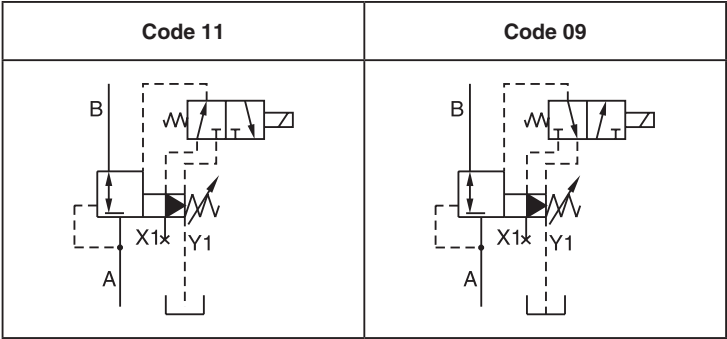
Port	Function	Port Size		
		R5R06	R5R08	R5R10
B	Inlet Pressure	3/4" SAE 61	1" SAE 61	1-1/4" SAE 61
A	Reduced Outlet Pressure	3/4" SAE 61	1" SAE 61	1-1/4" SAE 61
Y1	External Drain	SAE 4		
X1	Pressure Gauge	SAE 4		

Dimensions

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



External Drain



Vent Valve Seal Kits	
Nitrile	Fluorocarbon
DC Solenoid	
S26-58515-0	S26-58515-5
AC Solenoid	
S26-35237-0	S26-35237-5

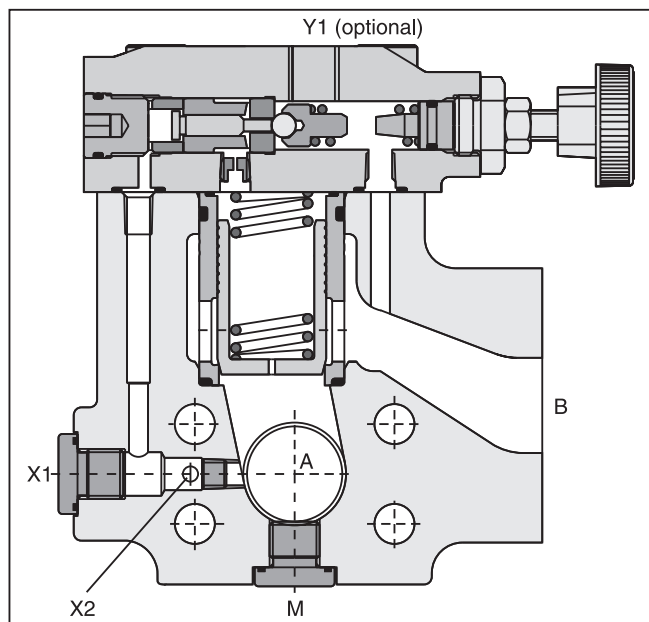
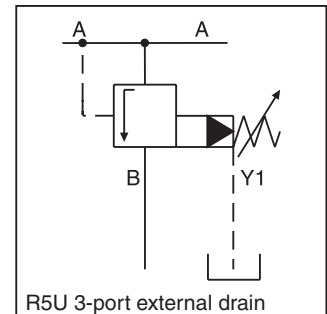
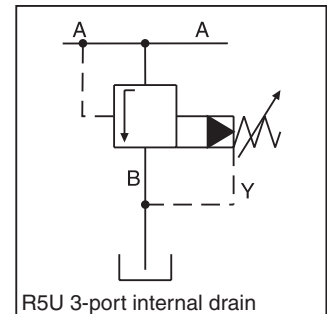
General Description

Series R5U pilot operated, pressure unloading valves have a similar design to the subplate mounted R4U series. The SAE flanges allow to mount the valve directly on the outlet flanges of pumps.

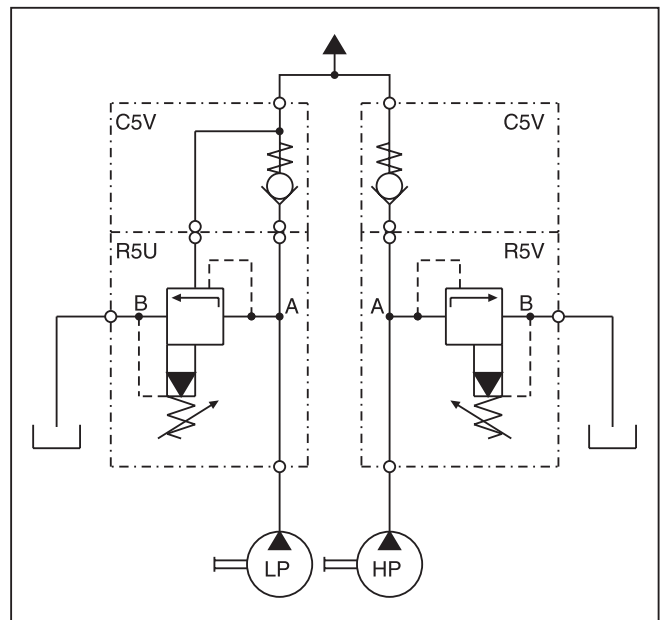
A typical application is the unloading of a pump in an accumulator circuit. The combination of an R5U, C5V and R5V on a double pump generates a high pressure / low pressure pump system without the need of a manifold block or piping between the valves.

Features

- Pilot operated unloading valve
- 3-port body with SAE 61 flange
- 4 sizes (SAE 3/4", 1", 1 1/4", 1 1/2")
- 3 pressure stages
- 3 adjustment modes:
 - Hand knob
 - Acorn nut with lead seal
 - Key lock
- With optional vent function



High Pressure / Low Pressure System



WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Ordering Information

R5U
Pressure Unloading Valve

Size

Code	Description
06	SAE 3/4"
08	SAE 1"
10	SAE 1-1/4"
12	SAE 1-1/2"

SAE61 Interface
M, Y1, X = SAE 4

3-Port Body

Pressure Range

Code	Size	Max. Pressure
3	12	210 Bar (3045 PSI)
4	10	280 Bar (4060 PSI)
5	06/08	350 Bar (5075 PSI)

Adjustment

Code	Description
1	Hand Knob
3	Acorn Nut with Lead Seal
4	Key Lock

Pilot Oil

Code	Pilot	Drain
4	External via port X1 or X2	External
5	External via port X1 or X2	Internal

Switching Type

Code	Description
Omit	Standard w/o vent function
G0R	12V
G0Q	24V
GAR	98V
GAG	205V
W30	110V 50Hz/ 120V 60Hz
W31	220V 50Hz/ 240V 60Hz

Solenoid Voltage

Design Series
A

Seal

Code	Description
1	Nitrile
5	Fluorocarbon

Options Check with Factory

Weight:

R5U06	3.6 kg (7.9 lbs.)
R5U08	4.6 kg (10.1 lbs.)
R5U10	5.2 kg (11.5 lbs.)
R5U12	8.0 kg (17.6 lbs.)

Pressure Stage

Code	Pressure Stage	Pressure Differential
1	up to 105 Bar (1523 PSI)	28%
3	up to 210 Bar (3045 PSI)	28%
5	up to 350 Bar (5075 Bar)	15%

Code Description

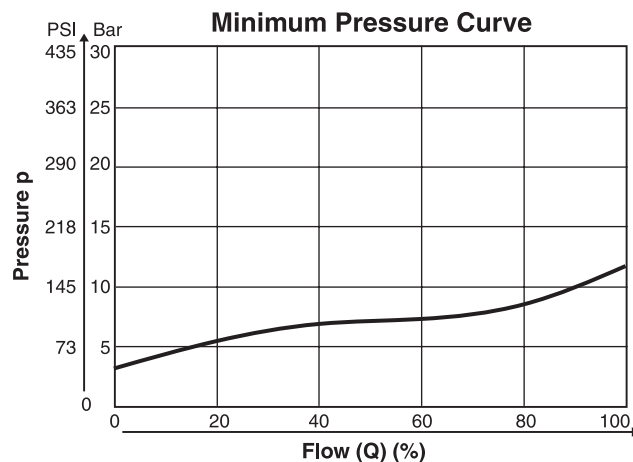
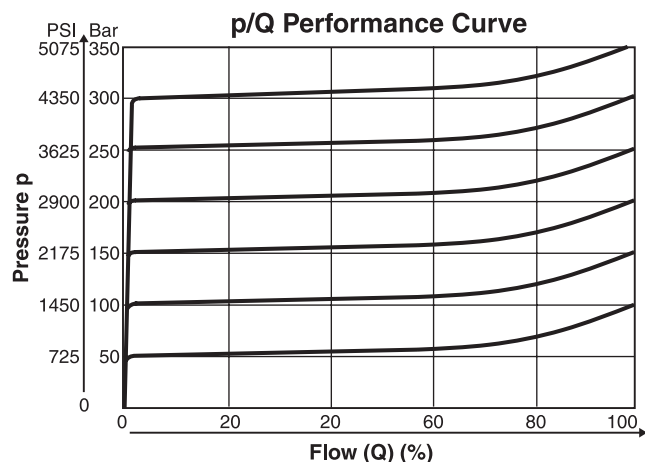
Omit	Standard w/o vent function
09*	Solenoid not activ. unpress. circulation
11**	Solenoid activated unpress. circulation

* Sol. de-energized: open to tank
Sol. energized: vent line blocked.

** Sol. de-energized: vent line blocked
Sol energized: open to tank.

Further options on request.

Performance Curves



The performance curves are measured with external drain.
 For internal drain the tank pressure has to be added to curve.

Specifications

Unloading Valves

Series R5U

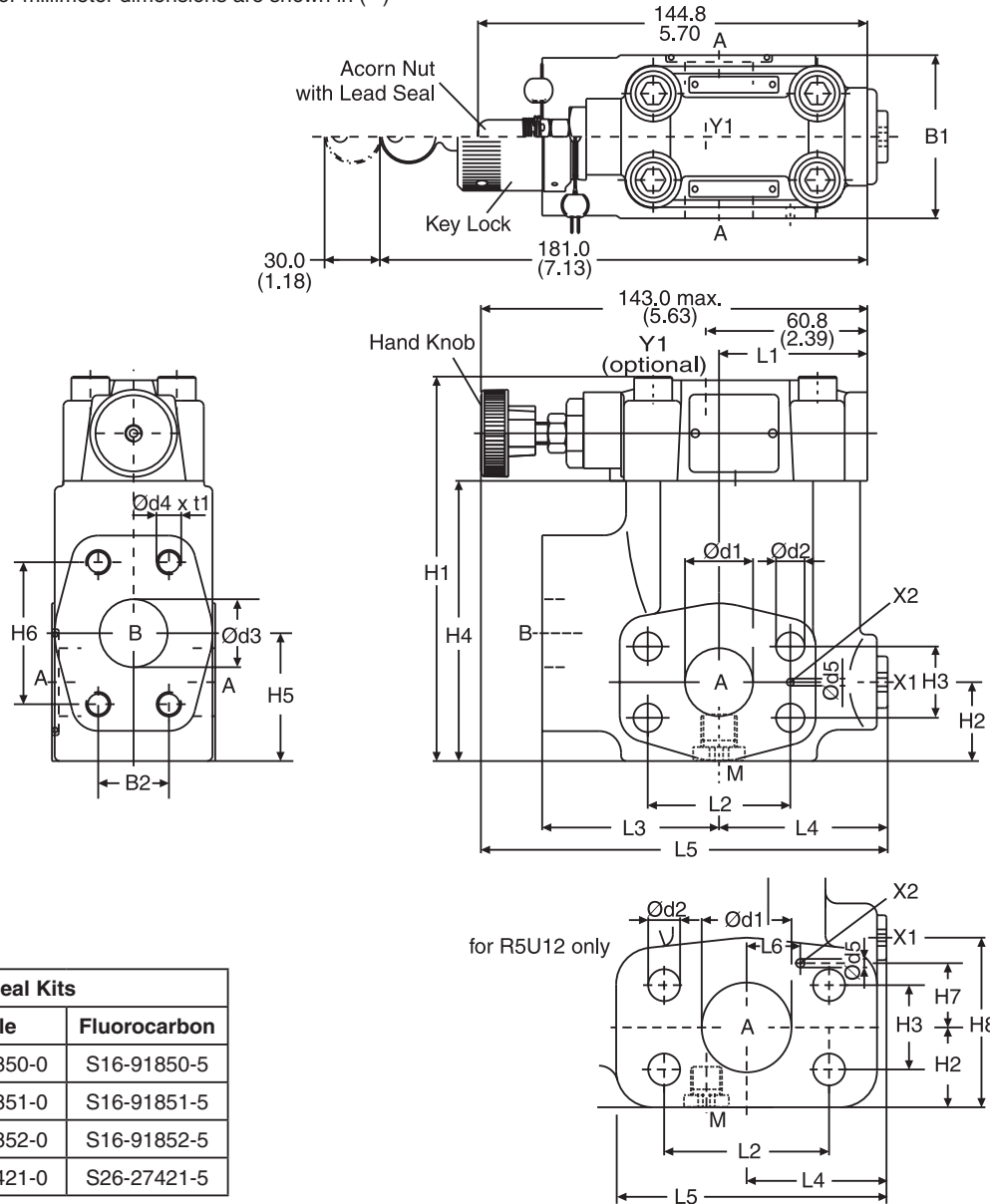
General						
Size	06		08		10	12
Mounting	Flanged according to SAE 61					
Mounting Position	Unrestricted					
Ambient Temperature	-20°C to +50°C (-4°F to +122°F)					
Hydraulic						
Maximum Operating Pressure	Ports A,B, X	350 Bar (5075 PSI)	350 Bar (5075 PSI)	280 Bar (4060 PSI)	210 Bar (3045 PSI)	
	Ports Y, Y1	30 Bar (435 PSI)	30 Bar (435 PSI)	30 Bar (435 PSI)	30 Bar (435 PSI)	
Pressure Ranges	105 Bar (1523 PSI), 210 Bar (3045 PSI), 350 Bar (5075 PSI)					
Nominal Flow	90 LPM (23.8 GPM)		300 LPM (79.4 GPM)	600 LPM (158.7 GPM)	600 LPM (158.7 GPM)	
Fluid	Hydraulic oil as per DIN 51524 ... 51525					
Fluid Temperature	-20°C to +80°C (-4°F to +176°F)					
Viscosity Permitted Recommended	10 to 650 cSt / mm²/s (46 to 3013 SSU) 30 cSt / mm²/s (139 SSU)					
Filtration	ISO Class 4406 (1999) 18/16/13 (acc. NAS 1638: 7)					
Electrical						
Duty Ratio	100%					
Solenoid Connection	Connector as per EN175301-803					
Protection Class	IP65 in accordance with EN60529 (plugged and mounted)					
Code	G0R	G0Q	GAR	GAG	W30	W31
Supply Voltage	12V	24V	98V	205V	110V at 50Hz 120V at 60Hz	220V at 50Hz 240V at 60Hz
Tolerance Supply Voltage	+5 to -10	+5 to -10	+5 to -10	+5 to -10	±5	±5
Power Consumption Hold In Rush	31W	31W	31W	31W	78W	78W
	31W	31W	31W	31W	264W	264W
Response Time	Energized / De-energized AC 20/18ms, DC 46/27 ms					
Maximum Switching Frequency	AC up to 7200 switchings/hour DC up to 16,000 switchings/hour					
Coil Insulation Class	H (180°C) (356°F)					

D

Dimensions

Unloading Valves Series R5U

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



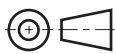
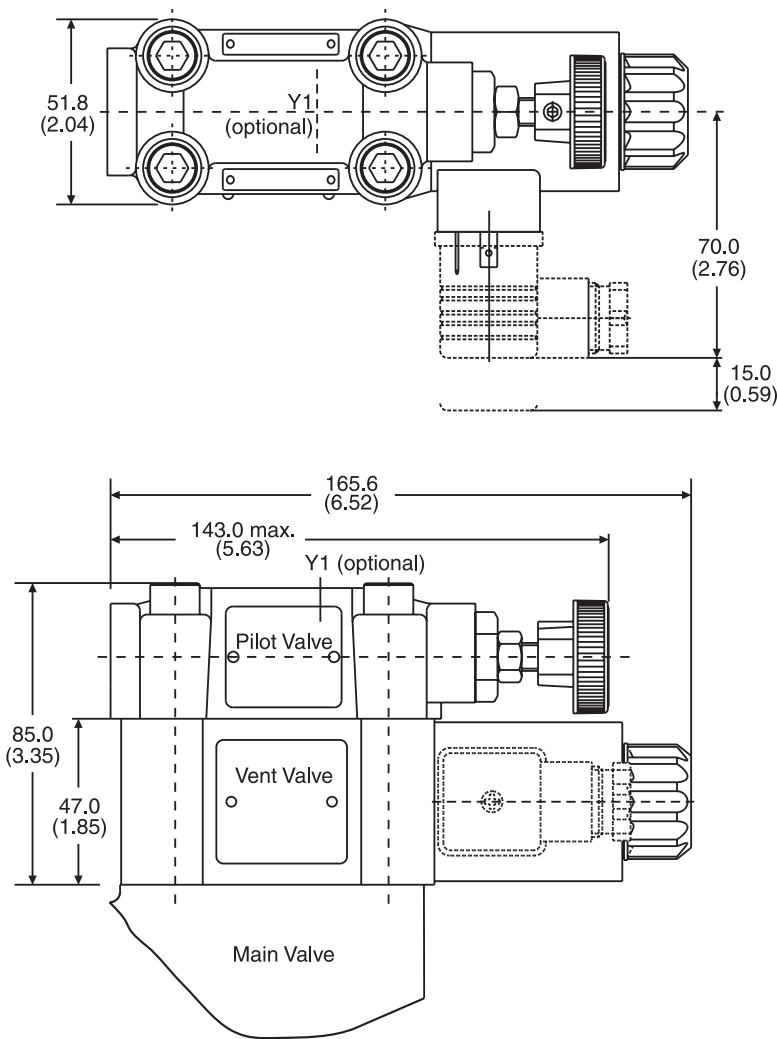
Seal Kits		
Size	Nitrile	Fluorocarbon
06	S16-91850-0	S16-91850-5
08	S16-91851-0	S16-91851-5
10	S16-91852-0	S16-91852-5
12	S26-27421-0	S26-27421-5

Size	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	d1	d2	d3	d4	t1	d5	L6	H7	H8
06	60.0 (2.36)	22.2 (0.87)	119.0 (4.69)	28.0 (1.10)	22.2 (0.87)	81.0 (3.19)	41.6 (1.64)	47.6 (1.87)	50.0 (1.98)	47.6 (1.87)	63.0 (2.48)	56.0 (2.20)	152.0 (5.98)	19.0 (0.75)	10.5 (0.41)	19.0 (0.75)	3/8"-16 UNC	20.0 (0.79)	3.0 (0.12)	-	-	-
08	60.0 (2.36)	26.2 (1.03)	141.0 (5.55)	29.0 (1.14)	26.2 (1.03)	103.0 (4.06)	47.0 (1.85)	52.4 (2.06)	55.8 (2.20)	52.4 (2.06)	65.0 (2.56)	58.0 (2.28)	149.0 (5.87)	25.0 (0.98)	10.5 (0.41)	25.0 (0.98)	3/8"-16 UNC	23.0 (0.91)	3.0 (0.12)	-	-	-
10	75.0 (2.95)	30.2 (1.19)	151.0 (5.94)	34.5 (1.36)	30.2 (1.19)	113.0 (4.45)	64.0 (2.52)	58.7 (2.31)	57.8 (2.28)	58.7 (2.31)	61.0 (2.40)	62.0 (2.44)	150.5 (5.93)	32.0 (1.26)	12.5 (0.49)	32.0 (1.26)	7/16"-14 UNC	22.0 (0.87)	3.0 (0.12)	-	-	-
12	80.0 (3.15)	35.7 (1.41)	178.0 (7.01)	34.0 (1.34)	35.7 (1.41)	140.0 (5.51)	73.0 (2.87)	69.8 (2.75)	37.3 (1.47)	69.8 (2.75)	92.5 (3.64)	55.2 (2.17)	171.2 (6.74)	38.0 (1.50)	13.5 (0.53)	38.0 (1.50)	1/2"-13 UNC	27.0 (1.06)	3.0 (0.12)	22.4 (0.88)	27.2 (1.07)	73.0 (2.87)

Port	Function	Port Size			
		R5U06	R5U08	R5U10	R5U12
A (2)	Pressure	3/4" SAE 61	1" SAE 61	1-1/4" SAE 61	1-1/2" SAE 61
B	Tank	3/4" SAE 61	1" SAE 61	1-1/4" SAE 61	1-1/2" SAE 61
X1	External Pilot Port*	SAE 4			
Y1	External Drain	SAE 4			
M	Pressure Gauge	SAE 4			

* closed when supplied.

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



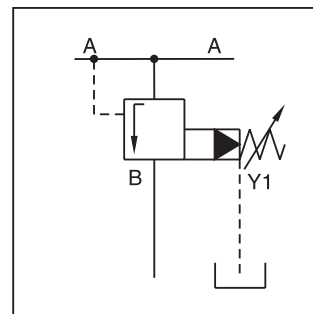
D

Code	Internal Drain	External Drain
11		
09		

Vent Valve Seal Kits	
Nitrile	Fluorocarbon
DC Solenoid	
S26-58515-0	S26-58515-5
AC Solenoid	
S26-35237-0	S26-35237-5

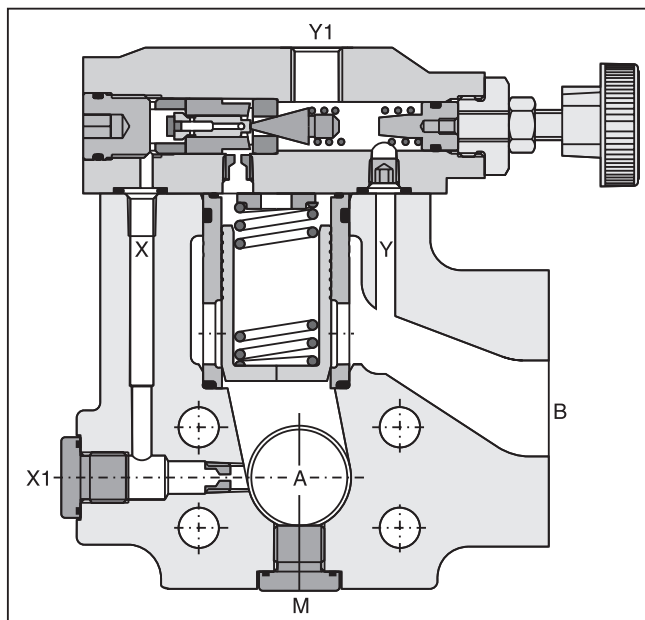
General Description

Series R5S pilot operated sequence valves have a similar design to the subplate mounted R4S series. The SAE flanges allow to mount the valve directly on the inlet flanges of actuators or outlet flanges of pumps to achieve a very compact design.



