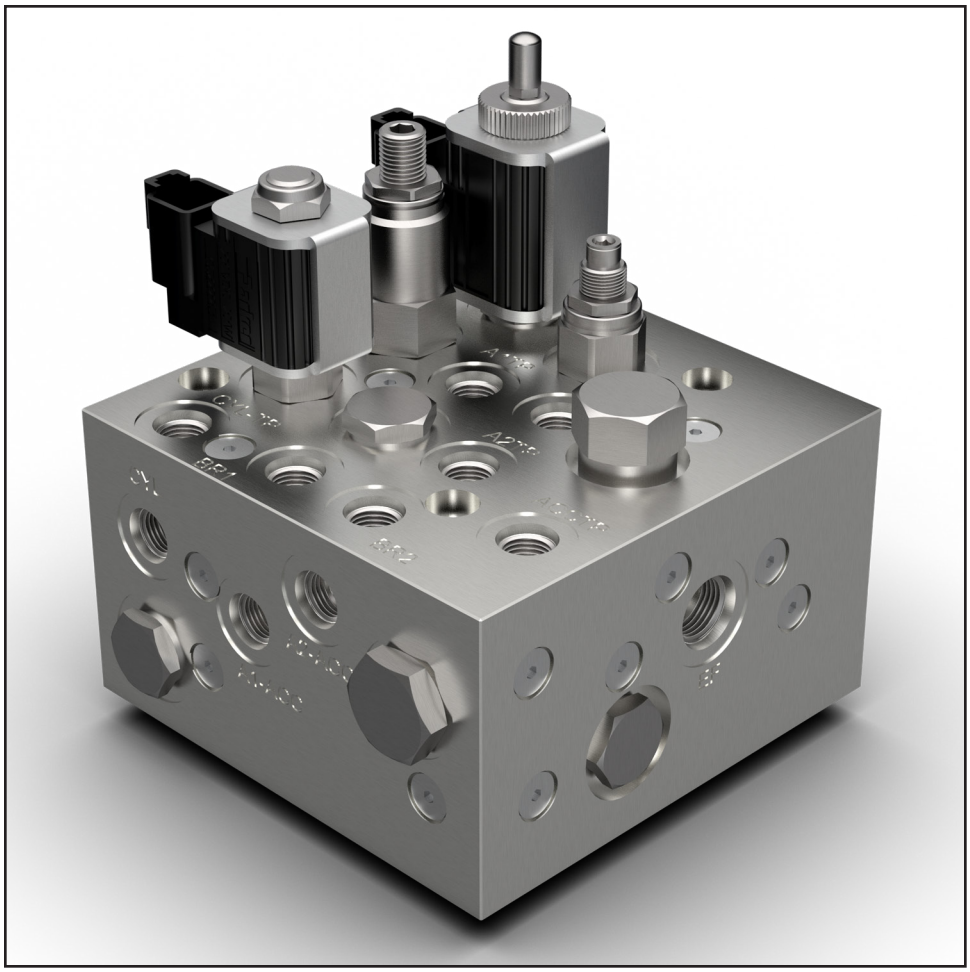




















Mobile Hydraulic Cartridge Systems Europe

Threaded Cartridge Valves and Integrated Hydraulic Products

ENGINEERING YOUR SUCCESS.

WARNING - USER RESPONSIBILITY

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OFFER OF SALE

The items described in this document are hereby offered for sale by Parker-Hannifin Corporation, its subsidiaries or its authorized distributor. This offer and its acceptance are governed by the provisions stated in the detailed “Offer of Sale” elsewhere in this document.

Check Valves CV1-CV27

Shuttle Valves SH1-SH7

Load and Motor Control Valves LM1-LM26

Flow Control Valves FC1-FC32

Pressure Control Valves PC1-PC70

Logic Element Valves LE1-LE19

Directional Control Valves DC1-DC6

Solenoid Valves SV1-SV76

Proportional Valves PV1-PV75

Coils and Electronics CE1-CE14

Bodies and Cavities BC1-BC62

Technical Data TD1-TD4

SERIES	DESCRIPTION	PAGE NO.
10SLC1-A	Normally Closed, Pilot to Close	LE7
16SLC1-A	Normally Closed, Pilot to Close	LE8
20SLC1-A	Normally Closed, Pilot to Close	LE9
A02A2	Direct Acting Relief, Ball Type	PC7-PC8
A02B2	Direct Acting Relief, Poppet Type	PC9-PC10
A04B2	Direct Acting Relief, Poppet Type	PC11-PC12
A04B2*CE	Direct Acting Relief, Poppet Type	PC13-PC14
A04C2	Direct Acting Relief, Spool Type	PC15-PC16
A04D2	Direct Acting Differential Area Relief	PC21-PC22
A04G2	Pilot Operated, Spool Type	PC25-PC26
A04H3	Pilot Operated Vented Relief	PC33-PC34
A04J2	Direct Acting Cross-over Relief	PC37-PC38
A04K2	Pilot Operated Spool Type Kick Down	PC29-PC30
A06G2	Pilot Operated Spool Type	PC27-PC28
A06H3	Pilot Operated Vented Relief	PC35-PC36
A06P2	Pilot Operated Poppet Type	PC41-PC42
AP02B2YP	Increase Pressure/Increase Current	PV7-PV8
AP02B2YR	Decrease Pressure/Increase Current	PV11-PV12
AP04G2YP	Increase Pressure/Increase Current	PV9-PV10
AP04G2YR	Decrease Pressure/Increase Current	PV15-PV16
B02E3F	Direct Acting, 2P-3W, Int. Pilot, Int. Drain	PC49-PC50
B04C3	Pilot Operated, Kick Down	PC47-PC48
B04D3	Pilot Operated, Reverse Check, Ext. Drain	PC45-PC46
B04F3	Direct Acting, 2P-2W, N.C., Ext. Pilot, Int. Drain	PC51-PC52
B04G3	Direct Acting, 2P-2W, N.O., Ext. Pilot, Int. Drain	PC53-PC54
B04H4	Direct Acting, 2P-2W, N.C., Ext. Pilot, Ext. Drain	PC55-PC56
B04J4	Direct Acting, 2P-2W, N.O., Ext. Pilot, Ext. Drain	PC57-PC58
B04K4	Direct Acting, 2P-3W, N.O., Ext. Pilot, Int. Drain	PC59-PC60
C02A3	Direct Acting Reducing/Relieving	PC61-PC62
C04B3	Pilot Operated Reducing/Relieving	PC67-PC68
C06B3	Pilot Operated Reducing/Relieving	PC69-PC70
CB101	Load Control Cartridge Valve	LM17-LM18
CPD084P	Dual P.O. Check Cartridge	CV20
CPH104P	Single P.O. Check, Pilot on Port 1	CV17
CVH081P	Cartridge Check, Poppet Type	CV7
CVH103P	Cartridge Check, Poppet Type	CV8
D0WB2	Cartridge Check, Ball Type	CV5
D02B2	Cartridge Check, Ball Type	CV6
D04B2	Cartridge Check, Ball Type	CV9
D04F2	Check With Thermal Relief, Relieving Port 2 to 1	CV27
D06B2P	Cartridge Check, Poppet Type	CV10
D1A060	Check Valve Insert, Ball Type	CV3
D1B125	Check Valve Insert, Ball Type	CV4
D4A020	Single P.O. Check, Pilot on Port 3	CV18
D4A040	Single P.O. Check, Pilot on Port 3	CV19
DS162	2 Position, 2 Way	SV37-SV38
DS163	2 Position, 3 Way	SV45-SV46
DSH081	2 Position, 2 Way, N.C. or N.O.	SV7-SV8
DSH082	2 Position, 2 Way	SV33-SV34
DSH083	2 Position, 3 Way	SV39-SV41
DSH084	2 Position, 4 Way	SV47-SV48
DSH101	2 Position, 2 Way, N.C. or N.O.	SV9-SV10
DSH102	2 Position, 2 Way	SV35-SV36
DSH103	2 Position, 3 Way	SV42-SV44
DSH104	2 Position, 4 Way	SV49-SV50
DSH121	2 Position, 2 Way, N.C. or N.O.	SV11-SV12
DSH125 52	3 Position, 4 Way	SV69-SV70
DSH125 54	3 Position, 4 Way	SV71-SV72
DSH125 57	3 Position, 4 Way	SV73-SV74
DSH125 59	3 Position, 4 Way	SV75-SV76
DSH161	2 Position, 2 Way, N.C. or N.O.	SV13-SV14
DSH164	2 Position, 4 Way	SV51-SV52
DSL201	2 Position, 2 Way, N.C. or N.O.	SV15-SV16
DSP105C1	3 Position, 4 Way - Closed Center	PV73-PV75
DSP105C4	3 Position, 4 Way - Float Center	PV73-PV75
E2*020	Load Control Cartridge Valve	LM7-LM8
E2*040	Load Control Cartridge Valve	LM9-LM10
E2*060	Load Control Cartridge Valve	LM11-LM12
E2*125	Load Control Cartridge Valve	LM13-LM14
E2*300	Load Control Cartridge Valve	LM15-LM16
E6B020	Load Control Cartridge Valve, 4.5:1 Ratio	LM19-LM20
E6B040	Load Control Cartridge Valve, 3:1 Ratio	LM23-LM24
E6B060*409	Load Control Cartridge Valve, 3:1 Ratio	LM25-LM26

SERIES	DESCRIPTION	PAGE NO.
E6K020	Load Control Cartridge Valve, 15:1 Ratio	LM21-LM22
EPR111C	Pressure Reducing/Relieving Valve	PV21-PV22
FA101	Restrictive Flow Control, Reverse Check, Adjustable	FC21-FC22
FAP081C	2 Way, Normally Closed	PV39-PV40
FAP101C	2 Way, Normally Closed	PV41-PV42
FAP121C	2 Way, Normally Closed	PV43-PV44
FAP161C	2 Way, Normally Closed	PV45-PV46
FAP081N	2 Way, Normally Open	PV47-PV48
FAP101N	2 Way, Normally Open	PV49-PV50
FAP121N	2 Way, Normally Open	PV51-PV52
FAP161N	2 Way, Normally Open	PV53-PV54
FAPC101C	2 Way, Normally Closed	PV55-PV56
FAPC121C	2 Way, Normally Closed	PV57-PV58
FAPC161C	2 Way, Normally Closed	PV59-PV60
FAPC101N	2 Way, Normally Open	PV61-PV62
FAPC121N	2 Way, Normally Open	PV63-PV64
FAPC161N	2 Way, Normally Open	PV65-PV66
FV101	Restrictive Flow Control, Reverse Check, Tuneable	FC13-FC14
GP01 30	Pressure Reducing Valve	PV17-PV18
GP02 51	4 Way, 3 Pos - Closed Center	PV69-PV70
GP02 52	4 Way, 3 Pos - Closed Center	PV69-PV70
GP02 53	4 Way, 3 Pos - Float Center	PV71-PV72
GP02 54	4 Way, 3 Pos - Float Center	PV71-PV72
GS02 51	3 Position, 4 Way	SV53-SV54
GS02 53	3 Position, 4 Way	SV55-SV56
GS02 57	3 Position, 4 Way	SV57-SV58
GS02 59	3 Position, 4 Way	SV59-SV60
GS02 72	Bi-Directional Poppet, N.C.	SV17-SV18
GS02 77	Bi-Directional Poppet, N.O.	SV25-SV26
GS02 81	Bi-Directional Poppet, N.C.	SV19-SV20
GS02 86	Bi-Directional Poppet, N.O.	SV27-SV28
GS04 52D	3 Position, 4 Way	SV61-SV62
GS04 54D	3 Position, 4 Way	SV63-SV64
GS04 57D	3 Position, 4 Way	SV65-SV66
GS04 59D	3 Position, 4 Way	SV67-SV68
GS04 81	Bi-Directional Poppet, N.C.	SV21-SV22
GS04 86	Bi-Directional Poppet, N.O.	SV29-SV30
GS06 81	Bi-Directional Poppet, N.C.	SV23-SV24
GS06 86	Bi-Directional Poppet, N.O.	SV31-SV32
GTP02 34	Pressure Reducing Valve	PV19-PV20
HP02C 21	Flow Control, N.C.	PV23-PV24
HP02P 21	Flow Control, N.O.	PV31-PV32
HP04C 21	Flow Control, N.C.	PV27-PV28
HP04P 21	Flow Control, N.O.	PV35-PV36
J02A2	Needle Valve, Cartridge Type	FC5-FC6
J02B2	Needle Valve with Reverse Check, 2 to 1 Free Flow	FC11-FC12
J02D3	Priority Type, with Bypass	FC23-FC24
J02E2	Restrictive Flow Control, Adjustable	FC15-FC16
J04A2	Restrictive Flow Control, Adjustable	FC7-FC8
J04C2	Restrictive Flow Control, Adjustable	FC19-FC20
J04D3	Priority Type, with Bypass	FC25-FC26
J04E2	Restrictive Flow Control, Adjustable	FC17-FC18
J06A2	Needle Valve, Cartridge Type	FC9-FC10
J1A125	Priority Type, with Bypass	FC27-FC28
JP02C 21	Flow Control, N.C.	PV25-PV26
JP02P 21	Flow Control, N.O.	PV33-PV34
JP04C 21	Flow Control, N.C.	PV29-PV30
JP04C 31	Priority Flow Control, N.C.	PV67-PV68
JP04P 21	Flow Control, N.O.	PV37-PV38
K02A3	Cartridge Shuttle	SH5
K04C3	Spool Type, Spring Centered, All Ports Closed	SH6
K04G3	Spool Type Shuttle, Inverse	SH7
K2A005	Poppet Insert Type	SH4
KSWA3	Ball Insert Type	SH3
L04A3	Flow Divider/Combiner	FC29-FC30
L06A3	Flow Divider/Combiner	FC31-FC32
MHC-010-S***	Load Control Cartridge Valve	LM5-LM6
MHC-010-V***	Load Control Cartridge Valve	LM5-LM6
N04A4	3 Way, Internal Vent, External Pilot	DC3
N04B4	3 Way, Internal Vent, External Pilot	DC4
N5A125	3 Way, 2 Position, External Drain, Open Transition	DC5
N5A300	3 Way, 2 Position, External Drain, Open Transition	DC6

SERIES	DESCRIPTION	PAGE NO.
PP02DP	Pilot Piston - Dual	CV21-CV22
PP02SP	Pilot Piston - Single	CV11-CV12
PP04DP	Pilot Piston - Dual	CV23-CV24
PP04SP	Pilot Piston - Single	CV13-CV14
PP06DP	Pilot Piston - Dual	CV25-CV26
PP06SP	Pilot Piston - Single	CV15-CV16
PR103	Direct Acting Reducing/Relieving	PC63-PC64
PRD081CW	Decrease Pressure/Increase Current	PV13-PV14
PRH081	Pilot Operated Reducing/Relieving	PC65-PC66
R04A4	2 Way, Normally Open, Pilot to Close, Ext. Vent	DC1
R04B4	2 Way, Normally Closed, Pilot to Open, Ext. Vent	DC2
R04E3	Normally Closed, Pilot to Close	LE10
R04F3	Normally Closed, Vent to Open	LE13
R04G3	Normally Open, Vent to Close	LE18
R04H3	Normally Open, Vent to Close	LE16
R06E3	Normally Closed, Pilot to Close	LE11
R06F3	Normally Closed, Vent to Open	LE14
R06G3	Normally Open, Vent to Close	LE19
R06H3	Normally Open, Vent to Close	LE17
R08E3	Normally Closed, Pilot to Close	LE12
R08F3	Normally Closed, Vent to Open	LE15
RAH081	Pilot Operated Spool Type	PC23-PC24
RAH101	Pilot Operated Spool Type	PC31-PC32
RD102	Direct Acting Relief, Poppet Type	PC17-PC18
RDH083	Direct Acting Differential Area Relief	PC19-PC20
RT10001	Threaded Retainer	CV4
RT10002	Threaded Retainer	CV4
RU101	Direct Acting Unloading	PC39-PC40
SVH081	Pilot Operated, Int. Pilot, Ext. Drain	PC43-PC44

Cartridge Valve Coils

CC	1/2″ Solenoid Tubes	CE3-CE4
CA	5/8″ Solenoid Tubes	CE5-CE6
HLC	5/8″ Hazardous Location	CE7-CE8
DS	1″ Solenoid Tubes	CE9

Electronics

XPRO704	Soft Start Valve Controller, 12/24 VDC	CE12
XPRO704b	Soft Start and Stop Valve Controller, 12/24 VDC	CE13
XPRO804	Power Saver Controller, 12/24 VDC PWM	CE14
XPRO902rid	12 VDC PWM Controller, 95-230Hz, 19W, Multi-adj.	CE10-CE11
XPRO904rid	24 VDC PWM Controller, 95-230Hz, 19W, Multi-adj.	CE10-CE11
XPRO932rid	12 VDC PWM Controller, 95-230Hz, 30W, Multi-adj.	CE10-CE11
XPRO934rid	24 VDC PWM Controller, 95-230Hz, 30W, Multi-adj.	CE10-CE11

Standard Bodies and Cavities

C08-2	08 Size, 2 Way	B08-2-6B	BC7
C08-3	08 Size, 3 Way	B08-3-6B	BC8
C08-4	08 Size, 4 Way	B08-4-6B	BC9
C09-2	09 Size, 2 Way	B09-2-6T	BC10
C10-2	10 Size, 2 Way	B10-2-8B	BC11
C10-3	10 Size, 3 Way	B10-3-8B	BC12
C10-3L	10 Size, 3 Way, L	4082075	BC13
C10-3S	10 Size, 3 Way, Short	LB10711S	BC14
C10-4	10 Size, 4 Way	B10-4-8B	BC15
C12-2	12 Size, 2 Way	B12-2-12B	BC16
C12-2F	12 Size, 2 Way (FAP121 Series)	B12-2F-12T	BC17
C12-3	12 Size, 3 Way	B12-3-12B	BC18
C12-3L	12 Size, 3 Way, Long	B12-3L-12T	BC19
C12-4	12 Size, 4 Way	B12-4-12T	BC20
C12-4L	12 Size, 4 Way, Long	B12-4L-12T	BC21
C16-2	16 Size, 2 Way	B16-2-16B	BC22
C16-3	16 Size, 3 Way	B16-3-16B	BC23
C16-3S	16 Size, 3 Way, Short	LB10726S	BC24
C16-4	16 Size, 4 Way	B16-4-16B	BC25
C20-2	20 Size, 2 Way	B20-2-20B	BC26
C20-3S	20 Size, 3 Way, Short	LB10746S	BC27

Counterbalance Cavities and Bodies

MHC-010	Single and Dual Counterbalance Bodies	BC28
MHC-022	Single and Dual Counterbalance Bodies	BC29

SERIES	DESCRIPTION	PAGE NO.

Standard Cavity Plugs

Cavity Plugs		BC31

Cartpak Bodies

BD03-ABN	A and B Port Interrupt, Body Only	B03-ABN-*	BC37
BD03-ABT	A and B Ports to Tank, Body Only	B03-ABT-*	BC39
BD03-ABX	A and B Port Crossover, Body Only	B03-ABX-*	BC38
BD03-ADB	A Port Drain to B, Body Only	B03-ADB-*	BC42
BD03-BDA	B Port Drain to A, Body Only	B03-BDA-*	BC41
BD03-DDX	Ports A and B Drain to Crossover Port, Body Only	B03-DDX-*	BC40
BD03-PN	P Port Interrupt, 2-Way, Body Only	B03-PN-*	BC32
BD03-PN2	P Port Interrupt, 2-Way, Body Only	B03-PN2-*	BC33
BD03-PNR	P Port Interrupt, Reducing Function, Body Only	B03-PNR-*	BC34
BD03-PNS	P Port Interrupt, Sequencing Function, Body Only	B03-PNS-*	BC35
BD03-POC	Dual P.O. Checks - A and B Ports to Tank	B03-POC-*	BC43
BD03-PT	P to T, Body Only	B03-PT-*	BC36

Special Bodies and Cavities

CAV0W-2	2 Port	LB10796S	BC44
CAVSW-3	3 Port	LB10816S	BC45
2C	2 Port	LB10210S	BC46
2G	2 Port	LB10325S	BC47
2R	2 Port	LB10545S	BC48
2U	2 Port	LB10205S	BC49
2X	2 Port	LB10515S	BC50
3A	3 Port	LB10007S	BC51
3C	3 Port or 4 Port Dual	LB10039S / LB10034S	BC52
3K	3 Port	LB10895S	BC53
3M	3 Port or 4 Port Dual	LB10076S / LB10104S	BC54
3U	3 Port	LB10092S	BC55
3X	3 Port	LB10554S	BC56
3Z	3 Port	LB10313S	BC57
4C	4 Port	LB10563S	BC58
5A	5 Port	LB10314S	BC59
53-1	3 Port or 4 Port Dual	LB10310S / LB10312S	BC60
68-1	3 Port or 4 Port Dual	LB10251S / LB10259S	BC61
100-1	5 Port	LB10316S	BC62

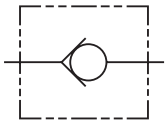
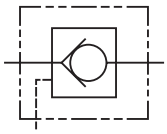
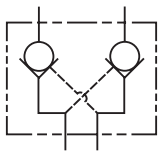
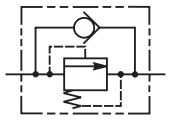
Technical Data

Basic Hydraulic Formulas	TD1
Ratings and Testing	TD1
Temperature Ratings	TD1
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Pressure Ratings	TD1
Thermal Shock	TD1
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Offer of Sale	TD4

Notes

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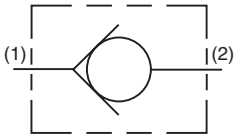
Check Valves

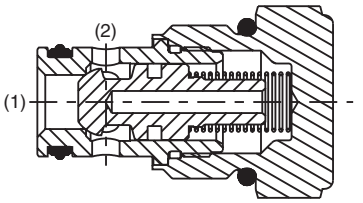
	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
	**STANDARD CHECKS**					
	D1A060	2U	Check Valve Insert, Ball Type	145/38	420/6000	CV3
	D1B125	2C	Check Valve Insert, Ball Type	500/132	420/6000	CV4
	D0WB2	CAV0W-2	Cartridge Check, Ball Type	3.5/0.9	420/6000	CV5
	D02B2	C08-2	Cartridge Check, Ball Type	45/12	420/6000	CV6
	CVH081P	C08-2	Cartridge Check, Poppet Type	38/10	350/5000	CV7
	CVH103P	C10-2	Cartridge Check, Poppet Type	60/16	350/5000	CV8
	D04B2	C10-2	Cartridge Check, Ball Type	160/42	420/6000	CV9
	D06B2P	C16-2	Cartridge Check, Poppet Type	280/74	420/6000	CV10
	**PILOT OPERATED CHECKS**					
	PP02SP	CAV02-SP	Pilot Piston - Single	40/11	420/6000	CV11-CV12
	PP04SP	CAV04-SP	Pilot Piston - Single	135/36	420/6000	CV13-CV14
	PP06SP	CAV06-SP	Pilot Piston - Single	340/90	420/6000	CV15-CV16
	CPH104P	C10-3	Single P.O. Check, Pilot on Port 1	30/8	350/5000	CV17
	D4A020	53-1	Single P.O. Check, Pilot on Port 3	30/8	420/6000	CV18
	D4A040	68-1	Single P.O. Check, Pilot on Port 3	60/16	420/6000	CV19
	**DUAL PILOT OPERATED CHECKS**					
	CPD084P	C08-4	Dual P.O. Check Cartridge	19/5	207/3000	CV20
	PP02DP	CAV02-DP	Pilot Piston - Dual	40/11	420/6000	CV21-CV22
	PP04DP	CAV04-DP	Pilot Piston - Dual	135/36	420/6000	CV23-CV24
	PP06DP	CAV06-DP	Pilot Piston - Dual	340/90	420/6000	CV25-CV26
	**CHECK WITH RELIEF**					
	D04F2	C10-2	Check With Thermal Relief, Relieving Port 2 to 1	130/40	420/6000	CV27

PRODUCT TYPES / APPLICATIONS

Check Valve - Poppet Type

Check valves are poppet style elements that allow free flow in one direction while preventing flow in the reverse direction. They can be used to isolate portions of a hydraulic circuit or to provide a free flow path around a restrictive valve.

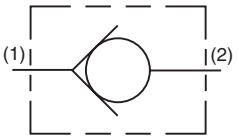


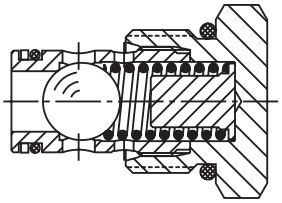


OPERATION - Pressure on the inlet (port 1) of the check valve creates a force against the poppet, pushing it off its seat and permitting free flow to port 2. Reverse flow through the check is blocked by the poppet.

Check Valve - Ball Type

Ball type check valves are check valves that use a hardened steel ball to seal against the valve seat as opposed to a poppet. They are simple in their design and provide low leakage over the life of the system.

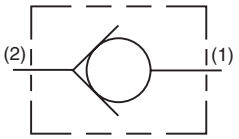


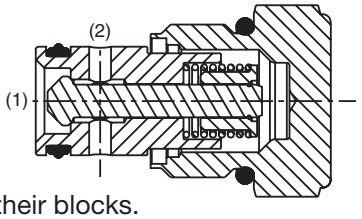


OPERATION - Pressure on the inlet (port 1) of the check valve creates a force on the steel ball pushing it off of it's seat and permitting free flow to port 2. Reverse flow through the check is blocked by the steel ball on the seat.

Side to Nose Check Valve

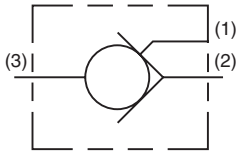
Side to nose check valves are a special type of check valve where the free flow path is from the side of the cartridge valve to the nose. They functionally are the same as the standard check valve. Side to nose check valves are occasionally used by manifold designers to simplify the flow path design of their blocks.





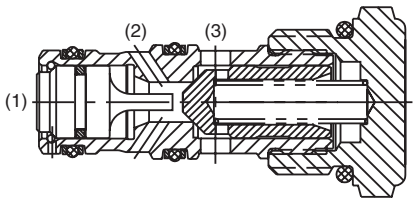
OPERATION - Pressure on the inlet (port 2) of the check valve creates a force against the poppet, pushing it off its seat and permitting free flow to port 1. Reverse flow through the check is blocked by the poppet.

Pilot Operated Check Valve

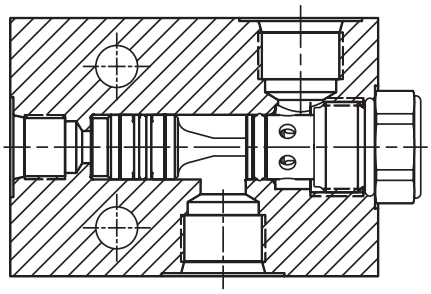


Pilot operated check valves (also referred to as P.O. check valves), are check valves which can be opened by an external pilot pressure. Thus, P.O. checks, block flow in one direction, like standard check valves, but can be released once an adequate pilot pressure is applied. Free flow is allowed in the reverse direction. P.O. checks are often used to positively lock a dual acting cylinder. There are two types of pilot operated check valves; threaded cartridge style and pilot piston style. These valves work best when used in conjunction with a control valve that vents the valve ports to tank when centered.

Cartridge Style P.O. Check Valve

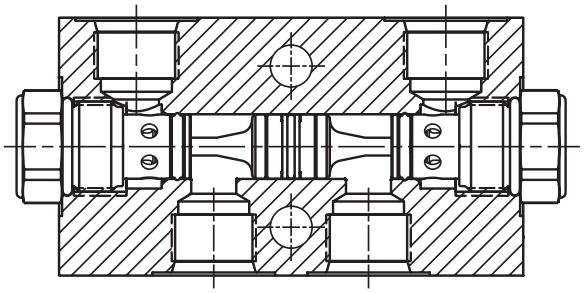


Single Pilot Piston Style P.O. Check Valve

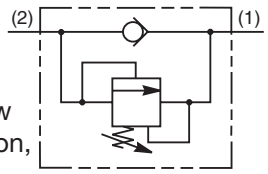


OPERATION - In the absence of adequate pilot pressure, the poppet remains seated preventing flow from the actuator port (port 3) to the valve port (port 2). Once adequate pilot pressure is applied at the pilot port (port 1), the internal pilot piston unseats the check poppet permitting flow from port 3 to port 2. The amount of pressure needed at port 1 to unseat the check valve is determined by the pilot ratio of the pilot piston to the poppet seat diameter. If you have a pilot operated check valve with a 3:1 ratio pilot piston, then you would need a pilot pressure at port 1 that is 1/3 of the pressure being checked at port 3 plus the spring. For example, if you had 3000 psi on port 3 and a 5 psi spring and a 3:1 pilot ratio, it would take 1002 psi [(3000 psi + 5 psi) / 3)] to release the check valve.
Free flow is permitted from the valve port (port 2) to the cylinder port (port 3).

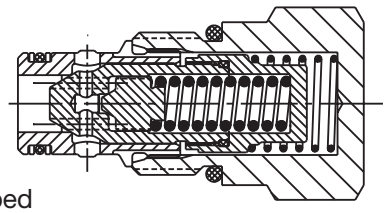
Dual Pilot Piston Style P.O. Check Valve



Check Valve With Thermal Relief



The check valve with thermal relief performs the same function as a standard check valve. It allows free flow in one direction. In the opposite direction, it performs as a normal check valve preventing flow, while also venting excess pressure caused by the thermal expansion of fluid. This type of valve can be used with an external pilot piston to provide a pilot operated valve that will vent trapped pressure due to thermal expansion. These valves work best when used in conjunction with a control valve that vents the valve ports to tank when centered.



OPERATION - The check valve is a guided poppet design. As the pressure on the inlet exceeds the spring rate, the poppet is pushed off of its seat allowing flow to pass. Once the pressure on the inlet side drops below the spring force, the spring then pushes the poppet back on its seat blocking flow from the outlet to the inlet of the check valve. If the pressure on the outlet side of the check valve (when it is in a load holding function) rises (through thermal expansion), the direct acting relief will vent the excess pressure caused by the thermal expansion to the inlet side of the check.

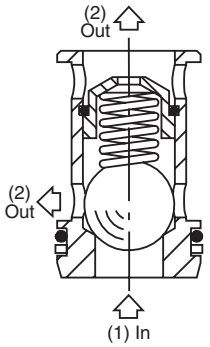
General Description

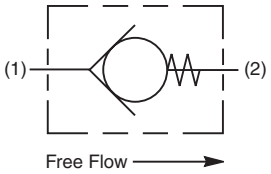
Ball Type, Check Valve Insert. For additional information see Technical Tips on pages CV1-CV2.

Features

- For inserting inside manifold blocks
- High flow capacity
- Minimal leakage - less than 3 drops/min.
- Simple construction - extremely cost effective
- Range of cracking pressures available
- Good contamination tolerance

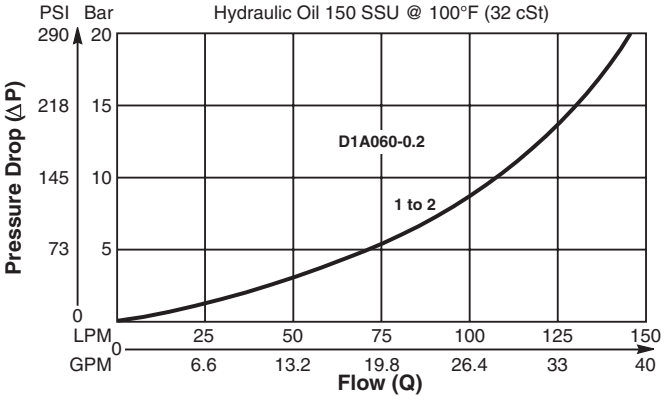




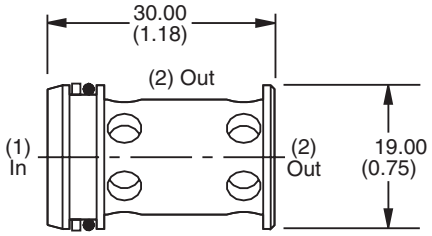


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	145 LPM (38 GPM)
Nominal Flow @ 7 Bar (100 PSI)	90 LPM (24 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Cartridge Material	Steel operating parts, hardened steel ball.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.085 kg (.19 lbs.)
Cavity	2U (See BC Section for more details)

Ordering Information

D1A060	–		N
Check Valve Insert		Cracking Pressure	Seals

Code	Cracking Pressure
0.2	0.2 Bar (3 PSI) Std.
1.0	1.0 Bar (15 PSI)
2.0	2.0 Bar (30 PSI)
3.0	3.0 Bar (45 PSI)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30019N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately See section BC

LB10	205	S
Line Body	Porting	Body Material

Code	Porting
205	1/2″ BSP

Code	Body Material
S	Steel

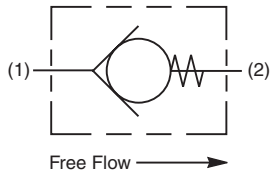
General Description

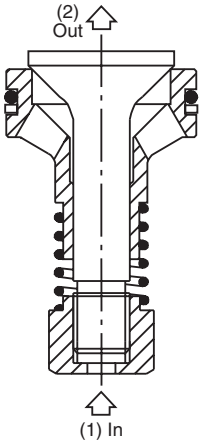
Poppet Type, Check Valve Insert. For additional information see Technical Tips on pages CV1-CV2.

Features

- For inserting inside manifold blocks
- High flow capacity
- Minimal leakage - less than 3 drops/min.
- Simple construction - extremely cost effective
- Range of cracking pressures available
- Good contamination tolerance

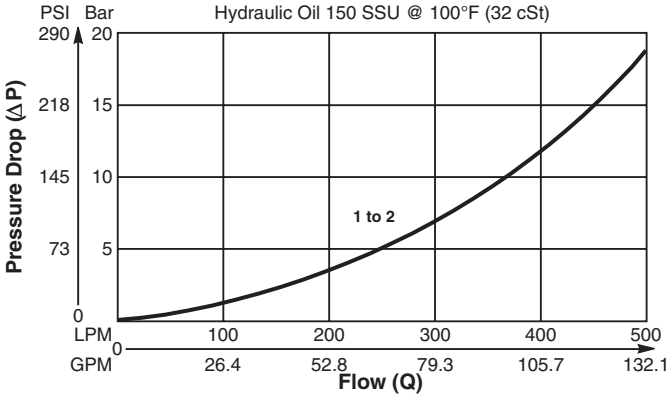




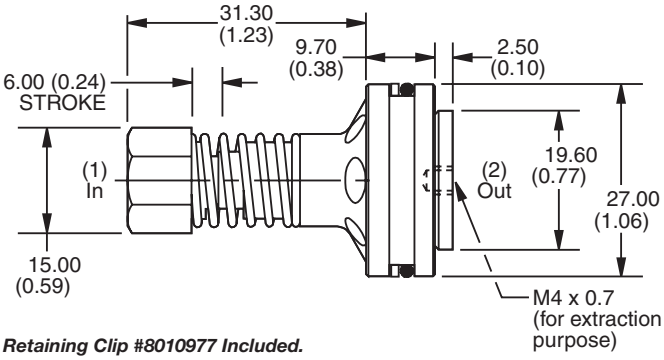


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Retaining Clip #8010977 Included.

Specifications

Rated Flow	500 LPM (132 GPM)
Nominal Flow @ 7 Bar (100 PSI)	300 LPM (79 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Cartridge Material	Steel operating parts, hardened steel poppet.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.06 kg (.13 lbs.)
Cavity	2C (See BC Section for more details)

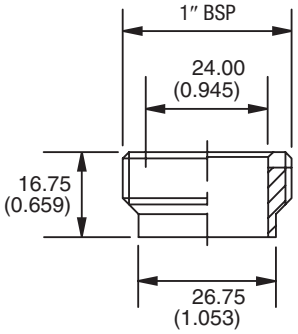
Ordering Information

D1B125	–		**N**
Check Valve Insert		**Cracking Pressure**	**Seals**

Code	Cracking Pressure
0.1	0.1 Bar (1.5 PSI)
0.2	0.2 Bar (3 PSI)
1.0	1.0 Bar (15 PSI) Std.
2.0	2.0 Bar (30 PSI)
3.0	3.0 Bar (45 PSI)
5.0	5.0 Bar (72 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30014N-1)
	Operating Temp.
	-34°C to +121°C (-30°F to +250°F)

Retainer



***Note:** Valve is supplied with retention round wire circlip. As an alternative to circlip retention of the check valve insert, the threaded retainer shown here can be used to lock the insert beneath 1″ BSP ports and should be ordered separately. For 1″ BSP order as RT10001. Torque to 85 Nm (63 lb. ft.)*

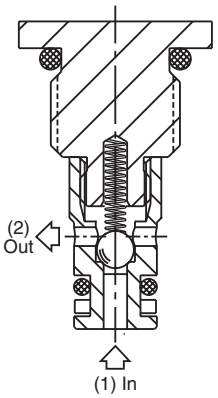
General Description

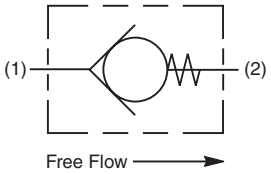
Miniature Ball Type Check Valve. For additional information see Technical Tips on pages CV1-CV2.

Features

- Low leakage - less than 3 drops/min.
- Ball type construction for cost effective design
- Extremely compact
- Good contamination tolerance
- All external parts zinc plated

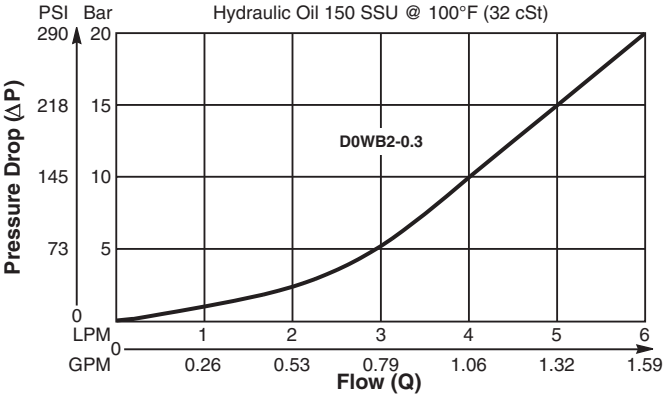




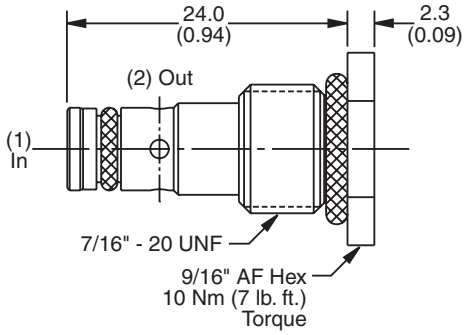


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	6 LPM (1.6 GPM)
Nominal Flow @ 7 Bar (100 PSI)	3.5 LPM (0.9 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Cartridge Material	Steel operating parts, hardened steel ball.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.012 kg (.026 lbs.)
Cavity	CAV0W-2 (See BC Section for more details)

Ordering Information

D0WB2	–	0.3		N
Check Valve		Cracking Pressure		Seals

Code	Cracking Pressure
0.3	0.3 Bar (4 PSI)

Order Bodies Separately See section BC

LB10	796	S
Line Body	Porting	Body Material

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30519N-1)	-34°C to +121°C (-30°F to +250°F)

Code	Porting
796	1/4″ BSP

Code	Body Material
S	Steel

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

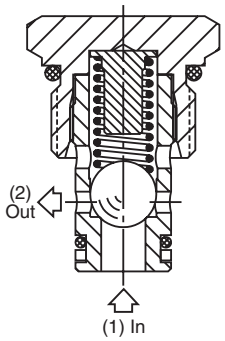
General Description

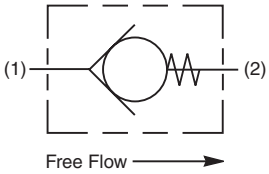
Ball Type Check Valve. For additional information see Technical Tips on pages CV1-CV2.

Features

- Low leakage - less than 3 drops/min.
- Ball type construction for cost effective design
- Single and dual pilot pistons available to create pilot to open check
- Range of cracking pressures available - up to 25 Bar (362 PSI)
- Good contamination tolerance
- All external parts zinc plated

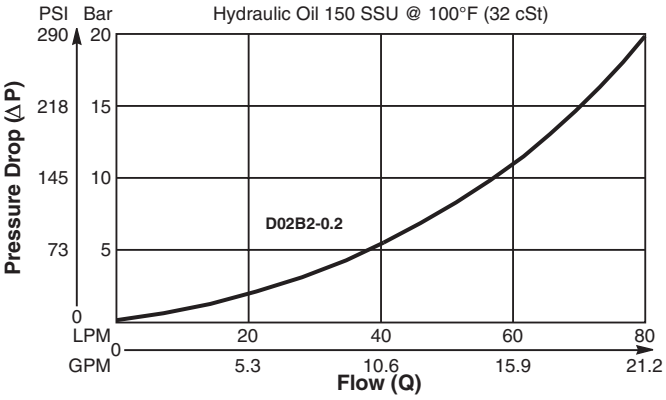




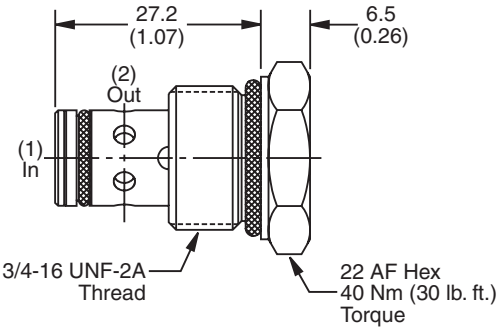


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	80 LPM (21 GPM)
Nominal Flow @ 7 Bar (100 PSI)	45 LPM (12 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Cartridge Material	Steel operating parts, hardened steel ball.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.05 kg (.11 lbs.)
Cavity	C08-2 (See BC Section for more details)

Ordering Information

D02B2	–		N
Ball Type Check Valve		Cracking Pressure	Seals

Order Bodies Separately See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

Code	Cracking Pressure
0.2	0.2 Bar (3 PSI) Std.
1.0	1.0 Bar (15 PSI)
1.5	1.5 Bar (22 PSI)
2.1	2.1 Bar (30 PSI)
2.5	2.5 Bar (36 PSI)
3.4	3.4 Bar (50 PSI)
6.0	6.0 Bar (87 PSI)
10.0	10.0 Bar (145 PSI)

Port Size
3/8″ BSP

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30515N-1)	-34°C to +121°C (-30°F to +250°F)

Body Material
Steel

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

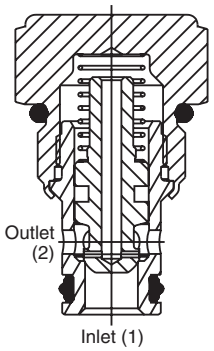
General Description

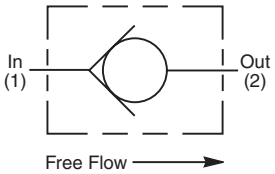
Cartridge Style Check Valve. For additional information see Technical Tips on pages CV1-CV2.

Features

- Spherical poppet for low leakage
- "D"-Ring eliminates back-up rings
- Dual sense paths for reduced ΔP
- All external parts zinc plated

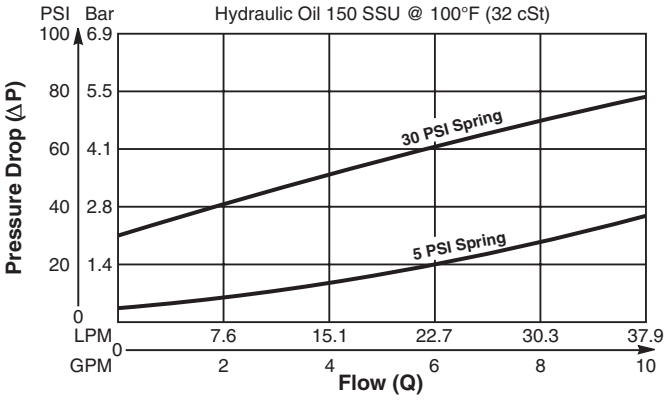




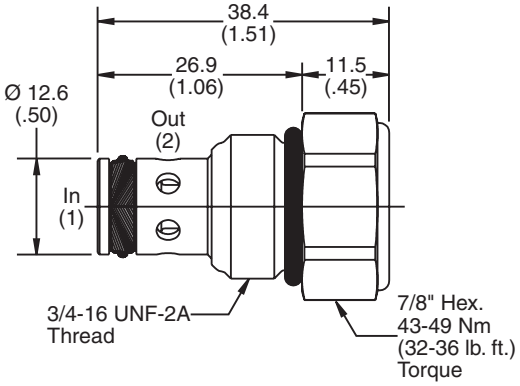


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	38 LPM (10 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	2 drops/min. (.13 cc/min.) at 350 Bar (5000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.10 kg (0.2 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

Ordering Information

CVH081P – ☐

08 Size Check Valve — **Cracking Pressure**

Code	Cracking Pressure
Omit	0.3 Bar (5 PSI)
10	0.7 Bar (10 PSI)
30	2.1 Bar (30 PSI)

Order Bodies Separately See section BC

B08 — **2** — **6B**

08 Size — **2-Way Cavity** — **Port Size**

Seals / Kit No.	Operating Temp.
"D" -Ring / (SK08-2)	-37°C to +93°C (-35°F to +200°F)

Port Size
3/8″ BSP

Body Material
Steel

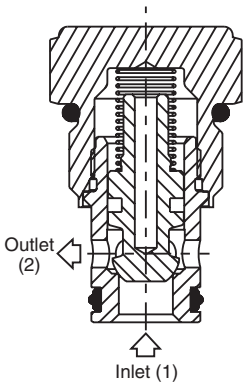
General Description

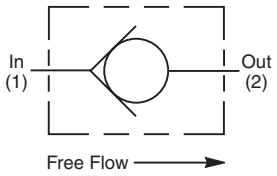
Cartridge Style Check Valve. For additional information see Technical Tips on pages CV1-CV2.

Features

- Spherical poppet for low leakage
- "D"-Ring eliminates back-up rings
- Dual sense paths for reduced ΔP
- All external parts zinc plated

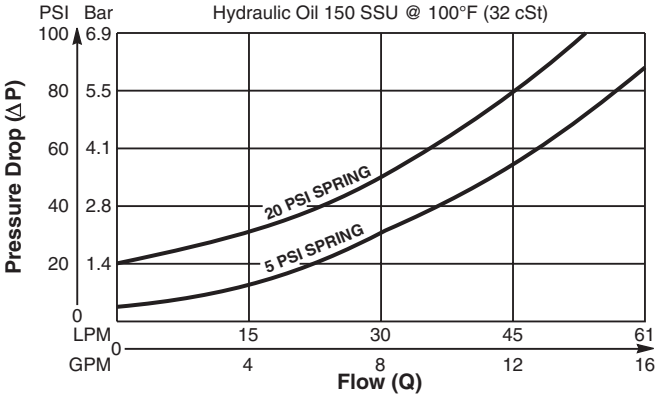




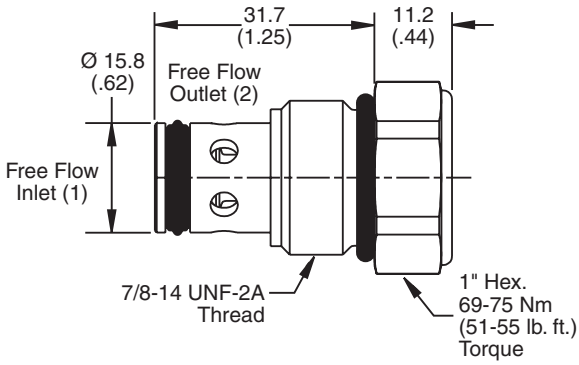


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	60 LPM (16 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	2 drops/min. (.13 cc/min.) at 350 Bar (5000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.09 kg (0.2 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

Ordering Information

CVH103P – [ ]

10 Size Check Valve — **Cracking Pressure**

Code	Cracking Pressure
Omit	0.3 Bar (5 PSI)
20	1.4 Bar (20 PSI)
50	3.5 Bar (50 PSI)

Order Bodies Separately
See section BC

B10 — **2** — **8B**

10 Size — **2-Way Cavity** — **Port Size**

Seals / Kit No.	Operating Temp.
"D" -Ring / (SK10-2)	-37°C to +93°C (-35°F to +200°F)

Port Size
1/2″ BSP

Body Material
Steel

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

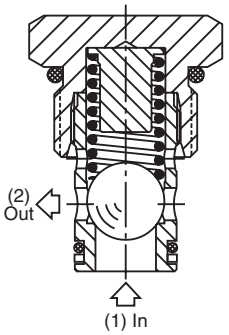
General Description

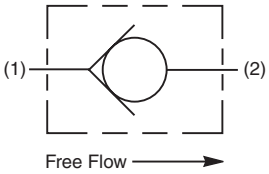
Ball Type Check Valve. For additional information see Technical Tips on pages CV1-CV2.

Features

- Low leakage - less than 3 drops/min.
- Ball type construction for cost effective design
- Single and dual pilot pistons available to create pilot to open check
- Range of cracking pressures available
- Good contamination tolerance
- All external parts zinc plated

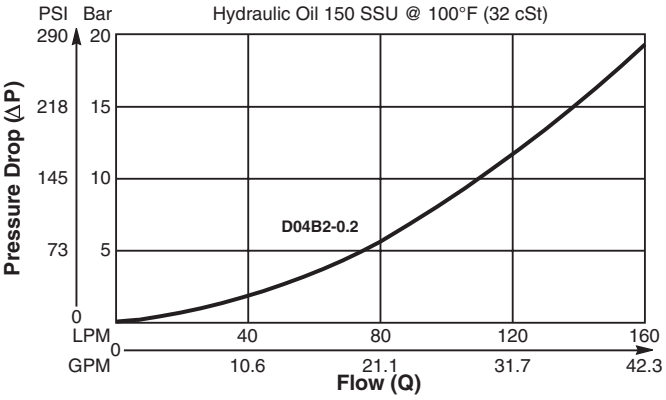




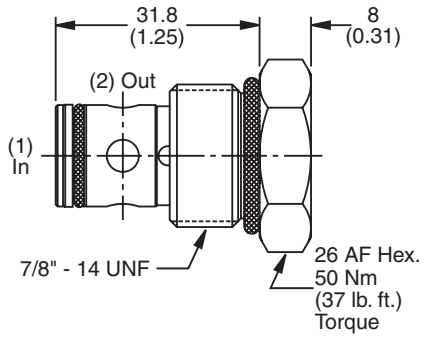


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	160 LPM (42 GPM)
Nominal Flow @ 7 Bar (100 PSI)	90 LPM (24 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	3 drops/min.
Cartridge Material	Steel operating parts, hardened steel ball.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.08 kg (.18 lbs.)
Cavity	C10-2 (See BC Section for more details)

Ordering Information

D04B2	–		N
Ball Type Check Valve		Cracking Pressure	Seals

Code	Cracking Pressure
0.2	0.2 Bar (3 PSI) Std.
1.0	1.0 Bar (15 PSI)
2.1	2.1 Bar (30 PSI)
10.0	10.0 Bar (145 PSI)

Order Bodies Separately See section BC

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30516N-1)	-34°C to +121°C (-30°F to +250°F)

Port Size
1/2″ BSP

Body Material
Steel

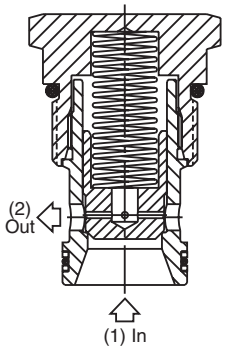
General Description

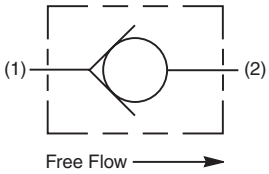
Poppet Type Check Valve. For additional information see Technical Tips on pages CV1-CV2.

Features

- Extra low pressure drop capability for systems up to 250 Bar
- Poppet type construction for minimal leakage - less than 3 drops/min.
- Hardened poppet for maximum durability
- Good contamination tolerance
- All external parts zinc plated

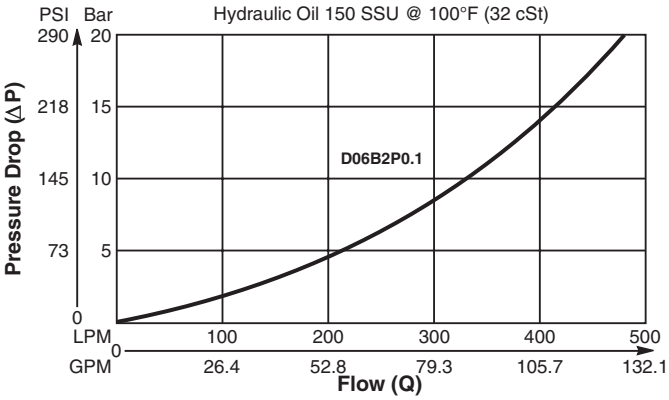






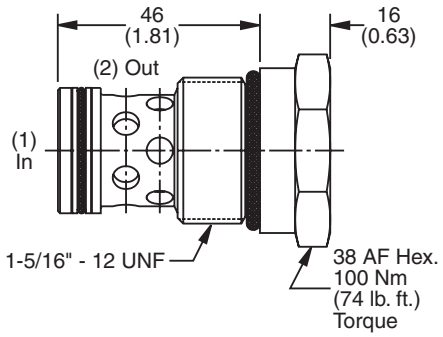
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions

Millimeters (Inches)



Specifications

Rated Flow	500 LPM (132 GPM)
Nominal Flow @ 7 Bar (100 PSI)	280 LPM (74 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Cartridge Material	Steel operating parts, hardened steel poppet.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.27 kg (.60 lbs.)
Cavity	C16-2 (See BC Section for more details)

Ordering Information

D06B2P	–		N
16 Size Check Valve		Cracking Pressure	Seals

Code	Cracking Pressure
0.1	0.1 Bar (1.5 PSI) Std.
1.0	1.0 Bar (15 PSI)
2.1	2.1 Bar (30 PSI)
3.4	3.4 Bar (50 PSI)
4.1	4.1 Bar (60 PSI)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30507N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B16	—	2	—	16B
16 Size		2-Way Cavity		Port Size

Port Size
1″ BSP

Body Material
Steel

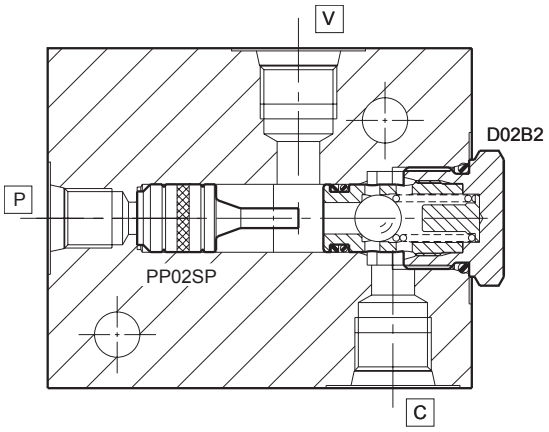
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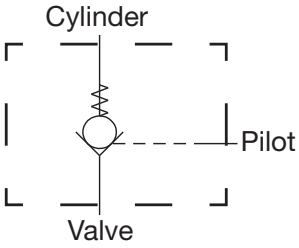
General Description

Single Pilot Operated Check Valve Package.
For additional information see Technical Tips on pages CV1-CV2.

Features

- Uses standard check valve cartridge with separate piston to form a single pilot operated check.
- Low Leakage
- Cost effective
- Leak free pilot pistons available - Consult Parker Sales
- All external parts zinc plated





OPERATION

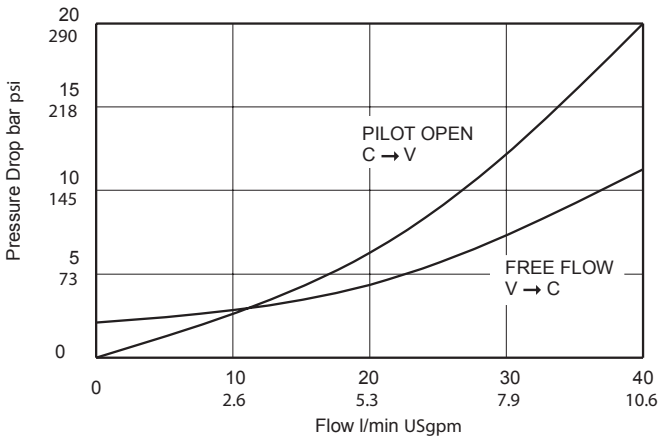
The spring-loaded ball is shifted by low pressure on port [V] allowing free flow to port [C]. The pilot piston is shifted by pilot pressure on port [P] and acts to shift the spring-loaded ball allowing flow from port [C] to port [V].

Reverse flow, [C] to [V], is blocked when pressure on port [C] is 4 times greater than the pilot pressure on port [P]. Back pressure on port [V] and a quarter of the load pressure on port [C] each adds to the pilot pressure required on port [P].

It is recommended that a check valve with at least 2 bar cracking pressure is selected to ensure rapid closure when the pilot pressure is released.

Performance Curve

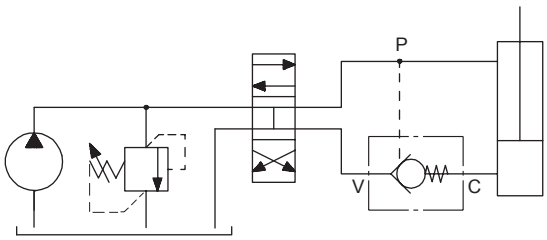
Pressure Drop vs. Flow (Through cartridge only)



Specifications

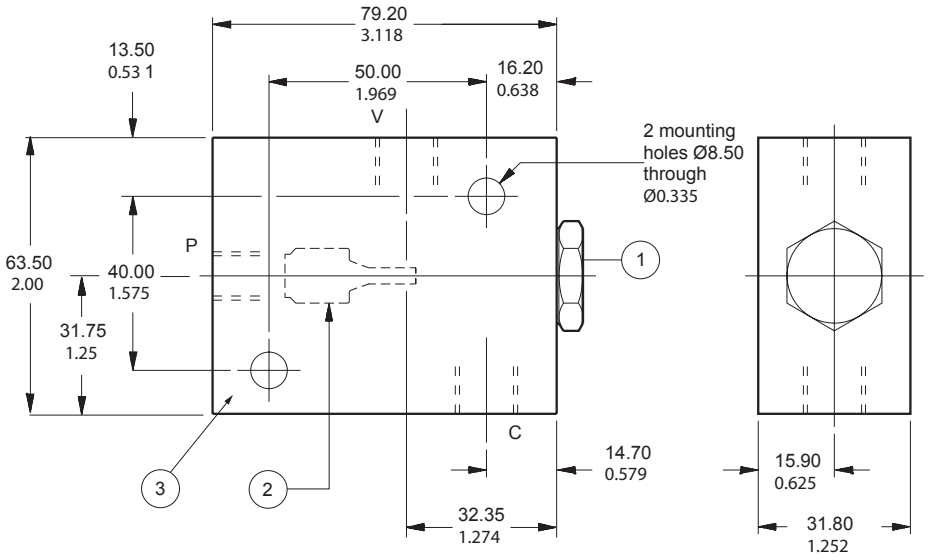
Description	**D02B2 -** Check Valve **PP02SP -** Pilot Piston
Rated Flow	40 LPM (11 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Ratio	4:1
Approx. Weight	Steel Block Assembly 1.3 kg (2.49 lbs.)

Typical Application



Dimensions Millimeters (Inches)

VALVE	PART #
1	D02B2
2	PP02SP
3	LB10771S



Ordering Information

PP02SP		N	771	S
Single P.O. Check Valve Package	Cracking Pressure	Seals	Porting	Body Material

Code	Cracking Pressure
2.1	2.1 Bar (30 PSI)
2.5	2.5 Bar (36 PSI)
3.4	3.4 Bar (50 PSI)
6.0	6.0 Bar (87 PSI)
10.0	10.0 Bar (145 PSI)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30517N-1)	-34°C to +121°C (-30°F to +250°F)

LB10	771	S
Line Body	Porting	Body Material

Code	Porting
771	3/8″ BSP (main) 1/4″ BSP (aux)

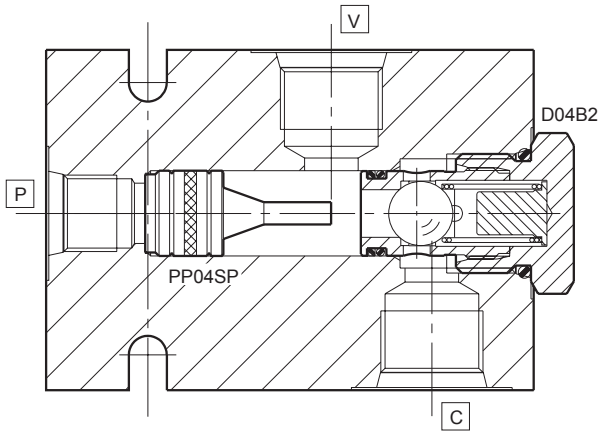
Code	Body Material
S	Steel

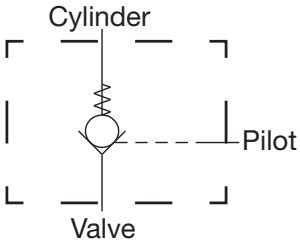
General Description

Single Pilot Operated Check Valve Package.
For additional information see Technical Tips on pages CV1-CV2.

Features

- Uses standard check valve cartridge with separate piston to form a single pilot operated check.
- Low Leakage
- Cost effective
- Leak free pilot pistons available - Consult Parker Sales
- All external parts zinc plated





OPERATION

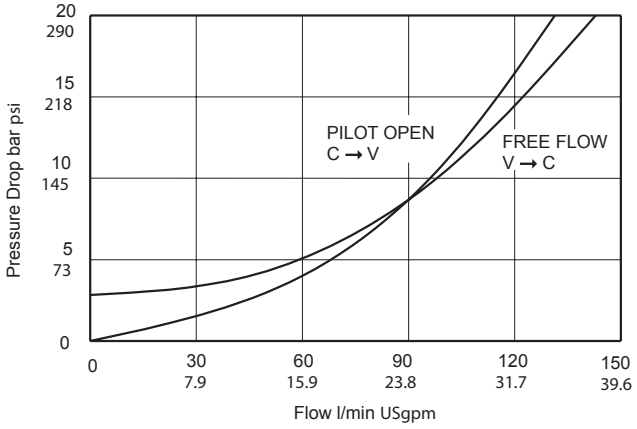
The spring-loaded ball is shifted by low pressure on port [V] allowing free flow to port [C]. The pilot piston is shifted by pilot pressure on port [P] and acts to shift the spring-loaded ball allowing flow from port [C] to port [V].

Reverse flow, [C] to [V], is blocked when pressure on port [C] is 3 times greater than the pilot pressure on port [P]. Back pressure on port [V] and a third of the load pressure on port [C] each adds to the pilot pressure required on port [P].

It is recommended that a check valve with at least 2 bar cracking pressure is selected to ensure rapid closure when the pilot pressure is released.

Performance Curve

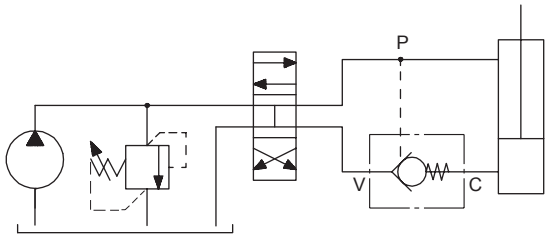
Pressure Drop vs. Flow (Through cartridge only)



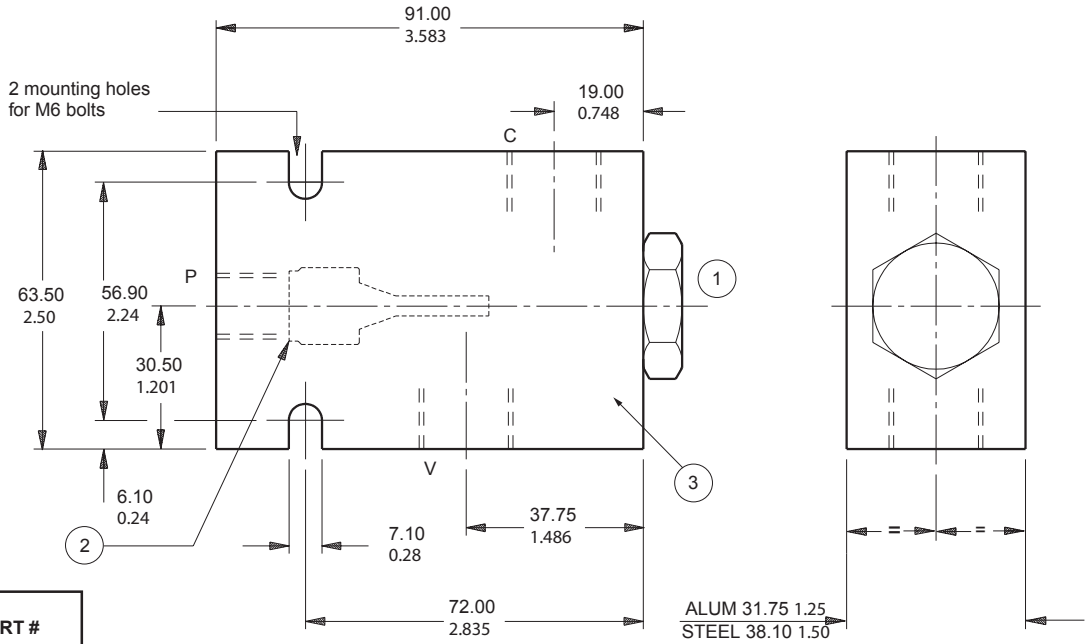
Specifications

Description	**D04B2 -** Check Valve **PP04SP -** Pilot Piston
Rated Flow	135 LPM (36 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Ratio	3:1
Approx. Weight	Steel Block Assembly 1.53 kg (3.37 lbs.)

Typical Application



Dimensions Millimeters (Inches)



VALVE	PART #
1	D04B2
2	PP04SP
3	LB10761S

Ordering Information

PP04SP		N	761	S
Single P.O. Check Valve Package	Cracking Pressure	Seals	Porting	Body Material

Code	Cracking Pressure
2.1	2.1 Bar (30 PSI)
10.0	10.0 Bar (145 PSI)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30518N-1)	-34°C to +121°C (-30°F to +250°F)

LB10	761	S
Line Body	Porting	Body Material

Code	Porting
761	1/2″ BSP (main) 1/4″ BSP (aux)

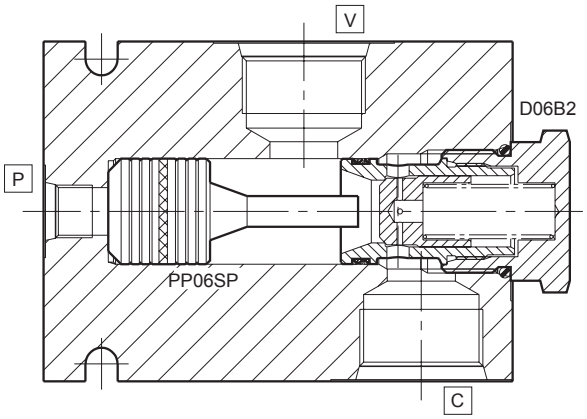
Code	Body Material
S	Steel

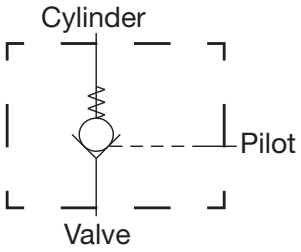
General Description

Single Pilot Operated Check Valve Package.
For additional information see Technical Tips on pages CV1-CV2.

Features

- Uses standard check valve cartridge with separate piston to form a single pilot operated check.
- Low Leakage
- Cost effective
- Leak free pilot pistons available - Consult Parker Sales
- All external parts zinc plated





OPERATION

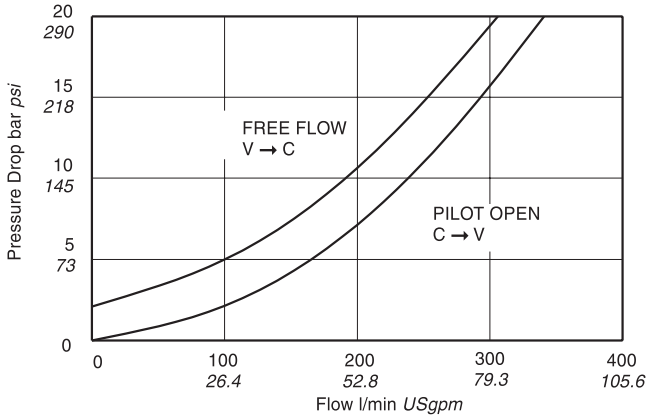
The spring-loaded poppet is shifted by low pressure on port [V] allowing free flow to port [C]. The pilot piston is shifted by pilot pressure on port [P] and acts to shift the spring-loaded poppet allowing flow from port [C] to port [V].

Reverse flow, [C] to [V], is blocked when pressure on port [C] is 3 times greater than the pilot pressure on port [P]. Back pressure on port [V] and a third of the load pressure on port [C] each adds to the pilot pressure required on port [P].

It is recommended that a check valve with at least 2 bar cracking pressure is selected to ensure rapid closure when the pilot pressure is released.

Performance Curve

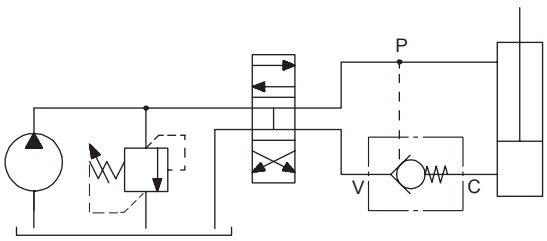
Pressure Drop vs. Flow (Through cartridge only)



Specifications

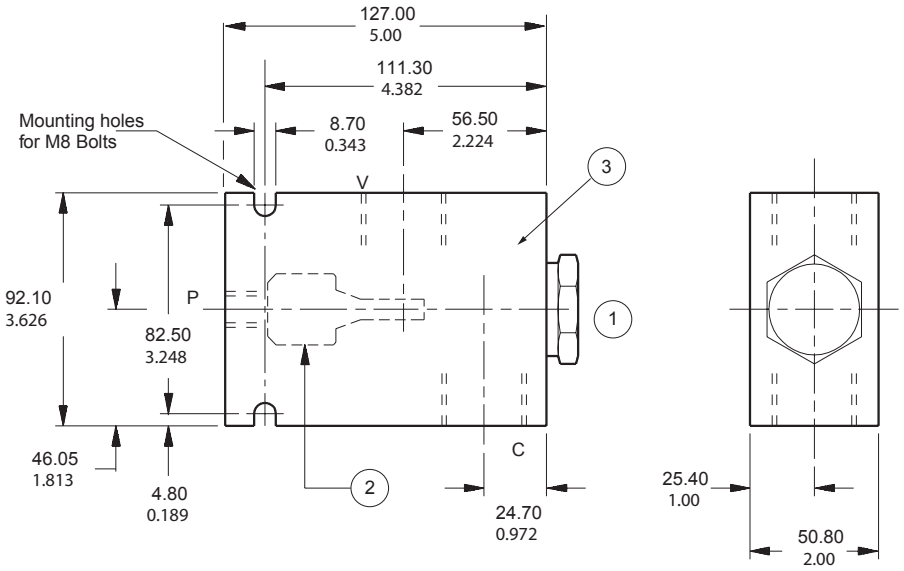
Description	**D06B2 -** Check Valve **PP06SP -** Pilot Piston
Rated Flow	340 LPM (90 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Ratio	3:1
Approx. Weight	Steel Block Assembly 4.56 kg (10.05 lbs.)

Typical Application



Dimensions Millimeters (Inches)

VALVE	PART #
1	D06B2
2	PP06SP
3	LB10806S



Ordering Information

PP06SP		N	806	S
Single P.O. Check Valve Package	Cracking Pressure	Seals	Porting	Body Material

Code	Cracking Pressure
2.1	2.1 Bar (30 PSI)
3.4	3.4 Bar (50 PSI)
4.1	4.1 Bar (60 PSI)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30524N-1)	-34°C to +121°C (-30°F to +250°F)

LB10	806	S
Line Body	Porting	Body Material

Code	Porting
806	1″ BSP (main) 3/8″ BSP (aux)

Code	Body Material
S	Steel

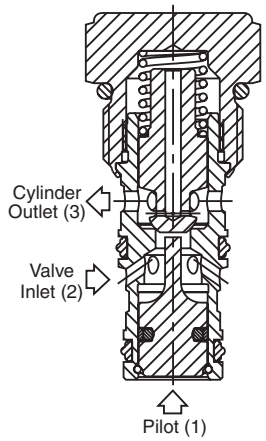
General Description

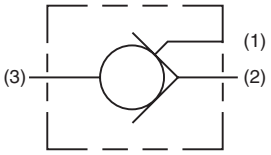
Cartridge Style Pilot Operated Check Valve. For additional information see Technical Tips on pages CV1-CV2.

Features

- Hardened, precision ground parts for durability
- Internal pilot position simplifies manifold design
- All external parts zinc plated

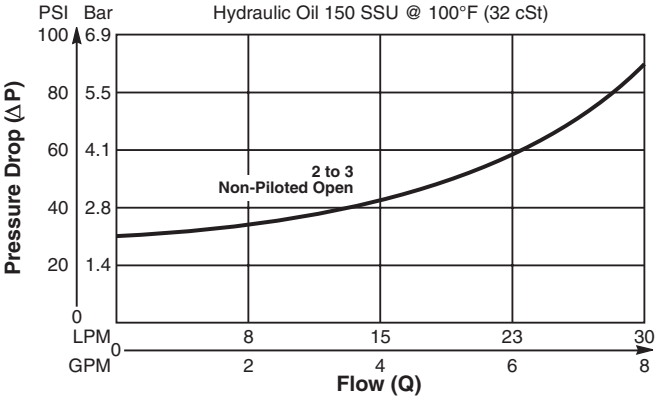




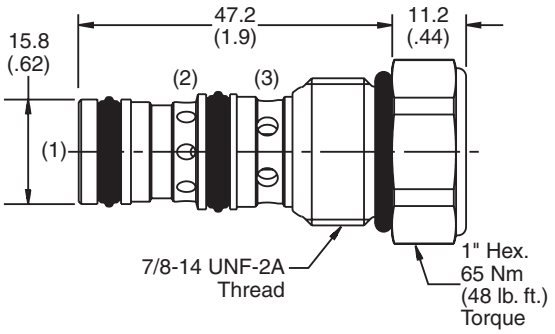


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	30 LPM (8 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	2 drops/min. (0.13 cc/min.) at 350 Bar (5000 PSI)
Pilot Ratio	4:1
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.09 kg (0.2 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

Ordering Information

CPH104P – [ ]

10 Size P.O. Check Valve — **Cracking Pressure**

Code	Cracking Pressure
Omit	2.1 Bar (31 PSI)
50	3.5 Bar (50 PSI)

Order Bodies Separately See section BC

B10 — **3** — **8B**

10 Size — **3-Way Cavity** — **Port Size**

Seals / Kit No.	Operating Temp.
Nitrile / (SK10-3N)	-34°C to +121°C (-30°F to +250°F)

Port Size
1/2″ BSP

Body Material
Steel

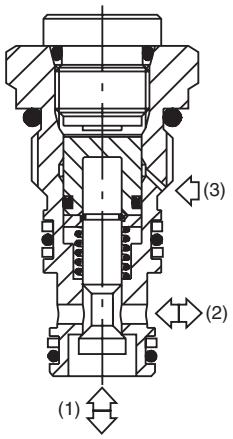
General Description

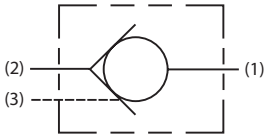
Miniature Pilot to Open, Poppet Type Check Valve. For additional information see Technical Tips on pages CV1-CV2.

Features

- Hardened poppet for maximum durability
- Low leakage - less than 3 drops/min.
- Sealed pilot
- Extremely compact construction - can be fitted directly into most cylinders
- Cavity commonality with load control valves
- Dual line blocks available
- All external parts zinc plated

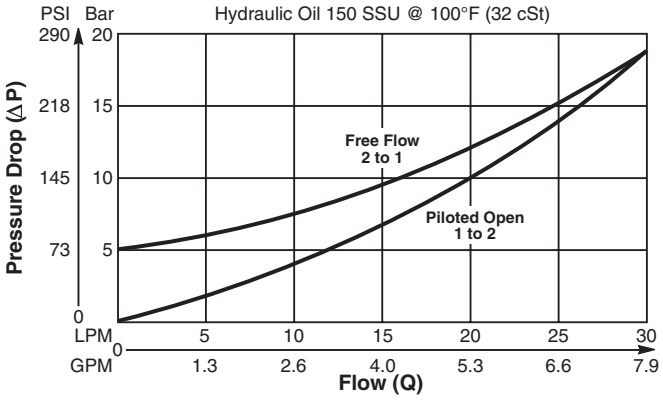






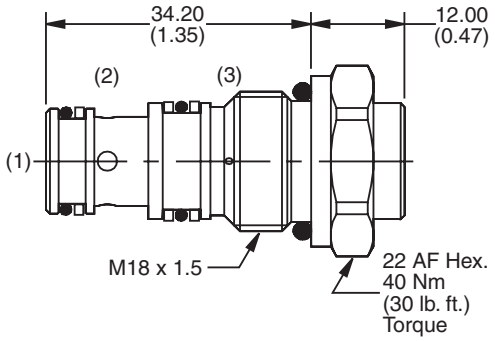
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions

Millimeters (Inches)



Specifications

Rated Flow	30 LPM (8 GPM)
Nominal Flow @ 7 Bar (100 PSI)	16 LPM (4.2 GPM) (Piloted Open)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Cracking Pressure	5 Bar (72 PSI)
Pilot Ratio	4:1
Cartridge Material	Steel operating parts, hardened steel poppet.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.066 kg (.145 lbs.)
Cavity	53-1 (See BC Section for more details)

Ordering Information

D4A020	N
Check Valve	Seals

Order Bodies Separately
See section BC

LB10		S
Line Body	Porting	Body Material

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30090N-1)	-34°C to +121°C (-30°F to +250°F)

Code	Porting
310	3/8″ BSP (main) 1/4″ BSP (aux)
312	3/8″ BSP Dual Cavity

Code	Body Material
S	Steel

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

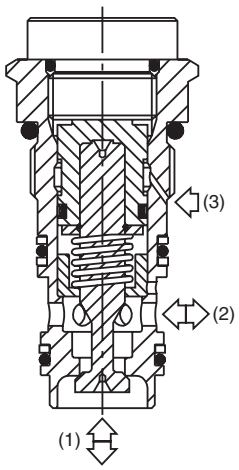
General Description

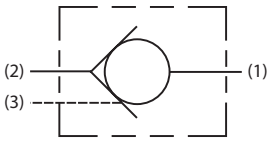
Pilot to Open, Poppet Type Check Valve. For additional information see Technical Tips on pages CV1-CV2.

Features

- Hardened poppet for maximum durability
- High flow capacity
- Low leakage - less than 3 drops/min.
- Sealed pilot
- Good contamination tolerance
- Cavity commonality with load control valves
- Dual line blocks available
- All external parts zinc plated

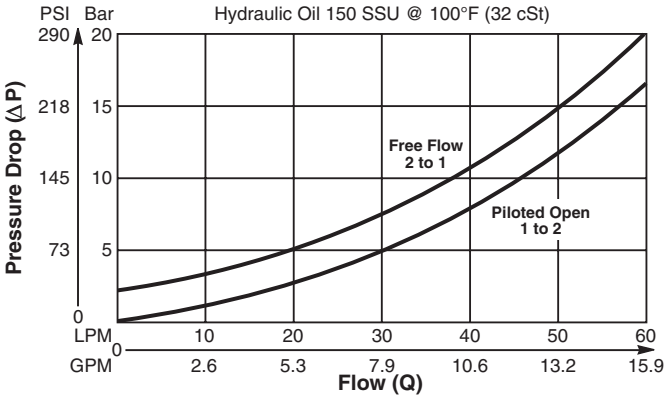






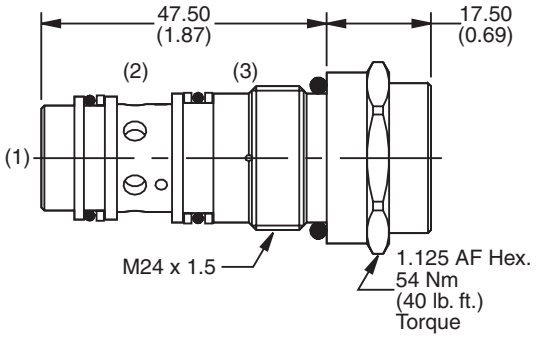
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions

Millimeters (Inches)



Specifications

Rated Flow	60 LPM (16 GPM)
Nominal Flow @ 7 Bar (100 PSI)	32 LPM (8.5 GPM) (Piloted Open)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Cracking Pressure	3 Bar (43.5 PSI)
Pilot Ratio	4:1
Cartridge Material	Steel operating parts, hardened steel poppet.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.15 kg (.33 lbs.)
Cavity	68-1 (See BC Section for more details)

Ordering Information

D4A040	N
Check Valve	Seals

Order Bodies Separately
See section BC

LB10		S
Line Body	Porting	Body Material

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30059N-1)	-34°C to +121°C (-30°F to +250°F)

Code	Porting
251	1/2″ BSP (main) 1/4″ BSP (aux)
259	1/2″ BSP Dual Cavity

Code	Body Material
S	Steel

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

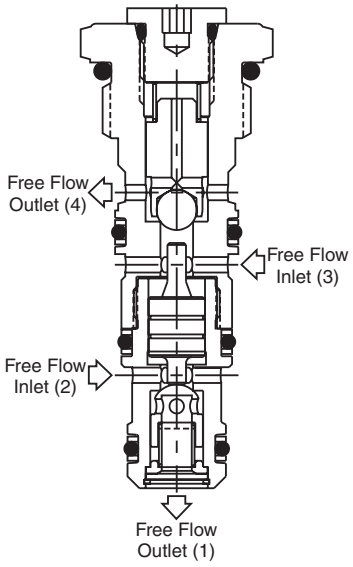
General Description

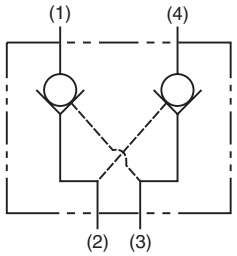
Cartridge Style Dual Pilot Operated Check Valve. For additional information see Technical Tips on pages CV1-CV2.

Features

- Hardened, precision ground parts for durability
- Cost effective-replaces two cartridges
- Internal pilot position
- Common cavity
- All external parts zinc plated

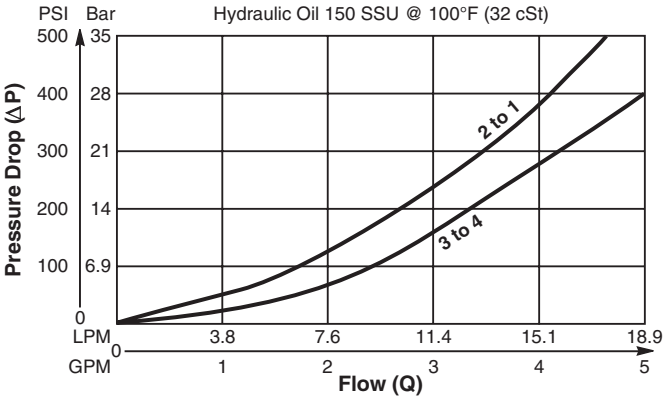




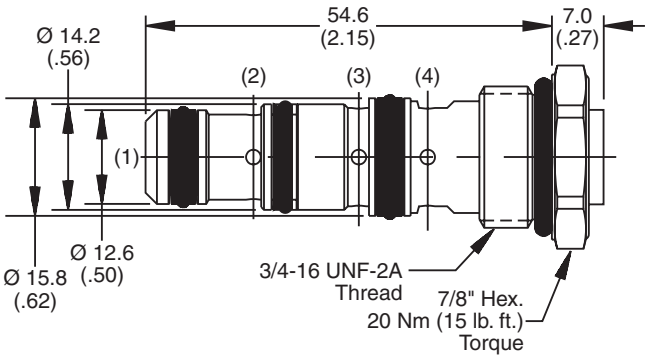


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	19 LPM (5 GPM)
Maximum Inlet Pressure	207 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) at 207 Bar (3000 PSI)
Pilot Ratio	3:1
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.05 kg (.11 lbs.)
Cavity	C08-4 (See BC Section for more details)
Form Tool	Rougher NFT08-4R Finisher NFT08-4F

Ordering Information

CPD084P

08 Size
Dual P.O.
Check Valve

Order Bodies Separately
See section BC

B08	—	4	—	6B
08 Size		**4-Way Cavity**		**Port Size**

Seals / Kit No.	Operating Temp.
Nitrile / (SK08-4N)	-34°C to +121°C (-30°F to +250°F)

Port Size
3/8″ BSP

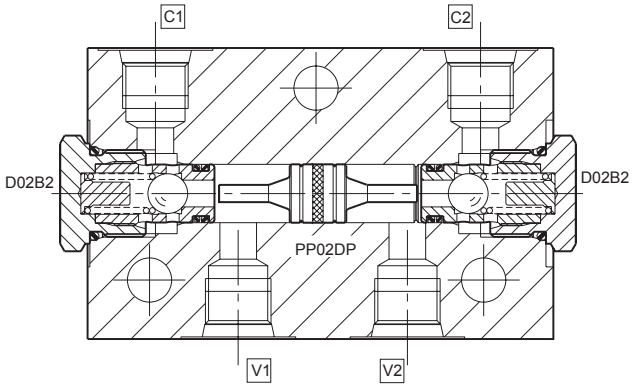
Body Material
Steel

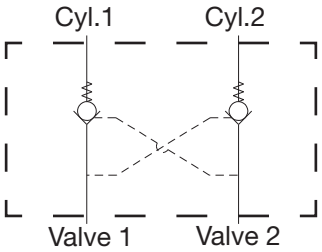
General Description

Dual Pilot Operated Check Valve Package.
For additional information see Technical Tips on pages CV1-CV2.

Features

- Uses standard check valve cartridge with separate piston to form a dual pilot operated check.
- Low Leakage
- Cost effective
- Leak free pilot pistons available - Consult Parker Sales
- All external parts zinc plated





OPERATION

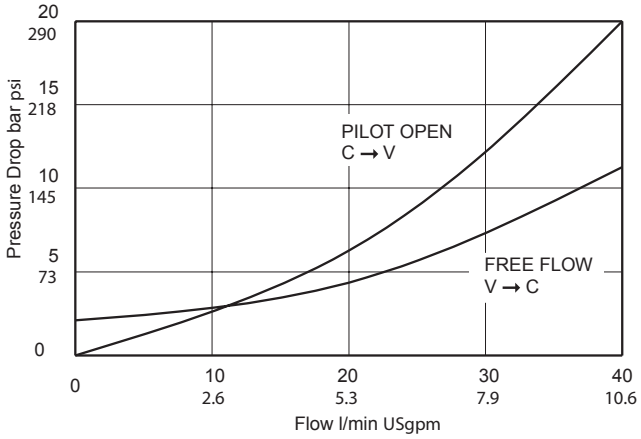
The spring-loaded ball is shifted by low pressure on ports [V1] or [V2] allowing free flow to port [C1] or [C2] respectively. The pilot piston is shifted by pilot pressure on port [V1] or [V2] and acts to shift the spring-loaded ball allowing flow from ports [C2] to [V2] or [C1] to [V1] respectively.

Reverse flow, [C] to [V], is blocked when pressure on port [C] is 4 times greater than the pilot pressure on the corresponding port [V]. Back pressure on port [V] and a quarter of the load pressure on port [C] each adds to the piloting pressure derived from the opposing port [V].