Features

- Pilot operated with manual adjustment
- 3-port body with SAE61 flange
- 3 sizes (SAE 3/4", 1", 1-1/4")
- 3 pressure stages:
- 2 adjustment modes:
 - Hand knob
 - Acorn nut with lead seal



Ordering Information

R5S

Pressure Sequence Valve

Size

SAE 61 Interface

3

3-Port Body
Y1, M = SAE 4

Pressure Range

Adjustment

6

External Drain from Y1 Port

A

Design Series

Seal

Options Check with Factory

Code

Description

06SAE 3/4"

08SAE 1"

10SAE 1-1/4"

Code

Description

1up to 105 Bar (1523 PSI)

3up to 210 Bar (3045 PSI)

5up to 350 Bar (5075 Bar)

Code

Description

1Hand Knob

3Acorn Nut with Lead Seal

4Key Lock

Code

Size

Max. Pressure

410280 Bar (4060 PSI)

506/08350 Bar (5075 PSI)

Code

Description

1Nitrile

5Fluorocarbon

Weight:

R5S063.6 kg (7.9 lbs.)

R5S084.6 kg (10.1 lbs.)

R5S105.2 kg (11.5 lbs.)

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

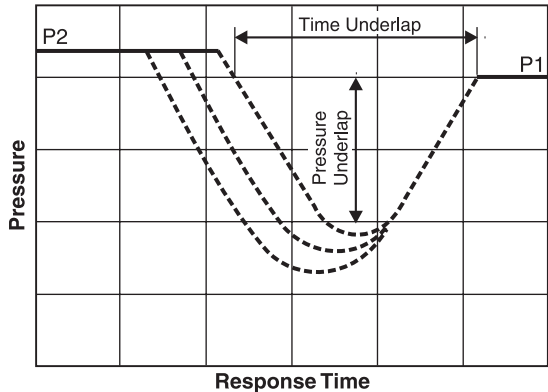
Specifications

General				
Size		06	08	10
Mounting		Flanged according to SAE 61		
Mounting Position		Unrestricted		
Ambient Temperature Range		-20°C to +50°C (-4°F to +122°F)		
Hydraulic				
Max. Operating Pressure	Ports A,B	350 Bar (5075 PSI)	350 Bar (5075 PSI)	280 Bar (4060 PSI)
	Ports Y, Y1	30 Bar (435 PSI)	30 Bar (435 PSI)	30 Bar (435 PSI)
Pressure Ranges		105 Bar (1523 PSI), 210 Bar (3045 PSI), 350 Bar (5075 PSI)		
Nominal Flow		90 LPM (23.3 GPM)	300 LPM (79.4 GPM)	600 LPM (158.7 GPM)
Fluid		Hydraulic oil as per DIN 51524 ... 51525		
Fluid Temperature		-20°C to 80°C (-4°F to 176°F)		
Viscosity	Permitted Recommended	10 to 650 cSt / mm²/s (46 to 3013 SSU) 30 cSt / mm²/s (139 SSU)		
Filtration		ISO Class 4406 (1999) 18/16/13 (acc. NAS 1638: 7)		

D

Performance Curve

Typical Pressure Characteristics
at Closing Point

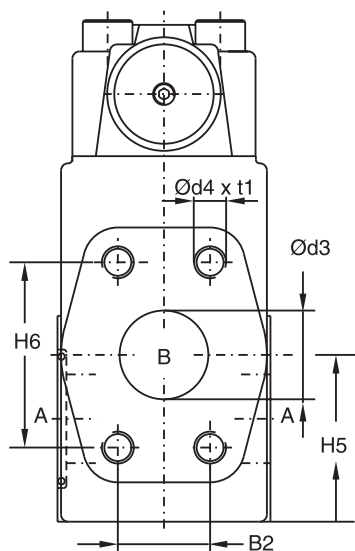
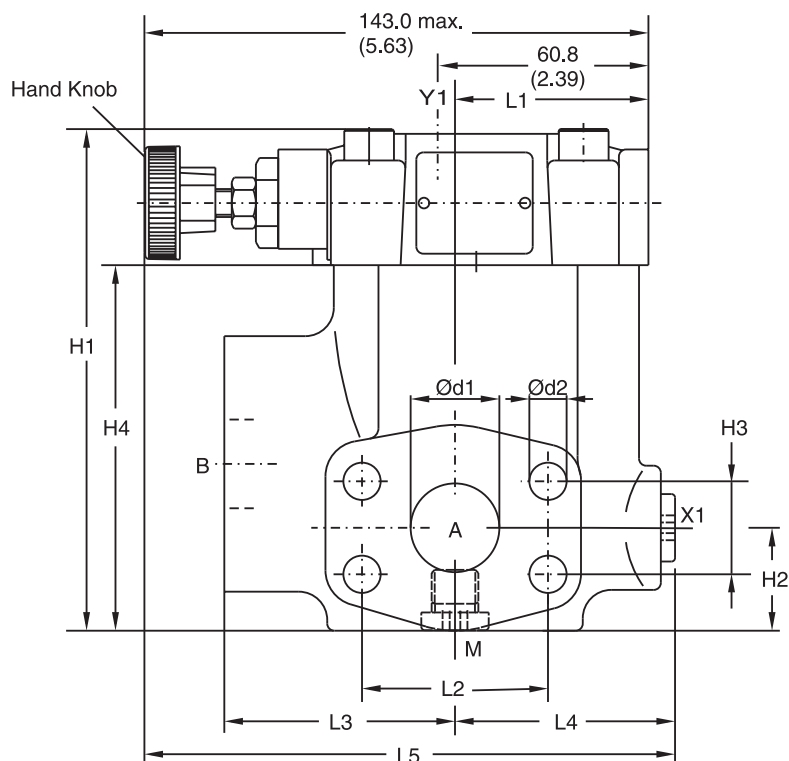
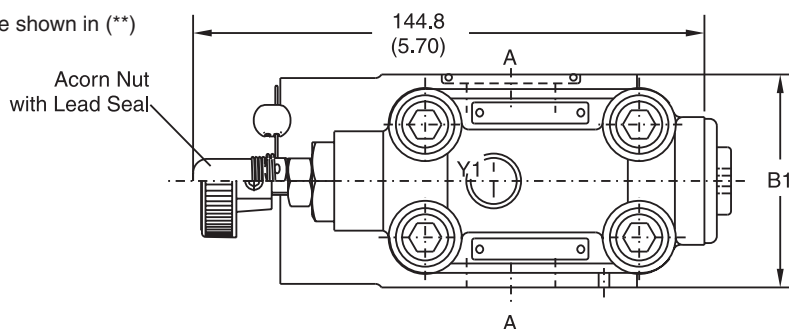


P1 = Setting Pressure
P2 = Operating Pressure

Time and pressure underlap depend on the characteristics of the specific system.

Dimensions**Sequence Valves****Series R5S**

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

**Seal Kits**

Size	Nitrile	Fluorocarbon
06	S16-91850-0	S16-91850-5
08	S16-91851-0	S16-91851-5
10	S16-91852-0	S16-91852-5

SAE 61

Size	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	d1	d2	d3	d4 (option 152)	t1
06	60.0 (2.36)	22.2 (0.87)	119.0 (4.69)	28.0 (1.10)	22.2 (0.87)	81.0 (3.19)	41.6 (1.64)	47.6 (1.87)	50.3 (1.98)	47.6 (1.87)	63.0 (2.48)	56.0 (2.20)	152.0 (5.98)	19.0 (0.75)	10.5 (0.41)	19.0 (0.75)	3/8"-16 UNC (M10)	20.0 (0.79)
08	60.0 (2.36)	26.2 (1.03)	141.0 (5.55)	29.0 (1.14)	26.2 (1.03)	103.0 (4.06)	47.0 (1.85)	52.4 (2.06)	55.8 (2.20)	52.4 (2.06)	65.0 (2.56)	58.0 (2.28)	149.0 (5.87)	25.0 (0.93)	10.5 (0.41)	25.0 (0.98)	3/8"-16 UNC (M10)	23.0 (0.91)
10	75.0 (2.95)	30.2 (1.19)	151.0 (5.94)	34.5 (1.36)	30.2 (1.19)	113.0 (4.45)	64.0 (1.52)	58.7 (2.31)	57.8 (2.28)	58.7 (2.31)	61.0 (2.40)	62.0 (2.44)	150.5 (5.93)	32.0 (1.26)	12.5 (0.49)	32.0 (1.26)	7/16"-14 UNC (M12)	22.0 (0.87)

Port	Function	Port Size		
		R5S06	R5S08	R5S10
A (2)	Pressure	3/4" SAE 61	1" SAE 61	1-1/4" SAE 61
B	Secondary Port	3/4" SAE 61	1" SAE 61	1-1/4" SAE 61
X1	External Pilot Port*	SAE 4		
Y1	External Drain	SAE 4		
M	Pressure Gauge	SAE 4		

* closed when supplied.

General Description

Series R4V pilot operated, pressure relief valves for in-line mounting have a similar design to the subplate mounted R4V series. For single functions where no manifold blocks are used, the valves can be directly placed in the pipework.

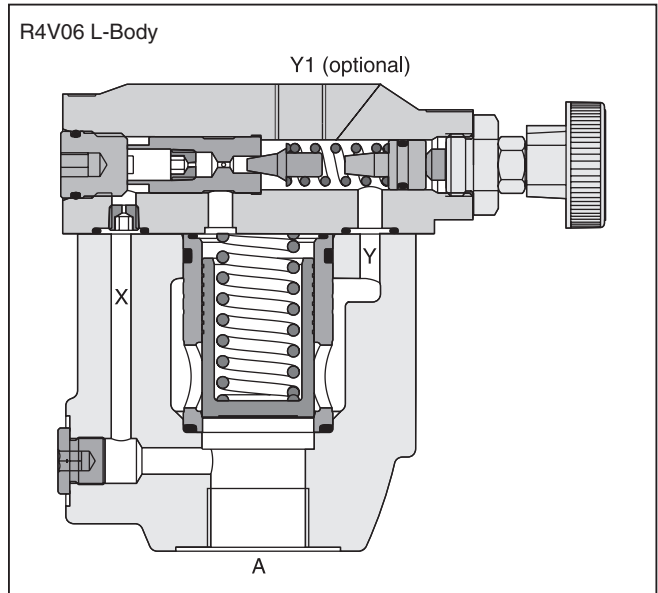
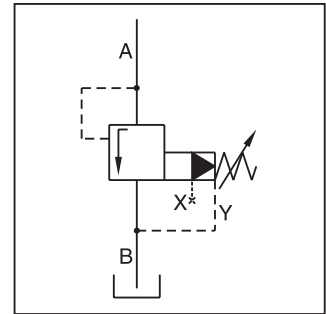
The R4V valves are available with 2 ports (L-body) for in-line relief function or with 3 ports (T-body) for relief functions in the bypass.

Operation

The system pressure in Port A is applied to the pilot valve and to the top surface of the main poppet via an orifice in X. The hydraulically balanced main poppet is held against the seat by the main spring. In this state there is no flow through the valve. The adjusted spring force acting on the pilot cone determines the relief pressure. If the pressure in Port A exceeds the set point, the pilot cone is lifted from its seat, releasing a small pilot flow to tank. The flow through the control orifice in X creates a pressure drop which limits the pressure at the top of the main poppet to the set point. The higher system pressure in Port A now lifts the main poppet off its seat and allows flow to Port B. In the resulting float position only enough flow is passed from Port A to Port B to maintain the inlet pressure in Port A at the set point. When the pressure in Port A falls below the set point, the hydraulic balance on the main poppet is restored. The main spring then forces the main poppet to close.

Features

- Pilot operated with manual adjustment
- 2 interfaces:
 - L-body (R4V06-SAE 12, R4V10-SAE 20)
 - T-body (R4V03-SAE 8, R4V06-SAE 16)
- 3 pressure stages
- 3 adjustment modes:
 - Hand knob
 - Acorn nut with lead seal
 - Key lock
- With optional vent function



WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Ordering Information

R4V

Pressure Relief Valve

Size

5

Max Pressure
350 Bar
(5075 PSI)

Body

Pressure Range

Adjustment

Drain Line

Switching Type

Solenoid Voltage
(Optional)

A

Design Series

Seal

Options
Check with
Factory

Code	Description
03	NG10 (SAE 8)
06	NG25 (SAE 16 – T-Body) (SAE 12 – L-Body)
10	NG32 (SAE 20)

Code	Description
0	Internal
2	External from Pilot Head (Y1)

Code	Description
Omit	Standard w/o vent function
G0R	12V
G0Q	24V
GAR	98V
GAG	205V
W30	110V 50Hz/ 120V 60Hz
W31	220V 50Hz/ 240V 60Hz

Code	Description
1	Nitrile
5	Fluorocarbon

Code	Description
1	R4V03 T-Body NPT R4V06 T-Body NPT
4	R4V03 T-Body R4V06 T-Body
6	R4V03 T-Body BSP R4V06 T-Body BSP
A	R4V06 T-Body NPT R4V10 T-Body NPT
B	R4V06 L-Body R4V10 L-Body
D	R4V06 L-Body BSP R4V10 L-Body BSP

Code	Description
1	Hand Knob
3	Acorn Nut with Lead Seal
4	Key Lock

Code	Description
Omit	Standard w/o vent function
09*	Solenoid not activ. unpress. circulation
11**	Solenoid activated unpress. circulation

Weight:

R4V03 3.2 kg (7.1 lbs.)

R4V06*4 6.6 kg (14.6 lbs.)

R4V06*B 3.3 kg (8.2 lbs.)

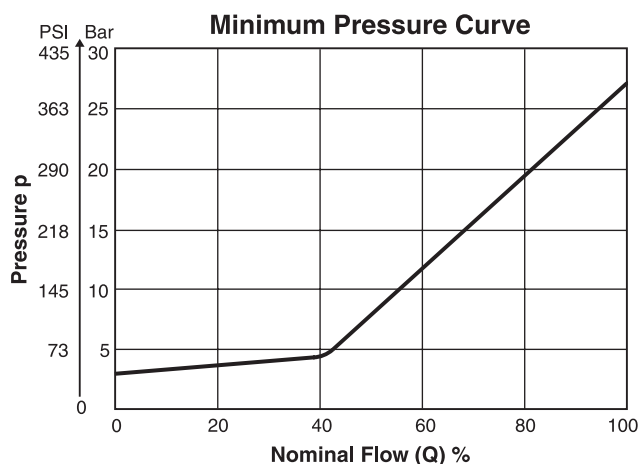
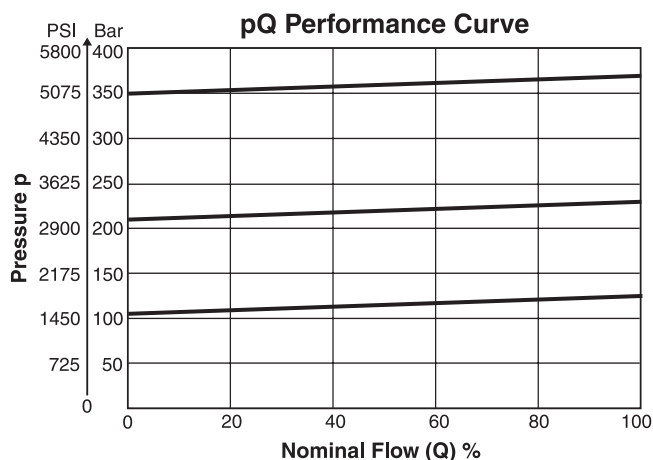
R4V10 5.6 kg (12.3 lbs.)

Code	Description
1	up to 105 Bar (1523 PSI)
3	up to 210 Bar (3045 PSI)
5	up to 350 Bar (5075 Bar)

* Sol. de-energized: open to tank
Sol. energized: vent line blocked.

** Sol. de-energized: vent line blocked
Sol energized: open to tank.

Performance Curves*



* The performance curves are measured with external drain. For internal drain, the tank pressure has to be added to the curve.

R4V

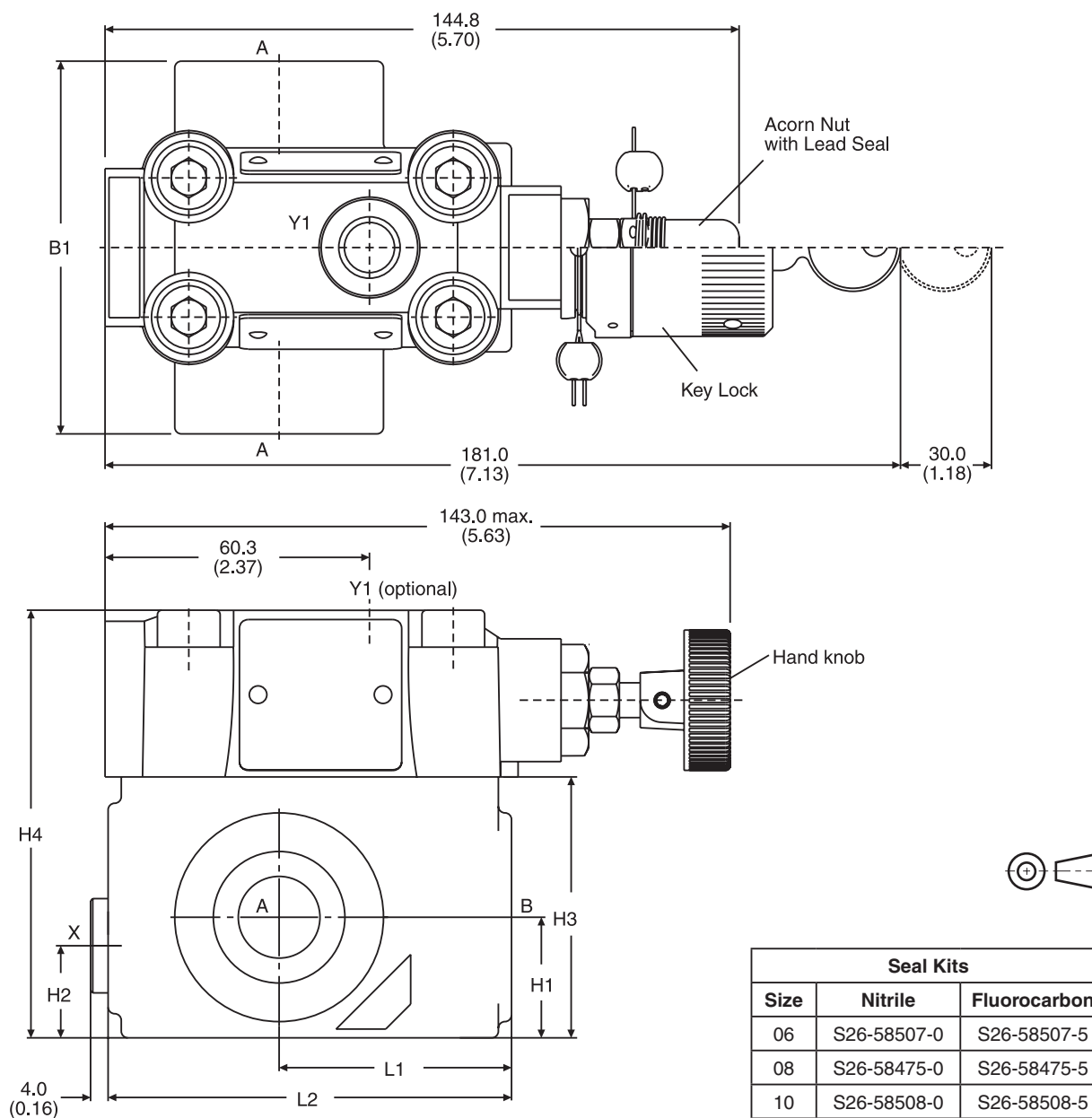
General				
Size	T-Body		L-Body	
	03 (SAE 8)	06 (SAE 16)	06 (SAE 12)	10 (SAE 20)
Mounting	Threaded Body			
Mounting Position	Unrestricted			
Ambient Temp. Range	-20°C to +50°C (-4°F to +122°F)			
Hydraulic				
Max. Operating Pressure	Ports A and X up to 350 Bar (5075 PSI); Ports B and Y 30 Bar (435 PSI)			
Pressure Ranges	105 Bar (1523 PSI), 210 Bar (3045 PSI), 350 Bar (5075 PSI)			
Nominal Flow	60 LPM (15.9 GPM)	200 LPM (52.9 GPM)	200 LPM (52.9 GPM)	450 LPM (119.0 GPM)
Fluid	Hydraulic oil as per DIN 51524 ... 51525			
Fluid Temperature	-20°C to +80°C (-4°F to +176°F)			
Viscosity	10 to 650 cSt / mm²/s (46 to 3013 SSU 30 cSt / mm²/s (139 SSU))			
Permitted Recommended				
Filtration	ISO Class 4406 (1999) 18/16/13 (acc. NAS 1638: 7)			

R4V with Vent Function

General						
Size	T-Body			L-Body		
	03 (SAE 8)	06 (SAE 16)		06 (SAE 12)	10 (SAE 20)	
Mounting	Threaded Body					
Mounting Position	Unrestricted					
Ambient Temp. Range	-20°C to +50°C (-4°F to +122°F)					
Weight	3.2 kg (7.0 lbs)	6.6 kg (14.5 lbs)		3.3 kg (7.3 lbs)	5.6 kg (12.3 lbs)	
Electrical (Solenoid)						
Duty Ratio	100%					
Response Time	Energized / De-energized AC: 20/18ms, DC: 46/27 ms					
	Code	G0R	G0Q	GAR	GAG	W30 W31
Supply Voltage		12V	24V	98V	205V	110V at 50Hz 120V at 60Hz 220V at 50Hz 240V at 60Hz
Tolerance Supply Voltage		+5 to -10	+5 to -10	+5 to -10	+5 to -10	±5 ±5
Power Consumption	Hold	31W	31W	31W	31W	78W 78W
	In Rush	31W	31W	31W	31W	264W 264W
Maximum Switching Frequency	AC up to 7,200 switchings per hour DC up to 16,000 switchings per hour					
Solenoid Connection	Connector as per EN175301-803					
Protection Class	IP65 in accordance with EN60529 (plugged and mounted)					
Coil Insulation Class	H (180°C) (356°F)					

T-Body

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



Size	Body	B1	B2	B3	B4	H1	H2	H3	H4	H5	H6	H7	H8	L1	L2	L3
03	T-body	85.0 (3.35)	–	–	–	27.5 (1.08)	21.0 (0.83)	59.5 (2.34)	97.5 (3.84)	–	–	–	–	53.0 (2.09)	92.0 (3.62)	–
06	T-body	136.0 (5.35)	–	–	–	38.0 (1.50)	28.0 (1.10)	93.0 (3.66)	131.0 (5.16)	–	–	–	–	66.5 (2.62)	117.5 (4.63)	–