It is recommended that a check valve with at least 2 bar cracking pressure is selected to ensure rapid closure when the pilot pressure is released.

Performance Curve

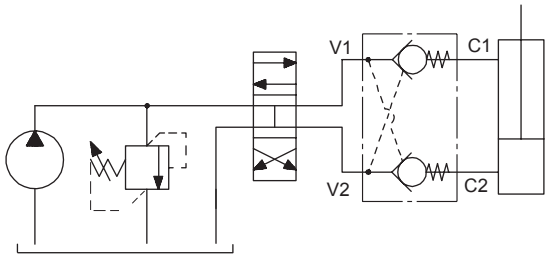
Pressure Drop vs. Flow (Through cartridge only)



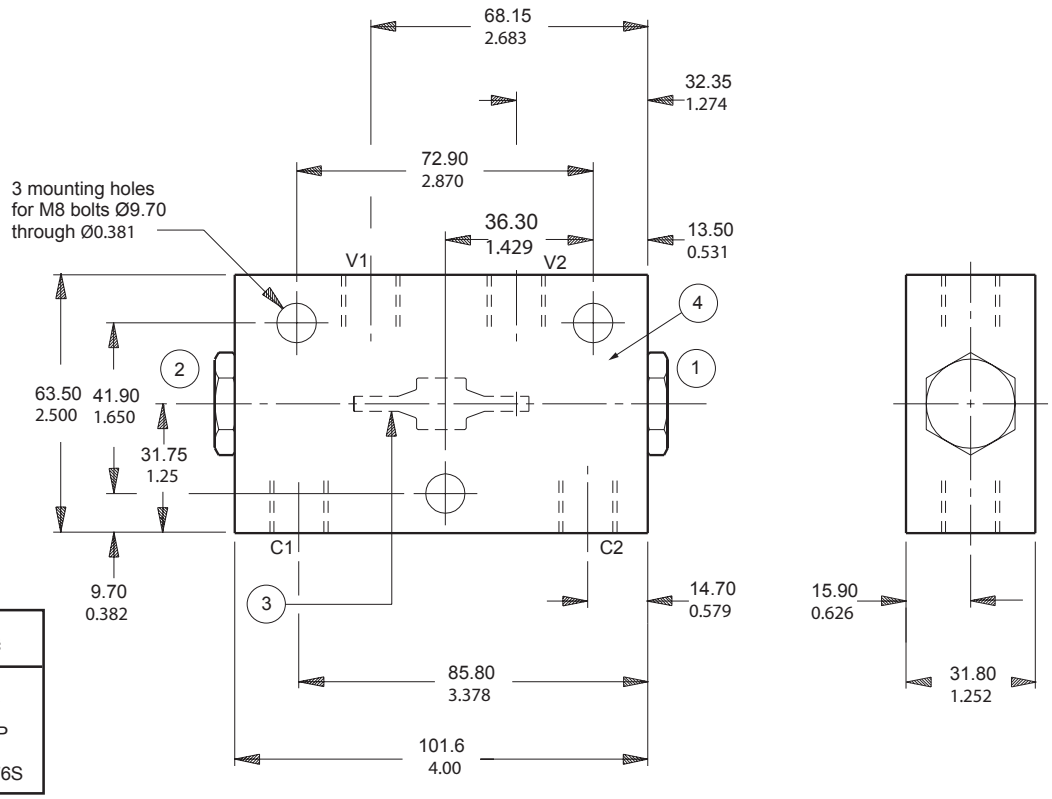
Specifications

Description	**D02B2 -** Check Valve **PP02DP -** Pilot Piston
Rated Flow	40 LPM (11 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Ratio	4:1
Approx. Weight	Steel Block Assembly 1.38 kg (3.04 lbs.)

Typical Application



Dimensions Millimeters (Inches)



VALVE	PART #
1 & 2	D02B2
3	PP02DP
4	LB10776S

Ordering Information

PP02DP		N	776	S
Dual P.O. Check Valve Package	Cracking Pressure	Seals	Porting	Body Material

Code	Cracking Pressure
2.1	2.1 Bar (30 PSI)
2.5	2.5 Bar (36 PSI)
3.4	3.4 Bar (50 PSI)
6.0	6.0 Bar (87 PSI)
10.0	10.0 Bar (145 PSI)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30517N-1)	-34°C to +121°C (-30°F to +250°F)

LB10	776	S
Line Body	Porting	Body Material

Code	Porting
776	3/8″ BSP

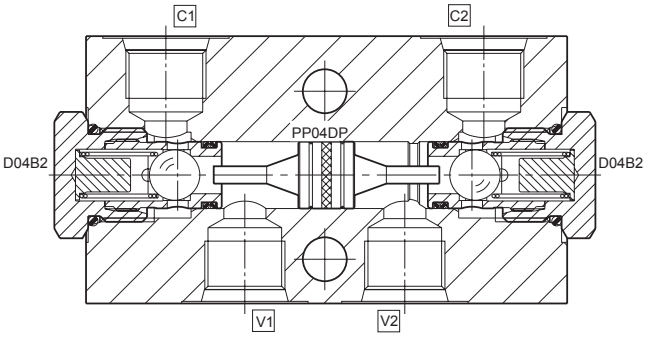
Code	Body Material
S	Steel

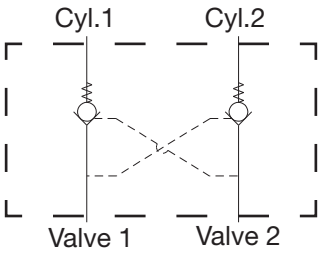
General Description

Dual Pilot Operated Check Valve Package.
For additional information see Technical Tips on pages CV1-CV2.

Features

- Uses standard check valve cartridge with separate piston to form a single pilot operated check.
- Low Leakage
- Cost effective
- Leak free pilot pistons available - Consult Parker Sales
- All external parts zinc plated





OPERATION

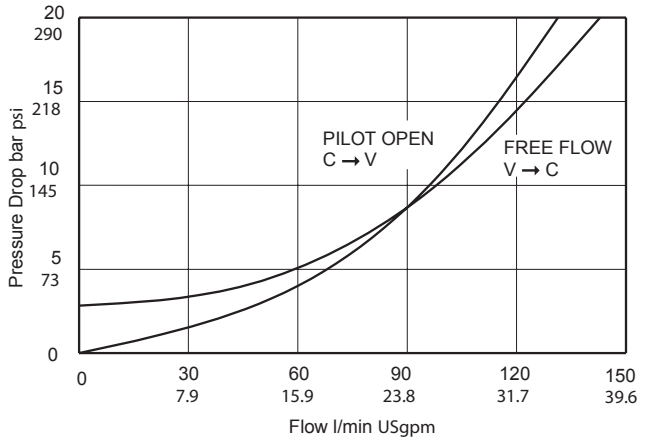
The pilot piston assembly is designed to open two check valve cartridges when fitted in a simple machined cavity. The spring-loaded ball is shifted by low pressure on ports [V1] or [V2] allowing free flow to port [C1] or [C2] respectively. The pilot piston is shifted by pilot pressure on port [V1] or [V2] and acts to shift the spring-loaded ball allowing flow from ports [C2] to [V2] or [C1] to [V1] respectively.

Reverse flow, [C] to [V], is blocked when pressure on port [C] is 3 times greater than the pilot pressure on the corresponding port [V]. Back pressure on port [V] and a third of the load pressure on port [C] each adds to the piloting pressure derived from the opposing port [V].

It is recommended that a check valve with at least 2 bar cracking pressure is selected to ensure rapid closure when the pilot pressure is released.

Performance Curve

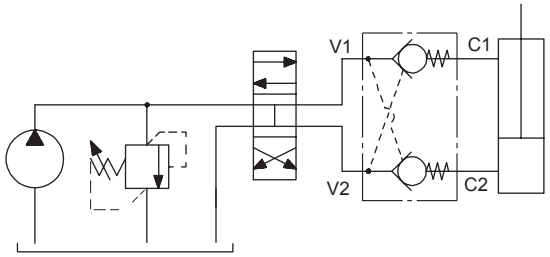
Pressure Drop vs. Flow (Through cartridge only)



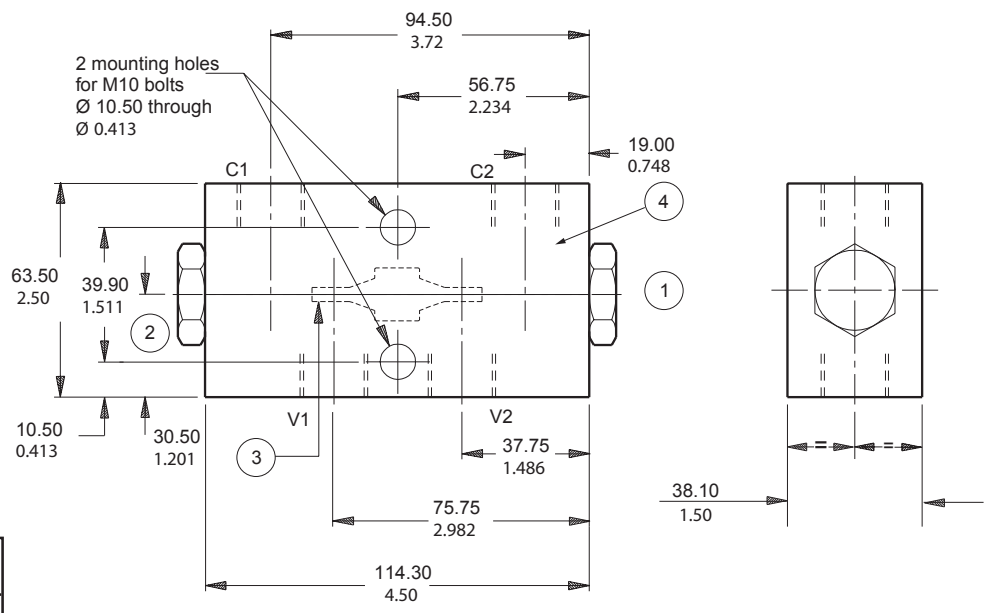
Specifications

Description	**D04B2 -** Check Valve **PP04DP -** Pilot Piston
Rated Flow	135 LPM (36 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Ratio	3:1
Approx. Weight	Steel Block Assembly 1.89 kg (4.17 lbs.)

Typical Application



Dimensions Millimeters (Inches)



VALVE	PART #
1 & 2	D04B2
3	PP04DP
4	LB10766S

Ordering Information

PP04DP		N	766	S
Dual P.O. Check Valve Package	Cracking Pressure	Seals	Porting	Body Material

Code	Cracking Pressure
2.1	2.1 Bar (30 PSI)
10.0	10.0 Bar (145 PSI)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30518N-1)	-34°C to +121°C (-30°F to +250°F)

LB10	766	S
Line Body	Porting	Body Material

Code	Porting
766	1/2″ BSP

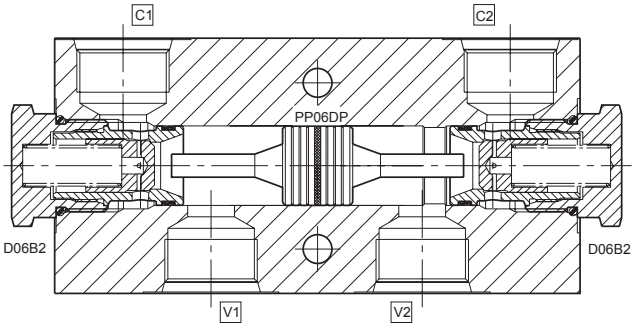
Code	Body Material
S	Steel

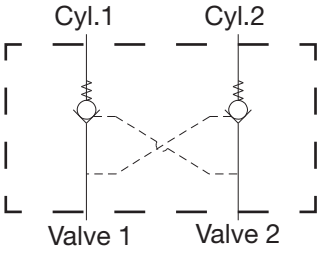
General Description

Single Pilot Operated Check Valve Package.
For additional information see Technical Tips on pages CV1-CV2.

Features

- Uses standard check valve cartridge with separate piston to form a single pilot operated check.
- Low Leakage
- Cost effective
- Leak free pilot pistons available - Consult Parker Sales
- All external parts zinc plated





OPERATION

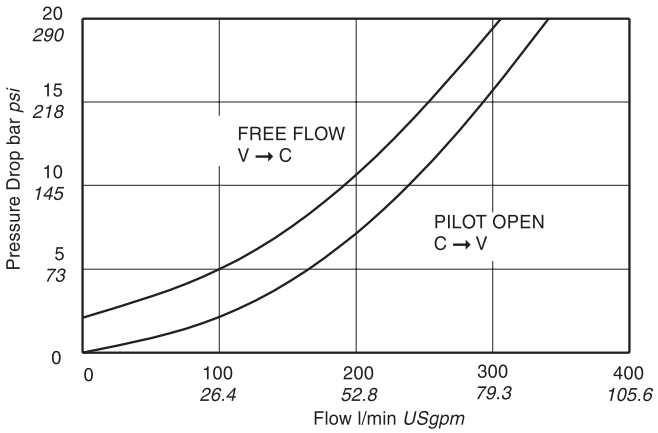
The pilot piston assembly is designed to open two check valve cartridges when fitted in a simple machined cavity. The spring-loaded poppet is shifted by low pressure on ports [V1] or [V2] allowing free flow to port [C1] or [C2] respectively. The pilot piston is shifted by pilot pressure on port [V1] or [V2] and acts to shift the spring-loaded poppet allowing flow from ports [C2] to [V2] or [C1] to [V1] respectively.

Reverse flow, [C] to [V], is blocked when pressure on port [C] is 3 times greater than the pilot pressure on the corresponding port [V]. Back pressure on port [V] and a third of the load pressure on port [C] each adds to the piloting pressure derived from the opposing port [V].

It is recommended that a check valve with at least 2 bar cracking pressure is selected to ensure rapid closure when the pilot pressure is released.

Performance Curve

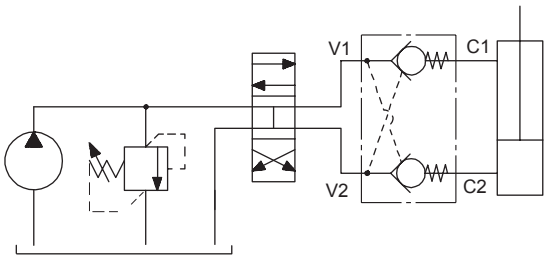
Pressure Drop vs. Flow (Through cartridge only)



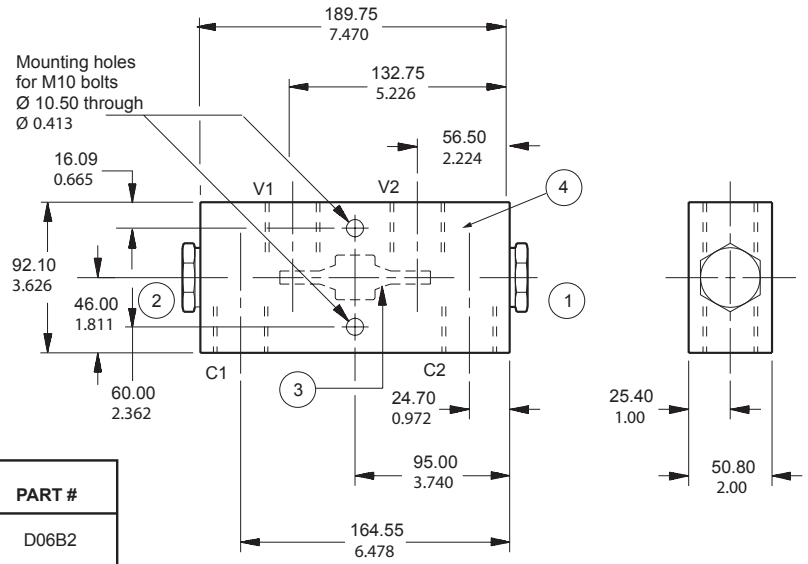
Specifications

Description	**D06B2 -** Check Valve **PP06DP -** Pilot Piston
Rated Flow	340 LPM (90 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Ratio	3:1
Approx. Weight	Steel Block Assembly 6.82 kg (15.04 lbs.)

Typical Application



Dimensions Millimeters (Inches)



VALVE	PART #
1 & 2	D06B2
3	PP06DP
4	LB10811S

Ordering Information

PP06DP		N	811	S
Dual P.O. Check Valve Package	Cracking Pressure	Seals	Porting	Body Material

Code	Cracking Pressure
2.1	2.1 Bar (30 PSI)
3.4	3.4 Bar (50 PSI)
4.1	4.1 Bar (60 PSI)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30524N-1)	-34°C to +121°C (-30°F to +250°F)

LB10	811	S
Line Body	Porting	Body Material

Code	Porting
811	1″ BSP

Code	Body Material
S	Steel

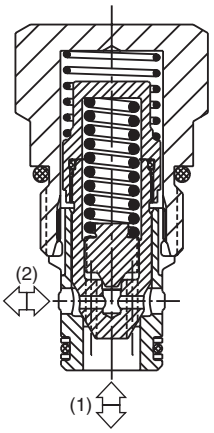
General Description

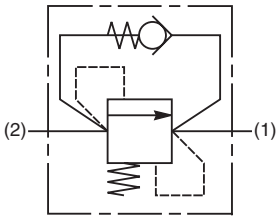
Poppet Type Check Valve with Relief Feature.
For additional information see Technical Tips on pages CV1-CV2.

Features

- Poppet type for minimal leakage - less than 3 drops/min.
- Relief feature to give thermal and shock relief protection
- Compact space saving design
- Hardened working parts for maximum durability
- Single and dual pilot pistons available to create pilot to open check
- Good contamination tolerance
- All external parts zinc plated

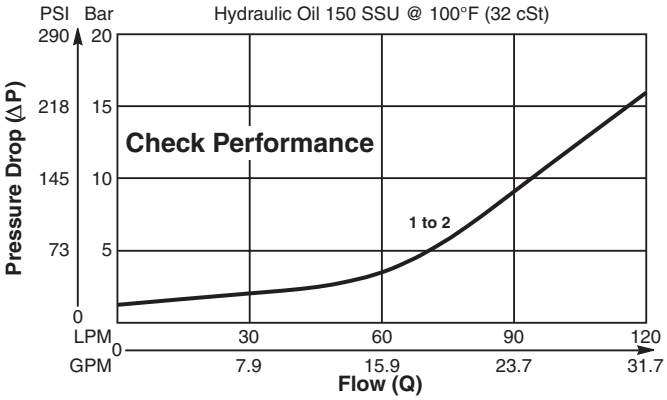






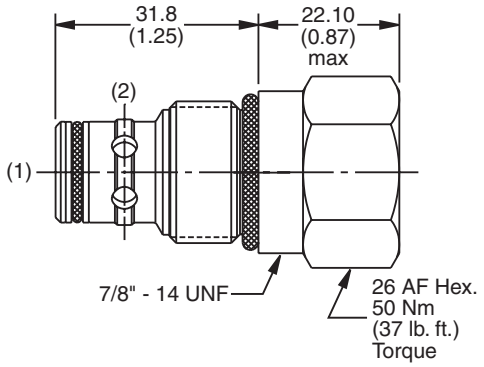
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions

Millimeters (Inches)



Specifications

Rated Flow	130 LPM (40 GPM)
Nominal Flow @ 7 Bar (100 PSI)	72 LPM (19 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	Less than 3 drops/min.
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.13 kg (.29 lbs.)
Cavity	C10-2 (See BC Section for more details)

Ordering Information

D04F2	–	2.5	–		N
Check Valve		Cracking Pressure (Check)		Cracking Pressure (Relief)	Seals

Code	Cracking Pressure (Check)
2.5	2.5 Bar (36 PSI)

Code	Cracking Pressure (Relief)
245	245 Bar (3553 PSI)
276	276 Bar (4000 PSI)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30503N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

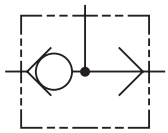
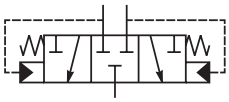
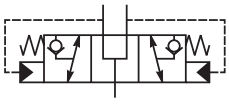
B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

Port Size
1/2″ BSP

Body Material
Steel

Contents

Shuttle Valves

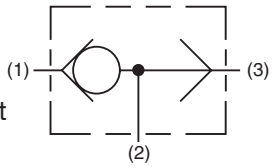
	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
	KSWA3	SW-3	Ball Insert Type	9.5/2.5	420/6000	SH3
	K2A005	3Z	Poppet Insert Type	38/10	350/5000	SH4
	K02A3	C08-3	Cartridge Shuttle	50/13	420/6000	SH5
	K04C3	C10-4	Spool Type, Spring Centered, All Ports Closed	100/26	420/6000	SH6
	K04G3	C10-4	Spool Type Shuttle, Inverse	50/13	350/5000	SH7

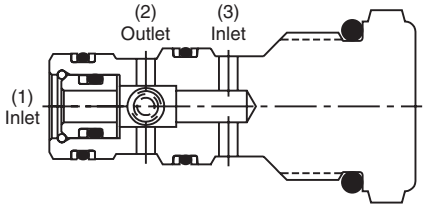
INTRODUCTION:

Shuttle valves accept flow from two different sources and divert the highest pressure to a single outlet port. Shuttle valves are commonly used in Load Sensing circuits as well as Brake circuits. Parker offers many different types of shuttles, including ball type, poppet type, spool type. There are a number of configurations available such as cartridge type, insert type, and an in-line version.

Ball Type - Cartridge Style

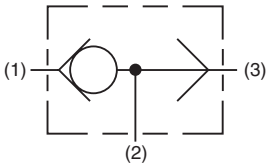
The valve consists of a steel ball that can seal against one of two adjacent seats, providing a path from the highest pressure signal to another function. When one inlet port is pressurized, the ball or poppet is forced against the opposite seat, blocking that inlet and providing a flow path to the outlet port.

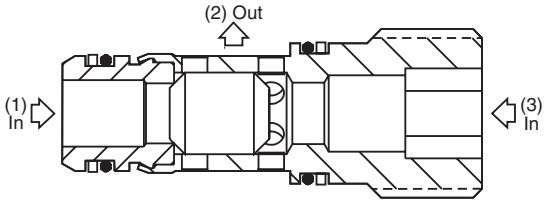




Poppet Type - Insert Style

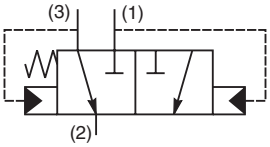
This shuttle performs the same function, but allows for higher flow rates due to poppet design.

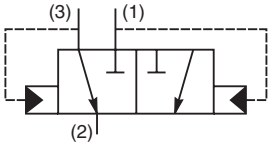


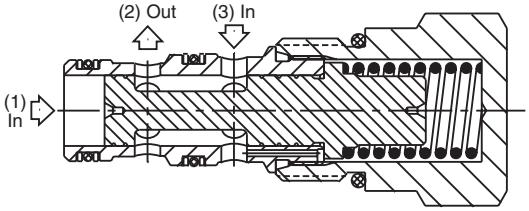


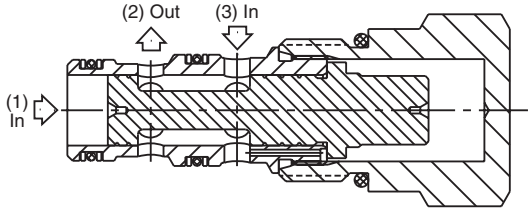
Spool Type - Centered or Spring Offset

The spool type shuttle allows for higher flow rates. These are 2 position valves.

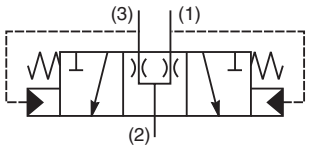


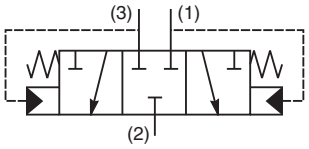


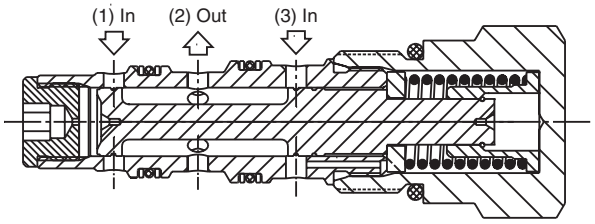


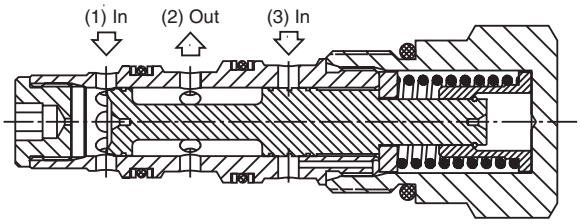


3 Way 2 Position Spool type shuttles are designed to direct flow in such a way as to allow higher pressure signals to open the lower pressure port and connect it to the common outlet port. These spring centered valves will shift when pressure at either end of the spool exceed the spring setting. These are typically used in transmission hot oil shuttle circuits.









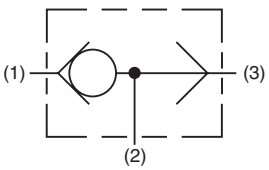
General Description

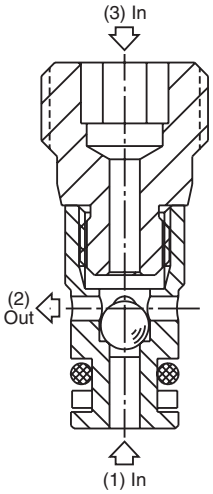
Ball Type, Two Position, Three Way Shuttle Valve. For additional information see Technical Tips on pages SH1-SH2.

Features

- Compact, cost effective design
- Ball type construction for maximum durability
- Minimal leakage - less than 10 drops/min.
- Contamination tolerant
- Hardened working parts for maximum durability
- All external parts zinc plated

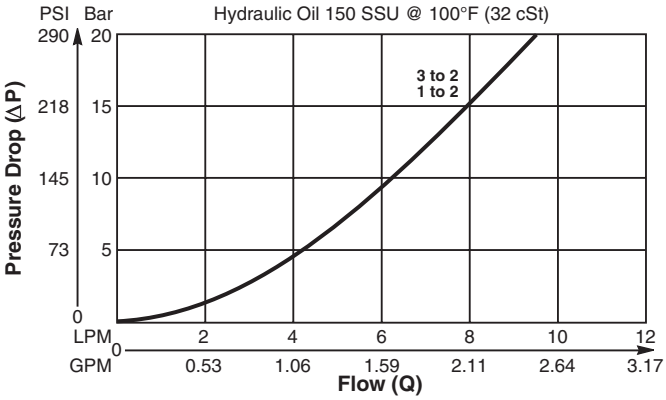




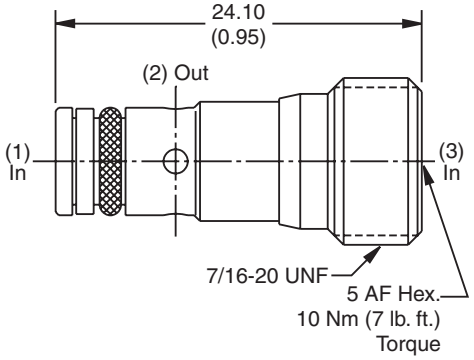


Performance Curve

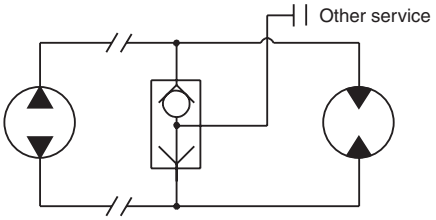
Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Application



Selects highest pressure from either line.

Specifications

Rated Flow	9.5 LPM (2.5 GPM)
Nominal Flow @ 7 Bar (100 PSI)	5 LPM (1.32 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.01 kg (.02 lbs.)
Cavity	CAVSW-3 (See BC Section for more details)

Ordering Information

KSWA3	N
Shuttle Valve	Seals

Order Bodies Separately See section BC

LB10	816	S
Line Body	Porting	Body Material

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30523N-1)	-34°C to +121°C (-30°F to +250°F)

Code	Porting
816	1/4" BSP

Code	Body Material
S	Steel

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Mobile Hydraulic Systems Division Europe

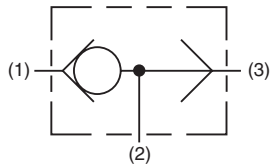
General Description

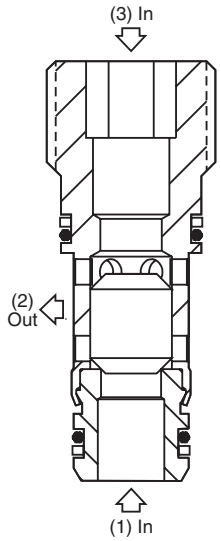
Poppet Type, Two Position, Three Way Shuttle Valve. For additional information see Technical Tips on pages SH1-SH2.

Features

- High flow capacity
- Compact cost effective design
- Poppet type construction for minimal leakage
- Contamination tolerant
- All external parts zinc plated

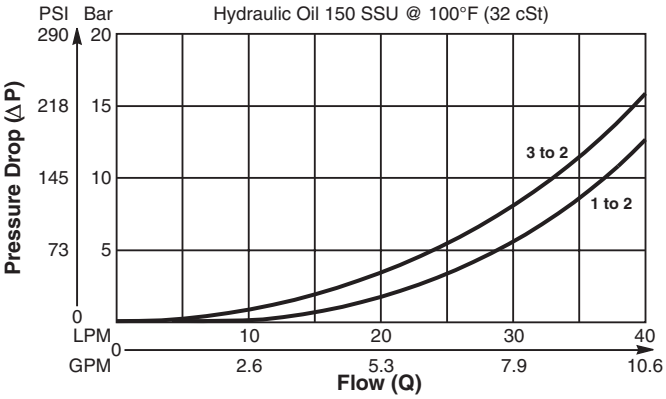




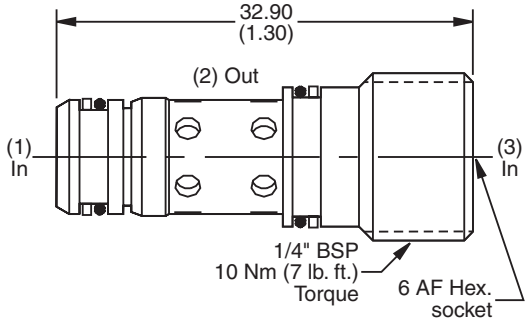


Performance Curve

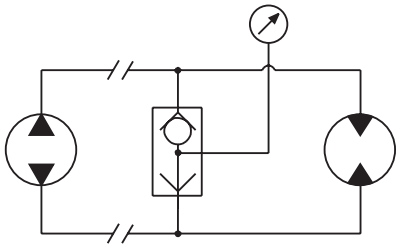
Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Application



Selects highest pressure from either line.

Specifications

Rated Flow	38 LPM (10 GPM)
Nominal Flow @ 7 Bar (100 PSI)	28 LPM (7.4 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Cartridge Material	Steel operating parts, hardened steel poppet.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.02 kg (.04 lbs.)
Cavity	3Z (See BC Section for more details)

Ordering Information

K2A005	N
Shuttle Valve	Seals

Order Bodies Separately See section BC

LB10	313	S
Line Body	Porting	Body Material

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30091N-1)	-34°C to +121°C (-30°F to +250°F)

Code	Porting
313	1/4" BSP

Code	Body Material
S	Steel

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

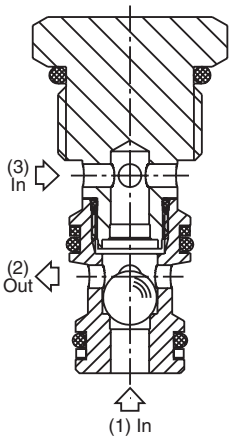
General Description

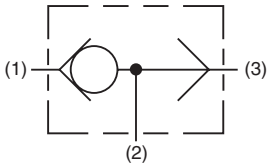
Ball Type, Two Position, Three Way Shuttle Valve. For additional information see Technical Tips on pages SH1-SH2.

Features

- High flow capacity
- Ball type construction for maximum wear resistance and greater durability
- Minimal leakage - less than 3 drops/min.
- Contamination tolerant
- All external parts zinc plated

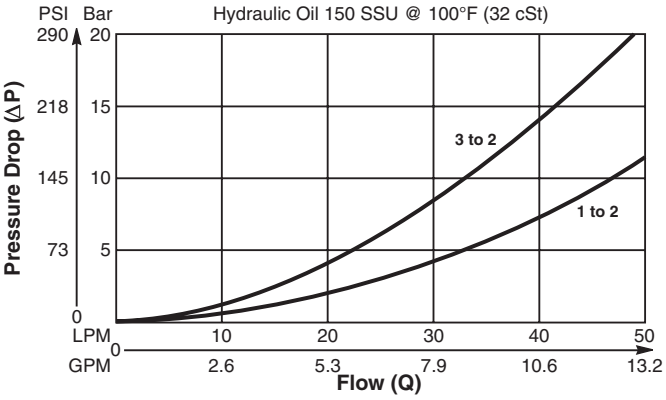






Performance Curve

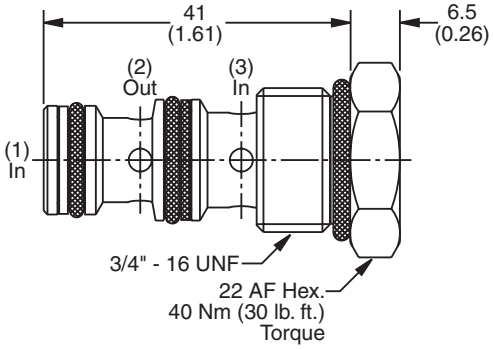
Pressure Drop vs. Flow (Through cartridge only)



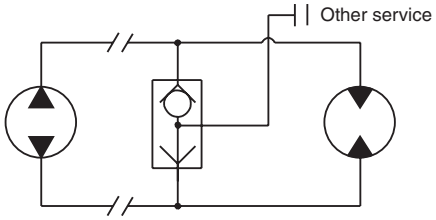
Specifications

Rated Flow	50 LPM (13 GPM)
Nominal Flow @ 7 Bar (100 PSI)	27 LPM (7 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	Steel operating parts, hardened steel poppet.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.07 kg (.15 lbs.)
Cavity	C08-3 (See BC Section for more details)

Dimensions Millimeters (Inches)



Application



Selects highest pressure from either line.

Ordering Information

K02A3	N
Shuttle Valve	Seals

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30521N-1)
	Operating Temp.
	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately See section BC

B08	—	3	—	6B
08 Size		3-Way Cavity		Port Size

Port Size
3/8″ BSP

Body Material
Steel

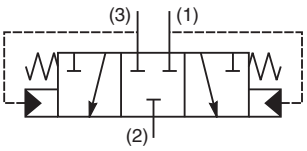
General Description

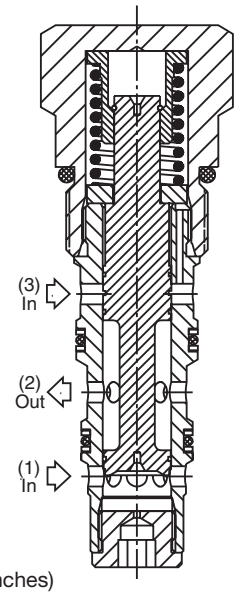
Two Position, Three Way, Spring Centered Shuttle Valve. For additional information see Technical Tips on pages SH1-SH2.

Features

- High flow capacity
- Various switching pressures available
- Use as purge valve in transmission systems
- Hardened working parts for maximum durability
- All external parts zinc plated

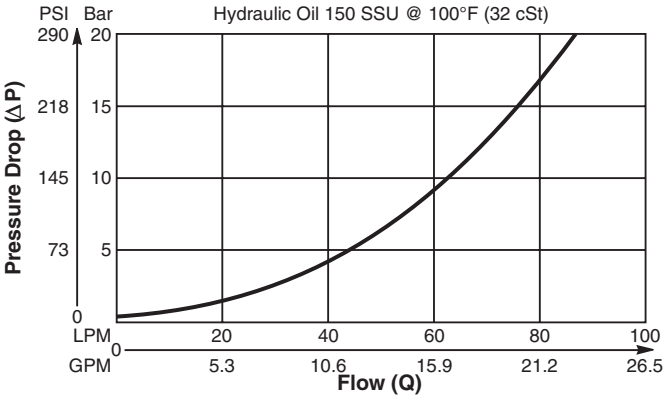






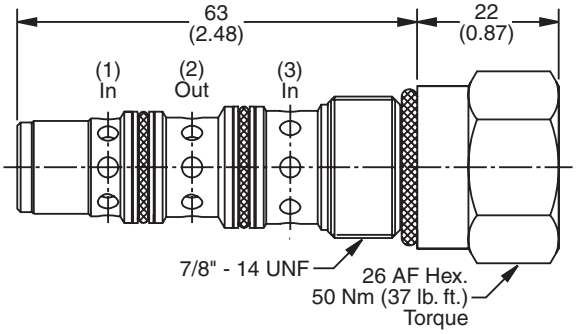
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)

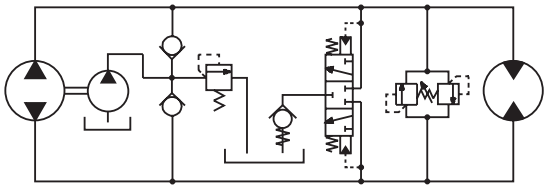


Dimensions

Millimeters (Inches)



Application



Purge valve in transmission circuit

Specifications

Rated Flow	100 LPM (26 GPM)
Nominal Flow @ 7 Bar (100 PSI)	55 LPM (15 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.17 kg (.37 lbs.)
Cavity	C10-4 (See BC Section for more details)

Ordering Information

K04C3	–		N
Shuttle Valve		**Switching Pressure**	**Seals**

Code	Switching Pressure
5.0	5.0 Bar (73 PSI)
10.0	10.0 Bar (145 PSI)

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30504N-1)
	Operating Temp.
	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B10	—	3	—	8B
10 Size		**3-Way Cavity**		**Port Size**

Port Size
1/2″ BSP

Body Material
Steel

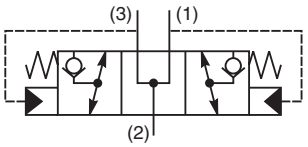
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

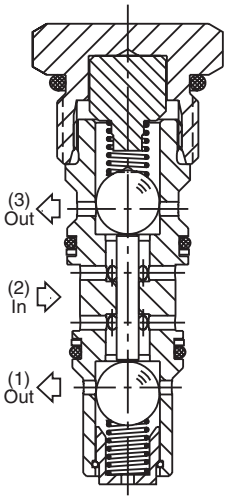
General Description

Three Way, Ball Type, Spring Centered Inverse Shuttle Valve. For additional information see Technical Tips on pages SH1-SH2.

Features

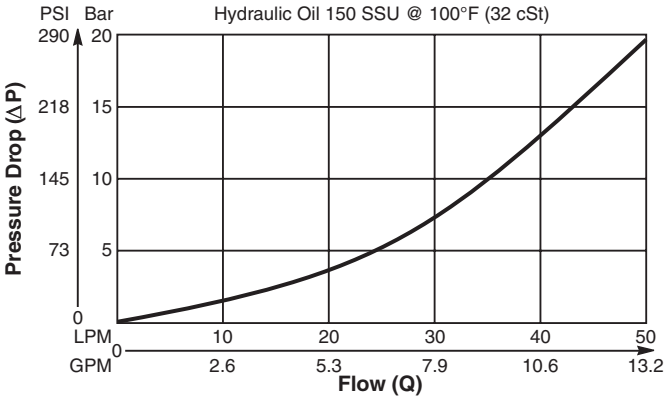
- Used to ensure that in a dual accumulator charging circuit the accumulator with the lowest pressure is sensed back to the charging valve
- Suitable for charge rates up to 25 LPM (7 GPM) per accumulator
- One size valve for most applications
- All external parts zinc plated



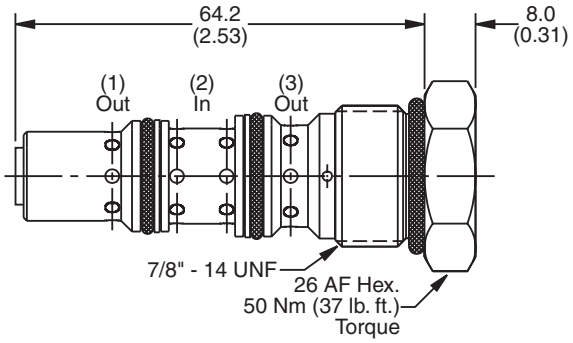


Performance Curve

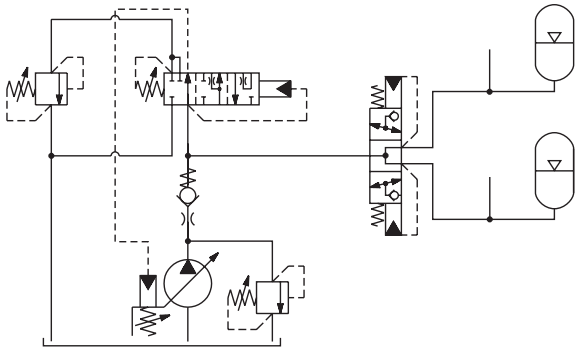
Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Application



Specifications

Rated Flow	50 LPM (13.2 GPM)
Nominal Flow @ 7 Bar (100 PSI)	30 LPM (7.9 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C10-4 (See BC Section for more details)

Ordering Information

K04G3	N
Shuttle Valve	Seals

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30534N-1)
	Operating Temp.
	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

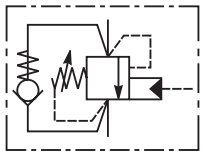
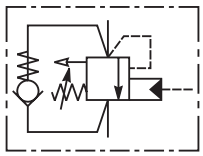
B10	—	3	—	8B
10 Size		3-Way Cavity		Port Size

Port Size
1/2″ BSP

Body Material
Steel

Contents

Load and Motor Control Valves

	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
	**STANDARD PILOT ASSISTED**					
	MHC-010-S***	CDD-1010	Load Control Cartridge Valve	37/10	350/5000	LM5-LM6
	E2*020	53-1	Load Control Cartridge Valve	20/5.3	420/6000	LM7-LM8
	E2*040	68-1	Load Control Cartridge Valve	60/16	350/5000	LM9-LM10
	E2*060	3C	Load Control Cartridge Valve	120/32	350/5000	LM11-LM12
	E2*125	3M	Load Control Cartridge Valve	200/53	350/5000	LM13-LM14
	E2*300	3K Flange	Load Control Cartridge Valve	350/92	350/5000	LM15-LM16
	CB101	10-3	Load Control Cartridge Valve	45/12	380/5500	LM17-LM18
	**INDEPENDENT OF BACK-PRESSURE, VENTED TO ATMOSPHERE**					
	E6B020	53-1	Load Control Cartridge Valve, 4.5:1 Ratio	20/5.3	350/5000	LM19-LM20
	E6K020	53-1	Load Control Cartridge Valve, 15:1 Ratio	20/5.3	420/6000	LM21-LM22
	E6B040	68-1	Load Control Cartridge Valve, 3:1 Ratio	60/16	350/5000	LM23-LM24
	E6B060*409	3C	Load Control Cartridge Valve, 3:1 Ratio	180/48	350/5000	LM25-LM26
	MHC-010-V***	CDD-1010	Load Control Cartridge Valve	37/10	350/5000	LM5-LM6

Introduction

Counterbalance valves are one of the most misunderstood products in the hydraulic industry. Many people tend to complicate the task of selecting a counterbalance valve and as such avoid opportunities. The goal of this Technical Tips Section is to hopefully eliminate some of this confusion and help you chose the correct valve for your application. It is only a guide! It is not meant to be your only method of input, nor is it meant to replace good hydraulic common sense and reasoning.

Application

DO I NEED A COUNTERBALANCE VALVE?

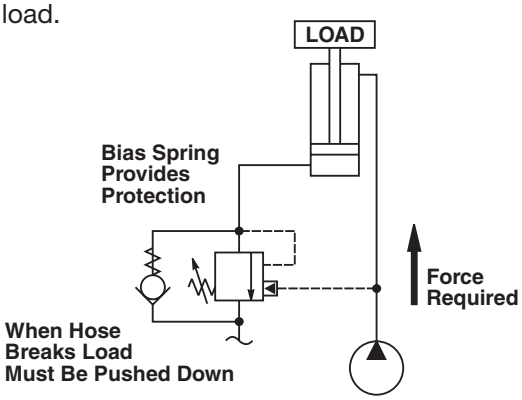
A counterbalance is generally used for one or more of the following purposes:

Control an Overrunning Load – It restricts the flow from an actuator, thus forcing the load to be pushed through the restriction and providing control of the potential runaway load. This also helps in the prevention of cavitation.

Control in Critical Metering Applications – The outward restriction also helps to gain control of systems with varying loads and speeds.

Holding a Load – Much like a pilot operated check valve, a load is held in one direction until the appropriate pilot pressure is available unseat the check and pass fluid.

Help Protect Against Hose Failures – Since the fluid must be pushed through a restriction, hose failures result in a controlled movement of the actuator and not a runaway load.

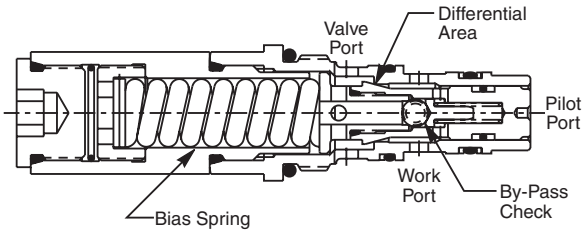


Operation

An understanding of the general operation of a counterbalance valve is required before proceeding further into valve selection.

The counterbalance valve is a pressure control device and functions as follows: Pressure is developed at the Work Port of the holding valve when the actuator is pressurized. This pressure acts on the differential area, and the force generated is counteracted by the bias spring. When there is sufficient pressure present to overcome the spring setting, the poppet begins to shift, allowing fluid to pass through the valve port to tank via the control valve.

To assist in the shifting of the poppet, an external pressure source (generally the opposite side of the actuator) is connected to the pilot port of the counterbalance valve. This pressure is applied to the pilot area and assists the differential area in opening the valve. The pilot assist reduces load pressure required to open the valve, and allows for a reduction in the horsepower required to move the load. If the load attempts to “run away” (move faster than the pump can supply flow), the pilot signal will diminish and the piston will begin to close restricting flow to tank and thus controlling the load. The counterbalance piston will maintain a position that maintains a positive pilot signal and will control the descent of the load.



An added feature of the counterbalance valve is its built-in thermal relief characteristic. A temperature rise can cause thermal expansion of the hydraulic fluid trapped between the actuator and the counterbalance valve’s poppet. As the pressure increases and reaches the bias spring setting, the poppet unseats and a few drops of oil are allowed to escape through the valve port of the counterbalance valve. This relieves the thermal expansion of oil, allowing the counterbalance valve to continue holding the load in the same position.

When the flow is reversed to the actuator, then pressure unseats the built-in bypass check portion of the counterbalance valve allowing flow to pass from the valve port to the work port. When no pressure is applied to either port of the counterbalance valve, the load is held in place.

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Mobile Hydraulic Systems Division Europe

Valve Series

Parker offers the four series of products outlined below:
MHC – The MHC series is a threaded cartridge style counterbalance valve. This series is ideal for incorporating into an integrated manifold or for installation directly into the port of the actuator. There are various flow rates and pilot ratios available for the MHC Series.

E2 Series – The E2 Series valves are threaded cartridge style counterbalance valves available in various sizes and pilot ratios.

E6 Series - The E6 Series valves are threaded cartridge style counterbalance valves but are vented to atmosphere and will maintain their setting regardless of backpressure, available in various sizes and pilot ratios.

E2A020



MHC-010



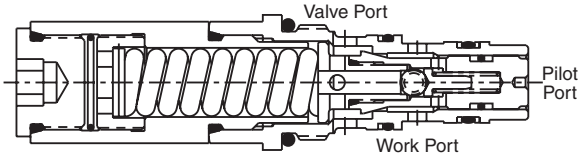
E6B060



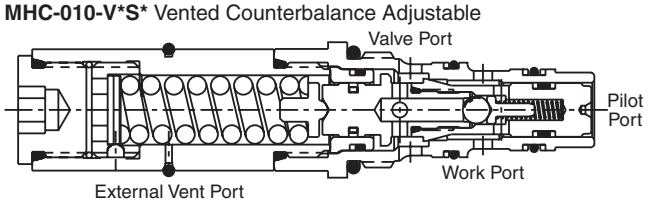
Selecting Options

Below is a brief description of the options available on the ordering information pages and a brief explanation of when each would be used.
Flow Selection – Generally the counterbalance valve is sized according to the actual flow the valve will see and not the system flow. Note that the ordering information callout is the nominal flow rate and not the maximum. In other words, refer to the pressure drop curves when sizing the valves. For example: A MHC-010 can flow 25 GPM, but is rated as a 10 GPM valve. It is possible to oversize a counterbalance valve! If the counterbalance is oversized, the annulus between the poppet and the seat is too large, thus the poppet opens too far causing instability. Remember you are gaining control by causing a restriction. If you oversize the counterbalance valve, the restriction is reduced and so is the control.
Vented versus Non-Vented – With a standard counterbalance valve, the bias spring is internally vented to tank. This means any pressure on the tank line is sensed in the bias spring chamber and additive to the setting. Thus, the pressure at the work port now must be greater than the bias spring plus the tank pressure before the counterbalance poppet will shift allowing flow.
A vented style counterbalance valve relieves the bias spring chamber to atmosphere. Thus, the spring chamber is in no way related to the tank chamber of the counterbalance valve. So, if the pressure on the tank line is high, or if the pressure setting is critical, then a vented style counterbalance valve would be required. Parker's counterbalance valves are externally vented. This means no extra porting or manifold costs are incurred when a vented counterbalance is needed.

MHC-010-S*S* Non-Vented Counterbalance Adjustable

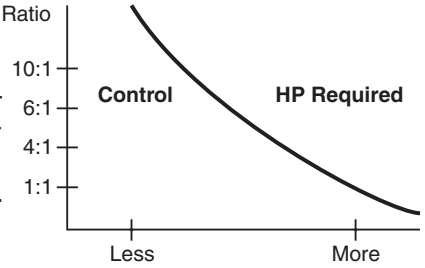


MHC-010-V*S* Vented Counterbalance Adjustable



Selection Options (Continued)

Pilot Ratio – The pilot ratio is the ratio of the pilot area versus the differential area poppet. Thus, the higher the pilot ratio, the less pressure that is needed to assist the load pressure in unseating the poppet. This means there is less restriction to the overrunning load, resulting in less horsepower required and more control of the load. So higher pilot ratio equates to less restriction to the overrunning load, less control and less horsepower required. Lower ratio equates to more restriction to the overrunning load, more control and more horse-power required. The pilot ratio decision is one of Horsepower versus Control. For reference the most popular ratio is 3:1.



Sample Ratios:

8:1
Primary function is motor control and hose break protection

4:1 and 3:1
Positioning is critical such as a pick and place application
Greater stability

1.75:1
Used in very unstable applications

ADJUSTMENT TYPE

Parker offers counterbalance valves with adjustable and non-adjustable pressure settings. The non-adjustable or shimmed version is recommended for most applications as it prevents tampering or improper adjustment by uneducated end users.

SELECTING SETTINGS

There are three basic settings to consider before finalizing a counterbalance valve for your application.

Holding Setting – The holding setting is sometimes referred to as the counterbalance setting. It is the maximum load setting you expect the counterbalance to hold. Note that the counterbalance valve should be set for the absolute maximum hold pressure required. Also note that counterbalance valves are restrictive type devices and as such are not ideal for low pressure applications, such as those below 750 psi. The holding setting is the setting you choose when selecting a counterbalance valve.

Thermal Setting – Counterbalance valves have a built-in thermal relief valve that compensates for the expansion of oil, due to temperature, by bleeding off excess pressure. In other words, the thermal setting is the pressure that the counterbalance will unload at if no pressure is present at the pilot port. Obviously, this setting should be above the holding setting. The Parker **MHC** counterbalance valves are automatically set 1000 psi above the holding setting of the valve. ***You do not specify this setting, only the holding setting.***

For the **CB101** Series, you do specify the Thermal/Crack setting in the model code. The holding setting (maximum load induced pressure) is 70% of that specified setting. Example: Hold at 3000 psi, crack at 4285 psi. For the **E2** Series, you specify the Thermal/Crack setting in the model code. The crack setting (maximum load induced pressure) should be 1.3 times the hold. Example: Hold at 210 Bar, crack at 273 Bar.

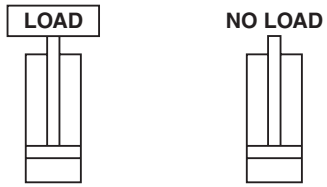
Pilot Area – The pilot pressure required to lower the cylinder when fully loaded and unloaded can also be determined before applying the valve. The pilot pressure can be determined by the below equation:

$$P_P = (T_S - L) / R_P$$

P_P = Pilot Pressure
T_S = Thermal Setting
L = Induced Load
R_P = Pilot Ratio

Example:

The maximum load is 210 Bar. A 3:1 Pilot Ratio was chosen and the thermal relief setting is the standard 30% over load setting. What is the pilot pressure required to retract the cylinder if it is fully loaded? What pilot pressure is required to retract the cylinder if there is no load?



FULLY LOADED:

$P_P = (273 - 210) / 3$
$P_P = 63 / 3$
$P_P = 21$ Bar

Thus, any time the pilot line sees at least 167 psi, the cylinder could lower the load.

UNLOADED:

$P_P = (273 - 0) / 3$
$P_P = 273 / 3$
$P_P = 91$ Bar

Thus, at least 91 Bar will be needed to lower the cylinder when it is unloaded.

Notes

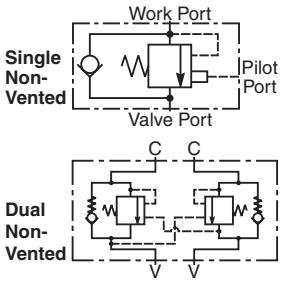
General Description

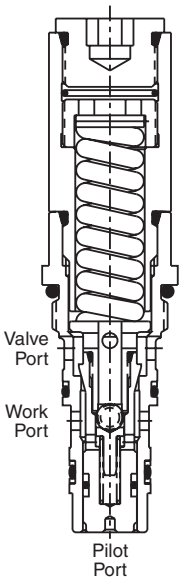
Threaded Cartridge Style Counterbalance Valve. For additional information see Technical Tips on pages LM1-LM3.

Features

- Conical Poppet design provides longer metering stroke for stable operation
- Hardened seat provides reliable load holding
- External vent option available for high back pressure applications
- Tamper resistant cap for added safety and security
- Various pilot ratios available for application flexibility
- Unique cavity prevents other valves from being "accidentally" installed



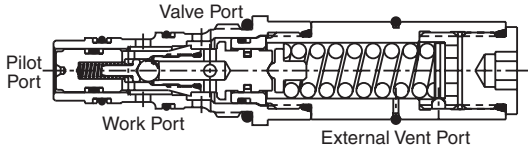




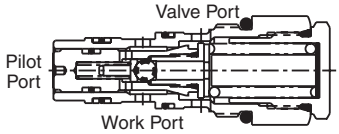
MHC-010-S*S* Non-Vented Counterbalance Adjustable

Construction

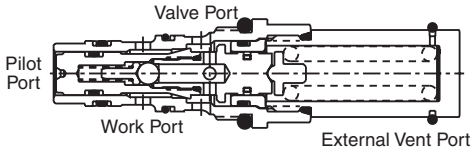
MHC-010-V*S* Vented Counterbalance Adjustable



MHC-010-S*N* Non-Vented Counterbalance Non-Adjustable



MHC-010-V*N* Vented Counterbalance Non-Adjustable

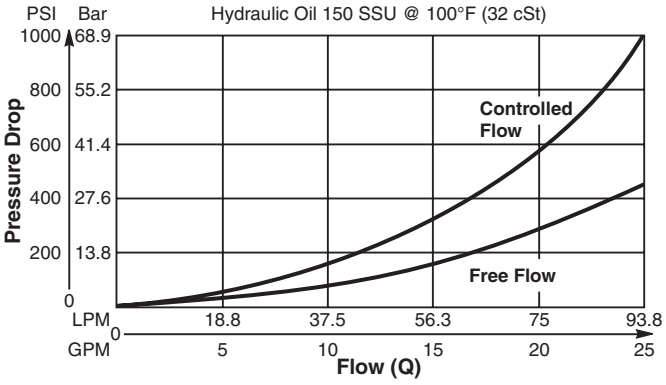


Specifications

Rated Flow	37.5 LPM (10 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) @ 80% of thermal crack pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.38 kg (.88 lbs.)
Cavity	CDD-1010 (See BC Section for more details)
Form Tool	FR-500

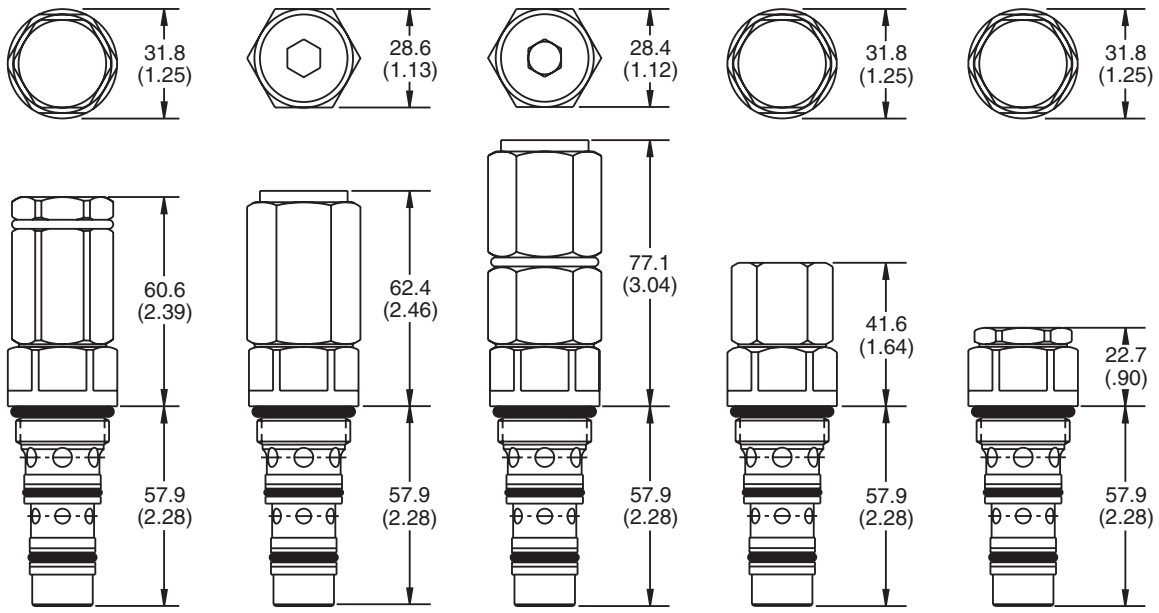
Performance Curve

Flow vs. Pressure Drop (Through cartridge only)



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



MHC-010-V*N* | **MHC-010-S*S*** | **MHC-010-V*S*** | **MHC-010-S*N* (3:1) MHC-010-S*NK (10:1)** | **MHC-010-S*N* (3000 PSI Maximum "H")**

Torque Values
68-75 Nm (50-55 lb. ft.)
Typical for all

Ordering Information

MHC	–	010	–					–		–		
Counterbalance Cartridge Valve		Nominal Flow Rating		Vent Type	Pilot Ratio	Design	Holding Pressure		Body Type		Ports	Seals

Code	Nominal Flow Rating
010	37.5 LPM (10 GPM)

Code	Vent Type
S	Standard (non-vented)
V	Vented

Code	Pilot Ratio
A	Equal Area (1:1)
B	4:1
F	7:1 (Standard)
J	10:1

Code	Design
S	Standard (adjustable)
N	Shimmed (non-adjustable)

Code	Holding Pressure
C	Equal Area 34.5 Bar (500 PSI) Crack
D	69 Bar (1000 PSI) Shim adjustable version only
E	105 Bar (1500 PSI)
F	140 Bar (2000 PSI)
G	170 Bar (2500 PSI)
H	210 Bar (3000 PSI) Standard version
K	350 Bar (5000 PSI) 7:1 and 10:1 only Shim version only

Code	Body Type	Part Number
Omit	No Body	
A	Single	MHC-010-A-53
D	Dual	MHC-010-D-53

Code	Ports
00	No Ports
52	SAE-8 through port
53	SAE-10 through port

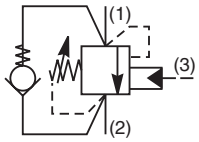
Code	Seals / Kit No.	Operating Temp.
B	Nitrile / 711922	-34°C to +121°C (-30°F to +250°F)
F	Fluorocarbon / 711825	-26°C to +204°C (-15°F to +400°F)

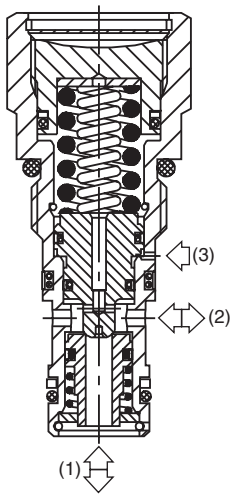
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

General Description

Threaded Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM3.







Features

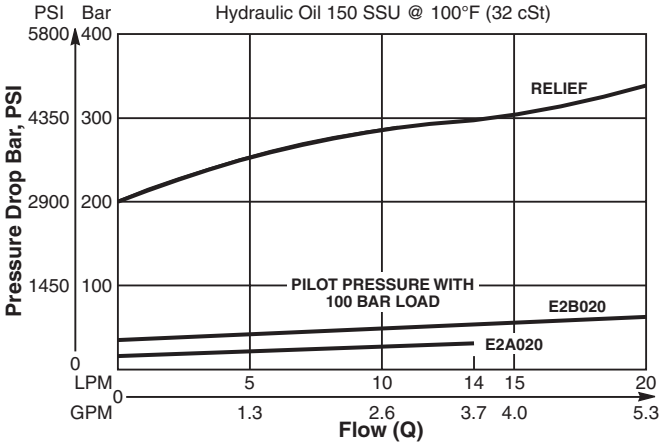
- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection
- Includes reverse check valve within body, saving space and minimizing installation cost
- Can be directly mounted into cylinder eliminating requirement for manifold block
- Fully sealed pilot for high efficiency and accurate pilot ratio
- Two pilot ratios available, 4.5:1 for cylinders and 8:1 for motor control
- Adjustable and tamper resistant versions available
- Preset version is tamper resistant and compact
- All external parts zinc plated

Specifications

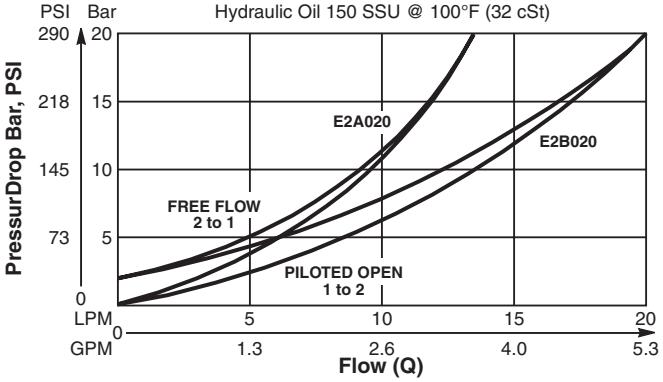
Rated Flow	**E2A020** 14 LPM (3.7 GPM) **E2B020** 20 LPM (5.3 GPM)
Pressure	50 - 420 Bar (725 - 6000 PSI)
Sensitivity: Pressure/Turn	**E2A020** 113 Bar (1640 PSI) **E2B020** 84 Bar (1220 PSI)
Pilot Ratio	**E2A020 -** 8 : 1 **E2B020 -** 4.5 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.08 kg (0.17 lbs.)
Cavity	53-1 (See BC Section for more details)

Performance Curves

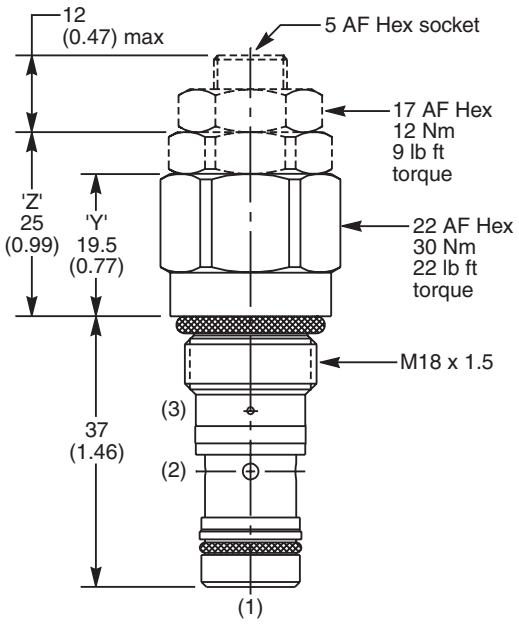
Relief & Pilot Performance 1 to 2



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E2		020	Z	N
Load Control Valve	Pilot Ratio		Adjustment Style	Seals

Code	Pilot Ratio
A	8 : 1
B	4.5 : 1

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Other settings are available, please contact Parker Sales.

Order Bodies Separately See section BC

LB10		S
Line Body	Porting	Body Material

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30087N-1)	-34°C to +121°C (-30°F to +250°F)

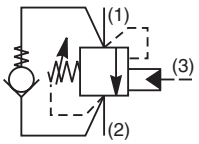
Code	Porting
310	3/8″ BSP (main) 1/4″ BSP (aux)
312	3/8″ BSP Dual Cavity

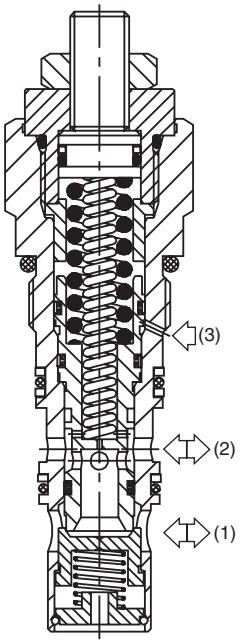
Body Material
Steel

General Description

Threaded Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM3.







Features

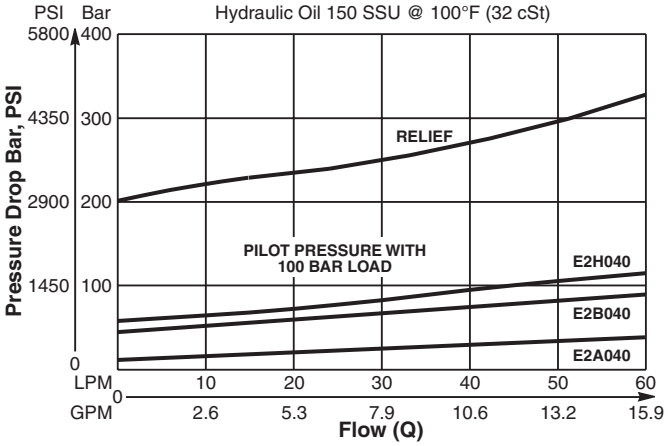
- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection
- Includes reverse check valve within body, saving space and minimizing installation cost
- Excellent control and very good stability
- Three pilot ratios available, 1.75:1 and 3:1 for cylinders and 8:1 for motor control
- Hardened working parts for maximum durability
- Adjustable, preset and tamper resistant versions available
- Preset version is tamper resistant and compact
- All external parts zinc plated

Specifications

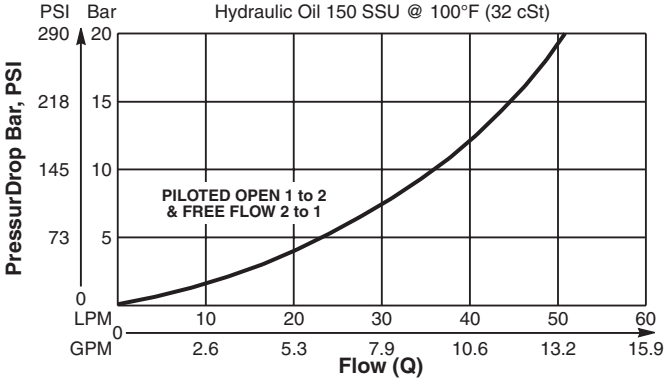
Rated Flow	60 LPM (15.9 GPM)
Pressure	50 - 350 Bar (725 - 5000 PSI)
Sensitivity: Pressure/Turn	99 Bar (1435 PSI)
Pilot Ratio	**E2A040 -** 8 : 1 **E2B040 -** 3 : 1 **E2H040 -** 1.75 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.27 kg (0.60 lbs.)
Cavity	68-1 (See BC Section for more details)

Performance Curves

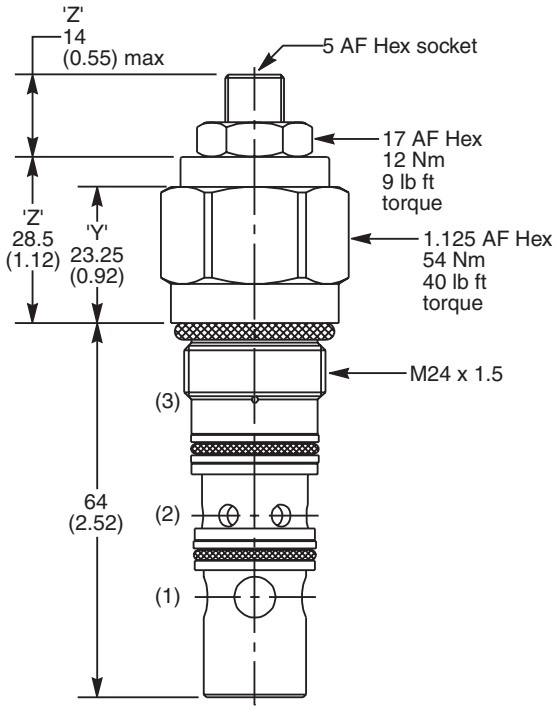
Relief & Pilot Performance 1 to 2



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E2		040	Z	N	MK3
Load Control Valve	Pilot Ratio		Adjustment Style	Seals	

Code	Pilot Ratio
A	8 : 1
B	3 : 1
H	1.75 : 1

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Other settings are available, please contact Parker Sales.

Order Bodies Separately See section BC

LB10		S
Line Body	Porting	Body Material

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30059N-1)	-34°C to +121°C (-30°F to +250°F)

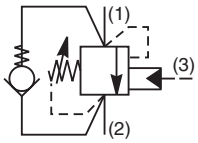
Code	Porting
251	1/2″ BSP (main) 1/4″ BSP (aux)
259	1/2″ BSP Dual Cavity

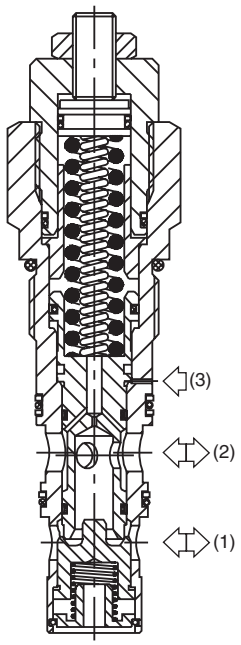
Body Material
Steel

General Description

Threaded Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM3.







Features

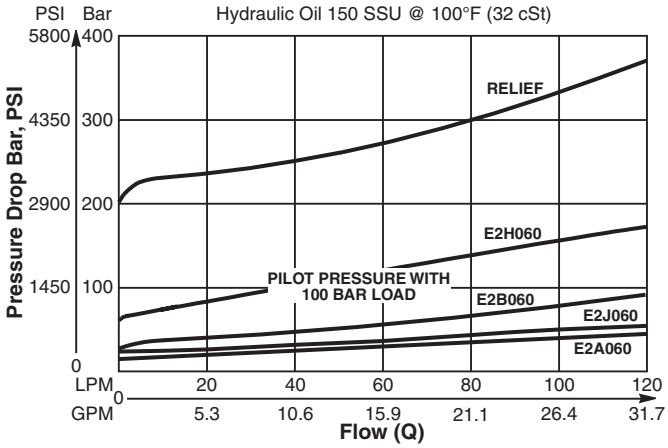
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- Includes reverse check valve within body, saving space and minimizing installation cost
- Excellent control and very good stability
- Four pilot ratios available, 1.75:1, 3:1, and 5:1 for cylinders and 8:1 for motor control
- Hardened working parts for maximum durability
- Adjustable and tamper resistant versions also available
- All external parts zinc plated

Specifications

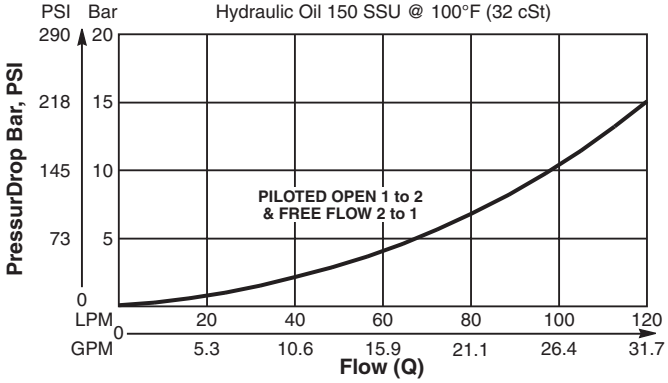
Rated Flow	120 LPM (32 GPM)
Pressure	50 - 350 Bar (725 - 5000 PSI)
Sensitivity: Pressure/Turn	44 Bar (640 PSI)
Pilot Ratio	**E2A060 -** 8 : 1 **E2B060 -** 3 : 1 **E2H060 -** 1.75 : 1 **E2J060 -** 5 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.54 kg (1.19 lbs.)
Cavity	3C (See BC Section for more details)

Performance Curves

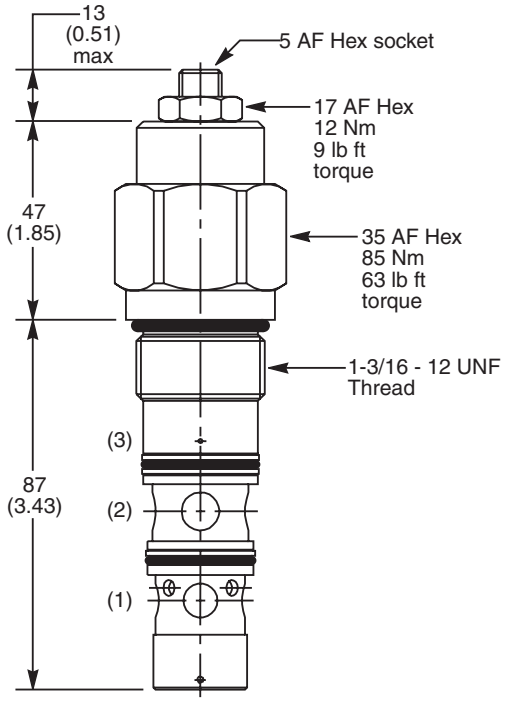
Relief & Pilot Performance 1 to 2



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E2		060	Z	N	MK2
Load Control Valve	Pilot Ratio		Adjustment Style	Seals	

Code	Pilot Ratio
A	8 : 1
B	3 : 1
H	1.75 : 1
J	5 : 1

Code	Adjustment Style
Z	Screw Adjust

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Other settings are available, please contact Parker Sales.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30008N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately See section BC

LB10		S
Line Body	Porting	Body Material

Code	Porting
039	3/4″ BSP (main) 1/4″ BSP (aux)
034	3/4″ BSP Dual Cavity

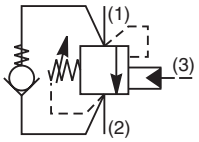
Body Material
Steel

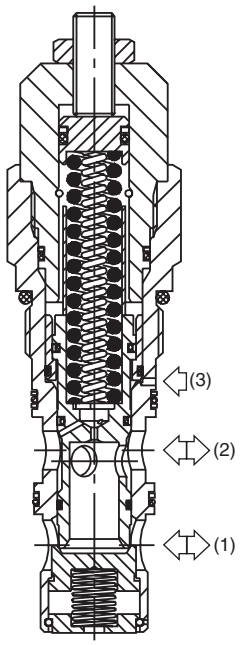
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

General Description

Threaded Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM3.







Features

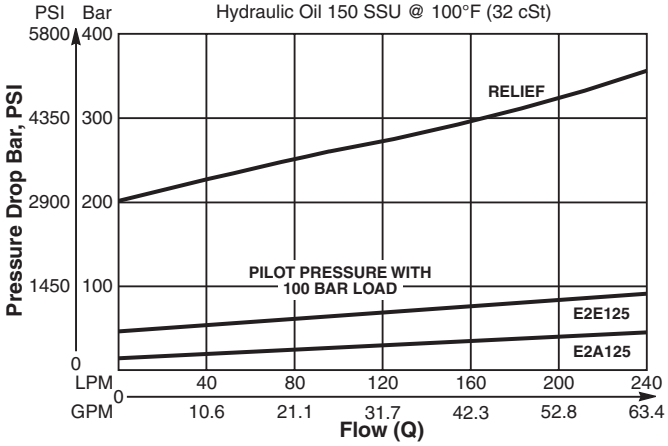
- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection, and reverse check valve, saving space and minimizing installation cost
- Two pilot ratios available, 3:1 for cylinders and 8:1 for motor control
- Hardened working parts for maximum durability
- Adjustable and tamper resistant versions also available
- All external parts zinc plated

Specifications

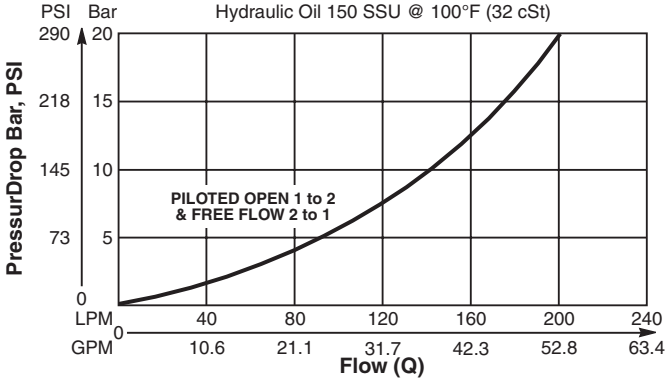
Rated Flow	200 LPM (53 GPM)
Pressure	50 - 350 Bar (725 - 5000 PSI)
Sensitivity: Pressure/Turn	34 Bar (493 PSI)
Pilot Ratio	**E2A125 -** 8 : 1 **E2E125 -** 3 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.75 kg (1.65 lbs.)
Cavity	3M (See BC Section for more details)

Performance Curves

Relief & Pilot Performance 1 to 2

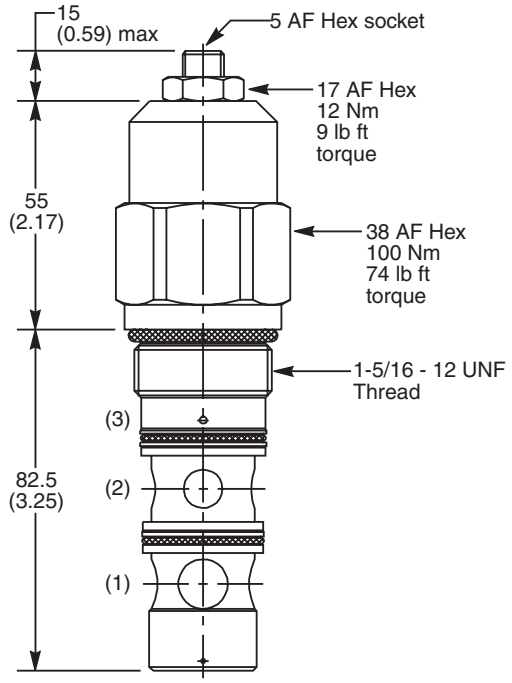


Pressure Drop vs Flow



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



Ordering Information

E2		125	Z	N	MK2
Load Control Valve	Pilot Ratio		Adjustment Style	Seals	

Code	Pilot Ratio
A	8 : 1
E	3 : 1

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Other settings are available, please contact Parker Sales.

Order Bodies Separately See section BC

LB10		S
Line Body	Porting	Body Material

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30035N-1)	-34°C to +121°C (-30°F to +250°F)

Code	Porting
076	1″ BSP (main) 1/4″ BSP (aux)
104	1″ BSP Dual Cavity

Body Material
Steel

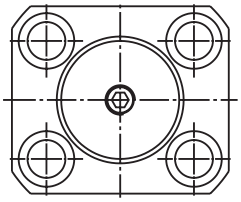
General Description

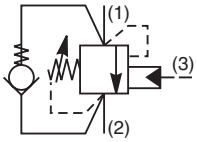
Flanged Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM3.

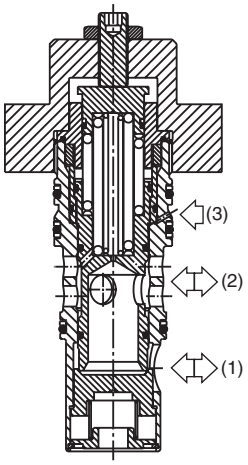
Features

- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection, and reverse check valve, saving space and minimizing installation cost
- Two pilot ratios available, 3:1 for cylinders and 8:1 for motor control
- Hardened working parts for maximum durability
- Adjustable and tamper resistant versions also available
- All external parts zinc plated







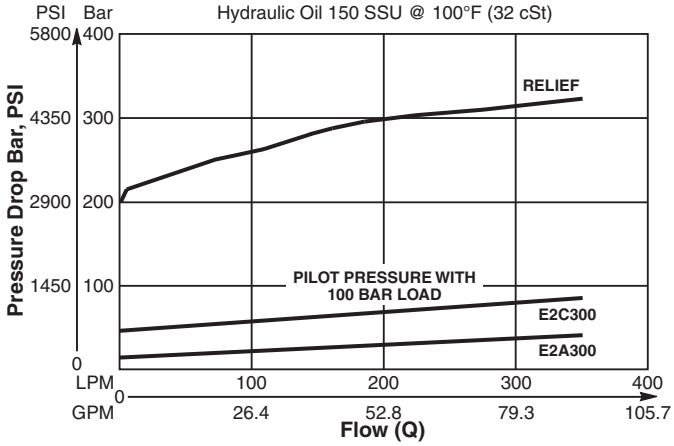


Specifications

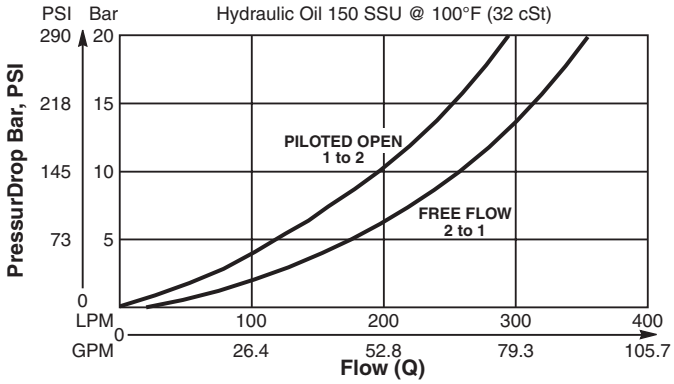
Rated Flow	350 LPM (92 GPM)
Pressure	50 - 350 Bar (725 - 5000 PSI)
Sensitivity: Pressure/Turn	45 Bar (653 PSI)
Pilot Ratio	**E2A300 -** 8 : 1 **E2C300 -** 3 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	1.44 kg (3.17 lbs.)
Cavity	3K (See BC Section for more details)

Performance Curves

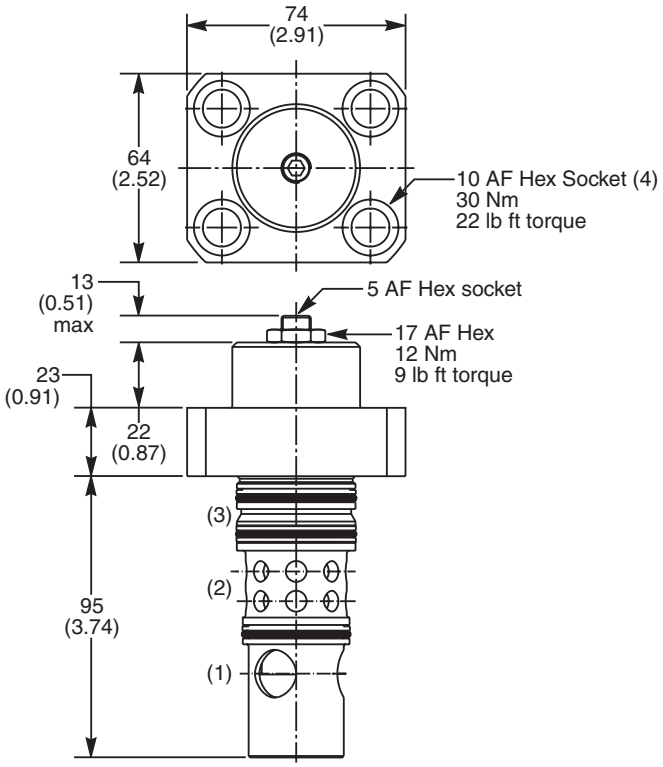
Relief & Pilot Performance 1 to 2



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E2		300	Z	N	MK2
Load Control Valve	Pilot Ratio		Adjustment Style	Seals	

Code	Pilot Ratio
A	8 : 1
C	3 : 1

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Other settings are available, please contact Parker Sales.

Order Bodies Separately See section BC

LB10		S
Line Body	Porting	Body Material

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30022N-1)	-34°C to +121°C (-30°F to +250°F)

Code	Porting
089	1. 1/4″ BSP (main) 1/4″ BSP (aux)

Body Material
Steel

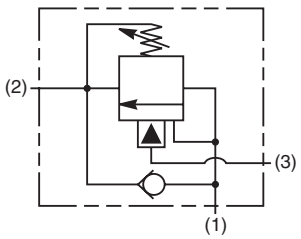
General Description

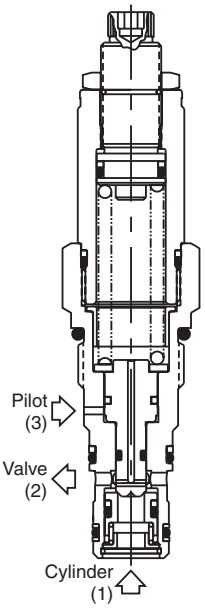
Cartridge Style Counterbalance Valve.
For additional information see Technical Tips on pages LM1-LM3.