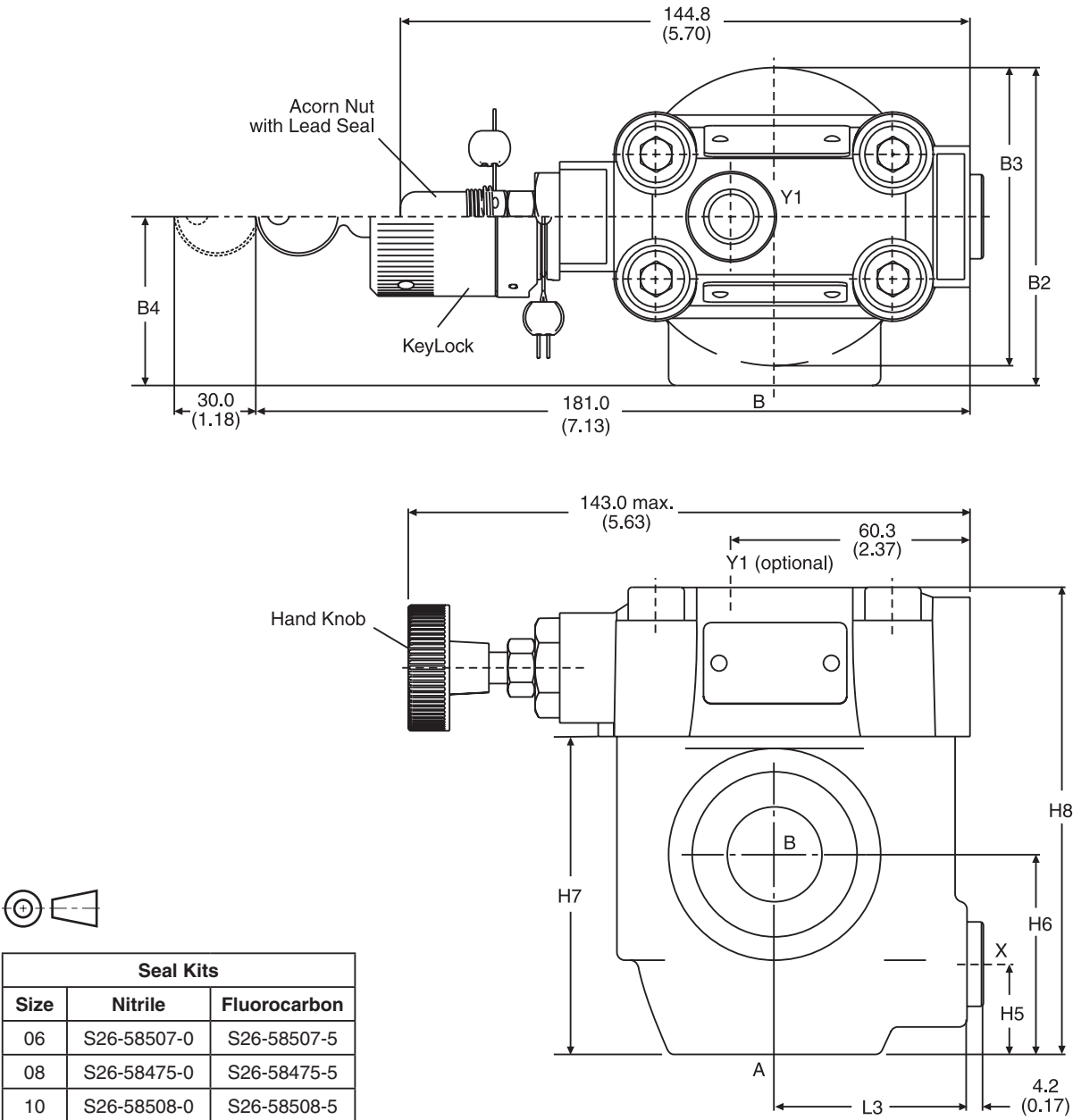
Ports	Function	Port size	
		R4V03 T-body	R4V06 T-body
A	Pressure (inlet)	SAE 8	SAE 16
B	Tank (outlet)	SAE 8	SAE 16
X ¹⁾	Ext. Remote Control or Vent Connection	SAE 4	
Y1 ²⁾	External Drain		

1) closed when supplied

²⁾ port Y1 is only available at drain line (code 2) external from the pilot head

L-Body

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



Seal Kits		
Size	Nitrile	Fluorocarbon
06	S26-58507-0	S26-58507-5
08	S26-58475-0	S26-58475-5
10	S26-58508-0	S26-58508-5

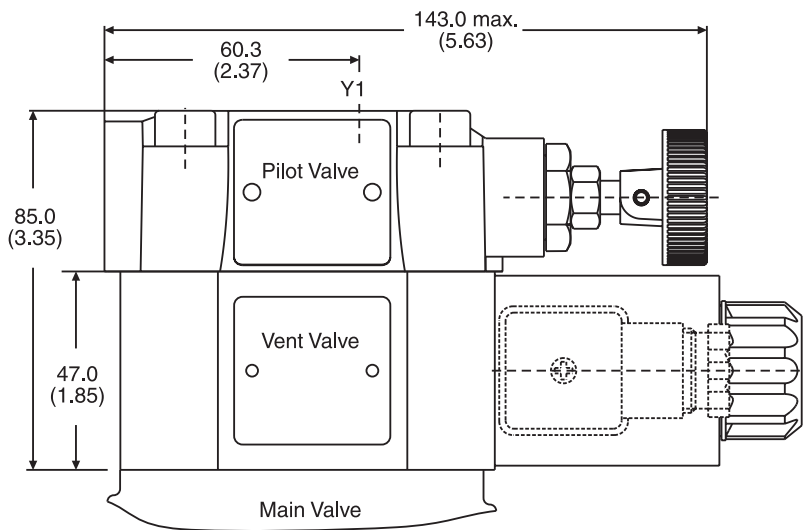
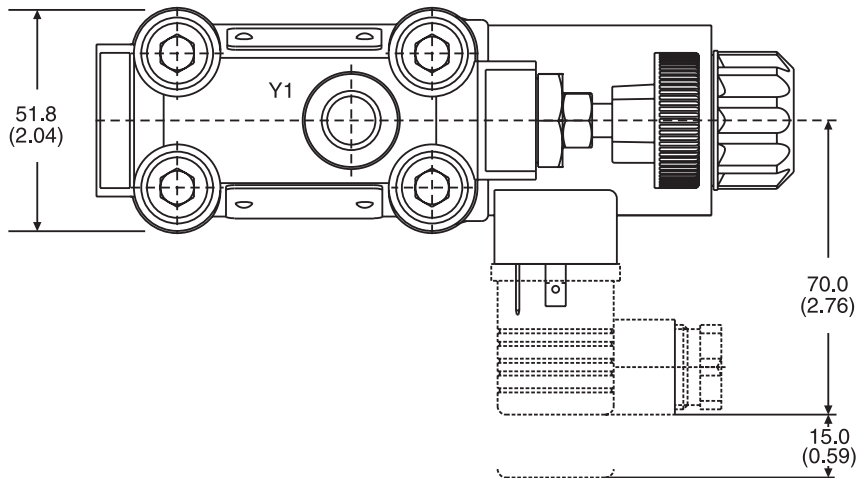
Size	Body	B1	B2	B3	B4	H1	H2	H3	H4	H5	H6	H7	H8	L1	L2	L3
06	L-body	—	81.0 (3.19)	76.0 (2.99)	43.0 (1.69)	—	—	—	—	23.0 (0.91)	51.0 (2.01)	81.0 (3.19)	119.0 (4.69)	—	—	49.0 (1.93)
10	L-body	—	120.7 (4.75)	85.8 (3.38)	77.8 (3.06)	—	—	—	—	31.8 (1.25)	50.8 (2.00)	96.0 (3.78)	134.0 (5.28)	—	—	49.8 (1.96)

Ports	Function	Port size	
		R4V06 L-body	R4V10 L-body
A	Pressure (inlet)	SAE 12	SAE 20
B	Tank (outlet)	SAE 12	SAE 20
X ¹⁾	Ext. Remote Control or Vent Connection	SAE 4	
Y1 ²⁾	External Drain		

¹⁾ closed when supplied

²⁾ port Y1 is only available at drain line (code 2) external from the pilot head

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



Vent Valve Seal Kits	
Nitrile	Fluorocarbon
DC Solenoid	
S26-58515-0	S26-58515-5
AC Solenoid	
S26-35237-0	S26-35237-5

Code	Internal Drain	External Drain
11		
09		

General Description

Series R1E02 direct operated, pressure relief valves are seated type valves typically used for remote pressure controls. In applications where the reliability and simplicity of a hydraulic remote control are preferred to an electrohydraulic system, Series R1E02 is an ideal solution.

Typically pilot operated pressure valves or compensators of variable pumps are controlled.



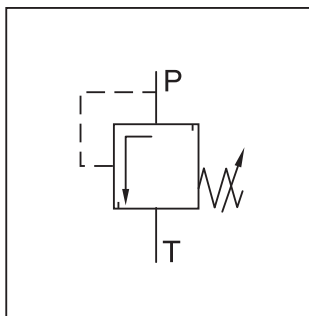
Front Panel Mounting



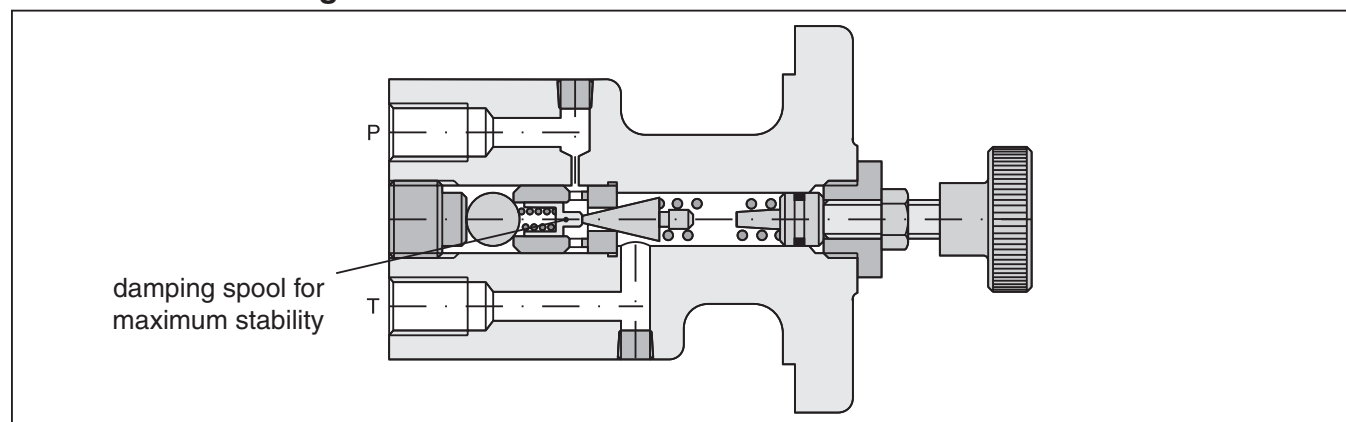
Subplate Mounting

Features

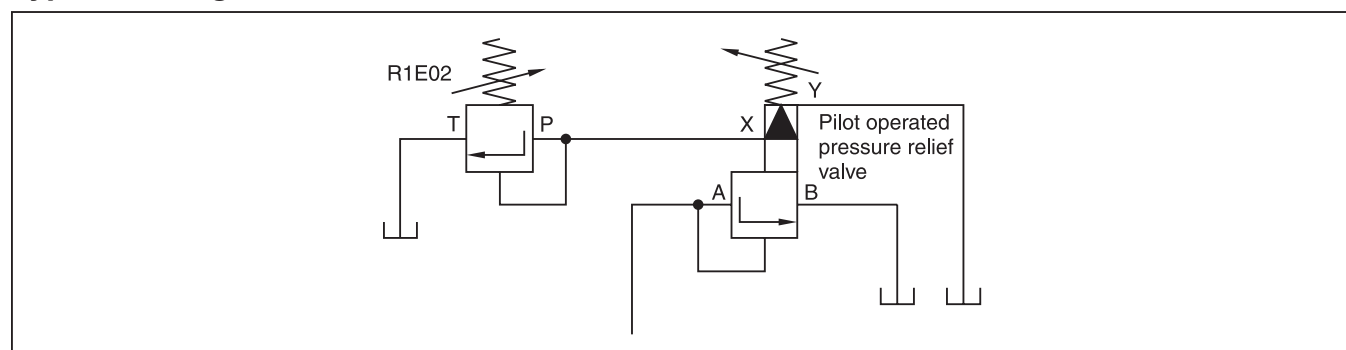
- Seated type valve
- 2 body variants:
 - front panel mounting
 - subplate mounting
- 3 pressure ranges
- 3 adjustment modes:
 - hand knobs
 - acorn nut with lead seal
 - adjusting with lock



Front Panel Mounting



Typical Configuration as Remote Pilot Valve



⚠ WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Ordering Information

R1E02 Pressure Relief Valve	Interface	Pressure Range	2 Connections G1/4"	Adjustment	A Design Series	1 Seal Nitrile	Options Check with Factory
--	---	--	--	--	--	---	--

Code	Description
2	Front Panel Mounting
3	Subplate Mounting

Code	Description
1	up to 105 Bar (1523 PSI)
3	up to 210 Bar (3045 PSI)
5	up to 350 Bar (5075 PSI)

Code	Description
1	Hand Knob Ø32mm
3	Acorn Nut with Lead Seal
4*	Adjusting Device with Lock (Key Order No. 700-70619)

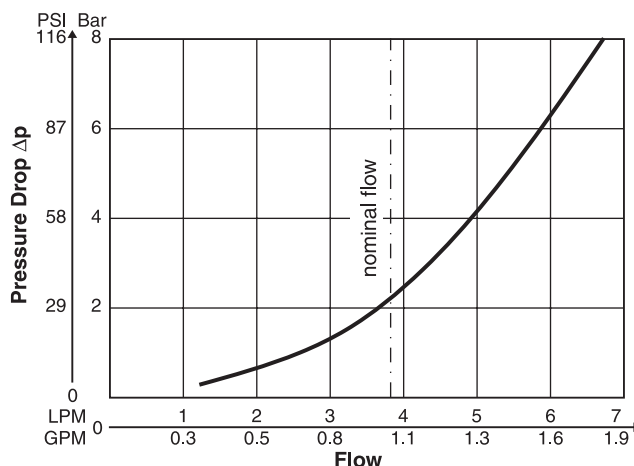
Weight: R1E022 2.1 kg (4.6 lbs.) R1E023 1.0 kg (2.2 lbs.)	Seal Kit: R1E022 S26-58466-0 R1E023 S16-91963-0	* On bodies for subplate mounting use plate S16-64188.
--	--	--

D

Specifications

General	
Size	1/4"
Interface	Front panel mounting, Subplate mounting
Mounting Position	Unrestricted
Ambient Temperature Range	-20°C to +70°C (-4°F to +158°F)
Hydraulic	
Maximum Operating Pressure	Port P 350 Bar (5075 PSI); Port T depressurized
Pressure Range	105 Bar (1523 PSI), 210 Bar (3045 PSI), 350 Bar (5075 PSI)
Fluid	Hydraulic oil as per DIN 51524 ... 51525
Fluid Temperature	-20°C to +70°C (-4°F to +158°F)
Nominal Flow	3.8 LPM (1.0 GPM)
Minimum Pressure Setting	7 Bar (102 PSI)
Viscosity	10 to 650 cSt / mm ² /s (46 to 3013 SSU)
Permitted Recommended	30 cSt / mm ² /s (139 SSU)
Filtration	ISO Class 4406 (1999) 18/16/13

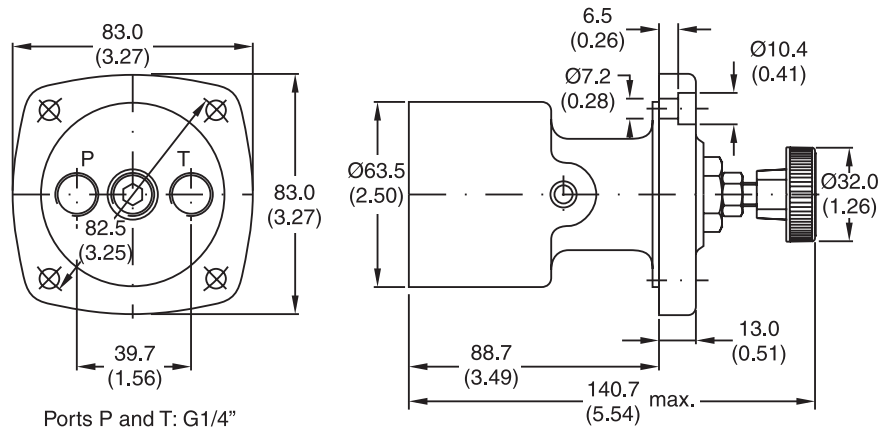
Performance Curve



Fluid viscosity 35 cSt at 50°C (122°F) $\pm$ 5°C (41°F)

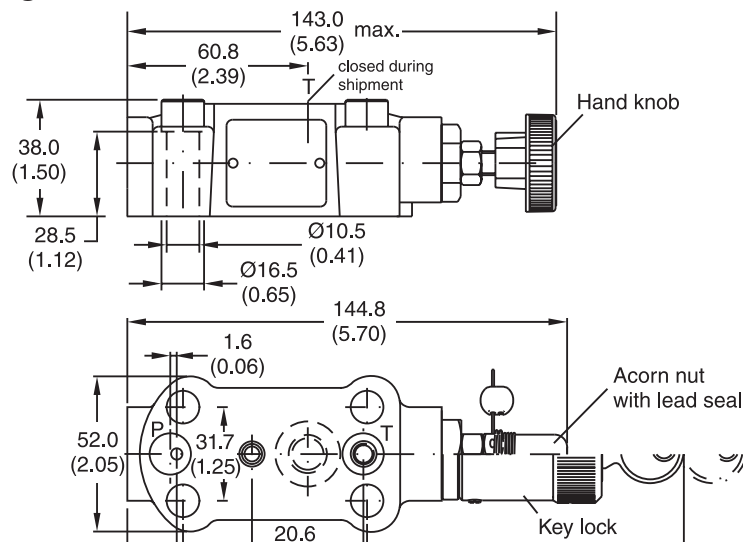
Inch equivalents for millimeter dimensions are shown in (**)

Front Panel Mounting



Subplate	Size
518-00139-0	3/8" NPT

Subplate Mounting



General Description

Pressure intensifiers are used wherever a particular section of a hydraulic system has to be pressurized to a substantially higher pressure than the available primary pressure (clamping functions). With an intensification ratio of 1 : 4 (1 : 2, 1 : 6) it enables a cost-effective system solution, especially in clamping applications, with primary pressures up to 125 bar (1813 PSI). A pilot operated check valve can be flanged underneath the pressure intensifier for quick filling and decompression of the high pressure section.

Features

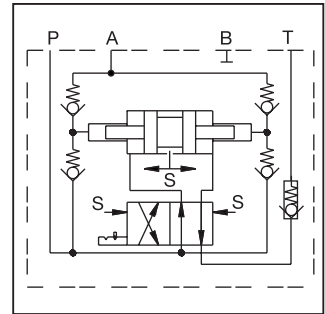
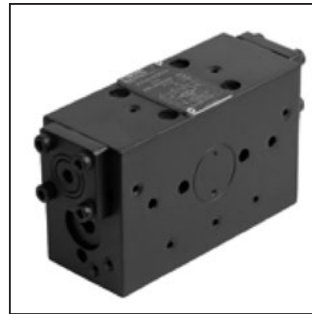
- Mounting pattern NG06, DIN 24 340 Design A, CETOP, ISO
- Check valve attachable to bottom flange
- High pressure up to 500 bar (7252 PSI)
- Volume flow formed with low pulsation
- Compact design

Design

Main functional parts of the pressure intensifier: piston, rocker mechanism, slide valve with lock, four check valves which separate the high pressure section from the low pressure section, check valve in the tank port to partition of the tank section from the primary pressure.

Function

After the high pressure section is filled with oil, (e.g., extension of a clamping cylinder), the pressure intensifier begins operation. The low pressure moves the intensifier piston because of the surface ratio and compresses the oil column in the high pressure section.



At the end of the intensifier's piston stroke, the rocker mechanism switches the directional slide valve to the crossed switching position and the intensifier piston pumps oil from the piston rod area into the high pressure section. The process repeats itself until the pressure ratio corresponding to the surface ratio has lead to a balance of force on the intensifier piston.

The pressure intensifier switches itself off and immediately on again when the high pressure (e.g., due to external leakage) begins to drop. (Pay attention to the flow characteristic.) The switching speed of the slide valve is dependent on the operating speed of the intensifier piston.

Note

- To avoid exceeding the admissible maximum pressure, a pressure relief or pressure control valve must be fitted on the primary side (pressure setting, max. 125 bar (1813 PSI) / 1 : 4, max. 250 bar (3626 PSI) / 1 : 2 or max. 83 bar (1204 PSI) / 1 : 6).
- There must be no pressure peak on the primary side when operating in the maximum pressure range.
- It is recommended to mount a 10µm filter on the primary side to ensure damage-free operation.

Ordering Information

SD	500		06	V									
Pressure Intensifier	Working Pressure 500 bar (7252 PSI) (max. pressure)	Intensification Ratio	Nominal Size (pressure intensifier) Interface DIN 24 340 Design A, CETOP, ISO	Seals	Design Series NOTE: Not required when ordering.								
		<table><tr><th>Code</th><th>Intensification Ratio</th></tr><tr><td>A</td><td>1 : 4</td></tr><tr><td>B</td><td>1 : 2</td></tr><tr><td>C</td><td>1 : 6</td></tr></table>	Code	Intensification Ratio	A	1 : 4	B	1 : 2	C	1 : 6			
Code	Intensification Ratio												
A	1 : 4												
B	1 : 2												
C	1 : 6												
			<table><tr><th>Code</th><th>Description</th></tr><tr><td>F</td><td>Fluorocarbon</td></tr></table>	Code	Description	F	Fluorocarbon						
Code	Description												
F	Fluorocarbon												

Specifications

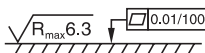
General		
Symbol		DIN 24 300
Design		Piston and poppet valve in body
Mounting Type		NG06, DIN 24 340, Design A, CETOP, ISO
Ports		Subplate
Mounting Position		Unrestricted
Ambient Temperature		-20 to +60°C (-4 to +140°F)
MTTF _D Value		150 years
Weight		3.0 kg (6.61 lbs)
Hydraulic		
Max. Operating Pressure	Port A Port P, B, T	500 bar (7252 PSI) 125 bar (1813 PSI) @ ratio 1:4, 250 bar (3626 PSI) @ ratio 1:2
Fluid		Hydraulic oil according to DIN 51524
Fluid Temperature		+10 to +70°C (+50 to +158°F)
Viscosity	Permitted Recommended	20 to 400 cSt / mm²/s (98 to 1853 SSU) 30 to 80 cSt / mm²/s (142 to 371 SSU)
Filtration		ISO 4406 (1999); 18/16/13
Flow		See performance curve
Intensificatin Ratio		P _P : P _A = 1:4, 1:2, 1:6
Flow Volume		Q _P : Q _A = 4:1, 2:1, 6:1
Stroke Volume		3 cm³ (0.18 cu. in.) per double stroke
Operating		Hydraulic-mechanic automatic control

Accessories

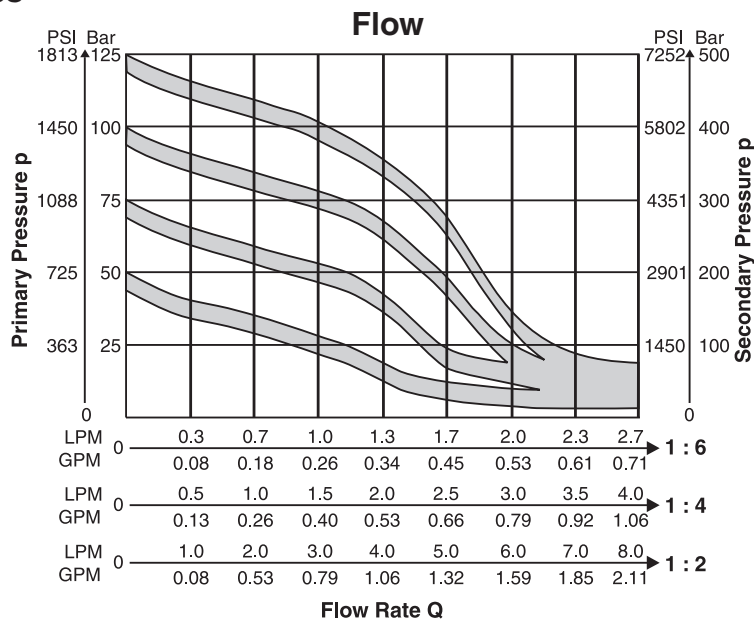
Type	Description	Number
SD 500*06V	Seals	—
	9.25 x 1.78	3
	10.82 x 1.78	1
	M5x75 ISO 4762-12.9	4

Seals are included in delivery.

Mounting screws are not included in delivery.

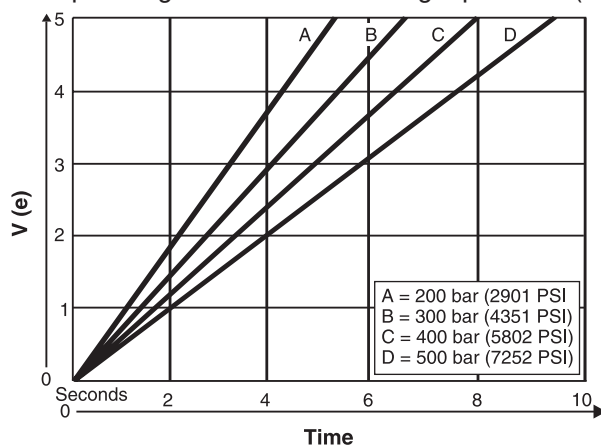
Surface Finish	 Kit		
	BK401	4 x M5x75 ISO 4762-12.9	9.0 Nm

Performance Curves



Compression

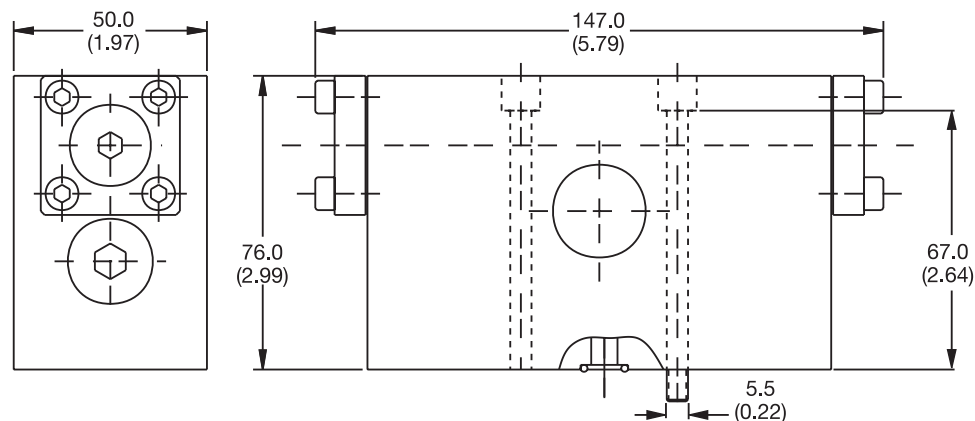
Approximate values of the compression time for compressing a filled volume to target pressure (1 : 4)



All characteristics curves measured with HLP46 at 50°C (122°F).

Dimensions

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



Pilot Operated Check Valve Plates NG06 and NG10

Description

Pilot operated check valve plates are flanged under the pressure intensifier for quick filling and decompression.

Design

The check valve plate is equipped with a hydraulic, pilot operated check valve.

Opening ratio: Main valve 2.5 : 1

Pilot ratio 10 : 1

Specifications

General		
Design	Spring loaded ball seat valve	
Mounting Type	Flange	
Mounting Position	Unrestricted	
Ambient Temp.	-20 to +60°C (-4 to +140°F)	
Hydraulic		
Max. Operating Pressure	Port A Port P, B, T	500 bar (7252 PSI) 125 bar (1813 PSI) @ ratio 1:4, 250 bar (3626 PSI) @ ratio 1:2
Fluid	Hydraulic oil according to DIN 51524	
Fluid Temperature	+10 to +70°C (+50 to +158°F)	
Viscosity	Permitted Recommended	20 to 400 cSt / mm²/s (98 to 1853 SSU) 30 to 80 cSt / mm²/s (142 to 371 SSU)
Filtration	ISO 4406 (1999); 18/16/13	
Flow	See performance curve	
Pilot Ratio	Main valve 2.5:1, pre-discharge 10:1	
Operating Pressure	Approx. 0.5 bar (7 PSI)	

Accessories

Type	Description	Qty
H06SDV	Seals	—
	9.25 x 1.78	4
	M5x115 ISO 4762-12.9	4
H10SDV	Seals	—
	12.24 x 1.78	4
	M5x75 ISO 4762-12.9	4
	M6x75 ISO 4762-12.9	4

Seals are included in delivery.

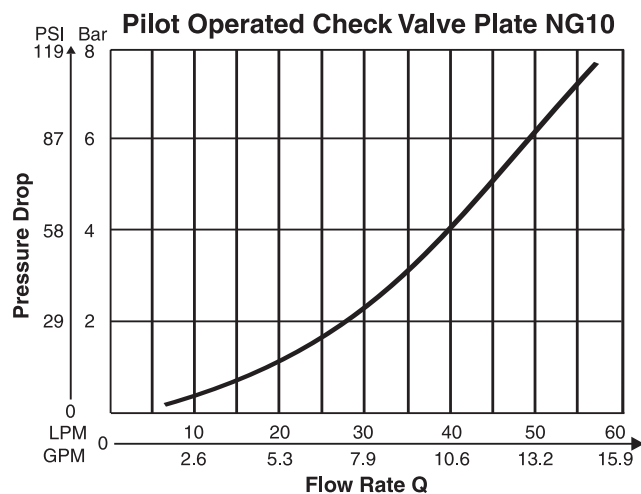
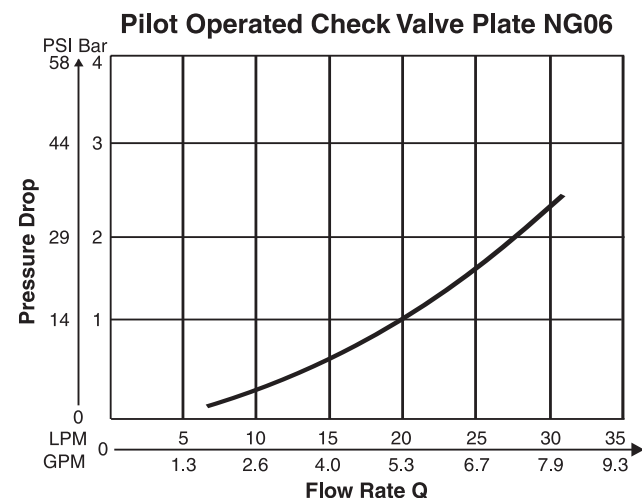
Mounting screws are not included in delivery.

Weight

NG06 1.3 kg (2.87 lbs.)

NG10 2.3 kg (5.07 lbs.)

Performance Curves



All curves measured with HLP46 at 50°C (122°F).

Ordering Information

NG06

H06 SDV

NG10

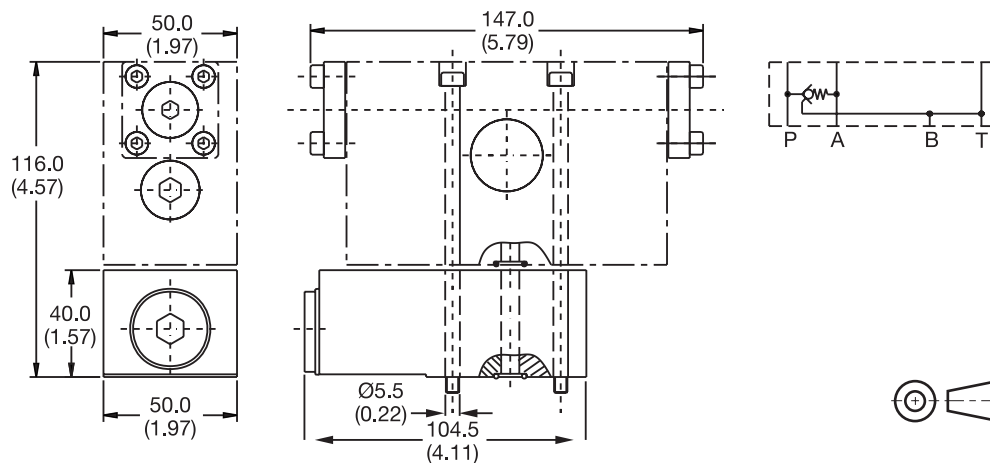
H10 SDV

Bold = Short-term availability.

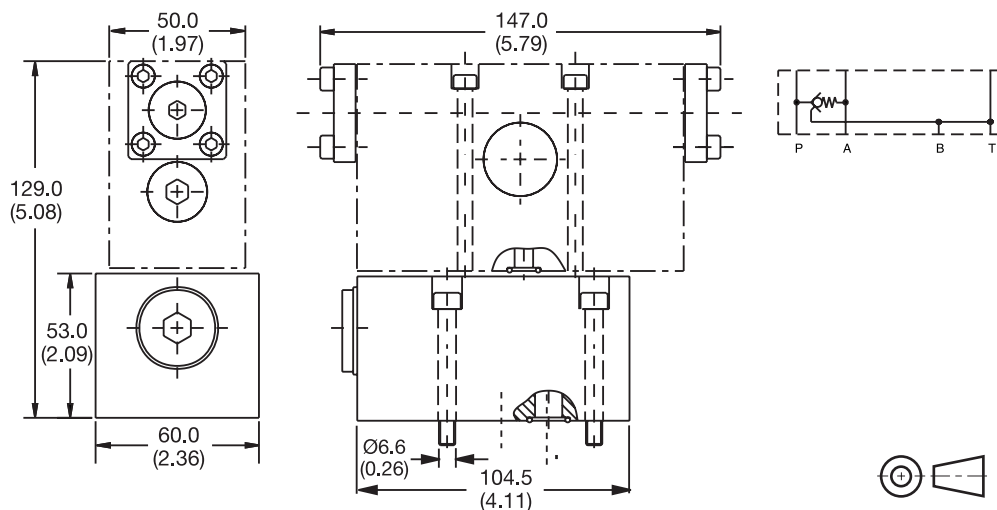
Dimensions

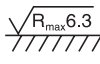
Inch equivalents for millimeter dimensions are shown in (**)

NG06



NG10



Size	Surface Finish	 Kit		
NG06	$\sqrt{R_{max} 6.3}$ 	BK406	4 x M5x115 ISO 4762-12.9	9.0 Nm
NG10	$\sqrt{R_{max} 6.3}$ 	BK490	4 x M5x75 4 x M6x50 ISO 4762-12.9	9.0 Nm 18.0 Nm

Contents

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General Description

Series 2F1C 2-way flow control valves provide pressure and viscosity compensated flow from port A to port B. The counter direction is blocked (standard) or can be open via an integral reverse flow check valve (optional).

Operation

The compensator spool is located in front of the metering spool. The metering spool is closed in the neutral position to avoid undesired initial actuator motion. The oil flow to open the metering spool has to pass a needle valve (not shown in the sectional drawing). The needle valve can be adjusted from the front panel to set the response time of the 2F1C.

The metering spool is adjusted by the main control knob. The key lock has three positions:

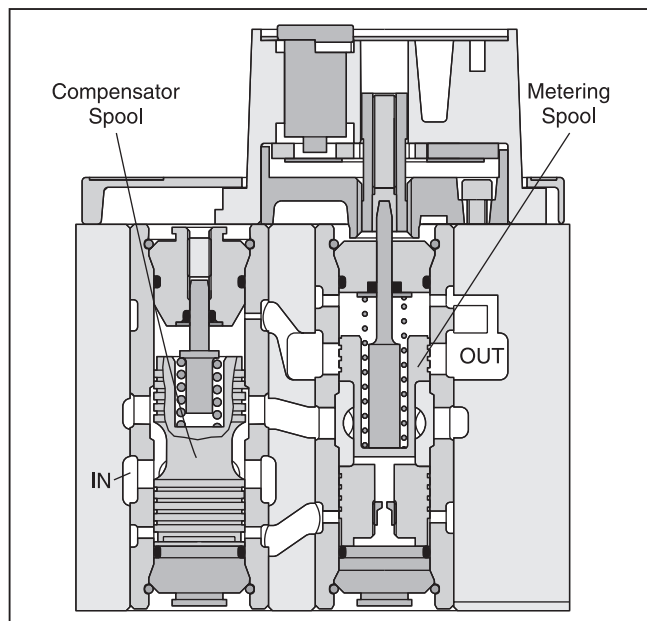
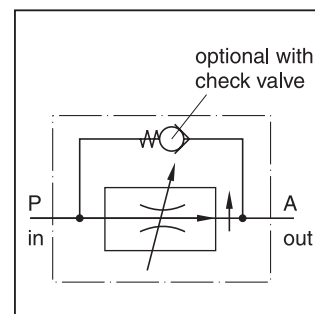
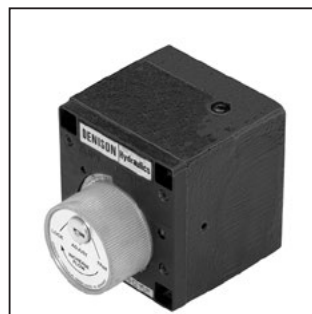
Lock: Adjustment is locked

Adjust: Full adjustment is permitted

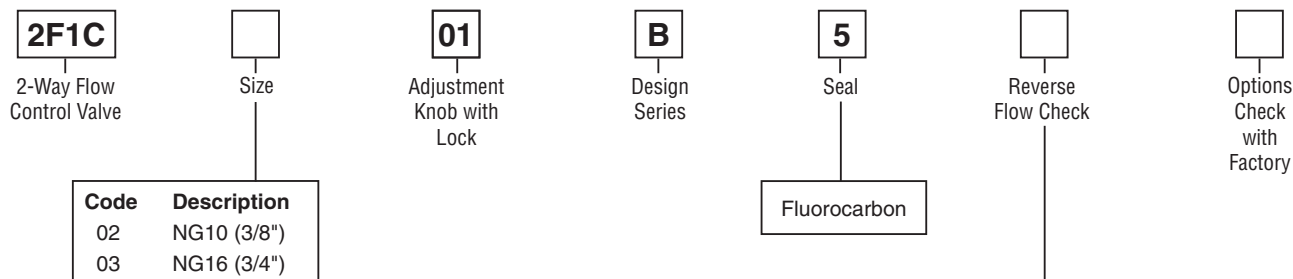
Trim: Fine adjustment of $\pm 5\%$ is possible

Features

- 2 way flow control valve
- Subplate mounting according to ISO 6263
- Excellent fine adjustment
- Adjustable response time
- Closed in neutral position
- Optional reverse flow check valve
- 2 sizes: NG10 (3/8"), NG16 (3/4")



Ordering Information



Weight:

2F1C02 6.0 kg (13.2 lbs.)

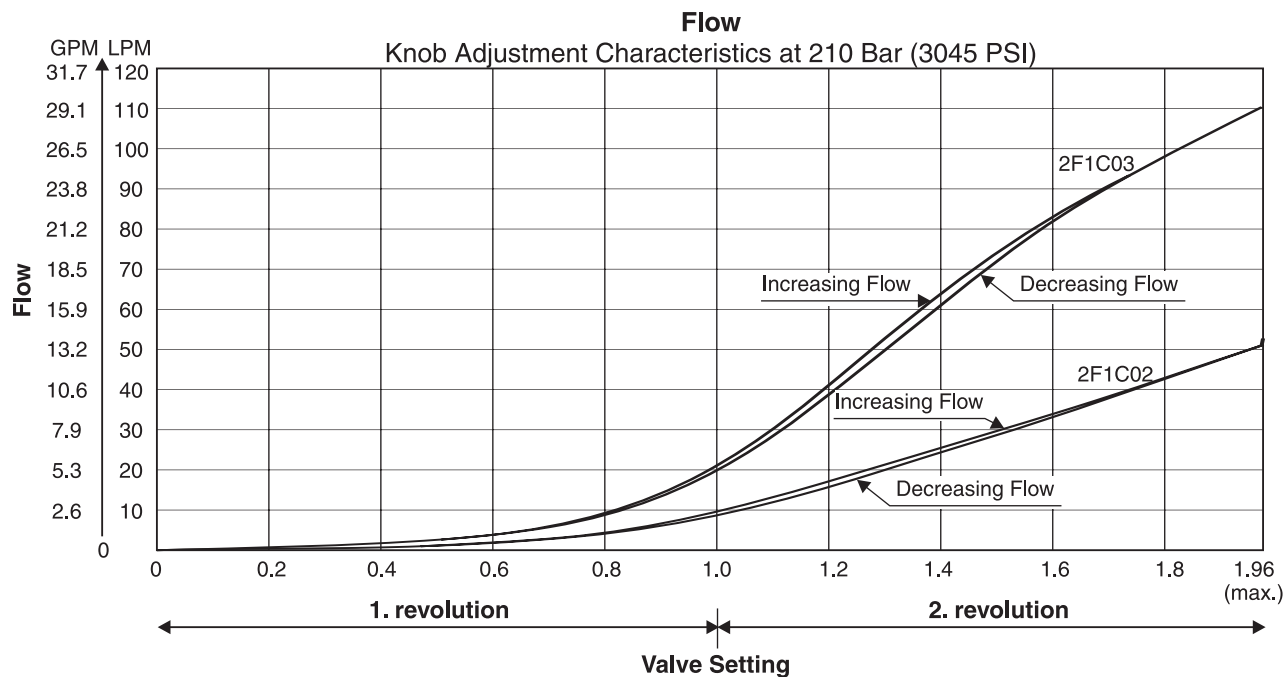
2F1C03 9.0 kg (19.8 lbs.)

WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Specifications**Pressure Compensated Flow Control Valves
Series 2F1C**

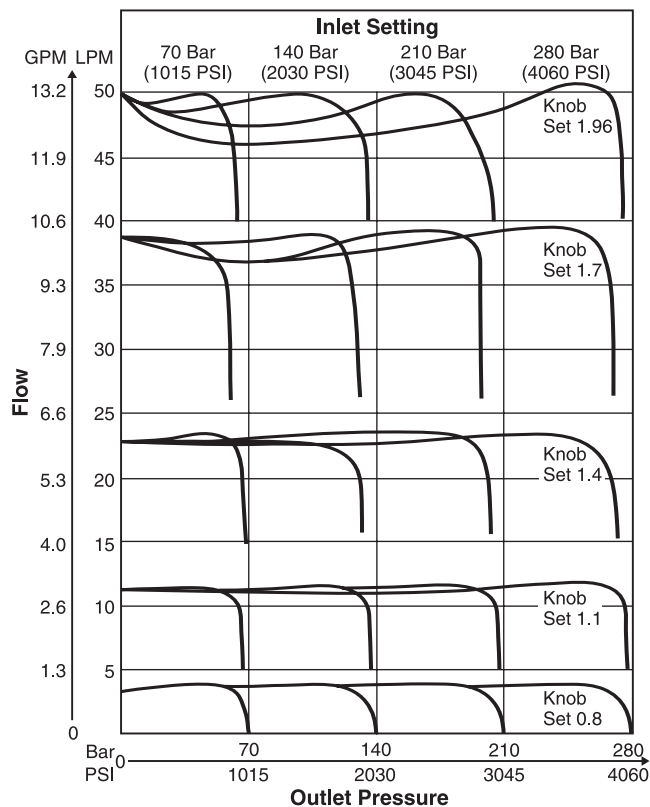
Size	NG10		NG16	
Actuator	Manual flow rate adjustment			
Mounting Type	ISO 6263			
Mounting Position	Unrestricted			
Fluid Temperature	+70°C (+158°F) Maximum			
Ambient Temperature	-25°C to +50°C (-13°F to +122°F)			
Viscosity Range	2.8 to 400 cSt / mm²/s (13 to 1854 SSU)			
Filtration	ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)			
Maximum Pressure Difference	See Diagram			
Maximum Operating Pressure	Port A	2F1C02 14 - 280 Bar (203 - 4060 PSI) 0 - 270 Bar (0 - 3915 PSI)		2F1C03 14 - 350 Bar (203 - 5075 PSI) 0 - 340 Bar (0 - 4930 PSI)
	Port B			
Flow Direction	A–B	Flow control function		
	B–A	Blocked or free flow through check valve		