Features

- Sealed spool type design for improved stability and accuracy as well as low leakage
- Low leakage poppet-type check valve for reliable load holding
- All external parts zinc plated
- Parker cartridge design for ease of installation and maintenance
- Compact size for reduced space requirements





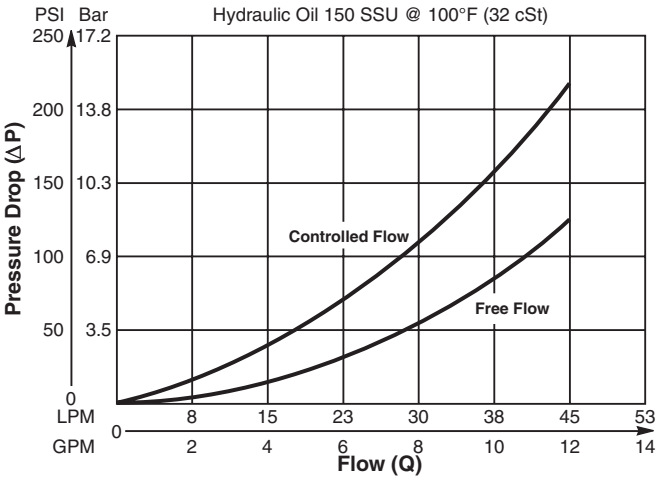


Specifications

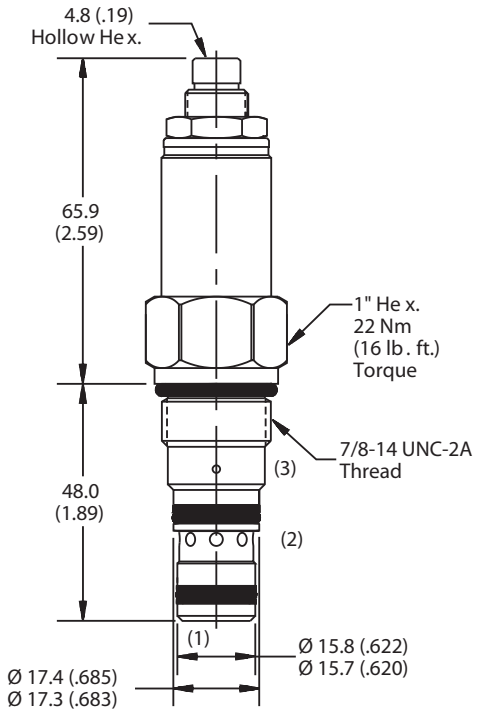
Rated Flow	45 LPM (12 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI) - Steel 210 Bar (3000 PSI) - Aluminum
Maximum Setting Pressure	350 Bar (5000 PSI) - Steel 210 Bar (3000 PSI) - Aluminum
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) @ 80% of thermal crack pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.23 kg (0.5 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

Performance Curve

Flow vs. Pressure Drop
(Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

CB101			
Counterbalance Cartridge Valve	Pilot Ratio	Adjustment Style	Pressure Range

Code	Pilot Ratio
A	3:1
B	4.5:1
C	7:1

Code	Adjustment Style
S	Screw Adjust

Code	Pressure Range
10	20.7 - 90 Bar (300 - 1300 PSI) Standard Setting: 69 Bar (1000 PSI) @ 11.3 LPM (3 GPM)
20	69 - 172.4 Bar (1000 - 2500 PSI) Standard Setting: 138 Bar (2000 PSI) @ 11.3 LPM (3 GPM)
30	166 - 350 Bar (2400 - 5000 PSI) Standard Setting: 210 Bar (3000 PSI) @ 11.3 LPM (3 GPM)

Code	Seals / Kit No.	Operating Temp.
Omit	Nitrile / (SK10-3N)	-34°C to +121°C (-30°F to +250°F)
V	Fluorocarbon / (SK10-3V)	-26°C to +204°C (-15°F to +400°F)

Valve to be set to 1.3 times maximum load induced pressure.

Other settings are available, please contact Parker Sales.

Order Bodies Separately
See section BC

B10	—	3	—	8B
10 Size		3-Way Cavity		Port Size

Port Size
1/2" BSP

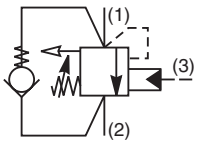
Body Material
Steel

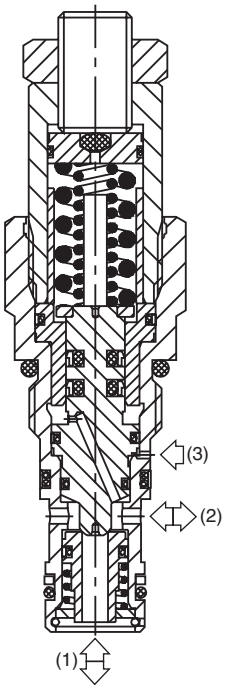
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

General Description

Threaded Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM3.







Features

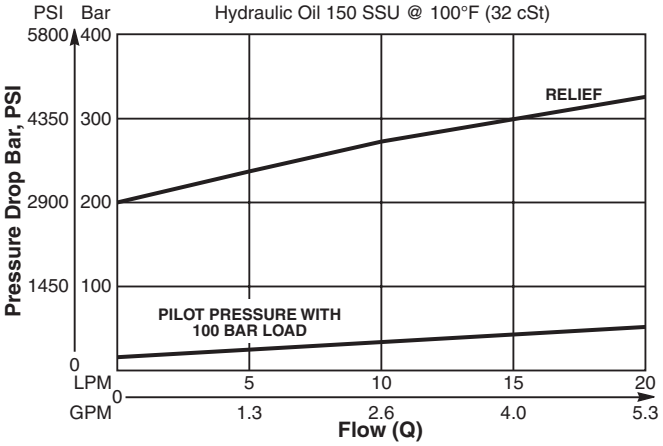
- Spring chamber isolated from system backpressure by double seal, eliminating vent port leakage and need for separate drain line
- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection
- Includes reverse check valve within body
- Small and compact, can be fitted directly into cylinder
- Adjustable and tamper resistant versions available
- All external parts zinc plated

Specifications

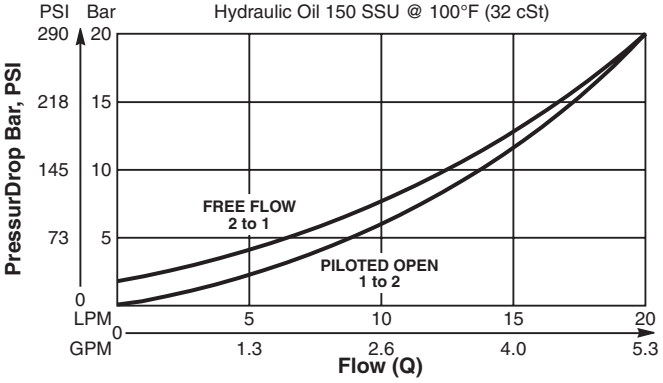
Rated Flow	20 LPM (5.3 GPM)
Pressure	50 - 420 Bar (725 - 6000 PSI)
Sensitivity: Pressure/Turn	84 Bar (1220 PSI)
Pilot Ratio	4.5 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.08 kg (0.18 lbs.)
Cavity	53-1 (See BC Section for more details)

Performance Curves

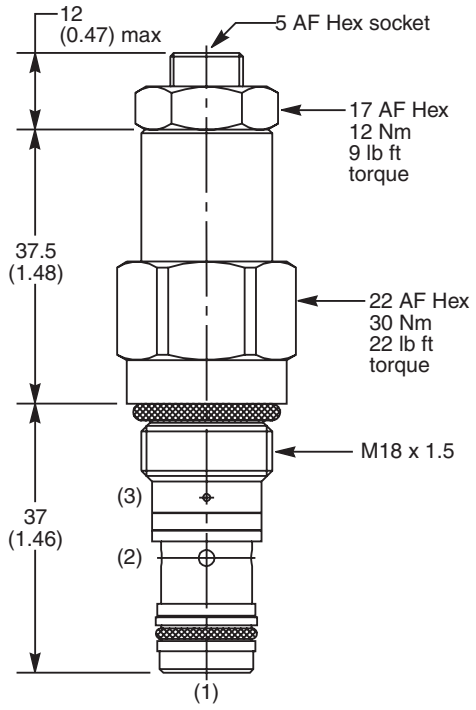
Relief & Pilot Performance 1 to 2



Pressure Drop vs Flow



Dimensions Millimeters (Inches)



Ordering Information

E6	B	020	Z	N
Load Control Valve	Pilot Ratio		Adjustment Style	Seals

Code	Pilot Ratio
B	4.5 : 1

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Other settings are available, please contact Parker Sales.

Order Bodies Separately See section BC

LB10		S
Line Body	Porting	Body Material

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30087N-1)	-34°C to +121°C (-30°F to +250°F)

Code	Porting
310	3/8″ BSP (main) 1/4″ BSP (aux)
312	3/8″ BSP Dual Cavity

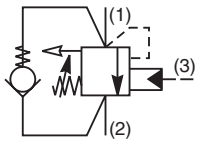
Body Material
Steel

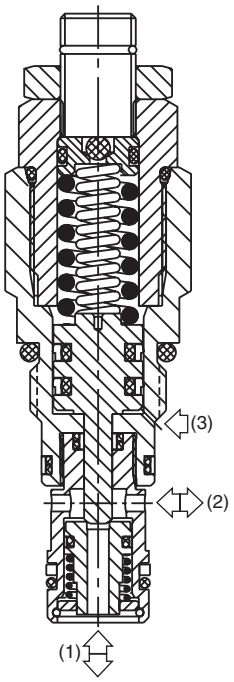
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

General Description

Threaded Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM3.







Features

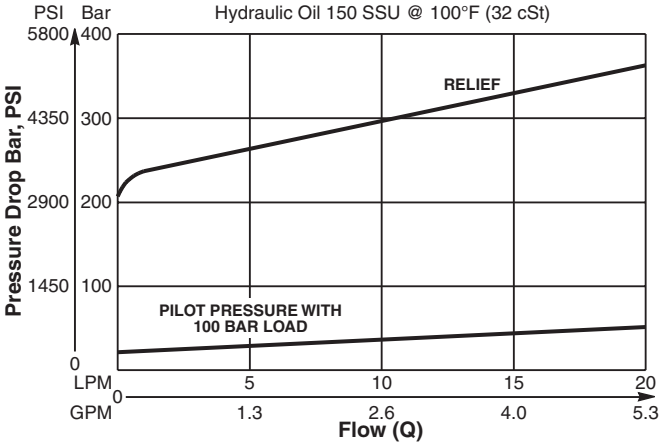
- Spring chamber isolated from system backpressure by double seal, eliminating vent port leakage and need for separate drain line
- Poppet construction for minimal leakage
- Suitable for remote pilot controlled boomlock applications as per ISO8463
- Incorporates direct acting relief valve for overload protection
- Includes reverse check valve within body
- Hardened working parts for maximum durability
- Adjustable and tamper resistant versions available
- All external parts zinc plated

Specifications

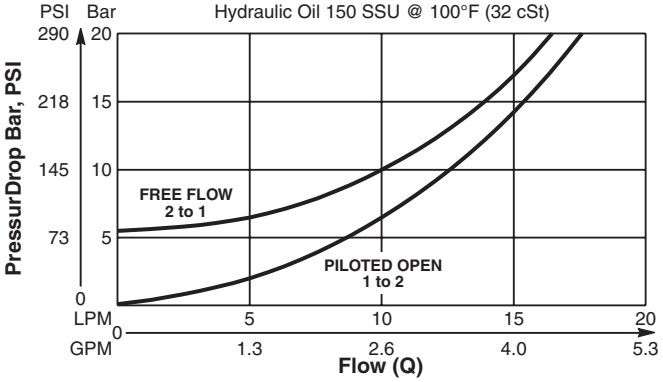
Rated Flow	20 LPM (5.3 GPM)
Pressure	100 - 350 Bar (1450 - 5075 PSI)
Sensitivity: Pressure/Turn	114 Bar (1650 PSI)
Pilot Ratio	15 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.08 kg (0.18 lbs.)
Cavity	53-1 (See BC Section for more details)

Performance Curves

Relief & Pilot Performance 1 to 2

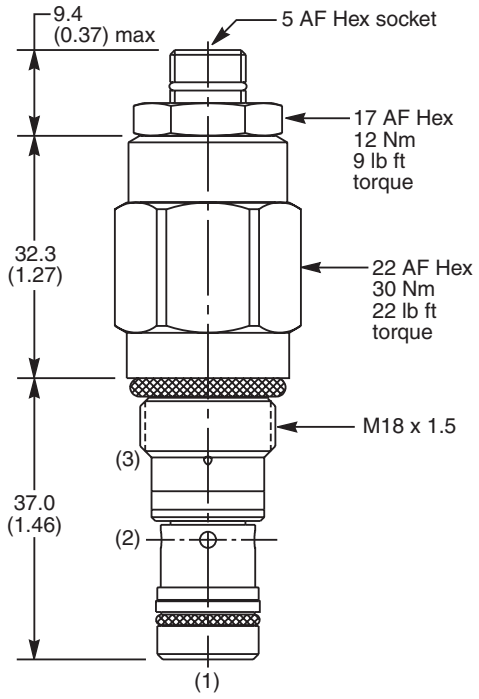


Pressure Drop vs Flow



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



Ordering Information

E6	K	020	Z	N
Load Control Valve	Pilot Ratio		Adjustment Style	Seals

Code	Pilot Ratio
K	1.5 : 1

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Other settings are available, please contact Parker Sales.

Order Bodies Separately See section BC

LB10		S
Line Body	Porting	Body Material

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30087N-1)	-34°C to +121°C (-30°F to +250°F)

Code	Porting
310	3/8″ BSP (main) 1/4″ BSP (aux)
312	3/8″ BSP Dual Cavity

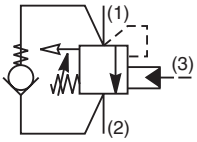
Body Material
Steel

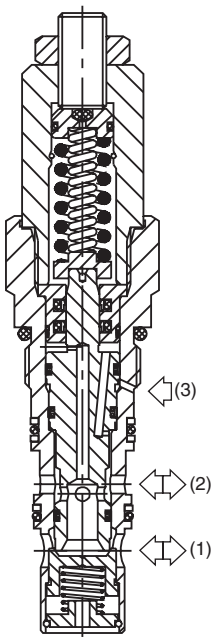
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

General Description

Threaded Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM3.







Features

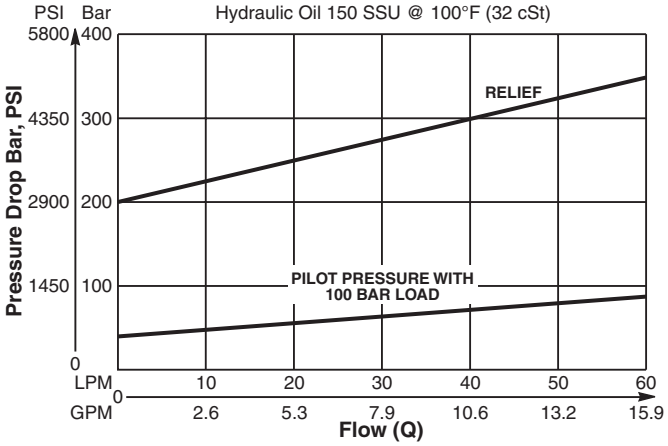
- Spring chamber isolated from system backpressure by double seal, eliminating vent port leakage and need for separate drain line
- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection
- Includes reverse check valve within body, saving space and minimizing installation cost
- Hardened working parts for maximum durability
- Adjustable and tamper resistant versions available
- All external parts zinc plated

Specifications

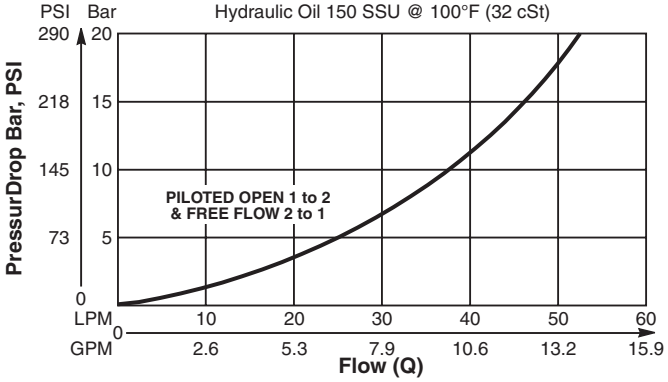
Rated Flow	60 LPM (15.9 GPM)
Pressure	50 - 350 Bar (725 - 5000 PSI)
Sensitivity: Pressure/Turn	92 Bar (1335 PSI)
Pilot Ratio	3 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.33 kg (0.73 lbs.)
Cavity	68-1 (See BC Section for more details)

Performance Curves

Relief & Pilot Performance 1 to 2

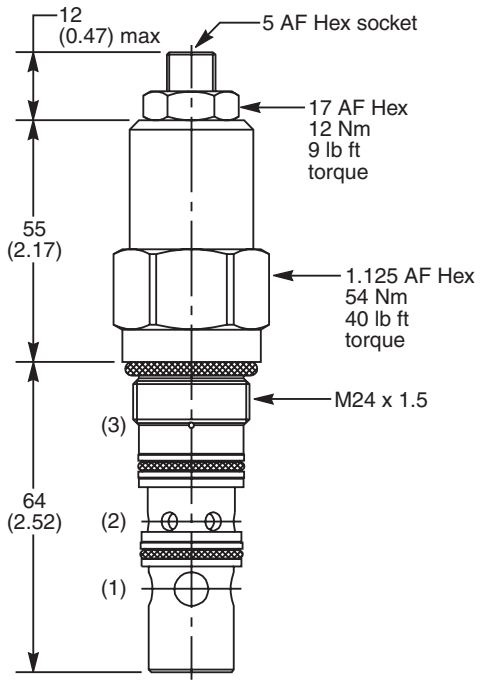


Pressure Drop vs Flow



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



Ordering Information

E6	B	040	Z	N	MK3
Load Control Valve	Pilot Ratio		Adjustment Style	Seals	

Code	Pilot Ratio
B	3 : 1

Code	Adjustment Style
Z	Screw Adjust

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30059N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately See section BC

LB10		S
Line Body	Porting	Body Material

Code	Porting
251	1/2″ BSP (main) 1/4″ BSP (aux)
259	1/2″ BSP Dual Cavity

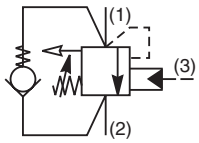
Body Material
Steel

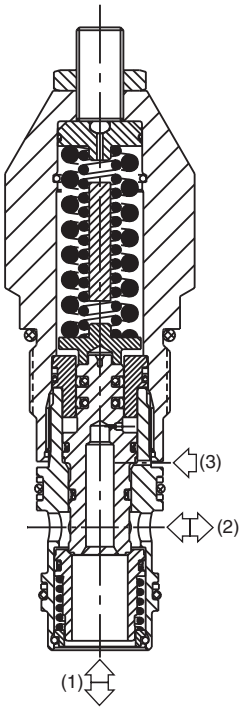
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

General Description

Threaded Cartridge Style Counterbalance Valve. Pilot assisted, designed for motion control applications. For additional information see Technical Tips on pages LM1-LM3.







Features

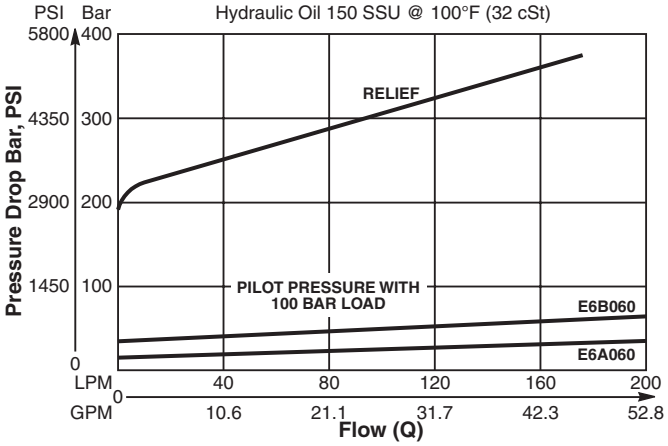
- High flow design with extra dampening
- Spring chamber isolated from system backpressure by double seal, eliminating vent port leakage and need for separate drain line
- Poppet construction for minimal leakage
- Incorporates direct acting relief valve for overload protection
- Includes reverse check valve within body, saving space and minimizing installation cost
- Hardened working parts for maximum durability
- Adjustable and tamper resistant versions available
- All external parts zinc plated

Specifications

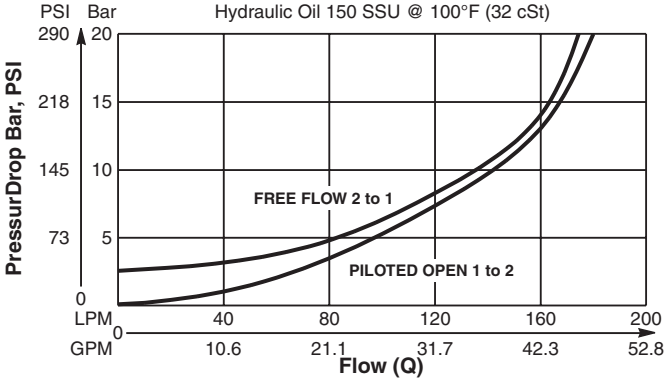
Rated Flow	180 LPM (48 GPM)
Pressure	50 - 350 Bar (725 - 5000 PSI)
Sensitivity: Pressure/Turn	50 Bar (725 PSI)
Pilot Ratio	**E6B060*409 -** 3 : 1
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.53 kg (1.17 lbs.)
Cavity	3C (See BC Section for more details)

Performance Curves

Relief & Pilot Performance 1 to 2

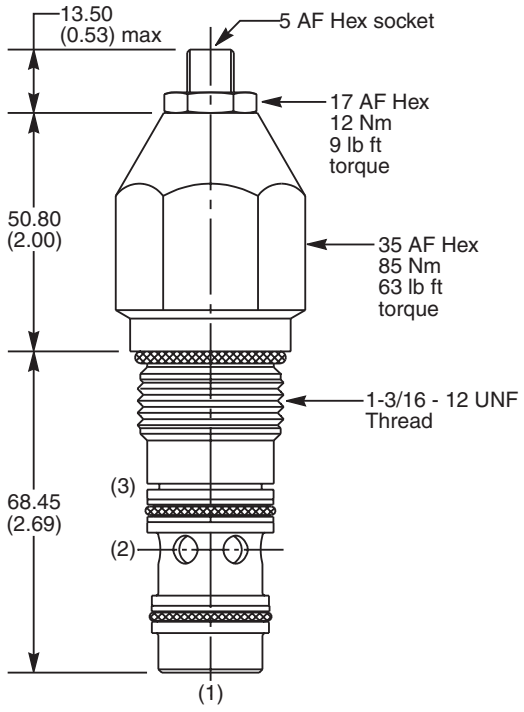


Pressure Drop vs Flow



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



Ordering Information

E6	B	060	Z	N	409
Load Control Valve	Pilot Ratio		Adjustment Style	Seals	Suffix Number

Code	Pilot Ratio
B	3 : 1

Standard valve is set to crack at 215 Bar (3120 PSI). Valve to be set to 1.3 times maximum load induced pressure.

Other settings are available, please contact Parker Sales.

Order Bodies Separately See section BC

LB10		S
Line Body	Porting	Body Material

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30008N-1)	-34°C to +121°C (-30°F to +250°F)

Code	Porting
039	3/4″ BSP (main) 1/4″ BSP (aux)
034	3/4″ BSP Dual Cavity

Code	Suffix Number
409	High flow design with extra dampening

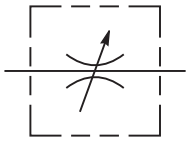
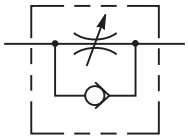
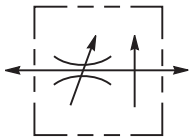
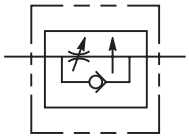
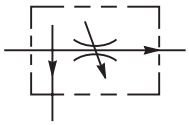
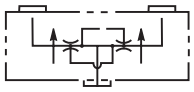
Body Material
Steel

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Notes

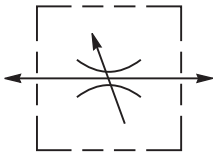
Contents

Flow Control Valves

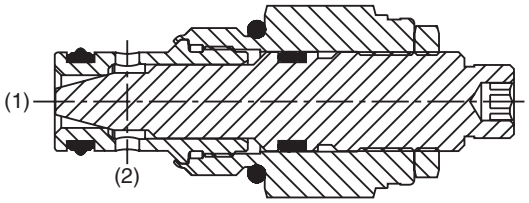
	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
	**NEEDLE VALVES**					
	J02A2	C08-2	Needle Valve, Cartridge Type	45/12	420/6000	FC5-FC6
	J04A2	C10-2	Needle Valve, Cartridge Type	110/29	420/6000	FC7-FC8
	J06A2	C16-2	Needle Valve, Cartridge Type	225/60	420/6000	FC9-FC10
	J02B2	C08-2	Needle Valve with Reverse Check, 2 to 1 Free Flow	30/8	420/6000	FC11-FC12
	FV101	C10-2	Needle Valve with Reverse Check, 1 to 2 Free Flow	45/12	210/3000	FC13-FC14
	**PRESSURE COMPENSATED FLOW CONTROLS**					
	J02E2	C08-2	Restrictive Flow Control, Adjustable	20/5.3	420/6000	FC15-FC16
	J04E2	C10-2	Restrictive Flow Control, Adjustable	40/10	420/6000	FC17-FC18
	J04C2	C10-2	Restrictive Flow Control, Adjustable	40/10	420/6000	FC19-FC20
	FA101S	C10-2	Restrictive Flow Control, Reverse Check, Adjustable	21/5.5	210/3000	FC21-FC22
	**PRESSURE COMPENSATED PRIORITY FLOW CONTROLS**					
	J02D3	C08-3	Priority Type, with Bypass	15/4	420/6000	FC23-FC24
	J04D3	C10-3	Priority Type, with Bypass	70/18	420/6000	FC25-FC26
	J1A125	3A	Priority Type, with Bypass	150/40	350/5000	FC27-FC28
	**FLOW DIVIDERS/COMBINERS**					
	L04A3	C10-4	Flow Divider/Combiner	60/16	420/6000	FC29-FC30
	L06A3	C16-4	Flow Divider/Combiner	180/47	420/6000	FC31-FC32

PRODUCT TYPES / APPLICATIONS

Needle Valve

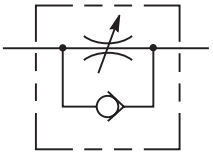


Needle valves provide uncompensated adjustable flow control of a desired function. They are ideal for applications where general control of hydraulic flow is needed, like in a bleed off circuit. When used with a compensator spool, a pressure compensated system can be obtained.

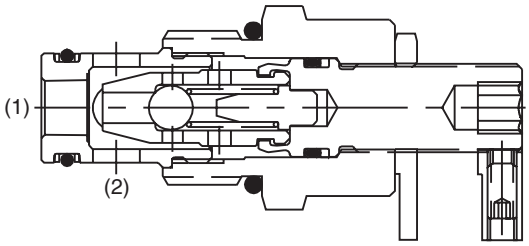


OPERATION - The valve acts as a fixed orifice in a hydraulic circuit. The effective size of the orifice increases as the tapered needle is opened. Shutoff is provided when fully closed. While a needle valve will meter flow regardless of the flow path, flow from port 2 to 1 is preferred. When you flow in the reverse direction (1 to 2), pressure forces work on the nose of the needle in an effort to drive it off of its seat. As such, all leakage conditions found in the catalog are based on flow from side to nose (port 2 to port 1). In addition, the adjustment will be harder to turn due to the added force.

Needle with a Reverse Check

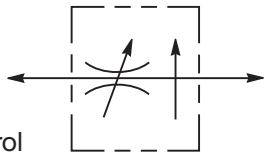


Needle valves with reverse check functions are sometimes also referred to as flow control valves. As the name implies, these valves provide uncompensated adjustable speed control in one direction and allow free flow in the opposite direction. When used with a compensator spool, a pressure compensated system can be obtained.

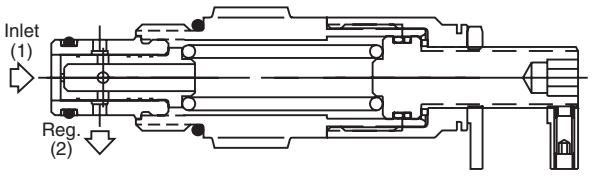


OPERATION - With flow entering the side of the cartridge (port 2), the needle acts as a fixed orifice. The effective size of this orifice is increased as the needle is opened controlling the output flow to port 1. With flow entering the nose (port 1), the check ball inside the needle is unseated allowing free flow to port 2.

P.C. Flow Regulator

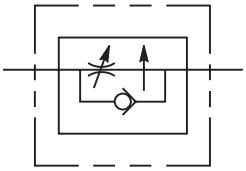


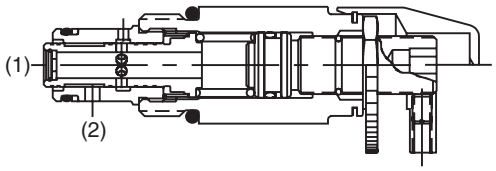
Pressure compensated flow regulators maintain a regulated flow regardless of changes in load or inlet pressure. They are commonly used to accurately control an actuator function. They can be used in meter-in or meter-out applications.



OPERATION - The valve consists of a control orifice within a normally open, spring biased compensator spool. Flow through the control orifice produces a pressure drop across the compensator spool. When inlet flow exceeds the flow setting of the valve, the force produced by the pressure differential across the spool exceeds the spring force and shifts the compensator spool to throttle or restrict flow; thus maintaining consistent flow through the valve. In the reverse direction, flow is metered, but not pressure compensated.

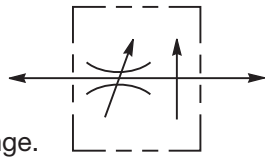
P.C. Flow Control

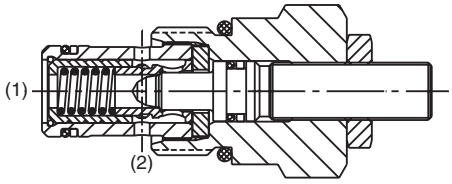




Pressure compensated flow controls are pressure compensated regulators with a reverse flow check valve. They provide constant regulated flow in the one direction regardless of changes in load pressure. Flow in the reverse direction is non-regulated, free flow. They can be used in meter-in or meter-out applications.

Adjustable Flow Controls

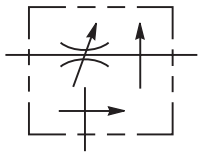


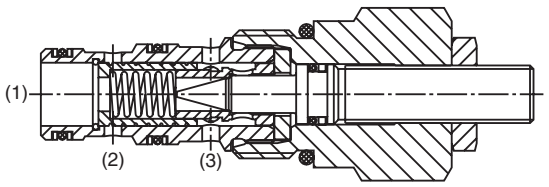


Most adjustable pressure compensated flow controls have a limited adjustment range. This means they are only adjustable within a pre-set range. The FA101, J02E2, J04E2 and J04C2 are fully adjustable. Keep this adjustment capability in mind when you select a flow control.

OPERATION - When flow enters the nose (port 1) of the cartridge, it passes through a control orifice. This control orifice creates a pressure differential across the regulating spool. As the inlet flow increases, the pressure differential across the regulating spool increases, allowing the regulating spool to overcome its spring force and begin to shift. As it shifts, it throttles to maintain a constant flow. When used in conjunction with a fixed displacement pump, a relief valve between pump and valve is needed. Full flow is allowed in the reverse direction (port 2 to 1).

Priority Style P.C. Flow Regulator



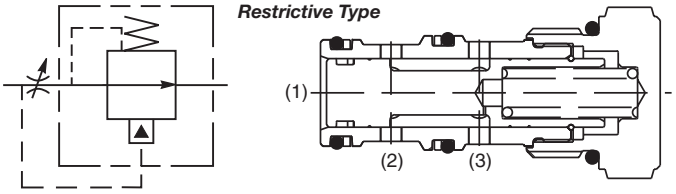


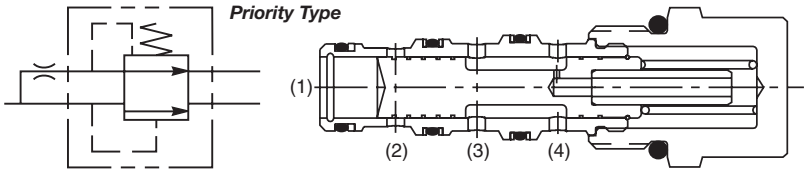
Priority style pressure compensator regulators maintain constant priority flow to one leg of the circuit regardless of changes in load or inlet pressure. Once this priority flow requirement is satisfied, the excess flow is diverted and can be used in another leg of the circuit. These valves are usually used in meter-in applications.

OPERATION - The valve consists of a control orifice within a spring biased compensator spool. The priority port is normally open while the bypass port is normally closed. As flow enters the inlet of the cartridge and passes through the control orifice, a pressure differential is created across the compensator spool. When the inlet flow exceeds the setting of the valve, the force produced by this pressure differential exceeds the spring force and shifts the compensator spool; opening up the bypass port, and bypassing the excess flow. If load pressure at the bypass port is greater than the load pressure at the priority port, the compensator spool will further shift restricting the priority flow to that of the valve setting. ***Caution:*** If the priority line is blocked so that no flow can pass through the control orifice, the compensator spool will shift, blocking the bypass port and allowing inlet pressure to go to full system relief pressure. These valves do not provide a pressure relieving function, so it is common to place an external relief valve downstream of port 3 to prevent a no flow condition.

Compensator Valves

Compensator valves are used to provide pressure compensated control across an external fixed or adjustable orifice. Parker offers both the restrictive type of compensator and a priority style.

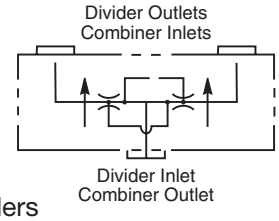


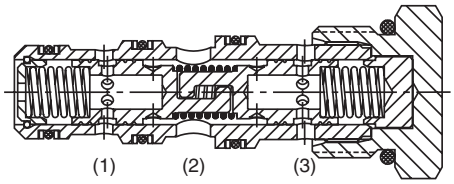


OPERATION - ***Restrictive Type:*** Inlet flow (upstream of the orifice) is split with one portion going to the compensator port inlet (port 1), the other portion passes through the orifice to the supply port (port 3). As pressure drop across the orifice reaches the selected compensator pressure drop, the higher pressure (pre-orifice) at port 1 starts to shift the compensator spool into throttling position. The valve works to maintain a constant pressure drop across the orifice.
Priority Type: Flow through the external orifice into the supply port (port 4) produces a pressure drop across the compensator spool. When the inlet pressure exceeds the initial setting of the valve, the force produced by the pressure differential across the spool exceeds the spring force and shifts the compensator spool to throttle or restrict the flow, thus maintaining constant flow through the priority port (port 3). The excess flow is bypassed to port 2. Regulated port flow must be maintained for bypass flow to continue.

Flow Divider / Combiner

Flow divider / combiner valves are used to proportion the flow from a single source into two actuators. In the reverse mode, the valve takes the flow from the two sources and combines it into one flow. When attempting to synchronize two cylinders with a flow/divider combiner valve, please consider that the flow accuracy is ±10%.
A crossover relief can be used to help re-synchronize the cylinders by bottoming them out after several cycles.



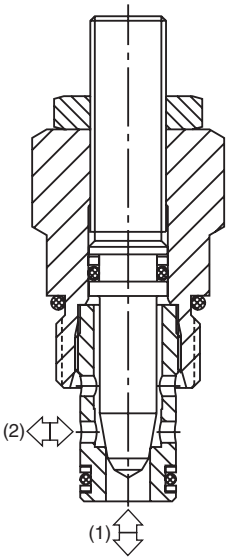


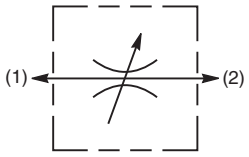
OPERATION - When flow enters the divider inlet port, it will pass through orifices in each of the interconnected spools. The flow passing through the orifices creates a pressure drop which pulls the two spools away from each other. The flow then passes to the two divider outlet ports. The division of flow (i.e. 50-50, 60-40, 66-33, etc.) is determined by the orifice sizes in the two spools.When flow is being combined, it enters the valve through two combiner inlets. The pressure drop across the orifices pulls the two spools together. The combined flow then passes through the combiner outlet.

General Description

Cartridge Style Needle Valve. For additional information see Technical Tips on pages FC1-FC4.







Features

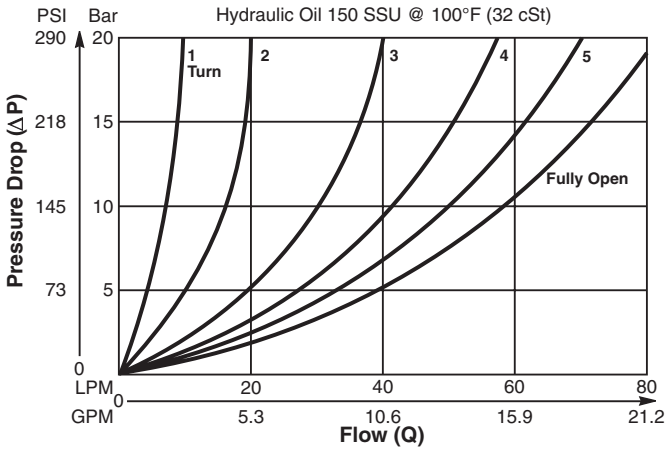
- Shuts off to a very low leakage level
- High flow capacity from a small cavity
- Good adjustment sensitivity - ideal for fine control
- Good contamination tolerant
- Adjustable and tamperproof versions available
- All external parts zinc plated

Specifications

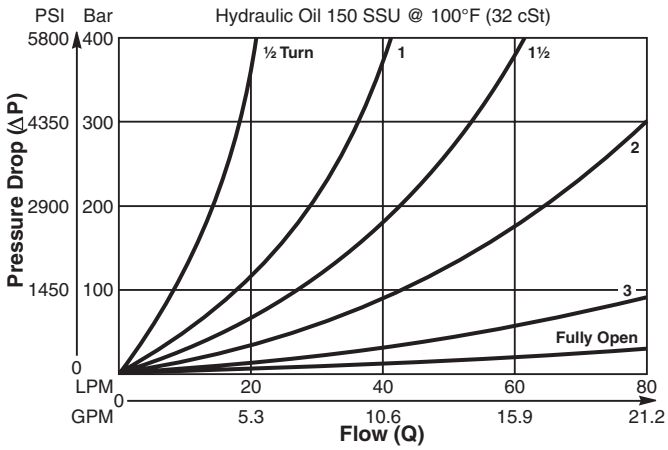
Rated Flow	45 LPM (12 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.11 kg (.24 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

Performance Curves (Through cartridge only)

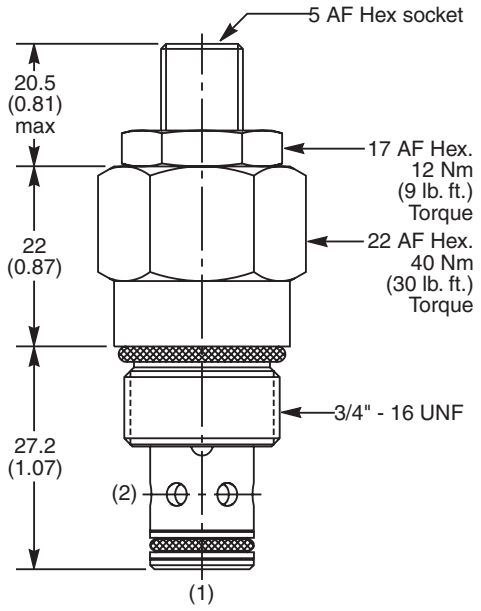
Low Pressure Drop vs. Flow 1 to 2 & 2 to 1



High Pressure Drop vs. Flow 1 to 2 & 2 to 1



Dimensions Millimeters (Inches)



Ordering Information

J02A2	Z	N
08 Size Needle Valve	Adjustment Style	Seals

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30500N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

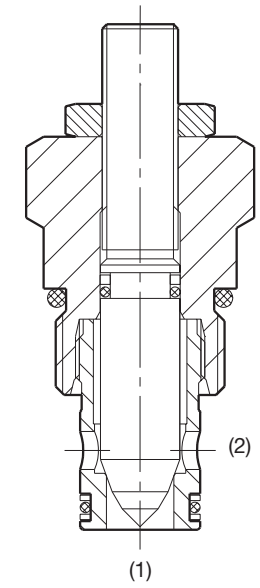
Port Size
3/8″ BSP

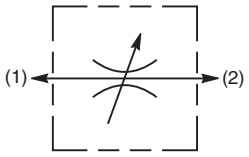
Body Material
Steel

General Description

Cartridge Style Needle Valve. For additional information see Technical Tips on pages FC1-FC4.







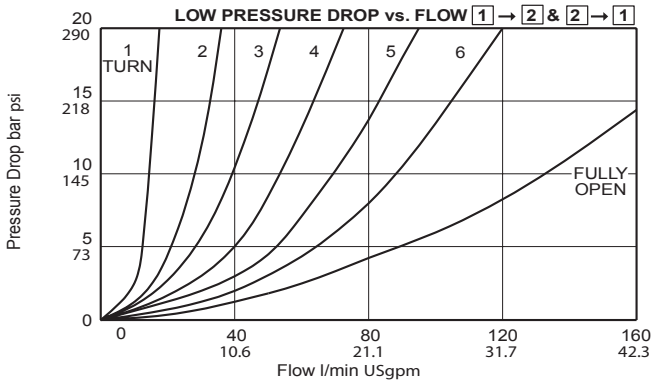
Features

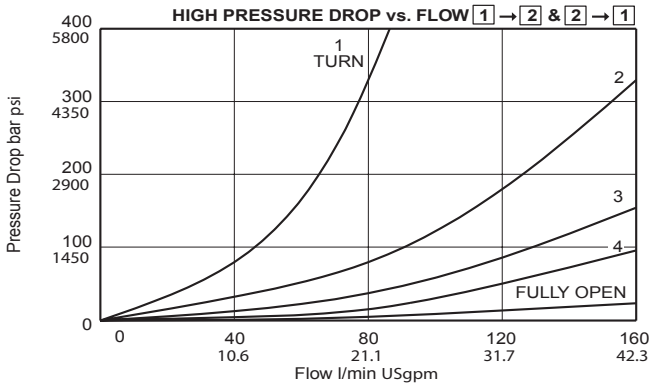
- Shuts off to a very low leakage level
- High flow capacity from a small cavity
- Good adjustment sensitivity - ideal for fine control
- Good contamination tolerant
- Adjustable and tamperproof versions available
- All external parts zinc plated

Specifications

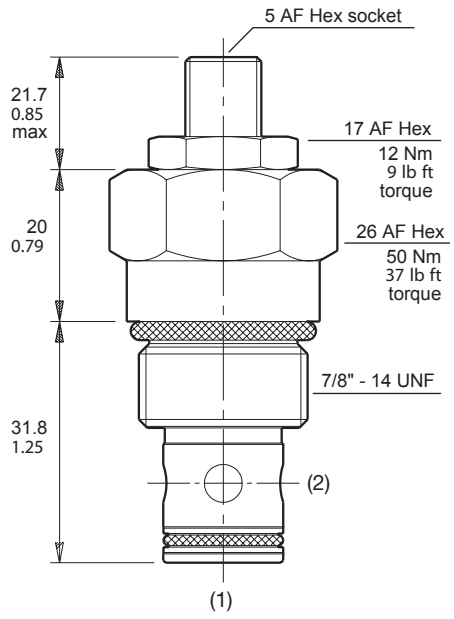
Rated Flow	110 LPM (29 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.20 kg (.44 lbs.)
Cavity	C10-2 (See BC Section for more details)

Performance Curves (Through cartridge only)





Dimensions Millimeters (Inches)



Ordering Information

J04A2	Z	N
10 Size Needle Valve	Adjustment Style	Seals

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30503N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

Port Size
1/2″ BSP

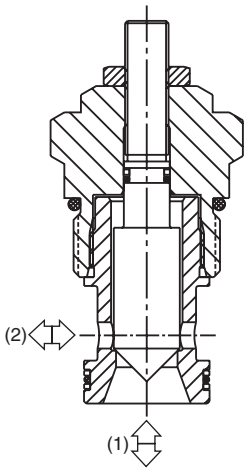
Body Material
Steel

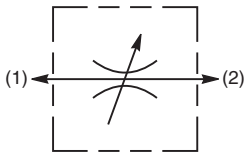
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

General Description

Cartridge Style Needle Valve. For additional information see Technical Tips on pages FC1-FC4.







Features

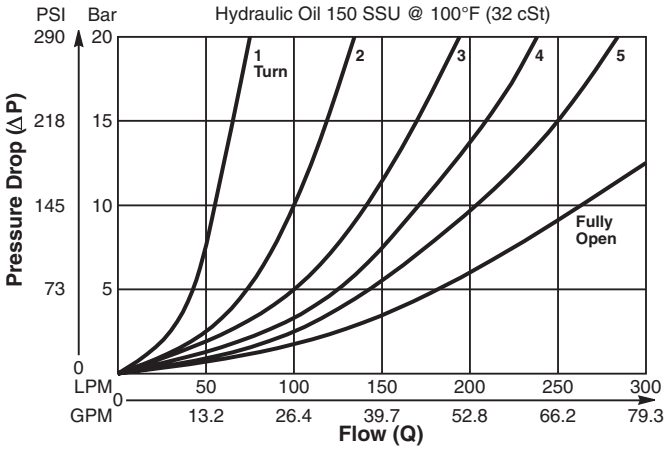
- Shuts off to a very low leakage level
- High flow capacity
- Good adjustment sensitivity - ideal for fine control
- Good contamination tolerant
- Adjustable and tamperproof versions available
- All external parts zinc plated

Specifications

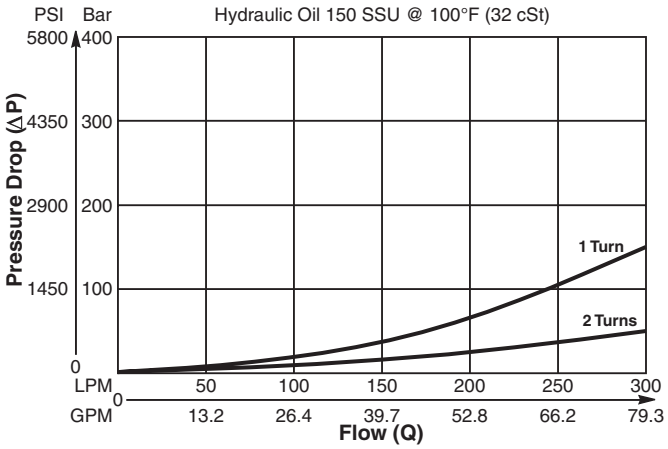
Rated Flow	225 LPM (60 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.38 kg (.84 lbs.)
Cavity	C16-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT16-2F

Performance Curves (Through cartridge only)

Low Pressure Drop vs. Flow 1 to 2 & 2 to 1

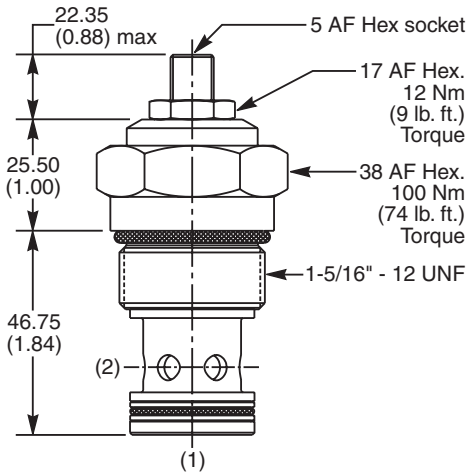


High Pressure Drop vs. Flow 1 to 2 & 2 to 1



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



Ordering Information

J06A2	Z	N
16 Size Needle Valve	Adjustment Style	Seals

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30507N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B16	—	2	—	16B
16 Size		2-Way Cavity		Port Size

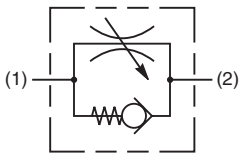
Port Size
1″ BSP

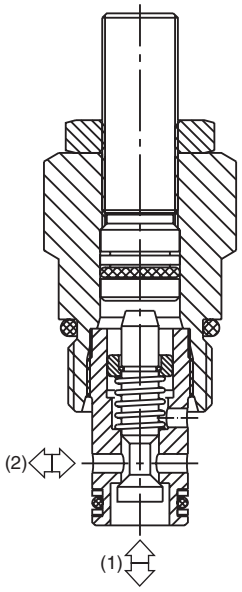
Body Material
Steel

General Description

Poppet Type Needle Valve with Reverse Flow Check. For additional information see Technical Tips on pages FC1-FC4.







Features

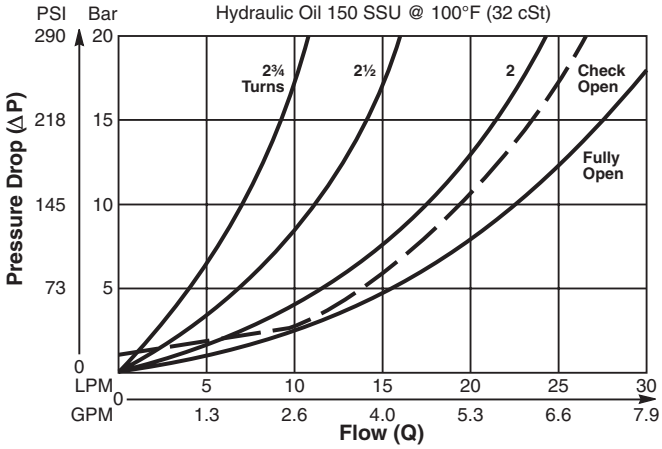
- Shuts off to a very low leakage level
- Good adjustment sensitivity - ideal for fine control
- Good contamination tolerant
- Adjustable and tamperproof versions available
- All external parts zinc plated

Specifications

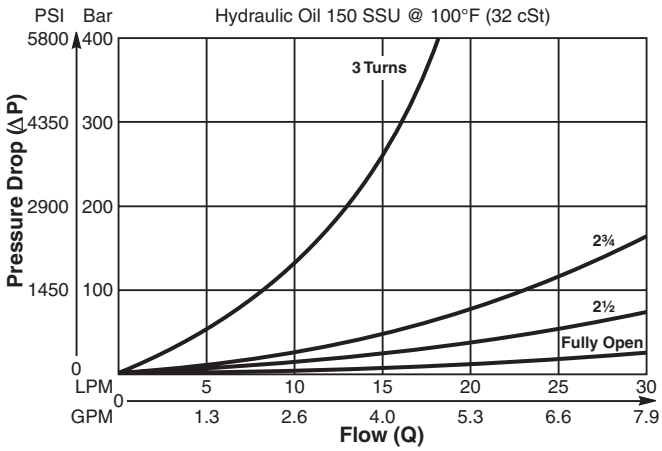
Rated Flow	30 LPM (8 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.11 kg (.24 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

Performance Curves (Through cartridge only)

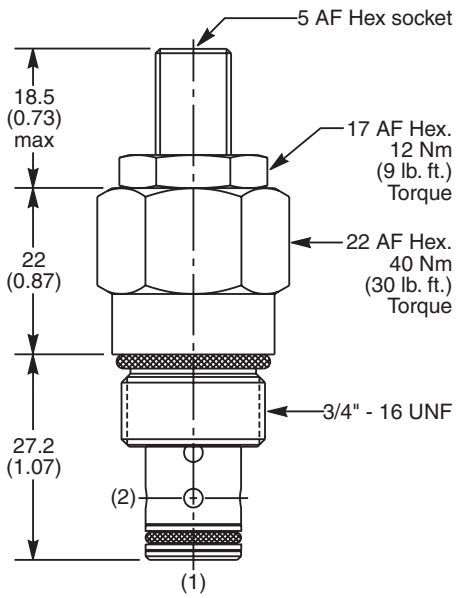
Low Pressure Drop vs. Flow 1 to 2 & 2 to 1



High Pressure Drop vs. Flow 1 to 2



Dimensions Millimeters (Inches)



Ordering Information

J02B2	Z	N
08 Size Needle Valve	Adjustment Style	Seals

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30500N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

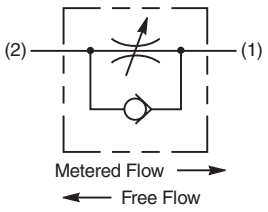
Port Size
3/8″ BSP

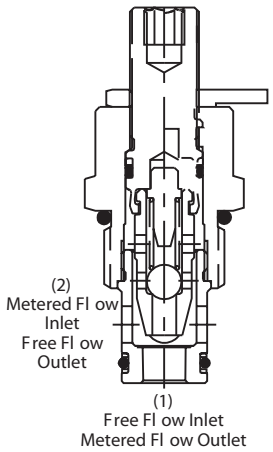
Body Material
Steel

General Description

Needle Valve with a Reverse Check. Also known as a Flow Control Valve. For additional information see Technical Tips on pages FC1-FC4.







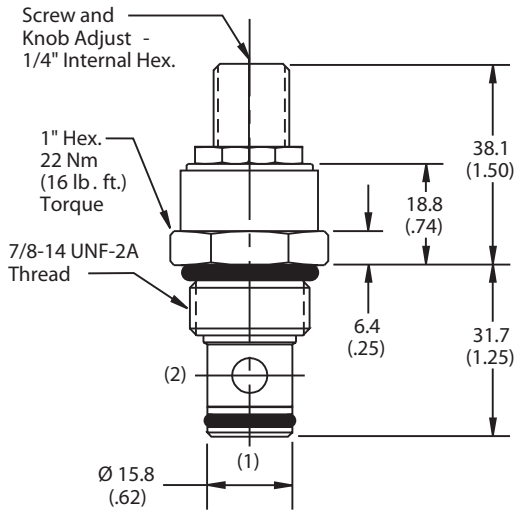
Features

- Hardened, precision ground parts for durability
- Compact size for reduced space requirements
- Fine thread needle option available for precise adjustment
- All external parts zinc plated

Specifications

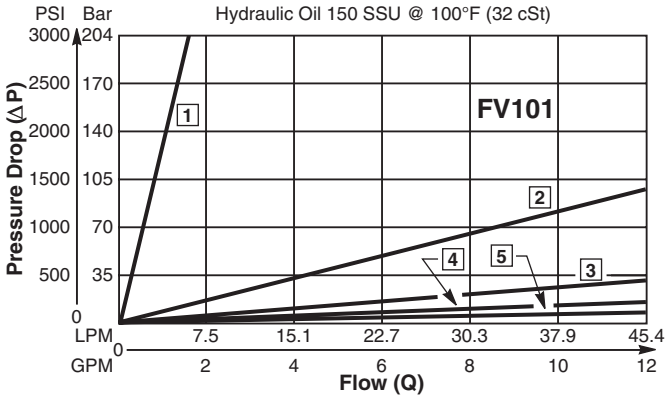
Rated Flow	**FV101** 45 LPM (12 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.23 kg (0.5 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

Dimensions Millimeters (Inches)



Performance Curve

Metered Flow vs. Pressure Drop (Through cartridge only)



☐ **= No. of Turns CCW From Fully Closed.**

The number on each curve indicates the number of complete turns of the knob or screw adjustment from fully closed. When the metered flow is 22.5 LPM (6 GPM) and the adjustment is two complete turns from closed, the pressure drop will be 13.8 Bar (200 PSI). When the metered flow is 22.5 LPM (6 GPM) and the adjustment is five complete turns from closed, the pressure drop will be 3.5 Bar (50 PSI).

Ordering Information

FV101	S	N
10 Size Flow Control Valve	Adjustment Style	Seals

Code	Style
1	Coarse Flow

Code	Adjustment Style
S	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK10-2N)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

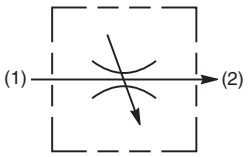
Port Size
1/2″ BSP

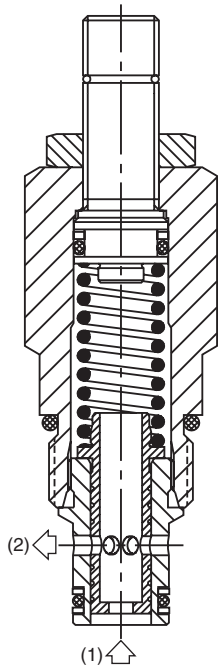
Body Material
Steel

General Description

Restrictive Style, Pressure Compensated Flow Control Valve. For additional information see Technical Tips on pages FC1-FC4.







Features

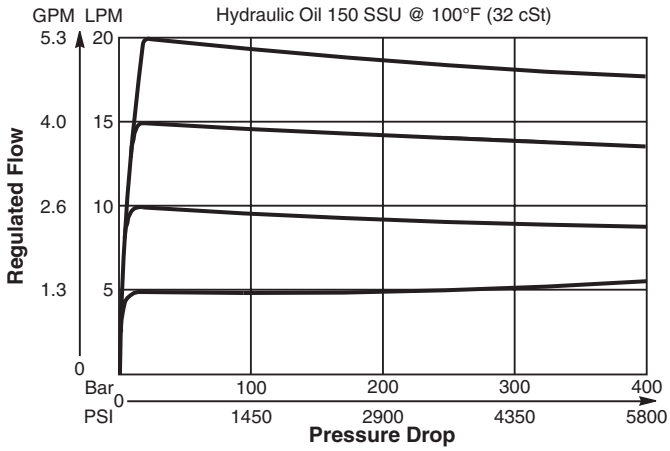
- Minimal flow change with pressure variation
- Reverse flow function
- Full adjustment from 1-20 LPM (0.3-5.3 GPM)
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated

Specifications

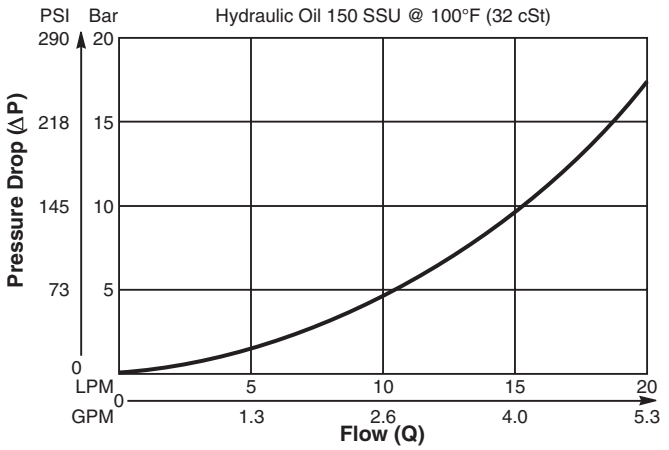
Rated Flow	20 LPM (5.3 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.13 kg (.29 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

Performance Curves (Through cartridge only)

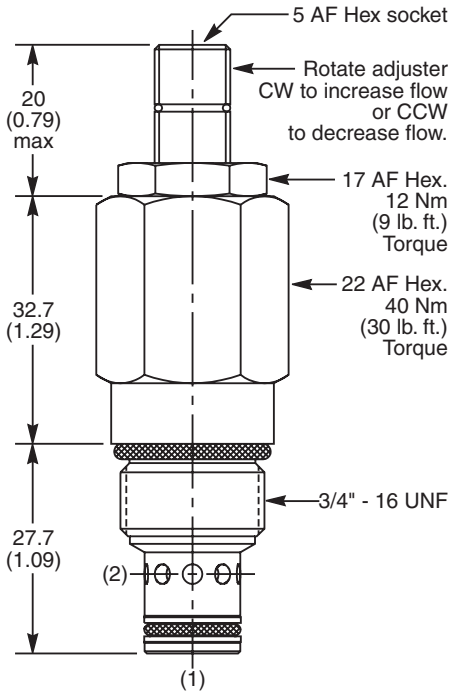
Flow Regulating Performance



Reverse Flow Pressure Drop vs. Flow



Dimensions Millimeters (Inches)



Ordering Information

J02E2	Z	N
08 Size Pressure Compensated Flow Control Valve	Adjustment Style	Seals

Code	Adjustment Style
Z	Screw Adjust

Standard valve has a flow setting of 10 LPM.

Valves are supplied at Standard setting.
Other settings are available, please contact Parker Sales.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30500N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

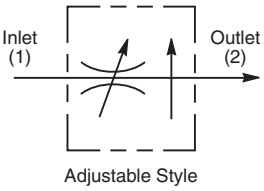
Port Size
3/8″ BSP

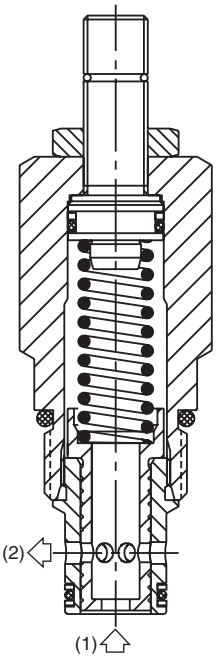
Body Material
Steel

General Description

Restrictive Style, Pressure Compensated Flow Control Valve. For additional information see Technical Tips on pages FC1-FC4.







Features

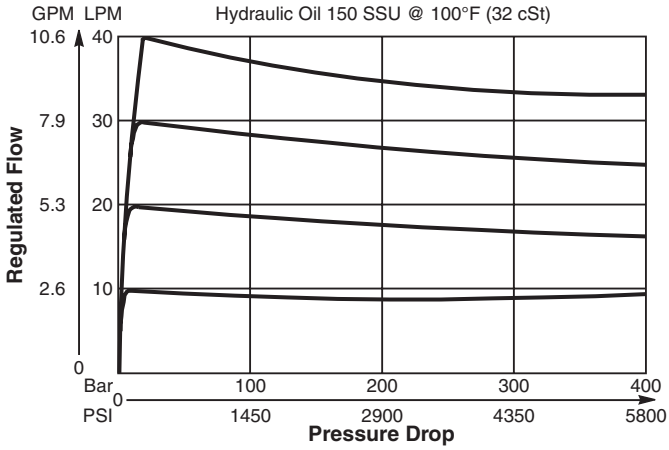
- Minimal flow change with pressure variation
- Reverse flow function
- Full adjustment from 1-40 LPM (0.3-10.6 GPM)
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated

Specifications

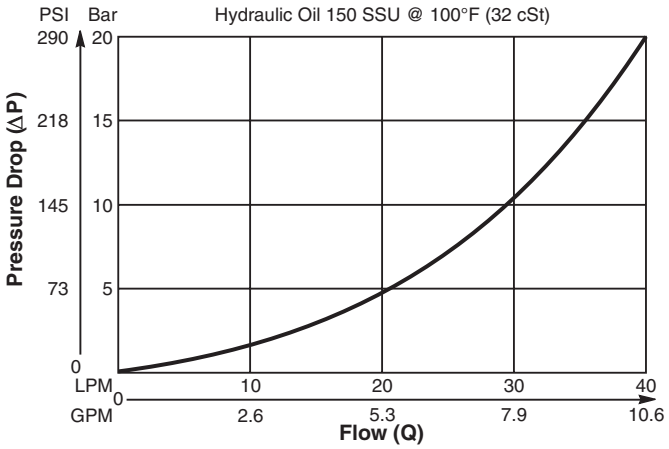
Rated Flow	40 LPM (10.6 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.20 kg (.44 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

Performance Curves (Through cartridge only)

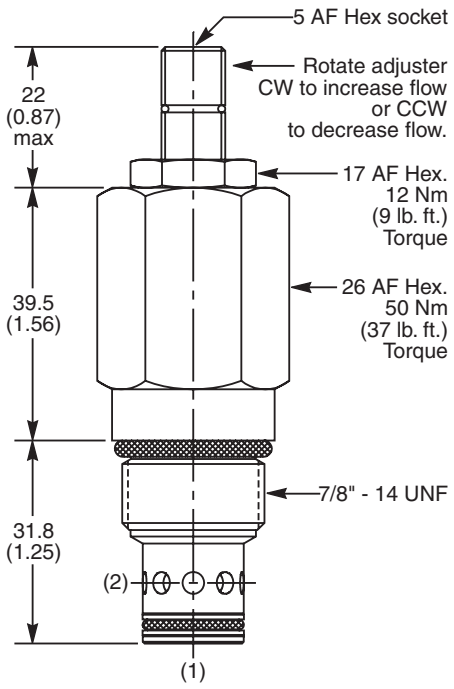
Flow Regulating Performance



Reverse Flow Pressure Drop vs. Flow



Dimensions Millimeters (Inches)



Ordering Information

J04E2	Z	N
10 Size Pressure Compensated Flow Control Valve	Adjustment Style	Seals

Code	Adjustment Style
Z	Screw Adjust

Standard valve has a flow setting of 20 LPM.

Valves are supplied at Standard setting.
Other settings are available, please contact Parker Sales.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30503N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

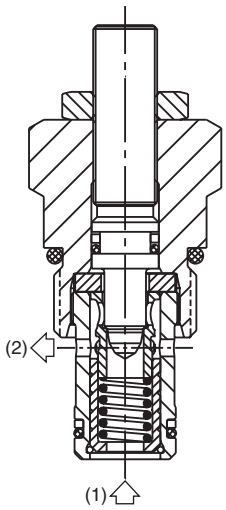
Port Size
1/2″ BSP

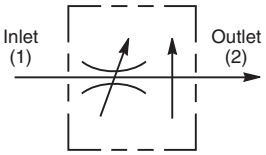
Body Material
Steel

General Description

Restrictive Variable Orifice Style, Pressure Compensated Flow Control Valve. For additional information see Technical Tips on pages FC1-FC4.







Adjustable Style

Features

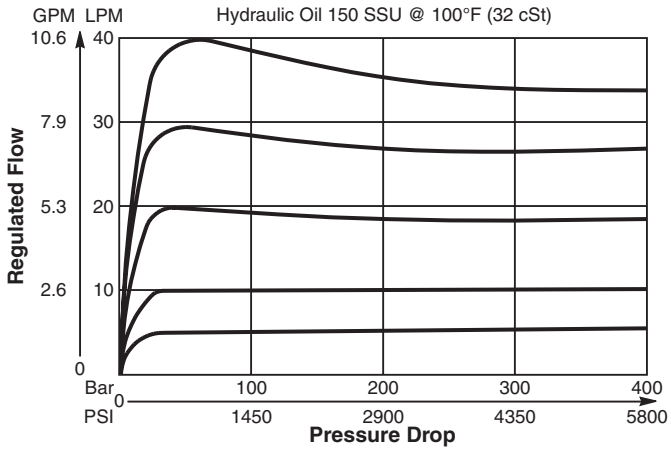
- Minimal flow change with pressure variation
- Partial reverse flow capability
- Full adjustment from 1-40 LPM (0.3-10.6 GPM)
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated

Specifications

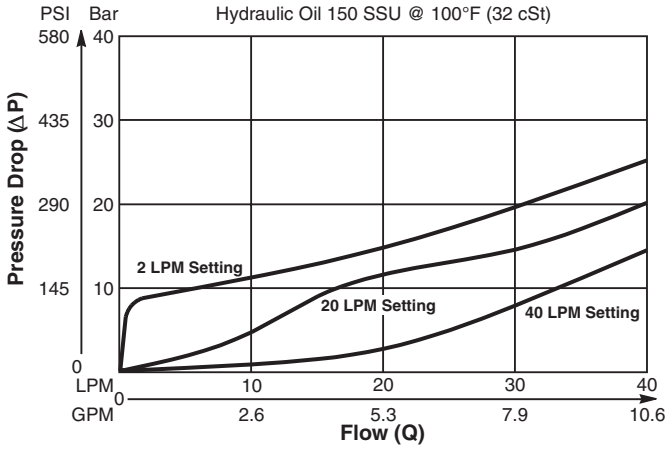
Rated Flow	40 LPM (10.6 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.15 kg (.33 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

Performance Curves (Through cartridge only)

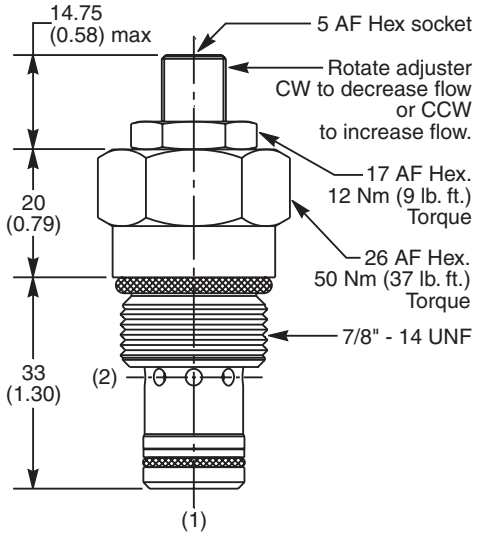
Flow Regulating Performance 1 to 2



Reverse Flow Pressure Drop vs. Flow 2 to 1



Dimensions Millimeters (Inches)



Ordering Information

J04C2	Z	N
10 Size Pressure Compensated Flow Control Valve	Adjustment Style	Seals

Code	Adjustment Style
Z	Screw Adjust

Standard valve has a flow setting of 20 LPM.

Valves are supplied at Standard setting.
Other settings are available, please contact Parker Sales.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30503N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

Port Size
1/2″ BSP

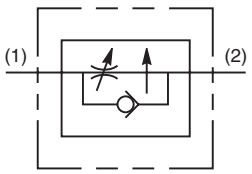
Body Material
Steel

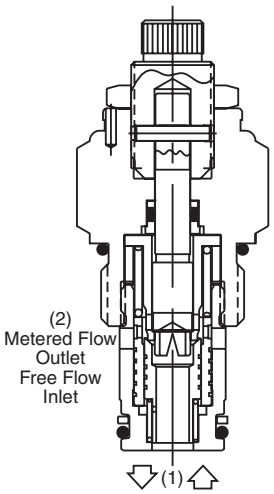
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

General Description

Fully Adjustable, Pressure Compensated Flow Control Valve. For additional information see Technical Tips on pages FC1-FC4.







Features

- Fully adjustable from 0.75 LPM (0.2 GPM) to 20.6 LPM (5.5 GPM)
- Hardened, precision ground parts for durability
- All external parts are zinc plated
- Compact size for reduced space requirements

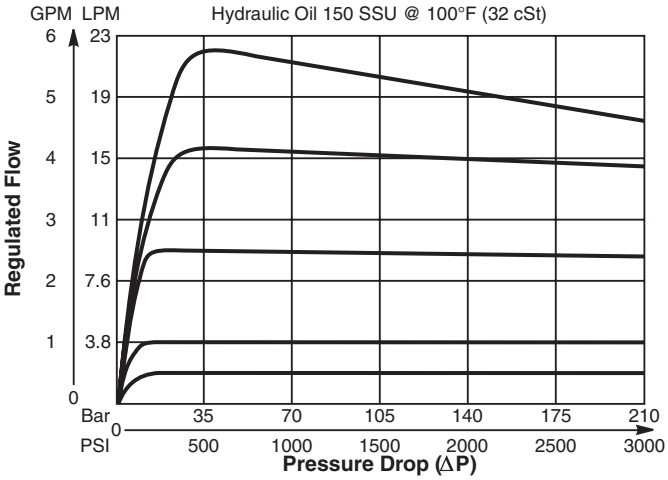
Specifications

Rated Flow	0.75 LPM (0.2 GPM) 20.6 LPM (5.5 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.23 kg (0.5 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

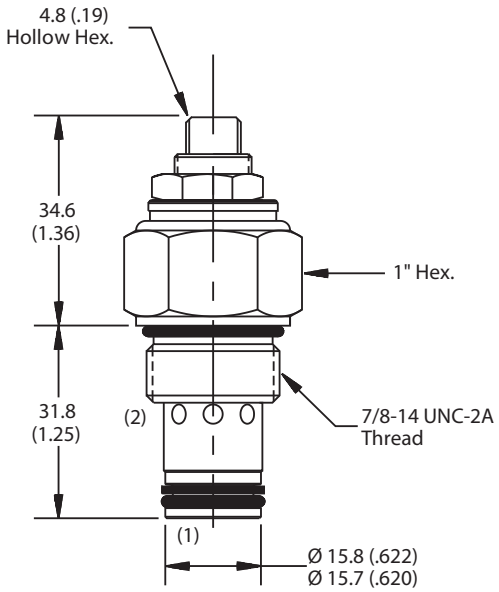
Performance Curves

Regulated Flow vs. Pressure Drop

(Through cartridge only)



Dimensions Millimeters (Inches)



Installation Torque
65 Nm (48 lb. ft.)

Ordering Information

FA101	S	N
10 Size Pressure Compensated Flow Control Valve	Adjustment Style	Seals

Code	Adjustment Style
S	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK10-2N)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

Port Size
1/2" BSP

Body Material
Steel

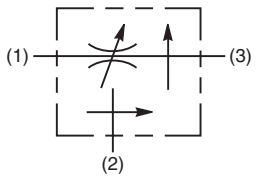
General Description

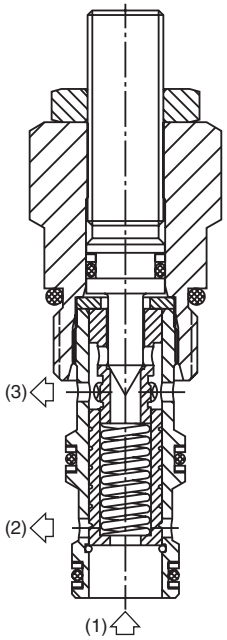
Priority Type, Pressure Compensated Flow Regulator Valve. For additional information see Technical Tips on pages FC1-FC4.

Features

- Good adjustment from 1-15 LPM (0.3-4 GPM)
- Used for systems requiring priority flow such as steering systems
- Hardened working parts for maximum durability
- Reverse flow function 3 to 1
- Adjustable and tamperproof versions available
- All external parts zinc plated





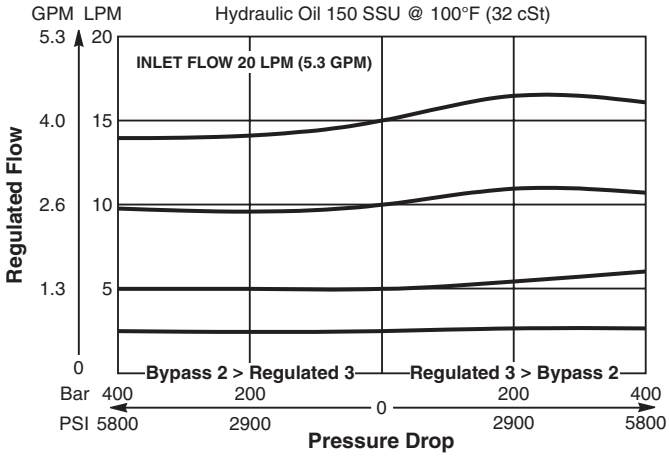


Specifications

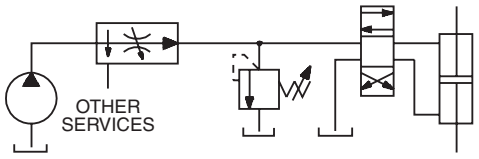
Rated Flow	15 LPM (4 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.08 kg (.18 lbs.)
Cavity	C08-3 (See BC Section for more details)
Form Tool	Rougher NFT08-3R Finisher NFT08-3F

Performance Curves (Through cartridge only)

Flow Regulating Performance

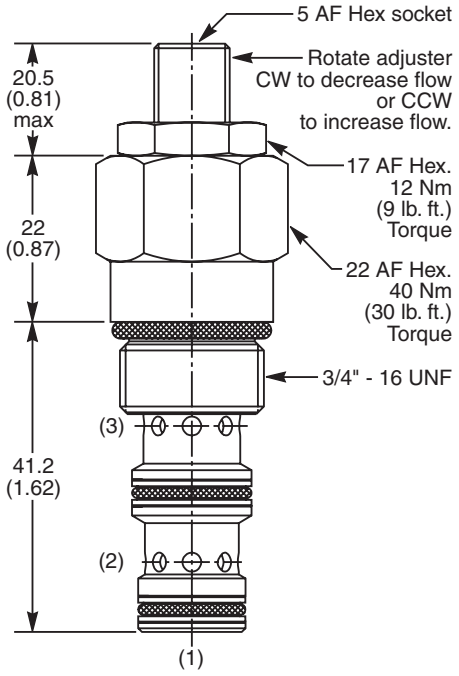


Application



Priority flow on steering circuit

Dimensions Millimeters (Inches)



Ordering Information

J02D3	Z	N
Pressure Compensated Priority Flow Control Valve	Adjustment Style	Seals

Code	Adjustment Style
Z	Screw Adjust

Standard valve has a flow setting of 7 LPM.

Valves are supplied at Standard setting.
Other settings are available, please contact Parker Sales.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30501N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B08	—	3	—	6B
08 Size		3-Way Cavity		Port Size

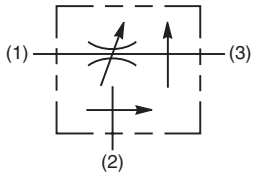
Port Size
3/8″ BSP

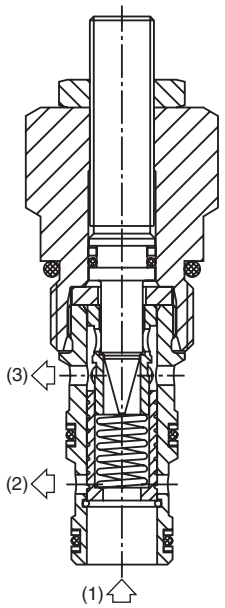
Body Material
Steel

General Description

Priority Type, Pressure Compensated Flow Regulator Valve. For additional information see Technical Tips on pages FC1-FC4.







Features

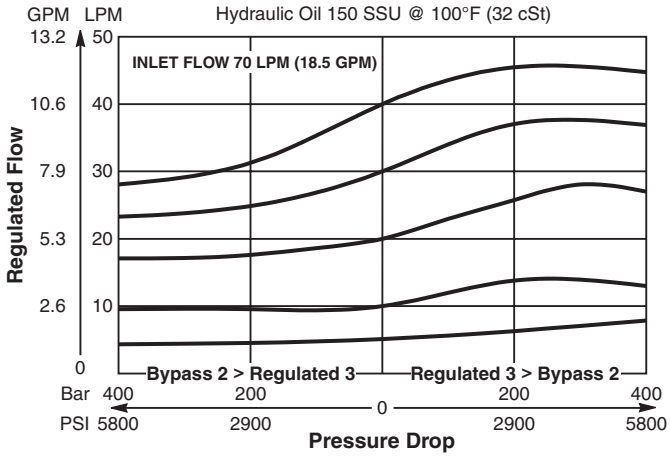
- High flow capacity
- Good adjustment from 2-45 LPM (0.5-12 GPM)
- Used for systems requiring priority flow such as steering systems
- Hardened working parts for maximum durability
- Reverse flow function 3 to 1
- Adjustable and tamperproof versions available
- All external parts zinc plated

Specifications

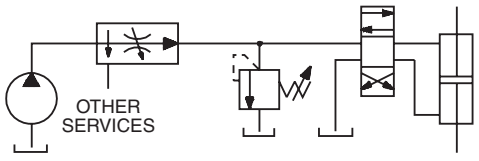
Rated Flow - Inlet	70 LPM (18 GPM)
Maximum Regulated Flow	45 LPM (12 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.18 kg (.40 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

Performance Curves (Through cartridge only)

Flow Regulating Performance

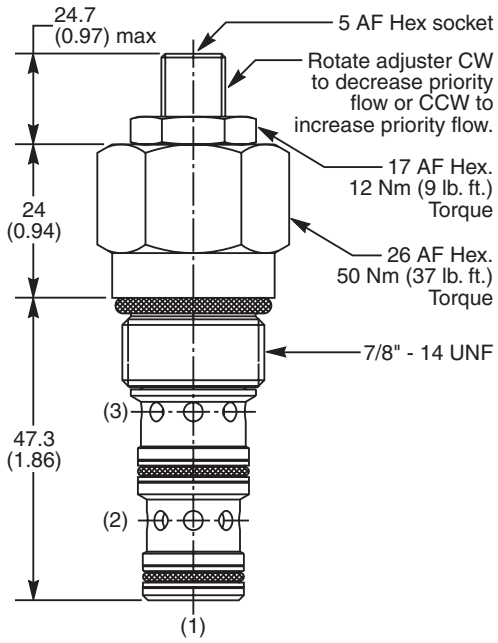


Application



Priority flow on steering circuit

Dimensions Millimeters (Inches)



Ordering Information

J04D3	Z	N
Pressure Compensated Priority Flow Control Valve	Adjustment Style	Seals

Code	Adjustment Style
Z	Screw Adjust

Standard valve has a flow setting of 20 LPM.

Valves are supplied at Standard setting.
Other settings are available, please contact Parker Sales.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30505N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B10	—	3	—	8B
10 Size		3-Way Cavity		Port Size

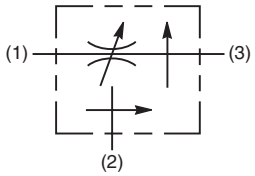
Port Size
1/2″ BSP

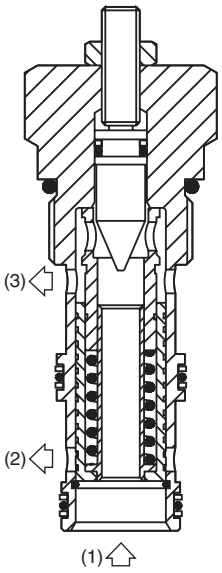
Body Material
Steel

General Description

Priority Style, Pressure Compensated Flow Regulator Valve With Bypass. For additional information see Technical Tips on pages FC1-FC4.







Features

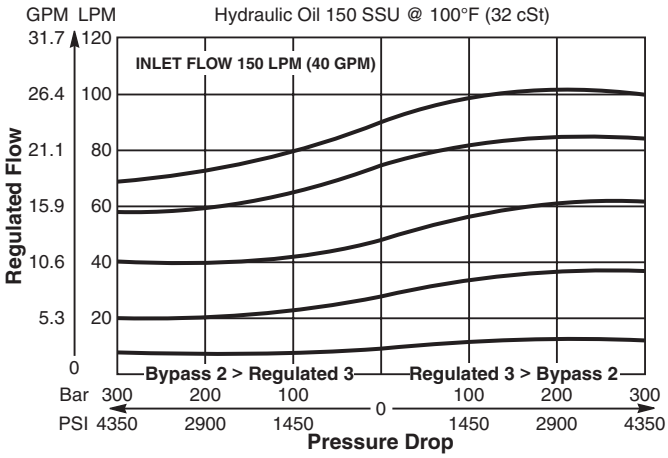
- Free reverse flow function
- High flow capacity
- Used for systems requiring priority flow such as steering systems
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated

Specifications

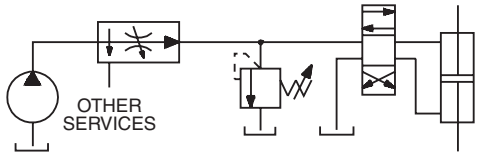
Rated Flow	150 LPM (40 GPM)
Maximum Regulated Flow	90 LPM (24 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.45 kg (1.00 lbs.)
Cavity	3A (See BC Section for more details)
Form Tool	See page BC56

Performance Curve (Through cartridge only)

Flow Regulating Performance

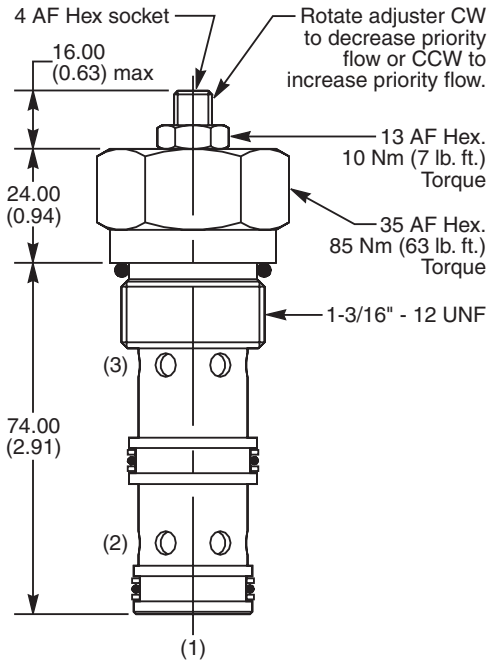


Application



Priority flow on steering circuit

Dimensions Millimeters (Inches)



Ordering Information

J1A125	Z	N
Pressure Compensated Priority Flow Control Valve	Adjustment Style	Seals

Code	Adjustment Style
Z	Screw Adjust

Standard valve has flow setting of 25 LPM and an inlet flow setting of 45 LPM.

Valves are supplied at Standard setting.
Other settings are available, please contact Parker Sales.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30011N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

LB10	007	S
Line Body	Porting	Body Material

Code	Porting
007	3/4" BSP

Code	Body Material
S	Steel

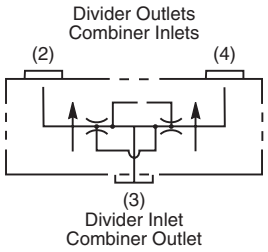
General Description

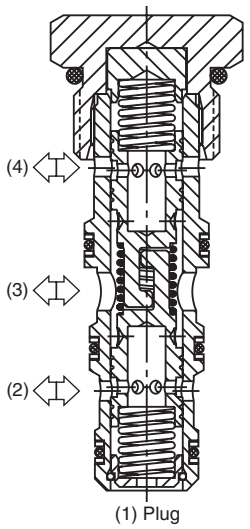
Spool Type, Flow Divider/Combiner Valve. For additional information see Technical Tips on pages FC1-FC4.

Features

- Interlocking spools for equal control dividing or combining
- Range of flow settings available for optimising control
- Pressure compensated control in both directions
- 50/50 ratio standard, other ratios available on request
- Commonly used for differential lock in transmission applications
- Hardened working parts for maximum durability
- All external parts zinc plated





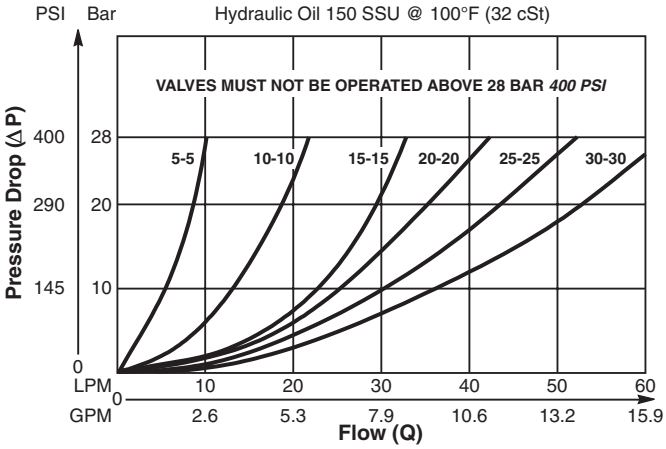


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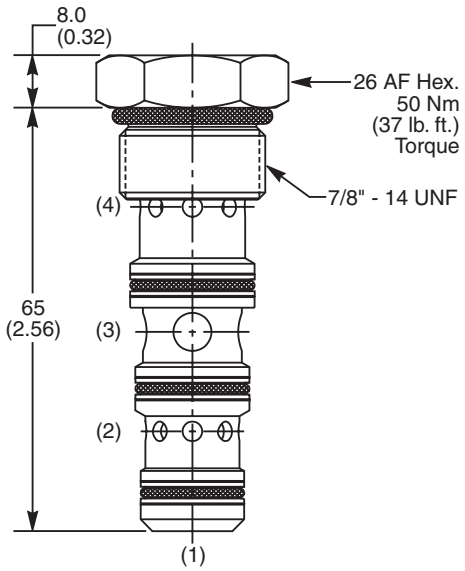
Rated Flow	60 LPM (16 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Flow Rating and Ratio	See Ordering Information
Accuracy Per Leg	± 10%
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.12 kg (0.26 lbs.)
Cavity	C10-4 (See BC Section for more details)
Form Tool	Rougher NFT10-4R Finisher NFT10-4F

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

L04A3	—		N
10 Size Flow Divider/ Combiner Valve		Flow Rating and Ratio	Seals

Code	Total Flow Rating - Port 3 (Flow Ratio)
5-5	6-10 LPM (1.6-2.6 GPM) (50/50 Ratio)
10-10	8-20 LPM (2.1-5.3 GPM) (50/50 Ratio)
15-15	10-30 LPM (2.6-7.9 GPM) (50/50 Ratio)
20-20	12-40 LPM (3.2-10.6 GPM) (50/50 Ratio)
25-25	13-50 LPM (3.4-13.2 GPM) (50/50 Ratio)
30-30	14-60 LPM (3.7-15.9 GPM) (50/50 Ratio)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30506N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B10	—	4	—	8B
10 Size		4-Way Cavity		Port Size

Port Size
1/2″ BSP

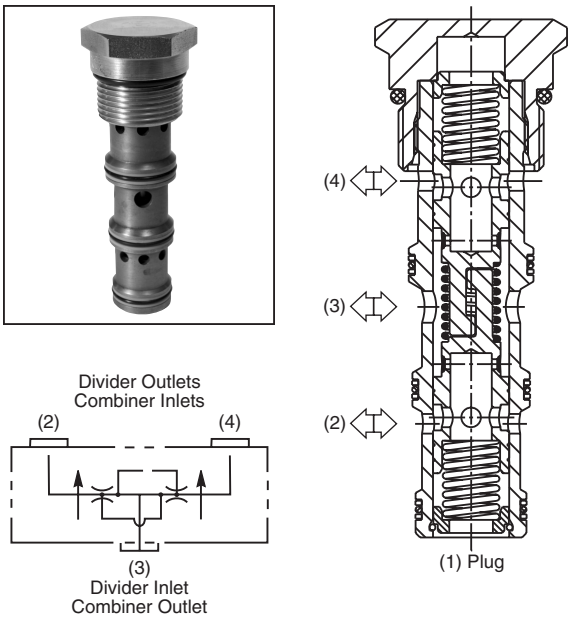
Body Material
Steel

General Description

Spool Type, Flow Divider/Combiner Valve. For additional information see Technical Tips on pages FC1-FC4.

Features

- Interlocking spools for equal control dividing or combining
- Range of flow settings available for optimising control
- Pressure compensated control in both directions
- 50/50 ratio standard, other ratios available on request
- Commonly used for differential lock in transmission applications
- Hardened working parts for maximum durability
- All external parts zinc plated

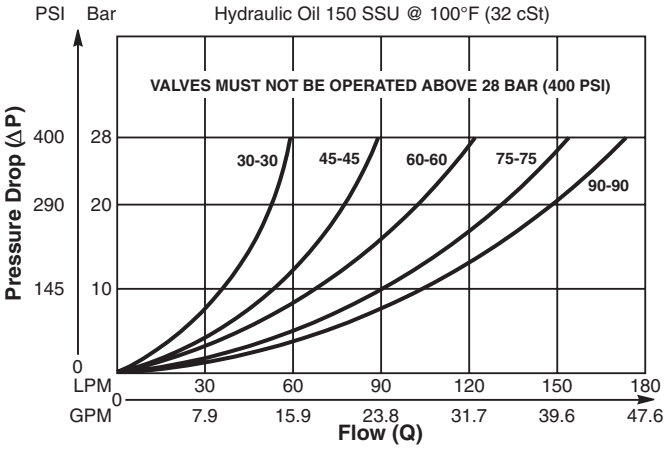


Specifications

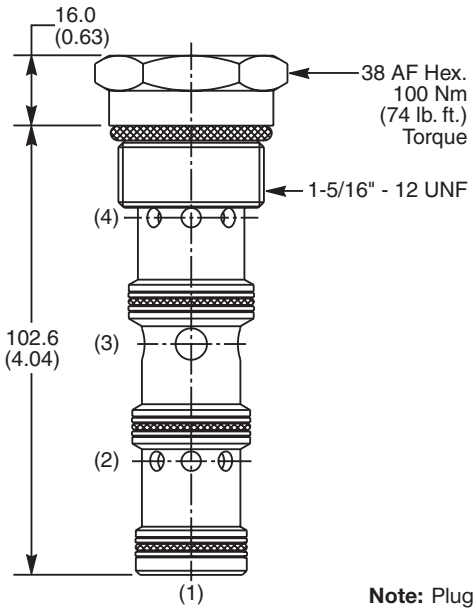
Rated Flow	180 LPM (47 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Flow Rating and Ratio	See Ordering Information
Accuracy Per Leg	± 10%
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.40 kg (0.86 lbs.)
Cavity	C16-4 (See BC Section for more details)
Form Tool	Rougher Finisher

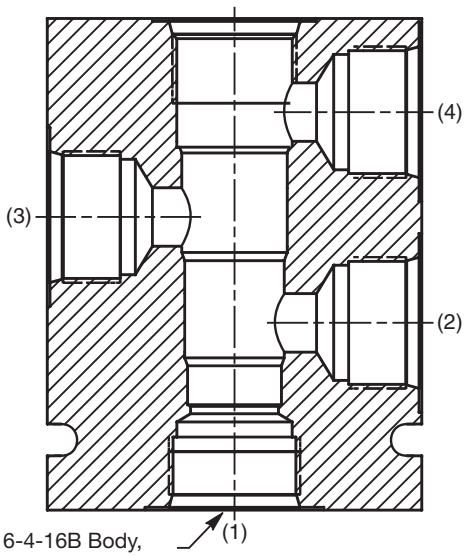
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)





Note: Plug Port #1 In B16-4-16B Body, use Parker #16HP5ON-S Hollow Hex Plug.

Ordering Information

L06A3	—		N
16 Size Flow Divider/ Combiner Valve		Flow Rating and Ratio	Seals

Code	Total Flow Rating - Port 3 (Flow Ratio)
30-30	20-60 LPM (5.3-15.9 GPM) (50/50 Ratio)
45-45	25-90 LPM (6.6-23.8 GPM) (50/50 Ratio)
60-60	35-120 LPM (9.2-31.7 GPM) (50/50 Ratio)
75-75	55-150 LPM (14.6-39.6 GPM) (50/50 Ratio)
90-90	65-180 LPM (17.2-47.8 GPM) (50/50 Ratio)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30510N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B16	—	4	—	16B
16 Size		4-Way Cavity		Port Size

Port Size
1″ BSP

Body Material
Steel

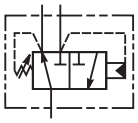
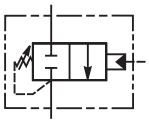
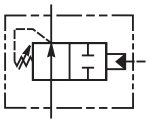
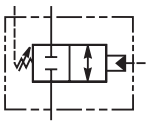
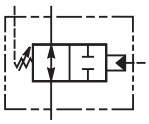
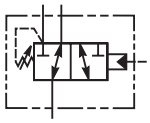
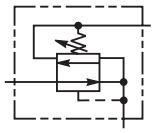
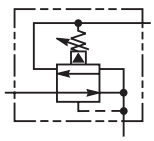
Contents

Pressure Control Valves

	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
RELIEF VALVES						
	DIRECT ACTING					
	A02A2	C08-2	Direct Acting Relief, Ball Type	6/1.6	420/6000	PC7-PC8
	A02B2	C08-2	Direct Acting Relief, Poppet Type	30/8	420/6000	PC9-PC10
	A04B2	C10-2	Direct Acting Relief, Poppet Type	100/26	420/6000	PC11-PC12
	A04B2*CE	C10-2	Direct Acting Relief, Poppet Type*			PC13-PC14
	A04C2	C10-2	Direct Acting Relief, Spool Type	200/53	100/1450	PC15-PC16
	RD102	C10-2	Direct Acting Relief, Poppet Type	30/10	250/3600	PC17-PC18
			**CE marked, PED Compliant*			
	DIFFERENTIAL AREA					
	RDH083	C08-2	Direct Acting Differential Area Relief	45/12	350/5000	PC19-PC20
	A04D2	C10-2	Direct Acting Differential Area Relief	75/20	350/5000	PC21-PC22
	PILOT OPERATED					
	RAH081	C08-2	Pilot Operated Spool Type	75.8/20	350/5000	PC23-PC24
	A04G2	C08-2	Pilot Operated Spool Type	75.8/20	350/5000	PC25-PC26
	A06G2	C16-2	Pilot Operated Spool Type	400/106	420/6000	PC27-PC28
	A04K2	C10-2	Pilot Operated Spool Type Kick Down	160/42	420/6000	PC29-PC30
	RAH101	C10-2	Pilot Operated Spool Type	113/30	350/5000	PC31-PC32
	VENTABLE					
	A04H3	C10-3S	Pilot Operated Vented Relief	190/50	420/6000	PC33-PC34
	A06H3	C16-3S	Pilot Operated Vented Relief	400/106	420/6000	PC35-PC36
	CROSS-OVER					
	A04J2	C10-2	Direct Acting Cross-over Relief	120/32	350/5000	PC37-PC38
	UNLOADING					
	RU101	C10-3	Direct Acting Unloading	3.75/1	210/3000	PC39-PC40
	PILOT OPERATED WITH REVERSE CHECK					
	A06P2	C16-2	Pilot Operated Poppet Type	400/106	420/6000	PC41-PC42
SEQUENCE VALVES						
	PILOT OPERATED					
	SVH081	C08-3	Pilot Operated, Int. Pilot, Ext. Drain	45/12	350/5000	PC43-PC44
	B04D3	C10-3S	Pilot Operated, Reverse Check, Ext. Drain	70/18.5	420/6000	PC45-PC46
	B04C3	C10-3S	Pilot Operated, Kick Down	160/42	420/6000	PC47-PC48

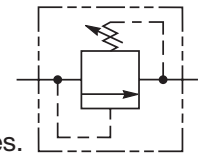
Contents

Pressure Control Valves

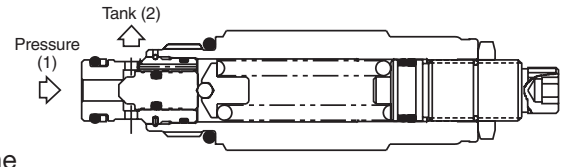
	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
SEQUENCE VALVES	**DIRECT ACTING**					
	B02E3F	C08-3	Direct Acting, 2P-3W, Int. Pilot, Int. Drain	30/8	420/6000	PC49-PC50
	B04F3	C10-3	Direct Acting, 2P-2W, NC, Ext. Pilot, Int. Drain	34/9	420/6000	PC51-PC52
	B04G3	C10-3	Direct Acting, 2P-2W, NO, Ext. Pilot, Int. Drain	40/10.6	420/6000	PC53-PC54
	B04H4	C10-4	Direct Acting, 2P-2W, NC, Ext. Pilot, Ext. Drain	47/12	420/6000	PC55-PC56
	B04J4	C10-4	Direct Acting, 2P-2W, NO, Ext. Pilot, Ext. Drain	47/12	420/6000	PC57-PC58
	B04K4	C10-4	Direct Acting, 2P-3W, NO, Ext. Pilot, Int. Drain	42/11	420/6000	PC59-PC60
REDUCING VALVES	**DIRECT ACTING**					
	C02A3	C08-3	Direct Acting Reducing/Relieving	20/5	420/6000	PC61-PC62
	PR103	C10-3	Direct Acting Reducing/Relieving	56/15	210/3000	PC63-PC64
	PILOT OPERATED					
	PRH081	C08-3	Pilot Operated Reducing/Relieving	30/8	350/5000	PC65-PC66
	C04B3	C10-3	Pilot Operated Reducing/Relieving	120/32	350/5000	PC67-PC68
	C06B3	C16-3	Pilot Operated Reducing/Relieving	200/53	350/5000	PC69-PC70

PRODUCT TYPES / APPLICATIONS

Direct Acting Relief Valves

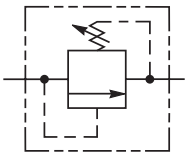


Direct acting relief valves are designed for fast response in intermittent duty applications. They are often used as an economical solution to clip pressure spikes. The poppet design allows for low leakage.

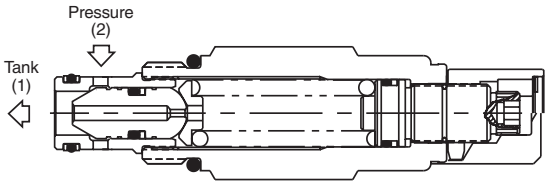


OPERATION - The valve poppet is held against the seat by the spring force. Inlet pressure on the nose (port 1) of the poppet acts against the spring force to unseat the poppet at the valve setting and allow flow to pass to tank. Since the pressure is working directly on the spring, this valve is very fast responding. It is not the best choice for system pressure regulation as it is slightly noisier than pilot operated relief valves and has higher pressure rise. *Note:* Any backpressure on port 2 would be additive to the spring setting.

Differential Area Relief Valves

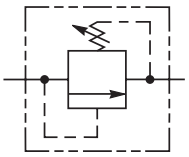


Differential area relief valves also are also best suited for intermittent applications where fast response is critical. These valves are often used as cross-over relief valves to chop pressure spikes. Due to their design, they generally can handle a larger flow rate and have a lower pressure rise than the standard directing acting relief. The poppet design allows for low leakage.

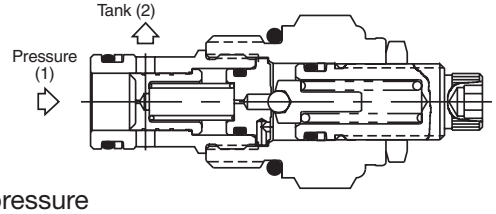


OPERATION - Pressure on the inlet (port 2) of the valve acts on the differential area of the poppet (difference between the O.D. of the poppet and the seat diameter) to produce a force which is opposed by the spring force. When pressure reaches the valve setting, the poppet is pushed off its seat, permitting flow to tank. *Note:* Any backpressure on port 1 would be additive to the spring setting.

Pilot Operated Relief



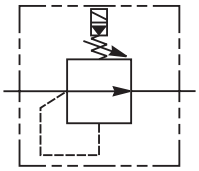
Pilot operated relief valves are designed for continuous duty applications. Due to their stability and low pressure rise, the pilot operated relief is the best option for setting the pressure of a hydraulic system.

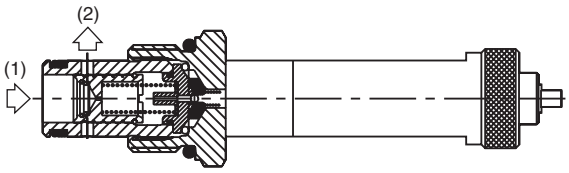


OPERATION - When inlet pressure at the nose (port 1) exceeds the valve setting, the pilot ball unseats. The pilot flow creates a pressure imbalance across the main spool causing the spool to move and allowing flow from inlet (port) 1 to tank (port 2.) *Note:* Any backpressure on port 2 would be additive to the spring setting.

Solenoid Operated Relief Valve

Solenoid operated relief valves are 2 valves in one. They can be a relief valve when energized or an unloading valve when de-energized. Relieving pressure is factory set per model code.

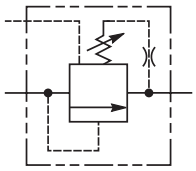


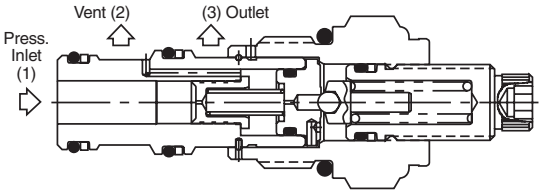


OPERATION - De-Energized the pilot is pushed away from its seat. Pressure on the nose port creates pilot flow through the spool and seat, lifting the spool against a light bias spring, allowing full flow.
Energized the armature pushes the pilot onto its seat with a pre-determined spring force. Pressure on the nose port acts against the pilot and lifts it, creating pilot flow. When the pressure exceeds the spring force, the main spool lifts allowing flow at the set pressure.

Ventable Pilot Operated Relief

Ventable relief valves are a unique type of pilot operated relief. With this valve, you can control the pressure setting with the internal adjustment as well as via remote circuit. These valves are ideal in cirucits where multiple pressures are needed.

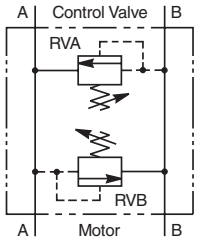


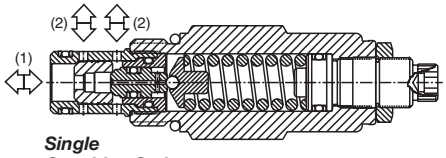


OPERATION - This valve can be controlled by the adjustment setting on the valve, or a remote circuit via the vent line. When the vent line is used, the smaller of the two pressure settings will determine the valve setting. In other words, if the pressure setting of the remote circuit is less than the adjusted setting, then the valve will relieve at the remote setting. If the pressure setting of the remote circuit is greater than the adjusted setting, then the valve will relieve at the adjusted setting. With the vent port (port 2) blocked, the valve operates like a standard pilot operated relief valve. Thus, a solenoid valve could be used on the vent port to select control between this valve another remote valve.

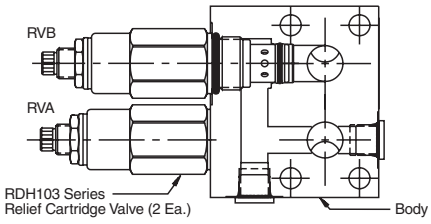
Dual Crossover Relief Valves

Dual crossover relief valves provide pressure surge protection for double acting hydraulic actuators. For best results, you always want to install the valve as close to the actuator as possible. The dual crossover feature can be achieved in two different methods. One way is to manifold two Differential Area Relief Valves into a single body. Parker offers three versions of this two cartridge arrangement. The advantage gained is higher flows can be pushed through this arrangement. The second method is to combine this dual function into a single cartridge. The single cartridge arrangement reduces cost considerably of the total package. In addition, a standard common cavity line body can be used instead of a special two body arrangement. The operation for the single cartridge style is shown below.





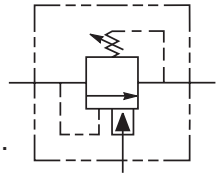
Single Cartridge Style

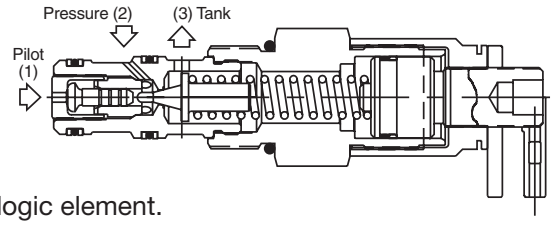


Two Cartridge Style

OPERATION - Pressure at port 1 acts on the spool to produce a force which is opposed by the spring setting. When pressure reaches the valve setting, the spool and poppet move relieving flow from port 1 to port 2. When port 2 is pressurized, the pressure acts on the differential area poppet to produce a force which is opposed by the spring force. When the pressure reaches the valve setting, the poppet is pushed off of its seat, relieving flow from port 2 to port 1. *Note:* Due to the construction and flow paths through the valve, the relief pressure settings may vary by approximately 300 psi from one direction to the other.

Differential Area Unloading Relief Valve

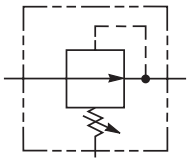


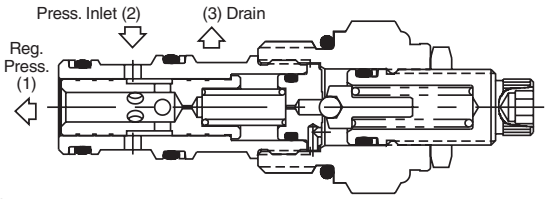


Unloading valves are differential area relief valves that can also be fully dumped or unloaded via a remote signal. They are best suited for low flow accumulator unloading circuits. They provide a fixed percentage between load and unload pressures. This pilot valve would generally be used in conjunction with a logic element.

OPERATION - The fixed differential is provided by the pilot piston which has greater area than the dart seat. With its greater area, the piston is able to hold the dart off its seat, permitting flow from pressure to tank, until pressure on the pilot piston falls below the fixed percentage of the valve settings.

Pilot Operated Reducing Valve





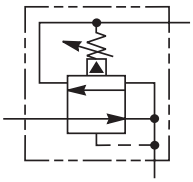
Pilot operated pressure reducing valves can be used to reduce the pressure in a leg of the circuit lower than system pressure. Thus, they can be used to provide protection to downstream components from higher pressures.

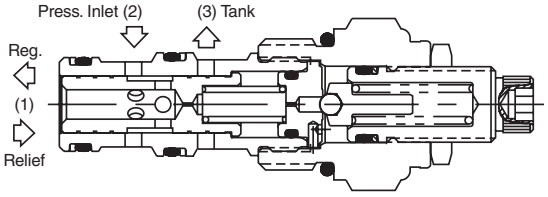
OPERATION - The pilot section controls the valve setting when reducing. As pressure at the regulated port exceeds the valve setting, the pilot ball is unseated. The pilot flow creates a pressure imbalance across the main spool causing the spool to throttle in order to maintain constant downstream pressure. The normally open design will allow flow to pass from inlet to reduced port with the only restriction being the pressure drop.

Pressure Reducing / Relieving Valves

Pressure reducing / relieving valves can be used to reduce the pressure in a leg of the circuit lower than system pressure. The valve also acts as a relief valve, relieving any shocks or surges that occur between the regulated port and the actuator. When the valve is in the relieving mode, the inlet port is blocked. Parker offers pressure reducing/relieving valves in both pilot operated and directing acting styles. The direct acting version is generally used in static applications where response is critical, or leakage is a concern.

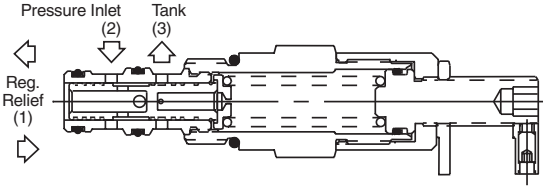
Pilot Operated





OPERATION - The pilot section controls the valve setting when reducing. As pressure at the regulated port exceeds the valve setting, the pilot ball is unseated. The pilot flow creates a pressure imbalance across the main spool causing the spool to throttle in order to maintain constant downstream pressure. A shock or surge at the regulated port shifts the spool, relieving flow to tank.

Direct Acting

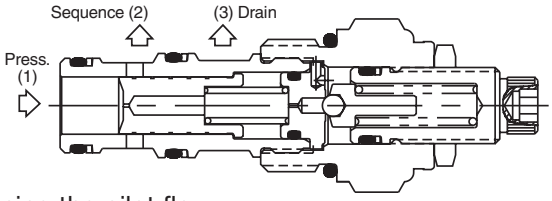


OPERATION - As pressure at the regulated port exceeds the valve setting, the valve throttles or closes in order to maintain constant downstream pressure. A shock or surge at the regulated port further shifts the spool, relieving flow to tank. This valve is not intended for rapidly changing flows which could lead to instability.

Pilot Operated Sequence Valves

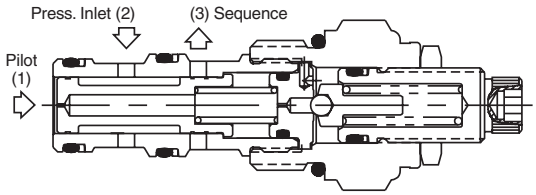
Sequence valves are used to control the sequence of operation of two or more hydraulic actuators. The sequence valve pressure is set higher than the first actuator operation pressure. Once the first actuator has completed its cycle, the sequence valve opens allowing the second actuator to move. Parker's line of pilot operated sequence valves include a series of internally piloted, externally drained valves and a series of externally piloted, internally vented valves. Parker also offers a line of direct acting sequence valves which are ideal for piloting logic elements in steady state applications.

P.O. Sequence (Internally Piloted, Externally Drained)



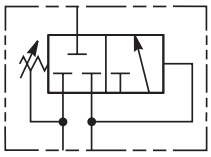
OPERATION - For this valve, the pilot pressure is sensed from the inlet of the valve (port 1). When the pilot pressure exceeds the valve setting, the pilot section opens creating a pressure imbalance across the main spool. This causes the spool to move allowing the flow to pass from the nose of the cartridge (port 1) to the actuator port (port 2). By externally draining the pilot flow directly to tank (port 3), the valve is insensitive to back pressure at the sequence port.

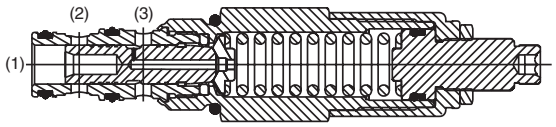
P.O. Sequence (Externally Piloted, Internally Vented)



OPERATION - For this valve, the pilot pressure is obtained from an external source and not from the pressure port. When the external pilot pressure (port 1) exceeds the valve setting, the pilot section opens creating a pressure imbalance across the main spool. This causes the spool to move allowing the flow to pass from the side of the cartridge (port 2) to the actuator port (port 3). Any pressure at port 3 is additive to the pressure setting. It is most common for port 3 to be connected to tank.

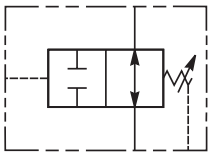
D.A. Sequence (Internally Piloted, Externally Drained)

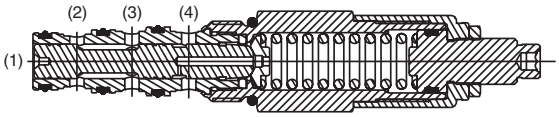




OPERATION - In the steady state condition, all three ports are blocked with the spring chamber drained to port 3. When the pressure at port 1 exceeds the valve setting, the spool moves allowing flow from the nose of the cartridge (port 1) to the actuator port (port 2). By externally draining the spring chamber directly to tank (port 3), the valve is insensitive to back pressure at the sequence port.

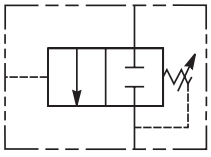
D.A. Sequence, N.O. (Externally Piloted, Externally Drained)

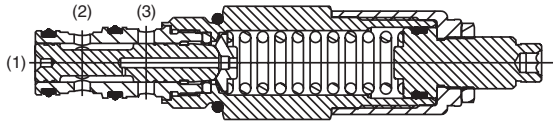




OPERATION - With no pressure at the pilot port (port 1), bi-directional flow is allowed between port 3 and port 2. When the pilot pressure at port 1 exceeds the valve setting the spool moves blocking both port 3 and port 2. By externally draining the spring chamber to tank (port 4), the valve is insensitive to back pressure at the sequencing ports.

D.A. Sequence, N.C. (Externally Piloted)





OPERATION - With no pressure at the pilot port (port 1), both port 3 and port 2 are blocked. When the pilot pressure at port 1 exceeds the valve setting, the spool moves opening a path and allowing flow from port 3 to port 2. This valve internally drains the spring chamber to tank via the sequencing port, thus any backpressure on port 2 would be additive to the spring setting.

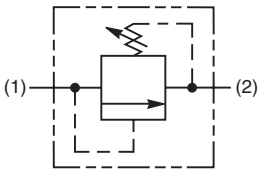
General Description

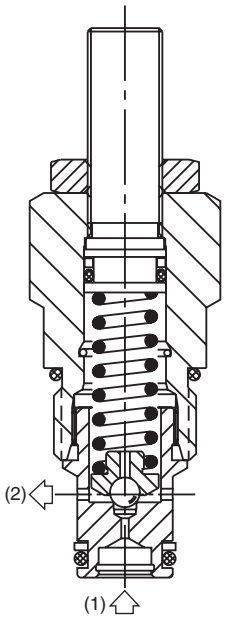
Direct Acting Ball-Type Relief Valve. For additional information see Technical Tips on pages PC1-PC4.

Features

- Fast response
- Ideal for controlling ventable relief valves, or for thermal relief
- Hardened working parts for maximum durability
- Integral 250 micron inlet filter available
- All external parts zinc plated







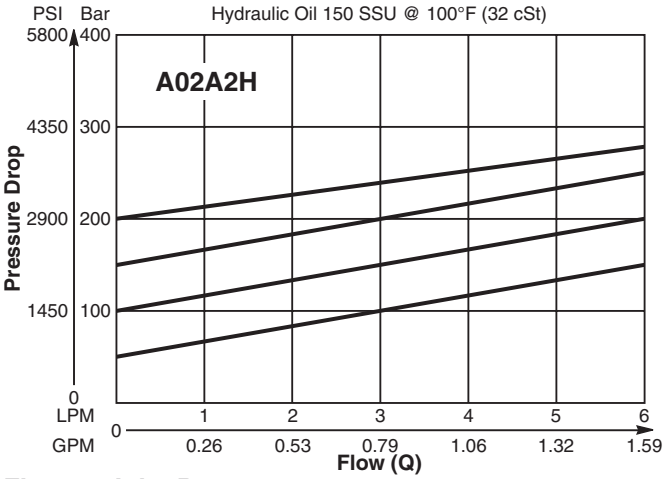
Specifications

Rated Flow	6 LPM (1.6 GPM)
Maximum Inlet Pressure	**H -** 10-210 Bar (145-3000 PSI) **P -** 10-420 Bar (145-6000 PSI)
Maximum Pressure Setting	420 Bar (6000 PSI)
Sensitivity: Pressure/Turn	**H** 30 Bar (435 PSI) **P** 55 Bar (800 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. @100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.11 kg (0.24 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

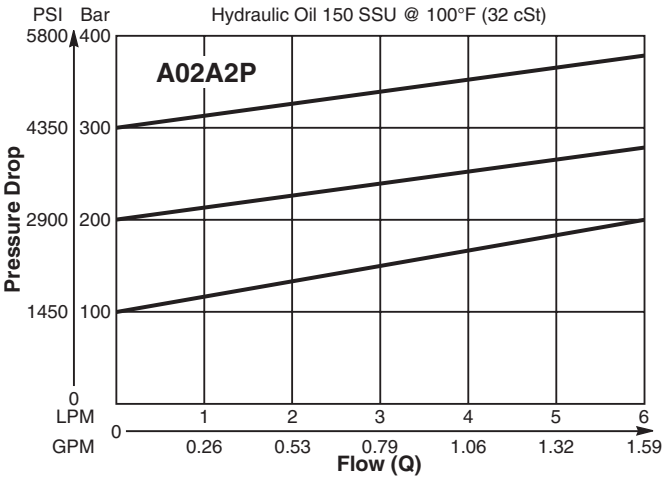
Performance Curves

(Pressure rise through cartridge only)

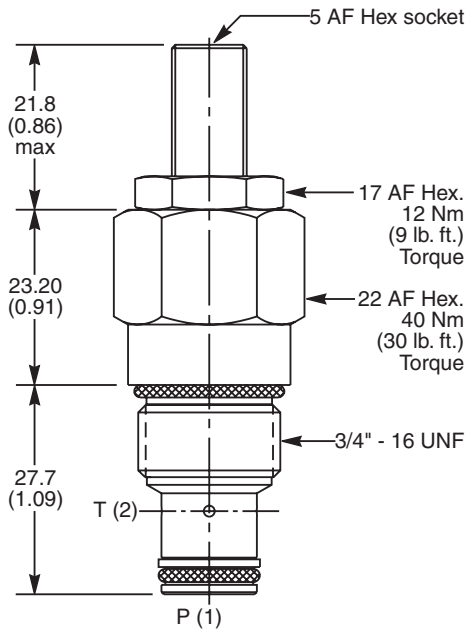
Flow vs. Inlet Pressure



Flow vs. Inlet Pressure



Dimensions Millimeters (Inches)



Ordering Information

A02A2		Z	N
08 Size Direct Acting Relief Valve	Pressure Adjustment Range	Adjustment Style	Seals

Code	Pressure Adjustment Range
H	10 - 210 Bar (145 - 3000 PSI)
P	10 - 420 Bar (145 - 6000 PSI)

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30515N-1)	-34°C to +121°C (-30°F to +250°F)

Standard Pressure Setting

A02A2H Standard Setting:
100 Bar (1400 PSI)
@ 0.5 LPM (0.13 GPM)

A02A2P Standard Setting:
200 Bar (2900 PSI)
@ 0.5 LPM (0.13 GPM)

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Order Bodies Separately
See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

Port Size
3/8″ BSP

Body Material
Steel

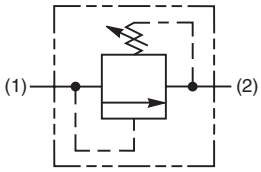
General Description

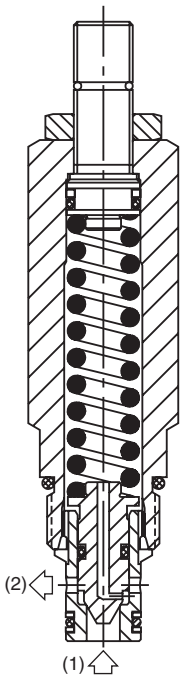
Direct Acting Poppet-Type Relief Valve. For additional information see Technical Tips on pages PC1-PC4.

Features

- Fast response
- Excellent stability throughout flow range
- Virtually leak free
- Hardened working parts for maximum durability
- Adjustable, preset and tamper resistant versions available
- Preset version is tamper resistant and compact
- All external parts zinc plated







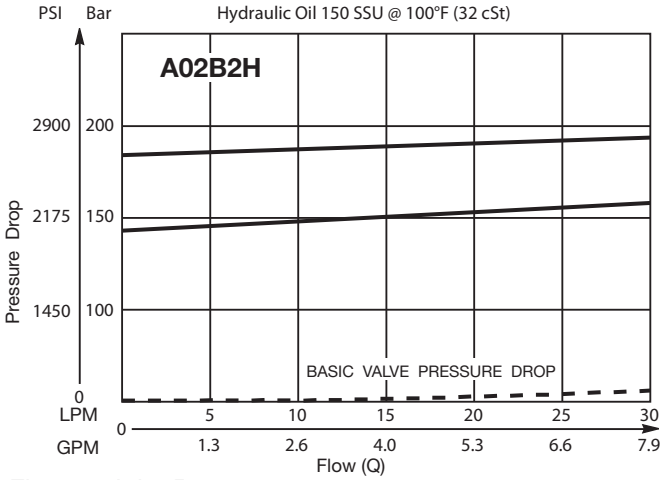
Specifications

Rated Flow	30 LPM (8 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**H -** 5-210 Bar (72-3000 PSI) **P -** 5-420 Bar (72-6000 PSI)
Sensitivity: Pressure/Turn	**H** 30 Bar (435 PSI) **P** 55 Bar (800 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.20 kg (0.44 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

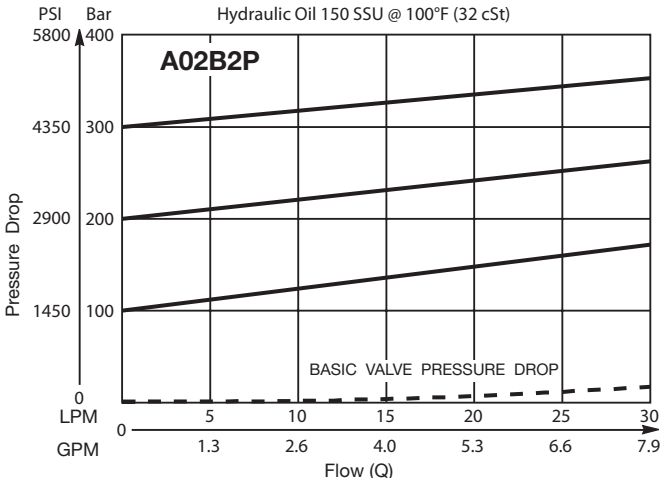
Performance Curves

(Pressure rise through cartridge only)

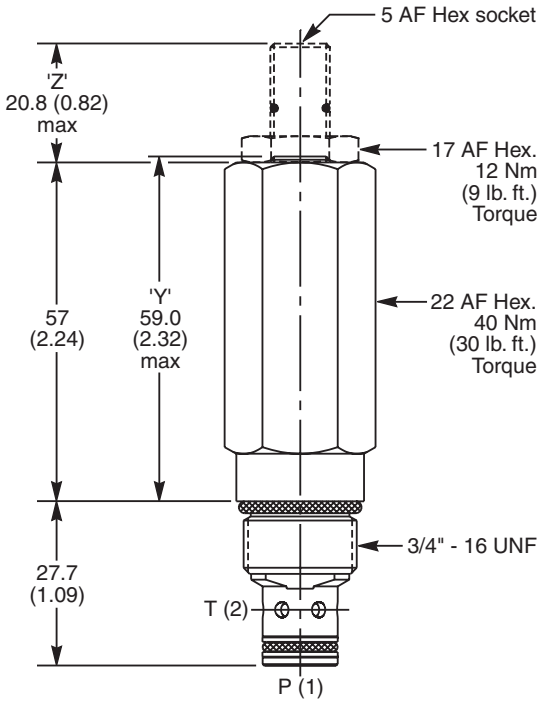
Flow vs. Inlet Pressure



Flow vs. Inlet Pressure



Dimensions Millimeters (Inches)



Ordering Information

A02B2		Z	N
08 Size Direct Acting Relief Valve	Pressure Adjustment Range	Adjustment Style	Seals

Code	Pressure Adjustment Range
H	5 - 210 Bar (72 - 3000 PSI)
P	5 - 420 Bar (72 - 6000 PSI)

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30500N-1)	-34°C to +121°C (-30°F to +250°F)

Standard Pressure Setting
A02B2H Standard Setting: 100 Bar (1450 PSI) @ 2 LPM (0.5 GPM)
A02B2P Standard Setting: 200 Bar (2900 PSI) @ 2 LPM (0.5 GPM)

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Order Bodies Separately
See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

Port Size
3/8" BSP

Body Material
Steel

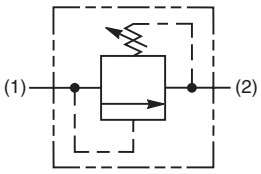
General Description

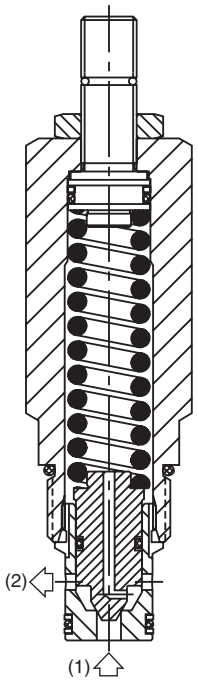
Direct Acting Poppet-Type Relief Valve. For additional information see Technical Tips on pages PC1-PC4.

Features

- Fast response with good stability
- Virtually leak-free
- Hardened working parts for maximum durability
- Adjustable, preset and tamperproof versions available
- Preset version is tamperproof and compact
- All external parts zinc plated







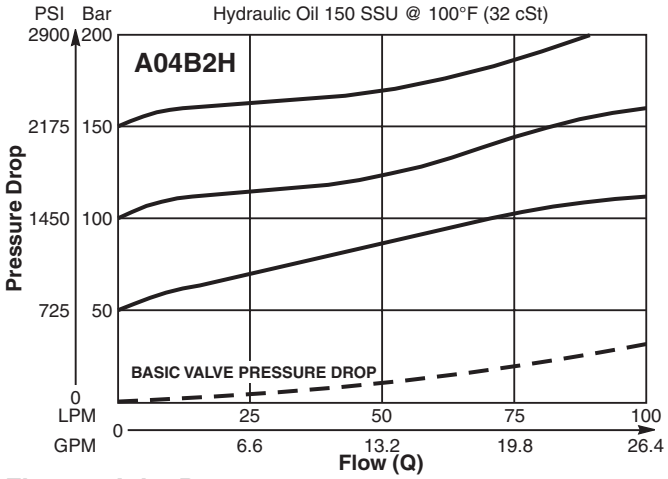
Specifications

Rated Flow	100 LPM (26 GPM)
Maximum Inlet Pressure	**H -** 5-210 Bar (72-3000 PSI) **P -** 5-420 Bar (72-6000 PSI)
Maximum Pressure Setting	420 Bar (6000 PSI)
Sensitivity: Pressure/Turn	**H** 21 Bar (305 PSI) **P** 43.4 Bar (630 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.28 kg (0.62 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

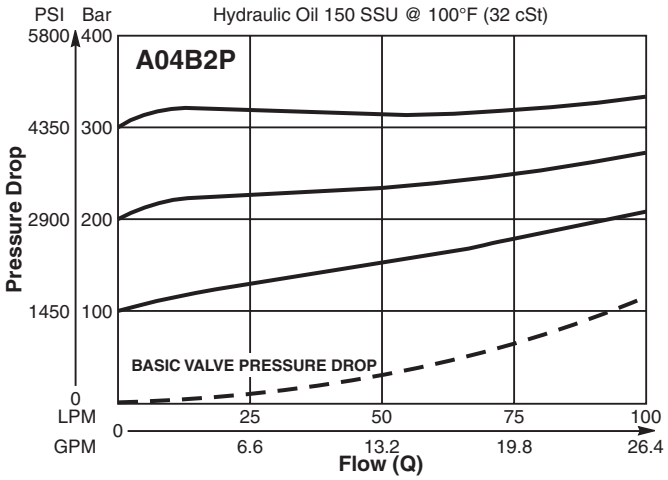
Performance Curves

(Pressure rise through cartridge only)

Flow vs. Inlet Pressure

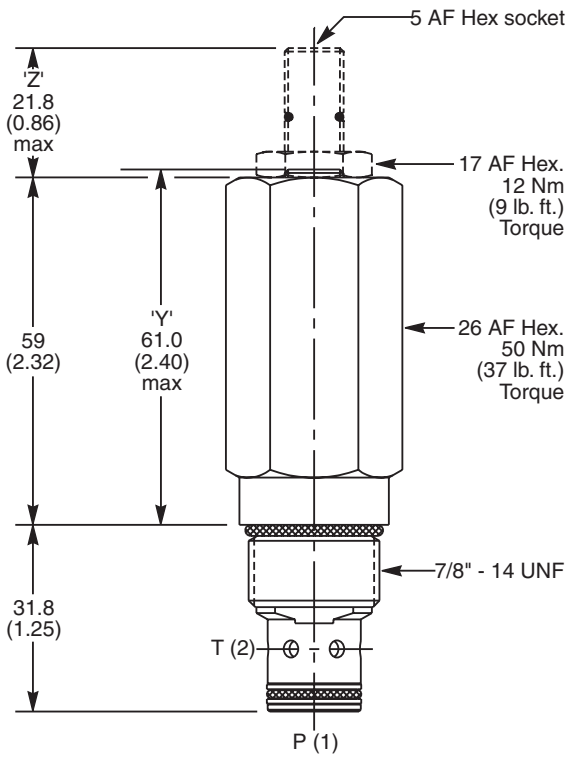


Flow vs. Inlet Pressure



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



Ordering Information

A04B2		Z	N
10 Size Direct Acting Relief Valve	Pressure Adjustment Range	Adjustment Style	Seals

Code	Pressure Adjustment Range
H	5 - 210 Bar (72 - 3000 PSI)
P	5 - 420 Bar (72 - 6000 PSI)

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30503N-1)	-34°C to +121°C (-30°F to +250°F)

Standard Pressure Setting
A04B2H *Standard Setting: 100 Bar (1450 PSI) @ 15 LPM (4.0 GPM)*
A04B2P *Standard Setting: 200 Bar (2900 PSI) @ 15 LPM (4.0 GPM)*

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Order Bodies Separately
See section BC

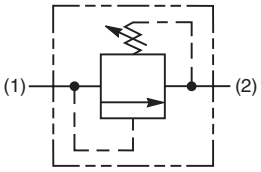
B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

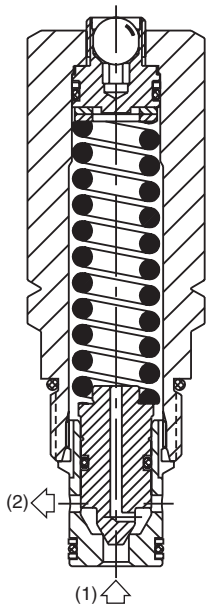
Port Size
1/2" BSP

Body Material
Steel

General Description

Direct Acting Poppet-Type Relief Valve. Pressure Equipment Directive (PED 2014/68/EU) compliant to hazard category IV. For additional information see Technical Tips on pages PC1-PC4.





Features

- Fast response with good stability
- Compact space saving design
- Poppet type construction for lower leakage
- Full 420 Bar (6000 PSI) pressure capability
- Hardened working parts for maximum durability
- Tamperproof setting
- All external parts zinc plated

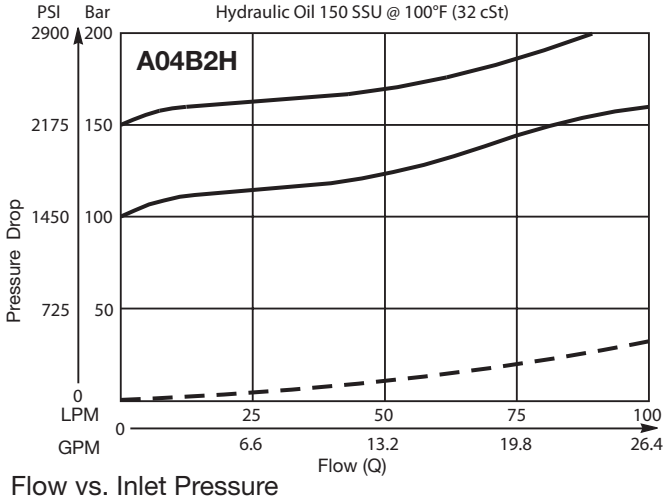
Specifications

Rated Flow	100 LPM (26 GPM)
Maximum Inlet Pressure	**HY -** 5-210 Bar (72-3000 PSI) **PY -** 5-420 Bar (72-6000 PSI)
Maximum Pressure Setting	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.25 kg (0.55 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

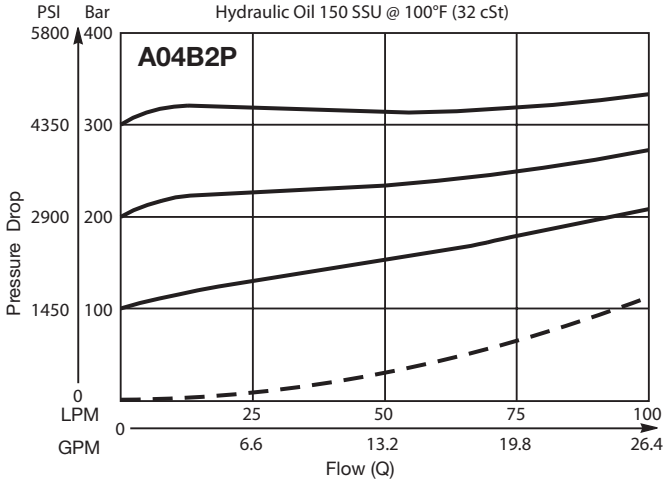
Performance Curves

(Pressure rise through cartridge only)

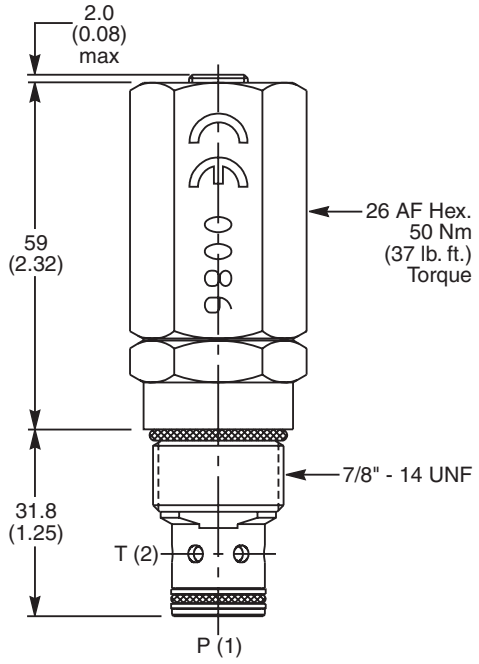
Flow vs. Inlet Pressure



Flow vs. Inlet Pressure



Dimensions Millimeters (Inches)



Ordering Information

A04B2		Y		—		N	CE
10 Size Direct Acting Relief Valve	Pressure Adjustment Range	Adjustment Style	Optional Flow @ Pressure Setting		Optional Pressure Setting	Seals	

Code	Pressure Adjustment Range
H	5 - 210 Bar (72 - 3000 PSI)
P	5 - 420 Bar (72 - 6000 PSI)

Flow and Pressure Setting
Flow and Pressure setting must be specified.

Code	Adjustment Style
Y	Non Adjustable Preset

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30503N-1)	-34°C to +121°C (-30°F to +250°F)

Code	Type
CE	PED Compliant

Order Bodies Separately
See section BC

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

Port Size
1/2″ BSP

Body Material
Steel

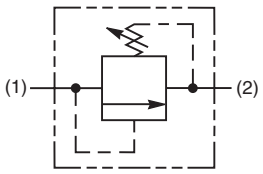
General Description

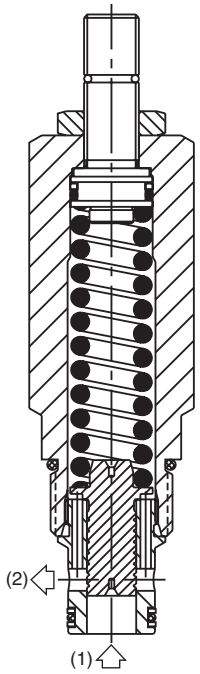
Direct Acting Spool-Type Relief Valve. For additional information see Technical Tips on pages PC1-PC4.

Features

- High flow capacity
- Fast response with good stability
- Low pressure setting
- Full 420 Bar 6000 PSI tank line back pressure
- Hardened working parts for maximum durability
- Adjustable, preset and tamperproof versions available
- All external parts zinc plated







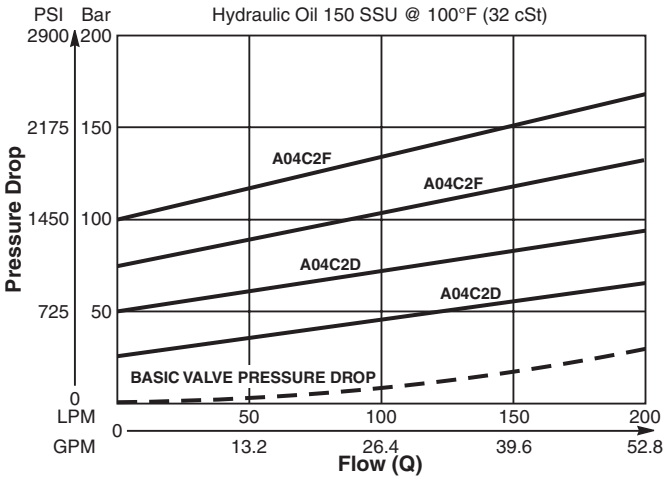
Specifications

Rated Flow	200 LPM (53 GPM)
Maximum Inlet Pressure	**D -** 2-50 Bar (29-725 PSI) **F -** 2-100 Bar (29-1450 PSI)
Maximum Pressure Setting	420 Bar (6000 PSI)
Sensitivity: Pressure/Turn	**D** 5.2 Bar (76 PSI) **F** 10.1 Bar (147 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	25 ml/min. @ 50 Bar (725 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.28 kg (0.62 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

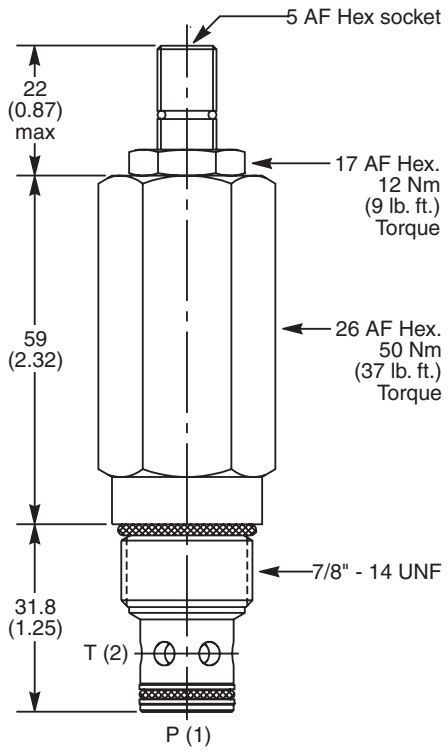
Performance Curve

(Pressure rise through cartridge only)

Flow vs. Inlet Pressure



Dimensions Millimeters (Inches)



Ordering Information

A04C2		Z	N
10 Size Direct Acting Relief Valve	Pressure Adjustment Range	Adjustment Style	Seals

Code	Pressure Adjustment Range
D	2 - 50 Bar (29 - 725 PSI)
F	2 - 100 Bar (29 - 1450 PSI)

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30503N-1)	-34°C to +121°C (-30°F to +250°F)

Standard Pressure Setting

A04C2D Standard Setting:
25 Bar (360 PSI)
@ 15 LPM (4.0 GPM)

A04C2F Standard Setting:
50 Bar (725 PSI)
@ 15 LPM (4.0 GPM)

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Order Bodies Separately
See section BC

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

Port Size
1/2" BSP

Body Material
Steel

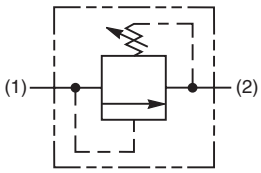
General Description

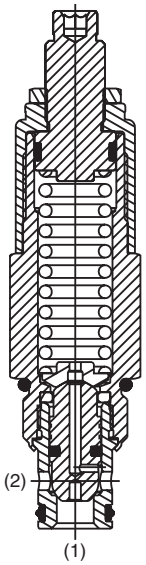
Direct Acting Poppet-Type Relief Valve.
For additional information see
Technical Tips on pages PC1-PC4.

Features

- Hardened, precision ground parts for durability
- Internal mechanical stop limits poppet travel eliminating spring solidification
- Spherical poppets for low leakage
- "D"-Ring eliminates backup rings
- All external parts zinc plated
- Fast response







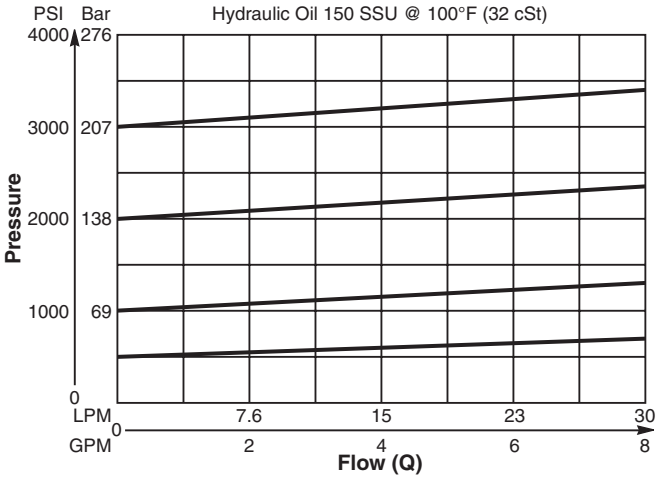
Specifications

Rated Flow	38 LPM (10 GPM)
Maximum Inlet Pressure	250 Bar (3600 PSI)
Maximum Pressure Setting	207 Bar (3000 PSI)
Sensitivity: Pressure/Turn	**03** 2.7 Bar (39 PSI) **09** 7.2 Bar (104 PSI) **18** 16 Bar (234 PSI) **30** 103.4 Bar (1500 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Reseat Pressure	85% of crack pressure
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.) @75% of crack pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluids	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.23 kg (0.5 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

Performance Curve

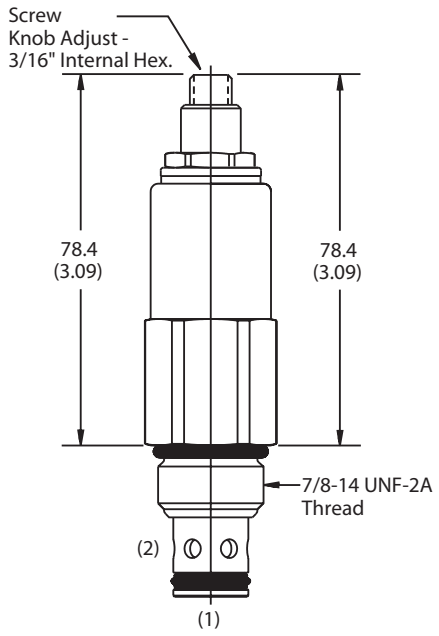
Flow vs. Inlet Pressure

(Pressure rise through cartridge only)



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



Screw / Knob Version

Ordering Information

RD102	S	
10 Size Direct Acting Relief Valve	Adjustment Style	Pressure Range

Code	Adjustment Style
S	Screw Adjust

Seals / Kit No.	Operating Temp.
"D" -Ring / (SK10-2)	-37°C to +93°C (-35°F to +200°F)

Code	Pressure Range
03	3.5 - 20.7 Bar (50 - 300 PSI) Standard Setting: 10.3 Bar (150 PSI) @ .95 LPM (.25 GPM)
09	7 - 62 Bar (100 - 900 PSI) Standard Setting: 31.0 Bar (450 PSI) @ .95 LPM (.25 GPM)
18	13.8 - 124 Bar (200 - 1800 PSI) Standard Setting: 62.1 Bar (900 PSI) @ .95 LPM (.25 GPM)
30	41.4 - 207 Bar (600 - 3000 PSI) Standard Setting: 103.4 Bar (1500 PSI) @ .95 LPM (.25 GPM)

Order Bodies Separately
See section BC

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

Port Size
1/2" BSP

Body Material
Steel

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

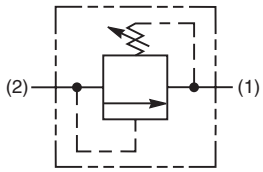
General Description

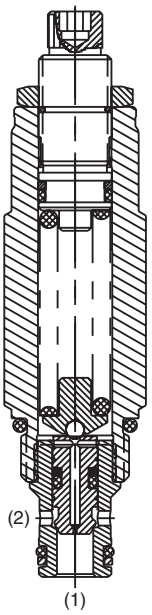
Differential Area Relief Valve. For additional information see Technical Tips on pages PC1-PC4.

Features

- Hardened, precision ground parts for durability
- Spherical poppets for low leakage
- High flow capacity
- Internal mechanical stop limits poppet travel eliminating spring solidification
- All external parts zinc plated







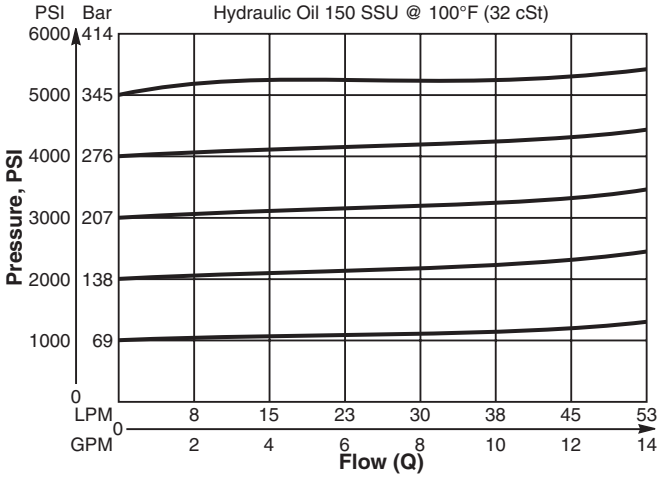
Specifications

Rated Flow	45 LPM (12 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Sensitivity: Pressure/Turn	**15** 15 Bar (218 PSI) **30** 27 Bar (396 PSI) **50** 42 Bar (614 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Reseat Pressure	75% of crack pressure
Leakage at 150 SSU (32 cSt)	10 drops/min. (.67 cc/min.) @75% of crack pressure
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.19 kg (.43 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

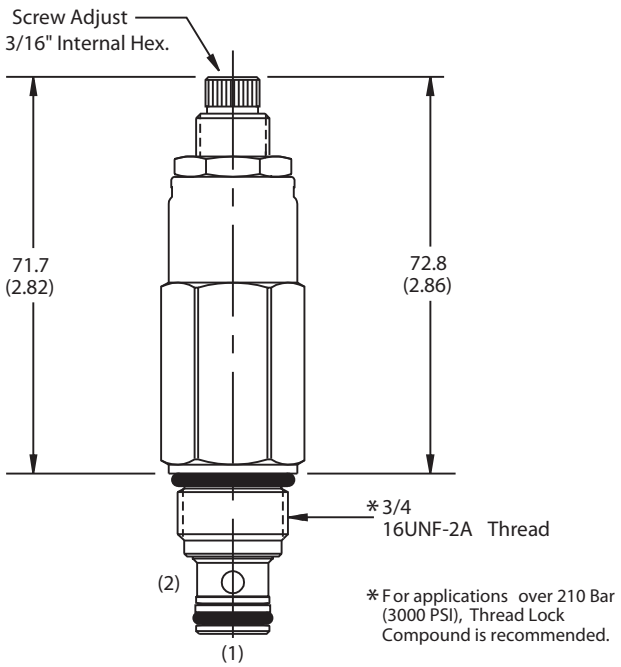
Performance Curve

Flow vs. Inlet Pressure

(Pressure rise through cartridge only)



Dimensions Millimeters (Inches)



Screw Version

Ordering Information

RDH083	S		N
08 Size Differential Area Relief Valve	Adjustment Style	Pressure Range	Seals

Code	Adjustment Style
S	Screw Adjust

Seals / Kit No.	Operating Temp.
"D" -Ring / (SK08-2)	-37°C to +93°C (-35°F to +200°F)

Code	Pressure Range
15	6.9 - 103 Bar (100 - 1500 PSI) Standard Setting: 51.7 Bar (750 PSI) @ crack pressure approximately .95 LPM (.25 GPM)
30	69 - 207 Bar (1000 - 3000 PSI) Standard Setting: 103 Bar (1500 PSI) @ crack pressure approximately .95 LPM (.25 GPM)
50	138 - 345 Bar (2000 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ crack pressure approximately .95 LPM (.25 GPM)

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Order Bodies Separately
See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

Port Size
3/8" BSP

Body Material
Steel

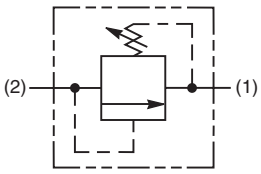
General Description

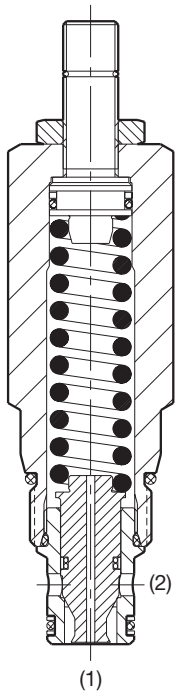
Direct Acting, Side to Nose, Poppet Type Relief Valve.
For additional information see
Technical Tips on pages PC1-PC4.

Features

- Hardened, precision ground parts for durability
- Fully guided pilot for more consistent reseat
- Steel adapters are zinc plated







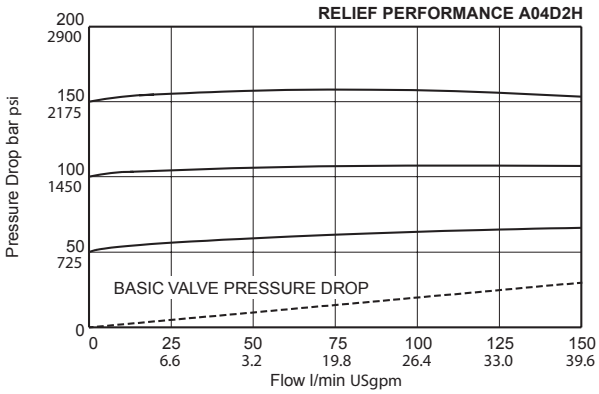
Specifications

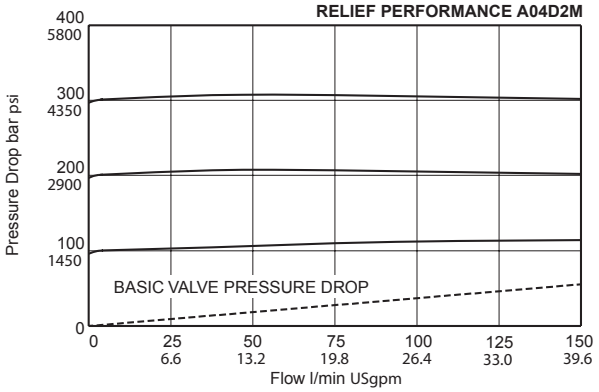
Rated Flow	150 LPM (40 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Maximum Pressure Setting	**H -** 210 Bar (3000 PSI) **M -** 350 Bar (5000 PSI)
Sensitivity: Pressure/Turn	**H -** 26 Bar (370 PSI) **M -** 35 Bar (510 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.28 kg (.62 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

Performance Curves

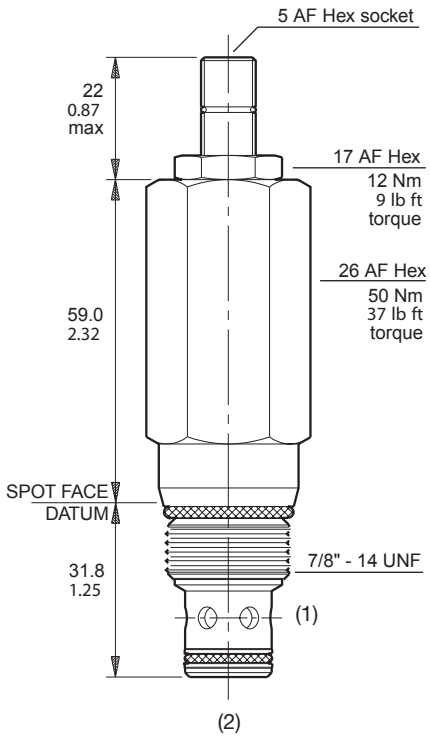
Flow vs. Inlet Pressure

(Pressure rise through cartridge only)





Dimensions Millimeters (Inches)



Ordering Information

A04D2		Z	N
10 Size Pilot Operated Relief Valve	Pressure Range	Adjustment Style	Seals

Code	Pressure Adjustment Range
H	5 - 210 Bar (72 - 3000 PSI)
M	5 - 350 Bar (72 - 5000 PSI)

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30529N-1)	-34°C to +121°C (-30°F to +250°F)

Standard Pressure Setting

A04D2H Standard Setting:
100 Bar (1450 PSI)
@ 15 LPM (4 GPM)

A04D2M Standard Setting:
200 Bar (2900 PSI)
@ 15 LPM (4 GPM)

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Order Bodies Separately
See section BC

LB10	707	S
Line Body	Porting	Body Material

Code	Porting
707	1/2″ BSP

Code	Body Material
S	Steel

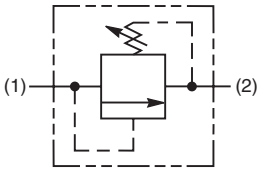
General Description

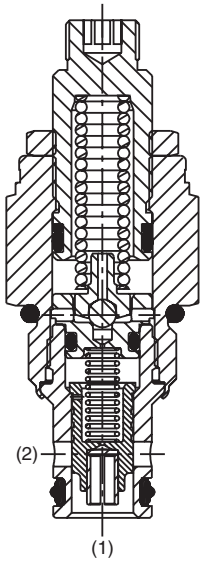
Pilot Operated Spool-Type Relief Valve.
For additional information see
Technical Tips on pages PC1-PC4.

Features

- Hardened, precision ground parts for durability
- Low profile adapter for minimal space requirements
- Fully guided pilot for more consistent reseat
- Steel adapters are zinc plated
- Polyurethane “D”-Ring eliminates backup rings and prevents hydrolysis
- Internal screening protects pilot spring from debris







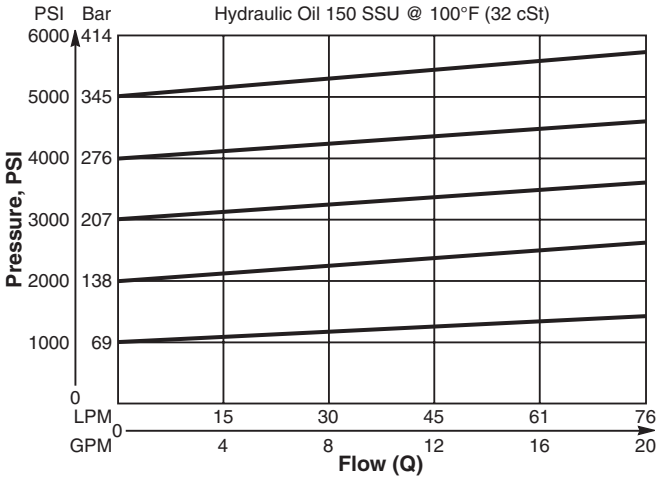
Specifications

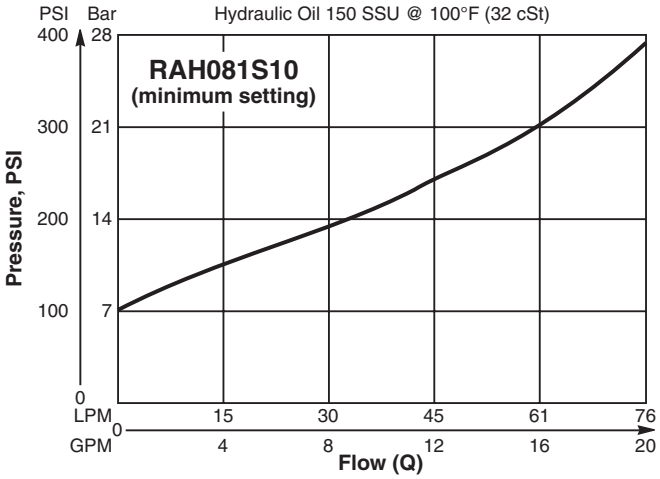
Rated Flow	75.8 LPM (20 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Sensitivity: Pressure/Turn	**10** 19.6 Bar (285 PSI) **20** 39.3 Bar (570 PSI) **30** 58.9 Bar (859 PSI) **50** 131.7 Bar (1910 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Reseat Pressure	90% of crack pressure
Leakage at 150 SSU (32 cSt)	5 cc per 100 PSI (6.8 Bar) setting
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.09 kg (.20 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

Performance Curves

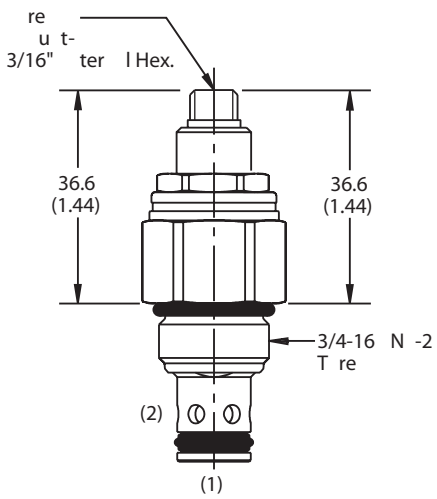
Flow vs. Inlet Pressure

(Pressure rise through cartridge only)





Dimensions Millimeters (Inches)



Screw Version

Ordering Information

RAH081	S	
08 Size Pilot Operated Relief Valve	Adjustment Style	Pressure Range

Code	Adjustment Style
S	Screw Adjust

Seals / Kit No.	Operating Temp.
"D" -Ring / (SK08-2)	-37°C to +93°C (-35°F to +200°F)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
20	6.9 - 138 Bar (100 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
30	13.8 - 207 Bar (200 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
50	13.8 - 345 Bar (200 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Order Bodies Separately
See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

Port Size
3/8" BSP

Body Material
Steel

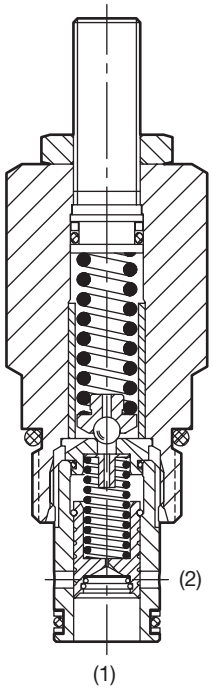
General Description

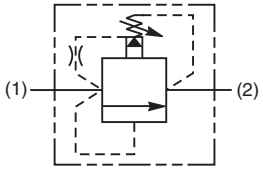
Pilot Operated Spool-Type Relief Valve.
For additional information see
Technical Tips on pages PC1-PC4.

Features

- Hardened, precision ground parts for durability
- Low profile adapter for minimal space requirements
- Fully guided pilot for more consistent reseat
- Steel adapters are zinc plated
- Internal screening protects pilot spring from debris







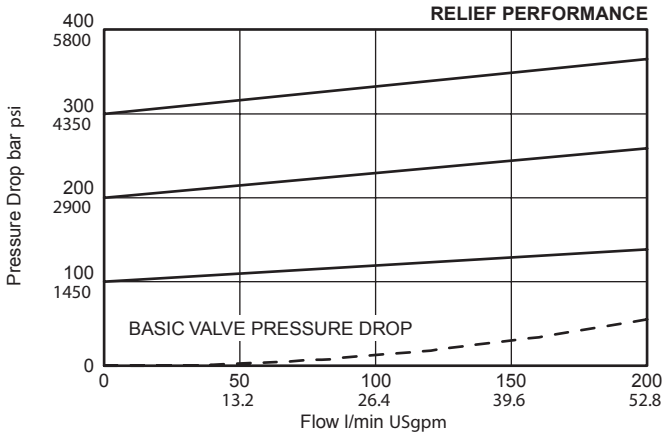
Specifications

Rated Flow	200 LPM (53 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	420 Bar (6000 PSI)
Sensitivity: Pressure/Turn	**H -** 30 Bar (435 PSI) **P -** 55 Bar (800 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.21 kg (.46 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

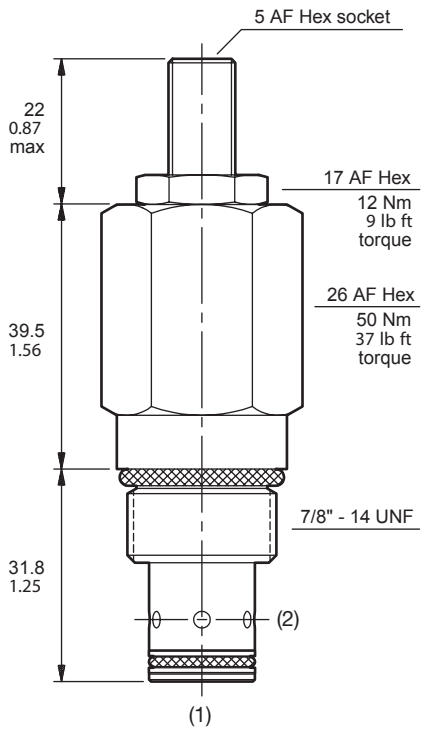
Performance Curves

Flow vs. Inlet Pressure

(Pressure rise through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

A04G2		Z	N
10 Size Pilot Operated Relief Valve	**Pressure Range**	**Adjustment Style**	**Seals**

Code	Pressure Adjustment Range
H	10 - 210 Bar (145 - 3000 PSI)
P	10 - 420 Bar (145 - 6000 PSI)

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30503N-1)	-34°C to +121°C (-30°F to +250°F)

Standard Pressure Setting

A04G2H Standard Setting:
100 Bar (1450 PSI)
@ 15 LPM (4 GPM)

A04G2P Standard Setting:
200 Bar (2900 PSI)
@ 15 LPM (4 GPM)

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Order Bodies Separately
See section BC

LB10	707	S
Line Body	**Porting**	**Body Material**

Code	Porting
707	1/2″ BSP

Code	Body Material
S	Steel

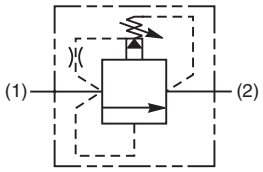
General Description

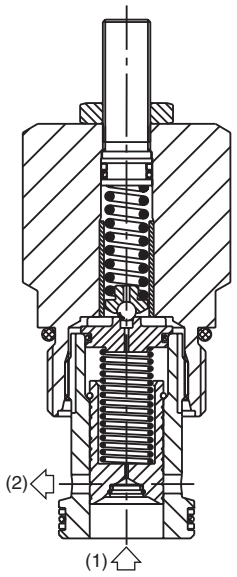
Pilot Operated, Spool-Type Relief Valve. For additional information see Technical Tips on pages PC1-PC4.

Features

- Very high flow capacity
- Minimal pressure variation with flow change
- Full tank line back pressure capability, ideal for crossline relief applications
- Integral 250 micron pilot flow filter
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated







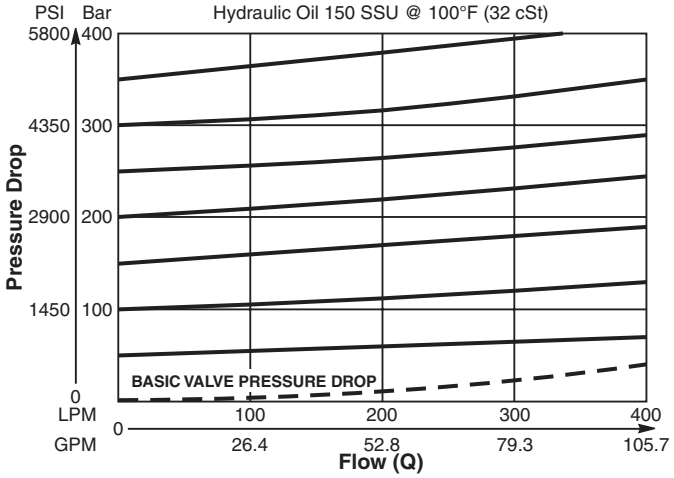
Specifications

Rated Flow	400 LPM (106 GPM)
Maximum Inlet Pressure	**H -** 10-210 Bar (145-3000 PSI) **P -** 10-420 Bar (145-6000 PSI)
Maximum Pressure Setting	420 Bar (6000 PSI)
Sensitivity: Pressure/Turn	**H** 30 Bar (435 PSI) **P** 55 Bar (800 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	100 ml/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.57 kg (1.26 lbs.)
Cavity	C16-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT16-2F

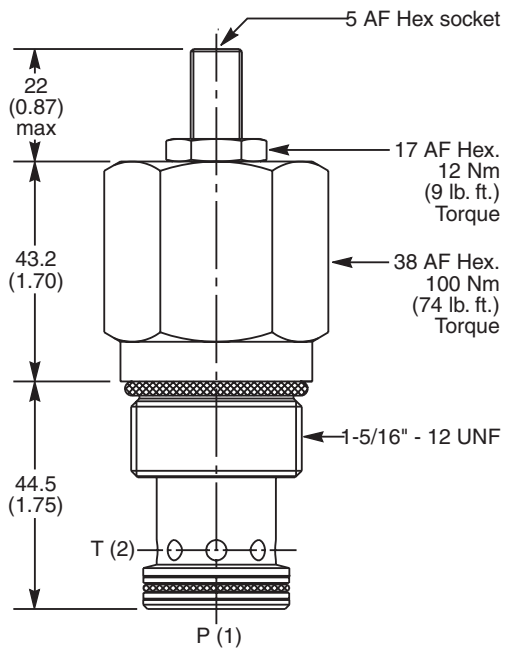
Performance Curve

(Pressure rise through cartridge only)

Flow vs. Inlet Pressure



Dimensions Millimeters (Inches)



Ordering Information

A06G2		Z	N
16 Size Pilot Operated Relief Valve	**Pressure Adjustment Range**	**Adjustment Style**	**Seals**

Code	Pressure Adjustment Range
H	10 - 210 Bar (145 - 3000 PSI)
P	10 - 420 Bar (145 - 6000 PSI)

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.
N	Nitrile, Buna-N / (SK30507N-1)

Standard Pressure Setting

A06G2H Standard Setting:
100 Bar (1450 PSI)
@ 15 LPM (4.0 GPM)

A06G2P Standard Setting:
200 Bar (2900 PSI)
@ 15 LPM (4.0 GPM)

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Order Bodies Separately
See section BC

B16	—	2	—	16B
16 Size		**2-Way Cavity**		**Port Size**

Port Size
1″ BSP

Body Material
Steel

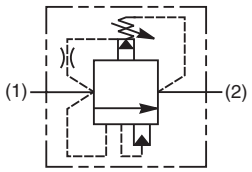
General Description

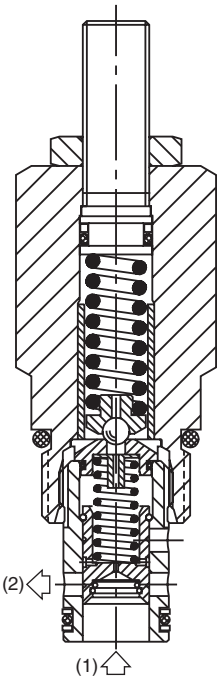
Kick-Down, Pilot Operated Relief Valve. For additional information see Technical Tips on pages PC1-PC4.

Features

- High flow capacity
- Integral 250 micron pilot flow filter
- Hardened working parts for maximum durability
- Adjustable and tamper resistant versions available
- All external parts zinc plated







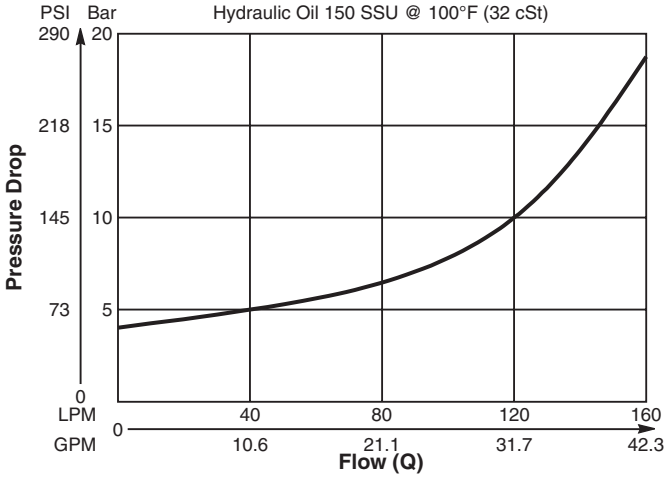
Specifications

Rated Flow	160 LPM (42 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**P -** 10-420 Bar (144-6000 PSI)
Sensitivity: Pressure/Turn	**P -** 55 Bar (800 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	25 ml/min. @ 50 Bar (725 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.29 kg (0.64 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher

Performance Curve

(Pressure rise through cartridge only)

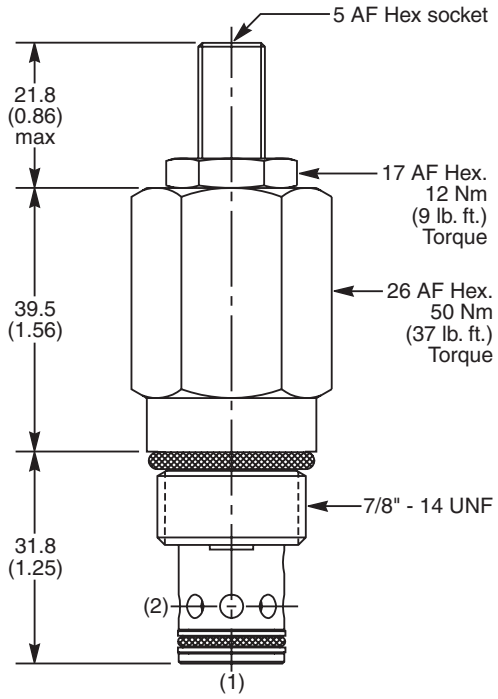
Pressure Drop vs. Flow



Application Note

Valve unloads completely when setting is reached and resets when fluid supply is removed.

Dimensions Millimeters (Inches)



Ordering Information

A04K2	P	Z	N
10 Size Kick-Down Relief Valve	Pressure Adjustment Range	Adjustment Style	Seals

Code	Pressure Adjustment Range
P	10 - 420 Bar (145 - 6000 PSI)

Standard Pressure Setting
A04K2P Standard Setting: 200 Bar (2900 PSI)

Code	Adjustment Style
Z	Screw Adjust

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30503N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

Port Size
1/2" BSP

Body Material
Steel

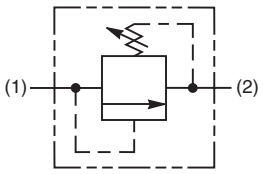
General Description

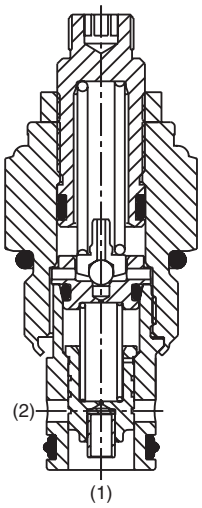
Pilot Operated Spool-Type Relief Valve.
For addition information see Technical Tips on pages PC1-PC6.

Features

- Hardened, precision ground parts for durability
- Low profile adapter for minimal space requirements
- Fully guided poppet for more consistent reseat
- Steel adapters are zinc plated
- Polyurethane “D”-Ring eliminates backup rings and prevents hydrolysis
- Internal screening protects pilot spring from debris







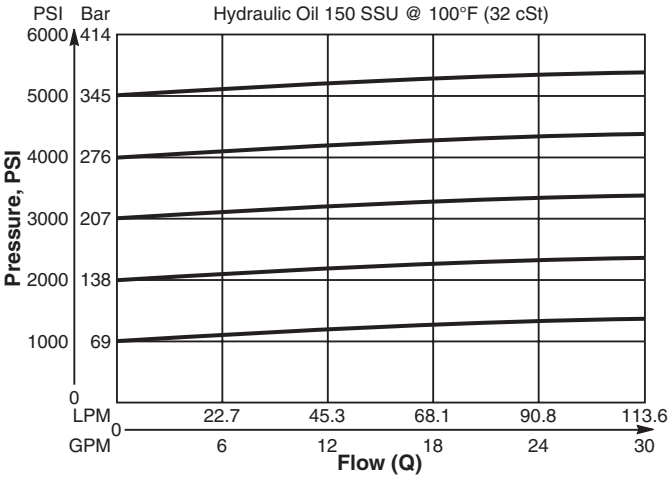
Specifications

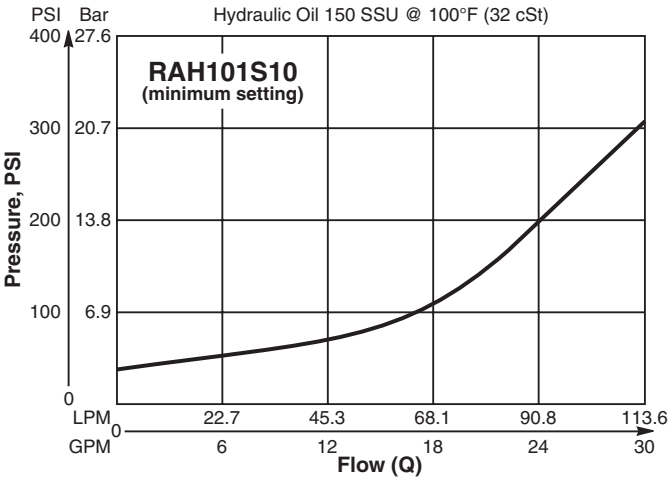
Rated Flow	113 LPM (30 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Sensitivity: Pressure/Turn	**10** 19.6 Bar (285 PSI) **20** 39.3 Bar (570 PSI) **30** 58.9 Bar (859 PSI) **50** 131.7 Bar (1910 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Reseat Pressure	90% of crack pressure
Leakage at 150 SSU (32 cSt)	5 cc per 100 PSI (6.8 Bar) setting
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.23 kg (.50 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

Performance Curves

Flow vs. Inlet Pressure

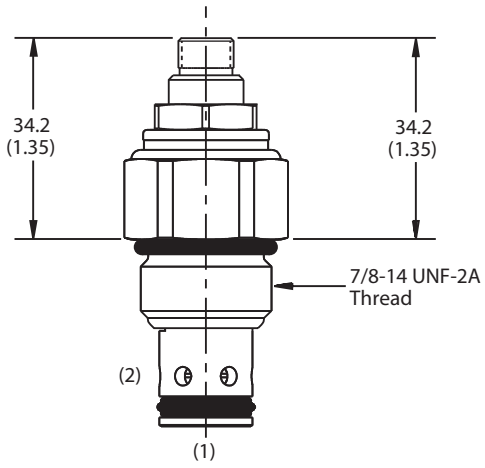
(Pressure rise through cartridge only)





Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



Screw Version

Ordering Information

RAH101	S	
10 Size Pilot Operated Relief Valve	Adjustment Style	Pressure Range

Code	Adjustment Style
S	Screw Adjust

Seals / Kit No.	Operating Temp.
"D" -Ring / (SK10-2N)	-37°C to +93°C (-35°F to +200°F)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
20	6.9 - 138 Bar (100 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
30	13.8 - 207 Bar (200 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
50	13.8 - 345 Bar (200 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Order Bodies Separately
See section BC

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

Port Size
1/2" BSP

Body Material
Steel

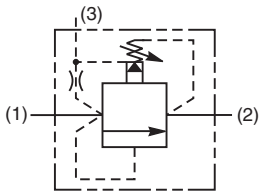
General Description

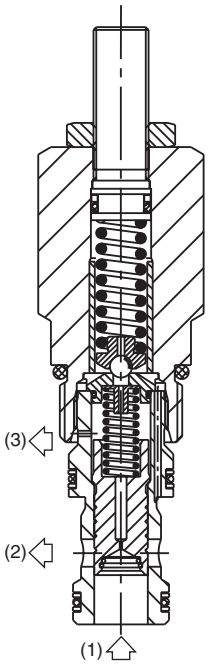
Pilot Operated, Spool-Type, Ventable Relief Valve. For additional information see Technical Tips on pages PC1-PC4.