E



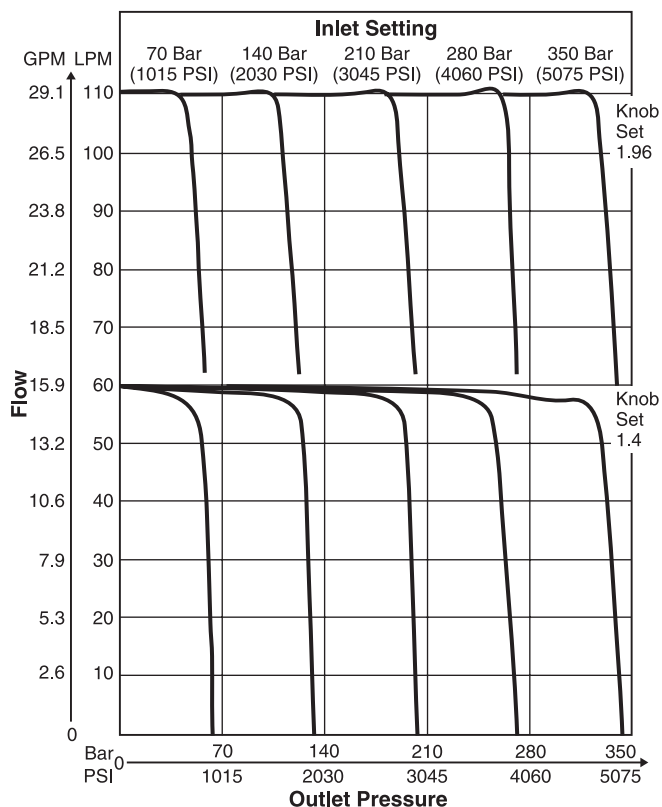
2F1C02

Flow / Pressure Drop
 Constant Inlet Pressure – Variable Outlet Pressure

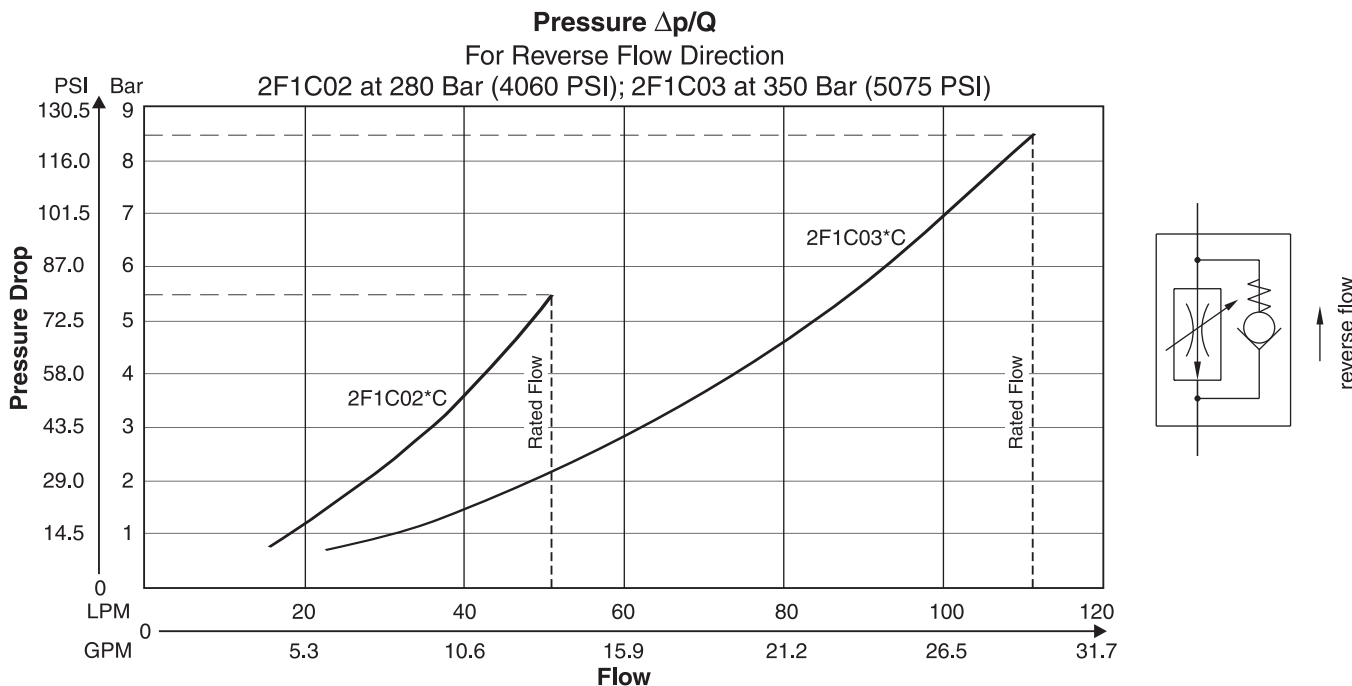


2F1C03

Flow / Pressure Drop
 Constant Inlet Pressure – Variable Outlet Pressure

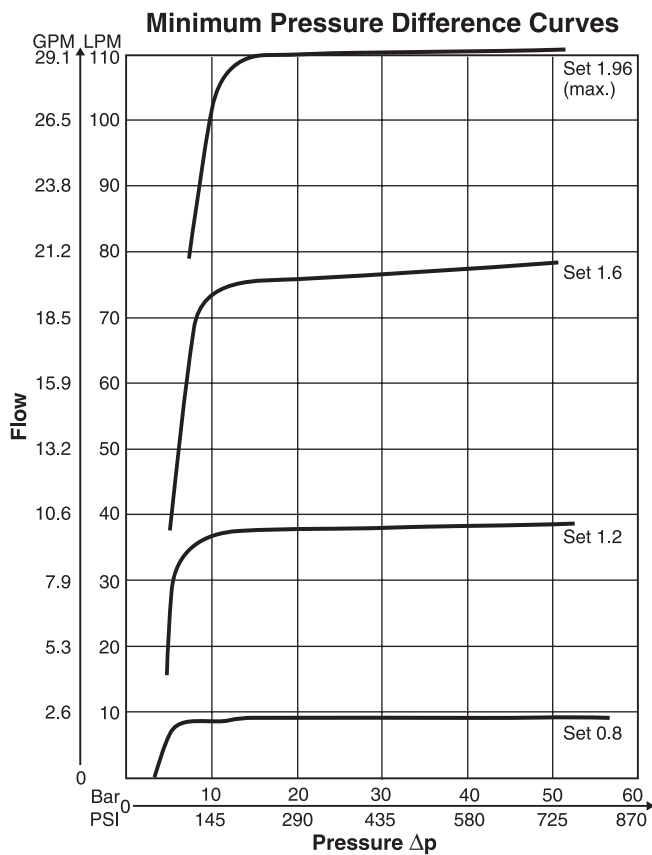
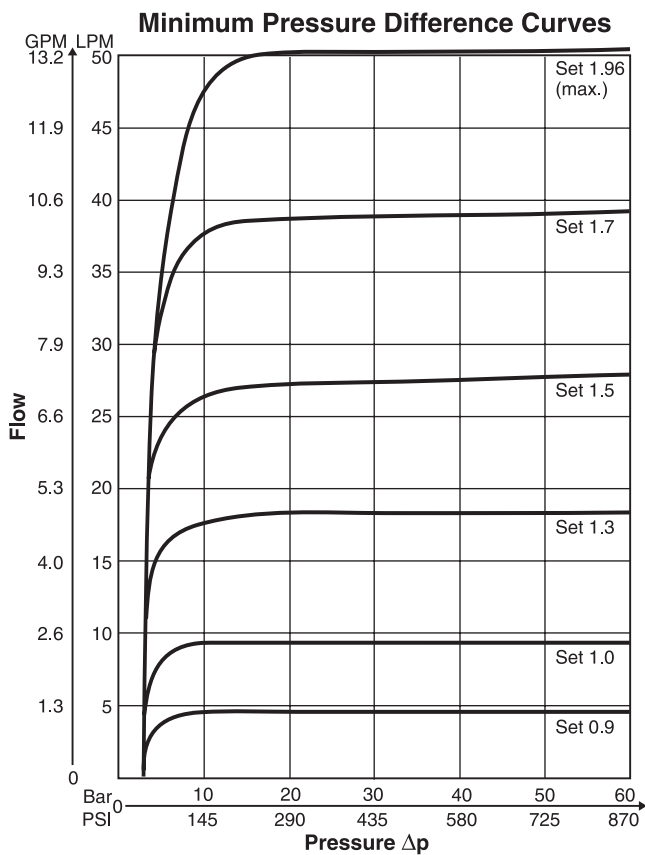


Fluid viscosity 40 cSt at 50°C (122°F)

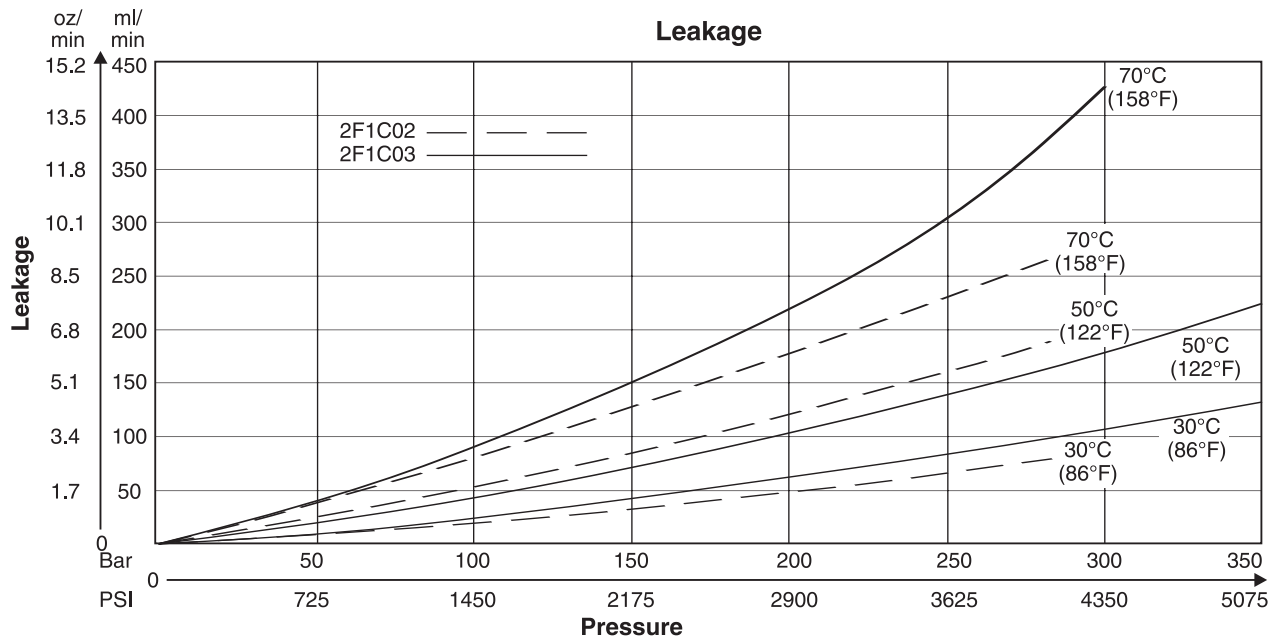


2F1C02

2F1C03



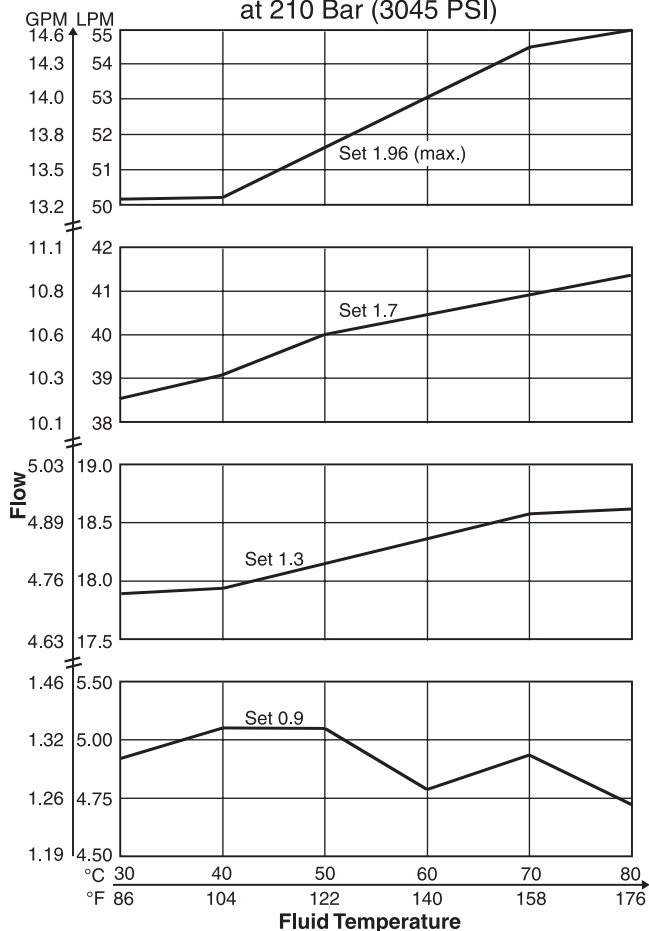
Fluid viscosity 40 cSt at 50°C (122°F)



E

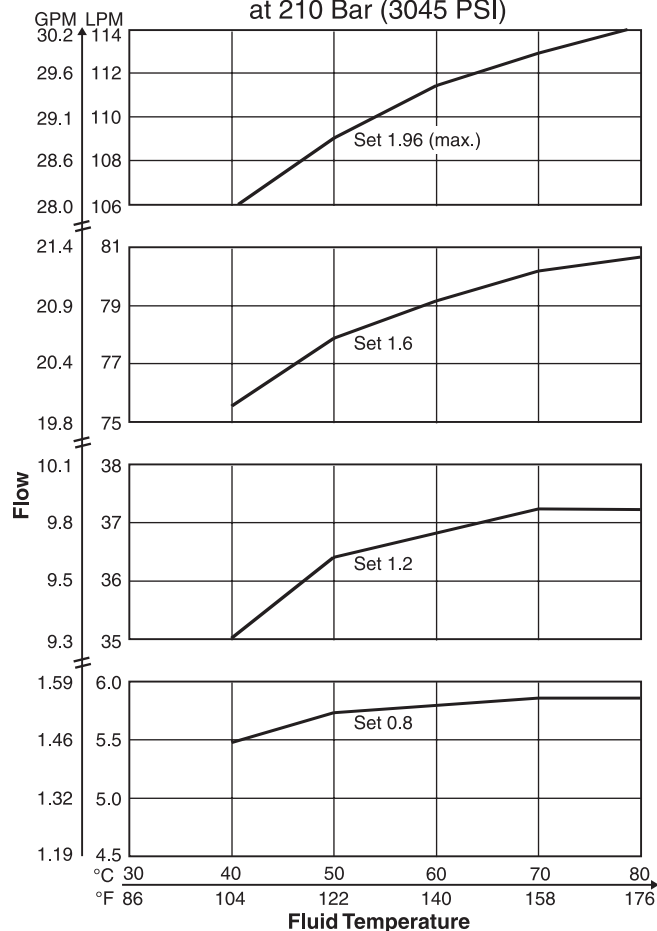
2F1C02

Flow / Temperature Curves
 at 210 Bar (3045 PSI)



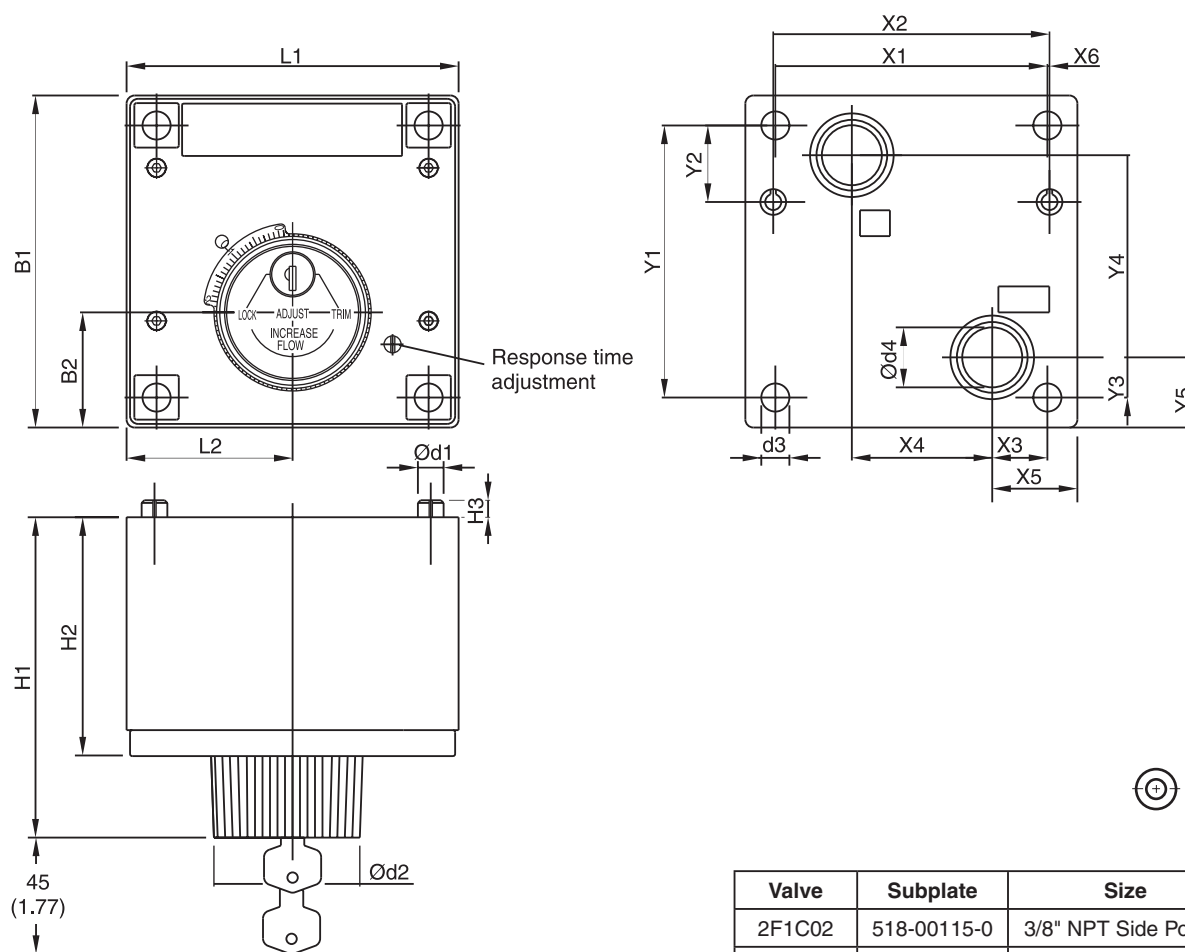
2F1C03

Flow / Temperature Curves
 at 210 Bar (3045 PSI)



Fluid viscosity 40 cSt at 50°C (122°F)

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



Valve	Subplate	Size
2F1C02	518-00115-0	3/8" NPT Side Ported
2F1C03	518-00118-0	1/2" NPT Side Ported

Size	ISO-code	x1	x2	x3	x4	x5	x6	y1	y2	y3	y4	y5
02	6263-AM-07-2-A	76.2 (3.00)	79.4 (3.13)	9.5 (0.37)	44.5 (1.75)	19.0 (0.75)	—	82.5 (3.25)	23.8 (0.94)	30.2 (1.19)	41.3 (1.63)	39.7 (1.56)
03	6263-AK-06-2-A	101.6 (4.00)	103.2 (4.06)	20.6 (0.81)	52.4 (2.06)	31.8 (1.25)	0.8 (0.03)	101.6 (4.00)	28.6 (1.13)	15.1 (0.59)	75.4 (2.97)	26.2 (1.03)

Size	ISO-code	B1	B2	H1	H2	H3	L1	L2	d1	d2	d3	d4
02	6263-AM-07-2-A	101.6 (4.00)	38.1 (1.50)	119.6 (4.71)	87.4 (3.44)	6.4 (0.25)	95.2 (3.75)	47.6 (1.87)	6.4 (0.25)	57.2 (2.25)	8.7 (0.34)	14.2 (0.56)
03	6263-AK-06-2-A	123.8 (4.87)	42.9 (1.69)	121.4 (4.78)	89.2 (3.51)	6.4 (0.25)	123.8 (4.87)	61.9 (2.44)	9.5 (0.37)	57.2 (2.25)	10.5 (0.41)	22.4 (0.88)

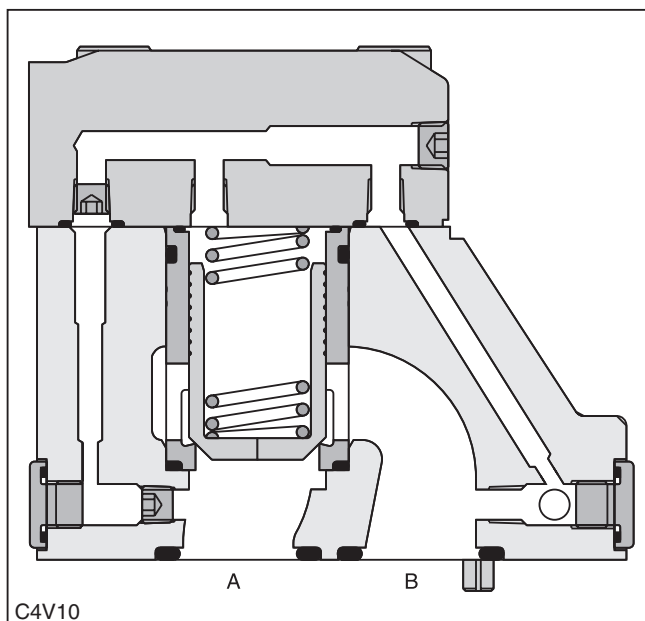
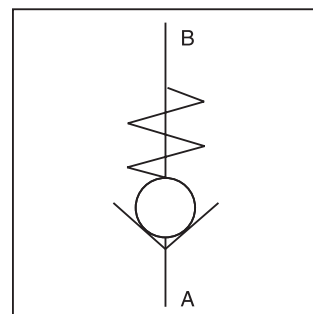
Size	ISO-Code	Bolt Kit  DIN912 12.9		Seal  Kit Fluorocarbon	Surface Finish
02	6263-AM-07-2-A	BK-700-70842-8 4xM8x100	31.8 Nm (23.5 lb.-ft.) ±15%	S26-98617-5	$\sqrt{R_{max} 6.3}$ 
03	6263-AK-06-2-A	BK395 4xM10x100	63 Nm (46.5 lb.-ft.) ±15%		

General Description

Series C4V direct operated check valves allow free flow from A to B. The counter direction is blocked. Series C4V valves are equipped with a leak-free seat type cartridge.

Operation

The pressure arising in port A lifts the poppet from the valve seat and releases the flow to B. In the counter direction, the spring and the pressure on top of the cartridge hold the poppet onto the seat and block the flow.



E

Features

- High flow, low pressure drop design
- Minimal internal leakage
- Six crack pressure options

Ordering Information

C4V		5	3	0		B		
Direct Operated Check Valve	Size	Maximum Pressure 350 Bar (5075 PSI)	Subplate Mounting		Approximate Cracking Pressure	Design Series	Seal	Options Check with Factory

Code	Description
03	NG10
06	NG25
10	NG32

Code	Description
1	Nitrile
5	Fluorocarbon

Code	Description
C4V03	
1	2.8 Bar (40.6 PSI)
2	0.5 Bar (7.3 PSI)
3	0.3 Bar (4.4 PSI)
4	2.2 Bar (31.9 PSI)
5	—
6	1.2 Bar (17.4 PSI)
7	3.0 Bar (43.5 PSI)

Code	Description
C4V06 / C4V10	
	3.5 Bar (50.8 PSI)
	0.5 Bar (7.3 PSI)
	0.3 Bar (4.4 PSI)
	2.2 Bar (31.9 PSI)
	9.0 Bar (130.5 PSI)
	1.2 Bar (17.4 PSI)
	—

Weight:

C4V03	2.8 kg (6.2 lbs.)
C4V06	4.6 kg (10.1 lbs.)
C4V10	6.1 kg (13.5 lbs.)