Features

- High flow capacity
- Full tank line back pressure capability
- Excellent flow pressure characteristics for consistent pressure setting
- Ideal for pump relief and remote control or unloading via vent (port 3)
- Integral 250 micron pilot flow filter
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated







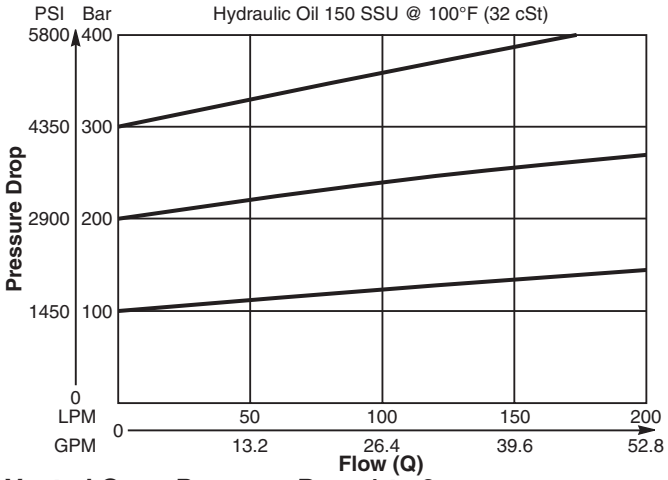
Specifications

Rated Flow	190 LPM (50 GPM)
Maximum Inlet Pressure	**H -** 10-210 Bar (145-3000 PSI) **P -** 10-420 Bar (145-6000 PSI)
Maximum Pressure Setting	420 Bar (6000 PSI)
Sensitivity: Pressure/Turn	**H** 30 Bar (435 PSI) **P** 55 Bar (800 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	25 ml/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.25 kg (0.55 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher None Finisher

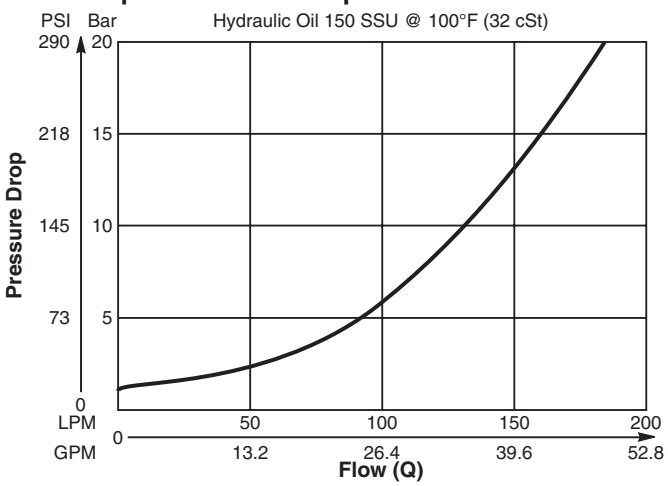
Performance Curves

(Pressure rise through cartridge only)

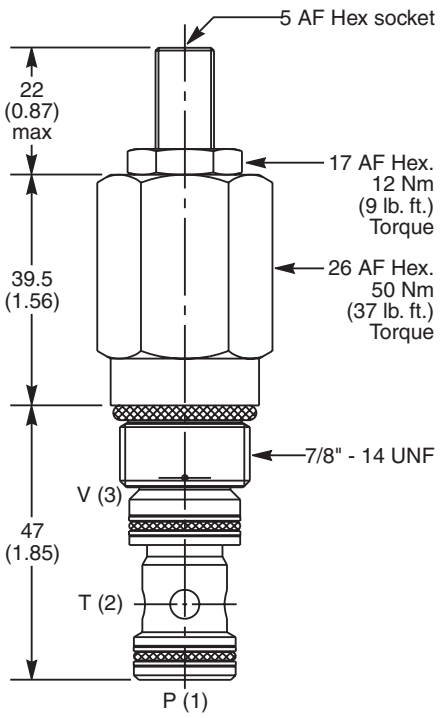
Flow vs. Inlet Pressure 1 to 2



Vented Open Pressure Drop 1 to 2



Dimensions Millimeters (Inches)



Ordering Information

A04H3		Z	N
10 Size Pilot Operated Relief Valve	**Pressure Adjustment Range**	**Adjustment Style**	**Seals**

Code	Pressure Adjustment Range
H	10 - 210 Bar (145 - 3000 PSI)
P	10 - 420 Bar (145 - 6000 PSI)

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30504N-1)	-34°C to +121°C (-30°F to +250°F)

Standard Pressure Setting

A04H3H Standard Setting:
100 Bar (1450 PSI)
@ 15 LPM (4.0 GPM)

A04H3P Standard Setting:
200 Bar (2900 PSI)
@ 15 LPM (4.0 GPM)

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Order Bodies Separately
See section BC

LB10	711	S
Line Body	**Porting**	**Body Material**

Code	Porting
711	3/4″ BSP (main) 1/4″ BSP (aux)

Code	Body Material
S	Steel

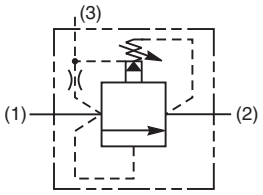
General Description

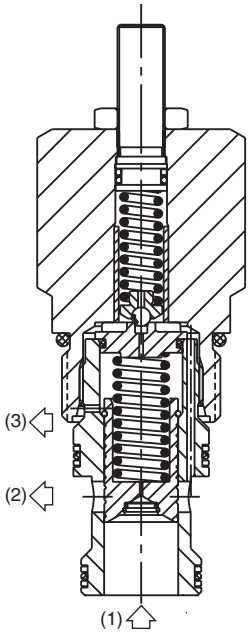
Pilot Operated, Spool-Type, Ventable Relief Valve. For additional information see Technical Tips on pages PC1-PC4.

Features

- High flow capacity
- Full tank line back pressure
- Excellent pressure flow characteristics
- Ideal for pump relief and remote control or unloading via vent (port 3)
- Integral 250 micron pilot flow filter
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated







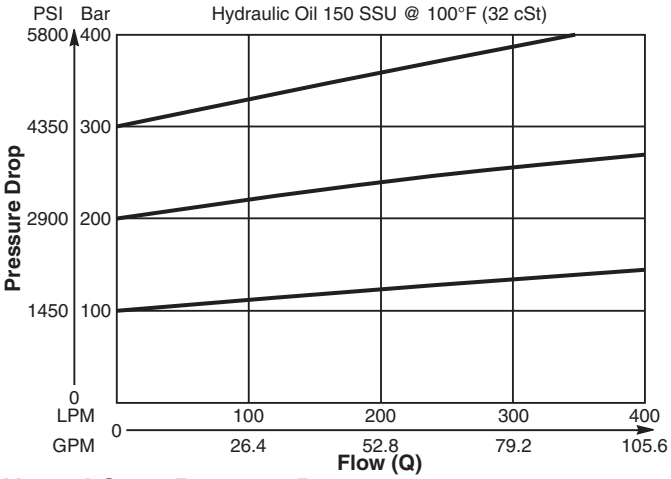
Specifications

Rated Flow	400 LPM (106 GPM)
Maximum Inlet Pressure	**H -** 10-210 Bar (145-3000 PSI) **P -** 10-420 Bar (145-6000 PSI)
Maximum Pressure Setting	420 Bar (6000 PSI)
Sensitivity: Pressure/Turn	**H** 30 Bar (435 PSI) **P** 55 Bar (800 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	100ml/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.58 kg (1.28 lbs.)
Cavity	C16-3S (See BC Section for more details)
Form Tool	Rougher None Finisher

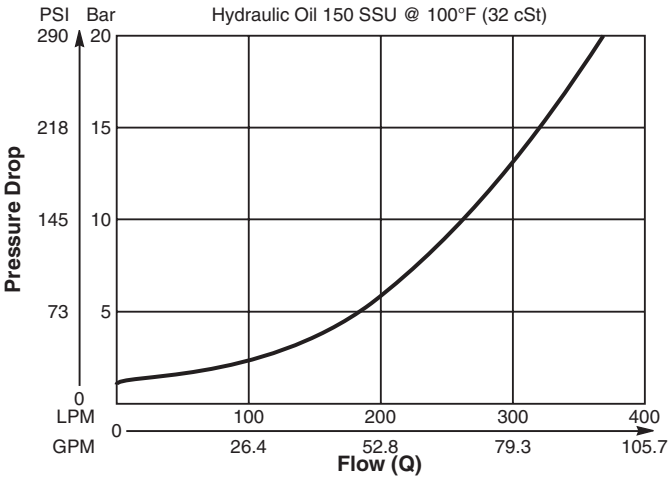
Performance Curves

(Pressure rise through cartridge only)

Flow vs. Inlet Pressure 1 to 2

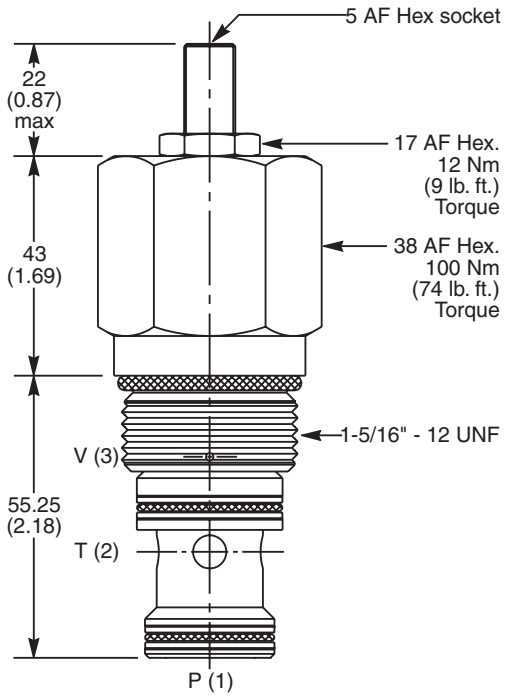


Vented Open Pressure Drop 1 to 2



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



Ordering Information

A06H3		Z	N
16 Size Pilot Operated Relief Valve	Pressure Adjustment Range	Adjustment Style	Seals

Code	Pressure Adjustment Range
H	10 - 210 Bar (145 - 3000 PSI)
P	10 - 420 Bar (145 - 6000 PSI)

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30508N-1)	-34°C to +121°C (-30°F to +250°F)

Standard Pressure Setting

A06H3H Standard Setting:
100 Bar (1450 PSI)
@ 15 LPM (4.0 GPM)

A06H3P Standard Setting:
200 Bar (2900 PSI)
@ 15 LPM (4.0 GPM)

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Order Bodies Separately
See section BC

LB10	726	S
Line Body	Porting	Body Material

Code	Porting
726	1″ BSP

Code	Body Material
S	Steel

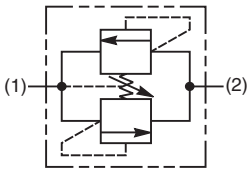
General Description

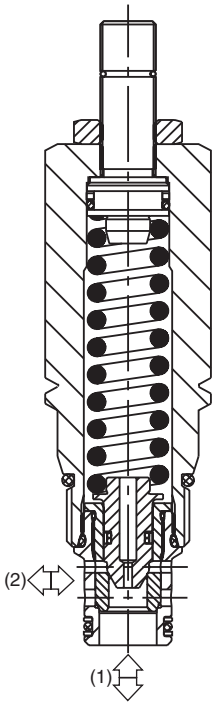
Direct Acting, Dual Poppet-Type, Cross-over Relief Valve. For additional information see Technical Tips on pages PC1-PC4.

Features

- Compact space saving design
- Cost effective - only requires one cavity
- Poppet-type construction for lower leakage
- Full 350 Bar, 5000 PSI pressure capability
- High flow capability for the size of valve
- Minimal pressure variation with flow change
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated







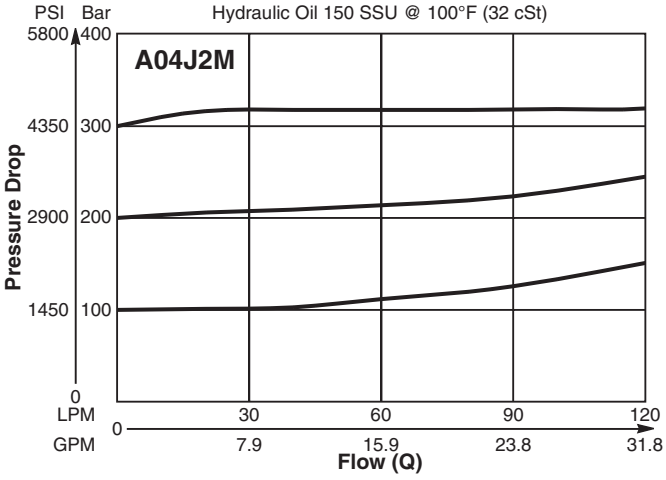
Specifications

Rated Flow	120 LPM (32 GPM)
Maximum Inlet Pressure	**M -** 10-350 Bar (144-5000 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Sensitivity: Pressure/Turn	**M -** 34 Bar (493 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	10 drops/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.29 kg (0.64 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher

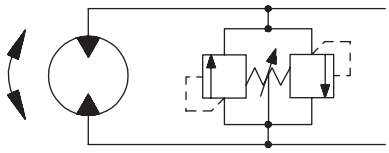
Performance Curves

(Pressure rise through cartridge only)

Flow vs. Inlet Pressure 1 to 2 and 2 to 1

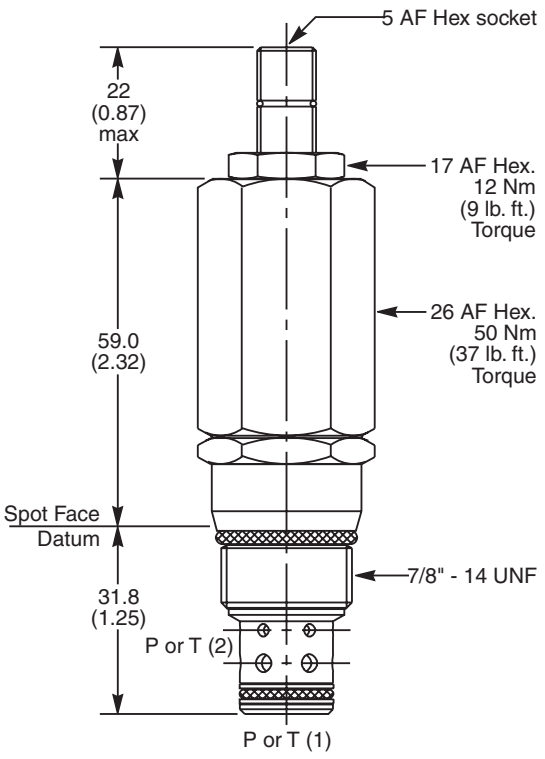


Application



Motor protection in both directions

Dimensions Millimeters (Inches)



Ordering Information

A04J2	M	Z	N
10 Size Direct Acting Relief Valve	Pressure Adjustment Range	Adjustment Style	Seals

Code	Pressure Adjustment Range
M	10 - 350 Bar (144 - 5000 PSI)

Standard Pressure Setting
A04J2M Standard Setting: 200 Bar (2900 PSI) @ 15 LPM (4.0 GPM)

Code	Adjustment Style
Z	Screw Adjust

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30529N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

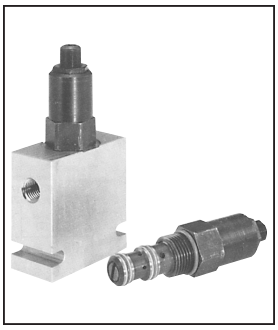
B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

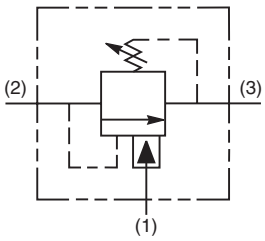
Port Size
1/2" BSP

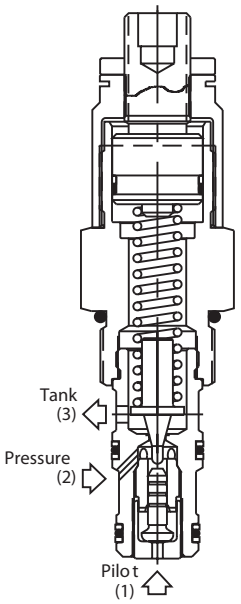
Body Material
Steel

General Description

Differential Area Unloading Relief Valve. This valve is best suited for low flow accumulator unloading circuits or can be used as remote pilot valves. They provide a fixed percentage between load and unload pressures. For additional information see Technical Tips on pages PC1-PC4.







Features

- Low hysteresis
- Cartridge design
- All external parts zinc plated

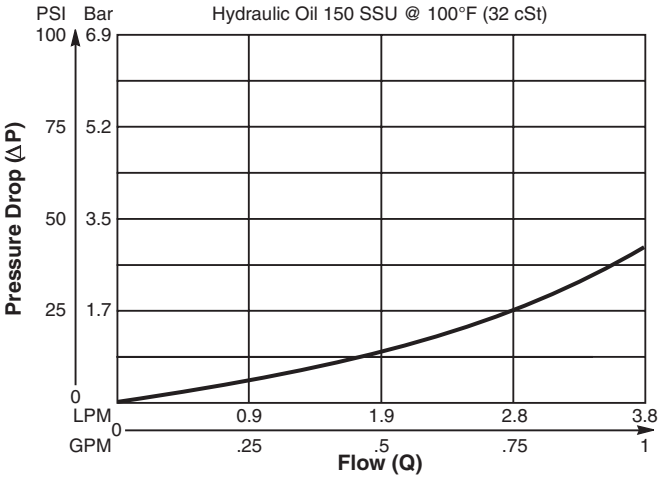
Specifications

Rated Flow	3.75 LPM (1 GPM)
Maximum Pilot Flow	.94 LPM (.25 GPM)
Maximum Inlet Pressure	245 Bar (3500 PSI)
Maximum Pressure Setting	210 Bar (3000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	Port 2 to 3 10 drops/min. (0.66 cc/min.) Port 1 to 2 60 drops/min. (3 cc/min.)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.23 kg (.50 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

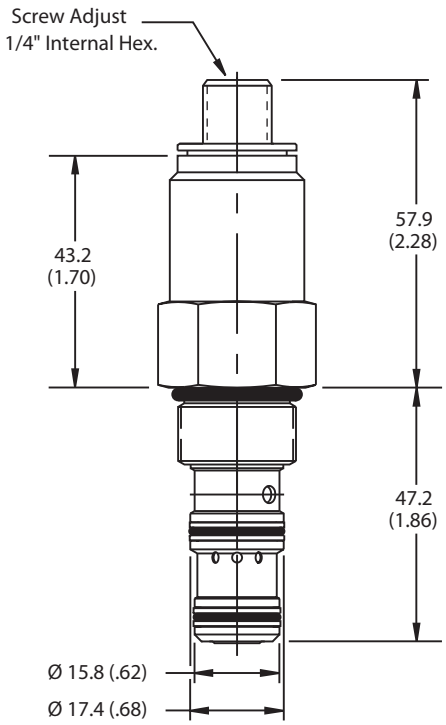
Performance Curve

Inlet Flow vs. Pressure Drop

Without pilot assist (Through cartridge only)



Dimensions Millimeters (Inches)



Screw Version

Ordering Information

RU101	S		C	N
10 Size Differential Area Unloading Relief Valve	Adjustment Style	Pressure Range	Reload	Seals

Code	Adjustment Style
S	Screw Adjust

Seals / Kit No.	Operating Temp.
Nitrile / (SK10-3N)	-34°C to +121°C (-30°F to +250°F)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ 1.1 LPM (.3 GPM)
20	10.3 - 138 Bar (150 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ 1.1 LPM (.3 GPM)
30	13.8 - 207 Bar (200 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ 1.1 LPM (.3 GPM)

Code	Reload
C	80% ±5% of Pressure Setting

Order Bodies Separately
See section BC

B10	—	3	—	8B
10 Size		3-Way Cavity		Port Size

Port Size
1/2" BSP

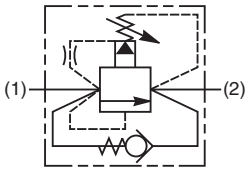
Body Material
Steel

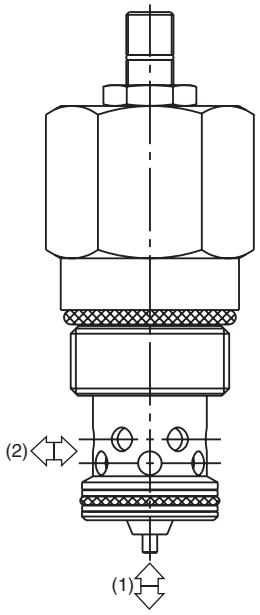
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

General Description

Pilot Operated, Poppet-Type Relief Valve with Free Reverse Check. For additional information see Technical Tips on pages PC1-PC4.







Features

- High flow capacity
- Virtually leak free, can be used for load holding applications
- Compact space saving design
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated

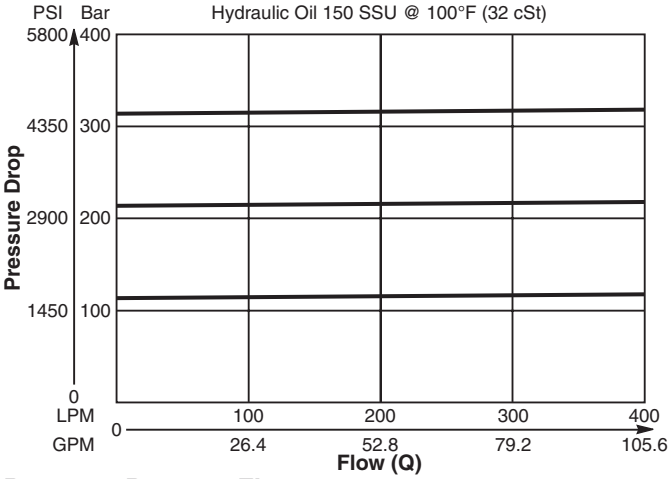
Specifications

Rated Flow	400 LPM (106 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	10-420 Bar (145-6000 PSI)
Sensitivity: Pressure/Turn	53 Bar (768 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.57 kg (1.26 lbs.)
Cavity	C16-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT16-2F

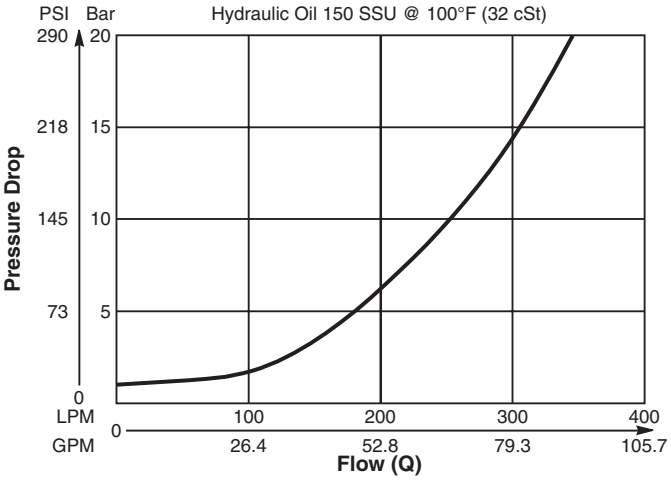
Performance Curves

(Pressure rise through cartridge only)

Relief Performance 1 to 2

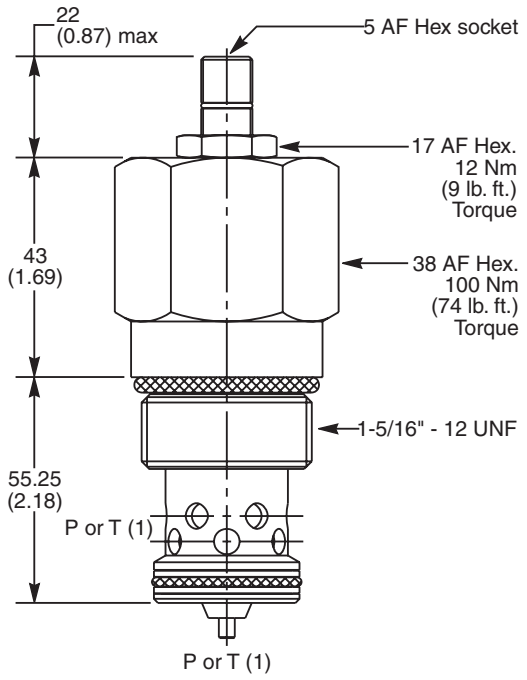


Pressure Drop vs. Flow 2 to 1



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



Ordering Information

A06P2	P	Z	N
16 Size Pilot Operated Relief Valve	Pressure Adjustment Range	Adjustment Style	Seals

Code	Pressure Adjustment Range
P	10 - 420 Bar (145 - 6000 PSI)

Standard Pressure Setting
A06P2P Standard Setting: 200 Bar (2900 PSI) @ 20 LPM (5.3 GPM)

Order Bodies Separately
See section BC

B16	—	2	—	16B
16 Size		2-Way Cavity		Port Size

Code	Adjustment Style
Z	Screw Adjust

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Port Size
1″ BSP

Body Material
Steel

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30507N-1)	-34°C to +121°C (-30°F to +250°F)

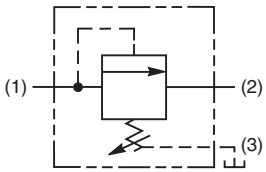
General Description

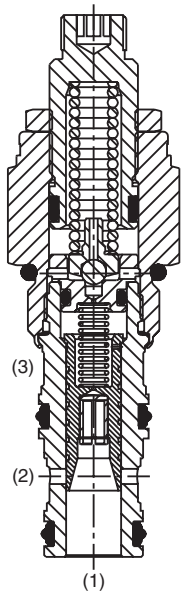
Pilot Operated Sequence Valve
(Internally Piloted, Externally Vented).
For additional information see
Technical Tips on pages PC1-PC4.

Features

- Hardened, precision ground parts for durability
- Low profile adapter for minimal space requirements
- Fully guided pilot for more consistent reseat
- Steel adapters are zinc plated
- Polyurethane “D”-Ring eliminates backup rings and prevents hydrolysis
- Internal screening protects pilot spring from debris







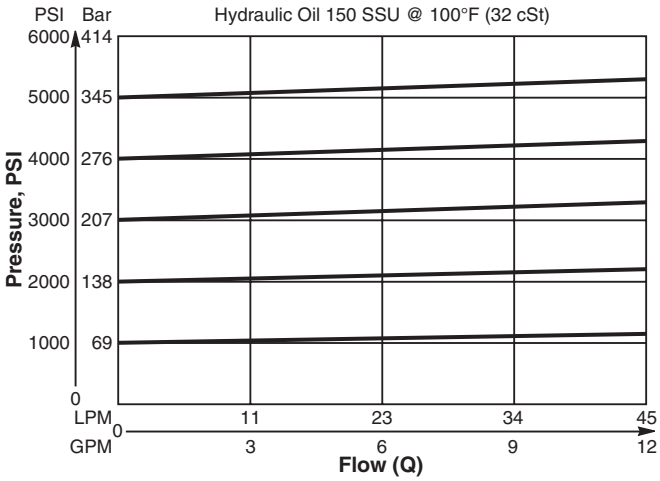
Specifications

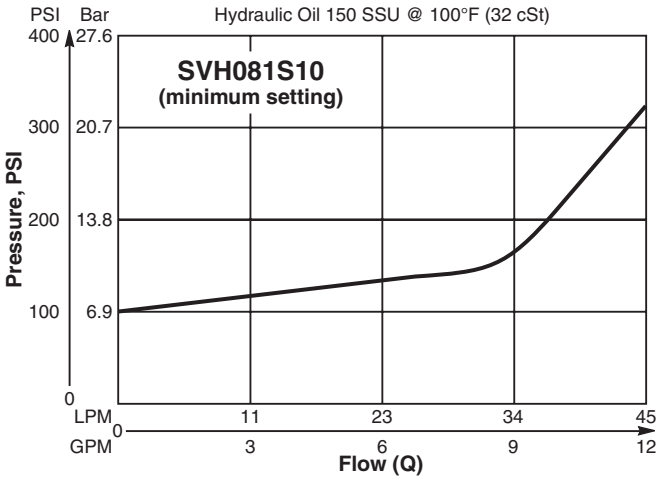
Rated Flow	45 LPM (12 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Sensitivity: Pressure/Turn	**10** 19.6 Bar (285 PSI) **20** 39.3 Bar (570 PSI) **30** 58.9 Bar (859 PSI) **50** 131.7 Bar (1910 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Maximum Drain Flow	0.56 LPM (0.15 GPM)
Reseat Pressure	90% of crack pressure
Leakage at 150 SSU (32 cSt)	82 cc/min. (5 cu. in./min.) @ 210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.11 kg (.25 lbs.)
Cavity	C08-3 (See BC Section for more details)
Form Tool	Rougher NTF08-3R Finisher NFT08-3F

Performance Curves

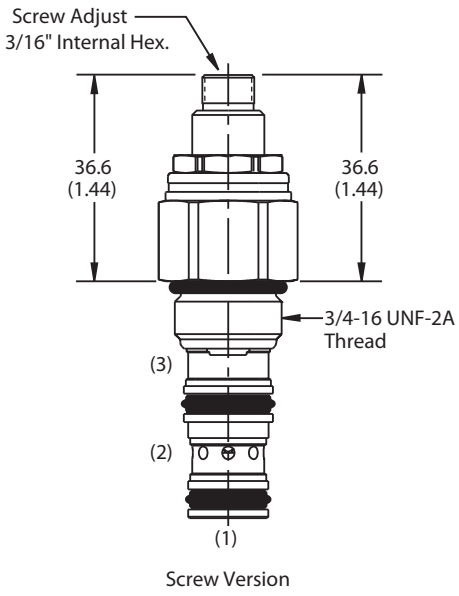
Flow vs. Inlet Pressure

(Pressure rise through cartridge only)





Dimensions Millimeters (Inches)



Screw Version

Ordering Information

SVH081	S	
08 Size P.O. Sequence Valve (Internal Pilot)	Adjustment Style	Pressure Range

Code	Adjustment Style
S	Screw Adjust

Seals / Kit No.	Operating Temp.
"D" -Ring / (SK08-3)	-37°C to +93°C (-35°F to +200°F)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
20	6.9 - 138 Bar (100 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
30	13.8 - 207 Bar (200 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)
50	13.8 - 345 Bar (200 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI) @ crack pressure, approximately .95 LPM (.25 GPM)

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Order Bodies Separately
See section BC

B08	—	3	—	6B
08 Size		3-Way Cavity		Port Size

Port Size
3/8" BSP

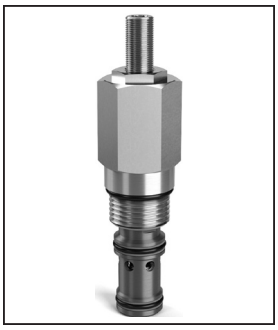
Body Material
Steel

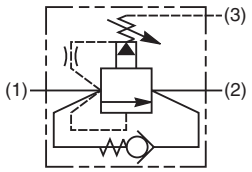
General Description

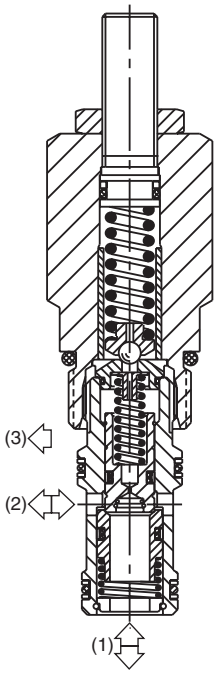
Pilot Operated Sequence Valve with Reverse Flow Check. For additional information see Technical Tips on pages PC1-PC4.

Features

- High flow capacity
- For use on clamp and drill circuits where pressure is to be maintained regardless of drop in system pressure
- Integral 250 micron pilot flow filter
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated







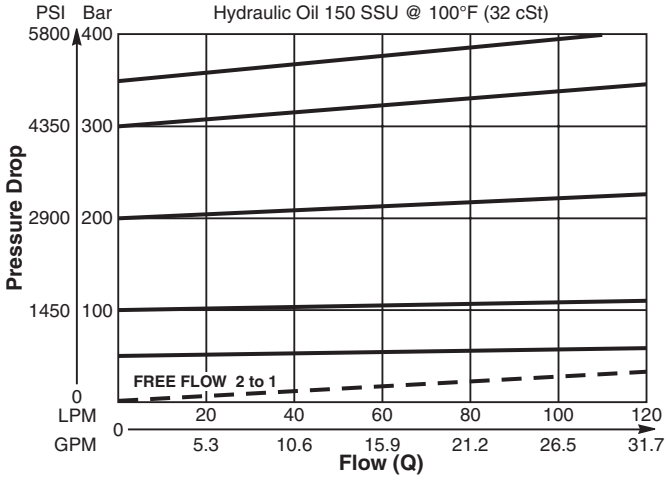
Specifications

Rated Flow	70 LPM (18.5 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**P -** 10-420 Bar (145-6000 PSI)
Sensitivity: Pressure/Turn	**P -** 55 Bar (800 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	50 drops/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.25 kg (0.55 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher NFT10S-3R Finisher NFT10S-3F

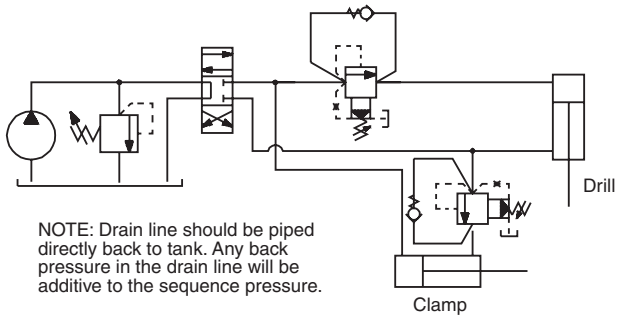
Performance Curve

(Pressure rise through cartridge only)

Flow vs. Inlet Pressure 1 to 2

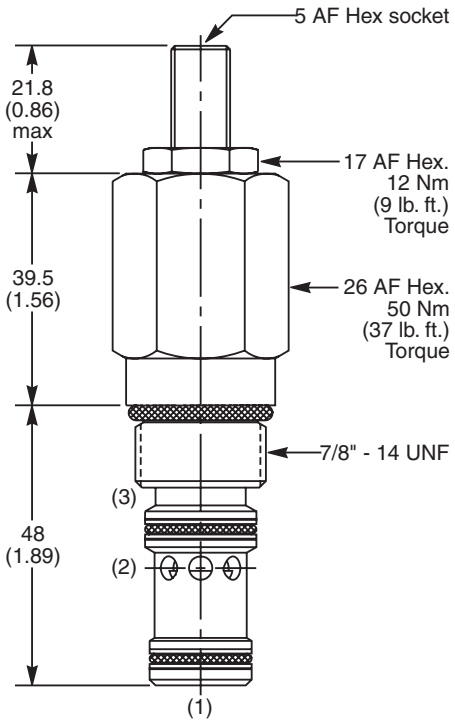


Application



NOTE: Drain line should be piped directly back to tank. Any back pressure in the drain line will be additive to the sequence pressure.

Dimensions Millimeters (Inches)



Ordering Information

B04D3	P	Z	N
10 Size Pilot Operated Sequence Valve	Pressure Adjustment Range	Adjustment Style	Seals

Code	Pressure Adjustment Range
P	10 - 420 Bar (145 - 6000 PSI)

Standard Pressure Setting
B04D3P Standard Setting: 200 Bar (2900 PSI) @ 15 LPM (4.0 GPM)

Order Bodies Separately
See section BC

LB10	711	S
Line Body	Porting	Body Material

Code	Adjustment Style
Z	Screw Adjust

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Code	Porting
711	3/4″ BSP (main) 1/4″ BSP (aux)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30504N-1)	-34°C to +121°C (-30°F to +250°F)

Code	Body Material
S	Steel

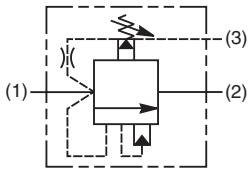
General Description

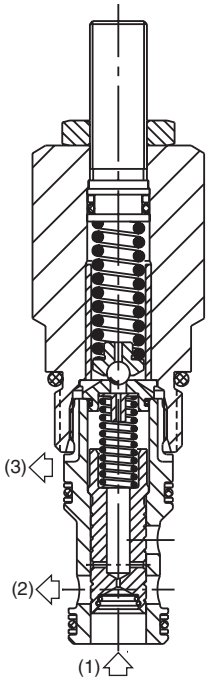
Kick-Down, Spool Type, Pilot Operated Sequence Valve. For additional information see Technical Tips on pages PC1-PC4.

Features

- High flow capacity
- Integral 250 micron pilot flow filter
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated







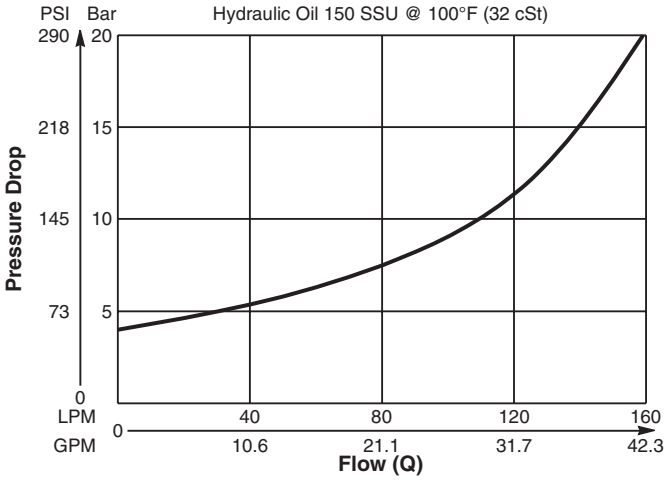
Specifications

Rated Flow	160 LPM (42 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**P -** 10-420 Bar (145-6000 PSI)
Sensitivity: Pressure/Turn	**P -** 55 Bar (800 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.27 kg (0.55 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher NFT10S-3R Finisher NFT10S-3F

Performance Curve

(Pressure rise through cartridge only)

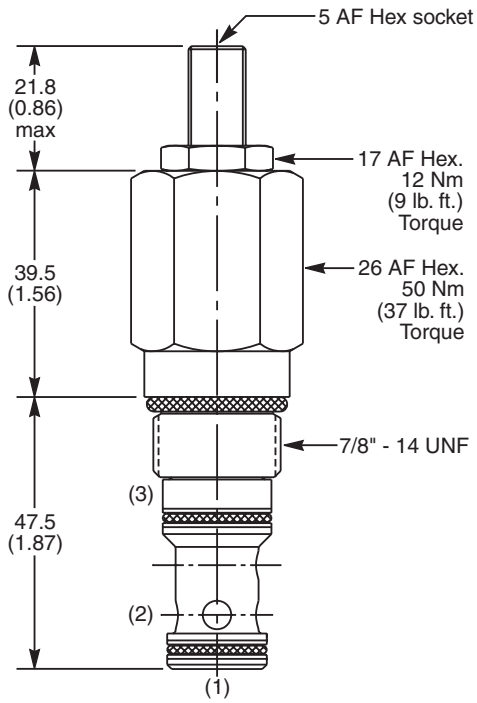
Pressure Drop vs. Flow 1 to 2



Application Note

Valve unloads completely when setting is reached and resets when fluid supply is removed.

Dimensions Millimeters (Inches)



Ordering Information

B04C3	P	Z	N
10 Size Kick-Down Pilot Operated Sequence Valve	Pressure Adjustment Range	Adjustment Style	Seals

Code	Pressure Adjustment Range
P	10 - 420 Bar (145 - 6000 PSI)

Standard Pressure Setting
B04C3P Standard Setting: 200 Bar (2900 PSI)

Code	Adjustment Style
Z	Screw Adjust

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30504N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately See section BC

LB10	711	S
Line Body	Porting	Body Material

Code	Porting
711	3/4″ BSP (main) 1/4″ BSP (aux)

Code	Body Material
S	Steel

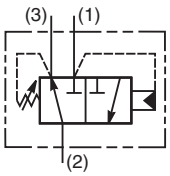
General Description

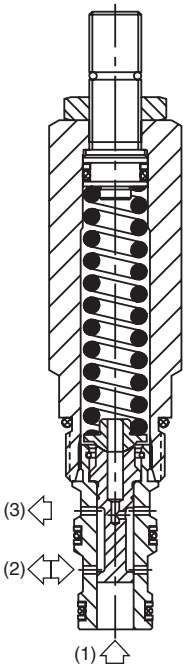
Direct Acting Sequence Valve with Internal Pilot and Drain. For additional information see Technical Tips on pages PC1-PC4.

Features

- Hardened working parts for maximum durability
- All external parts zinc plated
- Adjustable and tamperproof versions available







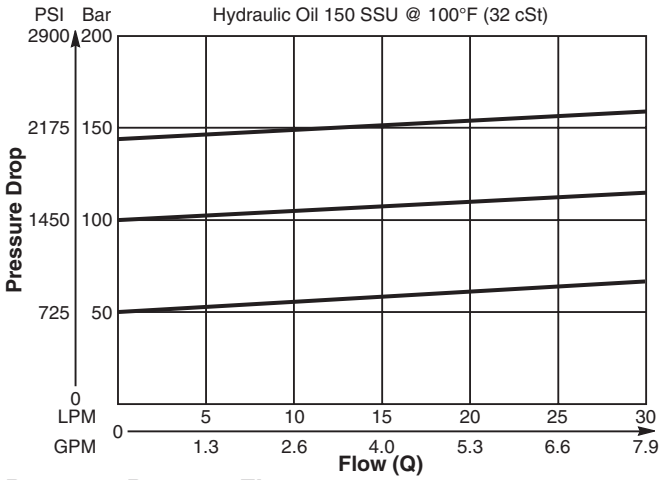
Specifications

Rated Flow	30 LPM (8 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	2-148 Bar (30-2150 PSI)
Sensitivity: Pressure/Turn	**F -** 22 Bar (318 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	25 ml/min. @ 35 Bar (580 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.21 kg (0.46 lbs.)
Cavity	C08-3 (See BC Section for more details)
Form Tool	Rougher NFT08-3R Finisher NFT08-3F

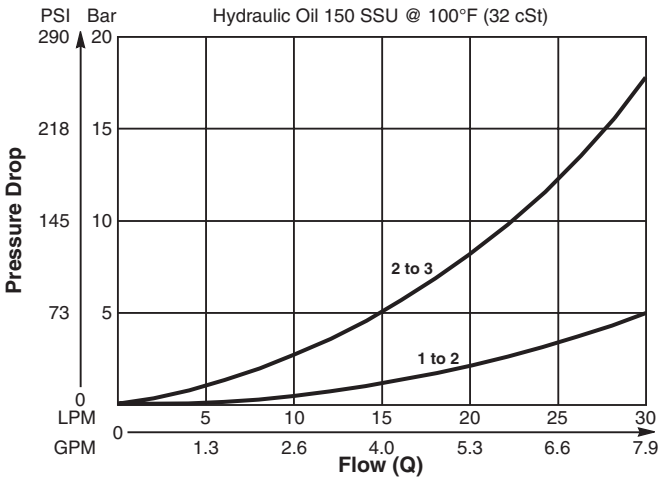
Performance Curves

(Pressure rise through cartridge only)

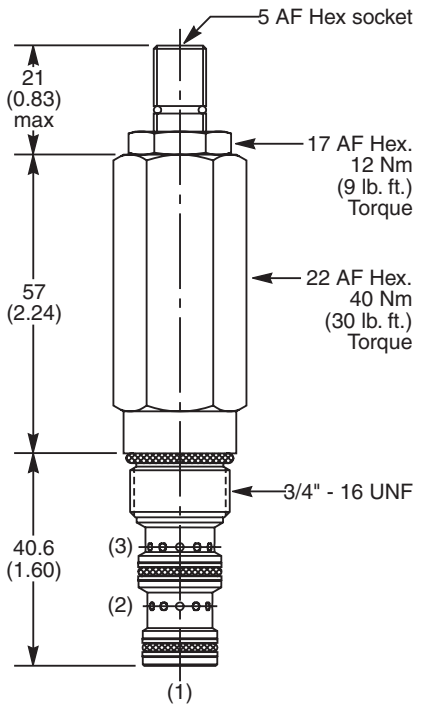
Flow vs. Inlet Pressure 1 to 2



Pressure Drop vs. Flow



Dimensions Millimeters (Inches)



Ordering Information

B02E3	F	Z	N
08 Size D.A. Sequence Valve (Int. Pilot & Drain)	Pressure Adjustment Range	Adjustment Style	Seals

Code	Pressure Adjustment Range
F	2 - 148 Bar (30 - 2150 PSI)

Standard Pressure Setting
B02E3F Standard Setting: 75 Bar (1100 PSI) @ 5 LPM (1.3 GPM)

Code	Adjustment Style
Z	Screw Adjust

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30501N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B08	—	3	—	6B
08 Size		3-Way Cavity		Port Size

Port Size
3/8″ BSP

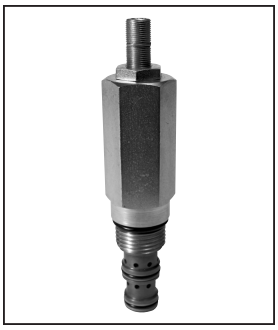
Body Material
Steel

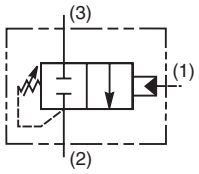
General Description

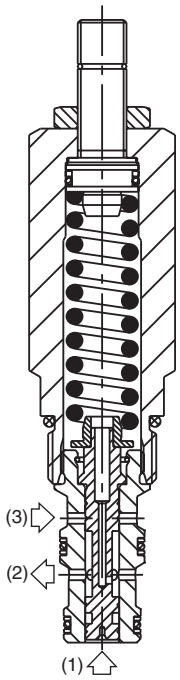
Direct Acting, Normally Closed Sequence Valve with External Pilot and Internal Drain. For additional information see Technical Tips on pages PC1-PC4.

Features

- Hardened working parts for maximum durability
- All external parts zinc plated
- Adjustable and tamperproof versions available







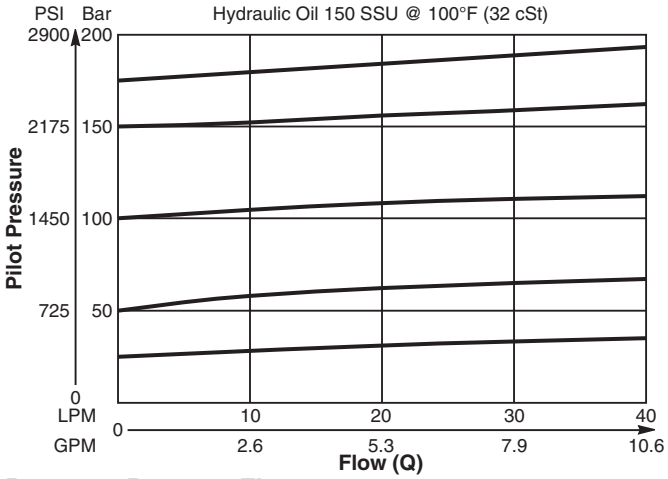
Specifications

Rated Flow	34 LPM (9 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**G -** 2-166 Bar (30-2400 PSI)
Sensitivity: Pressure/Turn	**G -** 17 Bar (248 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	25 ml/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.30 kg (0.66 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

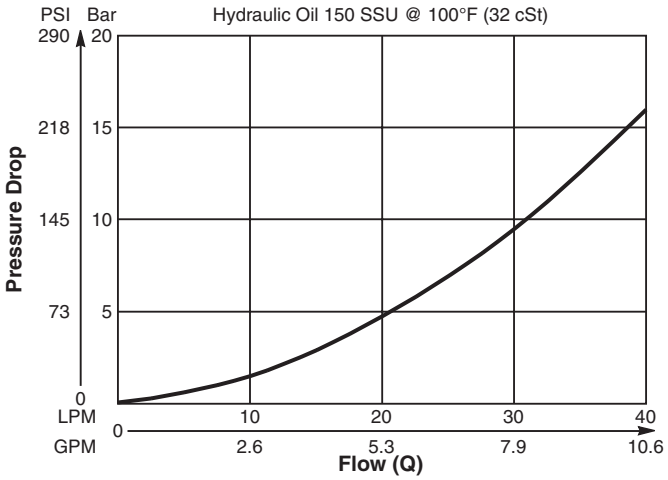
Performance Curves

(Pressure rise through cartridge only)

Flow vs. Inlet Pressure 3 to 2

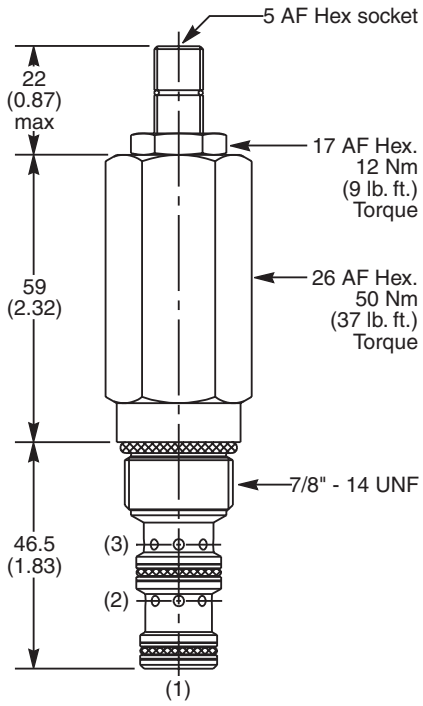


Pressure Drop vs. Flow 3 to 2



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



Ordering Information

B04F3	G	Z	N
10 Size D.A. Sequence Valve (External Pilot & Internal Drain)	Pilot Pressure Adjustment Range	Adjustment Style	Seals

Code	Pilot Pressure Adjustment Range
G	2 - 166 Bar (30 - 2400 PSI)

Pilot Switching Pressure
B04F3G Standard Setting: 80 Bar (1160 PSI) @ 5 LPM (1.3 GPM)

Code	Adjustment Style
Z	Screw Adjust

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30505N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B10	—	3	—	8B
10 Size		3-Way Cavity		Port Size

Port Size
1/2" BSP

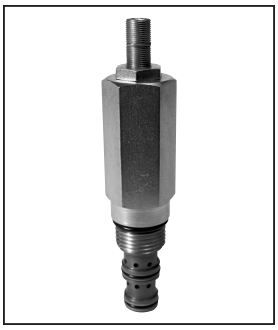
Body Material
Steel

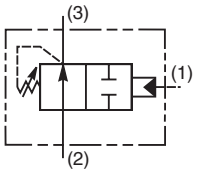
General Description

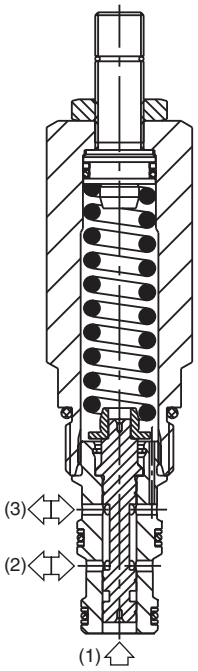
Direct Acting, Normally Open Sequence Valve with External Pilot and Internal Drain. For additional information see Technical Tips on pages PC1-PC4.

Features

- Sealed pilot option available
- Hardened working parts for maximum durability
- All external parts zinc plated
- Adjustable and tamperproof versions available







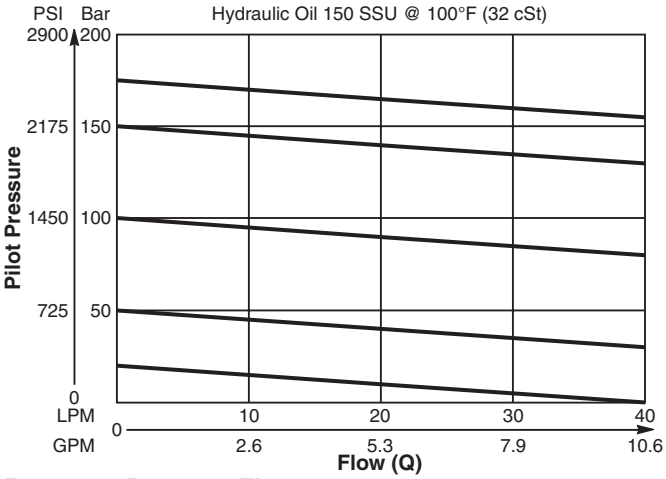
Specifications

Rated Flow	40 LPM (10.6 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**G -** 2-166 Bar (30-2400 PSI)
Sensitivity: Pressure/Turn	**G -** 17 Bar (248 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	25 ml/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.30 kg (0.66 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

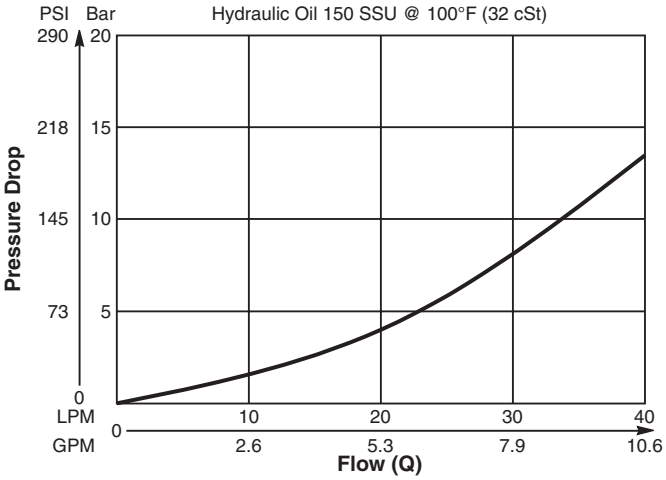
Performance Curves

(Pressure rise through cartridge only)

Flow vs. Inlet Pressure 2 to 3

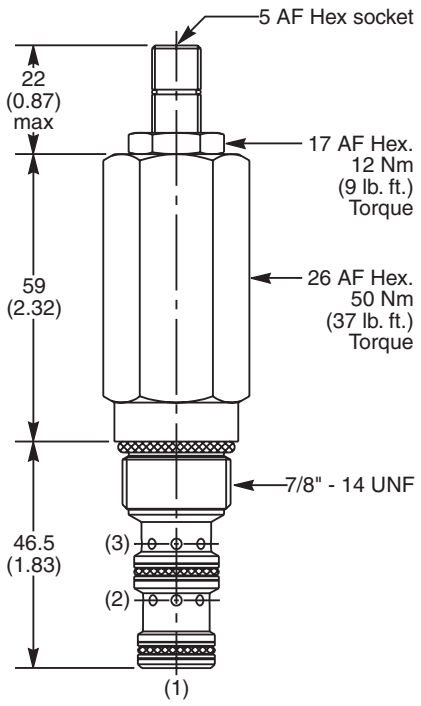


Pressure Drop vs. Flow 2 to 3



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



Ordering Information

B04G3	G	Z	N
10 Size D.A. Sequence Valve (External Pilot & Internal Drain)	**Pilot Pressure Adjustment Range**	**Adjustment Style**	**Seals**

Code	Pilot Pressure Adjustment Range
G	2 - 166 Bar (30 - 2400 PSI)

Pilot Switching Pressure
B04G3G Standard Setting: 80 Bar (1160 PSI) @ 5 LPM (1.3 GPM)

Code	Adjustment Style
Z	Screw Adjust

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30505N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B10	—	3	—	8B
10 Size		**3-Way Cavity**		**Port Size**

Port Size
1/2″ BSP

Body Material
Steel

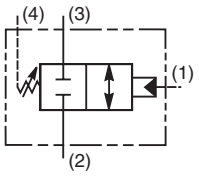
General Description

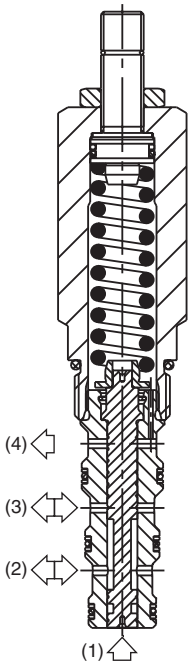
Direct Acting, Normally Closed Sequence Valve with External Pilot and Drain. For additional information see Technical Tips on pages PC1-PC4.

Features

- Hardened working parts for maximum durability
- All external parts zinc plated
- Adjustable and tamperproof versions available







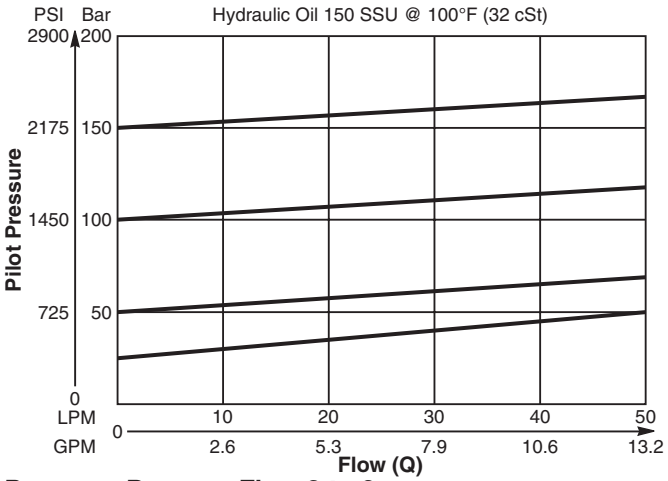
Specifications

Rated Flow	47 LPM (12 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**G -** 2-166 Bar (30-2400 PSI)
Sensitivity: Pressure/Turn	**G -** 17 Bar (248 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	25 ml/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.33 kg (0.73 lbs.)
Cavity	C10-4 (See BC Section for more details)
Form Tool	Rougher NFT10-4R Finisher NFT10-4F

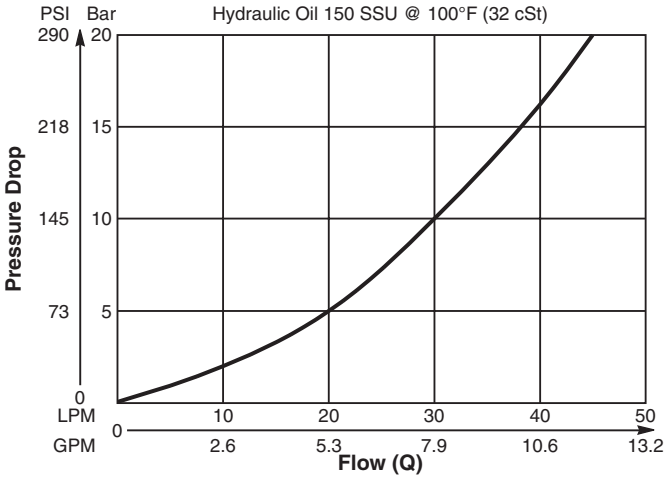
Performance Curves

(Pressure rise through cartridge only)

Flow vs. Inlet Pressure 2 to 3

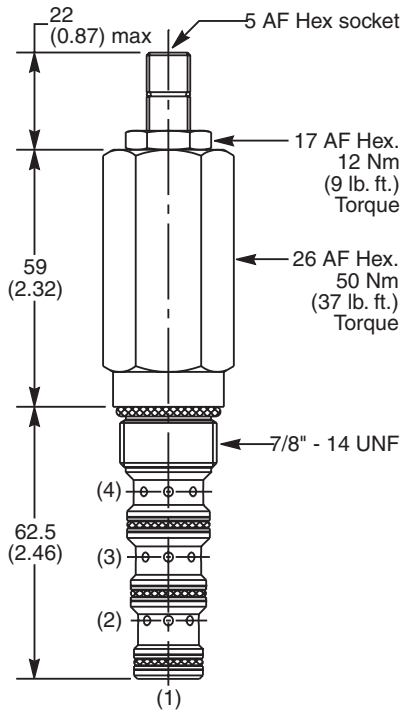


Pressure Drop vs. Flow 3 to 2



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



Ordering Information

B04H4	G	Z	N
10 Size D.A. Sequence Valve (External Pilot and Drain)	Pilot Pressure Adjustment Range	Adjustment Style	Seals

Code	Pilot Pressure Adjustment Range
G	2 - 166 Bar (30 - 2400 PSI)

Pilot Switching Pressure
B04H4G Standard Setting: 80 Bar (1160 PSI) @ 5 LPM (1.3 GPM)

Code	Adjustment Style
Z	Screw Adjust

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30506N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B10	—	4	—	8B
10 Size		4-Way Cavity		Port Size

Port Size
1/2″ BSP

Body Material
Steel

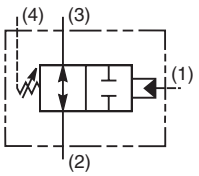
General Description

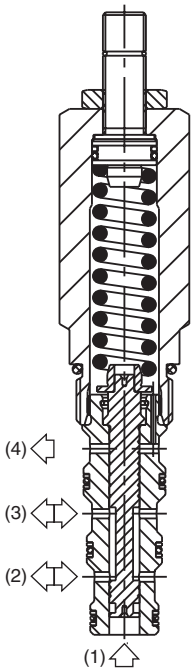
Direct Acting, Normally Open Sequence Valve with External Pilot and Drain. For additional information see Technical Tips on pages PC1-PC4.

Features

- Hardened working parts for maximum durability
- All external parts zinc plated
- Adjustable and tamperproof versions available







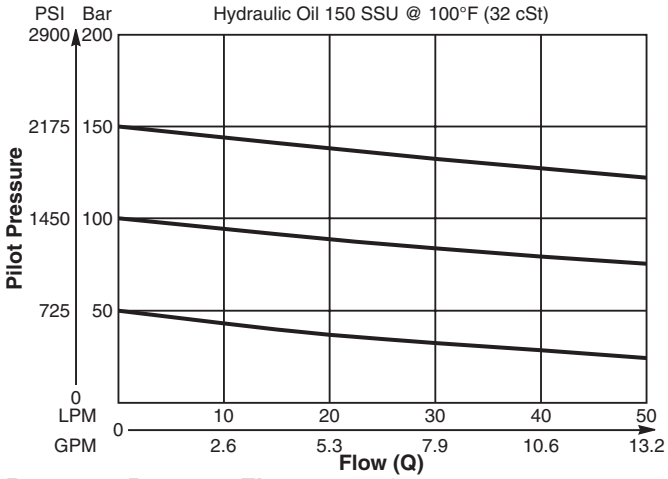
Specifications

Rated Flow	47 LPM (12 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**G -** 2-166 Bar (30-2400 PSI)
Sensitivity: Pressure/Turn	**G -** 17 Bar (248 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	25 ml/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.33 kg (0.73 lbs.)
Cavity	C10-4 (See BC Section for more details)
Form Tool	Rougher NFT10-4R Finisher NFT10-4F

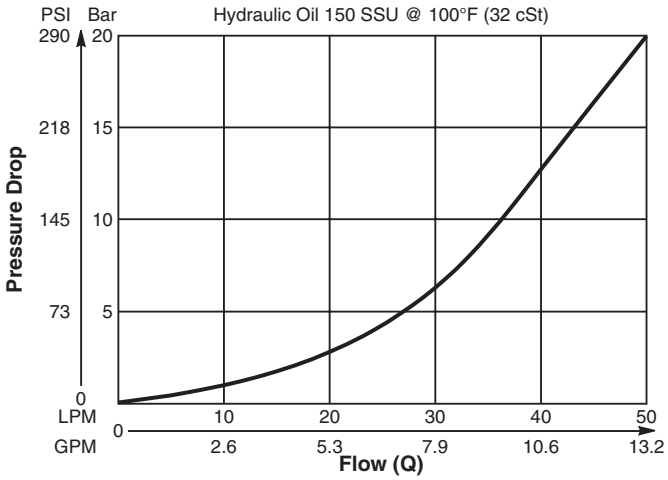
Performance Curves

(Pressure rise through cartridge only)

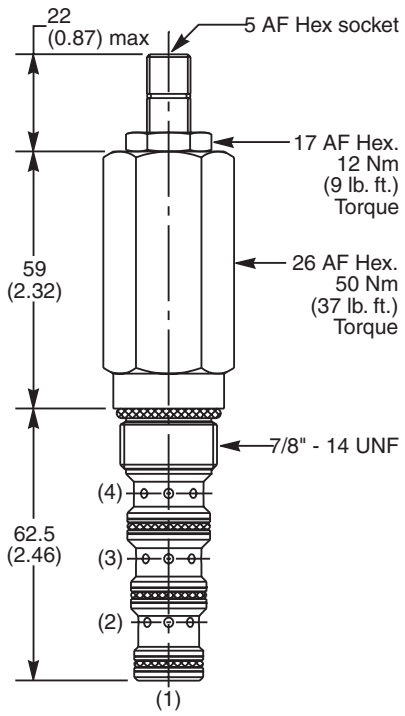
Flow vs. Inlet Pressure 2 to 3 & 3 to 2



Pressure Drop vs. Flow 2 to 3 & 3 to 2



Dimensions Millimeters (Inches)



Ordering Information

B04J4	G	Z	N
10 Size D.A. Sequence Valve (External Pilot and Drain)	Pilot Pressure Adjustment Range	Adjustment Style	Seals

Code	Pilot Pressure Adjustment Range
G	2 - 166 Bar (30 - 2400 PSI)

Pilot Switching Pressure
B04J4G Standard Setting: 80 Bar (1160 PSI) @ 5 LPM (1.3 GPM)

Code	Adjustment Style
Z	Screw Adjust

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30506N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B10	—	4	—	8B
10 Size		4-Way Cavity		Port Size

Port Size
1/2″ BSP

Body Material
Steel

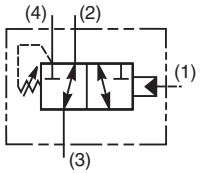
General Description

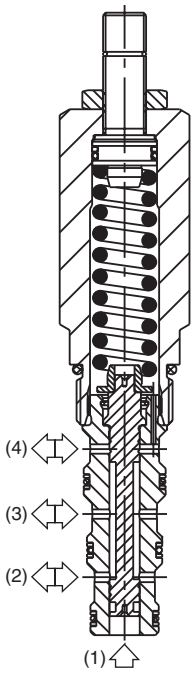
Direct Acting, Normally Open, 3 Way Sequence Valve with External Pilot and Internal Drain. For additional information see Technical Tips on pages PC1-PC4.

Features

- Hardened working parts for maximum durability
- All external parts zinc plated
- Adjustable and tamperproof versions available







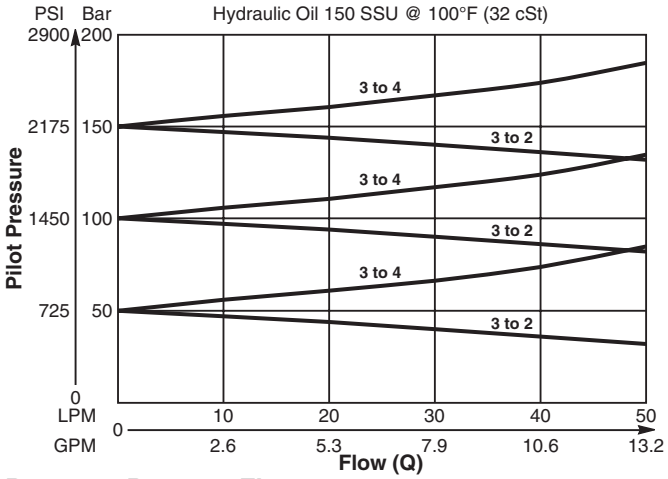
Specifications

Rated Flow	42 LPM (11 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**G -** 2-166 Bar (30-2400 PSI)
Sensitivity: Pressure/Turn	**G -** 17 Bar (248 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Leakage at 150 SSU (32 cSt)	40 ml/min. @ 100 Bar (1450 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.33 kg (0.73 lbs.)
Cavity	C10-4 (See BC Section for more details)
Form Tool	Rougher NFT10-4R Finisher NFT10-4F

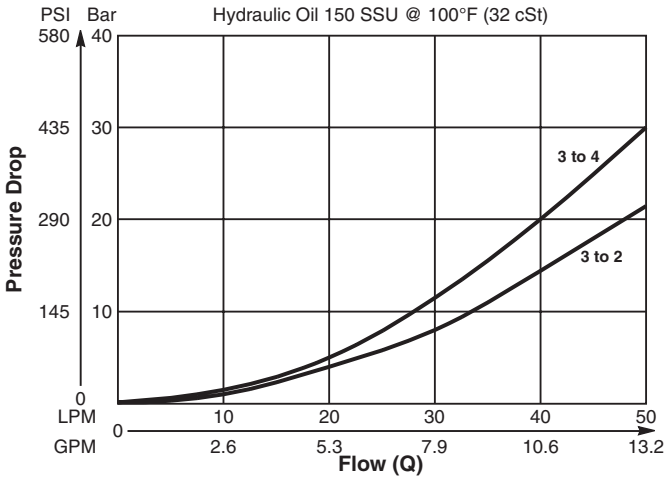
Performance Curves

(Pressure rise through cartridge only)

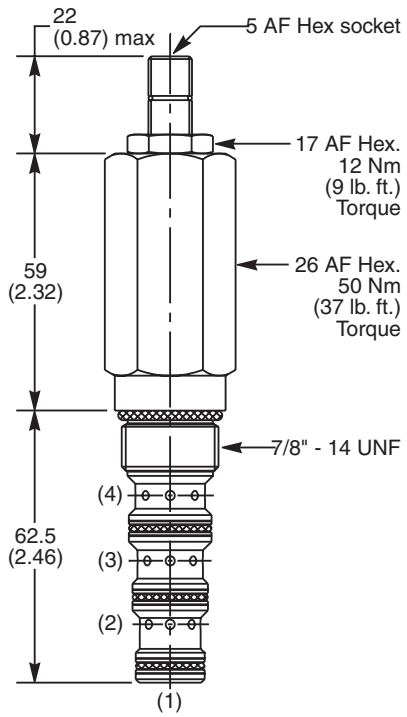
Flow vs. Inlet Pressure



Pressure Drop vs. Flow



Dimensions Millimeters (Inches)



Ordering Information

B04K4	G	Z	N
10 Size D.A. Sequence Valve (Internal Pilot & External Drain)	Pilot Pressure Adjustment Range	Adjustment Style	Seals

Code	Pilot Pressure Adjustment Range
G	2 - 166 Bar (30 - 2400 PSI)

Pilot Switching Pressure
B04K4G Standard Setting: 80 Bar (1160 PSI) @ 5 LPM (1.3 GPM)

Code	Adjustment Style
Z	Screw Adjust

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30506N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B10	—	4	—	8B
10 Size		4-Way Cavity		Port Size

Port Size
1/2" BSP

Body Material
Steel

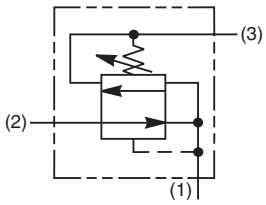
General Description

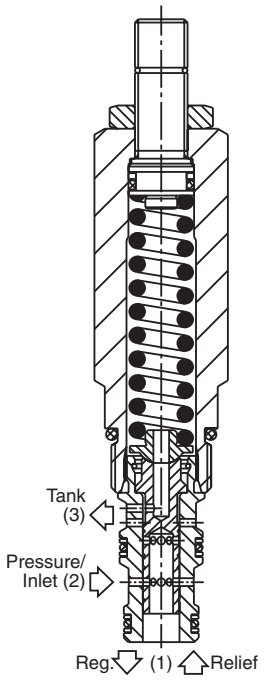
Direct Acting Pressure Reducing/Relieving Valve. For additional information see Technical Tips on pages PC1-PC4.

Features

- Maximum pressure setting up to 150 Bar, 2175 PSI
- Three pressure ranges available for more accurate pressure control
- Partial reverse flow capability
- Hardened working parts for maximum durability
- Adjustable and tamperproof versions available
- All external parts zinc plated







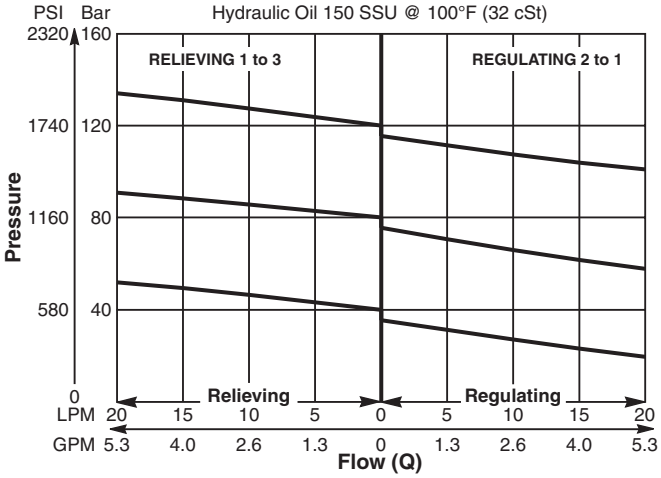
Specifications

Rated Flow	20 LPM (5 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	**C -** 5-40 Bar (73-580 PSI) **E -** 25-75 Bar (363-1088 PSI) **G -** 50-150 Bar (725-2175 PSI)
Sensitivity: Pressure/Turn	**C -** 5.6 Bar (81 PSI) **E -** 10.3 Bar (150 PSI) **G -** 20.8 Bar (302 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	0.20 kg (0.44 lbs.)
Cavity	C08-3 (See BC Section for more details)
Form Tool	Rougher NFT08-3R Finisher NFT08-3F

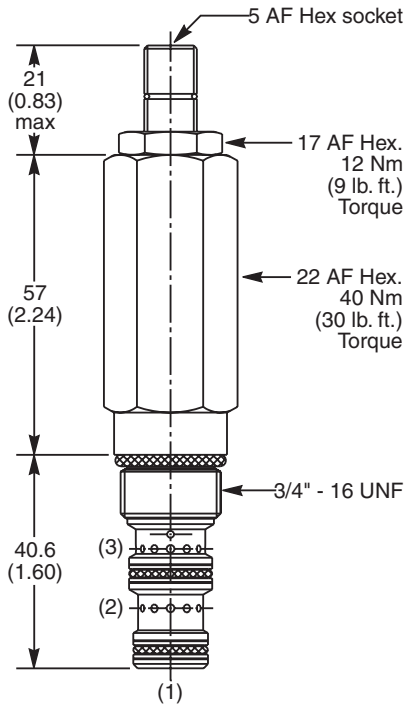
Performance Curve

(Pressure rise through cartridge only)

Flow vs. Regulated Pressure



Dimensions Millimeters (Inches)



Ordering Information

C02A3		Z	N
08 Size D.A. Pressure Reducing/Relieving Valve	**Pressure Adjustment Range**	**Adjustment Style**	**Seals**

Code	Pressure Adjustment Range
C	5 - 40 Bar (73 - 580 PSI)
E	25 - 75 Bar (363 - 1088 PSI)
G	50 - 150 Bar (725 - 2175 PSI)

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30501N-1)	-34°C to +121°C (-30°F to +250°F)

Standard Pressure Setting
C02A3C Standard Setting: 20 Bar (290 PSI)
C02A3E Standard Setting: 38 Bar (551 PSI)
C02A3G Standard Setting: 75 Bar (1088 PSI)

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Order Bodies Separately
See section BC

B08	—	3	—	6B
08 Size		**3-Way Cavity**		**Port Size**

Port Size
3/8″ BSP

Body Material
Steel

General Description

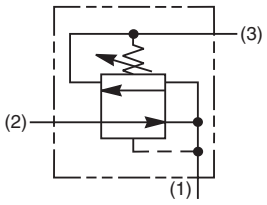
Direct Acting Pressure Reducing/Relieving Valve. For additional information see Technical Tips on pages PC1-PC4.

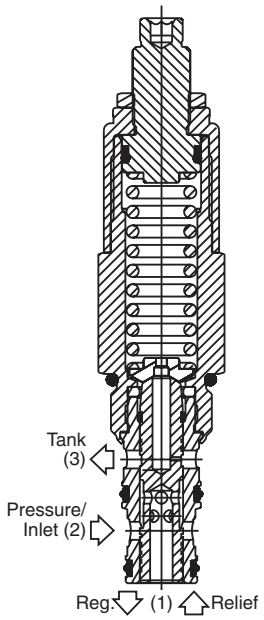
Note: The differential between system pressure and pressure setting of the valve can greatly affect the stability of this valve. For best performance, the inlet pressure setting should not exceed 69 Bar (1000 PSI) above the reducing valve setting.

Features

- Hardened, precision ground parts for durability
- Internal mechanical stop limits spool travel eliminating spring solidification
- "D"-Ring eliminates backup rings
- All external parts zinc plated







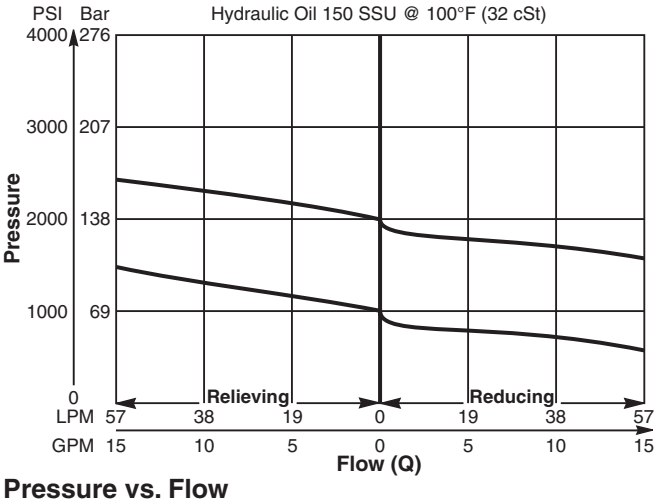
Specifications

Rated Flow	56 LPM (15 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI) 69 Bar (1000 PSI) maximum differential above valve setting for best stability
Maximum Pressure Setting	124 Bar (1800 PSI)
Sensitivity: Pressure/Turn	**02** 3.5 Bar (50 PSI) **06** 6.6 Bar (95 PSI) **12** 11.4 Bar (165 PSI) **21** 17.2 Bar (250 PSI)
Maximum Tank Pressure	124 Bar (1800 PSI)
Maximum Drain Flow	120 ml/min. (0.03 GPM)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Campatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.23 kg (0.5 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NTF10-3R Finisher NFT10-3F

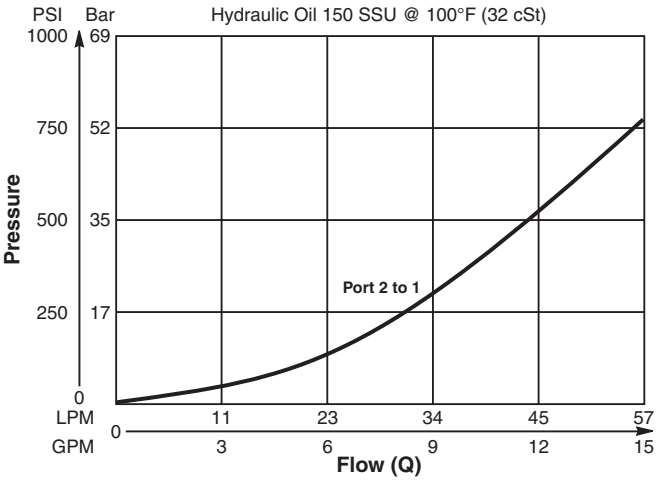
Performance Curves

(Pressure rise through cartridge only)

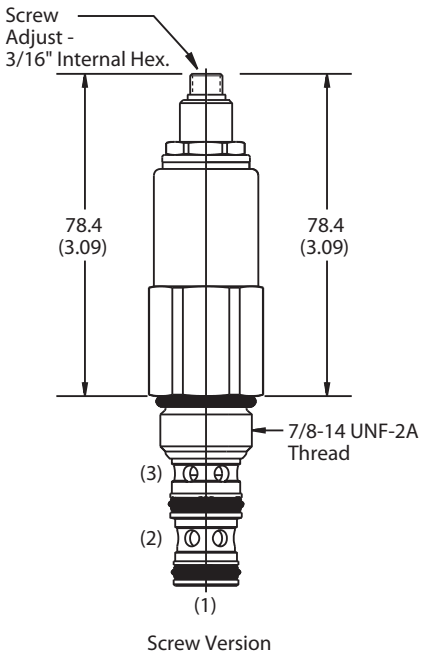
Flow vs. Regulated Pressure



Pressure vs. Flow



Dimensions Millimeters (Inches)



Screw Version

Ordering Information

PR103	S	
10 Size D.A. Pressure Reducing/Relieving Valve	Adjustment Style	Pressure Range

Code	Adjustment Style
S	Screw Adjust

Seals / Kit No.	Operating Temp.
"D" -Ring / (SK10-3)	-37°C to +93°C (-35°F to +200°F)

Code	Pressure Range
02	5.2 - 13.8 Bar (75 - 200 PSI) Standard Setting: 6.9 Bar (100 PSI) @ .95 LPM (.25 GPM)
06	17.2 - 41.4 Bar (250 - 600 PSI) Standard Setting: 20.7 Bar (300 PSI) @ .95 LPM (.25 GPM)
12	39.3 - 83 Bar (570 - 1200 PSI) Standard Setting: 41.4 Bar (600 PSI) @ .95 LPM (.25 GPM)
21	41.4 - 124.1 Bar (600 - 1800 PSI) Standard Setting: 69 Bar (1000 PSI) @ .95 LPM (.25 GPM)

Order Bodies Separately
See section BC

B10	—	3	—	8B
10 Size		3-Way Cavity		Port Size

Port Size
1/2" BSP

Body Material
Steel

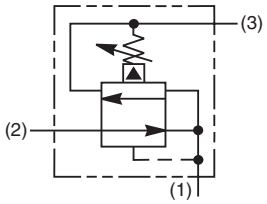
General Description

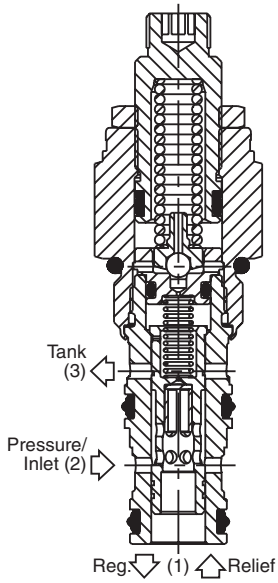
Pilot Operated Pressure Reducing/ Relieving Valve. For additional information see Technical Tips on pages PC1-PC4.

Features

- Hardened, precision ground parts for durability
- Low profile adapter for minimal space requirements
- Fully guided pilot for more consistent reseat
- Steel adapters are zinc plated
- Polyurethane “D”-Ring eliminates backup rings and prevents hydrolysis
- Internal screening protects pilot spring from debris





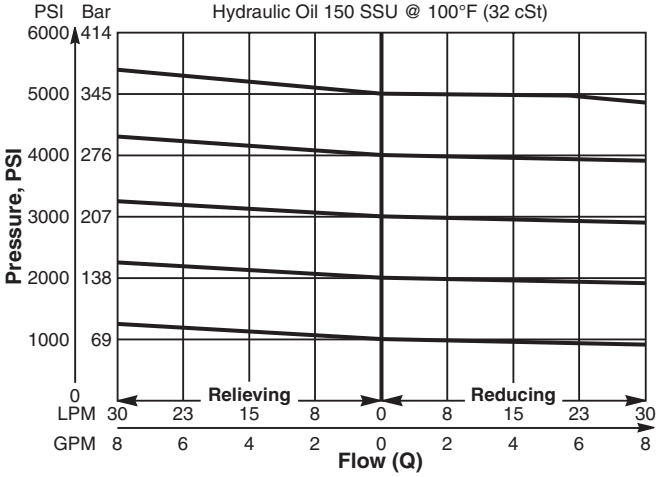


Specifications

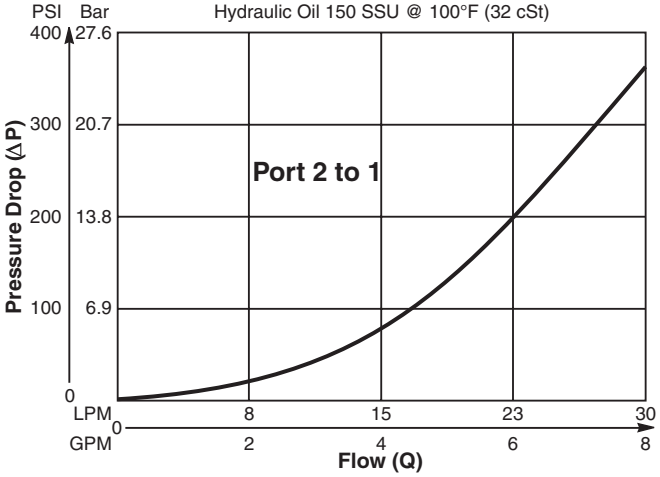
Rated Flow	30 LPM (8 GPM)
Maximum Inlet Pressure	380 Bar (5500 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Sensitivity: Pressure/Turn	**10** 19.6 Bar (285 PSI) **20** 39.3 Bar (570 PSI) **30** 58.9 Bar (859 PSI) **50** 131.7 Bar (1910 PSI)
Maximum Tank Pressure	350 Bar (5000 PSI)
Maximum Drain Flow	0.56 LPM (0.15 GPM)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Campatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.11 kg (.25 lbs.)
Cavity	C08-3 (See BC Section for more details)
Form Tool	Rougher NTF08-3R Finisher NFT08-3F

Performance Curves

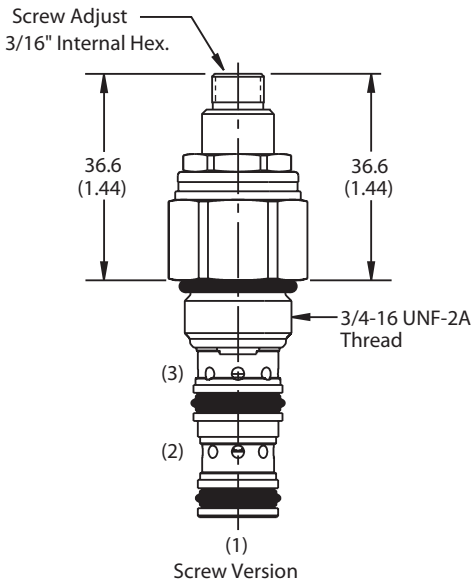
Flow vs. Regulated Pressure (Through cartridge only)



Flow vs. Pressure Drop (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

PRH081	S	
08 Size P.O. Pressure Reducing/Relieving Valve	Adjustment Style	Pressure Range

Code	Adjustment Style
S	Screw Adjust

Seals / Kit No.	Operating Temp.
"D" -Ring / (SK08-3)	-37°C to +93°C (-35°F to +200°F)

Code	Pressure Range
10	6.9 - 69 Bar (100 - 1000 PSI) Standard Setting: 34.5 Bar (500 PSI)
20	6.9 - 138 Bar (100 - 2000 PSI) Standard Setting: 69 Bar (1000 PSI)
30	13.8 - 207 Bar (200 - 3000 PSI) Standard Setting: 103.5 Bar (1500 PSI)
50	13.8 - 345 Bar (200 - 5000 PSI) Standard Setting: 172.4 Bar (2500 PSI)

NOTE: For settings below 20.7 Bar (300 PSI), flow rating is limited to 11.3 LPM (3 GPM).

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Order Bodies Separately
See section BC

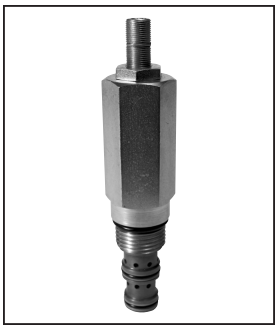
B08	—	3	—	6B
08 Size		3-Way Cavity		Port Size

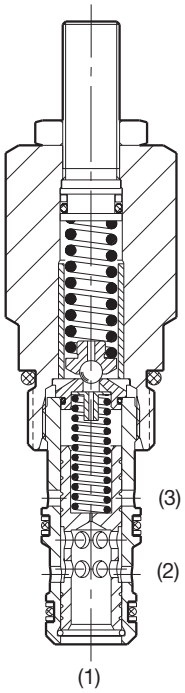
Port Size
3/8" BSP

Body Material
Steel

General Description

Pilot Operated, Spool Type Relief Valve.
For additional information see Technical Tips on pages PC1-PC4.



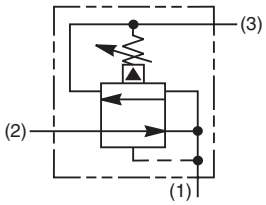


Features

- Fast response
- Ideal for controlling ventable relief valves, or for thermal relief
- Spool valve for good stability
- Partial reverse flow capacity
- Hardened working parts for maximum durability
- Integral 250 micron inlet filter available
- All external parts zinc plated

Specifications

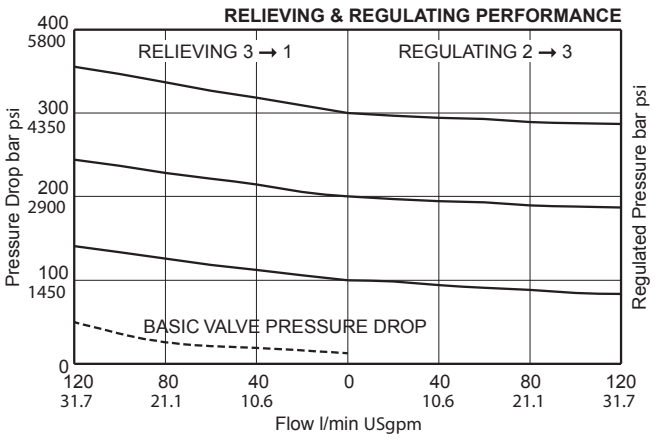
Rated Flow	120 LPM (32 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Sensitivity: Pressure/Turn	**H -** 30 Bar (5000 PSI) **M -** 55 Bar (800 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.24 kg (.53 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F



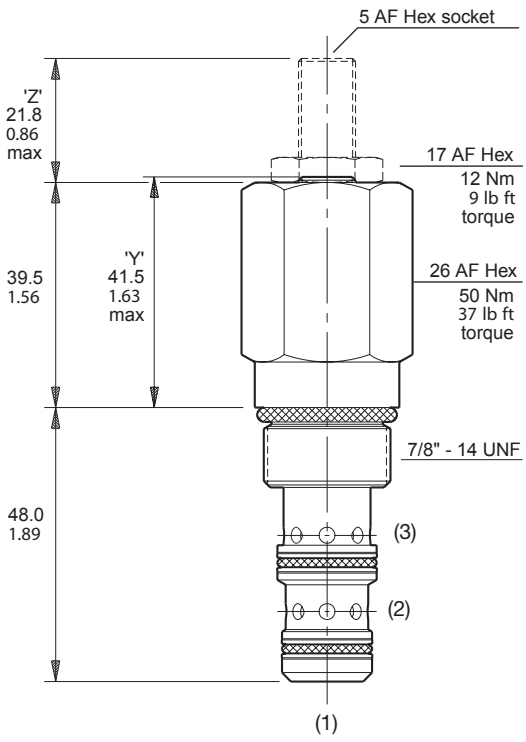
Performance Curves

Flow vs. Inlet Pressure

(Pressure rise through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

C04B3		Z	N
10 Size Pilot Operated Relief Valve	Pressure Adjustment Range	Adjustment Style	Seals

Code	Pressure Adjustment Range
H	10 - 210 Bar (145 - 3000 PSI)
M	10 - 350 Bar (145 - 5000 PSI)

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30505N-1)	-34°C to +121°C (-30°F to +250°F)

Standard Pressure Setting

C04B3H Standard Setting:
100 Bar (1450 PSI)
@ 0.5 LPM (0.13 GPM)

C04B3M Standard Setting:
200 Bar (2900 PSI)
@ 0.5 LPM (0.13 GPM)

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Order Bodies Separately
See section BC

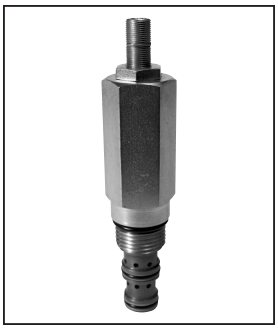
B10	—	3	—	8B
10 Size		3-Way Cavity		Port Size

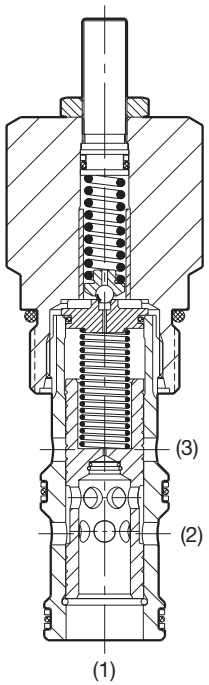
Port Size
1/2" BSP

Body Material
Steel

General Description

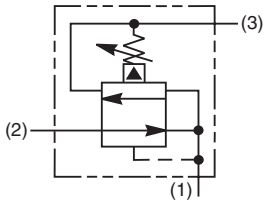
Pilot Operating, Spool Type, Relief Valve.
For additional information see Technical Tips on pages PC1-PC4.





Features

- Fast response
- Ideal for controlling ventable relief valves, or for thermal relief
- Spool valve for good stability
- Partial reverse flow capacity
- Hardened working parts for maximum durability
- Integral 250 micron inlet filter available
- All external parts zinc plated



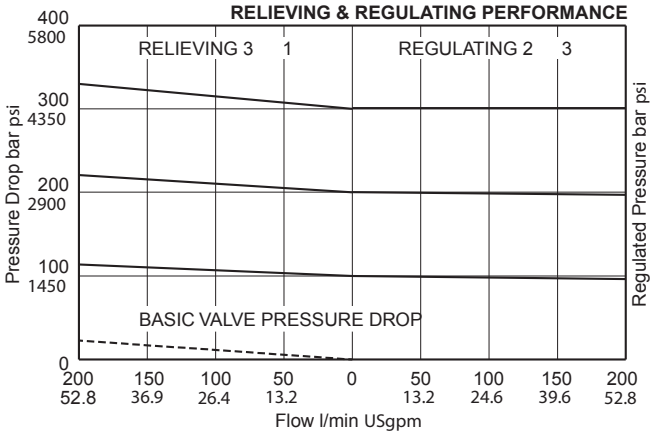
Specifications

Rated Flow	200 LPM (53 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Maximum Pressure Setting	350 Bar (5000 PSI)
Sensitivity: Pressure/Turn	**H -** 30 Bar (435 PSI) **M -** 55 Bar (800 PSI)
Maximum Tank Pressure	420 Bar (6000 PSI)
Maximum Drain Flow	1.9 LPM (0.5 GPM)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.63 kg (1.39 lbs.)
Cavity	C16-3 (See BC Section for more details)
Form Tool	Rougher NFT16-3R Finisher NFT16-3F

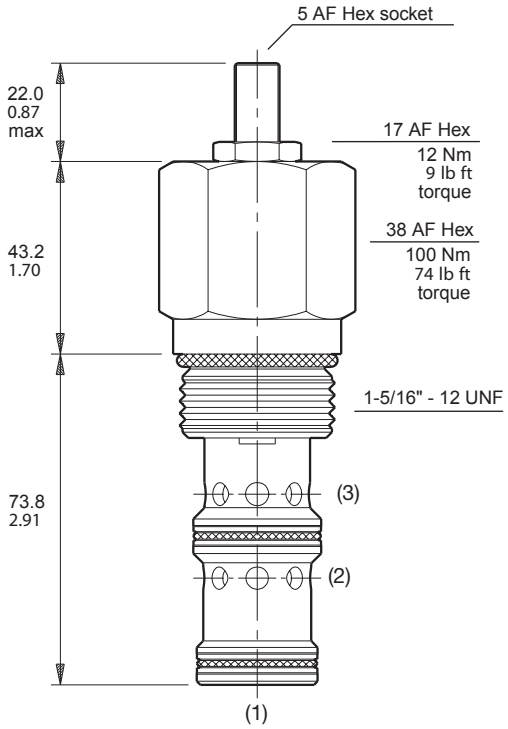
Performance Curves

Flow vs. Inlet Pressure

(Pressure rise through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

C06B3		Z	N
10 Size Pilot Operated Relief Valve	Pressure Adjustment Range	Adjustment Style	Seals

Code	Pressure Adjustment Range
H	10 - 210 Bar (145 - 3000 PSI)
M	10 - 350 Bar (145 - 5000 PSI)

Code	Adjustment Style
Z	Screw Adjust

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30509N-1)	-34°C to +121°C (-30°F to +250°F)

Standard Pressure Setting

C06B3H Standard Setting:
100 Bar (1450 PSI)
@ 0.5 LPM (0.13 GPM)

C06B3M Standard Setting:
200 Bar (2900 PSI)
@ 0.5 LPM (0.13 GPM)

Valves are supplied at Standard setting. Other settings are available, please contact Parker Sales.

Order Bodies Separately
See section BC

B16	—	3	—	16B
16 Size		3-Way Cavity		Port Size

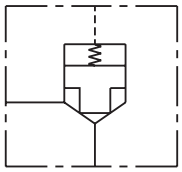
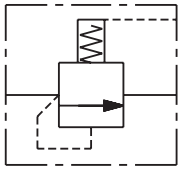
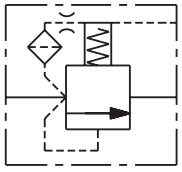
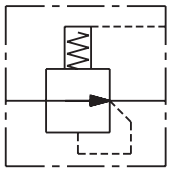
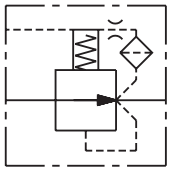
Port Size
1″ BSP

Body Material
Steel

Notes

Contents

Logic Elements

	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
	**POPPET TYPE**					
	10SLC1-A	C10-3S	Normally Closed, Pilot to Close	57/15	240/3500	LE7
	16SLC1-A	C16-3S	Normally Closed, Pilot to Close	189/50	240/3500	LE8
	20SLC1-A	C20-3S	Normally Closed, Pilot to Close	303/80	240/3500	LE9
	**SPOOL TYPE**					
	R04E3	C10-3S	Normally Closed, Pilot to Close	170/45	420/6000	LE10
	R06E3	C16-3S	Normally Closed, Pilot to Close	400/106	420/6000	LE11
	R08E3	C20-3S	Normally Closed, Pilot to Close	500/132	420/6000	LE12
	R04F3	C10-3S	Normally Closed, Vent to Open	170/45	420/6000	LE13
	R06F3	C16-3S	Normally Closed, Vent to Open	400/106	420/6000	LE14
	R08F3	C20-3S	Normally Closed, Vent to Open	500/132	420/6000	LE15
	R04H3	C10-3S	Normally Open, Vent to Close	57/15	420/6000	LE16
	R06H3	C16-3S	Normally Open, Vent to Close	160/42	420/6000	LE17
	R04G3	C10-3S	Normally Open, Vent to Close	57/15	420/6000	LE18
	R06G3	C16-3S	Normally Open, Vent to Close	160/42	420/6000	LE19

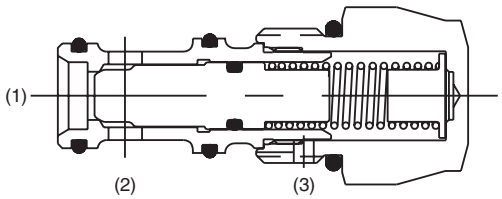
INTRODUCTION:

Parker's logic valves offer system designers a versatile range of screw-in elements that, when used in the proper combinations, can provide flexible design solutions for many common cartridge valve applications. They offer system designers the advantage of applying cartridge valve technology in applications where the flow and pressure conditions may exceed the limits of typical cartridge valves. Logic valves are essentially high flow poppet or spool elements that are controlled by small pilot devices. They can be used to control flow, pressure, or direction, and when applied in the proper arrangements, can perform multi-task control functions. Parker's logic valves offer system designers alternative products that can help reduce the size, cost, and complexity of integrated manifold systems.

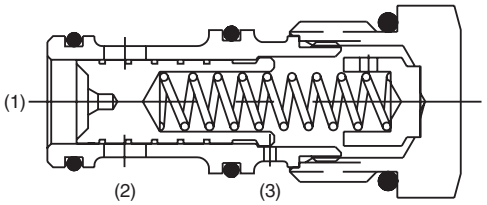
NEW PRODUCTS:

Parker Logic Valves are offered in two basic categories: Poppet and Spool.

Poppet Type - Used for flow switching directional control applications.

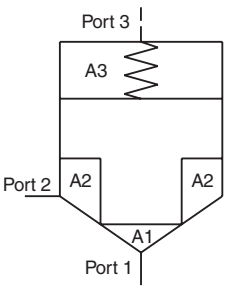


Spool Type - Used for pressure sensing in modulating applications to regulate flow and pressure.



PRODUCT TYPES / APPLICATIONS

POPPET TYPE



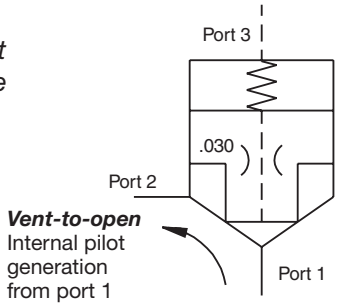
A1 + A2 = A3

Poppet type logic valves are 3 ported, 2-way on/off valves that switch flow between port 1 and port 2. The poppet's on/off action is operated by controlling pilot oil at port 3 of the valve. A small low flow solenoid or pilot valve is an ideal control for this purpose. Parker offers vent-to-open and pilot-to-close style poppet logic valves.

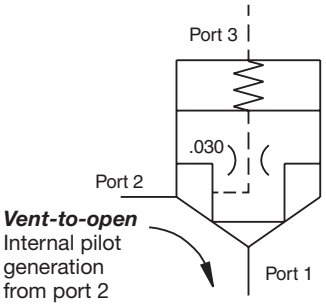
Note: *Poppet logic valves are an unbalanced 2:1 ratio poppet design. The opening and closing of the poppet is dependent on the force balances on the areas of the poppet at port 1, port 2, and port 3.*

Vent-to-open logic valves:

Vent-to-open logic valves are primarily used for uni-directional flow switching applications. The poppet in the vent-to-open logic valve is spring biased to the closed condition. The pilot oil source that operates the logic element is generated internally by direct pressure from either work port 1 or 2, depending on the option chosen. Venting the pilot oil at port 3 allows the valve to open and pass flow between port 1 and port 2 at the bias spring setting. Blocking the pilot at port 3 causes the valve to close. When closed, the 2:1 ratio poppet design provides a positive low leak seal. Because the pilot source is generated internally within the valve, vent-to-open logic valves are best suited for uni-directional applications.



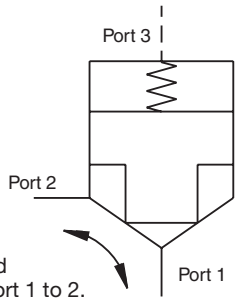
Vent-to-open
Internal pilot generation from port 1
Uni-directional flow, port 1 to 2.



Vent-to-open
Internal pilot generation from port 2
Uni-directional flow, port 2 to 1.

POPPET TYPE *Continued*

Pilot-to-close logic valve:
Pilot-to-close logic elements are primarily used for bi-directional flow switching applications. The poppet in the pilot-to-close logic valve is spring biased to the closed condition. With no pilot signal at port 3, the valve will open allowing flow in either direction between work ports 1 and 2 once pressure at one of the work ports reaches the biased spring setting. Appling a sufficient externally generated pilot force to port 3 of the valve closes the poppet creating a low leak seal between port 1 and port 2.



Pilot-to-close
External pilot required
Bi-directional flow, port 1 to 2.

2-way, 3-way, and 4-way Directional Control:
Poppet logic valves are typically used to perform high flow directional switching operations using small low power pilot valves to control the sequence of the directional operation.

- A single logic valve can be used to control 2-way, on/off switching.
- Multiple elements in a bridge arrangement can control 3-way or 4-way directional switching.
- Since each logic valve is individually controlled, the timing, sequence, and overlap of directional functions can be controlled very precisely.
- Uni-directional or bi-directional flow can be achieved, depending on the valve selected.
- Flows in excess of 80 gpm can be controlled through a single logic element, and more than one logic valve can be used in parallel to control flow in excess of the rated flow of a single element.
- Poppet construction provides a low leak directional control.

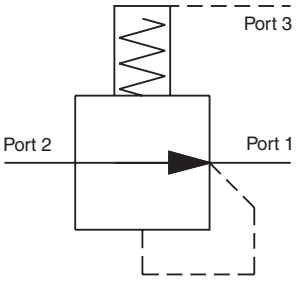
(See circuit examples on pages LE4-LE5)

SPOOL TYPE

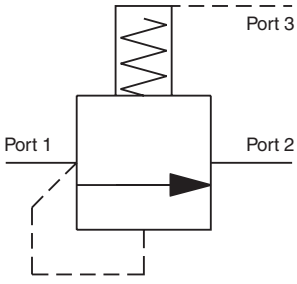
Spool type logic valves can also be used for directional switching, however, they are typically used in modulating applications to control flow or regulate pressure. Virtually any pressure or flow control function can be achieved with a spool type logic valve including; restrictive or priority flow control, pressure relief, pressure reducing, sequencing, and unloading.

The spools in this category of logic valves are balanced designs; the spool area at the work port (port 1) and the pilot port (port 3) are equal (1:1). The spool is held in a biased condition by a spring. Venting the pilot at port 3 creates an unbalanced condition causing the valve spool to modulate open or close, depending on the valve chosen. This spool design makes the valve vary stable because the forces acting to open and close the valve are in balance.

Flow Control / Compensators:
Parker offers two types of logic valves for flow control functions.
1) Normally open spools function as a restrictive type compensator.
2) Normally closed spools function as a priority or by-pass compensator.

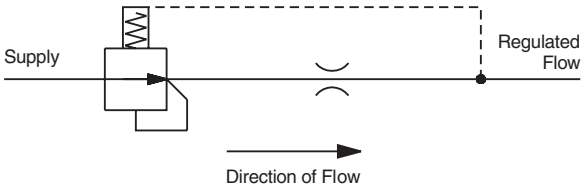


Normally open spool

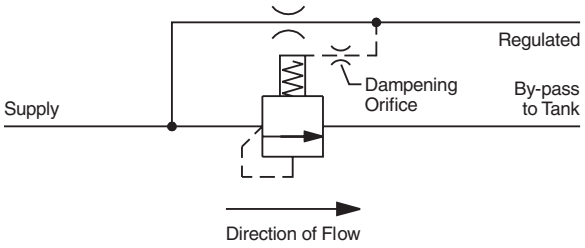


Normally closed spool

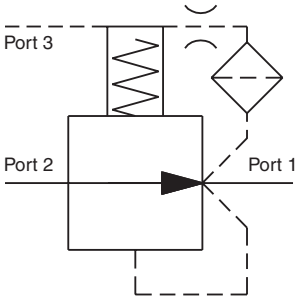
Restrictive Flow Regulator:
Normally open spool type logic elements can be used with an external orifice or valve as a compensator to regulate flow. Used as restrictive compensator, a normally open spool senses the upstream and downstream pressure across an orifice or valve. The spool modulates closed to maintain a constant pressure drop across the controlled device equal to the bias spring in the logic valve, thus maintaining a constant flow rate regardless of changes in upstream or downstream pressure.



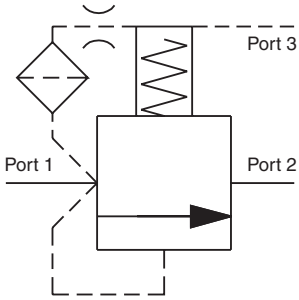
Priority / Bypass Flow Regulator:
A logic valve with a normally closed spool can be used as a priority or by-pass compensator. In this case, the spool modulates open to maintain a constant pressure drop across the controlled orifice or valve, thereby maintaining a constant priority flow regardless of upstream or downstream pressure changes. In a priority arrangement, any oil that doesn't saturate the controlled device is by-passed at load pressure plus the value of the bias spring in the logic valve.



Pressure Control:
Spool type logic valves can be used as the main stage spool in high flow pressure control applications with the logic valve handling the high flow, and a small pilot valve controlling the action of the logic valve spool. Normally open, and normally closed spool options are available enabling virtually all pressure control functions to be achieved. When used in pressure control applications, the logic valve spool modulates open or closed to maintain the pressure setting of the pilot valve communicated to port 3. Pressure control applications require a pilot connection between the control port (port 1 or 2), and the pilot port (port 3). In order to simplify the design, Parker offers spool type logic valves with internal piloting options that can help minimize the number of connections needed. When used in manifold systems, the internal piloting options help to simplify the manifold design by reducing the number of construction drillings in the block. Multiple functions such as relief, pump unloading, and pressure compensation can be performed with one logic valve by communicating multiple pilot devices to the same logic element.



Normally open spool
- Pressure Reducing



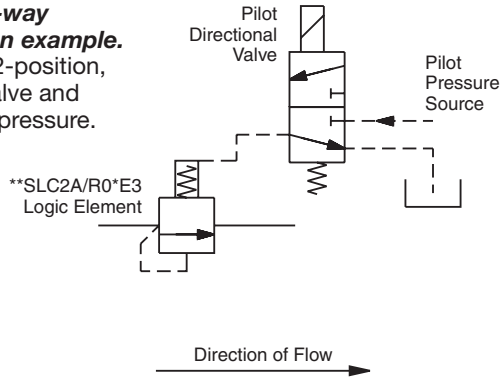
Normally closed spool
- Relief
- Sequence
- Unloading

(See circuit examples on page LE6)

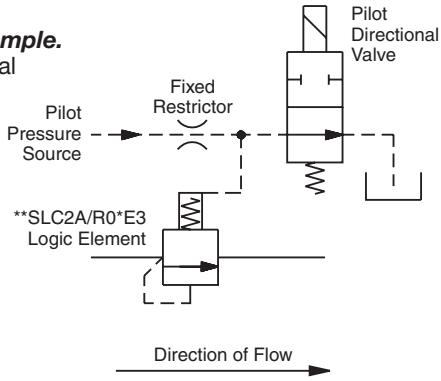
Application Note:
This section is as an application guide, and it is intended to illustrate the various ways that logic elements can be used to create a variety of hydraulic control functions. For additional help applying logic valves, contact your Parker Sales Engineer.

DIRECTIONAL CONTROL EXAMPLES

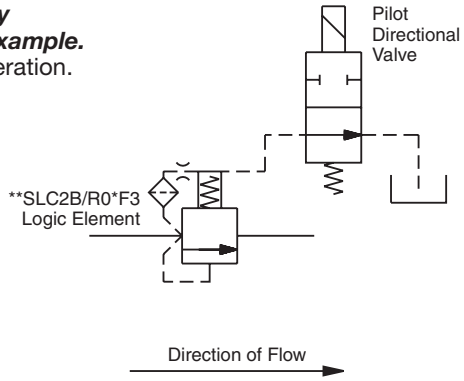
2-position, 2-way normally open example.
Switched by 2-position, 3-way pilot valve and external pilot pressure.



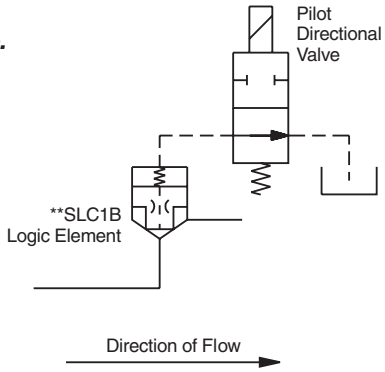
2-position, 2-way normally open example.
Switched by external pilot pressure and vented through 2-position, 2-way pilot valve.



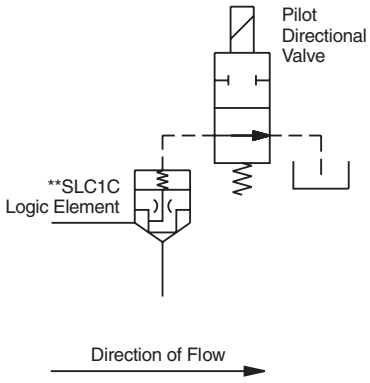
2-position, 2-way normally open example.
Internal pilot generation.



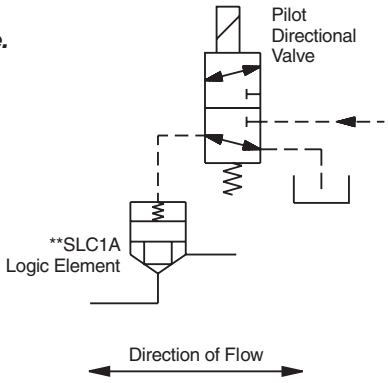
2-position, 2-way normally open example.
Internal pilot generation.



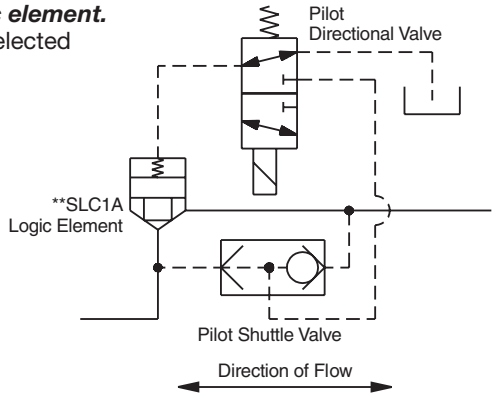
2-position, 2-way normally open example.
Internal pilot generation.



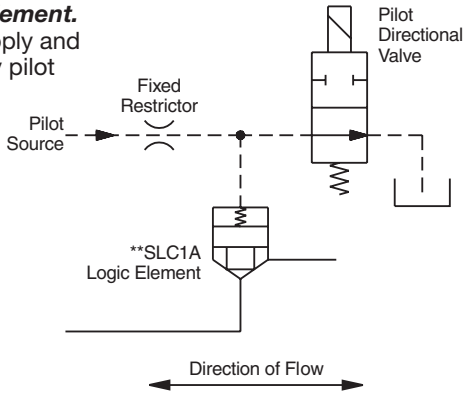
2-position, 2-way normally open example.
Switched by 2-position, 3-way pilot valve and external pilot.



*****SLC1A logic element.***
With shuttle-selected pilot supply.



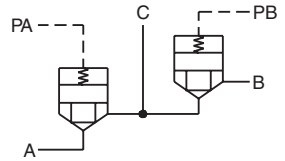
*****SLC1A logic element.***
External pilot supply and 2-position, 2-way pilot directional valve.



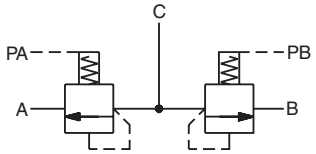
DIRECTIONAL CONTROL EXAMPLES

THREE-WAY BRIDGE CIRCUITS

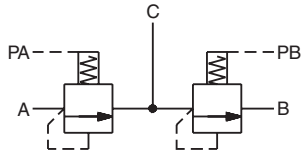
Circuit 1, with **SLC1A poppet logic element.

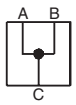
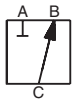


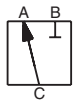
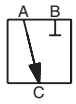
Circuit 2, with **SLC2A/R0*E3 spool logic element.



Circuit 3, with **SLC2A/R0*E3 spool logic element.



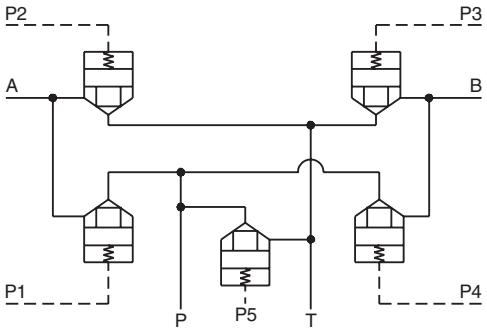
Required Flow Path	Pilot Pressure Applied To		Available From Circuit		
	PA	PB	1	2	3
	NO	NO	X	X	
	YES	NO	X	X	X

Required Flow Path	Pilot Pressure Applied To		Available From Circuit		
	PA	PB	1	2	3
	NO	YES	X	X	
	NO	YES	X		X

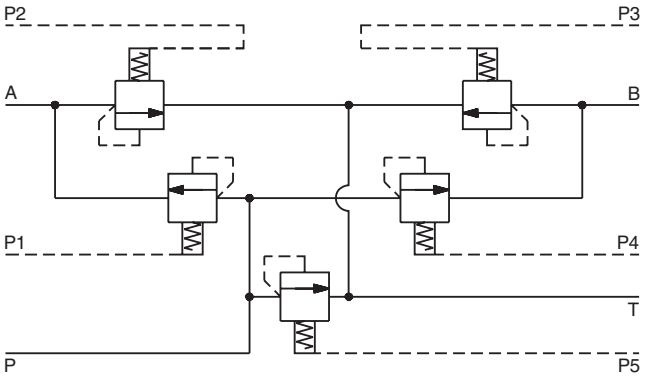
***NOTE:** Pilot pressure must exceed load pressure in order for valve to close.*

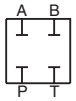
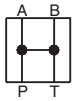
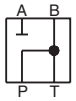
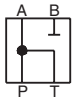
FOUR-WAY BRIDGE CIRCUITS

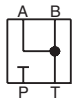
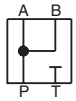
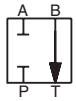
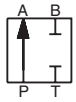
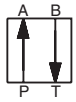
Circuit 1, with **SLC1A poppet logic elements.

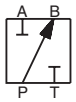


Circuit 2, with **SLC2A/R0*E3 spool logic elements.



Required Flow Path	Pilot Pressure Applied To				
	P1	P2	P3	P4	P5
	YES	YES	YES	YES	YES
	NO	NO	NO	NO	NO
	YES	YES	NO	NO	NO
	NO	NO	YES	YES	NO
	YES	YES	YES	YES	NO

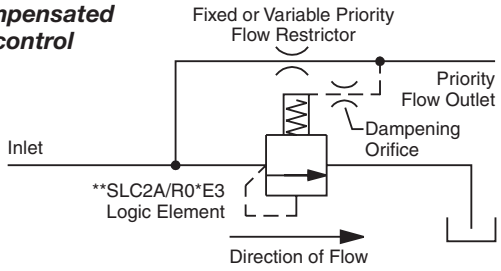
Required Flow Path	Pilot Pressure Applied To				
	P1	P2	P3	P4	P5
	YES	NO	NO	YES	YES
	NO	YES	YES	NO	YES
	YES	YES	NO	YES	YES
	NO	YES	YES	YES	YES
	NO	YES	NO	YES	YES

Required Flow Path	Pilot Pressure Applied To				
	P1	P2	P3	P4	P5
	YES	NO	YES	NO	YES
	YES	YES	YES	NO	YES
	YES	NO	YES	YES	YES

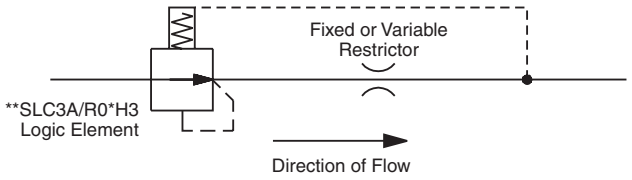
***NOTE:** Pilot pressure must exceed load pressure in order for valve to close.*

FLOW CONTROL EXAMPLES

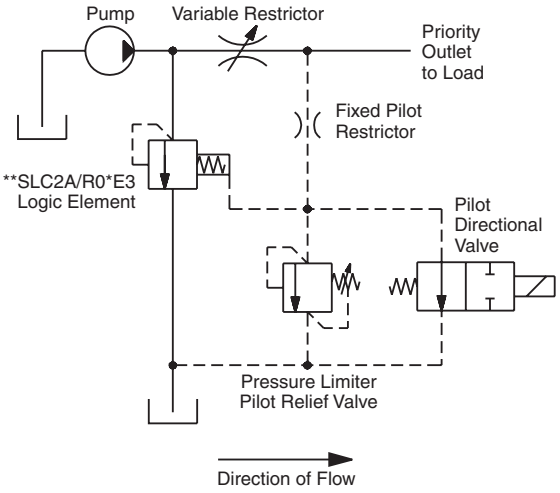
Pressure compensated priority flow control example.



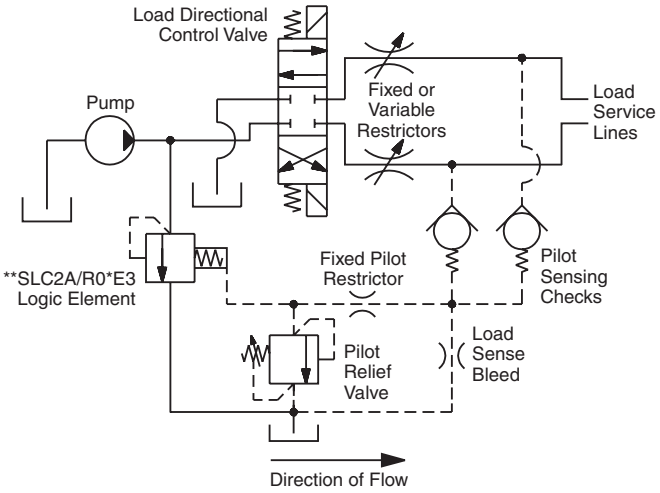
Pressure compensated restrictive flow control example.



Load sensing priority flow control example with pressure limiting and unloading.

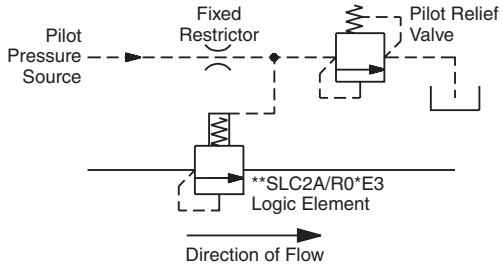


Load sensing priority flow control example with pressure limiter.

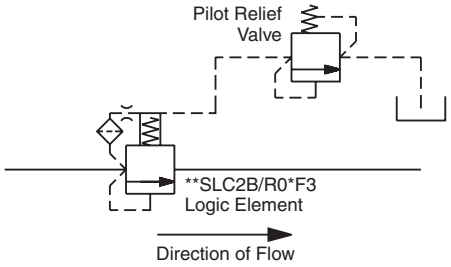


PRESSURE CONTROL EXAMPLES

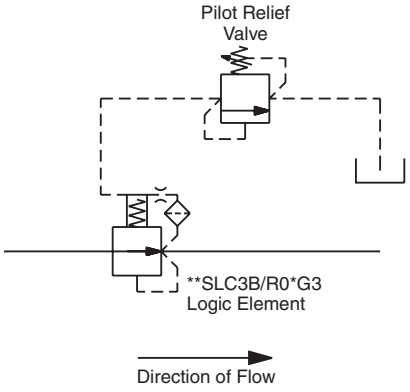
Pressure relief or sequence example with external pilot supply and pilot relief.



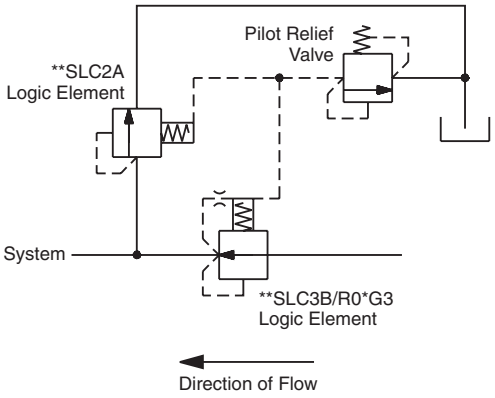
Pressure relief or sequence example with internal pilot supply and pilot relief.



Pressure reducing example, non-relieving type.



Pressure reducing-relieving example.



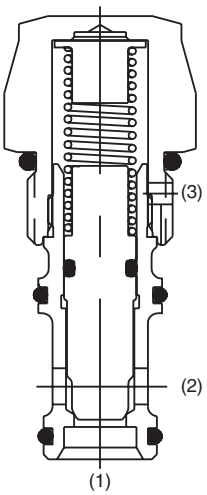
General Description

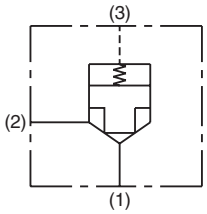
Poppet Type, Bi-Directional, Normally Closed, Pilot to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- Hardened, precision ground parts for durability
- Polyurethane seals only
- No backup rings
- Low leakage design
- All external parts zinc plated

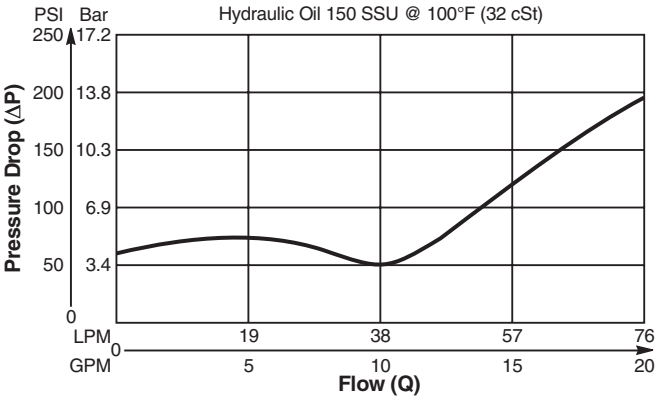




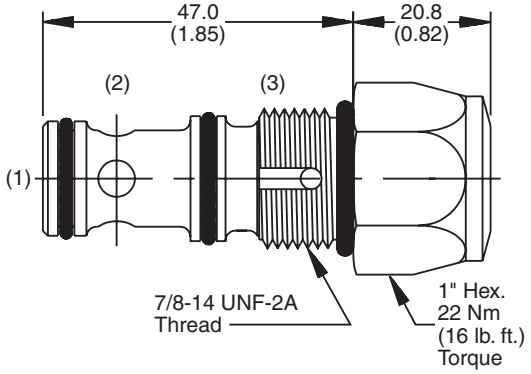


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	57 LPM (15 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage @ 150 SSU (32 cst)	Port 1 to 2 5 drops/min. (.33 cc/min.) @ 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.14 kg (.30 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher NFT10-3SR Finisher NFT10-3SF

Ordering Information

10SLC1	—	A	—	50
10 Size Logic Element		Poppet Bi-Directional		Bias Spring

Code	Bias Spring
50	3.5 Bar (50 PSI)

Seals / Kit No.
Polyurethane, EPS / (WRK-10-3S)
Operating Temp.
-45°C to +93.3°C (-50°F to +200°F)

Order Bodies Separately See section BC

LB10	711	S
Line Body	Porting	Body Material

Code	Porting
711	3/4" BSP

Code	Body Material
S	Steel

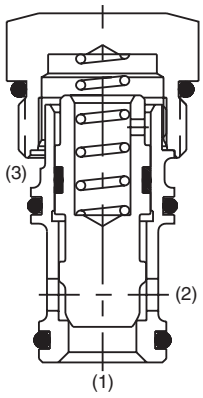
General Description

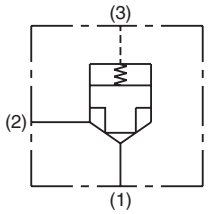
Poppet Type, Bi-Directional, Normally Closed, Pilot to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- Hardened, precision ground parts for durability
- Polyurethane seals only
- No backup rings
- Low leakage design
- All external parts zinc plated

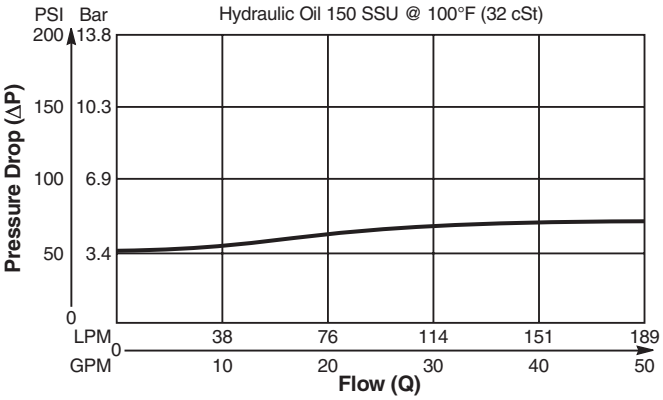




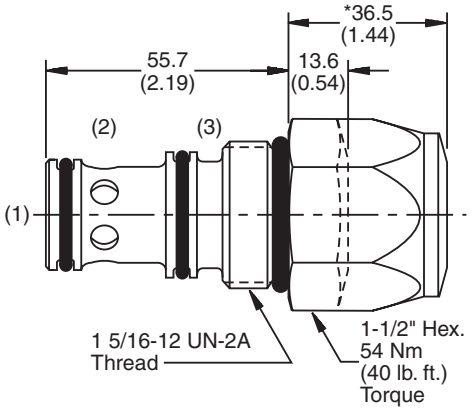


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	189 LPM (50 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage @ 150 SSU (32 cst)	Port 1 to 2 5 drops/min. (.33 cc/min.) @ 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.33 kg (.78 lbs.)
Cavity	C16-3S (See BC Section for more details)
Form Tool	Rougher NFT16-3SR Finisher NFT16-3SF

Ordering Information

16SLC1	—	A	—	50
16 Size Logic Element		Poppet Bi-Directional		Bias Spring

Code	Bias Spring
50	3.5 Bar (50 PSI)

Seals / Kit No.
Polyurethane, EPS / (WRK-16-3S)
Operating Temp.
-45°C to +93.3°C (-50°F to +200°F)

Order Bodies Separately See section BC

LB10	726	S
Line Body	Porting	Body Material

Code	Porting
726	1″ BSP

Code	Body Material
S	Steel

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

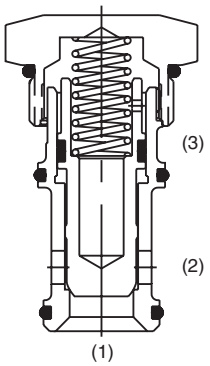
General Description

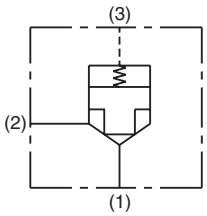
Poppet Type, Bi-Directional , Normally Closed, Pilot to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- Hardened, precision ground parts for durability
- Polyurethane seals only
- No backup rings
- Low leakage design
- All external parts zinc plated

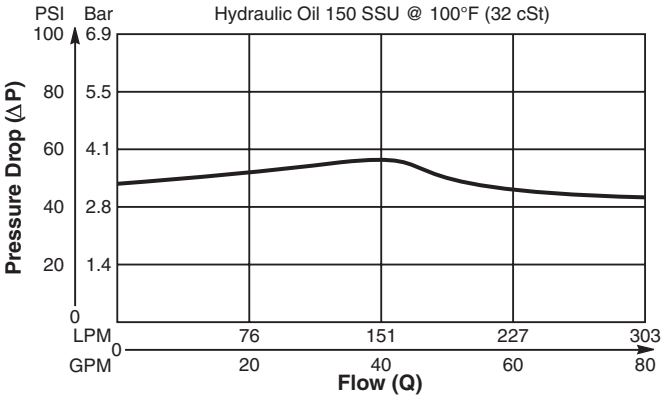




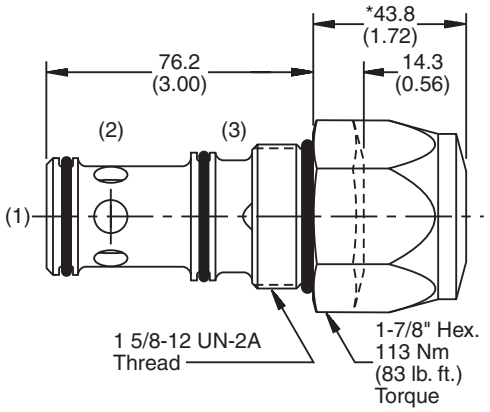


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	303 LPM (80 GPM)
Maximum Inlet Pressure	240 Bar (3500 PSI)
Leakage @ 150 SSU (32 cst)	Port 1 to 2 5 drops/min. (.33 cc/min.) @ 240 Bar (3500 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.81 kg (1.78 lbs.)
Cavity	C20-3S (See BC Section for more details)
Form Tool	Rougher NFT20-3SR Finisher NFT20-3SF

Ordering Information

20SLC1	—	A	—	50
20 Size Logic Element		Poppet Bi-Directional		Bias Spring

Code	Bias Spring
50	3.5 Bar (50 PSI)

Order Bodies Separately
See section BC

LB10	746	S
Line Body	Porting	Body Material

Seals / Kit No.
Polyurethane, EPS / (WRK-20-3S)
Operating Temp.
-45°C to +93.3°C (-50°F to +200°F)

Code	Porting
746	1. 1/2″ BSP

Code	Body Material
S	Steel

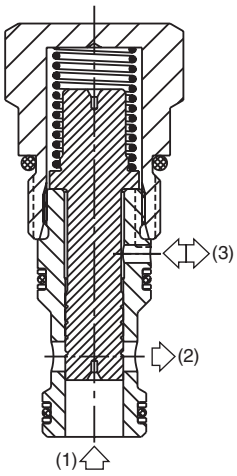
General Description

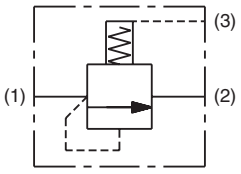
Spool Type , Normally Closed, Pilot to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Used as high flow switching or metering element
- Can be used as bleed off style pressure compensated flow regulator when used with restrictor
- More stable than poppet type
- Various switching pressures available
- 1:1 pilot pressure ratio
- Hardened working parts for maximum durability
- All external parts zinc plated

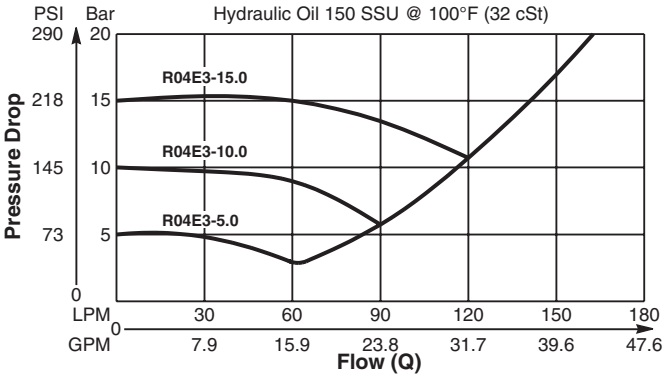




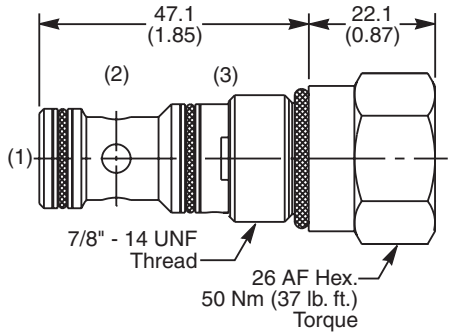


Performance Curve (Through cartridge only)

Vented Open Pressure Drop vs. Flow 1 to 2



Dimensions Millimeters (Inches)



Specifications

Rated Flow	170 LPM (45 GPM)
Nominal Flow @ 7 Bar (100 PSI)	100 LPM (26 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	50 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher NFT10-3SR Finisher NFT10-3SF

Ordering Information

R04E3	—		N
10 Size Logic Element		Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)

If no switching pressure is specified, valve will be supplied as R04E3-5.0N

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30504N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately See section BC

LB10	711	S
Line Body	Porting	Body Material

Code	Porting
711	3/4″ BSP

Code	Body Material
S	Steel

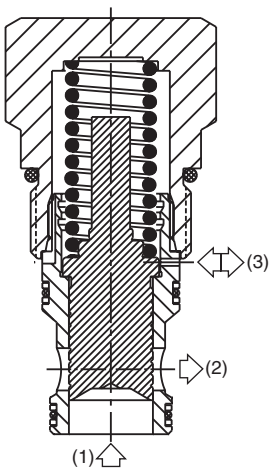
General Description

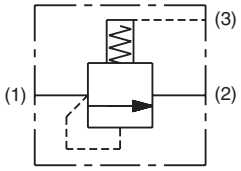
Spool Type , Normally Closed, Pilot to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Used as high flow switching or metering element
- Can be used as bleed off style pressure compensated flow regulator when used with restrictor
- More stable than poppet type
- Various switching pressures available
- 1:1 pilot pressure ratio
- Hardened working parts for maximum durability
- All external parts zinc plated

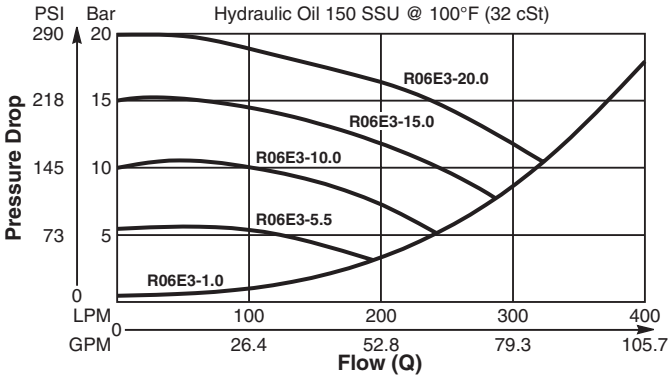






Performance Curve (Through cartridge only)

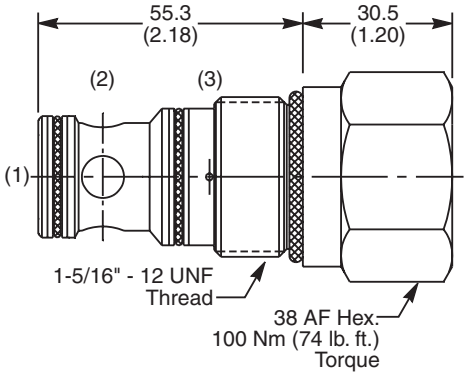
Vented Open Pressure Drop vs. Flow 1 to 2



Specifications

Rated Flow	400 LPM (106 GPM)
Nominal Flow @ 7 Bar (100 PSI)	270 LPM (71 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	90 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.38 kg (.84 lbs.)
Cavity	C16-3S (See BC Section for more details)
Form Tool	Rougher NFT16-3SR Finisher NFT16-3SF

Dimensions Millimeters (Inches)



Ordering Information

R06E3	—		N
16 Size Logic Element		Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
5.5	5.5 Bar (80 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)

If no switching pressure is specified, valve will be supplied as R06E3-5.5N

Order Bodies Separately See section BC

LB10	726	S
Line Body	Porting	Body Material

Code	Porting
726	1″ BSP

Code	Body Material
S	Steel

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30508N-1)	-34°C to +121°C (-30°F to +250°F)

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

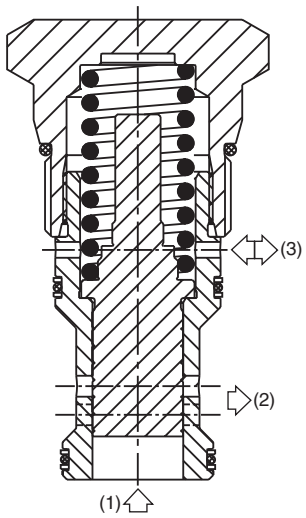
General Description

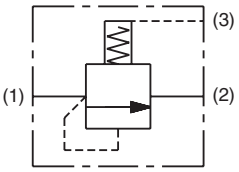
Spool Type , Normally Closed, Pilot to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Can be used as high flow switching or metering element
- Can be used as bleed off style pressure compensated flow regulator when used with restrictor
- Various switching pressures available
- 1:1 pilot pressure ratio
- Hardened working parts for maximum durability
- All external parts zinc plated

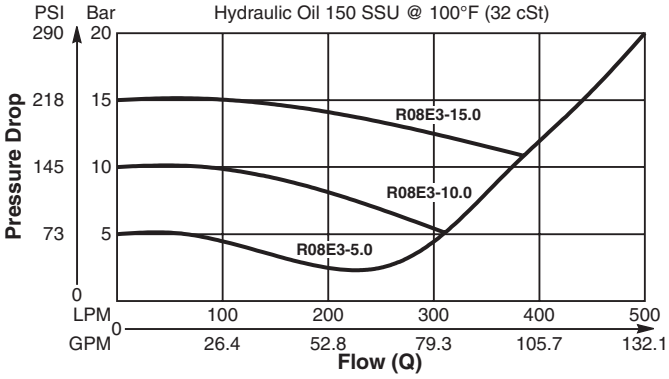




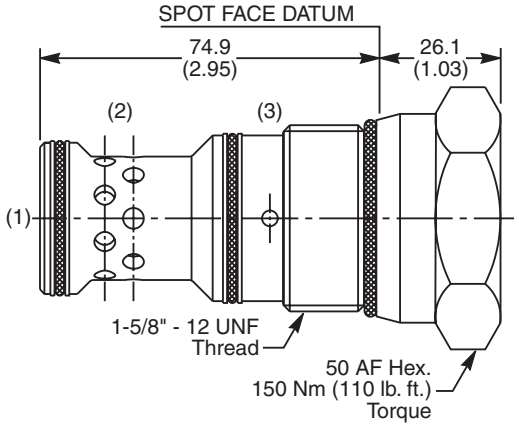


Performance Curve (Through cartridge only)

Vented Open Pressure Drop vs. Flow 1 to 2



Dimensions Millimeters (Inches)



Specifications

Rated Flow	500 LPM (132 GPM)
Nominal Flow @ 7 Bar (100 PSI)	340 LPM (90 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	90 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.69 kg (1.52 lbs.)
Cavity	C20-3S (See BC Section for more details)
Form Tool	Rougher NFT20-3SR Finisher NFT20-3SF

Ordering Information

R08E3	—		N
20 Size Logic Element		Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)

If no switching pressure is specified, valve will be supplied as R06E3-5.0N

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30512N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately See section BC

LB10	746	S
Line Body	Porting	Body Material

Code	Porting
746	1. 1/2″ BSP

Code	Body Material
S	Steel

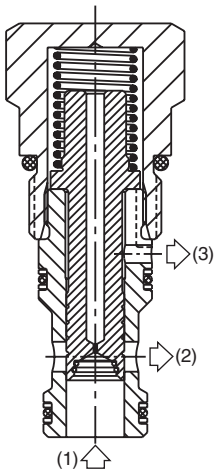
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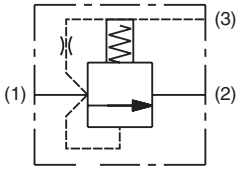
Spool Type , Normally Closed, Vent to Open Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Used as high flow switching or metering element
- Can be used as main stage for a pilot operated relief or sequence valve
- Integral 250 micron pilot flow filter
- Various switching pressures available
- 1:1 pilot pressure ratio
- Hardened working parts for maximum durability
- All external parts zinc plated

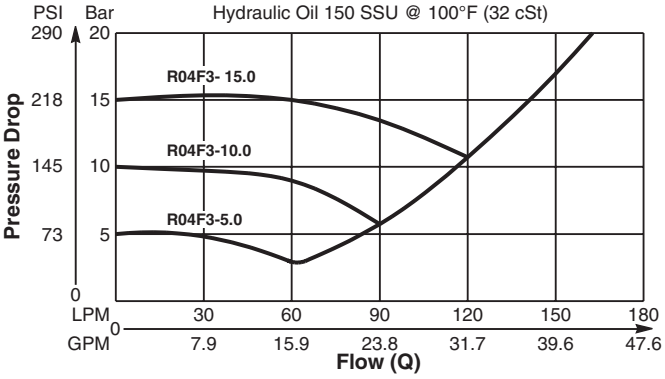




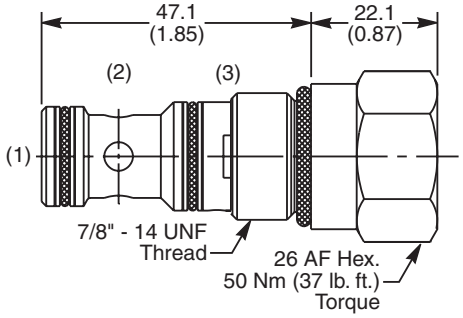


Performance Curve (Through cartridge only)

Vented Open Pressure Drop vs. Flow 1 to 2



Dimensions Millimeters (Inches)



Specifications

Rated Flow	170 LPM (45 GPM)
Nominal Flow @ 7 Bar (100 PSI)	100 LPM (26 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	50 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.13 kg (.29 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher NFT10-3SR Finisher NFT10-3SF

Ordering Information

R04F3	—		N
10 Size Logic Element		Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)

If no switching pressure is specified, valve will be supplied as R04F3-5.0N

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30504N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately See section BC

LB10	711	S
Line Body	Porting	Body Material

Code	Porting
711	3/4″ BSP

Code	Body Material
S	Steel

General Description

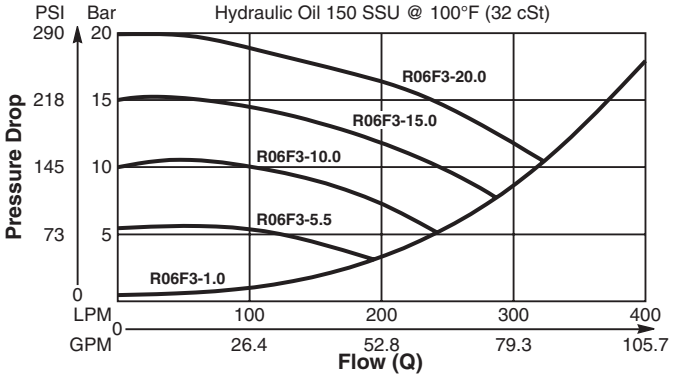
Spool Type , Normally Closed, Vent to Open Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

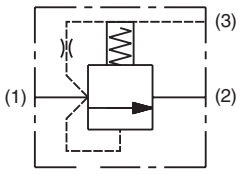
- High flow capacity
- Used as high flow switching or metering element
- Can be used as main stage for a pilot operated relief or sequence valve
- Integral 250 micron pilot flow filter
- Various switching pressures available
- 1:1 pilot pressure ratio
- Hardened working parts for maximum durability
- All external parts zinc plated

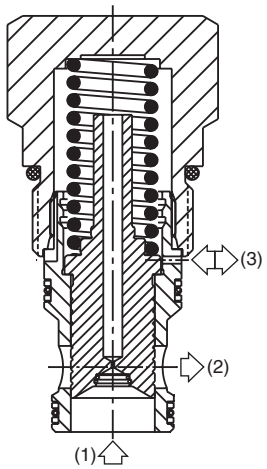
Performance Curve (Through cartridge only)

Vented Open Pressure Drop vs. Flow 1 to 2

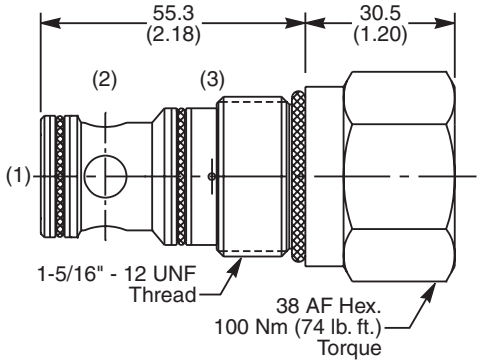








Dimensions Millimeters (Inches)



Specifications

Rated Flow	400 LPM (106 GPM)
Nominal Flow @ 7 Bar (100 PSI)	270 LPM (71 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	90 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.38 kg (.84 lbs.)
Cavity	C16-3S (See BC Section for more details)
Form Tool	Rougher NFT16-3SR Finisher NFT16-3SF

Ordering Information

R06F3	—		N
16 Size Logic Element		Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
5.5	5.5 Bar (80 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)

If no switching pressure is specified, valve will be supplied as R06F3-5.5N

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30508N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately See section BC

LB10	726	S
Line Body	Porting	Body Material

Code	Porting
726	1″ BSP

Code	Body Material
S	Steel

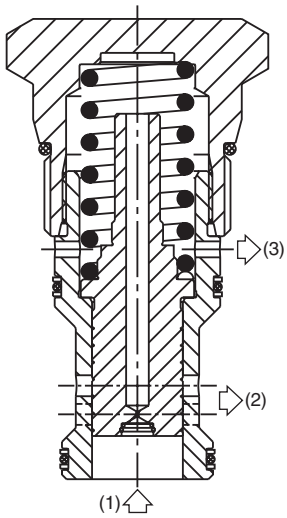
General Description

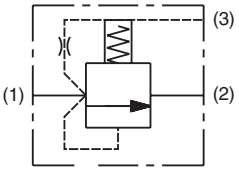
Spool Type , Normally Closed, Vent to Open Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Can be used as high flow switching or metering element
- Can be used as main stage for a pilot operated relief or sequence valve
- Integral 250 micron pilot flow filter
- Various switching pressures available
- 1:1 pilot pressure ratio
- Hardened working parts for maximum durability
- All external parts zinc plated

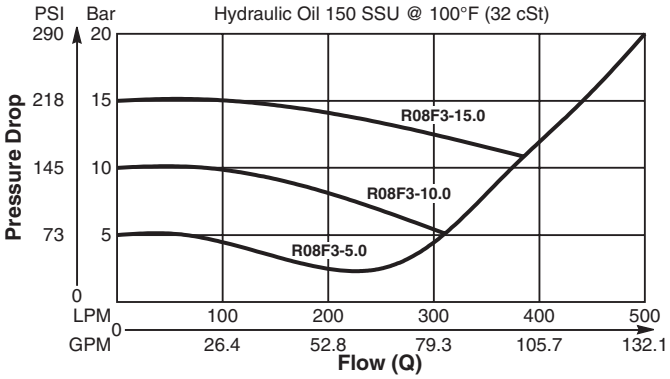






Performance Curve (Through cartridge only)

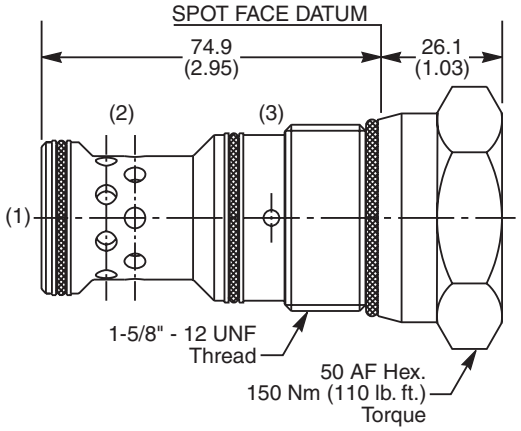
Vented Open Pressure Drop vs. Flow 1 to 2



Specifications

Rated Flow	500 LPM (132 GPM)
Nominal Flow @ 7 Bar (100 PSI)	340 LPM (90 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	90 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.69 kg (1.52 lbs.)
Cavity	C20-3S (See BC Section for more details)
Form Tool	Rougher NFT20-3SR Finisher NFT20-3SF

Dimensions Millimeters (Inches)



Ordering Information

R08F3	—		N
20 Size Logic Element		Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)

If no switching pressure is specified, valve will be supplied as R08E3-5.0N

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30512N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately See section BC

LB10	746	S
Line Body	Porting	Body Material

Code	Porting
746	1. 1/2″ BSP

Code	Body Material
S	Steel

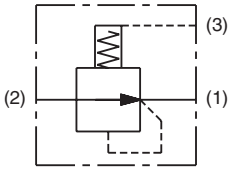
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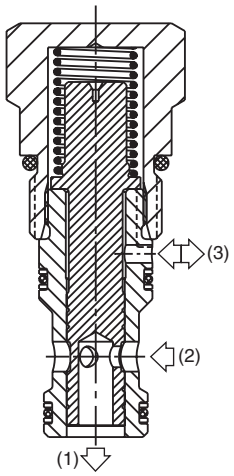
Spool Type , Normally Open, Vent to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Used as high flow switching or metering element
- Can be used for inline pressure compensated flow control when used with restrictor (refer to application)
- More stable than poppet type
- Various switching pressures available
- 1:1 pilot ratio
- Hardened working parts for maximum durability
- All external parts zinc plated

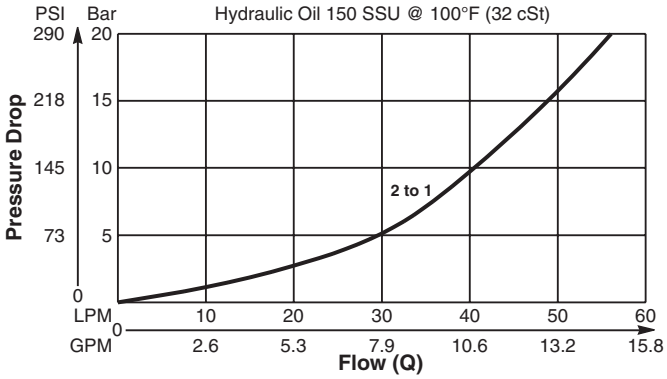






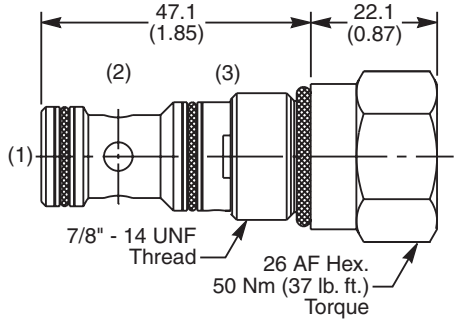
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions

Millimeters (Inches)



Specifications

Rated Flow	57 LPM (15 GPM)
Nominal Flow @ 7 Bar (100 PSI)	35 LPM (9.2 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	50 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher NFT10-3SR Finisher NFT10-3SF

Ordering Information

R04H3	—		N
10 Size Logic Element		Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)

If no switching pressure is specified, valve will be supplied as R04H3-5.0N

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30504N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately See section BC

LB10	711	S
Line Body	Porting	Body Material

Code	Porting
711	3/4″ BSP

Code	Body Material
S	Steel

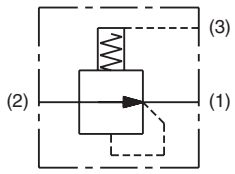
General Description

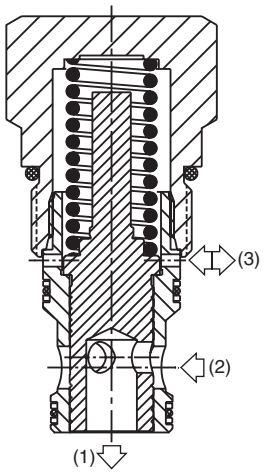
Spool Type , Normally Open, Vent to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Used as high flow switching or metering element
- Can be used for inline pressure compensated flow control when used with restrictor (refer to application)
- More stable than poppet type
- Range of spring ratings available
- Integral 250 micron pilot flow filter
- 1:1 pilot ratio
- Hardened working parts for maximum durability
- All external parts zinc plated

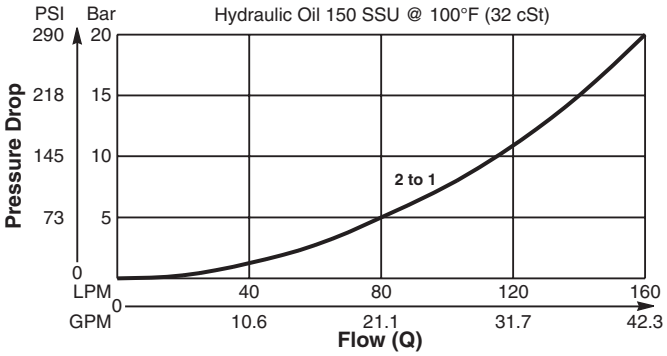




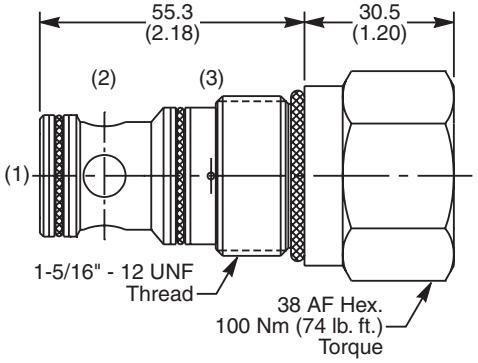


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	160 LPM (42 GPM)
Nominal Flow @ 7 Bar (100 PSI)	90 LPM (24 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	125 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.37 kg (.82 lbs.)
Cavity	C16-3S (See BC Section for more details)
Form Tool	Rougher NFT16-3SR Finisher NFT16-3SF

Ordering Information

R06H3	—		N
16 Size Logic Element		Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
5.5	5.5 Bar (80 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)

If no switching pressure is specified, valve will be supplied as R06H3-5.5N

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30508N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately See section BC

LB10	726	S
Line Body	Porting	Body Material

Code	Porting
726	1″ BSP

Code	Body Material
S	Steel

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

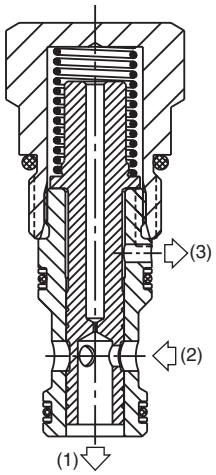
General Description

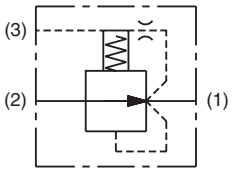
Spool Type , Normally Open, Vent to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Used as high flow switching or metering element
- Can be used as pressure regulator with mainstage controlled remotely by a pilot relief valve or a proportional valve
- Various switching pressures available
- 1:1 pilot ratio
- Hardened working parts for maximum durability
- All external parts zinc plated

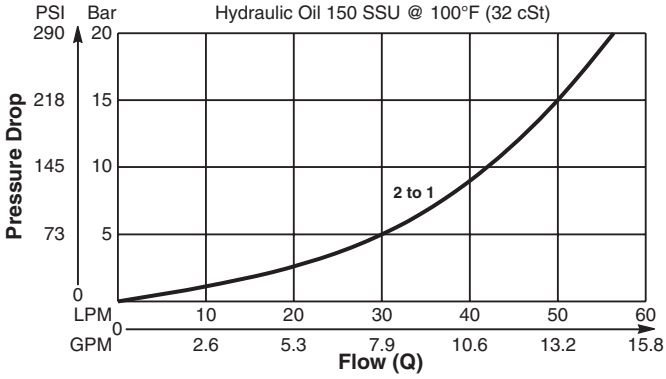






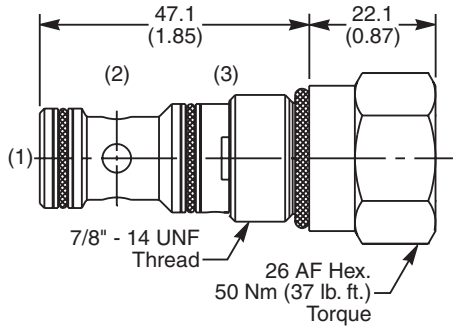
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions

Millimeters (Inches)



Specifications

Rated Flow	57 LPM (15 GPM)
Nominal Flow @ 7 Bar (100 PSI)	35 LPM (9.2 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	50 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C10-3S (See BC Section for more details)
Form Tool	Rougher NFT10-3SR Finisher NFT10-3SF

Ordering Information

R04G3	—		N
10 Size Logic Element		Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)

If no switching pressure is specified, valve will be supplied as R04G3-5.0N

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30504N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately See section BC

LB10	711	S
Line Body	Porting	Body Material

Code	Porting
711	3/4″ BSP

Code	Body Material
S	Steel

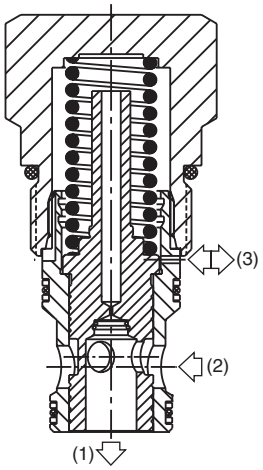
General Description

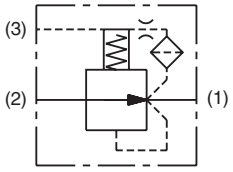
Spool Type , Normally Open, Vent to Close Logic Element. For additional information see Technical Tips on pages LE1-LE6.

Features

- High flow capacity
- Used as high flow switching or metering element
- Can be used as pressure regulator with mainstage controlled remotely by a pilot relief valve or a proportional valve
- Various switching pressures available
- Integral 250 micron pilot flow filter
- Hardened working parts for maximum durability
- All external parts zinc plated

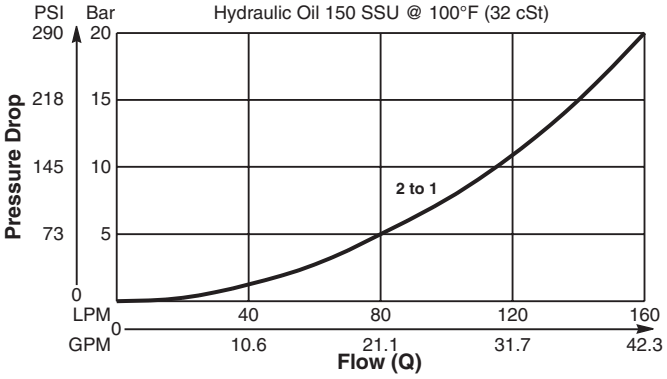






Performance Curve

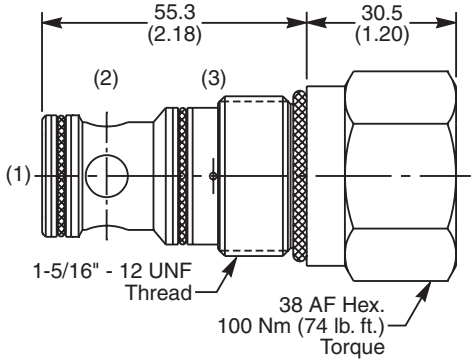
Pressure Drop vs. Flow (Through cartridge only)



Specifications

Rated Flow	160 LPM (42 GPM)
Nominal Flow @ 7 Bar (100 PSI)	90 LPM (24 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Leakage @ 150 SSU (32 cst)	125 ml/min. @ 100 Bar (1450 PSI)
Switching Press.	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.38 kg (.84 lbs.)
Cavity	C16-3S (See BC Section for more details)
Form Tool	Rougher NFT16-3SR Finisher NFT16-3SF

Dimensions Millimeters (Inches)



Ordering Information

R06G3	—		N
16 Size Logic Element		Switching Pressure	Seals

Code	Switching Pressure Non Adjustable Preset
5.5	5.5 Bar (80 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (218 PSI)

If no switching pressure is specified, valve will be supplied as R06G3-5.5N

Order Bodies Separately See section BC

LB10	726	S
Line Body	Porting	Body Material

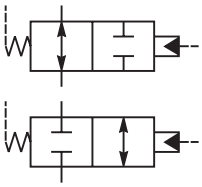
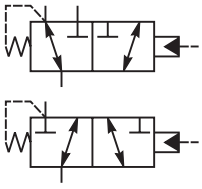
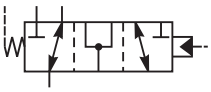
Code	Porting
726	1″ BSP

Code	Body Material
S	Steel

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30508N-1)	-34°C to +121°C (-30°F to +250°F)

Contents

Directional Control Valves

	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
	R04A4	C10-4	2 Way, Normally Open, Pilot to Close, External Vent	80/21	420/6000	DC1
	R04B4	C10-4	2 Way, Normally Closed, Pilot to Open, External Vent	80/21	420/6000	DC2
	N04A4	C10-4	3 Way, Internal Vent, External Pilot	90/24	420/6000	DC3
	N04B4	C10-4	3 Way, Internal Vent, External Pilot	90/24	420/6000	DC4
	N5A125	5A	3 Way, 2 Position, External Drain, Open Transition	160/42	420/6000	DC5
	N5A300	100-1	3 Way, 2 Position, External Drain, Open Transition	400/105	420/6000	DC6

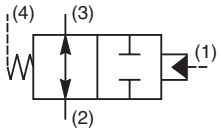
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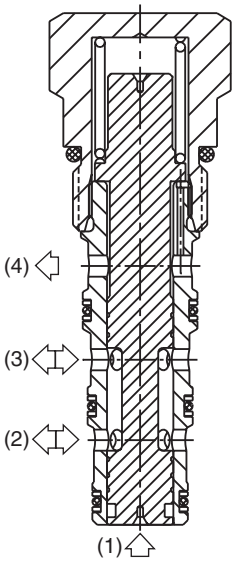
Diverter Valve, Normally Open, 2-Way with External Pilot and Vent.

Features

- High flow capacity
- Two switching pressures
- Sealed pilot option available
- Hardened working parts for maximum durability
- All external parts zinc plated

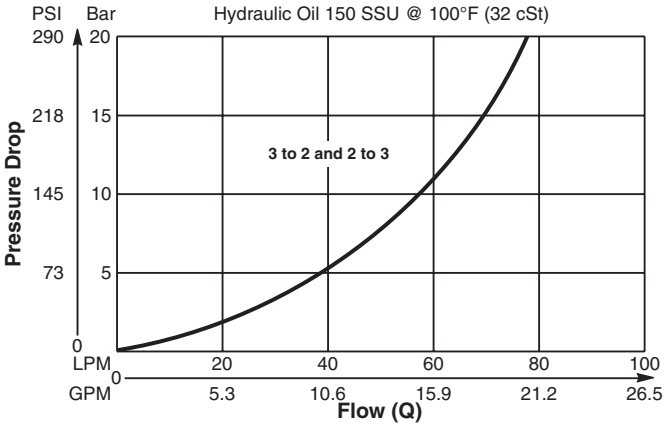




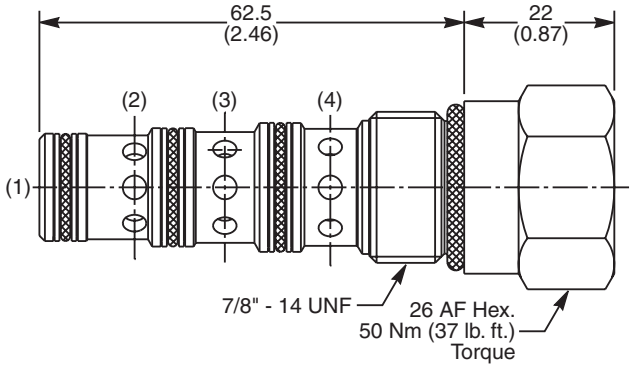


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	80 LPM (21 GPM)
Nominal Flow @ 7 Bar (100 PSI)	47 LPM (12 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.17 kg (.37 lbs.)
Cavity	C10-4 (See BC Section for more details)

Ordering Information

R04A4	–		N	
10 Size Diverter Valve		Pilot Switching Pressure	Seals	Sealed Pilot

Order Bodies Separately See section BC

Code	Switching Pressure
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)

If no switching pressure is specified, valve will be supplied as R04A4-5.0N

B10	—	4	—	8B
10 Size		4-Way Cavity		Port Size

Code	Sealed Pilot
Omit	If not required
S	Sealed Pilot

Port Size
1/2" BSP

Body Material
Steel

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30506N-1)	-34°C to +121°C (-30°F to +250°F)

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

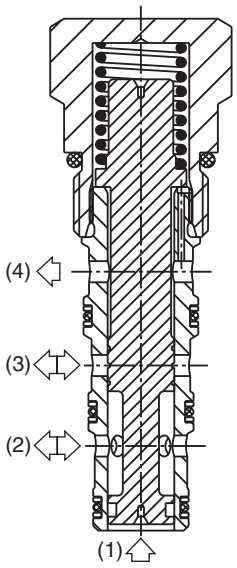
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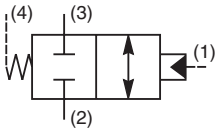
Diverter Valve, Normally Closed, 2-Way with External Pilot and Vent.

Features

- High flow capacity
- Two switching pressures available
- Sealed pilot option available
- Hardened working parts for maximum durability
- All external parts zinc plated

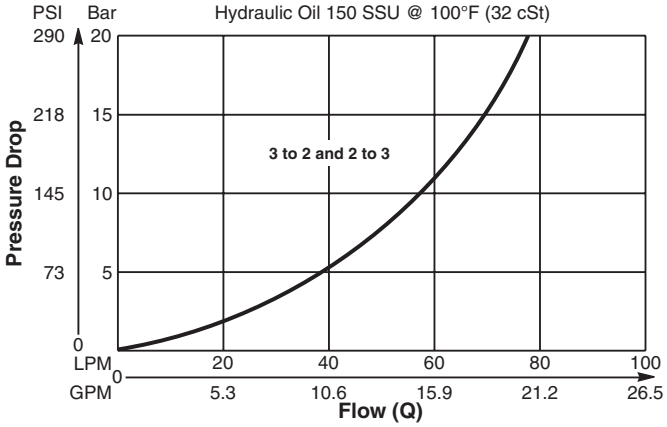




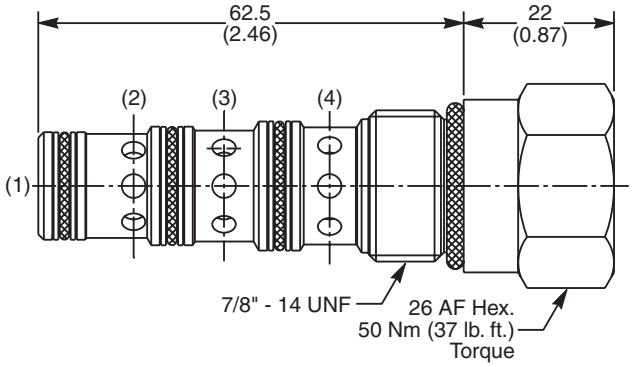


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	80 LPM (21 GPM)
Nominal Flow @ 7 Bar (100 PSI)	47 LPM (12 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.17 kg (.37 lbs.)
Cavity	C10-4 (See BC Section for more details)

Ordering Information

R04B4	–		N	
10 Size Diverter Valve		Pilot Switching Pressure	Seals	Sealed Pilot

Order Bodies Separately See section BC

Code	Switching Pressure
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)

If no switching pressure is specified, valve will be supplied as R04B4-5.0N

B10	—	4	—	8B
10 Size		4-Way Cavity		Port Size

Code	Sealed Pilot
Omit	If not required
S	Sealed Pilot

Port Size
1/2" BSP

Body Material
Steel

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30506N-1)	-34°C to +121°C (-30°F to +250°F)

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

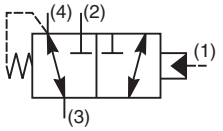
General Description

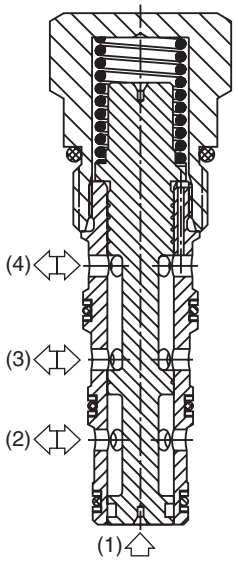
Pilot Operated Directional Valve, 3-Way External Pilot, Internal Vent.

Features

- High flow capacity
- Two switching pressures available
- Sealed pilot option available
- Hardened working parts for maximum durability
- All external parts zinc plated

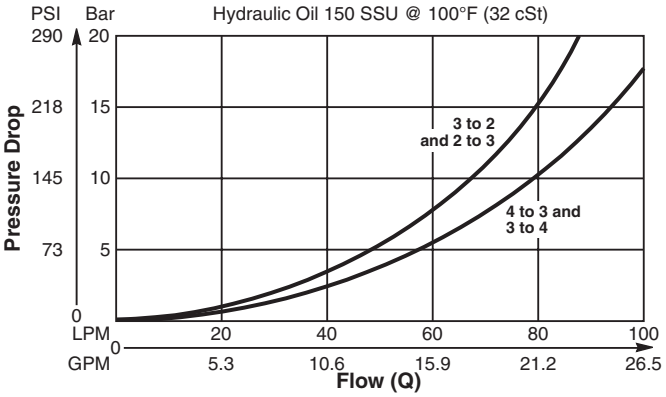




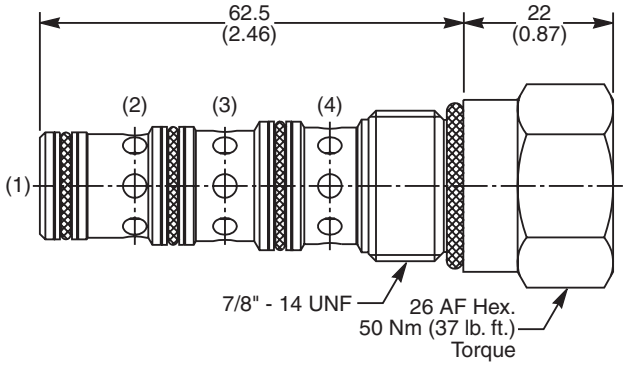


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	90 LPM (24 GPM)
Nominal Flow @ 7 Bar (100 PSI)	50 LPM (13 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.17 kg (.37 lbs.)
Cavity	C10-4 (See BC Section for more details)

Ordering Information

N04A4	–		N	
10 Size Directional Valve		Pilot Switching Pressure	Seals	Sealed Pilot

Order Bodies Separately See section BC

Code	Switching Pressure
5.0	5.0 Bar (73 PSI) Std.
10.0	10.0 Bar (145 PSI)

If no switching pressure is specified, valve will be supplied as N04A4-5.0N

B10	—	4	—	8B
10 Size		4-Way Cavity		Port Size

Code	Sealed Pilot
Omit	If not required
S	Sealed Pilot

Port Size
1/2" BSP

Body Material
Steel

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30506N-1)	-34°C to +121°C (-30°F to +250°F)

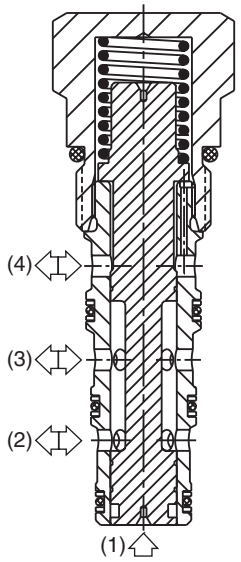
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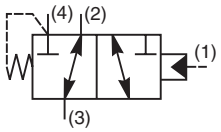
Pilot Operated Directional Valve, 3-Way External Pilot, Internal Vent.

Features

- High flow capacity
- Two switching pressures available
- Sealed pilot option available
- Hardened working parts for maximum durability
- All external parts zinc plated

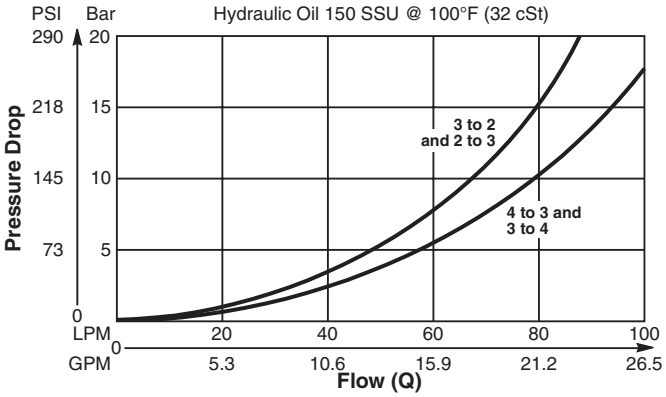




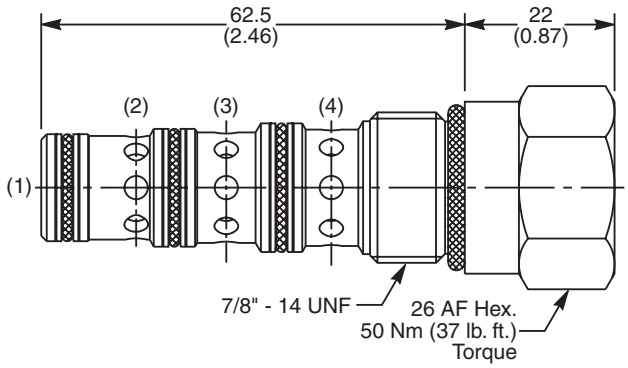


Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Specifications

Rated Flow	90 LPM (24 GPM)
Nominal Flow @ 7 Bar (100 PSI)	50 LPM (13 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.17 kg (.37 lbs.)
Cavity	C10-4 (See BC Section for more details)

Ordering Information

N04B4	–		N	
10 Size Directional Valve		Pilot Switching Pressure	Seals	Sealed Pilot

Order Bodies Separately See section BC

Code	Switching Pressure
5.0	5.0 Bar (73 PSI) Std.
9.0	9.0 Bar (131 PSI)

If no switching pressure is specified, valve will be supplied as N04B4-5.0N

B10	—	4	—	8B
10 Size		4-Way Cavity		Port Size

Code	Sealed Pilot
Omit	If not required
S	Sealed Pilot

Port Size
1/2″ BSP

Body Material
Steel

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30506N-1)	-34°C to +121°C (-30°F to +250°F)

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

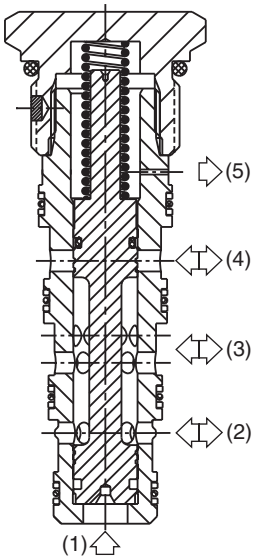
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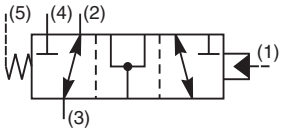
Pilot Operated Directional Valve, 3-Way, 2 Position, External Drain, Open Transition.