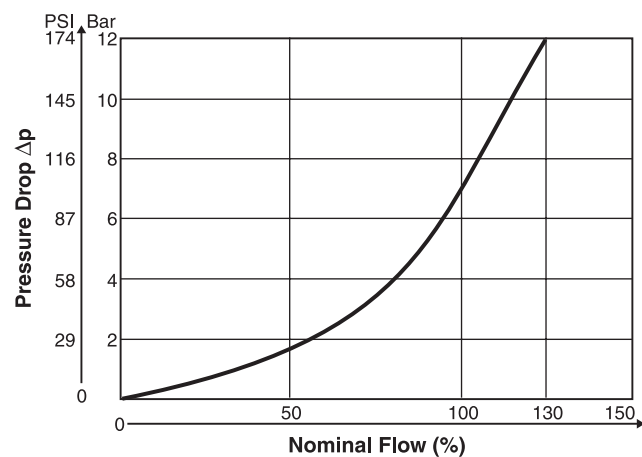
WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Specifications

General				
Size	NG10		NG25	NG32
Subplate Mounting	ISO 5781			
Mounting Position	Unrestricted			
Ambient Temperature Range	-20°C to +80°C (-4°F to +176°F)			
Hydraulic				
Maximum Operating Pressure	350 Bar (5075 PSI)			
Pressure Range	105 Bar (1523 PSI), 210 Bar (3045 PSI), 350 Bar (5075 PSI)			
Nominal Flow	150 LPM (39.7 GPM)	270 LPM (71.4 GPM)	450 LPM (119.0 GPM)	
Fluid	Hydraulic oil to DIN 51524			
Viscosity	Recommended Permitted	30 to 50 cSt / mm²/s (139 to 232 SSU) 20 to 380 cSt / mm²/s (93 to 1761 SSU)		
Fluid Temperature	Recommended Permitted	+30°C to +50°C (86°F to +122°F) -20°C to +70°C (-4°F to +158°F)		
Filtration	ISO Class 4406 (1999) 18/16/13 (meet NAS 1638:7)			

E

Performance Curve

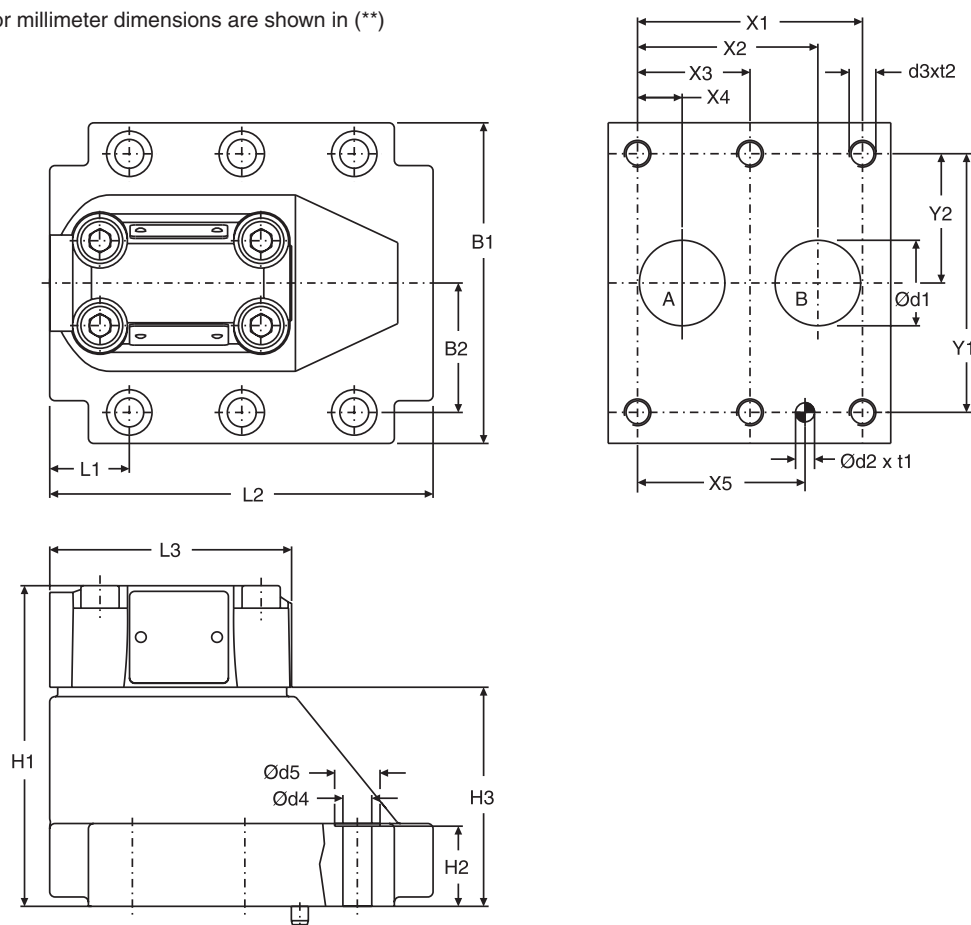


Dimensions

Check Valves

Series C4V (Direct Operated)

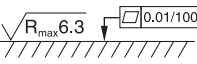
Inch equivalents for millimeter dimensions are shown in (**)



NG	ISO-code	x1	x2	x3	x4	x5	y1	y2	B1	B2	H1	H2	H3	L1	L2
10	5781-06-07-0-00	42.9 (1.69)	35.8 (1.41)	—	7.2 (0.28)	31.8 (1.25)	66.7 (2.63)	33.4 (1.31)	87.3 (3.44)	33.4 (1.31)	83.0 (3.27)	21.0 (0.83)	45.0 (1.77)	29.0 (1.14)	94.8 (3.73)
25	5781-08-10-0-00	60.3 (2.37)	49.2 (1.94)	—	11.1 (0.44)	44.5 (1.75)	79.4 (3.13)	39.7 (1.56)	105.0 (4.13)	39.7 (1.56)	109.5 (4.31)	29.0 (1.14)	71.5 (2.81)	34.7 (1.37)	126.8 (4.99)
32	5781-10-13-0-00	84.2 (3.31)	67.5 (2.66)	42.1 (1.66)	16.7 (0.66)	62.7 (2.47)	96.8 (3.81)	48.4 (1.91)	120.0 (4.72)	48.4 (1.91)	120.0 (4.72)	29.0 (1.14)	82.0 (3.23)	30.6 (1.20)	144.3 (5.68)

Tolerance for all dimensions ± 0.2 mm (0.01 inches)

NG	ISO-code	d1max	d2	t1	d3	t2	d4	d5
10	5781-06-07-0-00	15.0 (0.59)	7.1 (0.28)	8.0 (0.31)	M10	16.0 (0.63)	10.8 (0.43)	17.0 (0.67)
25	5781-08-10-0-00	23.4 (0.92)	7.1 (0.28)	8.0 (0.31)	M10	18.0 (0.71)	10.8 (0.43)	17.0 (0.67)
32	5781-10-13-0-00	32.0 (1.26)	7.1 (0.28)	8.0 (0.31)	M10	20.0 (0.79)	10.8 (0.43)	17.0 (0.67)

NG	ISO-code	Bolt Kit			Seal  Kit		Surface finish
					Nitrile	Fluorocarbon	
10	5781-06-07-0-00	BK505	4xM10 x 35 DIN 912 12.9	68 Nm (50.2 lb-ft) ±15%	S16-39362-0	S16-39362-5	
25	5781-08-10-0-00	BK485	4xM10 x 45 DIN 912 12.9	68 Nm (50.2 lb-ft) ±15%	S16-39364-0	S16-39364-5	
32	5781-10-13-0-00	BK506	6xM10 x 45 DIN 912 12.9	68 Nm (50.2 lb-ft) ±15%	S16-39366-0	S16-39366-5	

General Description

Series C4V hydraulically pilot operated check valves allow free flow from A to B. The counter-flow direction is blocked.

When pressure is applied to control port X, the ring chamber flow from B to A is released.

Up to four different pilot control ratios are available (see Ordering Information).

Check valves allow free flow from A to B. The counter direction is blocked. The C4V series are equipped with a leak-free seat type cartridge.

Operation

When no pressure is applied to the X-port, the flow from B to A is blocked, because the pressure in B is also in effect on top of the poppet.

Pressurizing the X port relieves the area on top of the poppet to the drain port and allows flow from B to A.

The seat design of the C4V valve series provides leak-free separation of port A and B in the closed position.

Features

- High flow, low pressure drop design
- Minimal internal leakage

Ordering Information

C4V

Pilot Operated
Check Valve

Size

Size

5

Maximum
Pressure
350 Bar
(5075 PSI)

9

Y1 Port
G1/4"

Opening Ratio

Opening Ratio

Approximate Cracking Pressure

Approximate
Cracking
Pressure

B

Design
Series

Seal

Seal

Options Check with Factory

Options
Check
with
Factory

Code Description

03	NG10
06	NG25
10	NG32

Code Description

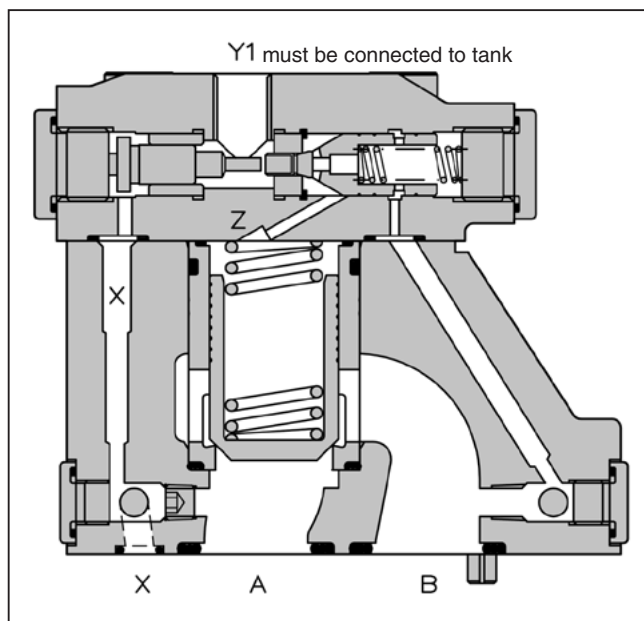
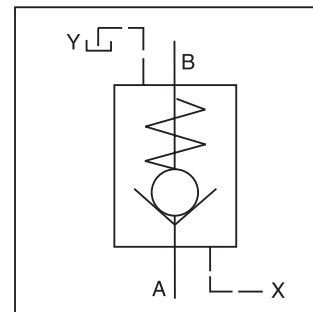
1	1:1
3	3:1
8	8:1
9	10:1

Code Description

1	Nitrile
5	Fluorocarbon

Weight:

C4V03	2.8 kg (6.2 lbs)
C4V06	4.6 kg (10.1 lbs.)
C4V10	6.1 kg (13.5 lbs.)



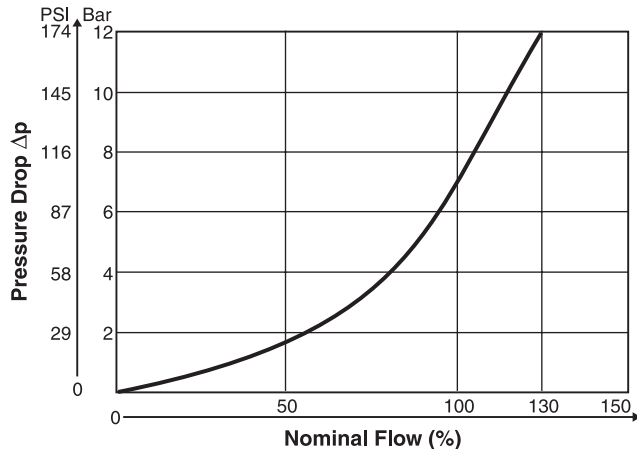
Code	Description	Flow A to B	Flow A to B
		C4V03	C4V06 / C4V10
2	1.0 Bar (14.5 PSI)	1.0 Bar (14.5 PSI)	1.0 Bar (14.5 PSI)
4	4.0 Bar (58.0 PSI)	3.5 Bar (50.8 PSI)	3.5 Bar (50.8 PSI)
6	2.0 Bar (29.0 PSI)	2.2 Bar (31.9 PSI)	2.2 Bar (31.9 PSI)
		Flow B to A	Flow B to A
		C4V03	C4V06 / C4V10
2	1.5 Bar (21.8 PSI)	1.7 Bar (24.7 PSI)	1.7 Bar (24.7 PSI)
4	5.5 Bar (79.8 PSI)	6.0 Bar (87.0 PSI)	6.0 Bar (87.0 PSI)
6	3.0 Bar (43.5 PSI)	3.8 Bar (55.1 PSI)	3.8 Bar (55.1 PSI)

Specifications

General				
Size	NG10		NG25	NG32
Subplate Mounting	ISO 5781			
Mounting Position	Unrestricted			
Ambient Temperature Range	-20°C to +80°C (-4°F to +176°F)			
Hydraulic				
Maximum Operating Pressure	350 Bar (5075 PSI)			
Nominal Flow	150 LPM (39.7 GPM)	270 LPM (71.4 GPM)	450 LPM (119.0 GPM)	
Fluid	Hydraulic oil to DIN 51524			
Viscosity	Recommended Permitted	30 to 50 cSt / mm²/s (139 to 232 SSU) 20 to 380 cSt / mm²/s (93 to 1761 SSU)		
Fluid Temperature	Recommended Permitted	+30C° to +50°C (86°F to +122°F) -20°C to +70°C (-4°F to +158°F)		
Filtration	ISO Class 4406 (1999) 18/16/13 (meet NAS 1638:7)			

E

Performance Curve

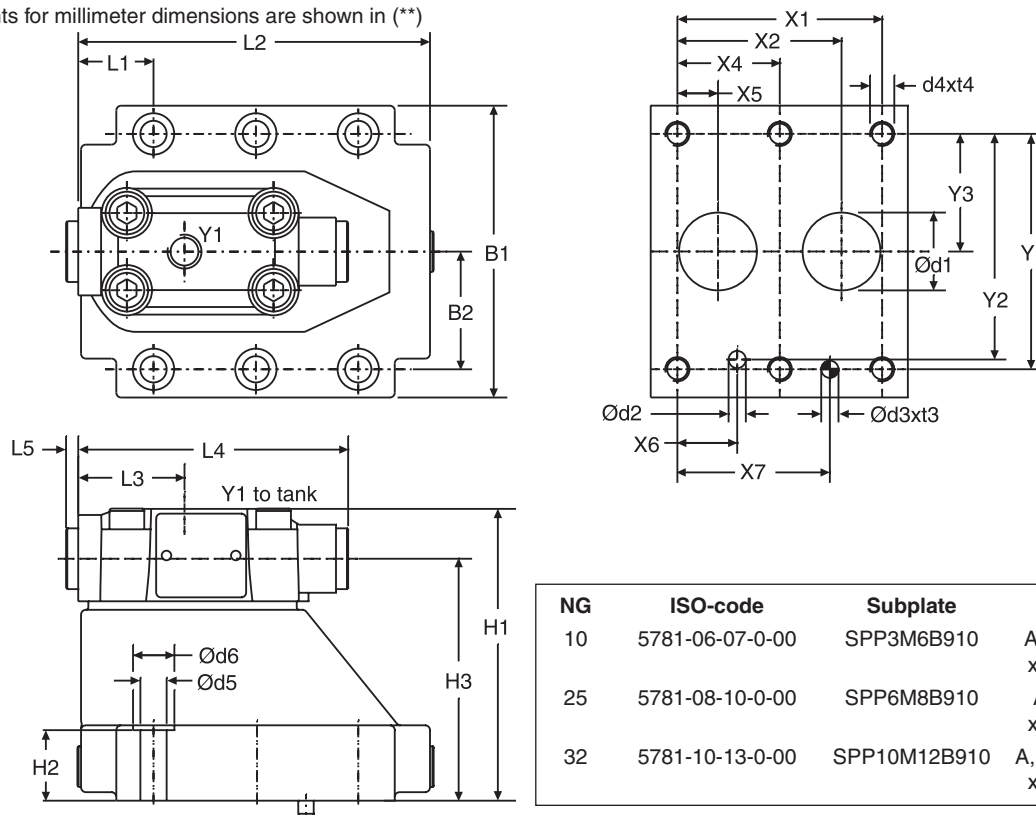


Dimensions

Check Valves

Series C4V (Pilot Operated)

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



NG	ISO-code	Subplate	Size
10	5781-06-07-0-00	SPP3M6B910	A, B = 3/4" BSPP x, y = 1/4" BSPP
25	5781-08-10-0-00	SPP6M8B910	A, B = 1" BSPP x, y = 1/4" BSPP
32	5781-10-13-0-00	SPP10M12B910	A, B = 1 1/2" BSPP x, y = 1/4" BSPP

NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	5781-06-07-0-00	42.9 (1.69)	35.8 (1.41)	—	—	7.2 (0.28)	21.5 (0.85)	31.8 (1.25)	66.7 (2.63)	58.8 (2.31)	33.4 (1.31)	—	—	—
25	5781-08-10-0-00	60.3 (2.37)	49.2 (1.94)	—	—	11.1 (0.44)	20.6 (0.81)	44.5 (1.75)	79.4 (3.13)	73.0 (2.87)	39.7 (1.56)	—	—	—
32	5781-10-13-0-00	84.2 (3.31)	67.5 (2.66)	—	42.1 (1.66)	16.7 (0.66)	24.6 (0.97)	62.7 (2.47)	96.8 (3.81)	92.8 (3.65)	48.4 (1.91)	—	—	—

Tolerance for all dimensions ±0.2 mm (0.01 inches)

NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
10	5781-06-07-0-00	87.3 (3.44)	33.4 (1.31)	83.0 (3.27)	21.0 (0.83)	62.5 (2.46)	—	—	—	29.4 (1.16)	95.2 (3.75)	43.7 (1.72)	111.0 (4.37)	5.0 (0.20)	—
25	5781-08-10-0-00	105 (4.13)	39.7 (1.56)	109.5 (4.31)	29.0 (1.14)	89.0 (3.50)	—	—	—	35.1 (1.38)	127.2 (5.01)	43.7 (1.72)	111.0 (4.37)	5.0 (0.20)	—
32	5781-10-13-0-00	120 (4.72)	48.4 (1.91)	120.0 (4.72)	29.0 (1.14)	99.5 (3.92)	—	—	—	31.0 (1.22)	144.7 (5.70)	43.7 (1.72)	111.0 (4.37)	5.0 (0.20)	—

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6
10	5781-06-07-0-00	15.0 (0.59)	7.0 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	16.0 (0.63)	10.8 (0.43)	17.0 (0.67)
25	5781-08-10-0-00	23.4 (0.92)	7.1 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	18.0 (0.71)	10.8 (0.43)	17.0 (0.67)
32	5781-10-13-0-00	32.0 (1.26)	7.1 (0.28)	7.1 (0.28)	8.0 (0.31)	M10	20.0 (0.79)	10.8 (0.43)	17.0 (0.67)

NG	ISO-code	Bolt Kit	Seal Kit	Surface finish
10	5781-06-07-0-00	BK505	4xM10 x 35 DIN 912 12.9	68 Nm (50.2 lb-ft) ±15%
25	5781-08-10-0-00	BK485	4xM10 x 45 DIN 912 12.9	68 Nm (50.2 lb-ft) ±15%
32	5781-10-13-0-00	BK506	6xM10 x 45 DIN 912 12.9	68 Nm (50.2 lb-ft) ±15%

General Description

Series C5V direct operated check valves provide free flow in one direction and block the flow in the counter direction.

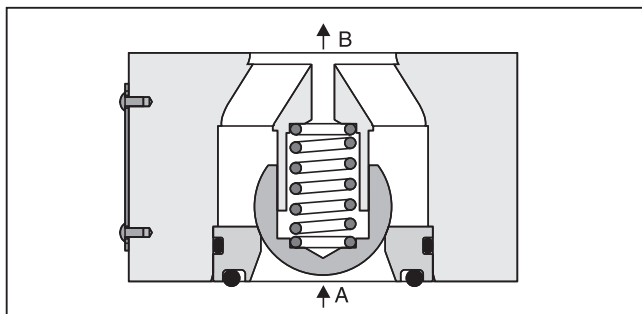
The SAE flanges allow to mount the C5V directly on the pressure port of pumps for protection against pressure shocks from the system.

Operation

The ball is held on its seat by a spring under zero pressure condition. When flow is increased to the cracking pressure, free flow is allowed from port A to port B. Blocked flow is created when operating pressure and spring on Port B exceed pressure on port A.

Features

- Direct operated check valve
- SAE 61 and SAE 62 flanges
- 4 sizes (SAE 3/4", 1", 1 1/4", 1 1/2")
- 3 springs
- 2 different seal configurations



Ordering Information

C5V

Direct Operated Check Valve

Size

Code	Description
06	SAE 3/4"
08	SAE 1"
10	SAE 1 1/4"
12	SAE 1 1/2"

Flange

Code	Description
3	SAE 61
6	SAE 62

Body Sealing

Code	Description
1	Sealing for Port A
2*	Sealing for Ports A and X
3	Without Sealing

* For combination with R5U Unloading Valve (SAE 61 only).

Cracking Pressure

Code	Description
0	0.5 Bar (7 PSI)
1	1.0 Bar (15 PSI)
2	2.0 Bar (29 PSI)

B

Design Series

Seal

Code	Description
1	Nitrile
5	Fluorocarbon

Options

Code	Description
Omit	Standard
019*	C5V10 for M14 Mounting Screws

* For SAE 62 only.

Weight:

C5V06

0.6 kg (1.3 lbs.)

C5V08

0.9 kg (2.0 lbs.)

C5V10

1.3 kg (2.9 lbs.)

C5V12

1.8 kg (4.0 lbs.)

Weight:

C5V06	0.6 kg (1.3 lbs.)
C5V08	0.9 kg (2.0 lbs.)
C5V10	1.3 kg (2.9 lbs.)
C5V12	1.8 kg (4.0 lbs.)