Features

- High flow capacity
- Used as high flow switching or metering element
- Range of spring settings available
- All external parts zinc plated

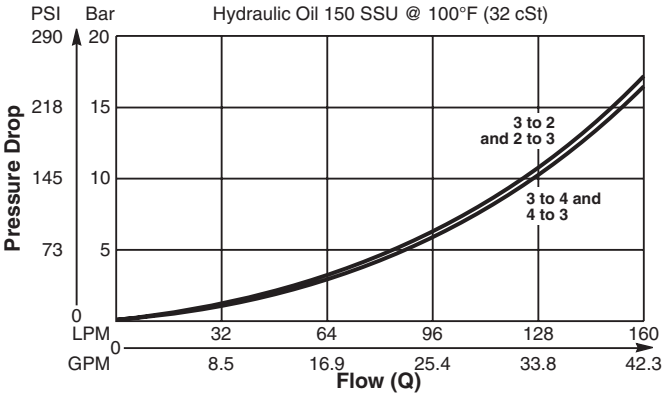






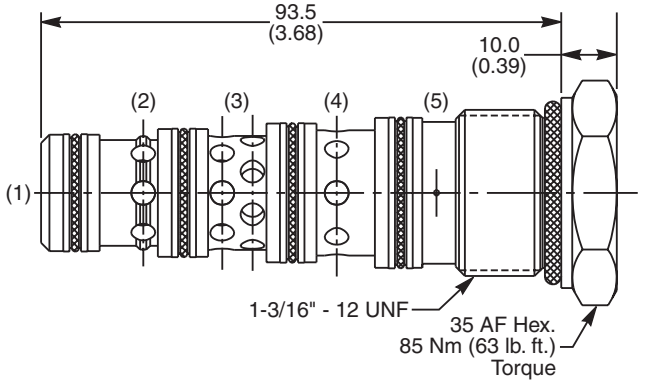
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions

Millimeters (Inches)



Specifications

Rated Flow	160 LPM (42.3 GPM)
Nominal Flow @ 7 Bar (100 PSI)	90 LPM (24 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	Steel operating parts, hardened steel spool.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.33 kg (.76 lbs.)
Cavity	5A (See BC Section for more details)

Ordering Information

N5A125	–		N
Directional Valve (All Ports Open)		Pilot Switching Pressure	Seals

Code	Switching Pressure
5.0	5.0 Bar (73 PSI)
6.9	6.9 Bar (100 PSI) Std.
10.0	10.0 Bar (145 PSI)
15.0	15.0 Bar (217 PSI)

If no switching pressure is specified, valve will be supplied as N5A125-6.9N

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30103N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately See section BC

LB10	314	S
Line Body	Porting	Body Material

Code	Porting
314	3/4″ BSP (main) 1/4″ BSP (aux)

Body Material
Steel

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

General Description

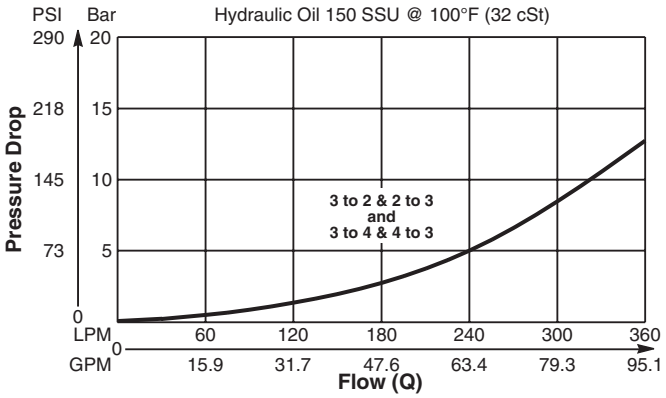
Pilot Operated Directional Valve, 3-Way, 2 Position, External Drain, Open Transition.

Features

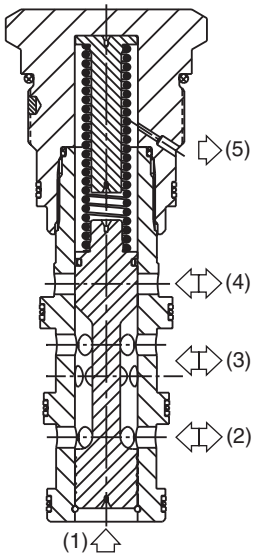
- High flow capacity
- Used as high flow switching or metering element
- Range of spring settings available
- All external parts zinc plated

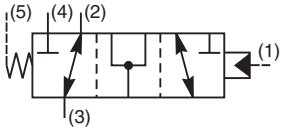
Performance Curve

Pressure Drop vs. Flow (Through cartridge only)

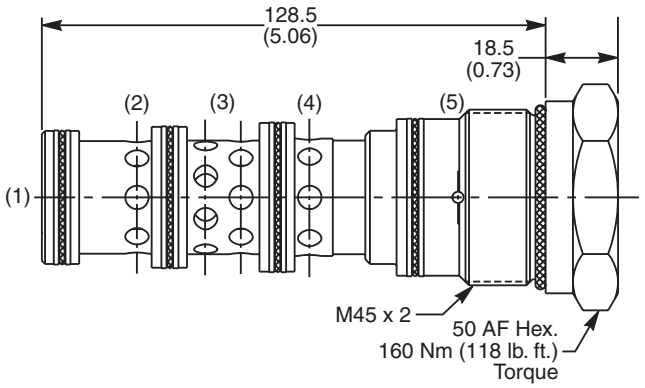








Dimensions Millimeters (Inches)



Specifications

Rated Flow	400 LPM (105 GPM)
Nominal Flow @ 7 Bar (100 PSI)	270 LPM (71 GPM)
Maximum Inlet Pressure	420 Bar (6000 PSI)
Pilot Switching Pressure	See ordering information
Cartridge Material	Steel operating parts, hardened steel spool.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	1.00 kg (2.2 lbs.)
Cavity	100-1 (See BC Section for more details)

Ordering Information

N5A300	–		N
Directional Valve (All Ports Open)		Pilot Switching Pressure	Seals

Code	Switching Pressure
6.9	6.9 Bar (100 PSI) Std.
10.0	10.0 Bar (145 PSI)

If no switching pressure is specified, valve will be supplied as N5A300-6.9N

Order Bodies Separately

LB10	316	S
Line Body	Porting	Body Material

Code	Porting
316	1. 1/4″ BSP (main) 3/8″ BSP (aux)

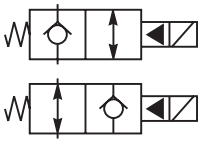
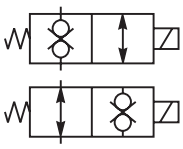
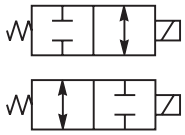
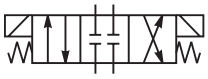
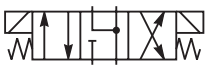
Body Material
Steel

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30065N-1)	-34°C to +121°C (-30°F to +250°F)

Notes

Contents

Solenoid Valves

	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
HIGH FLOW VALVE FAMILY			*See individual catalog pages for exact specifications.*			
	**2 WAY POPPET TYPE**					
	DSH081	C08-2	2 Position, 2 Way, N.C. or N.O.	30/8	350/5000	SV7-SV8
	DSH101	C10-2	2 Position, 2 Way, N.C. or N.O.	60/15	350/5000	SV9-SV10
	DSH121	C12-2	2 Position, 2 Way, N.C. or N.O.	90/24	350/5000	SV11-SV12
	DSH161	C16-2	2 Position, 2 Way, N.C. or N.O.	150/40	350/5000	SV13-SV14
	DSL201	C20-2	2 Position, 2 Way, N.C. or N.O.	260/70	250/3600	SV15-SV16
	GS02 72	C08-2	Bi-Directional Poppet, N.C.	1.7/.45	210/3000	SV17-SV18
	GS02 81	C08-2	Bi-Directional Poppet, N.C.	34/9	350/5000	SV19-SV20
	GS04 81	2R	Bi-Directional Poppet, N.C.	68/18	350/5000	SV21-SV22
	GS06 81	C16-2	Bi-Directional Poppet, N.C.	285/75	350/5000	SV23-SV24
	GS02 77	C08-2	Bi-Directional Poppet, N.O.	1.7/.45	210/3000	SV25-SV26
	GS02 86	C08-2	Bi-Directional Poppet, N.O.	34/9	350/5000	SV27-SV28
	GS04 86	2R	Bi-Directional Poppet, N.O.	68/18	350/5000	SV29-SV30
	GS06 86	C16-2	Bi-Directional Poppet, N.O.	285/75	350/5000	SV31-SV32
					*210/3000 psi rating	
	**2 WAY SPOOL TYPE**					
	DSH082	C08-2	2 Position, 2 Way	15/4	350/5000	SV33-SV34
	DSH102	C10-2	2 Position, 2 Way	30/8	350/5000	SV35-SV36
	DS162	C16-2	2 Position, 2 Way	75/20	210/3000	SV37-SV38
	**3 WAY SPOOL TYPE**					
	DSH083	C08-3	2 Position, 3 Way	15/4	350/5000	SV39-SV41
	DSH103	C10-3	2 Position, 3 Way	30/8	350/5000	SV42-SV44
	DS163	C16-3	2 Position, 3 Way	57/15	210/3000	SV45-SV46
	**4 WAY, 2 POSITION SPOOL TYPE**					
	DSH084	C08-4	2 Position, 4 Way	15/4	350/5000	SV47-SV48
	DSH104	C10-4	2 Position, 4 Way	38/10	350/5000	SV49-SV50
	DSH164	C16-4	2 Position, 4 Way	113/30	350/5000	SV51-SV52
	**4 WAY, 3 POSITION SPOOL TYPE**					
	GS02 51	C08-4	3 Position, 4 Way	17/4.5	350/5000	SV53-SV54
	GS02 53	C08-4	3 Position, 4 Way	15/4	350/5000	SV55-SV56
	GS02 57	C08-4	3 Position, 4 Way	13/3.5	350/5000	SV57-SV58
	GS02 59	C08-4	3 Position, 4 Way	13/3.5	350/5000	SV59-SV60
	GS04 52D	C10-4	3 Position, 4 Way	42/11	350/5000	SV61-SV62
	GS04 54D	C10-4	3 Position, 4 Way	42/11	350/5000	SV63-SV64
	GS04 57D	C10-4	3 Position, 4 Way	42/11	350/5000	SV65-SV66
	GS04 59D	C10-4	3 Position, 4 Way	42/11	350/5000	SV67-SV68
	DSH125 52	C12-4L	3 Position, 4 Way	57/15	350/5000	SV69-SV70
	DSH125 54	C12-4L	3 Position, 4 Way	57/15	350/5000	SV71-SV72
	DSH125 57	C12-4L	3 Position, 4 Way	57/15	350/5000	SV73-SV74
	DSH125 59	C12-4L	3 Position, 4 Way	57/15	350/5000	SV75-SV76

INTRODUCTION

This technical tips section is designed to help familiarize you with the Parker line of Solenoid Valves. In this section we highlight new products to this catalog as well as some design features of our solenoid valves. In addition we present common options available to help you in selecting products for your application. Finally, we give a brief synopsis of the operation and applications of the various products offered in this section. Some tips in applying and selecting our products are provided throughout this guide.

NEW PRODUCTS

There are several new additions and product improvements to our Solenoid Valve product line.

Here are just some of the design features and advantages to the product line.



***Nylon Insert Nut**
Nylon inserted jam nut resists vibration preventing the nut from backing out.
**Used only on DSH/DSL series.*

New Super Coil
Exceeds IP69K specifications with Deutsch molded connector or LS sealed lead wire assemblies.

Crimp Design
Fold over crimp provides secure holding and eliminates the need for adhesive.

"D"-Ring
Standard 4301 Polyurethane Seal eliminates the need for backup rings providing easier manifold installation. (For more information on "D"-Ring see Technical Data Section)

Parker *SUPER COIL*

Exceeds IP69k Specifications

After exhaustive testing, the new Super Coil has clearly distanced itself from the competition. This coil was subjected to the rigors of this environmental standard and the results were excellent. This coil stands up to most rugged of environmental conditions including weather, dust, and extreme temperature variations.

Water Dunk Test Qualified

The Super Coil was taken to task in a repeated water dunk thermal cycle test program with alternate exposure to high and low temperature, only to perform with outstanding results.

Endurance Tested

The goal of this test was to cycle the coil to high temperature extremes in order to validate the coils ability to perform in extreme temperature environments.

Water Spray and Chemical Solvent Compatibility

The Super Coil was subjected to numerous chemical solvents in a rigorous test which established the fact that these coils can withstand harsh and unusual environments. Also, the coils were subjected to a high pressure water spray test. Once again, the Super Coil passed this test.

***Deutsch molded connector is highly recommended.**

COMMON OPTIONS

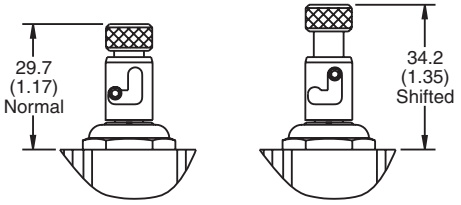
As you will see, Parker offers a variety of solenoid valve products. As such, some of the options mentioned below may not be available on all valves. Consult the model coding and dimensions for each valve for more specifics. Here are some of the common options available.

Seals: The Winner's Circle products feature a standard Polyurethane "D"-Ring. The "D"-Ring eliminates the need for backup rings. For more information on the "D"-Ring see the Technical Data section of the catalog. The majority of the products are available in Nitrile or Fluorocarbon Seals. You should always match the seal compatibility to the temperature and fluid being used in your application.

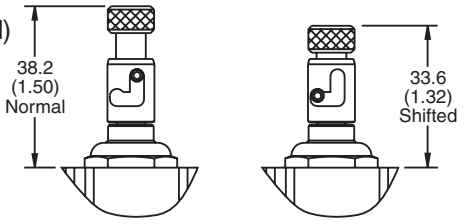
Coils: Coils can be ordered as part of the full assembly or separately. Various terminations and voltages are available. For detailed information on the coil options consult the coil section of the catalog. The ordering information for each valve will direct you to the proper coil.

Manual Overrides: Many of our solenoid valves are also offered with a manual override. The override allows the user to shift the valve when coil force is not available. They provide a means of shifting the solenoid valve due to a loss of power or a coil failure. Overrides are intended for infrequent usage and are not designed to be used as a primary method of valve actuation.

The most common override option for the 2 Position valves is the push & twist style shown below. With a normally closed valve or a pull style tube, the valve is in normal operation (or de-energized) when the pin is seated in the slotted groove at the lowest position. To shift the valve manually, the operator pushes down on the knob and twists it counterclockwise. When the pressure is removed from the knob, an internal spring pushes the pin up the slotted groove to the upper position of the override. With a normally open valve, or push style tube, the actuation is reversed. The valve is in the normal position (or de-energized) when the pin is in the upper position of the override. To shift the valve manually, the operator pushes down on the knob and twists is clockwise. Once the pin is seated in the slotted groove, the operator can remove pressure and the valve will stay actuated.

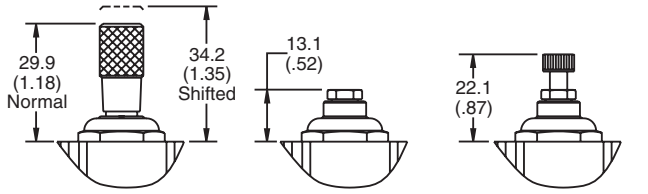


Normally Closed Pull Type Tube



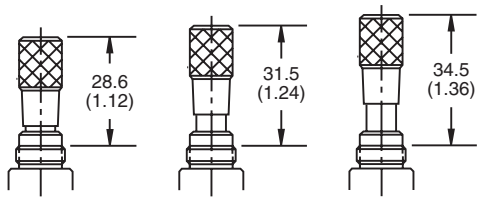
Normally Open Push Type Tube

In addition to the push and twist style override, normally closed (pull style tube) 2 position valves can be ordered with a pull and release override. Normally open (push style) 2 position valves are available with flush style and extended style overrides. These overrides are not detented. Each style is shown below.



Pull and Release Manual Override ***Flush Manual Override*** ***Extended Manual Override***

3 Position valves are offered with a Push / Pull style override. This override is not detented. Springs hold the spool of the valve in the center position of the valve. When the knob is pulled, the spool is moved upward simulating the action of the upper coil. When the override is pushed, the spool moves downward simulating the action of the lower coil. When no pressure is applied to the knob, it centers the spool.



Push Position ***Normal Position*** ***Pull Position***

Screens: 2 way valves can be ordered with a small mesh screen (60 x 60 mesh) placed over the cage of the cartridge valve. This screen is intended for cursory protection of the internal components of the solenoid valve. It should not be used as the primary method of filtration. The mesh catches small pieces of debris that could impede spool or poppet movement. Note that a screen will trap debris from both directions. Thus, any debris coming from the nose of the cartridge would be trapped inside the valve. As such, we recommend that screens be implemented in only applications where hydraulic fluid passes through the cartridge from the side of the cage to the nose. It should also be noted that the pressure drop through the cartridge will be increased slightly due to the small restriction of the mesh. As the screen fills with debris, pressure drop will continue to rise.

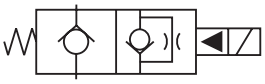


PRODUCT TYPES / APPLICATIONS

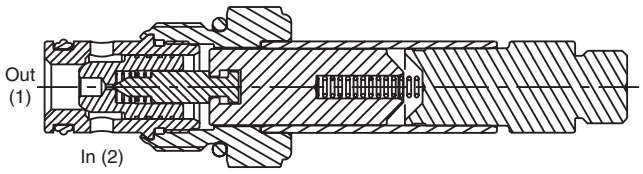
Two Way Poppet Valves

Two way poppet valves are pilot operated, low leakage solenoid actuated valves. Two way poppet valves control the flow of a two way function by blocking flow in one direction (similar to a check valve). They are generally selected due to their low leakage and ability to meet higher flow requirements. Poppet valves are often used on single operation actuators or in unloading functions. They are available in normally closed and normally open types. In addition, free reverse flow and fast response versions are available.

Normally Closed Poppet

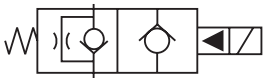


Normally closed two way poppet valves act as a check valve when de-energized, blocking flow from one direction and allowing restricted free flow in the reverse condition. When energized, the poppet lifts allowing free flow from the side to the nose of the cartridge. Should the application require free flow in both directions, the free reverse flow option should be chosen.

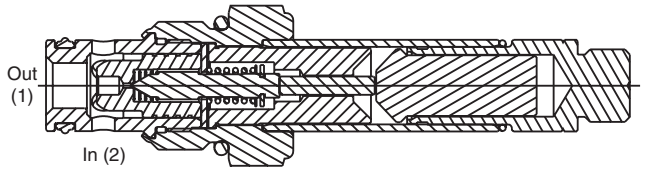


OPERATION - The valve pilot is held on its seat by spring force, blocking pilot flow. This allows pressure at the inlet (port 2) to hold the poppet on its seat, thus, preventing flow through the valve (2-1). If the nose of the cartridge (port 1) is pressurized, the pressure will overcome the spring force, pushing the poppet off of its seat, allowing free flow through the cartridge (1-2). When the coil is energized, the valve pilot is pulled off of its seat. This vents the pressure inside the poppet to port 1, creating a pressure imbalance across the main poppet. This differential lifts the poppet allowing flow from the side to nose (2-1). Since poppet valves are piloted operated, a minimum amount of pressure differential (25-50 psi) and flow between ports 2 and 1 must be present to overcome the spring and lift the poppet.

Normally Open Poppet



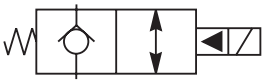
Normally open two way poppet valves, when de-energized, allow free flow from the side (port 2) of the cartridge to the nose (port 1). Flow in the reverse direction is restricted. Should free flow be required in both directions, the free reverse flow option should be specified. Once the coil is energized the normally open poppet valve acts as a check valve, blocking flow from one direction and allowing restricted free flow in the reverse condition.

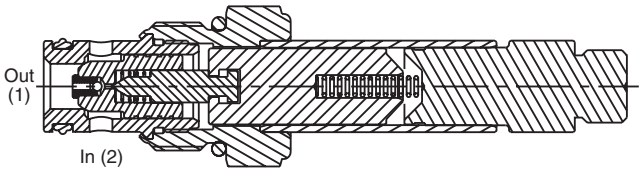


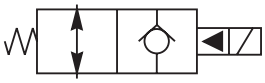
OPERATION - The valve pilot is held off its seat by spring force. Pilot flow is vented to port 1, creating a pressure imbalance that moves the main poppet. This differential lifts the poppet allowing flow from the side to nose (2-1). Since poppet valves are piloted operated, a minimum amount of pressure differential (25-50 psi) between ports 2 and 1 must be present to overcome the spring and lift the poppet. When the coil is energized, the coil force
overcomes the spring force to drive the valve pilot and main poppet into their seats, thus blocking flow from port 2-1. If the nose of the cartridge (port 1) is pressurized, the pressure will overcome the spring force and solenoid force, pushing the poppet off of its seat, allowing restricted flow through the cartridge (1-2).

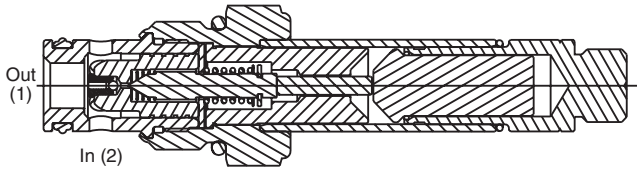
Free Reverse Flow

The free reverse flow versions are available on both the normally closed and normally open poppet valves. As mentioned above, the operation is the same as the standard poppet valve except flow through the reverse direction is not restricted. The free reverse flow option is only needed if the application requires flow to pass through the cartridge valve from the nose to side (port 1 to port 2).









Fast Response

Since poppet valves are pilot operated valves, a few milliseconds are needed to move the pilot and allow the poppet to lift. Should a faster response time be required on normally closed poppet valves, this option can be chosen. The fast response is accomplished by reducing the movement of the pilot. Thus, the flow capacity of the poppet valve is also decreased.

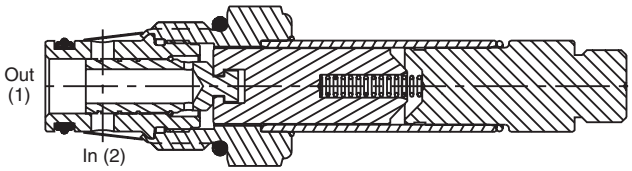
Two Way Spool Valves

Two way spool valves are direct acting, fast responding solenoid actuated valves. Like the poppet valves described earlier, they block the flow of a two way function. Unlike two way poppet valves, spool valves block flow from both the side port and the nose port. They do not have the check like function of the poppet valve, thus they are either open or closed. Spool valves are directed operated, so they respond more quickly to coil voltage than poppet valves. Spool valves operate via a sliding spool, thus, some leakage will be present due to the required spool clearance. Spool valves block flow in both directions, but the preferred flow path is still from the side of the cartridge to the nose due to the flow forces acting on the spool. Two way spool valves are available in normally open and normally closed types.

Normally Closed Spool

When de-energized, the spool is positioned by the spring force to cover both the side (2) and nose (1) ports of the valve. Thus, no flow is allowed from either direction. Once the coil is energized, the spool shifts exposing a flow path between the two ports. Flow can then be passed through the valve from either direction.

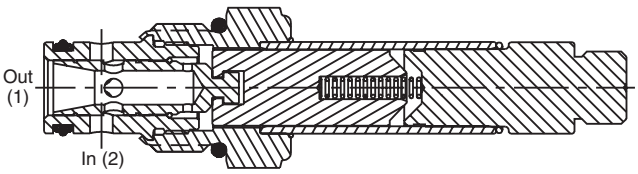




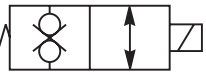
Normally Open Spool

When de-energized, the spool is positioned by the spring force so that a flow path between the side (2) and nose (1) ports is exposed, allowing flow through the valve from either direction. Once the coil is energized, the spool shifts to cover both the side (2) and nose (1) ports of the valve. Thus, no flow is allowed from either direction.

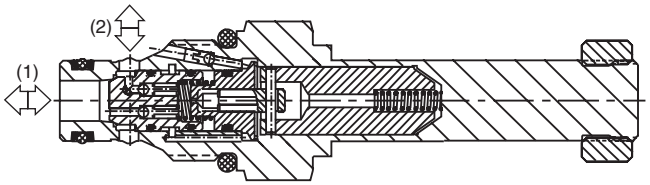




Bi-Directional Poppet Valve



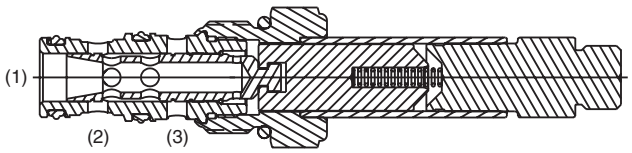
Bi-directional poppet valves combine the dual blocking function of spool valves with the lower leakage capabilities of poppet valves. These valves also have a limited flow capacity compared to standard poppet or spool valves.



Two Position, Three Way Spool Valve

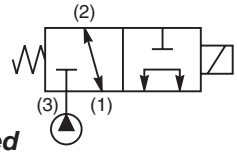


Three way spool solenoid valves provide directional control of flow. Each three way valve has a special internal spool which connects two of the three valve ports. When actuated, the spool connects a different combination of valve ports. These valves are often used for raise and lower functions of a single acting cylinder, control of a uni-directional motor, or as a circuit selector.

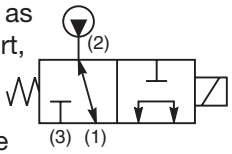


OPERATION - In the de-energized mode, the spool is positioned by spring force. When energized, the coil force directly shifts the spool against the spring, thus changing the flow through the valve. Each spool type can be used as a normally open, normally closed, or selector valve. To explain this we will review the DSL103A which is pictured here. When the valve is de-energized, ports 1 and 2 are open to one another. When energized, ports 1 and 3 are connected.

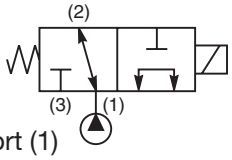
Thus, if we use port 3 as our pressure port, we have a ***normally closed valve***. The pressure port (3) is blocked, while the actuator port (1) is drained to tank (2).



If we use port 2 as our pressure port, we have a ***normally open valve***. The pressure port (2) is connected to the actuator port (1), and the tank port (3) is blocked.



If we use port 1 as our pressure port, we have a ***selector valve***. The pressure port (1) is either connected to port (2) or port (3). Thus, it is "selecting" which port will get the system pressure and flow.

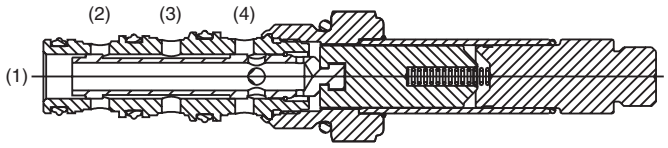


Note that in all three examples, we were using the same valve. The flow forces acting on the spool change depending on which port is pressurized. Thus, if you will be shifting the three way valve under full flow and pressure, it is important to review the shift limit characteristics for the flow paths you have chosen to be sure the coil has enough force to shift the spool. Various spools are available in this catalog to maximize the flow and pressure capacities for the desired flow function.

Two Position, Four Way Spool Valve

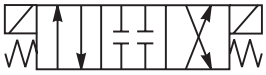


Four way spool solenoid valves provide directional control of flow. Each four way valve has a special internal spool which connects some combination of the four valve ports together. When actuated, the spool connects a different combination of valve ports. These valves are often used for the raise / lower function of a double acting cylinder, or as a forward / reverse function of bi-directional motors.

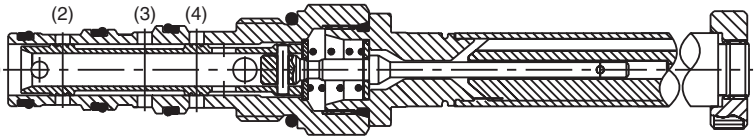


OPERATION - In the de-energized mode, the spool is positioned by spring force. When energized, the coil force directly shifts the spool against the spring, thus changing the flow through the valve. Each spool type is customized to provide the flow combination desired. The flow forces acting on the spool change depending on which port is pressurized. Thus, if you will be shifting the four way valve under full flow and pressure, it is important to review the shift limit characteristics for the flow paths you have chosen to ensure the coil has enough force to shift the spool. Various spools are shown in this catalog to maximize the flow and pressure capacities for the desired flow function.

Three Position, Four Way Spool Valve



Three position, four way spool solenoid valves provide directional control of flow. Each four way valve has a special internal spool which connects some combination of the four ports together. When one coil is actuated, the spool connects a different combination of valve ports. When the other coil is actuated a third combination of valve ports are connected. These valves are often used for the raise / lower function of a double acting cylinder, or as a forward / reverse function of bi-directional motors. The center position can be used to stop the actuator in mid-stroke, or dump the pump flow.



OPERATION - In the de-energized mode, the spool is positioned by spring force. When energized, the coil force directly shifts the against the spring, thus changing the flow through the valve. Each spool type is customized to provide the flow combination desired. The flow forces acting on the spool change depending on which port is pressurized. Thus, if you will be shifting the four way valve under full flow and pressure, it is important to review the shift limit characteristics for the flow paths you chosen to ensure the coil has enough force to shift the spool. Various spools are shown in this catalog to maximize the flow and pressure capacities for the desired flow function.

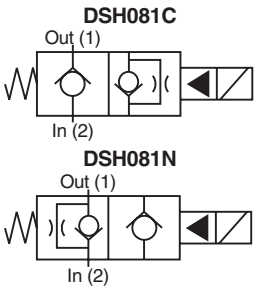
General Description

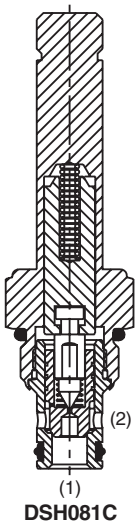
2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

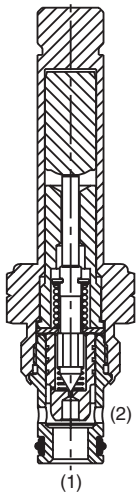
Features

- Replaceable, one piece encapsulated, coils with minimal amperage draw
- Variety of coil terminations and voltages
- Variety of manual override options available
- Polyurethane “D”-Ring eliminates need for backup rings
- Spherical poppet for low leakage
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated









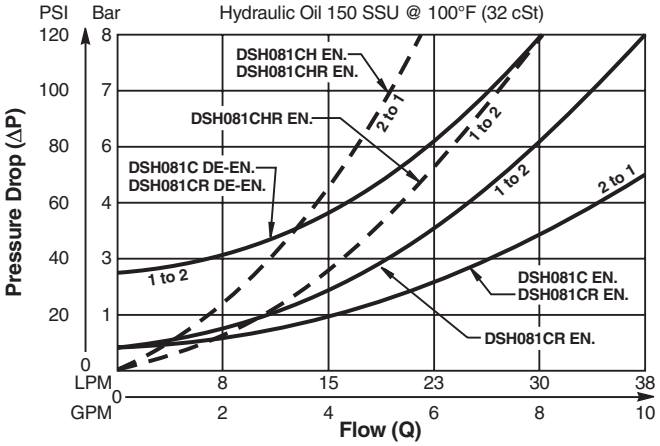
Specifications

Rated Flow	30 LPM (8 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Energized** / **De-Energized** **C, CR** 50 ms / 50 ms **N, NR** 50 ms / 40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.11 kg (.25 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

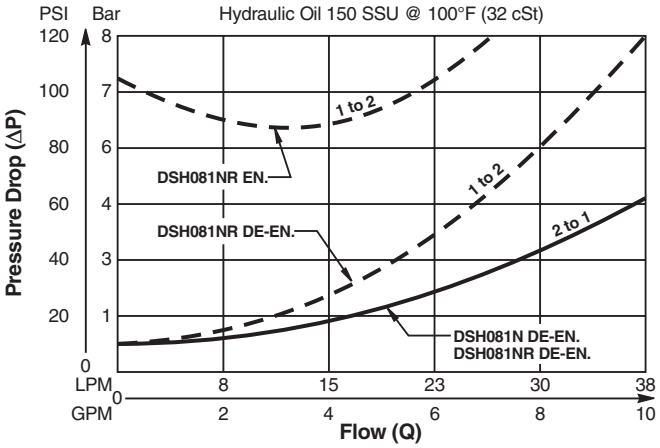
Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

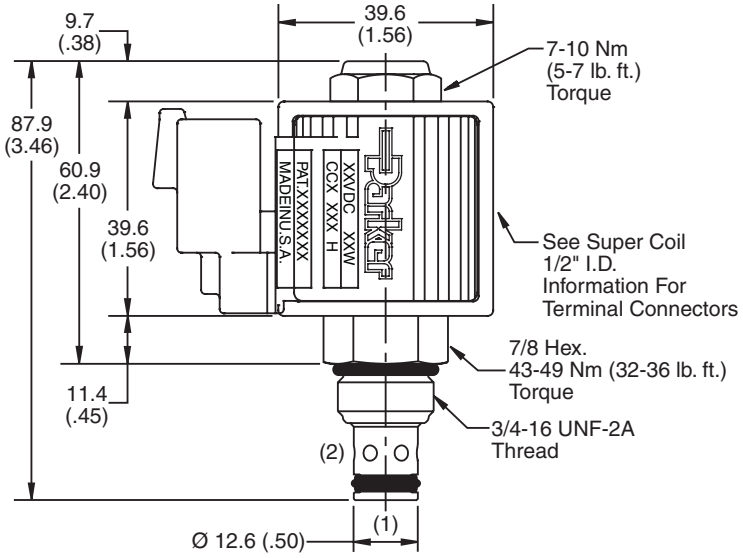
Normally Closed

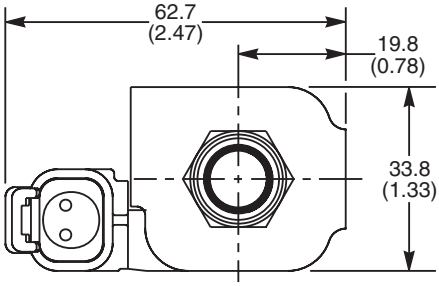


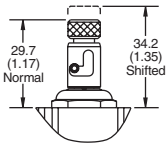
Normally Open



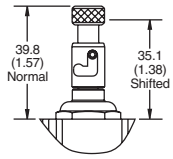
Dimensions Millimeters (Inches)



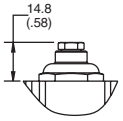




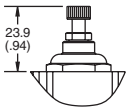
Push and Twist M.O.
(Normally Closed Valves Only)



Push and Twist M.O.
(Normally Open Valves Only)



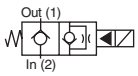
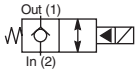
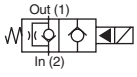
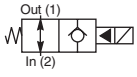
Flush M.O.
(Normally Open Valves Only)



Extended M.O.
(Normally Open Valves Only)

Ordering Information

DSH081			
08 Size Solenoid Valve	Style	Override Option	Screen

Code / Style	
C Normally Closed Metered reverse flow	
CR Normally Closed Free reverse flow	
N Normally Open Metered reverse flow	
NR Normally Open Free reverse flow	

Code	Override Options
Omit	None
E	Push Type with Extended Rod (N.O. Only)
M	Push Type with Flush Rod (N.O. Only)
T	Push & Twist (N.C.* & N.O.)

Order Bodies Separately
See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

Port Size
3/8″ BSP

Body Material
Steel

Code	Screen
Omit	None
S	Screen

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Seals / Kit No.	Operating Temp.
"D" -Ring / (SK08-2)	-37°C to +93°C (-35°F to +200°F)

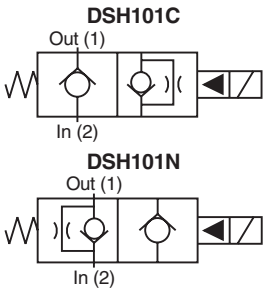
General Description

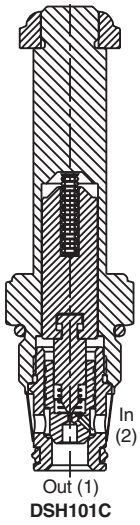
2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

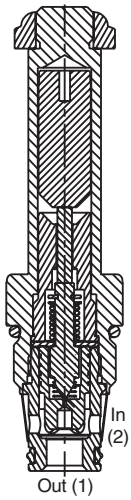
Features

- Low hysteresis
- Replaceable, one piece encapsulated coils with minimal amperage draw
- Various coil terminations and voltages
- Various manual override options
- Polyurethane "D"-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated









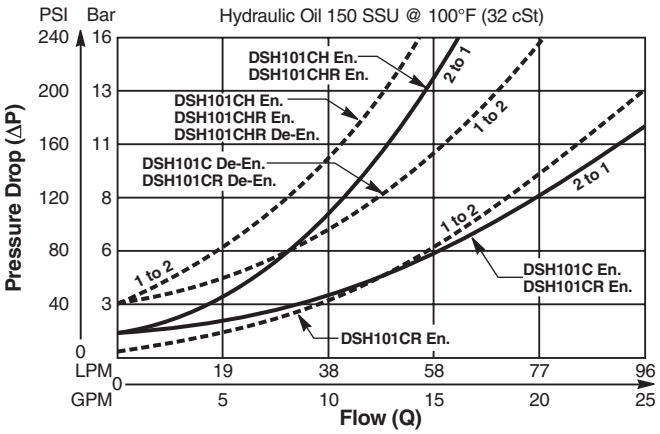
Specifications

Rated Flow	60 LPM (15 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Energized** / **De-Energized** **C, CR** 80 ms / 150 ms **N, NR** 70 ms / 35 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.20 kg (0.41 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

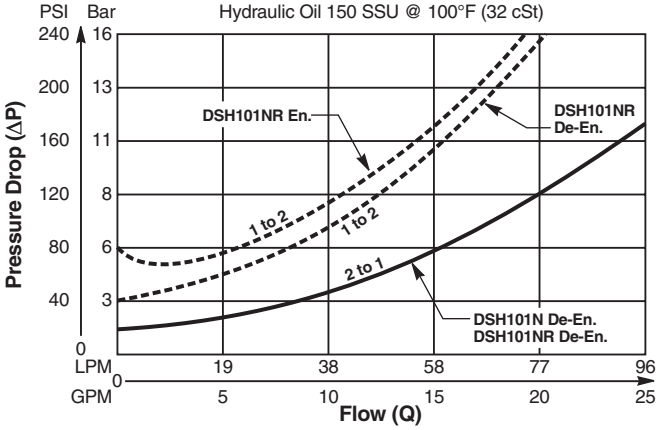
Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Normally Closed

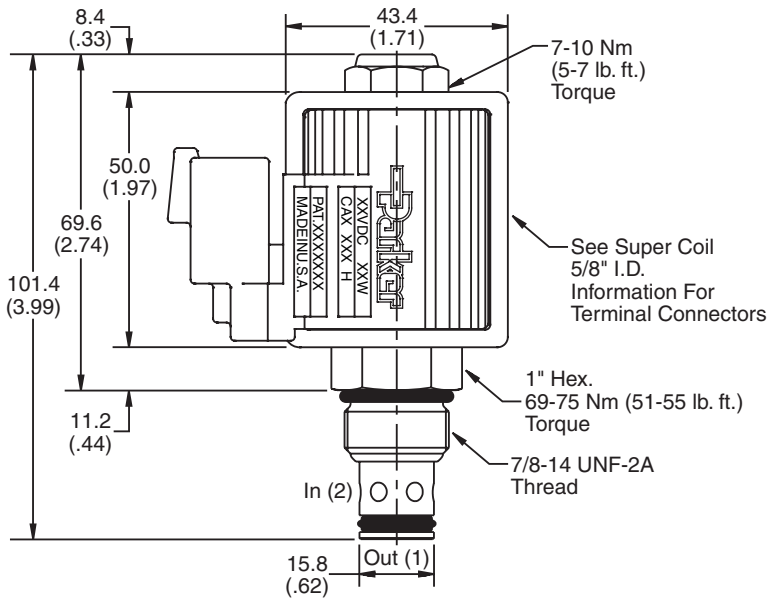


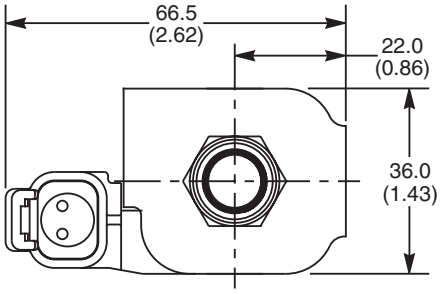
Normally Open

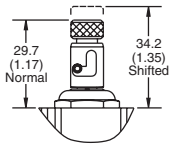


Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

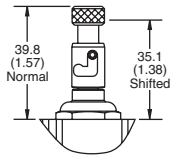
Dimensions Millimeters (Inches)



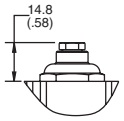




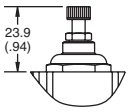
Push and Twist M.O.
(Normally Closed Valves Only)



Push and Twist M.O.
(Normally Open Valves Only)



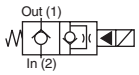
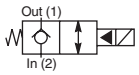
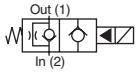
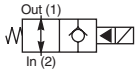
Flush M.O.
(Normally Open Valves Only)



Extended M.O.
(Normally Open Valves Only)

Ordering Information

DSH101			
10 Size Solenoid Valve	**Style**	**Override Option**	**Screen**

Code / Style	
C Normally Closed Metered reverse flow	
CR Normally Closed Free reverse flow	
N Normally Open Metered reverse flow	
NR Normally Open Free reverse flow	

Code	Override Options
Omit	None
E	Push Type with Extended Rod (N.O. Only)
M	Push Type with Flush Rod (N.O. Only)
T	Push & Twist (N.C. & N.O.)

Code	Screen
Omit	None
S	Screen

Seals / Kit No.	Operating Temp.
"D" -Ring / (SK10-2)	-37°C to +93°C (-35°F to +200°F)

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

Order Bodies Separately
See section BC

B10	—	2	—	8B
10 Size		**2-Way Cavity**		**Port Size**

Port Size
1/2" BSP

Body Material
Steel

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

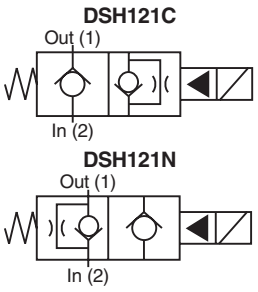
General Description

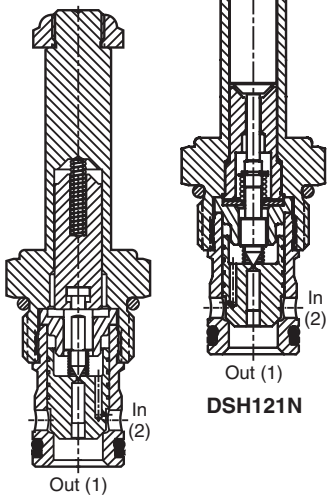
2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

- Low hysteresis
- Replaceable, one piece encapsulated coils with minimal amperage draw
- Various coil terminations and voltages
- Various manual override options
- All external parts zinc plated







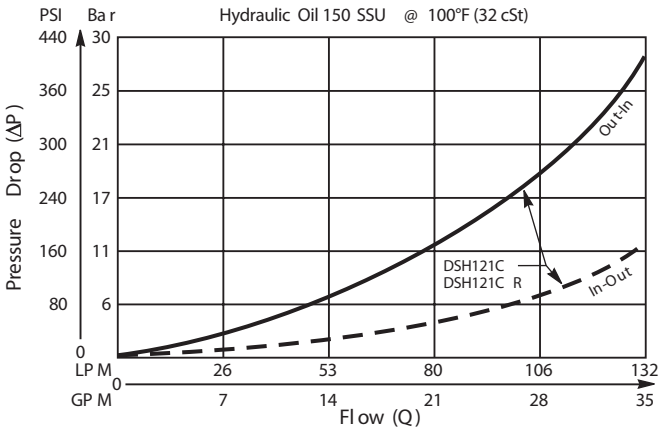
Specifications

Rated Flow	90 LPM (24 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Energized** / **De-Energized** **C, CR** 100 ms / 150 ms **N, NR** 70 ms / 150 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.29 kg (.65 lbs.)
Cavity	C12-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT12-2F

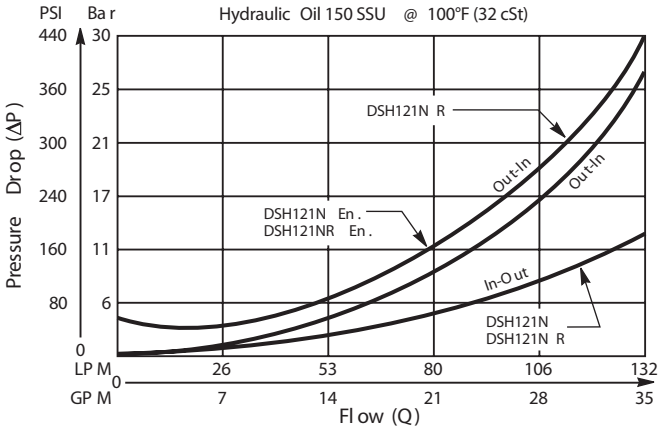
Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Normally Closed

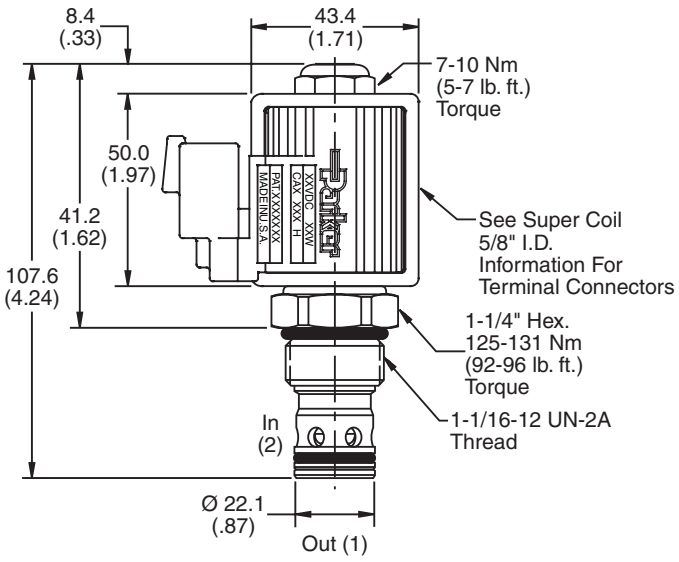


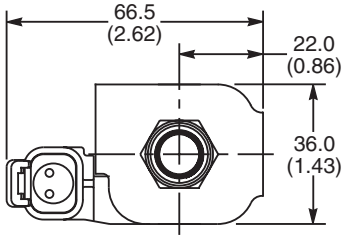
Normally Open

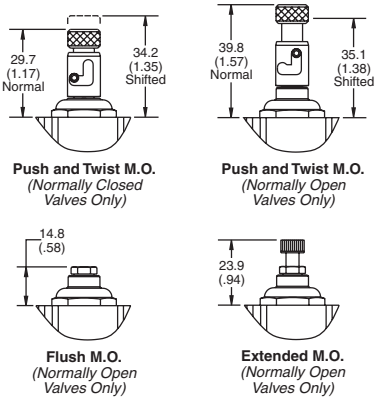


Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)

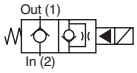
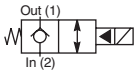
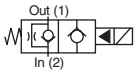
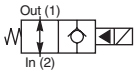






Ordering Information

DSH121		
12 Size Solenoid Valve	Style	Override Option

Code / Style	
C Normally Closed Metered reverse flow	
CR Normally Closed Free reverse flow	
N Normally Open Metered reverse flow	
NR Normally Open Free reverse flow	

Code	Override Options
Omit	None
E	Push Type with Extended Rod (N.O. Only)
M	Push Type with Flush Rod (N.O. Only)
T	Push & Twist (N.C. & N.O.)

Order Bodies Separately
See section BC

B12	—	2	—	12T
12 Size		2-Way Cavity		Port Size

Port Size
SAE 12

Body Material
Steel

Seals / Kit No.	Operating Temp.
Nitrile / (SK12-2)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

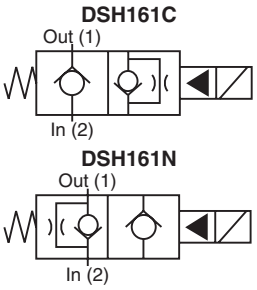
General Description

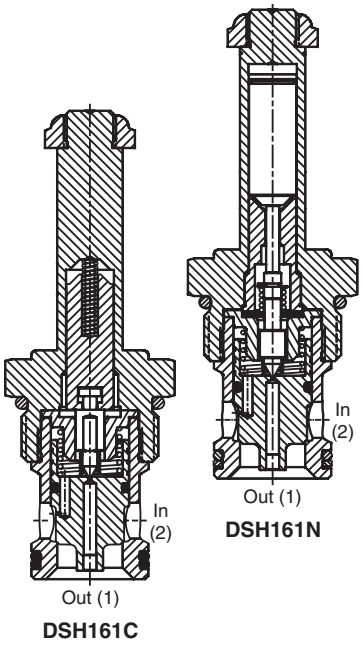
2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

- Replaceable, one piece encapsulated coils with minimal amperage draw
- Various coil terminations and voltages
- Various manual override options
- All external parts zinc plated
- New 350 Bar (5000 PSI) rating







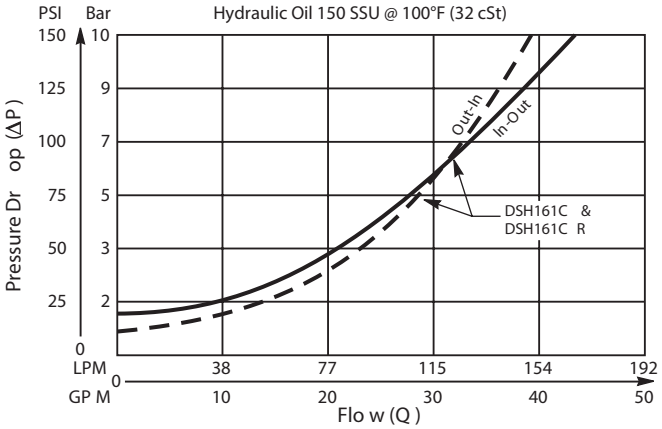
Specifications

Rated Flow	150 LPM (40 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Energized** / **De-Energized** **C, CR** 50 ms / 130 ms **N, NR** 45 ms / 75 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.34 kg (.75 lbs.)
Cavity	C16-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT16-2F

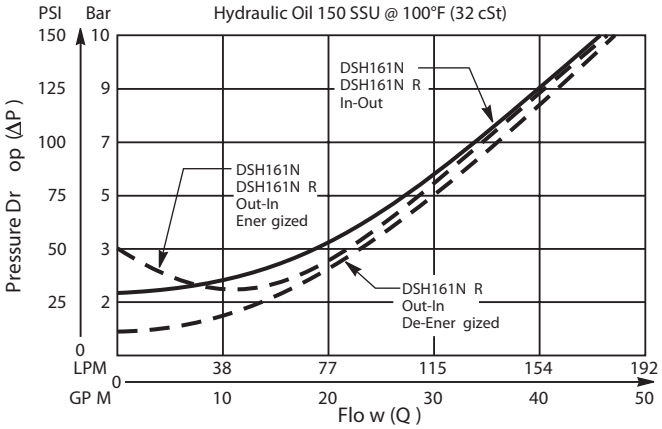
Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Normally Closed

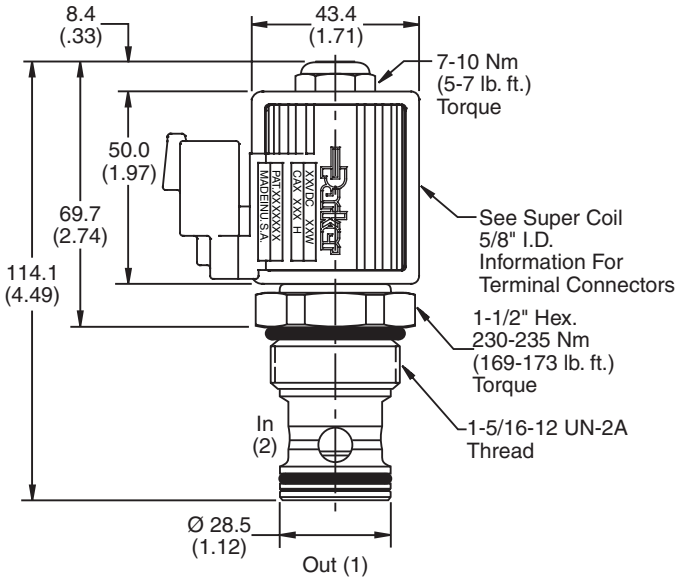


Normally Open

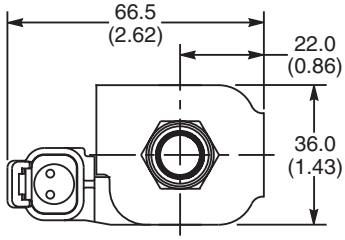


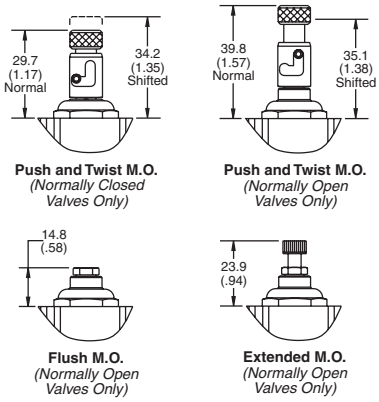
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



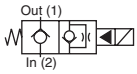
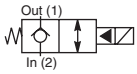
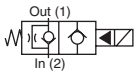
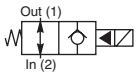
Normally Closed





Ordering Information

DSH161		
16 Size Solenoid Valve	Style	Override Option

Code / Style	
C Normally Closed Metered reverse flow	
CR Normally Closed Free reverse flow	
N Normally Open Metered reverse flow	
NR Normally Open Free reverse flow	

Code	Override Options
Omit	None
E	Push Type with Extended Rod (N.O. Only)
M	Push Type with Flush Rod (N.O. Only)
T	Push & Twist (N.C. & N.O.)

Order Bodies Separately
See section BC

B16	—	2	—	16B
16 Size		2-Way Cavity		Port Size

Port Size
1″ BSP

Body Material
Steel

Seals / Kit No.	Operating Temp.
Nitrile / (SK16-2)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

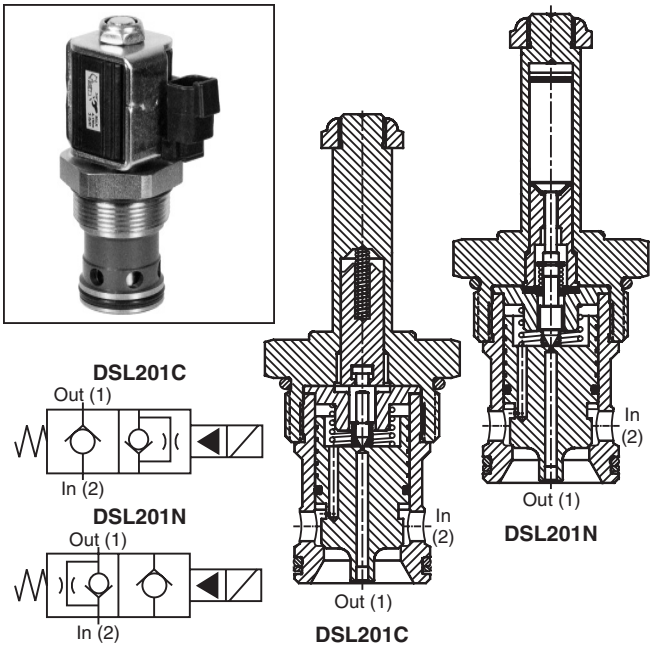
Coil Type	
CAP	Super Coil - 28w

General Description

2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

- Replaceable, one piece encapsulated coils with minimal amperage draw
- Various coil terminations and voltages
- Various manual override options
- All external parts zinc plated
- New 250 Bar (3600 PSI) rating

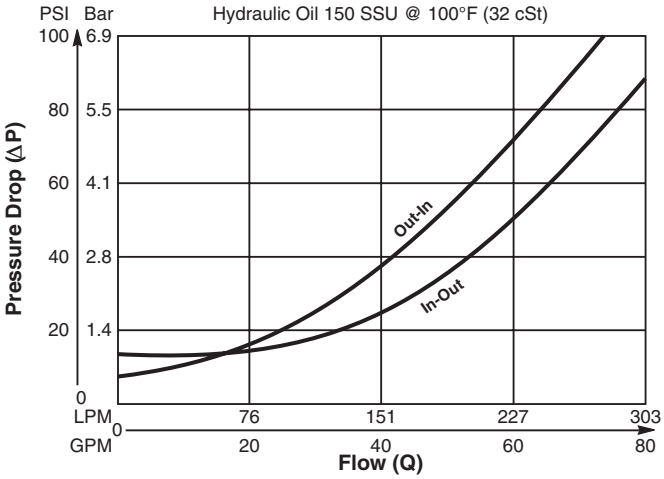


Specifications

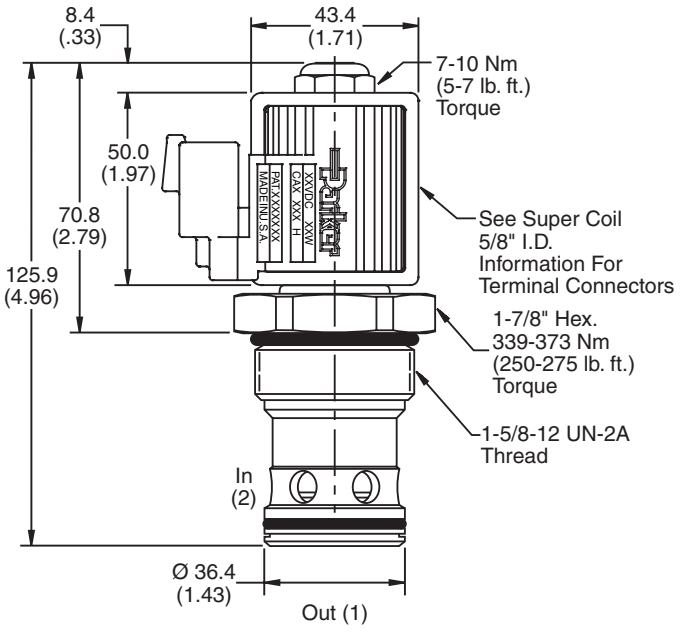
Rated Flow	260 LPM (70 GPM)
Maximum Inlet Pressure	250 Bar (3600 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Energized** / **De-Energized** **C, CR** 350 ms / 160 ms **N, NR** 300 ms / 45 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.34 kg (.75 lbs.)
Cavity	C20-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT20-2F

Performance Curve

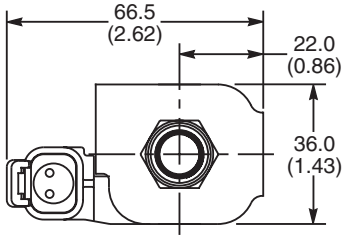
Pressure Drop vs. Flow (Through cartridge only)

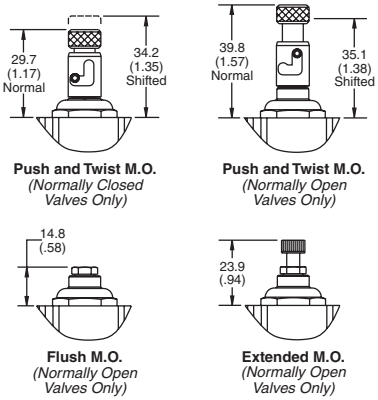


Dimensions Millimeters (Inches)



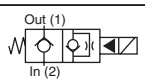
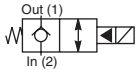
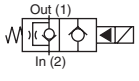
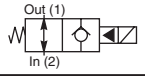
Normally Closed





Ordering Information

DSL201		
20 Size Solenoid Valve	Style	Override Option

Code / Style	
C Normally Closed Metered reverse flow	
CR Normally Closed Free reverse flow	
N Normally Open Metered reverse flow	
NR Normally Open Free reverse flow	

Code	Override Options
Omit	None
E	Push Type with Extended Rod (N.O. Only)
M	Push Type with Flush Rod (N.O. Only)
T	Push & Twist (N.C. & N.O.)

Order Bodies Separately
See section BC

B20	—	2	—	20T
20 Size		2-Way Cavity		Port Size

Port Size
SAE 20

Body Material
Steel

Seals / Kit No.	Operating Temp.
Nitrile / (SK20-2N)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

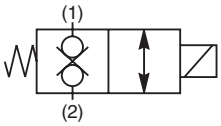
General Description

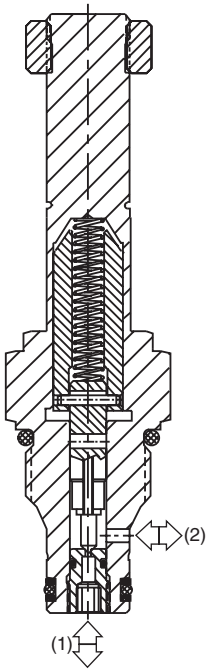
2-Way, 2 Position, Normally Closed Poppet Valve. Bi-Directional Direct Acting. For additional information see Technical Tips on pages SV1-SV6.

Features

- Fast Response
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 04 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.





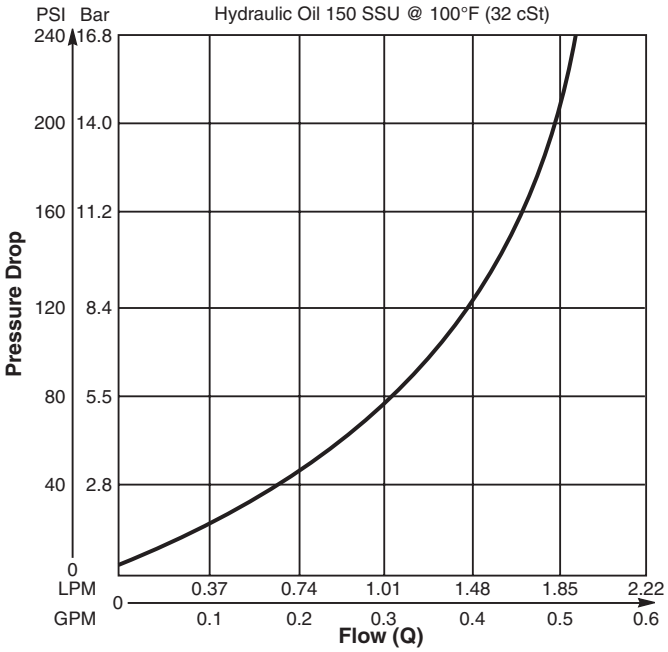


Specifications

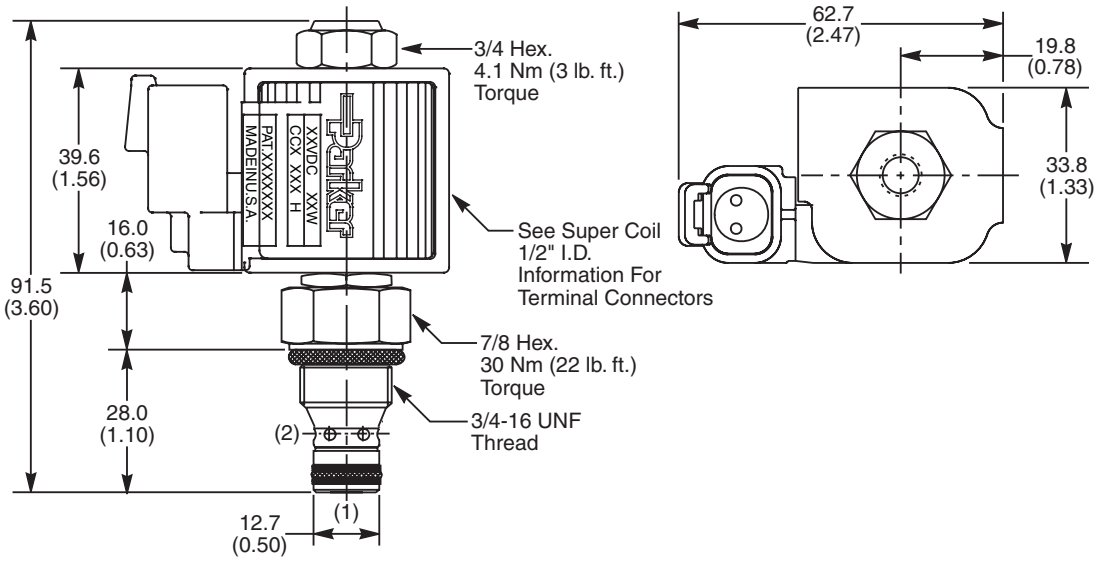
Rated Flow	1.7 LPM (0.45 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 10 ms **Close** 10 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C08-2 (See BC Section for more details)

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

GS02	72			N
08 Size Solenoid Valve	Style Normally Closed	Override Option	Screen	Seals

Code	Override Options
0	None

Code	Screen
0	None
1	60 Mesh Screen

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30088N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

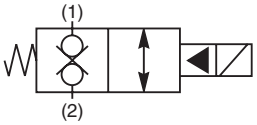
Port Size
3/8″ BSP

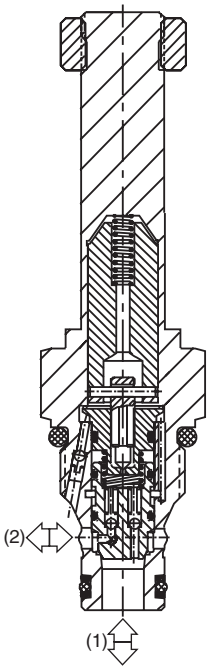
Body Material
Steel

General Description

2-Way, 2 Position, Normally Closed, Bi-Directional Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.







Features

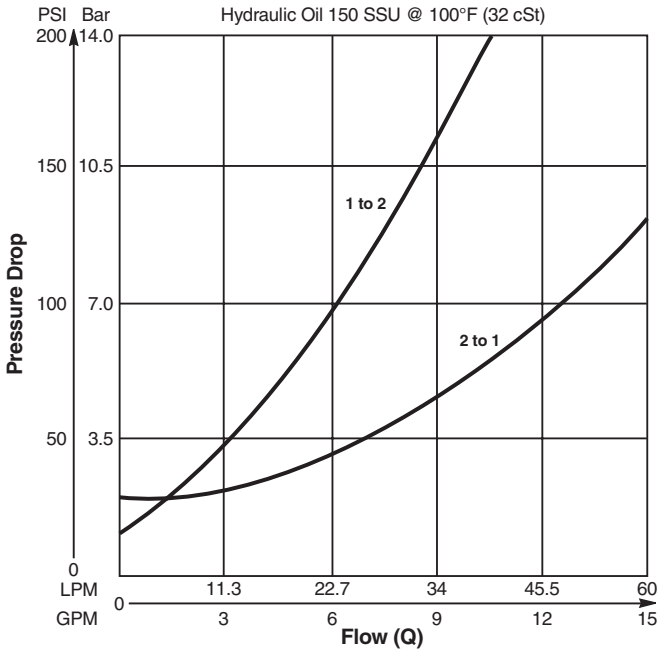
- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 04 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.

Specifications

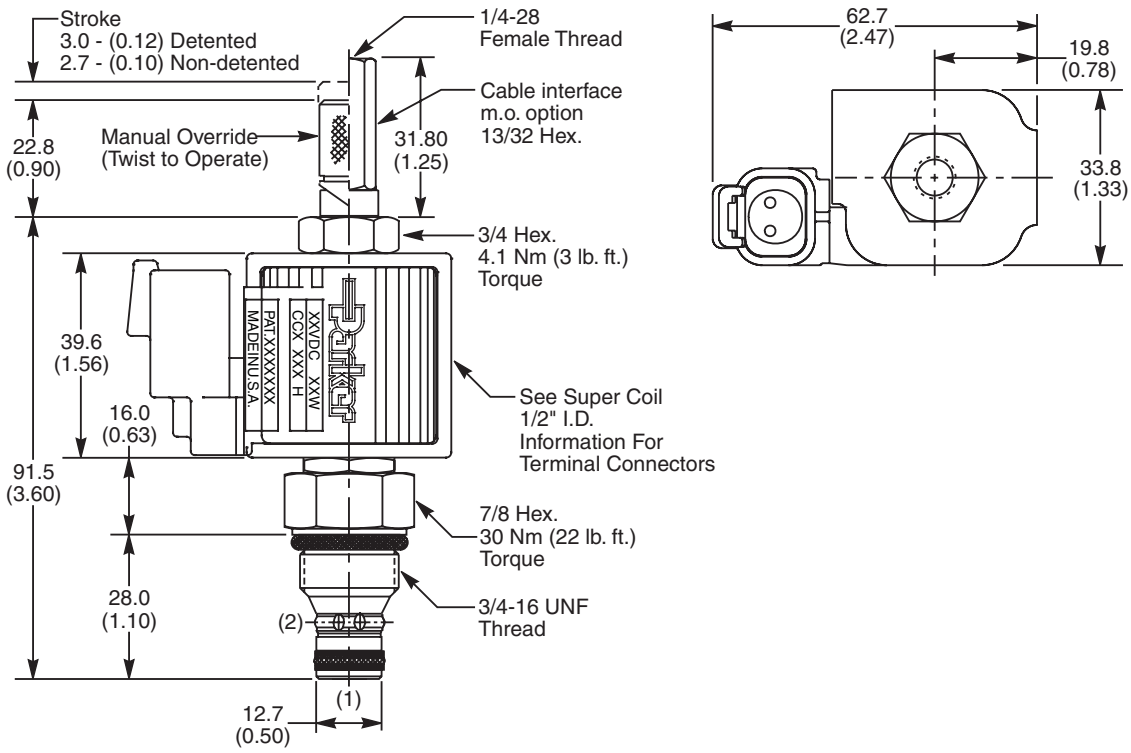
Rated Flow	**2 to 1** 34 LPM (9 GPM) **1 to 2** 19 LPM (5 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 40 ms **Close** 40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C08-2 (See BC Section for more details)

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

GS02	81			N
08 Size Solenoid Valve	Style Normally Closed	Override Option	Screen	Seals

Code	Style
81	High Pressure ('SP' Coil)

Code	Override Options
0	None
1	Detented
2	Non-Detented

Code	Screen
0	None
1	60 Mesh Screen

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30088N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

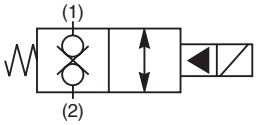
Port Size
3/8" BSP

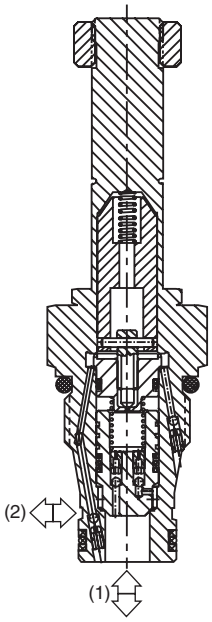
Body Material
Steel

General Description

2-Way, 2 Position, Normally Closed, Bi-Directional Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.







Features

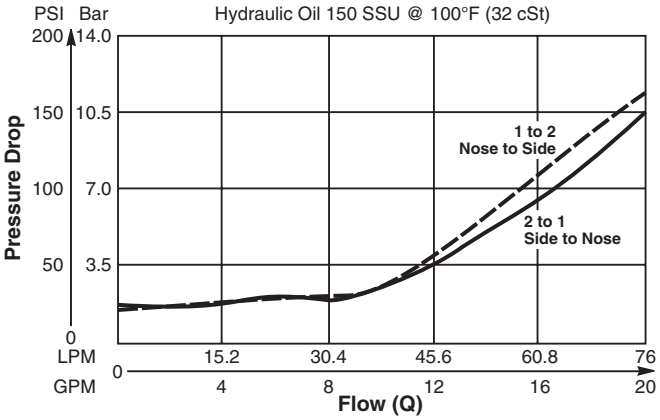
- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 02 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.

Specifications

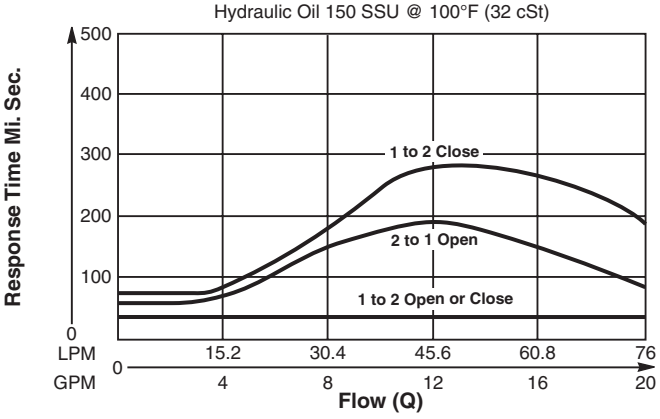
Rated Flow	**2 to 1** 68 LPM (18 GPM) **1 to 2** 46 LPM (12 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	See Performance Curves
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.17 kg (.37 lbs.)
Cavity	2R (See BC Section for more details)

Performance Curves

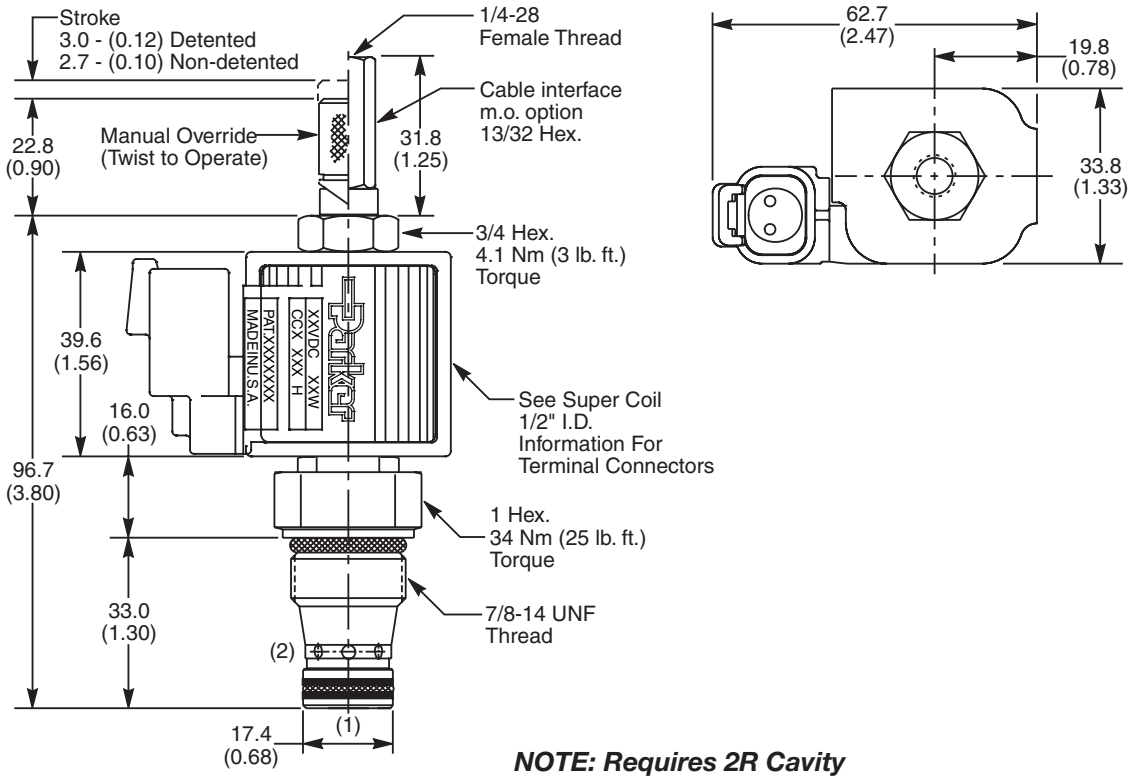
Pressure Drop vs. Flow (Through cartridge only)



Response Time vs. Flow



Dimensions Millimeters (Inches)



NOTE: Requires 2R Cavity

Ordering Information

GS04	81			N
10 Size Solenoid Valve	Style Normally Closed	Override Option	Screen	Seals

Code	Style
81	High Pressure ('SP' Coil)

Code	Override Options
0	None
1	Detented
2	Non-Detented

Code	Screen
0	None

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30113N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

LB10	545	S
Line Body	Porting	Body Material

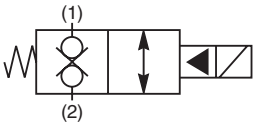
Code	Porting
545	1/2" BSP

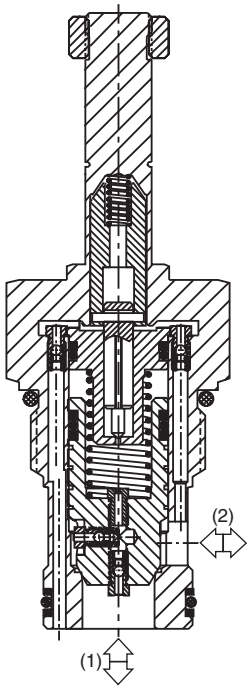
Code	Body Material
S	Steel

General Description

2-Way, 2 Position, Normally Closed, Bi-Directional Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.







Features

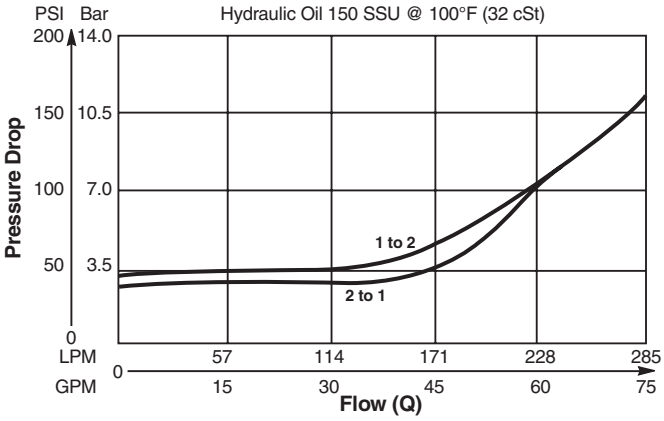
- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 02 and 04 series poppet valves; Symmetrical coil can be reversed without affecting performance.

Specifications

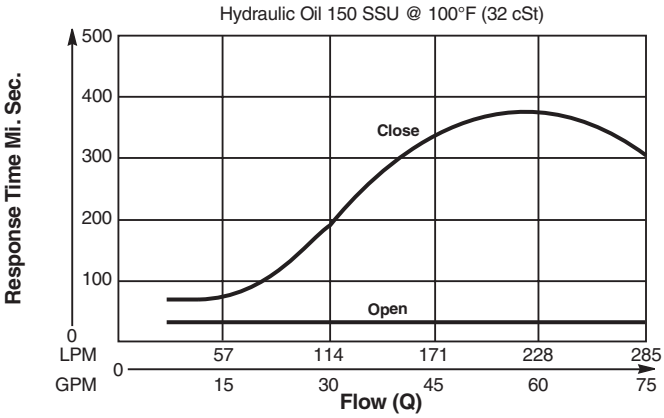
Rated Flow	285 LPM (75 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	9 drops/min. (.58 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	See Performance Curves
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	0.4 kg (.88 lbs.)
Cavity	C16-2 (See BC Section for more details)

Performance Curves

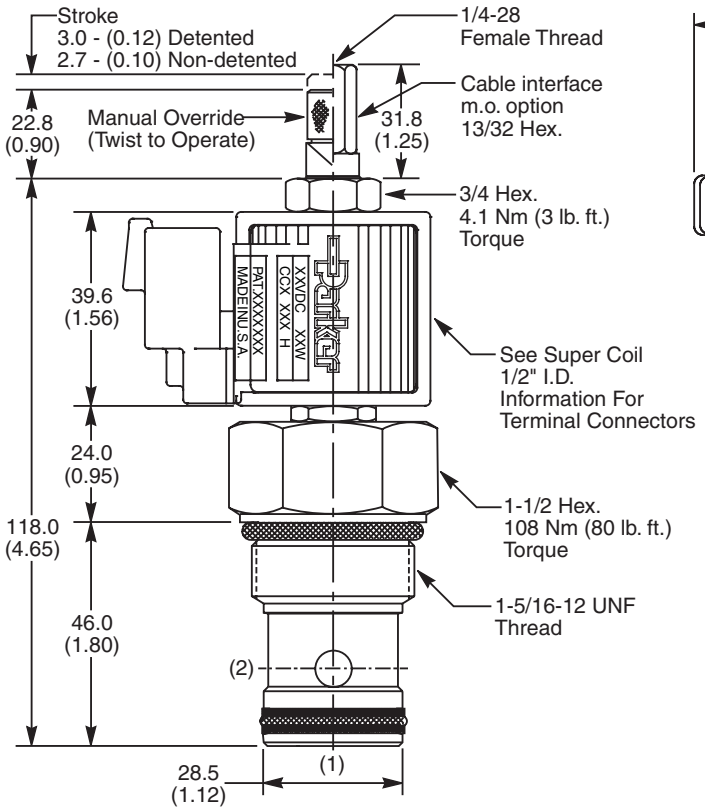
Pressure Drop vs. Flow (Through cartridge only)

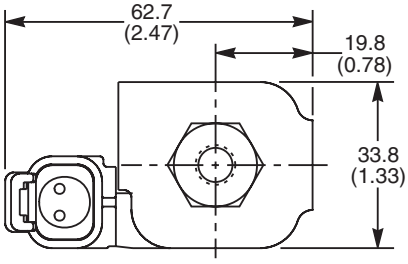


Response Time vs. Flow



Dimensions Millimeters (Inches)





Ordering Information

GS06	81			N
16 Size Solenoid Valve	Style Normally Closed	Override Option	Screen	Seals

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

B16	—	2	—	16B
16 Size		2-Way Cavity		Port Size

Code	Style
81	High Pressure ('SP' Coil)

Code	Override Options
0	None
1	Detented
2	Non-Detented

Code	Screen
0	None

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30089N-1)	-34°C to +121°C (-30°F to +250°F)

Port Size
1″ BSP

Body Material
Steel

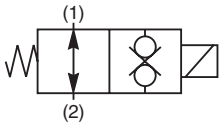
General Description

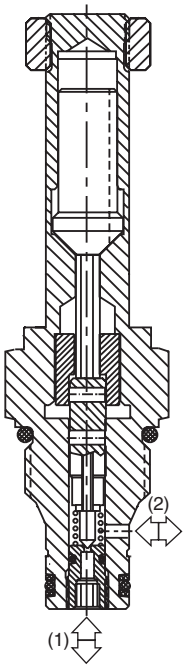
2-Way, 2 Position, Normally Open Poppet Valve. Bi-Directional Direct Acting. For additional information see Technical Tips on pages SV1-SV6.

Features

- Fast Response
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 04 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.





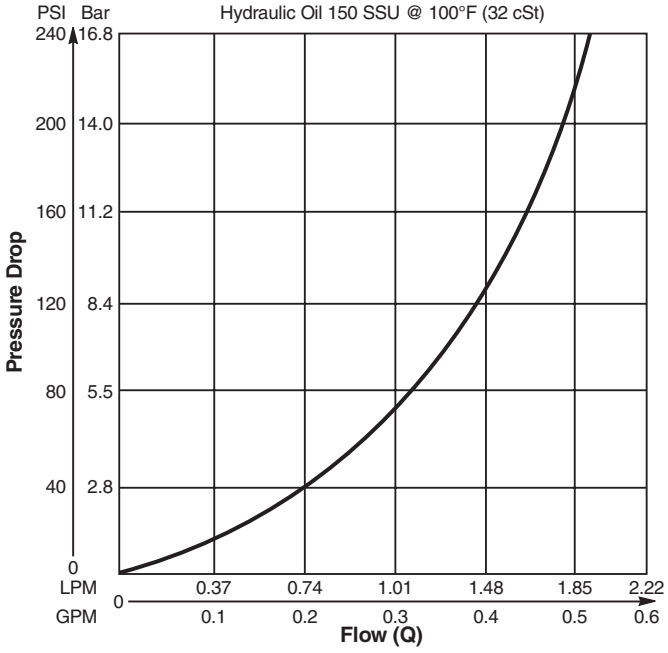


Specifications

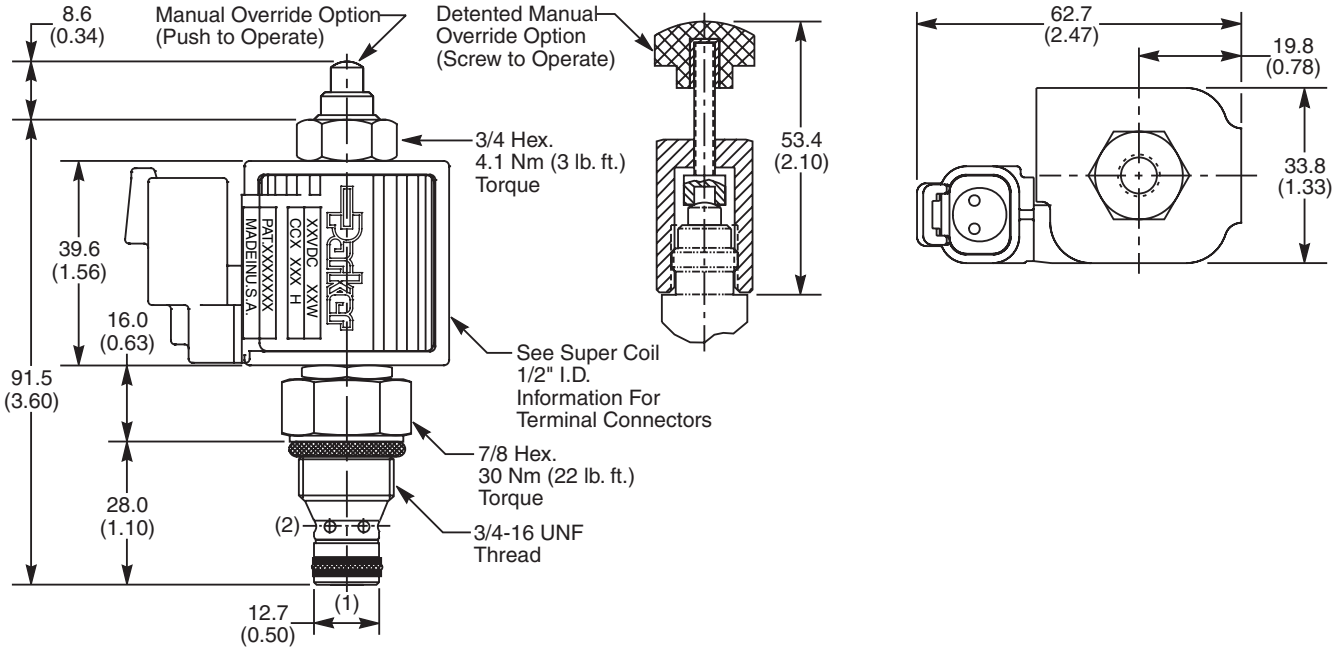
Rated Flow	1.7 LPM (0.45 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 10 ms **Close** 10 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C08-2 (See BC Section for more details

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

GS02	77			N
08 Size Solenoid Valve	Style Normally Open	Override Option	Screen	Seals

Code	Style
77	Standard ('SP' Coil)

Code	Override Options
0	None
1	Manual Override
2	Detented Part No. 900690

Code	Screen
0	None
1	60 Mesh Screen

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30088N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

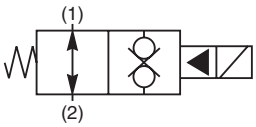
Port Size
3/8" BSP

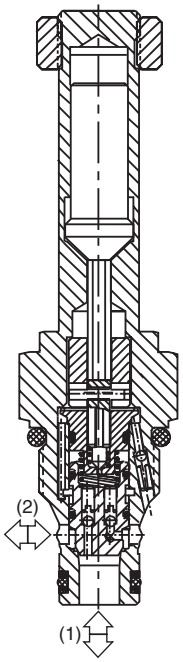
Body Material
Steel

General Description

2-Way, 2 Position, Normally Open, Bi-Directional Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.