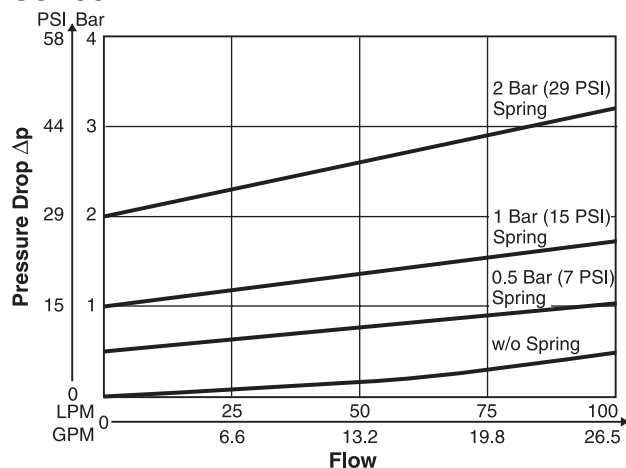
WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Specifications

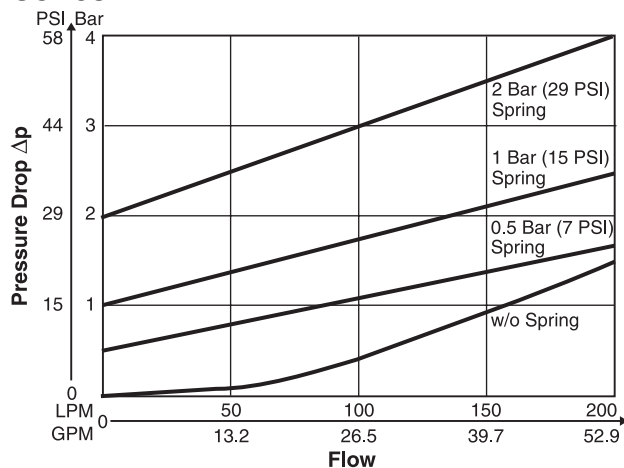
General				
Size	06 (3/4")	08 (1")	10 (1 1/4")	12 (1 1/2")
Mounting	2-port in-line flange SAE 61 and SAE 62			
Mounting Position	Unrestricted			
Ambient Temperature	-20°C to +50°C (-4°F to +122°F)			
Hydraulic				
Maximum Operating Pressure				
SAE 61 SAE 62	350 Bar (5075 PSI) 420 Bar (6090 PSI)	350 Bar (5075 PSI) 420 Bar (6090 PSI)	280 Bar (4060 PSI) 420 Bar (6090 PSI)	210 Bar (3045 PSI) 420 Bar (6090 PSI)
Nominal Flow	100 LPM (26.5 GPM)	200 LPM (52.9 GPM)	400 LPM (105.8 GPM)	750 LPM (198.4 GPM)
Fluid	Hydraulic oil in accordance with DIN 51524...51525			
Fluid Temperature	-20°C to +80°C (-4°F to +176°F)			
Viscosity Permitted Recommended	10 to 650 cSt / mm²/s (46 to 3013 SSU) 30 cSt / mm²/s (139 SSU)			
Filtration	ISO 4406 (1999) 18/16/13 (acc. NAS 1638:7)			

Performance Curves

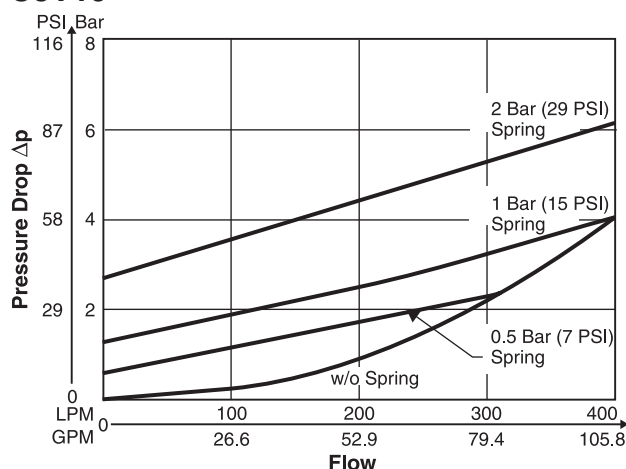
C5V06



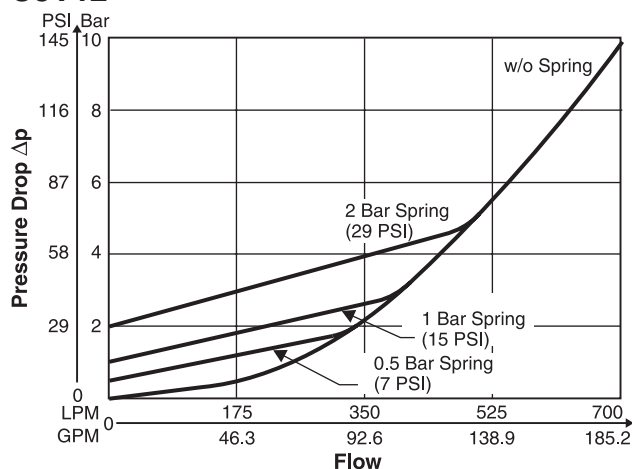
C5V08



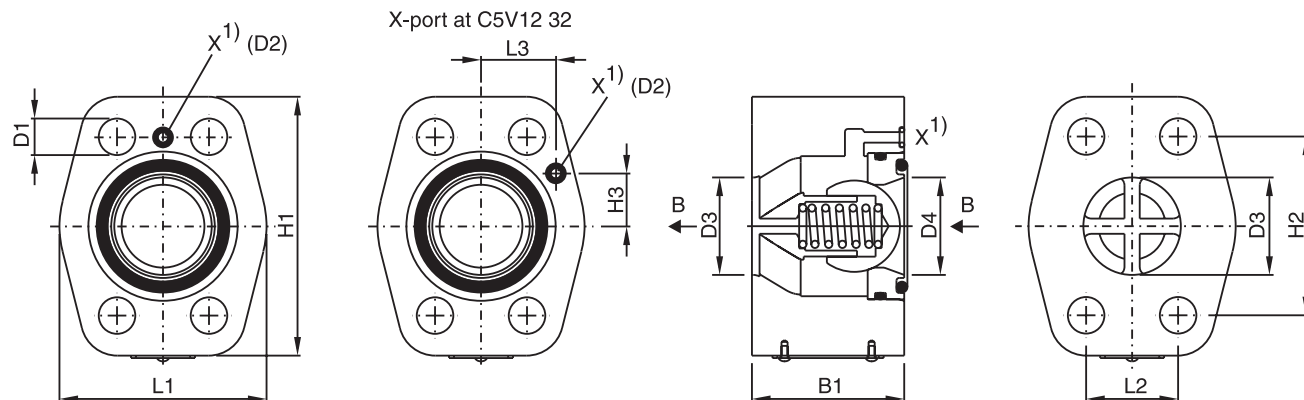
C5V10



C5V12



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



Position of O-ring seal according to ordering information

1) X1 port for C5V*32* (for use with Unloading Valve R5U)

E

Series	Nominal Size		L1	L2	L3	H1	H2	H3	B1	D1	D2	D3 + 0.8	D4
C5V06	3/4"	SAE 61	48.0 (1.89)	22.2 (0.87)	27.2 (1.07)	64.0 (2.52)	47.6 (1.87)	22.4 (0.88)	45.0 (1.77)	10.5 (0.41)	Ø3.0 (0.12)	19.0 (0.75)	19.0 (0.75)
		SAE 62	48.0 (1.89)	23.8 (0.94)	27.2 (1.07)	64.0 (2.52)	50.8 (2.00)	22.4 (0.88)	45.0 (1.77)	10.5 (0.41)	—	19.0 (0.75)	19.0 (0.75)
C5V08	1"	SAE 61	60.0 (2.36)	26.2 (1.03)	27.2 (1.07)	74.0 (2.91)	52.4 (2.06)	22.4 (0.88)	45.0 (1.77)	10.5 (0.41)	Ø3.0 (0.12)	25.0 (0.98)	25.0 (0.98)
		SAE 62	60.0 (2.36)	27.8 (1.09)	27.2 (1.07)	74.0 (2.91)	57.2 (2.25)	22.4 (0.88)	45.0 (1.77)	12.5 (0.49)	—	25.0 (0.98)	25.0 (0.98)
C5V10	1 1/4"	SAE 61	68.0 (2.68)	30.2 (1.19)	27.2 (1.07)	85.0 (3.35)	58.7 (2.31)	22.4 (0.88)	50.0 (1.97)	12.5 (0.49)	Ø3.0 (0.12)	32.0 (1.26)	32.0 (1.26)
		SAE 62	68.0 (2.68)	31.8 (1.25)	27.2 (1.07)	85.0 (3.35)	66.7 (2.63)	22.4 (0.88)	50.0 (1.97)	13.5* (0.53)	—	32.0 (1.26)	32.0 (1.26)
C5V12	1 1/2"	SAE 61	80.0 (3.15)	35.7 (1.41)	27.2 (1.07)	104.0 (4.09)	69.8 (2.75)	22.4 (0.88)	50.0 (1.97)	13.5 (0.53)	Ø3.0 (0.12)	42.0 (1.65)	38.0 (1.50)
		SAE 62	80.0 (3.15)	36.5 (1.44)	27.2 (1.07)	104.0 (4.09)	79.4 (3.13)	22.4 (0.88)	50.0 (1.97)	17.0 (0.67)	—	42.0 (1.65)	38.0 (1.50)

* D1 = 15 (0.59) at option code 019 for M14 mounting screws.

Seal Kits		
NG	Nitrile	Fluorocarbon
3	S26-75409-0	S26-75409-5
6	S26-75410-0	S26-75410-5
10	S26-75411-0	S26-75411-5
12	S26-75412-0	S26-75412-5

Terms of Sale with Warranty Limitations

PARKER-HANNIFIN CORPORATION — HYDRAULIC VALVE DIVISION OFFER OF SALE

1. Definitions. As used herein, the following terms have the meanings indicated.

- Buyer:** means any customer receiving a Quote for Products from Seller.
Goods: means any tangible part, system or component to be supplied by the Seller.
Products: means the Goods, Services and/or Software as described in a Quote provided by the Seller.
Quote: means the offer or proposal made by Seller to Buyer for the supply of Products.
Seller: means Parker-Hannifin Corporation, including all divisions and businesses thereof.
Services: means any services to be supplied by the Seller.
Software: means any software related to the Products, whether embedded or separately downloaded.
Terms: means the terms and conditions of this Offer of Sale or any newer version of the same as published by Seller electronically at www.parker.com/saleterms.

2. Terms. All sales of Products by Seller are contingent upon, and will be governed by, these Terms and, these Terms are incorporated into any Quote provided by Seller to any Buyer. Buyer's order for any Products whether communicated to Seller verbally, in writing, by electronic data interface or other electronic commerce, shall constitute acceptance of these Terms. Seller objects to any contrary or additional terms or conditions of Buyer. Reference in Seller's order acknowledgement to Buyer's purchase order or purchase order number shall in no way constitute an acceptance of any of Buyer's terms of purchase. No modification to these Terms will be binding on Seller unless agreed to in writing and signed by an authorized representative of Seller.

3. Price: Payment. The Products set forth in Seller's Quote are offered for sale at the prices indicated in Seller's Quote. Unless otherwise specifically stated in Seller's Quote, prices are valid for thirty (30) days and do not include any sales, use, or other taxes or duties. Seller reserves the right to modify prices at any time to adjust for any raw material price fluctuations. Unless otherwise specified by Seller, all prices are F.C.A. Seller's facility (INCOTERMS 2010). All sales are contingent upon credit approval and payment for all purchases is due thirty (30) days from the date of invoice (or such date as may be specified in the Quote). Unpaid invoices beyond the specified payment date incur interest at the rate of 1.5% per month or the maximum allowable rate under applicable law.

4. Shipment: Delivery: Title and Risk of Loss. All delivery dates are approximate. Seller is not responsible for damages resulting from any delay. Regardless of the manner of shipment, delivery occurs and title and risk of loss or damage pass to Buyer, upon placement of the Products with the shipment carrier at Seller's facility. Unless otherwise agreed, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferral of shipment at Buyer's request beyond the respective indicated shipping date will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's acts or omissions.

5. Warranty. The warranty related to the Products is as follows: (i) Goods are warranted against defects in material or workmanship for a period of eighteen (18) months from the date of delivery; (ii) Services shall be performed in accordance with generally accepted practices and using the degree of care and skill that is ordinarily exercised and customary in the field to which the Services pertain and are warranted for a period of six (6) months from the completion of the Services by Seller; and (iii) Software is only warranted to perform in accordance with applicable specifications provided by Seller to Buyer for ninety (90) days from the date of delivery or, when downloaded by a Buyer or end-user, from the date of the initial download. All prices are based upon the exclusive limited warranty stated above, and upon the following disclaimer:

DISCLAIMER OF WARRANTY: THIS WARRANTY IS THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING DESIGN, NON-INFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE. SELLER DOES NOT WARRANT THAT THE SOFTWARE IS ERROR-FREE OR FAULT-TOLERANT, OR THAT BUYER'S USE THEREOF WILL BE SECURE OR UNINTERRUPTED. BUYER AGREES AND ACKNOWLEDGES THAT UNLESS OTHERWISE AUTHORIZED IN WRITING BY SELLER THE SOFTWARE SHALL NOT BE USED IN CONNECTION WITH HAZARDOUS OR HIGH RISK ACTIVITIES OR ENVIRONMENTS. EXCEPT AS EXPRESSLY STATED HEREIN, ALL PRODUCTS ARE PROVIDED "AS IS".

6. Claims: Commencement of Actions. Buyer shall promptly inspect all Products upon receipt. No claims for shortages will be allowed unless reported to the Seller within ten (10) days of delivery. Buyer shall notify Seller of any alleged breach of warranty within thirty (30) days after the date the non-conformance is or should have been discovered by Buyer. Any claim or action against Seller based upon breach of contract or any other theory, including tort, negligence, or otherwise must be commenced within twelve (12) months from the date of the alleged breach or other alleged event, without regard to the date of discovery.

7. LIMITATION OF LIABILITY. IN THE EVENT OF A BREACH OF WARRANTY, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE THE NON-CONFORMING PRODUCT, RE-PERFORM THE SERVICES, OR REFUND THE PURCHASE PRICE PAID WITHIN A REASONABLE PERIOD OF TIME. IN NO EVENT IS SELLER LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, NON-COMPLETION OF SERVICES, USE, LOSS OF USE OF, OR INABILITY TO USE THE PRODUCTS OR ANY PART THEREOF, LOSS OF DATA, IDENTITY, PRIVACY, OR CONFIDENTIALITY, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT. WHETHER BASED IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE PAID FOR THE PRODUCTS.

8. Loss to Buyer's Property. Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which are or become Buyer's property, will be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer ordering the Products 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. Special Tooling. Special Tooling includes but is not limited to tooling, jigs, fixtures and associated manufacturing equipment acquired or necessary to manufacture Products. A tooling charge may be imposed for any Special Tooling. 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 Special Tooling belonging to Seller that is utilized in the manufacture of the Products, even if such Special Tooling has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller has the right to alter, discard or otherwise dispose of any Special Tooling or other property in its sole discretion at any time.

10. Security Interest. To secure payment of all sums due, Seller retains a security interest in all Products delivered to Buyer and, Buyer's acceptance of these Terms is deemed to be a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest.

11. User Responsibility. The Buyer through its own analysis and testing, is solely responsible for making the final selection of the Products and assuring that all performance, endurance, maintenance, safety and warning requirements of the application of the Products are met. The Buyer must analyze all aspects of the application and follow applicable industry standards, specifications, and other technical information provided with the Product. If Seller provides Product options based upon data or specifications provided

by the Buyer, the Buyer is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products. In the event the Buyer is not the end-user, Buyer will ensure such end-user complies with this paragraph.

12. Use of Products. Indemnity by Buyer. Buyer shall comply with all instructions, guides and specifications provided by Seller with the Products. Unauthorized Uses. If Buyer uses or resells the Products for any uses prohibited in Seller's instructions, guides or specifications, or Buyer otherwise fails to comply with Seller's instructions, guides and specifications, Buyer acknowledges that any such use, resale, or non-compliance is at Buyer's sole risk. Buyer shall indemnify, defend, and hold Seller harmless from any losses, claims, liabilities, damages, lawsuits, judgments and costs (including attorney fees and defense costs), whether for personal injury, property damage, intellectual property infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, application, design, specification or other misuse of Products provided by Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, tooling, equipment, plans, drawings, designs or specifications or other information or things furnished by Buyer; (d) damage to the Products from an external cause, repair or attempted repair by anyone other than Seller, failure to follow instructions, guides and specifications provided by Seller, use with goods not provided by Seller, or opening, modifying, deconstructing or tampering with the Products for any reason; or (e) Buyer's failure to comply with these Terms. Seller shall not indemnify Buyer under any circumstance except as otherwise provided in these Terms.

13. Cancellations and Changes. Buyer may not cancel or modify any order for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller, at any time, may change Product features, specifications, designs and availability.

14. Limitation on Assignment. Buyer may not assign its rights or obligations without the prior written consent of Seller.

15. Force Majeure. Seller does not assume the risk and is not liable for delay or failure to perform any of Seller's obligations by reason of events or circumstances beyond its reasonable control ("Events of Force Majeure"). Events of Force Majeure shall include without limitation: accidents, strikes or labor disputes, acts of any government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller's reasonable control.

16. Waiver and Severability. Failure to enforce any provision of these Terms will not invalidate that provision; nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of these Terms by legislation or other rule of law shall not invalidate any other provision herein and, the remaining provisions will remain in full force and effect.

17. Termination. Seller may terminate any agreement governed by or arising from these Terms for any reason and at any time by giving Buyer thirty (30) days prior written notice. Seller may immediately terminate, in writing, if Buyer: (a) breaches any provision of these Terms (b) appoints a trustee, receiver or custodian for all or any part of Buyer's property (c) files a petition for relief in bankruptcy on its own behalf, or one if filed by a third party (d) makes an assignment for the benefit of creditors; or (e) dissolves its business or liquidates all or a majority of its assets.

18. Ownership of Software. Seller retains ownership of all Software supplied to Buyer hereunder. In no event shall Buyer obtain any greater right in and to the Software than a right in the nature of a license limited to the use thereof and subject to compliance with any other terms provided with the Software.

19. Indemnity for Infringement of Intellectual Property Rights. Seller is not liable for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights ("Intellectual Property Rights") except as provided in this Section. 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 a third party claim that one or more of the Products sold hereunder infringes the Intellectual Property Rights of a third party in the country of delivery of the Products by the Seller to the Buyer. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of any such claim, and Seller having sole control over the defense of the claim including all negotiations for settlement or compromise. If one or more Products sold hereunder is subject to such a claim, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Products, replace or modify the Products so as to render them non-infringing, or offer to accept return of the Products and refund the purchase price less a reasonable allowance for depreciation. Seller has no obligation or liability for any claim of infringement: (i) arising from information provided by Buyer; or (ii) directed to any Products provided hereunder for which the designs are specified in whole or part by Buyer; or (iii) resulting from the modification, combination or use in a system of any Products provided hereunder. The foregoing provisions of this Section constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for such claims of infringement of Intellectual Property Rights.

20. Governing Law. These Terms and the sale and delivery of all Products are deemed to have taken place in, and shall be governed and construed in accordance with, the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to the sale and delivery of the Products.

21. Entire Agreement. These Terms, along with the terms set forth in the main body of any Quote, forms the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. In the event of a conflict between any term set forth in the main body of a Quote and these Terms, the terms set forth in the main body of the Quote shall prevail. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter shall have no effect. These Terms may not be modified unless in writing and signed by an authorized representative of Seller.

22. Compliance with Laws. Buyer agrees to comply with all applicable laws, regulations, and industry and professional standards, including those of the United States of America, and the country or countries in which Buyer may operate, including without limitation the U.S. Foreign Corrupt Practices Act ("FCPA"), the U.S. Anti-Kickback Act ("Anti-Kickback Act"), U.S. and E.U. export control and sanctions laws ("Export Laws"), the U.S. Food Drug and Cosmetic Act ("FDCA"), and the rules and regulations promulgated by the U.S. Food and Drug Administration ("FDA"), each as currently amended. Buyer agrees to indemnify, defend, and hold harmless Seller from the consequences of any violation of such laws, regulations and standards by Buyer, its employees or agents. Buyer acknowledges that it is familiar with all applicable provisions of the FCPA, the Anti-Kickback Act, Export Laws, the FDCA and the FDA and certifies that Buyer will adhere to the requirements thereof and not take any action that would make Seller violate such requirements. Buyer represents and agrees that Buyer will not make any payment or give anything of value, directly or indirectly, to any governmental official, foreign political party or official thereof, candidate for foreign political office, or commercial entity or person, for any improper purpose, including the purpose of influencing such person to purchase Products or otherwise benefit the business of Seller. Buyer further represents and agrees that it will not receive, use, service, transfer or ship any Product from Seller in a manner or for a purpose that violates Export Laws or would cause Seller to be in violation of Export Laws.



A

This image shows a full page of blank graph paper. The grid consists of thin, light gray horizontal and vertical lines that intersect to form a uniform pattern of small squares across the entire surface. There are no margins, text, or other markings on the paper.



WARNING: Failure or improper selection or improper use of hose, tubing, fittings, assemblies, valves, connectors, conductors or related accessories ("Products") can cause death, personal injury and property damage. Possible consequences of failure or improper selection or improper use of these Products include but are not limited to:

- Fittings thrown off at high speed.
- High velocity fluid discharge.
- Explosion or burning of the conveyed fluid.
- Electrocution from high voltage electric powerlines.
- Contact with suddenly moving or falling objects that are controlled by the conveyed fluid.
- Injections by high-pressure fluid discharge.
- Dangerously whipping Hose.
- Tube or pipe burst.
- Weld joint fracture.
- Contact with conveyed fluids that may be hot, cold, toxic or otherwise injurious.
- Sparking or explosion caused by static electricity buildup or other sources of electricity.
- Sparking or explosion while spraying paint or flammable liquids.
- Injuries resulting from inhalation, ingestion or exposure to fluids.

Before selecting or using any of these Products, it is important that you read and follow the instructions below. No product from any division in Parker Fluid Connectors Group is approved for in-flight aerospace applications. For hoses and fittings used in in-flight aerospace applications, please contact Parker Aerospace Group.

1.0 GENERAL INSTRUCTIONS

1.1 Scope: This safety guide provides instructions for selecting and using (including assembling, installing, and maintaining) these Products. For convenience, all rubber and/or thermoplastic products commonly called "hose" or "tubing" are called "Hose" in this safety guide. Metallic tube or pipe are called "tube". All assemblies made with Hose are called "Hose Assemblies". All assemblies made with Tube are called "Tube Assemblies".

All products commonly called "fittings", "couplings" or "adapters" are called "Fittings". Valves are fluid system components that control the passage of fluid. Related accessories are ancillary devices that enhance or monitor performance including crimping, flaring, flanging, presetting, bending, cutting, deburring, swaging machines, sensors, tags, lockout handles, spring guards and associated tooling. This safety guide is a supplement to and is to be used with the specific Parker publications for the specific Hose, Fittings and Related Accessories that are being considered for use. Parker publications are available at www.parker.com. SAE J1273 (www.sae.org) and ISO 17165-2 (www.ansi.org) also provide recommended practices for hydraulic Hose Assemblies, and should be followed.

1.2 Fail-Safe: Hose, Hose Assemblies, Tube, Tube Assemblies and Fittings can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of the Hose, Hose Assembly, Tube, Tube Assembly or Fitting will not endanger persons or property.

1.3 Distribution: Provide a copy of this safety guide to each person responsible for selecting or using Hose, Tube and Fitting products. Do not select or use Parker Hose, Tube or Fittings without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the Products.

1.4 User Responsibility: Due to the wide variety of operating conditions and applications for Hose, Tube and Fittings, Parker does not represent or warrant that any particular Hose, Tube or Fitting is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the Products.
- Assuring that the user's requirements are met and that the application presents no health or safety hazards.
- Following the safety guide for Related Accessories and being trained to operate Related Accessories.
- Providing all appropriate health and safety warnings on the equipment on which the Products are used.
- Assuring compliance with all applicable government and industry standards.

1.5 Additional Questions: Call the appropriate Parker technical service department if you have any questions or require any additional information.

See the Parker publication for the Products being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2.0 HOSE, TUBE & FITTINGS SELECTION INSTRUCTIONS

2.1 Electrical Conductivity: Certain applications require that the Hose be nonconductive to prevent electrical current flow. Other applications require the Hose and the Fittings and the Hose/Fitting interface to be sufficiently conductive to drain off static electricity. Extreme care must be exercised when selecting Hose, Tube and Fittings for these or any other applications in which electrical conductivity or nonconductivity is a factor.

The electrical conductivity or nonconductivity of Hose, Tube and Fittings is dependent upon many factors and may be susceptible to change.

These factors include but are not limited to the various materials used to make the Hose and the Fittings, Fitting finish (some Fitting finishes are electrically conductive while others are nonconductive), manufacturing methods (including moisture control), how the Fittings contact the Hose, age and amount of deterioration or damage or other changes, moisture content of the Hose at any particular time, and other factors.

The following are considerations for electrically nonconductive and conductive Hose. For other applications consult the individual catalog pages and the appropriate industry or regulatory standards for proper selection.

2.1.1 Electrically Nonconductive Hose: Certain applications require that the Hose be nonconductive to prevent electrical current flow or to maintain electrical isolation. For applications that require Hose to be electrically nonconductive, including but not limited to applications near high voltage electric lines, only special nonconductive Hose can be used. The manufacturer of the equipment in which the nonconductive Hose is to be used must be consulted to be certain that the Hose, Tube and Fittings that are selected are proper for the application. Do not use any Parker Hose or Fittings for any such application requiring nonconductive Hose, including but not limited to applications near high voltage electric lines or dense magnetic fields, unless (i) the application is expressly approved in the Parker technical publication for the product, (ii) the Hose is marked "nonconductive", and (iii) the manufacturer of the equipment on which the Hose is to be used specifically approves the particular Parker Hose, Tube and Fittings for such use.

2.1.2 Electrically Conductive Hose: Parker manufactures special Hose for certain applications that require electrically conductive Hose. Parker manufactures special Hose for conveying paint in airless paint spraying applications. This Hose is labeled "Electrically Conductive Airless Paint Spray Hose" on its layline and packaging. This Hose must be properly connected to the appropriate Parker Fittings and properly grounded in order to dissipate dangerous static charge buildup, which occurs in all airless paint spraying applications. Do not use any other Hose for airless paint spraying, even if electrically conductive. Use of any other Hose or failure to properly connect the Hose can cause a fire or an explosion resulting in death, personal injury, and property damage. All hoses that convey fuels must be grounded.

Parker manufactures a special Hose for certain compressed natural gas ("CNG") applications where static electricity buildup may occur. Parker CNG Hose assemblies comply with the requirements of ANSI/IAS NGV 4.2; CSA 12.52, "Hoses for Natural Gas Vehicles and Dispensing Systems"

(www.ansi.org). This Hose is labeled "Electrically Conductive for CNG Use" on its layline and packaging. This Hose must be properly connected to the appropriate Parker Fittings and properly grounded in order to dissipate dangerous static charge buildup, which occurs in, for example, high velocity CNG dispensing or transfer. Do not use any other Hose for CNG applications where static charge buildup may occur, even if electrically conductive. Use of other Hoses in CNG applications or failure to properly connect or ground this Hose can cause a fire or an explosion resulting in death, personal injury, and property damage. Care must also be taken to protect against CNG permeation through the Hose wall. See section 2.6, Permeation, for more information. Parker CNG Hose is intended for dispenser and vehicle use within the specified temperature range. Parker CNG Hose should not be used in confined spaces or unventilated areas or areas exceeding the specified temperature range.

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Final assemblies must be tested for leaks. CNG Hose Assemblies should be tested on a monthly basis for conductivity per ANSI/IAS NGV 4.2; CSA 12.52.

Parker manufactures special Hose for aerospace in-flight applications. Aerospace in-flight applications employing Hose to transmit fuel, lubricating fluids and hydraulic fluids require a special Hose with a conductive inner tube. This Hose for in-flight applications is available only from Parker's Stratoflex Products Division. Do not use any other Parker Hose for in-flight applications, even if electrically conductive. Use of other Hoses for in-flight applications or failure to properly connect or ground this Hose can cause a fire or an explosion resulting in death, personal injury and property damage. These Hose assemblies for in-flight applications must meet all applicable aerospace industry, aircraft engine and aircraft requirements.

2.2 Pressure: Hose, Tube and Fitting selection must be made so that the published maximum working pressure of the Hose, Tube and Fittings are equal to or greater than the maximum system pressure. The maximum working pressure of a Hose, or Tube Assembly is the lower of the respective published maximum working pressures of the Hose, Tube and the Fittings used. Surge pressures or peak transient pressures in the system must be below the published maximum working pressure for the Hose, Tube and Fitting. Surge pressures and peak pressures can usually only be determined by sensitive electrical instrumentation that measures and indicates pressures at millisecond intervals. Mechanical pressure gauges indicate only average pressures and cannot be used to determine surge pressures or peak transient pressures. Published burst pressure ratings for Hose is for manufacturing test purposes only and is no indication that the Product can be used in applications at the burst pressure or otherwise above the published maximum recommended working pressure.

2.3 Suction: Hoses used for suction applications must be selected to insure that the Hose will withstand the vacuum and pressure of the system. Improperly selected Hose may collapse in suction application.

2.4 Temperature: Be certain that fluid and ambient temperatures, both steady and transient, do not exceed the limitations of the Hose, Tube, Fitting and Seals. Temperatures below and above the recommended limit can degrade Hose, Tube, Fittings and Seals to a point where a failure may occur and release fluid. Tube and Fittings performances are normally degraded at elevated temperature. Material compatibility can also change at temperatures outside of the rated range. Properly insulate and protect the Hose Assembly when routing near hot objects (e.g. manifolds). Do not use any Hose in any application where failure of the Hose could result in the conveyed fluids (or vapors or mist from the conveyed fluids) contacting any open flame, molten metal, or other potential fire ignition source that could cause burning or explosion of the conveyed fluids or vapors.

2.5 Fluid Compatibility: Hose, and Tube Assembly selection must assure compatibility of the Hose tube, cover, reinforcement, Tube, Plating and Seals with the fluid media used. See the fluid compatibility chart in the Parker publication for the product being considered or used. This information is offered only as a guide. Actual service life can only be determined by the end user by testing under all extreme conditions and other analysis.

Hose, and Tube that is chemically compatible with a particular fluid must be assembled using Fittings and adapters containing likewise compatible seals. Flange or flare processes can change Tube material properties that may not be compatible with certain requirements such as NACE

2.6 Permeation: Permeation (that is, seepage through the Hose or Seal) will occur from inside the Hose or Fitting to outside when Hose or Fitting is used with gases, liquid and gas fuels, and refrigerants (including but not limited to such materials as helium, diesel fuel, gasoline, natural gas, or LPG). This permeation may result in high concentrations of vapors which are potentially flammable, explosive, or toxic, and in loss of fluid. Dangerous explosions, fires, and other hazards can result when using the wrong Hose for such applications. The system designer must take into account the fact that this permeation will take place and must not use Hose or Fitting if this permeation could be hazardous. The system designer must take into account all legal, government, insurance, or any other special regulations which govern the use of fuels and refrigerants. Never use a Hose or Fitting even though the fluid compatibility is acceptable without considering the potential hazardous effects that can result from permeation through the Hose or Tube Assembly. Permeation of moisture from outside the Hose or Fitting to inside the

Hose or Fitting will also occur in Hose or Tube assemblies, regardless of internal pressure. If this moisture permeation would have detrimental effects (particularly, but not limited to refrigeration and air conditioning systems), incorporation of sufficient drying capacity in the system or other appropriate system safeguards should be selected and used. The sudden pressure release of highly pressurized gas could also result in Explosive Decompression failure of permeated Seals and Hoses.

2.7 Size: Transmission of power by means of pressurized fluid varies with pressure and rate of flow. The size of the components must be adequate to keep pressure losses to a minimum and avoid damage due to heat generation or excessive fluid velocity.

2.8 Routing: Attention must be given to optimum routing to minimize inherent problems (kinking or flow restriction due to Hose collapse, twisting of the Hose, proximity to hot objects or heat sources). For additional routing recommendations see SAE J1273 and ISO 17165-2. Hose Assemblies have a finite life and should be installed in a manner that allows for ease of inspection and future replacement. Hose because of its relative short life, should not be used in residential and commercial buildings inside of inaccessible walls or floors, unless specifically allowed in the product literature. Always review all product literature for proper installation and routing instructions.

2.9 Environment: Care must be taken to insure that the Hose, Tube and Fittings are either compatible with or protected from the environment (that is, surrounding conditions) to which they are exposed. Environmental conditions including but not limited to ultraviolet radiation, sunlight, heat, ozone, moisture, water, salt water, chemicals and air pollutants can cause degradation and premature failure.

2.10 Mechanical Loads: External forces can significantly reduce Hose, Tube and Fitting life or cause failure. Mechanical loads which must be considered include excessive flexing, twist, kinking, tensile or side loads, bend radius, and vibration. Use of swivel type Fittings or adapters may be required to insure no twist is put into the Hose. Use of proper Hose or Tube clamps may also be required to reduce external mechanical loads. Unusual applications may require special testing prior to Hose selection.

2.11 Physical Damage: Care must be taken to protect Hose from wear, snagging, kinking, bending smaller than minimum bend radius and cutting, any of which can cause premature Hose failure. Any Hose that has been kinked or bent to a radius smaller than the minimum bend radius, and any Hose that has been cut or is cracked or is otherwise damaged should be removed and discarded. Fittings with damages such as scratches on sealing surfaces and deformation should be replaced.

2.12 Proper End Fitting: See instructions 3.2 through 3.5. These recommendations may be substantiated by testing to industry standards such as SAE J517 for hydraulic applications, or MIL-A-5070, AS1339, or AS3517 for Hoses from Parker's Stratoflex Products Division for aerospace applications.

2.13 Length: When determining the proper Hose or Tube length of an assembly, be aware of Hose length change due to pressure, Tube length change due to thermal expansion or contraction, and Hose or Tube and machine tolerances and movement must be considered. When routing short hose assemblies, it is recommended that the minimum free hose length is always used. Consult the hose manufacturer for their minimum free hose length recommendations. Hose assemblies should be installed in such a way that any motion or flexing occurs within the same plane.

2.14 Specifications and Standards: When selecting Hose, Tube and Fittings, government, industry, and Parker specifications and recommendations must be reviewed and followed as applicable.

2.15 Hose Cleanliness: Hose and Tube components may vary in cleanliness levels. Care must be taken to insure that the Hose and Tube Assembly selected has an adequate level of cleanliness for the application.

2.16 Fire Resistant Fluids: Some fire resistant fluids that are to be conveyed by Hose or Tube require use of the same type of Hose or Tube as used with petroleum base fluids. Some such fluids require a special Hose, Tube, Fitting and Seal, while a few fluids will not work with any Hose at all. See instructions 2.5 and 1.5. The wrong Hose, Tube, Fitting or Seal may fail after a very short service. In addition, all liquids but pure water may burn fiercely under certain conditions, and even pure water leakage may be hazardous.

2.17 Radiant Heat: Hose and Seals can be heated to destruction without contact by such nearby items as hot manifolds or molten metal. The

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same heat source may then initiate a fire. This can occur despite the presence of cool air around the Hose or Seal. Performance of Tube and Fitting subjected to the heat could be degraded.

2.18 Welding or Brazing: When using a torch or arc welder in close proximity to hydraulic lines, the hydraulic lines should be removed or shielded with appropriate fire resistant materials. Flame or weld spatter could burn through the Hose or Seal and possibly ignite escaping fluid resulting in a catastrophic failure. Heating of plated parts, including Hose Fittings and adapters, above 450°F (232°C) such as during welding, brazing or soldering may emit deadly gases. Any elastomer seal on fittings shall be removed prior to welding or brazing, any metallic surfaces shall be protected after brazing or welding when necessary. Welding and brazing filler material shall be compatible with the Tube and Fitting that are joined.

2.19 Atomic Radiation: Atomic radiation affects all materials used in Hose and Tube assemblies. Since the long-term effects may be unknown, do not expose Hose or Tube assemblies to atomic radiation. Nuclear applications may require special Tube and Fittings.

2.20 Aerospace Applications: The only Hose, Tube and Fittings that may be used for in-flight aerospace applications are those available from Parker's Stratoflex Products Division. Do not use any other Hose or Fittings for in-flight applications. Do not use any Hose or Fittings from Parker's Stratoflex Products Division with any other Hose or Fittings, unless expressly approved in writing by the engineering manager or chief engineer of Stratoflex Products Division and verified by the user's own testing and inspection to aerospace industry standards.

2.21 Unlocking Couplings: Ball locking couplings or other Fittings with quick disconnect ability can unintentionally disconnect if they are dragged over obstructions, or if the sleeve or other disconnect member, is bumped or moved enough to cause disconnect. Threaded Fittings should be considered where there is a potential for accidental uncoupling.

3.0 HOSE AND FITTINGS ASSEMBLY AND INSTALLATION INSTRUCTIONS

3.1 Component Inspection: Prior to assembly, a careful examination of the Hose and Fittings must be performed. All components must be checked for correct style, size, catalog number, and length. The Hose must be examined for cleanliness, obstructions, blisters, cover looseness, kinks, cracks, cuts or any other visible defects. Inspect the Fitting and sealing surfaces for burrs, nicks, corrosion or other imperfections. Do NOT use any component that displays any signs of nonconformance.

3.2 Hose and Fitting Assembly: Do not assemble a Parker Fitting on a Parker Hose that is not specifically listed by Parker for that Fitting, unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division. Do not assemble a Parker Fitting on another manufacturer's Hose or a Parker Hose on another manufacturer's Fitting unless (i) the engineering manager or chief engineer of the appropriate Parker division approves the Assembly in writing or that combination is expressly approved in the appropriate Parker literature for the specific Parker product, and (ii) the user verifies the Assembly and the application through analysis and testing. For Parker Hose that does not specify a Parker Fitting, the user is solely responsible for the selection of the proper Fitting and Hose Assembly procedures. See instruction 1.4.

To prevent the possibility of problems such as leakage at the Fitting or system contamination, it is important to completely remove all debris from the cutting operation before installation of the Fittings. The Parker published instructions must be followed for assembling the Fittings on the Hose. These instructions are provided in the Parker Fitting catalog for the specific Parker Fitting being used, or by calling 1-800-CPARKER, or at www.parker.com.

3.3 Related Accessories: Do not crimp or swage any Parker Hose or Fitting with anything but the listed swage or crimp machine and dies in accordance with Parker published instructions. Do not crimp or swage another manufacturer's Fitting with a Parker crimp or swage die unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division.

3.4 Parts: Do not use any Parker Fitting part (including but not limited to socket, shell, nipple, or insert) except with the correct Parker mating parts, in accordance with Parker published instructions, unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division.

3.5 Field Attachable/Permanent: Do not reuse any field attachable Hose Fitting that has blown or pulled off a Hose. Do not reuse a Parker permanent Hose Fitting (crimped or swaged) or any part thereof. Complete Hose Assemblies may only be reused after proper inspection under section 4.0. Do not assemble Fittings to any previously used hydraulic Hose that was in service, for use in a fluid power application.

3.6 Pre-Installation Inspection: Prior to installation, a careful examination of the Hose Assembly must be performed. Inspect the Hose Assembly for any damage or defects. DO NOT use any Hose Assembly that displays any signs of nonconformance.

3.7 Minimum Bend Radius: Installation of a Hose at less than the minimum listed bend radius may significantly reduce the Hose life. Particular attention must be given to preclude sharp bending at the Hose to Fitting juncture. Any bending during installation at less than the minimum bend radius must be avoided. If any Hose is kinked during installation, the Hose must be discarded.

3.8 Twist Angle and Orientation: Hose Assembly installation must be such that relative motion of machine components does not produce twisting.

3.9 Securement: In many applications, it may be necessary to restrain, protect, or guide the Hose to protect it from damage by unnecessary flexing, pressure surges, and contact with other mechanical components. Care must be taken to insure such restraints do not introduce additional stress or wear points.

3.10 Proper Connection of Ports: Proper physical installation of the Hose Assembly requires a correctly installed port connection insuring that no twist or torque is transferred to the Hose when the Fittings are being tightened or otherwise during use.

3.11 External Damage: Proper installation is not complete without insuring that tensile loads, side loads, kinking, flattening, potential abrasion, thread damage or damage to sealing surfaces are corrected or eliminated. See instruction 2.10.

3.12 System Checkout: All air entrapment must be eliminated and the system pressurized to the maximum system pressure (at or below the Hose maximum working pressure) and checked for proper function and freedom from leaks. Personnel must stay out of potential hazardous areas while testing and using.

3.13 Routing: The Hose Assembly should be routed in such a manner so if a failure does occur, the escaping media will not cause personal injury or property damage. In addition, if fluid media comes in contact with hot surfaces, open flame or sparks, a fire or explosion may occur. See section 2.4.

3.14 Ground Fault Equipment Protection Devices (GFE PDs): WARNING! Fire and Shock Hazard. To minimize the danger of fire if the heating cable of a Multitube bundle is damaged or improperly installed, use a Ground Fault Equipment Protection Device. Electrical fault currents may be insufficient to trip a conventional circuit breaker.

For ground fault protection, the IEEE 515: (www.ansi.org) standard for heating cables recommends the use of GFE PDs with a nominal 30 milliamper trip level for "piping systems in classified areas, those areas requiring a high degree of maintenance, or which may be exposed to physical abuse or corrosive atmospheres".

4.0 TUBE AND FITTINGS ASSEMBLY AND INSTALLATION INSTRUCTIONS

4.1 Component Inspection: Prior to assembly, a careful examination of the Tube and Fittings must be performed. All components must be checked for correct style, size, material, seal, and length. Inspect the Fitting and sealing surfaces for burrs, nicks, corrosion, missing seal or other imperfections. Do NOT use any component that displays any signs of nonconformance.

4.2 Tube and Fitting Assembly: Do not assemble a Parker Fitting with a Tube that is not specifically listed by Parker for that Fitting, unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division. The Tube must meet the requirements specified to the Fitting. The Parker published instructions must be followed for assembling the Fittings to a Tube. These instructions are provided in the Parker Fitting catalog for the specific Parker Fitting being used, or by calling 1-800-CPARKER, or at www.parker.com.

4.3 Related Accessories: Do not preset or flange Parker Fitting components using another manufacturer's equipment or procedures unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division. Tube, Fitting component and tool

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ing must be checked for correct style, size and material. Operation and maintenance of Related Accessories must be in accordance with the operation manual for the designated Accessory.

4.4 Securement: In many applications, it may be necessary to restrain, protect, or guide the Tube to protect it from damage by unnecessary flexing, pressure surges, vibration, and contact with other mechanical components. Care must be taken to insure such restraints do not introduce additional stress or wear points.

4.5 Proper Connection of Ports: Proper physical installation of the Tube Assembly requires a correctly installed port connection insuring that no torque is transferred to the Tube when the Fittings are being tightened or otherwise during use.

4.6 External Damage: Proper installation is not complete without insuring that tensile loads, side loads, flattening, potential abrasion, thread damage or damage to sealing surfaces are corrected or eliminated. See instruction 2.10.

4.7 System Checkout: All air entrapment must be eliminated and the system pressurized to the maximum system pressure (at or below the Tube Assembly maximum working pressure) and checked for proper function and freedom from leaks. Personnel must stay out of potential hazardous areas while testing and using.

4.8 Routing: The Tube Assembly should be routed in such a manner so if a failure does occur, the escaping media will not cause personal injury or property damage. In addition, if fluid media comes in contact with hot surfaces, open flame or sparks, a fire or explosion may occur. See section 2.4.

5.0 HOSE AND FITTING MAINTENANCE AND REPLACEMENT INSTRUCTIONS

5.1 Even with proper selection and installation, Hose life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a possible Hose failure, and experience with any Hose failures in the application or in similar applications should determine the frequency of the inspection and the replacement for the Products so that Products are replaced before any failure occurs. Certain products require maintenance and inspection per industry requirements. Failure to adhere to these requirements may lead to premature failure. A maintenance program must be established and followed by the user and, at minimum, must include instructions 5.2 through 5.7

5.2 Visual Inspection Hose/Fitting: Any of the following conditions require immediate shut down and replacement of the Hose Assembly:

- Fitting slippage on Hose;
- Damaged, cracked, cut or abraded cover (any reinforcement exposed);
- Hard, stiff, heat cracked, or charred Hose;
- Cracked, damaged, or badly corroded Fittings;
- Leaks at Fitting or in Hose;
- Kinked, crushed, flattened or twisted Hose; and
- Blistered, soft, degraded, or loose cover.

5.3 Visual Inspection All Other: The following items must be tightened, repaired, corrected or replaced as required:

- Leaking port conditions;
- Excess dirt buildup;/
- Worn clamps, guards or shields; and
- System fluid level, fluid type, and any air entrapment.

5.4 Functional Test: Operate the system at maximum operating pressure and check for possible malfunctions and leaks. Personnel must avoid potential hazardous areas while testing and using the system. See section 2.2.

5.5 Replacement Intervals: Hose assemblies and elastomeric seals used on Hose Fittings and adapters will eventually age, harden, wear and deteriorate under thermal cycling and compression set. Hose Assemblies and elastomeric seals should be inspected and replaced at specific replacement intervals, based on previous service life, government or industry recommendations, or when failures could result in unacceptable downtime, damage, or injury risk. See section 1.2. Hose and Fittings may be subjected to internal mechanical and/or chemical wear from the conveying fluid and may fail without warning. The user must determine the product life under such circumstances by testing. Also see section 2.5.

5.6 Hose Inspection and Failure: Hydraulic power is accomplished by utilizing high pressure fluids to transfer energy and do work. Hoses, Fittings and Hose Assemblies all contribute to this by transmitting fluids at high pressures. Fluids under pressure can be dangerous and potentially lethal and, therefore, extreme caution must be exercised when working with fluids under pressure and handling the Hoses transporting the fluids. From time to time, Hose Assemblies will fail if they are not replaced at proper time intervals. Usually these failures are the result of some form of misapplication, abuse, wear or failure to perform proper maintenance. When Hoses fail, generally the high pressure fluids inside escape in a stream which may or may not be visible to the user. Under no circumstances should the user attempt to locate the leak by "feeling" with their hands or any other part of their body. High pressure fluids can and will penetrate the skin and cause severe tissue damage and possibly loss of limb. Even seemingly minor hydraulic fluid injection injuries must be treated immediately by a physician with knowledge of the tissue damaging properties of hydraulic fluid.

If a Hose failure occurs, immediately shut down the equipment and leave the area until pressure has been completely released from the Hose Assembly. Simply shutting down the hydraulic pump may or may not eliminate the pressure in the Hose Assembly. Many times check valves, etc., are employed in a system and can cause pressure to remain in a Hose Assembly even when pumps or equipment are not operating. Tiny holes in the Hose, commonly known as pinholes, can eject small, dangerously powerful but hard to see streams of hydraulic fluid. It may take several minutes or even hours for the pressure to be relieved so that the Hose Assembly may be examined safely.

Once the pressure has been reduced to zero, the Hose Assembly may be taken off the equipment and examined. It must always be replaced if a failure has occurred. Never attempt to patch or repair a Hose Assembly that has failed. Consult the nearest Parker distributor or the appropriate Parker division for Hose Assembly replacement information.

Never touch or examine a failed Hose Assembly unless it is obvious that the Hose no longer contains fluid under pressure. The high pressure fluid is extremely dangerous and can cause serious and potentially fatal injury.

5.7 Elastomeric seals: Elastomeric seals will eventually age, harden, wear and deteriorate under thermal cycling and compression set. Elastomeric seals should be inspected and replaced.

5.8 Refrigerant gases: Special care should be taken when working with refrigeration systems. Sudden escape of refrigerant gases can cause blindness if the escaping gases contact the eye and can cause freezing or other severe injuries if it contacts any other portion of the body.

5.9 Compressed natural gas (CNG): Parker CNG Hose Assemblies should be tested after installation and before use, and at least on a monthly basis per instructions provided on the Hose Assembly tag. The recommended procedure is to pressurize the Hose and check for leaks and to visually inspect the Hose for damage and to perform an electrical resistance test.

Caution: Matches, candles, open flame or other sources of ignition shall not be used for Hose inspection. Leak check solutions should be rinsed off after use.

6.0 HOSE STORAGE

6.1 Age Control: Hose and Hose Assemblies must be stored in a manner that facilitates age control and first-in and first-out usage based on manufacturing date of the Hose and Hose Assemblies. Unless otherwise specified by the manufacturer or defined by local laws and regulations:

6.1.1 The shelf life of rubber hose in bulk form or hose made from two or more materials is 28 quarters (7 years) from the date of manufacture, with an extension of 12 quarters (3 years), if stored in accordance with ISO 2230;

6.1.2 The shelf life of thermoplastic and polytetrafluoroethylene hose is considered to be unlimited;

6.1.3 Hose assemblies that pass visual inspection and proof test shall not be stored for longer than 2 years.

6.1.4 Storage: Stored Hose and Hose Assemblies must not be subjected to damage that could reduce their expected service life and must be placed in a cool, dark and dry area with the ends capped. Stored Hose and Hose Assemblies must not be exposed to temperature extremes, ozone, oils, corrosive liquids or fumes, solvents, high humidity, rodents, insects, ultraviolet light, electromagnetic fields or radioactive materials.

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This image shows a full page of blank graph paper. The grid consists of small, uniform squares formed by thin, light gray lines. There are no margins, text, or other markings on the page.



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