Features

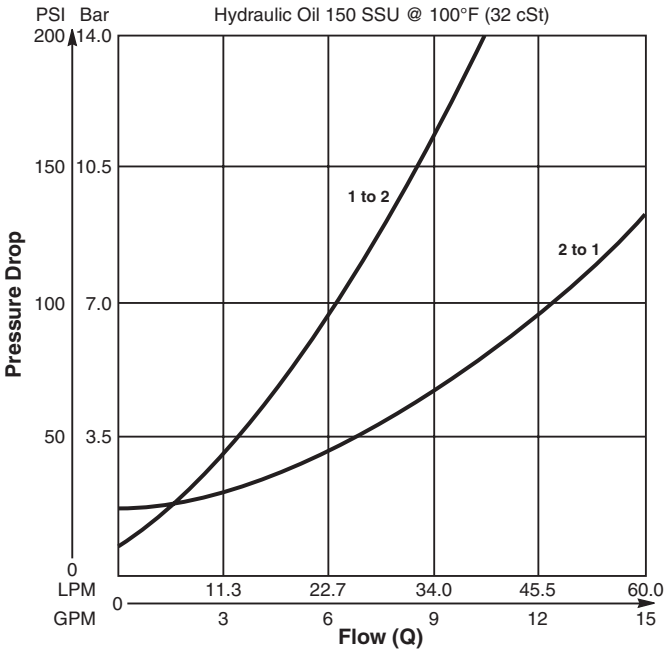
- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 04 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.

Specifications

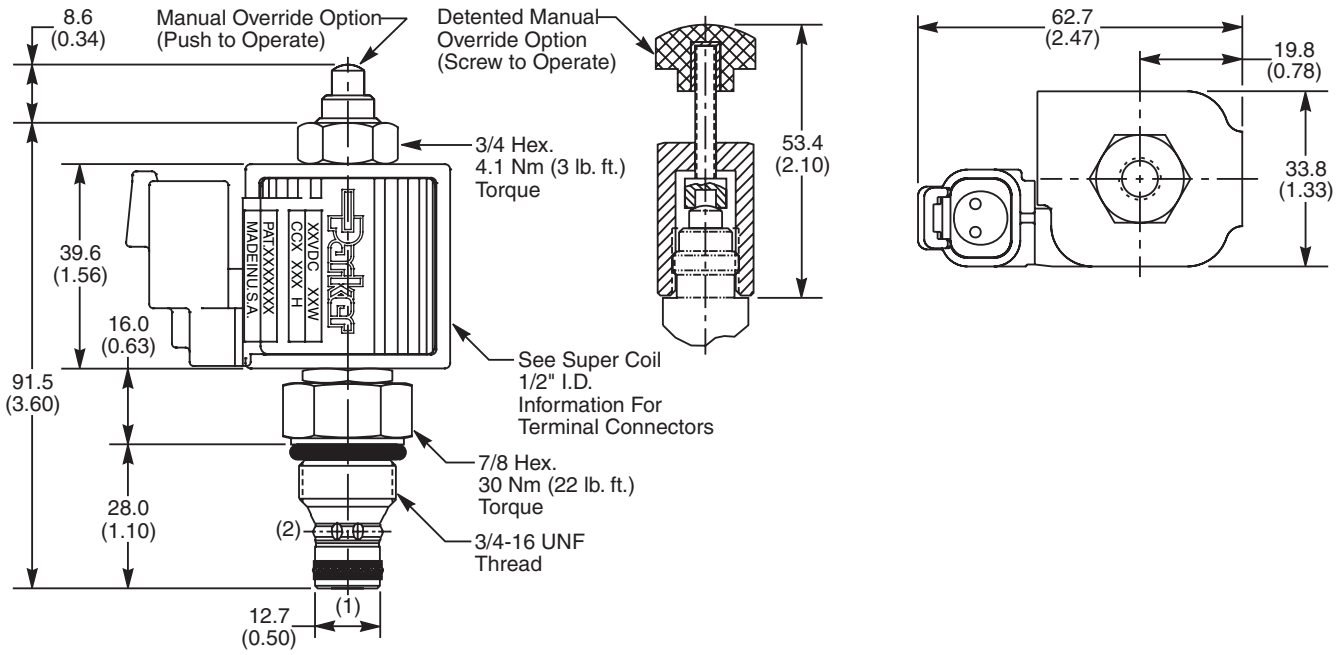
Rated Flow	**2 to 1** 34 LPM (9 GPM) **1 to 2** 19 LPM (5 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 40 ms **Close** 40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C08-2 (See BC Section for more details)

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

GS02	86			N
08 Size Solenoid Valve	Style Normally Open	Override Option	Screen	Seals

Code	Style
86	High Pressure ('SP' Coil)

Code	Override Options
0	None
1	Manual Override
2	Detented Part No. 900690

Code	Screen
0	None

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30088N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

Port Size
3/8" BSP

Body Material
Steel

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

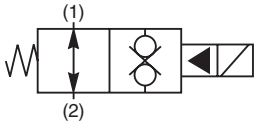
General Description

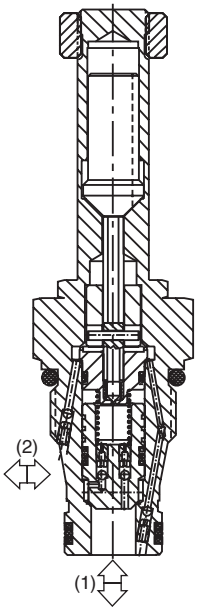
2-Way, 2 Position, Normally Open, Bi-Directional Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 02 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.





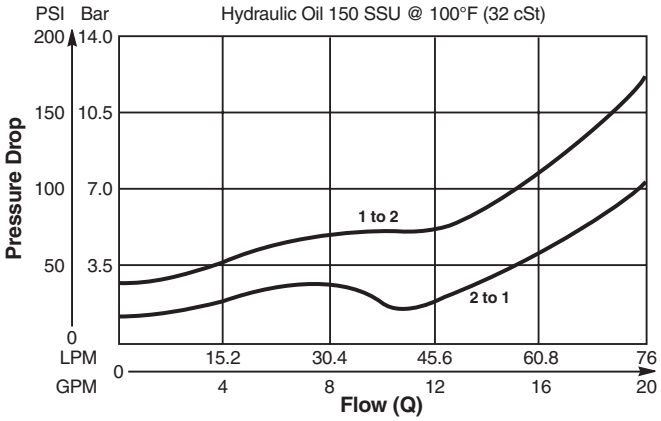


Specifications

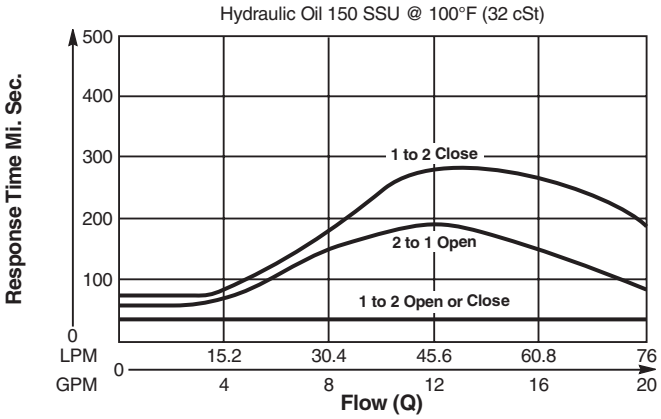
Rated Flow	**2 to 1** 68 LPM (18 GPM) **1 to 2** 46 LPM (12 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	See Performance Curves
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4404 18/16/13, SAE Class 4
Approx. Weight	.17 kg (.37 lbs.)
Cavity	2R (See BC Section for more details)

Performance Curves

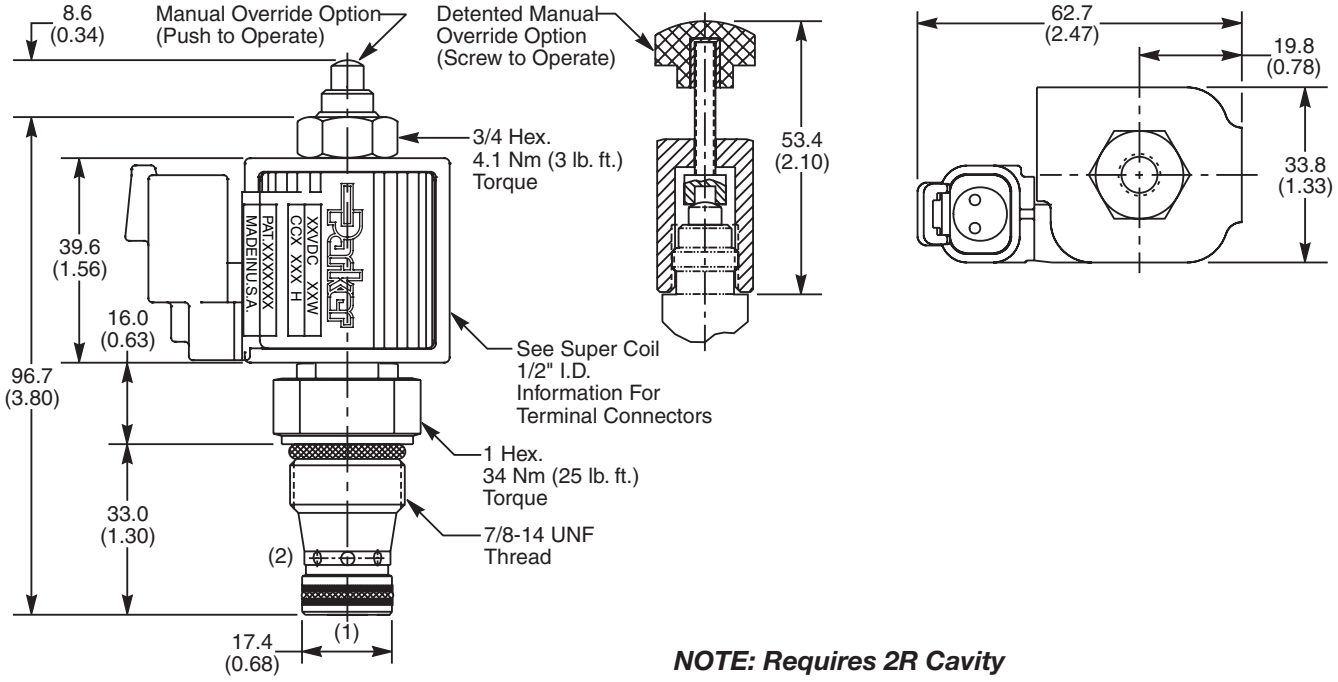
Pressure Drop vs. Flow (Through cartridge only)



Response Time vs. Flow



Dimensions Millimeters (Inches)



NOTE: Requires 2R Cavity

Ordering Information

GS04	86			N
10 Size Solenoid Valve	Style Normally Open	Override Option	Screen	Seals

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

LB10	545	S
Line Body	Porting	Body Material

Code	Style
86	High Pressure ('SP' Coil)

Code	Override Options
0	None
1	Manual Override
2	Detented Part No. 900690

Code	Screen
0	None

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30113N-1)	-34°C to +121°C (-30°F to +250°F)

Code	Porting
545	1/2" BSP

Code	Body Material
S	Steel

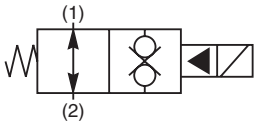
General Description

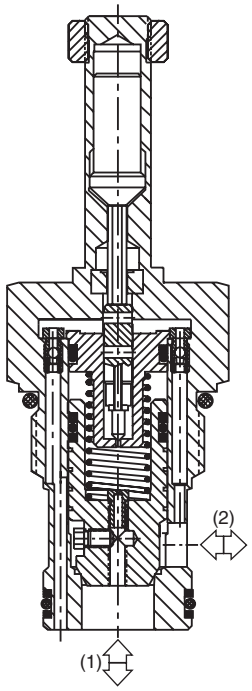
2-Way, 2 Position, Normally Open, Bi-Directional Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Coil is interchangeable with 02 and 04 series poppet valves; Symmetrical coil can be reversed without affecting performance.





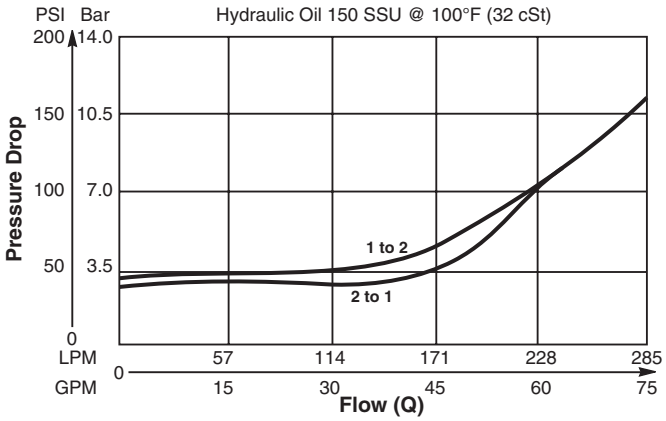


Specifications

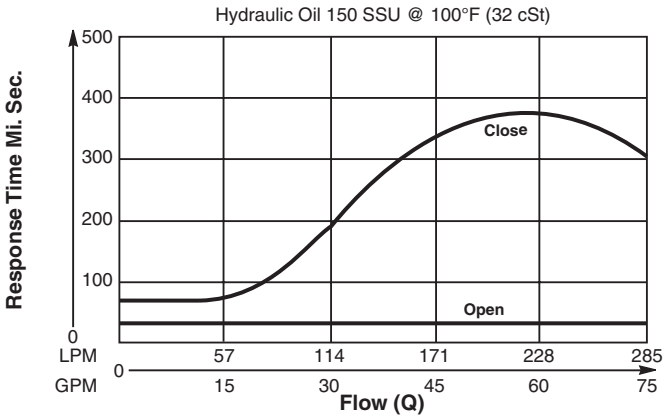
Rated Flow	285 LPM (75 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	5 drops/min. (.33 cc/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	See Performance Curves
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	0.4 kg (.88 lbs.)
Cavity	C16-2 (See BC Section for more details)

Performance Curves

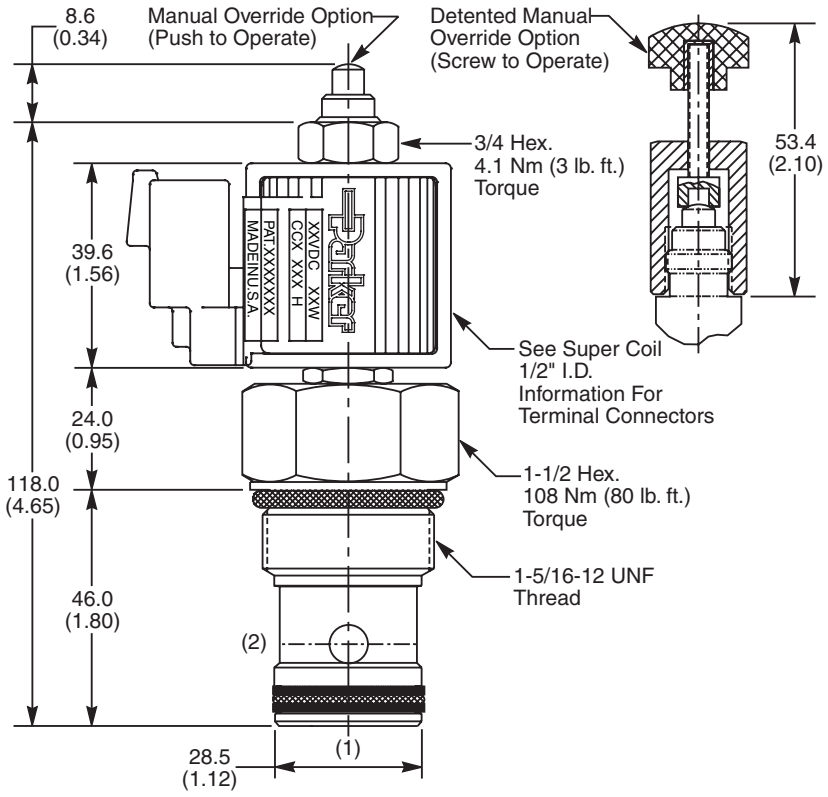
Pressure Drop vs. Flow (Through cartridge only)

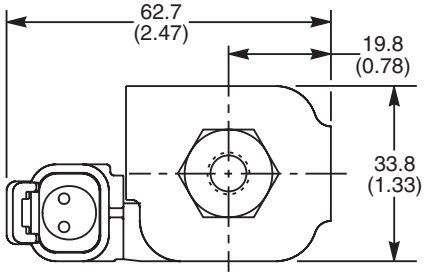


Response Time vs. Flow



Dimensions Millimeters (Inches)





Ordering Information

GS06	86			N
16 Size Solenoid Valve	Style Normally Open	Override Option	Screen	Seals

Code	Style
86	High Pressure ('SP' Coil)

Code	Override Options
0	None
1	Manual Override
2	Detented Part No. 900690

Code	Screen
0	None

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30089N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

B16	—	2	—	16B
16 Size		2-Way Cavity		Port Size

Port Size
1" BSP

Body Material
Steel

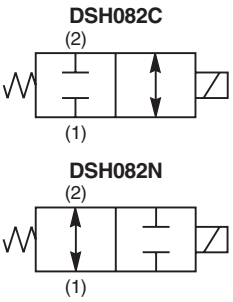
General Description

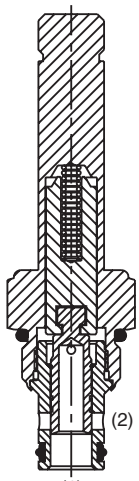
2-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

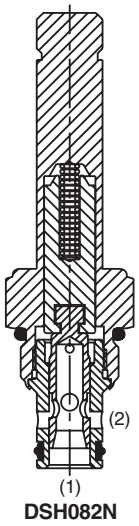
Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated







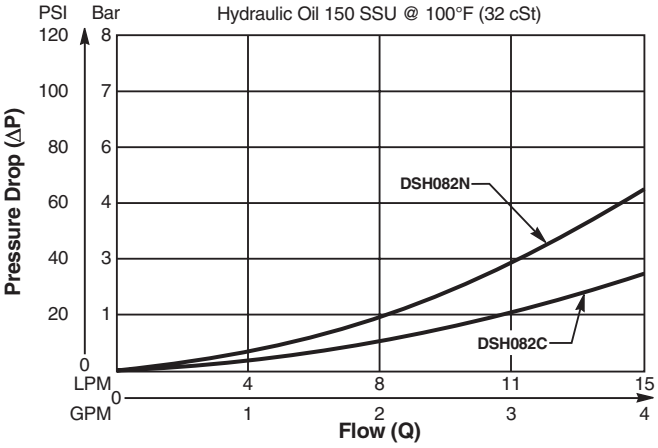


Specifications

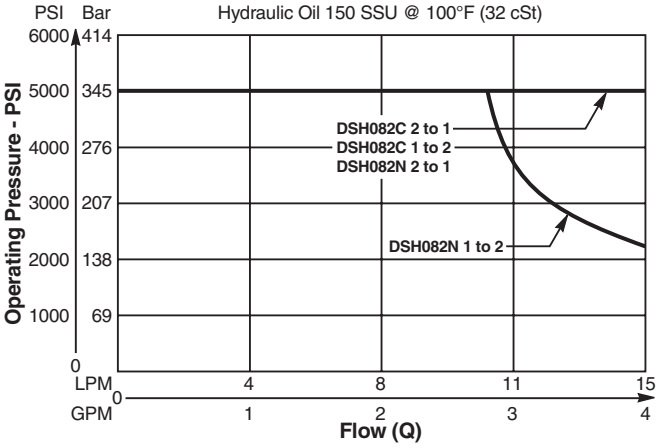
Rated Flow	**C -** 15.0 LPM (4 GPM) **N -** 8.4 LPM (2.8 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min. (10 in^3/min.) at 350 Bar (5000 PSI)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Energized** / **De-Energized** **C** 40 ms / 40 ms **N** 40 ms / 40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.11 kg (.25 lbs.)
Cavity	C08-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT08-2F

Performance Curves

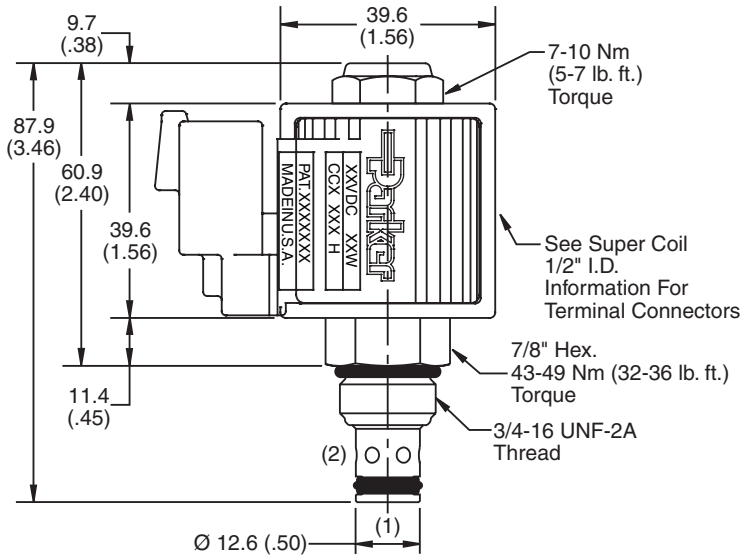
Pressure Drop vs. Flow (Through cartridge only)

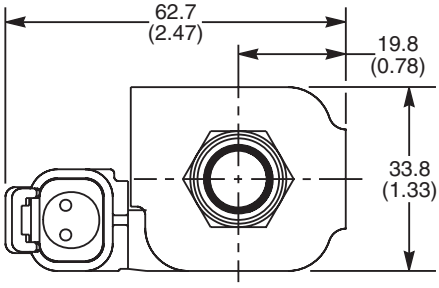


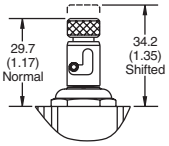
Shift Limit Characteristics (Min. Operating Voltage)



Dimensions Millimeters (Inches)



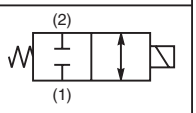
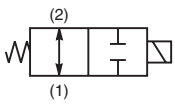




Push and Twist M.O.

Ordering Information

DSH082				
08 Size Solenoid Valve	Style	Override Option	Seals	Screen

Code / Style	
C Normally Closed	
N Normally Open	

Code	Seals / Kit No.	Operating Temp.
Omit	"D" -Ring / (SK08-2)	-37°C to +93°C (-35°F to +200°F)
N	Nitrile / (SK08-2N)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

Port Size
3/8" BSP

Body Material
Steel

Code	Override Options
Omit	None
T	Push & Twist* (N.C. & N.O.)

Code	Screen
Omit	None
S	Screen

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

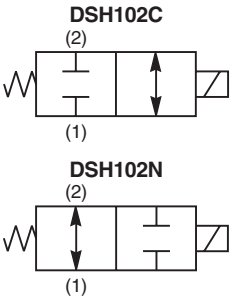
General Description

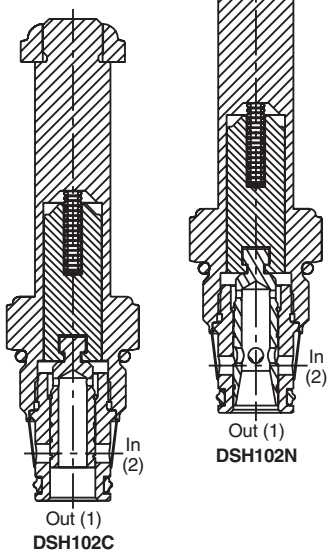
2-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated





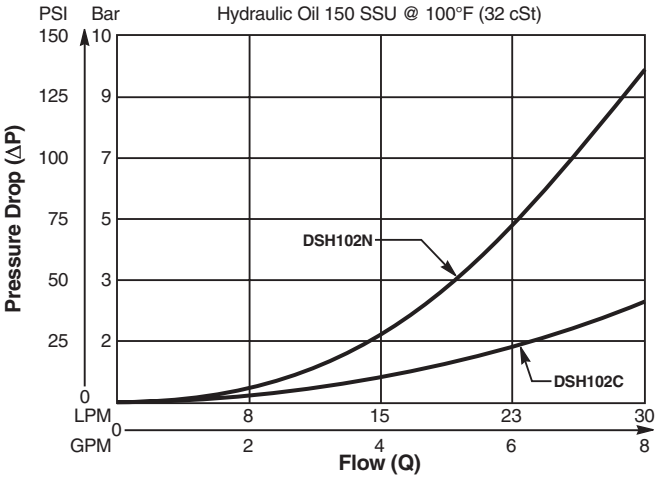


Specifications

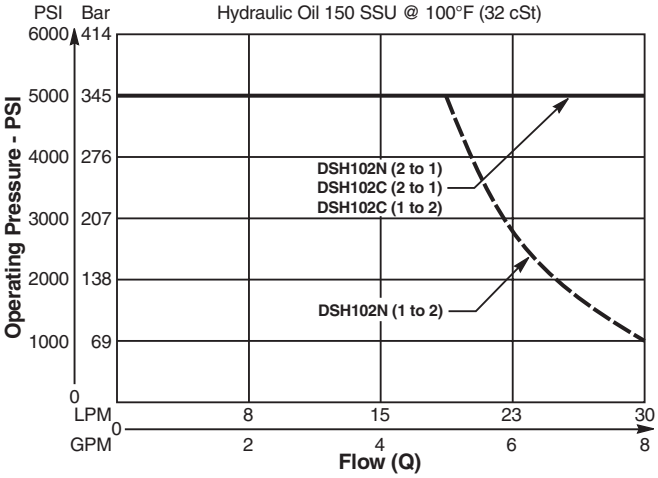
Rated Flow	**C** - 30 LPM (8.0 GPM) **N** - 19 LPM (5.0 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min. (10 in^3/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Energized** / **De-Energized** **C** 30 ms / 20 ms **N** 50 ms / 25 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.18 kg (.40 lbs.)
Cavity	C10-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT10-2F

Performance Curves

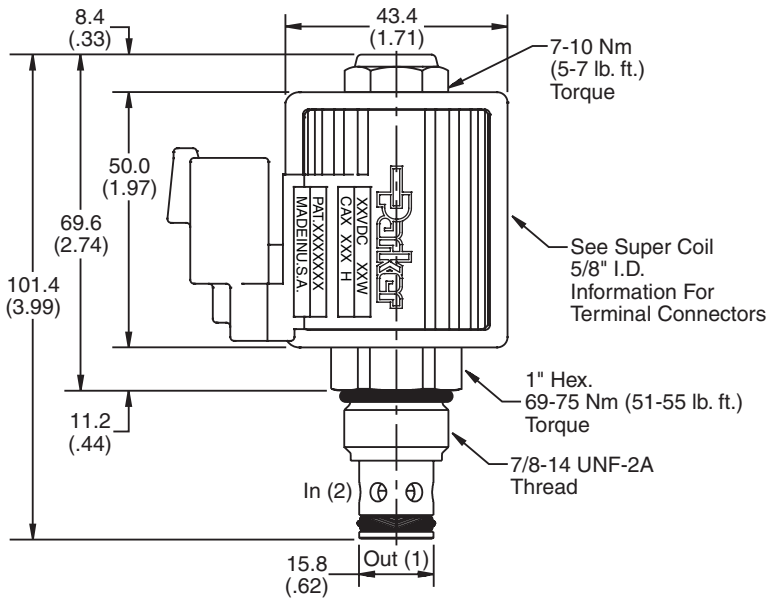
Pressure Drop vs. Flow (Through cartridge only)

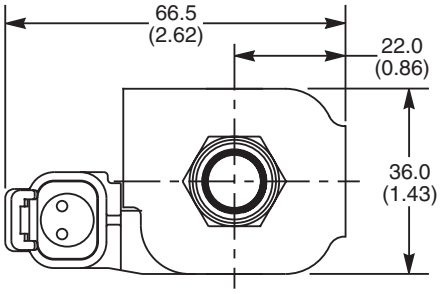


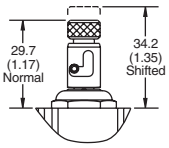
Shift Limit Characteristics (Min. Operating Voltage)



Dimensions Millimeters (Inches)



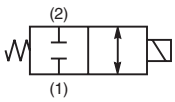
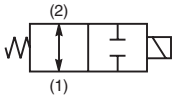




Push and Twist M.O.

Ordering Information

DSH102			N	
10 Size Solenoid Valve	Style	Override Option	Seals	Screen

Code / Style	
C Normally Closed	
N Normally Open	

Code	Override Options
Omit	None
T	Push & Twist (N.C. & N.O.)

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

Code	Seals / Kit No.	Operating Temp.
Omit	"D" -Ring / (SK10-2)	-37°C to +93°C (-35°F to +200°F)
N	Nitrile / (SK10-2N)	-34°C to +121°C (-30°F to +250°F)

Code	Screen
Omit	None
S	Screen

Order Bodies Separately
See section BC

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

Port Size
1/2" BSP

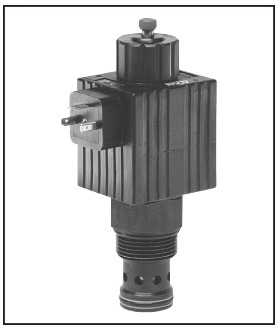
Body Material
Steel

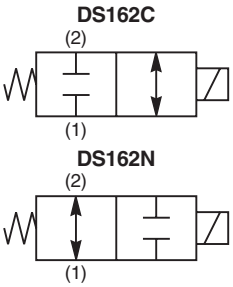
General Description

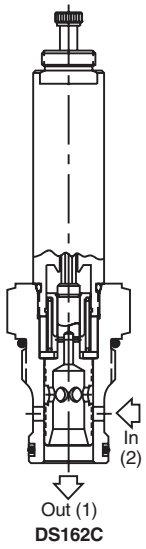
2-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

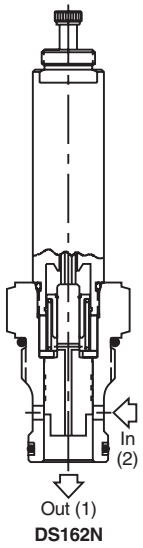
Features

- Low hysteresis
- One-piece encapsulated coil with minimal amperage draw
- Variety of coil terminations and voltages
- Manual override standard (push and release)
- All external parts zinc plated







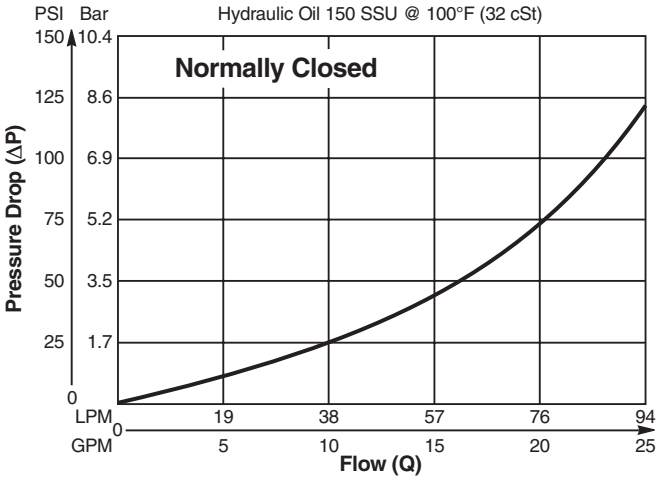


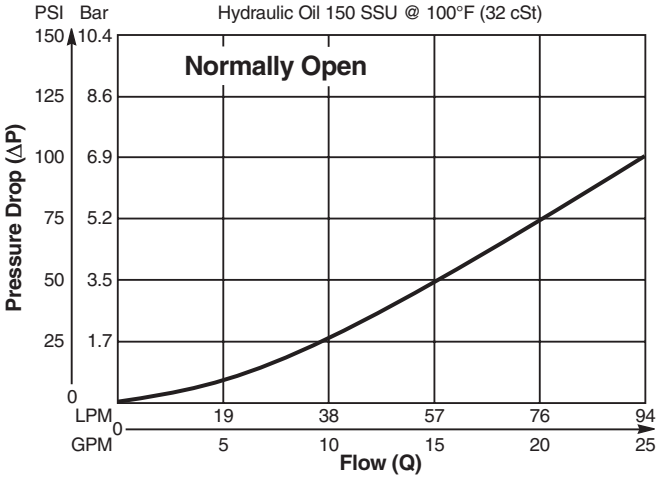
Specifications

Rated Flow	75 LPM (20 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	240 cc/min. (15 in^3/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**C -** 90 ms **N -** 100 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.59 kg (1.3 lbs.)
Cavity	C16-2 (See BC Section for more details)
Form Tool	Rougher None Finisher NFT16-2F

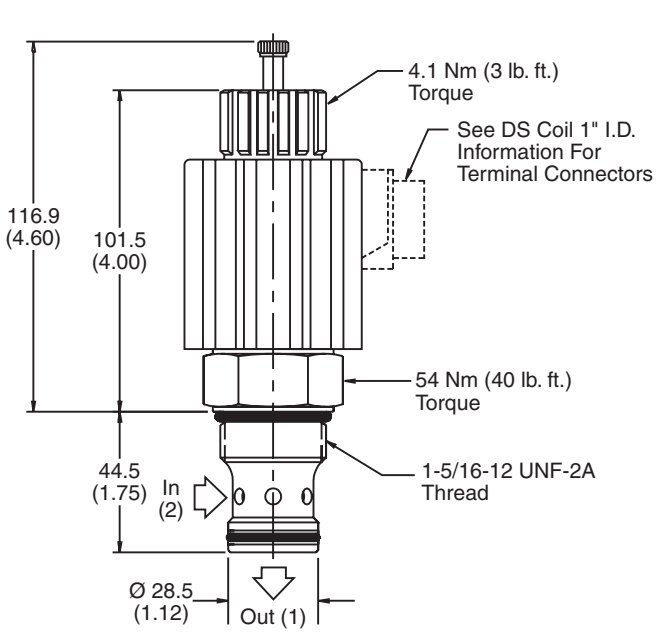
Performance Curves

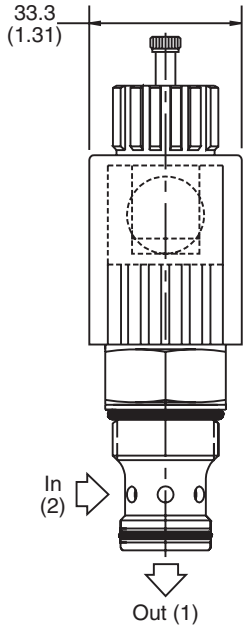
Pressure Drop vs. Flow (Through cartridge only)





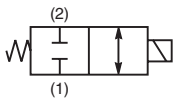
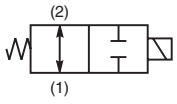
Dimensions Millimeters (Inches)





Ordering Information

DS162					—		
16 Size Solenoid Valve	Style	Seals	Coil Voltage	Coil Termination		Body Material	Port Size

Code / Style	
C Normally Closed	
N Normally Open	

Code	Override Options
Omit	None
T	Push & Twist* (N.C. & N.O.)

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Code	Seals / Kit No.	Operating Temp.
Omit	"D" -Ring / (SK16-2)	-37°C to +93°C (-35°F to +200°F)
N	Nitrile / (SK08-2N)	-34°C to +121°C (-30°F to +250°F)

Code	Screen
Omit	None
S	Screen

Order Bodies Separately
See section BC

B16	—	2	—	12T
16 Size		2-Way Cavity		Port Size

Port Size	Body Material
SAE 12	Steel

Order Bodies Separately
See section BC

B16	—	2	—	16T
16 Size		2-Way Cavity		Port Size

Port Size	Body Material
SAE 16	Steel

Notes

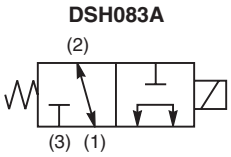
General Description

3-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One piece encapsulated coils with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated



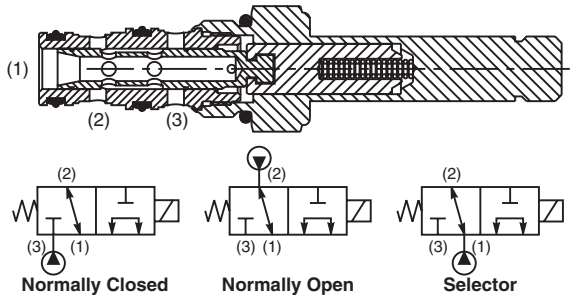


Specifications

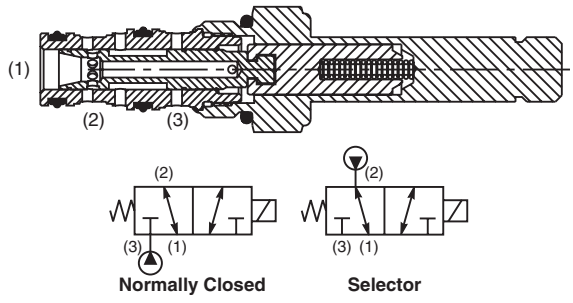
Rated Flow	**DSH083A** N.O. 11.3 LPM (3.0 GPM) N.C. 7.5 LPM (2.0 GPM) Selector 7.5 LPM (2.0 GPM) **DSH083B** N.C. 15.0 LPM (4.0 GPM) Selector 15.0 LPM (4.0 GPM) **DSH083C** N.O. 15.0 LPM (4.0 GPM) **DSH083N** N.O. 11.3 LPM (3.0 GPM) Selector 15.0 LPM (4.0 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min. (10 in^3/min.) at 350 Bar (5000 PSI) DSH083B - 250 cc/min. (15 in^3/min.) DSH083N - 250 cc/min. (15 in^3/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	50 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.13 kg (.28 lbs.)
Cavity	C08-3 (See BC Section for more details)
Form Tool	Rougher NFT08-3R Finisher NFT08-3F

Construction/Symbols

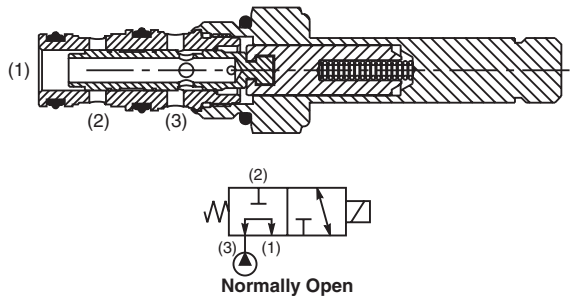
DSH083A



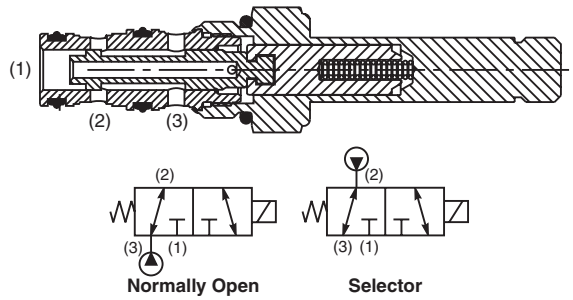
DSH083B



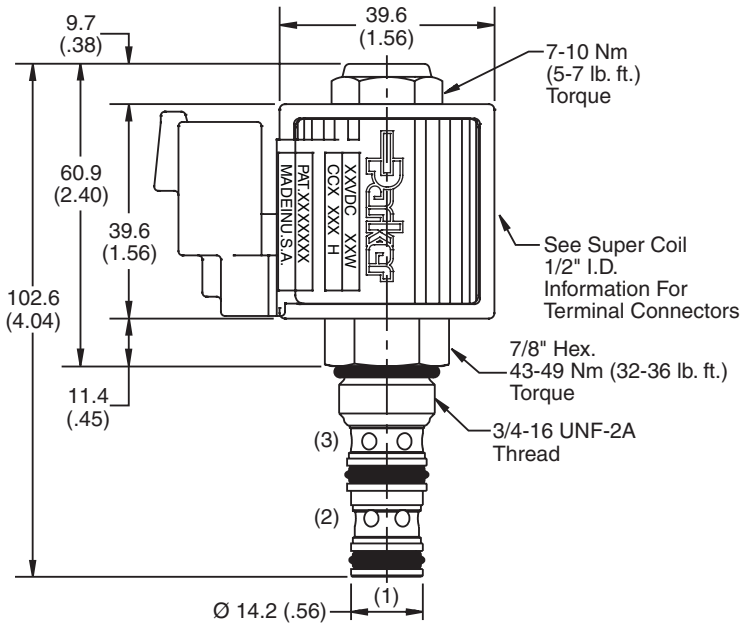
DSH083C

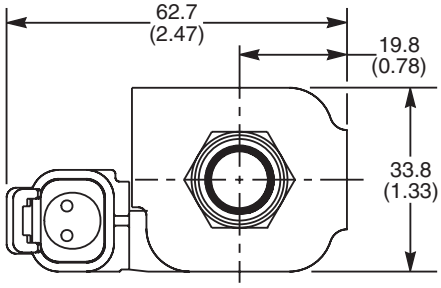


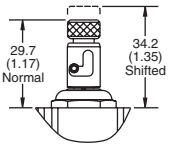
DSH083N



Dimensions Millimeters (Inches)



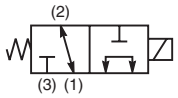
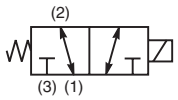
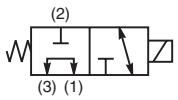
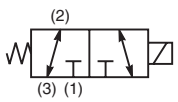




Push and Twist M.O.

Ordering Information

DSH083			
08 Size Solenoid Valve	Style	Override Option	Seals

Code	Style
A	
B	
C	
N	

Code	Seals / Kit No.	Operating Temp.
Omit	"D" -Ring / (SK08-3)	-37°C to +93°C (-35°F to +200°F)
N	Nitrile / (SK08-3N)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Code	Override Options
Omit	None
T	Push & Twist* (N.C. & N.O.)

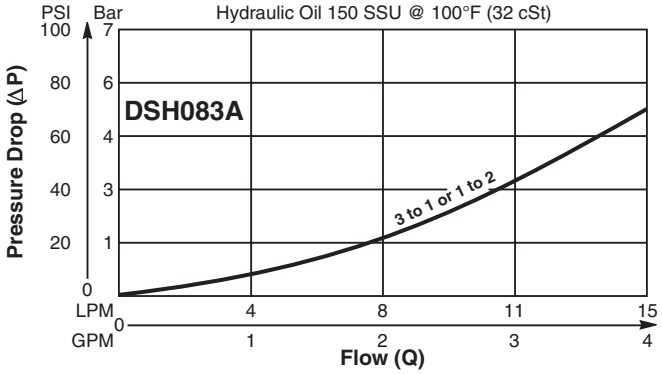
Order Bodies Separately
See section BC

B08	—	3	—	6B
08 Size		3-Way Cavity		Port Size

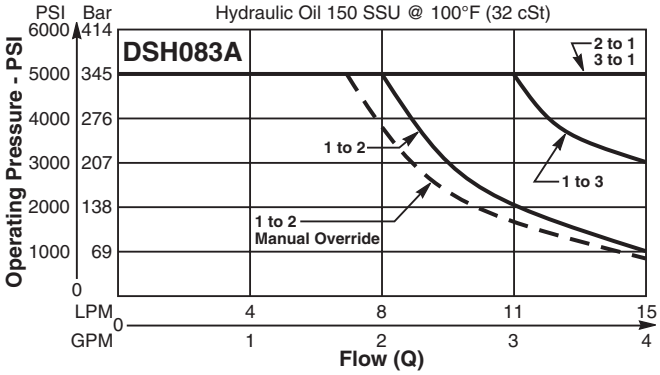
Port Size
3/8" BSP

Body Material
Steel

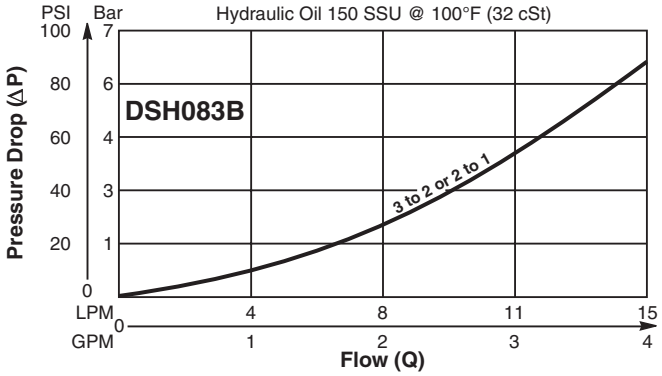
Pressure Drop vs. Flow (Through cartridge only)



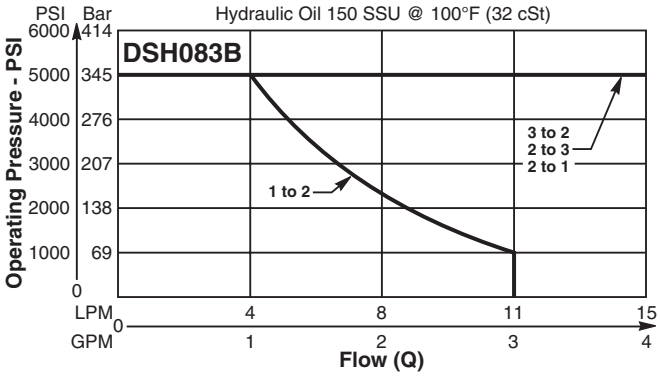
Shift Limit Characteristics (Min. Operating Voltage)



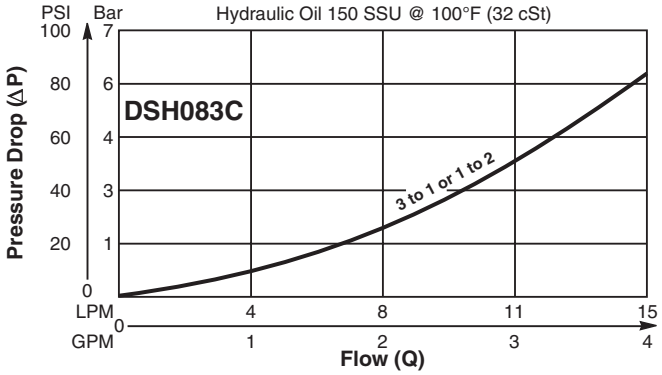
Pressure Drop vs. Flow (Through cartridge only)



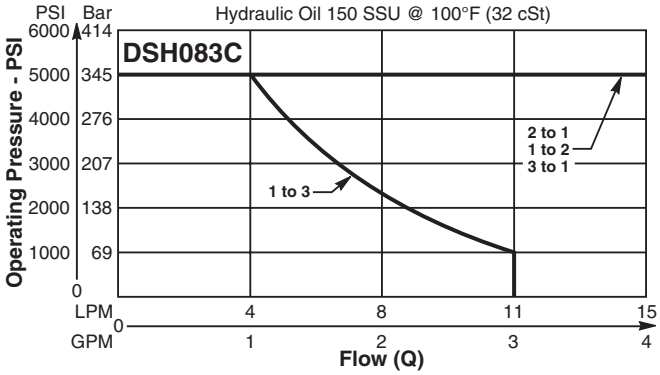
Shift Limit Characteristics (Min. Operating Voltage)



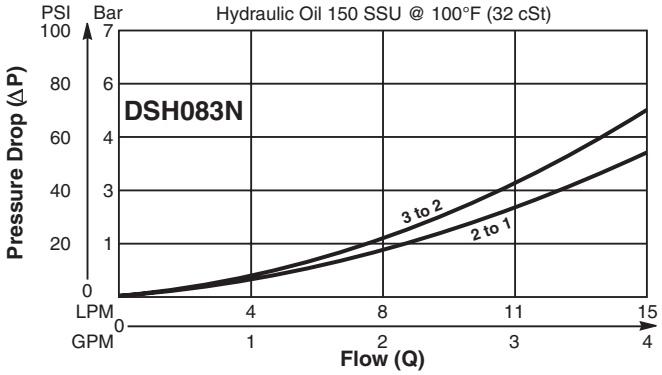
Pressure Drop vs. Flow (Through cartridge only)



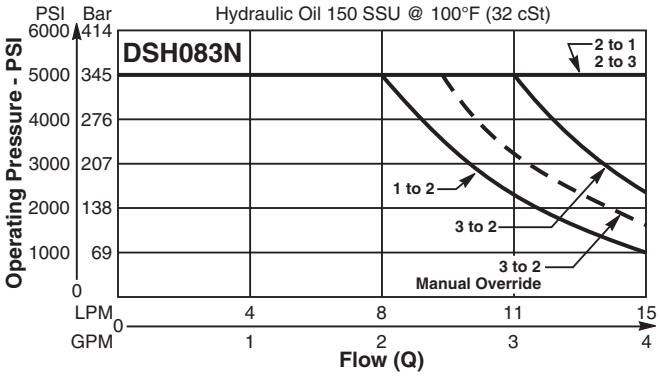
Shift Limit Characteristics (Min. Operating Voltage)



Pressure Drop vs. Flow (Through cartridge only)



Shift Limit Characteristics (Min. Operating Voltage)



Notes

General Description

3-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

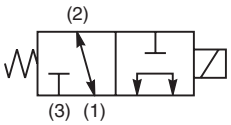
- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

Specifications

Rated Flow	**DSH103A** N.O. 17.0 LPM (4.5 GPM) N.C. 15.0 LPM (4.0 GPM) Selector 15.0 LPM (4.0 GPM) **DSH103B** N.C. 30.0 LPM (8.0 GPM) Selector 30.0 LPM (8.0 GPM) **DSH103C** N.O. 30.0 LPM (8.0 GPM) **DSH103N** N.O. 15.0 LPM (4.0 GPM) N.C. 15.0 LPM (4.0 GPM) Selector 30.0 LPM (8.0 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min. (10 in^3/min.) DSH103B - 250 cc/min. (15 in^3/min.) DSH103N - 250 cc/min. (15 in^3/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	50 ms to 100 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.19 kg (.42 lbs.)
Cavity	C10-3 (See BC Section for more details)
Form Tool	Rougher NFT10-3R Finisher NFT10-3F

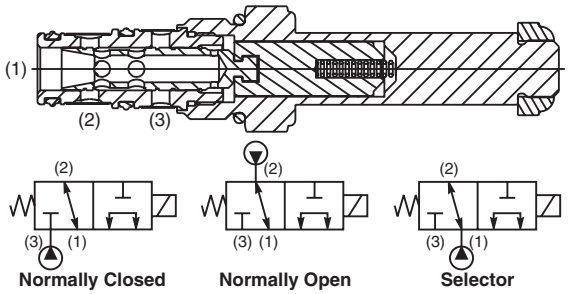


DSH103A

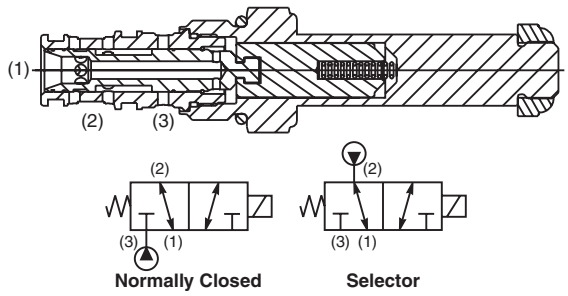


Construction/Symbols

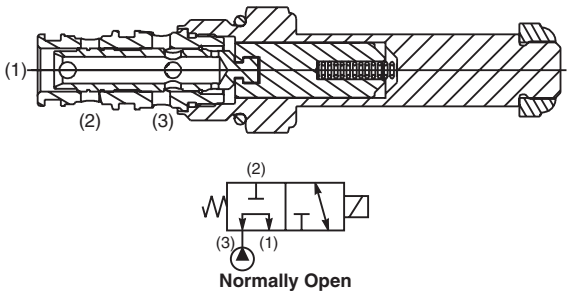
DSH103A



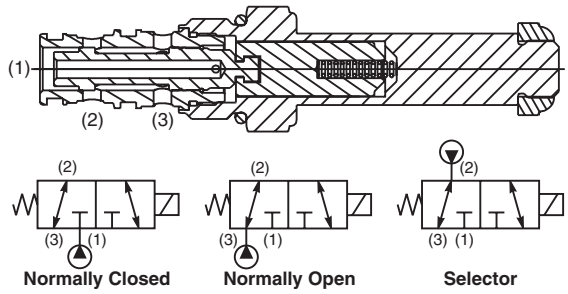
DSH103B



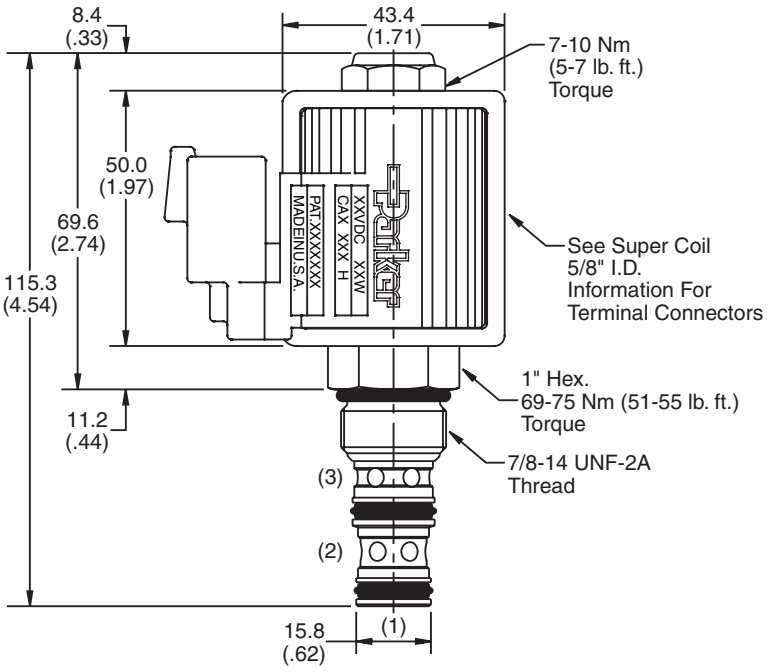
DSH103C

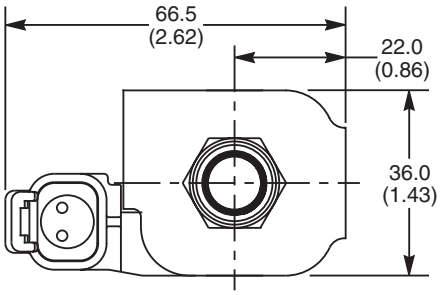


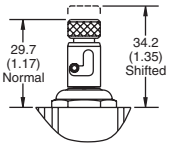
DSH103N



Dimensions Millimeters (Inches)



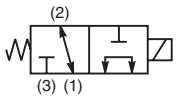
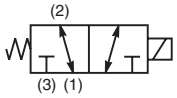
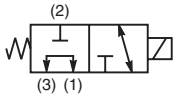
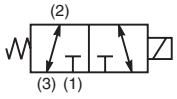




Push and Twist M.O.

Ordering Information

DSH103			
10 Size Solenoid Valve	Style	Override Option	Seals

Code	Style
A	
B	
C	
N	

Code	Seals / Kit No.	Operating Temp.
Omit	"D" -Ring / (SK10-3)	-37°C to +93°C (-35°F to +200°F)
N	Nitrile / (SK10-3N)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

Code	Override Options
Omit	None
T	Push & Twist (N.C. & N.O.)

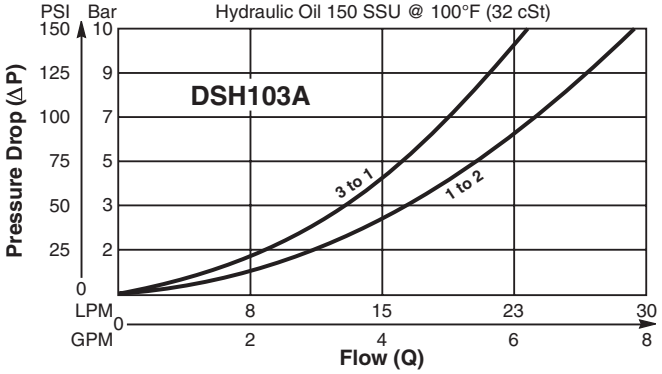
Order Bodies Separately
See section BC

B10	—	3	—	8B
10 Size		3-Way Cavity		Port Size

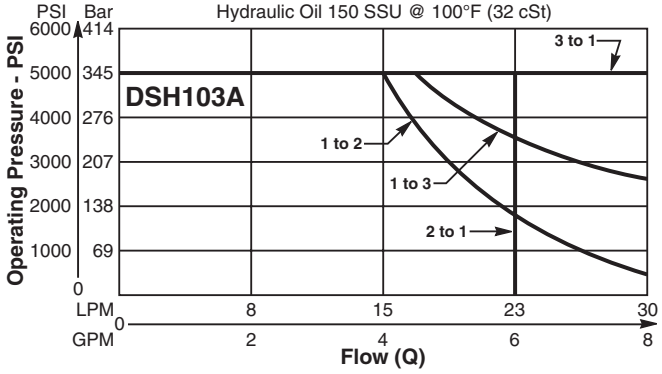
Port Size
1/2" BSP

Body Material
Steel

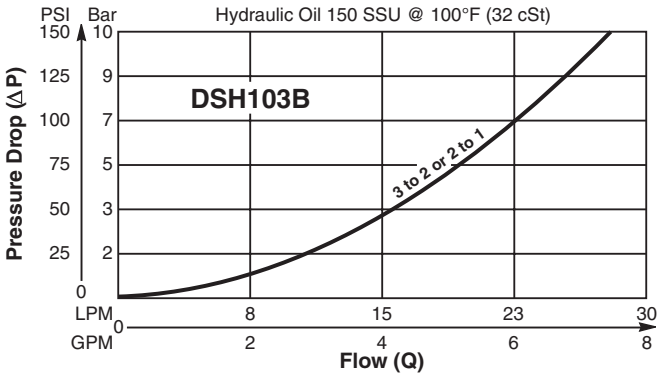
Pressure Drop vs. Flow (Through cartridge only)



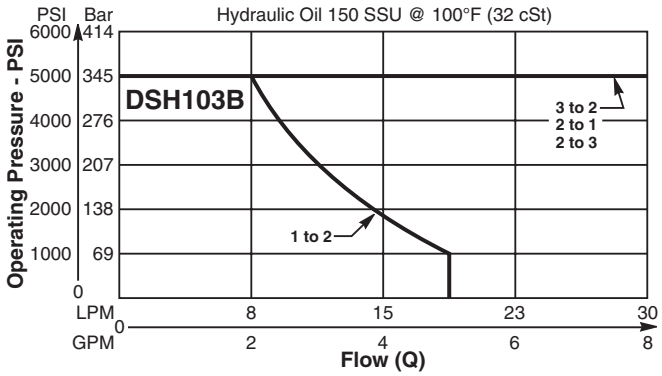
Shift Limit Characteristics (Min. Operating Voltage)



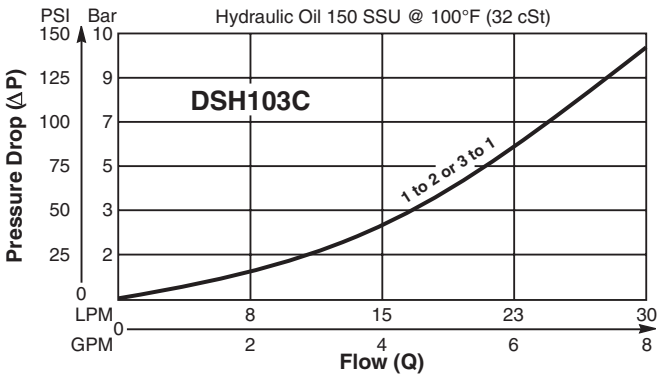
Pressure Drop vs. Flow (Through cartridge only)



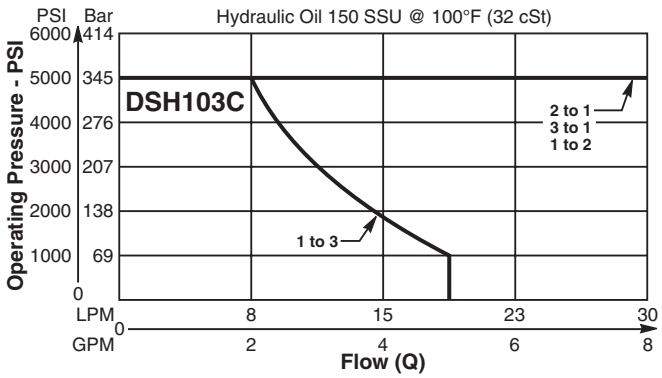
Shift Limit Characteristics (Min. Operating Voltage)



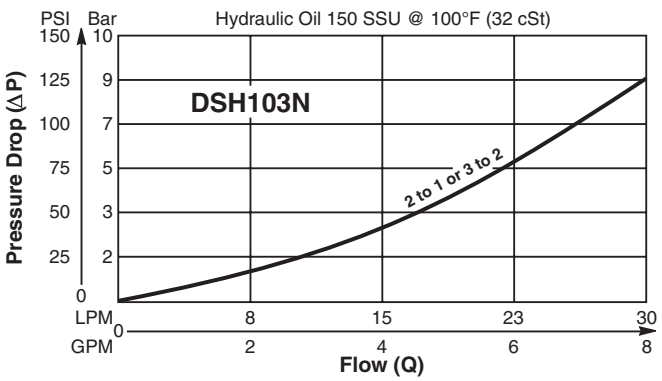
Pressure Drop vs. Flow (Through cartridge only)



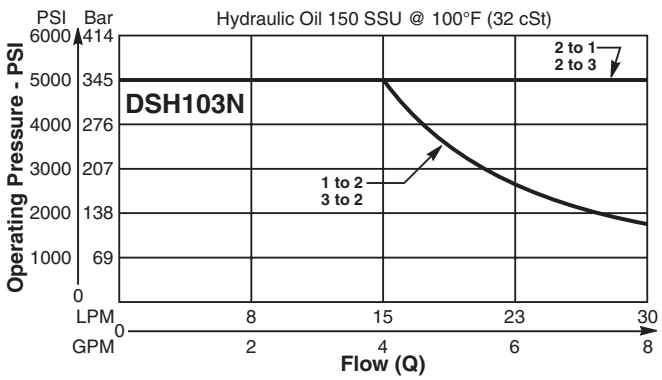
Shift Limit Characteristics (Min. Operating Voltage)



Pressure Drop vs. Flow (Through cartridge only)



Shift Limit Characteristics (Min. Operating Voltage)

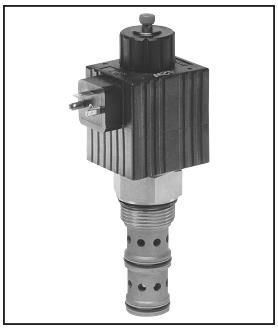


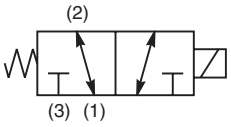
General Description

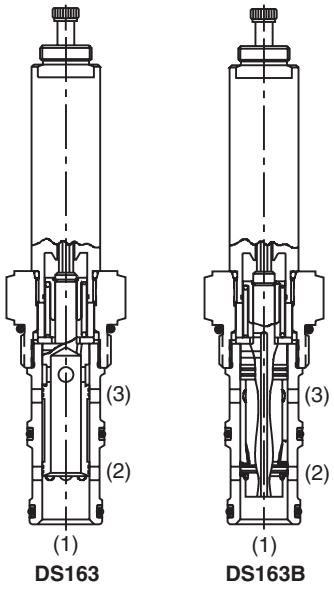
3-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- No dynamic seals
- Variety of coil terminations
- All external parts zinc plated
- Manual override standard



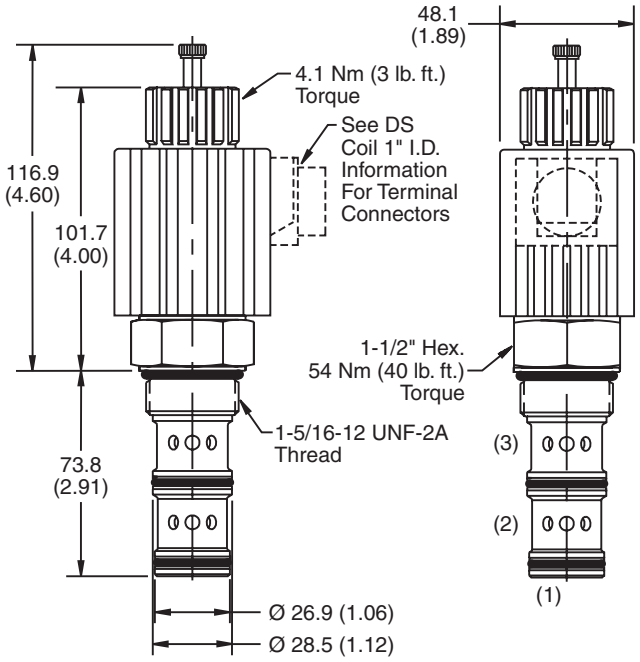




Specifications

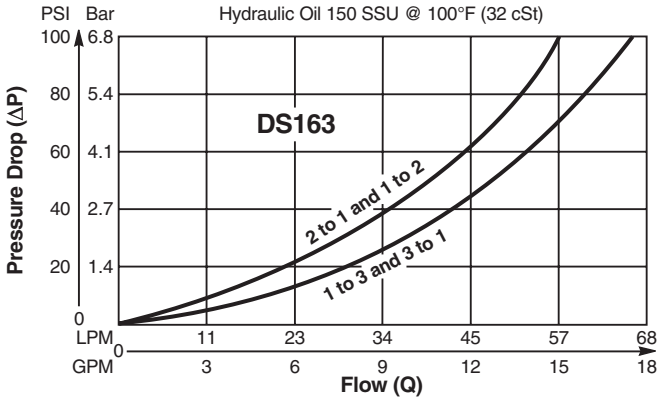
Rated Flow	**DS163** N.O. 45.4 LPM (12 GPM) N.C. 49.2 LPM (13 GPM) Selector 41.6 LPM (11 GPM) **DS163B** N.O. 26.5 LPM (7 GPM) N.C. 53.0 LPM (14 GPM) Selector 56.8 LPM (15 GPM)
Maximum Inlet Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	82 cc/min. (5 in^3/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	Normally Closed up to 90 ms Normally Open up to 100 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.59 kg (1.3 lbs.)
Cavity	C16-3 (See BC Section for more details)
Form Tool	Rougher NFT16-3R Finisher NFT16-3F

Dimensions Millimeters (Inches)

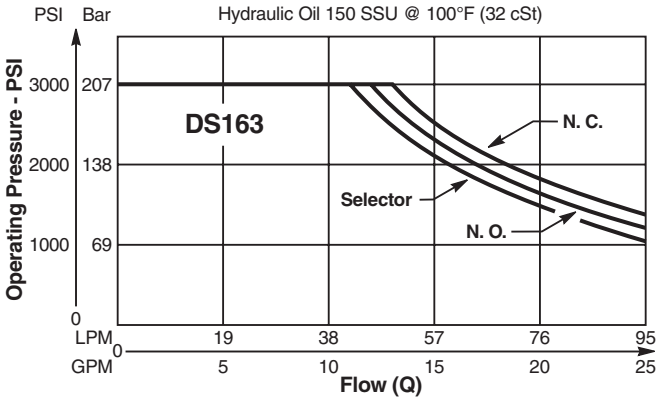


Performance Curves

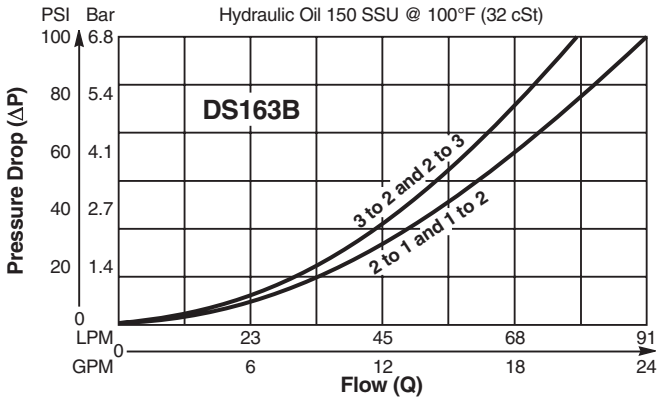
Pressure Drop vs. Flow (Through cartridge only)



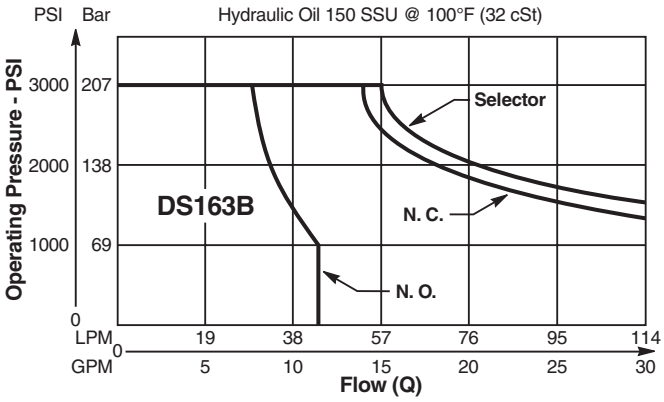
Shift Limit Characteristics (Min. Operating Voltage)



Pressure Drop vs. Flow (Through cartridge only)

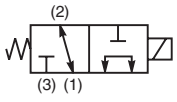
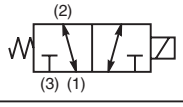


Shift Limit Characteristics (Min. Operating Voltage)



Ordering Information

DS163	
16 Size Solenoid Valve	Style

Code	Style
Omit	
B	

Order Coils Separately
See section CE

Coil Type	
DS	Super Coil - 42w

Order Bodies Separately
See section BC

B16	—	3	—	16B
16 Size		3-Way Cavity		Port Size

Port Size
1″ BSP

Body Material
Steel

Seals / Kit No.	Operating Temp.
Nitrile / (SK16-3)	-34°C to +121°C (-30°F to +250°F)

General Description

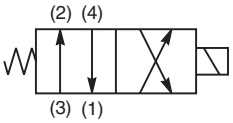
4-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

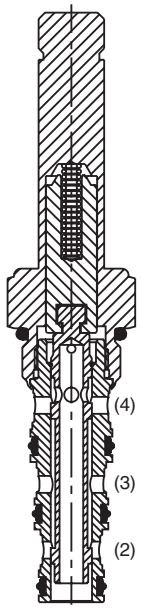
Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated



DSH084B





DSH084B

Specifications

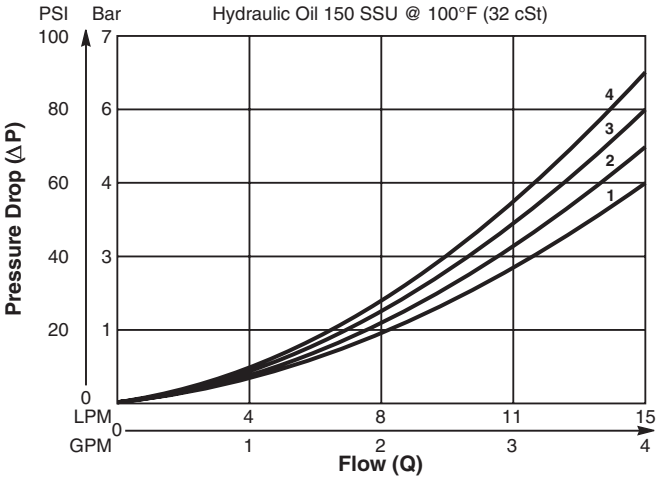
Rated Flow	11-15 LPM (3-4 GPM) See Shift Limit Characteristics
Max. Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min. (10 in^3/min.) at 350 Bar (5000 PSI) DSH084B - 240 cc/min. (15 in^3/min.)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	Energized - 50 ms De-energized - 30 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.13 kg (.29 lbs.)
Cavity	C08-4 (See BC Section for more details)
Form Tool	Rougher NFT08-4R Finisher NFT08-4F

Curve Selection Chart

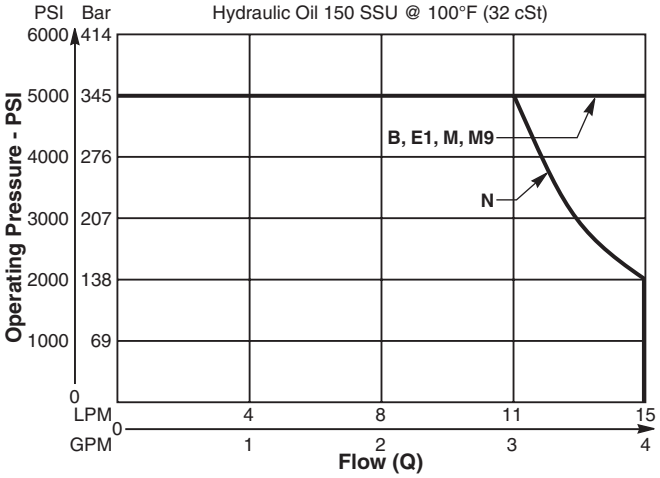
SPOOL CODE	NEUTRAL					SHIFTED				
	4 to 1	3 to 2	2 to 1	3 to 1	3 to 4	4 to 1	3 to 2	2 to 1	3 to 1	3 to 4
B	4	3	—	—	—	—	—	2	—	4
E1	—	—	—	—	—	—	—	2	—	3
M	—	—	3	—	1	—	—	—	—	—
N	—	—	—	—	—	4	3	—	—	—
M9	—	—	3	—	1	—	—	—	4	—

Performance Curves

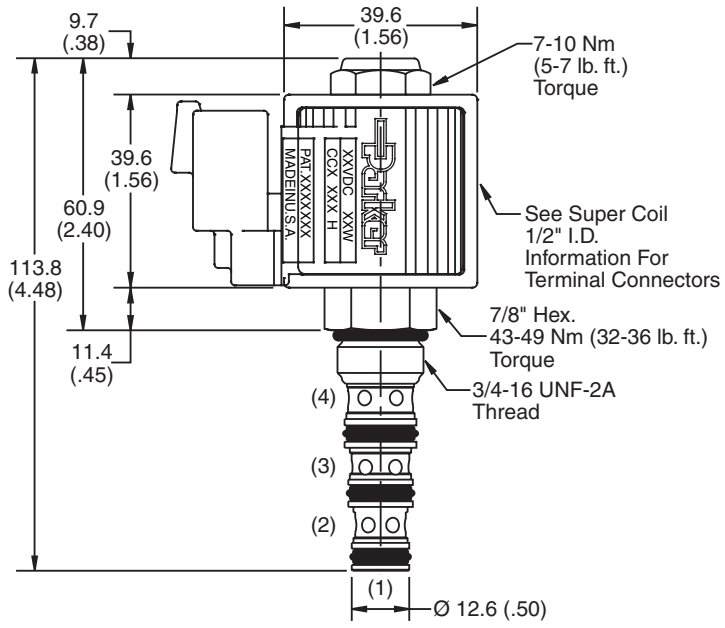
Pressure Drop vs. Flow (Through cartridge only)

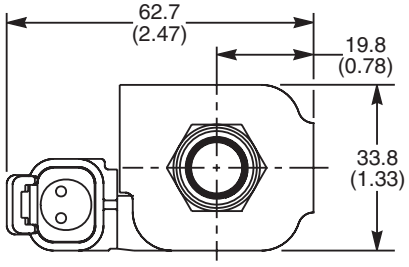


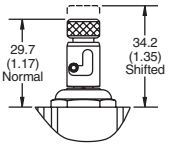
Shift Limit Characteristics (Min. Operating Voltage)



Dimensions Millimeters (Inches)



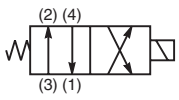
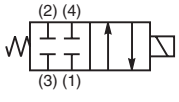
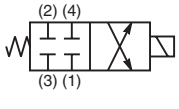
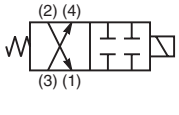
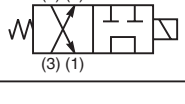




Push and Twist M.O.

Ordering Information

DSH084			
08 Size Solenoid Valve	Style	Override Option	Seals

Code	Style
B	
N	
E1	
M	
M9	

Code	Seals / Kit No.	Operating Temp.
Omit	"D" -Ring / (SK08-4)	-37°C to +93°C (-35°F to +200°F)
N	Nitrile / (SK08-4N)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Code	Override Options
Omit	None
T	Push & Twist*

Order Bodies Separately
See section BC

B08	—	4	—	6B
08 Size		4-Way Cavity		Port Size

Port Size
3/8" BSP

Body Material
Steel

General Description

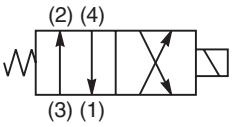
4-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

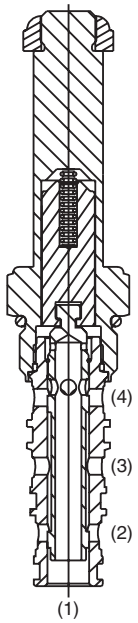
Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated



DSH104B





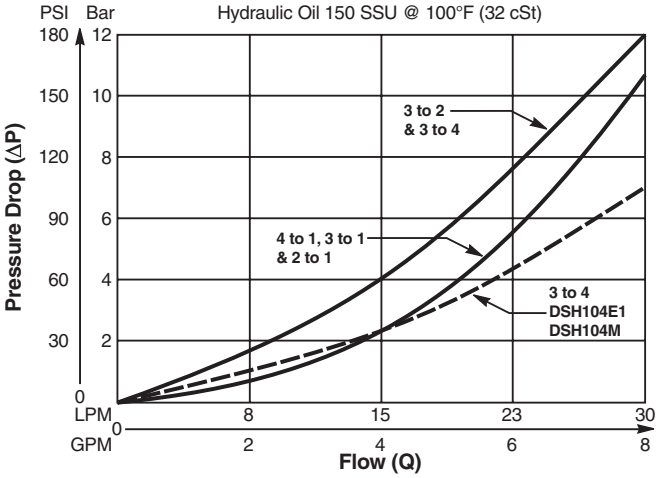
DSH104B

Specifications

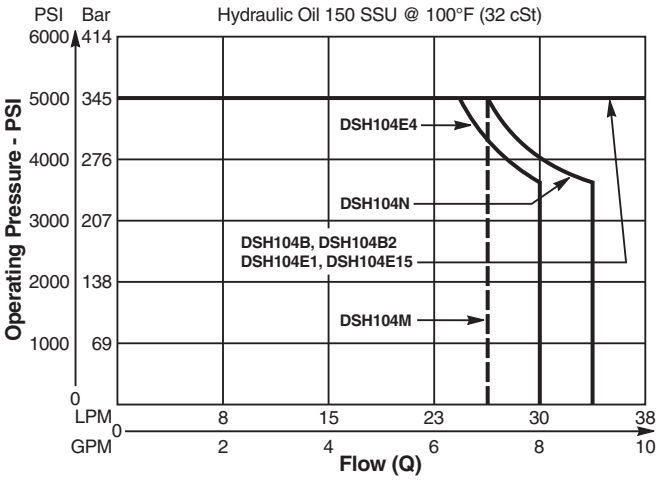
Rated Flow	25 - 38 LPM (6.5 - 10 GPM) See Shift Limit Characteristics
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min (10 in^3/min) DSH104B - 320 cc/min (19.5 in^3/min)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	Energized - 30 - 60 ms De-energized - 30 - 60 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.20 kg (.44 lbs.)
Cavity	C10-4 (See BC Section for more details)
Form Tool	Rougher NFT10-4R Finisher NFT10-4F

Performance Curves

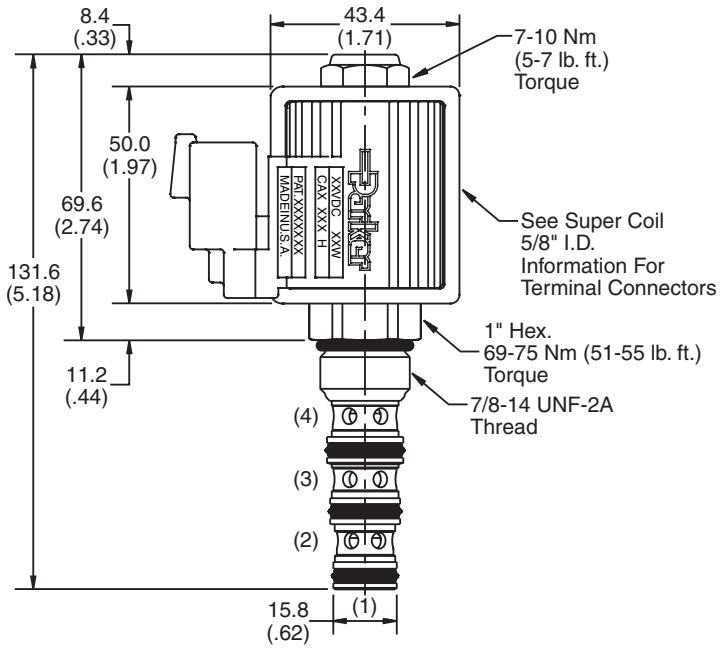
Pressure Drop vs. Flow (Through cartridge only)

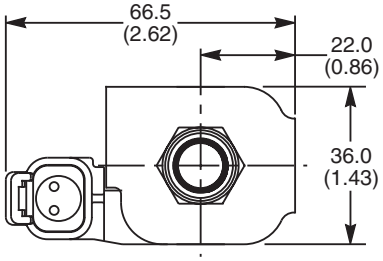


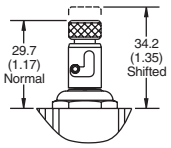
Shift Limit Characteristics (Min. Operating Voltage)



Dimensions Millimeters (Inches)



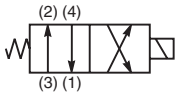
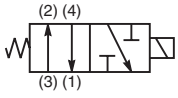
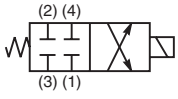
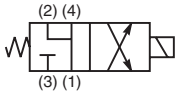
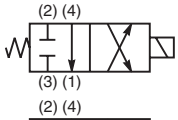
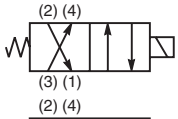
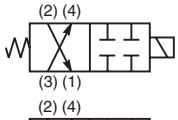
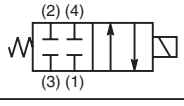




Push and Twist M.O.

Ordering Information

DSH104			
10 Size Solenoid Valve	Style	Override Option	Seals

Code	Style
B	
B2	
E1	
E4	
E15	
H	
M	
N	

Code	Seals / Kit No.	Operating Temp.
Omit	"D" -Ring / (SK10-4)	-37°C to +93°C (-35°F to +200°F)
N	Nitrile / (SK10-4N)	-34°C to +121°C (-30°F to +250°F)

Code	Override Options
Omit	None
T	Push & Twist

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

Order Bodies Separately
See section BC

B10	—	4	—	8B
10 Size		4-Way Cavity		Port Size

Port Size
1/2" BSP

Body Material
Steel

General Description

4-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

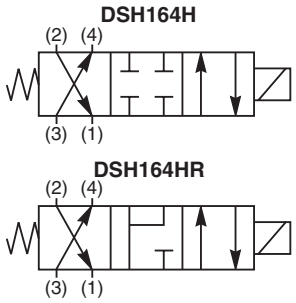
Application Note

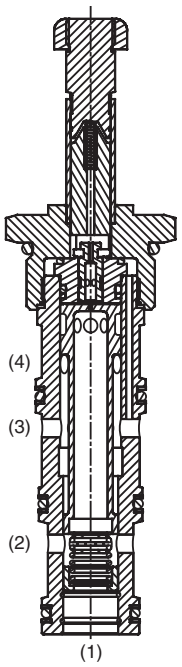
This valve is a pilot operated spool type valve. It does not require a separate pilot supply, but does require that the work port pressure or the inlet pressure is 40-60 psi higher than port 1. In an open flowing condition, with zero load and low flow, it will require a 4-6 gpm flow to create internal pilot pressure to shift. If load pressure or system pressure is 40-60 psi higher than tank, the valve will shift. Ultimately, the valve shifts based upon pressure differential from port 3 to port 1 of 40-60 psi.

Specifications

Rated Flow	113 LPM (30 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Leakage at 150 SSU (32 cSt)	350 cc/min (21 in³/min) De-Energ. 5.6 LPM (1.5 GPM) Energized Pilot Flow @ 207 Bar (3000 PSI)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	Pull In - 600 ms Drop Out - 130 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.59 kg (1.3 lbs.)
Cavity	C16-4 (See BC Section for more details)
Form Tool	Rougher NFT16-4R Finisher NFT16-4F

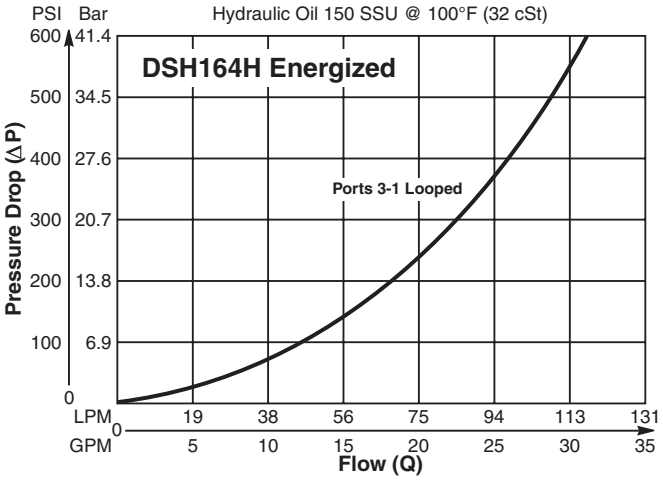




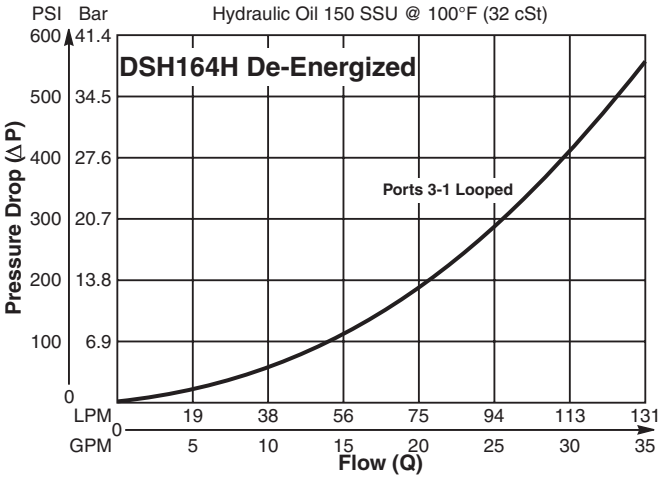


Performance Curves

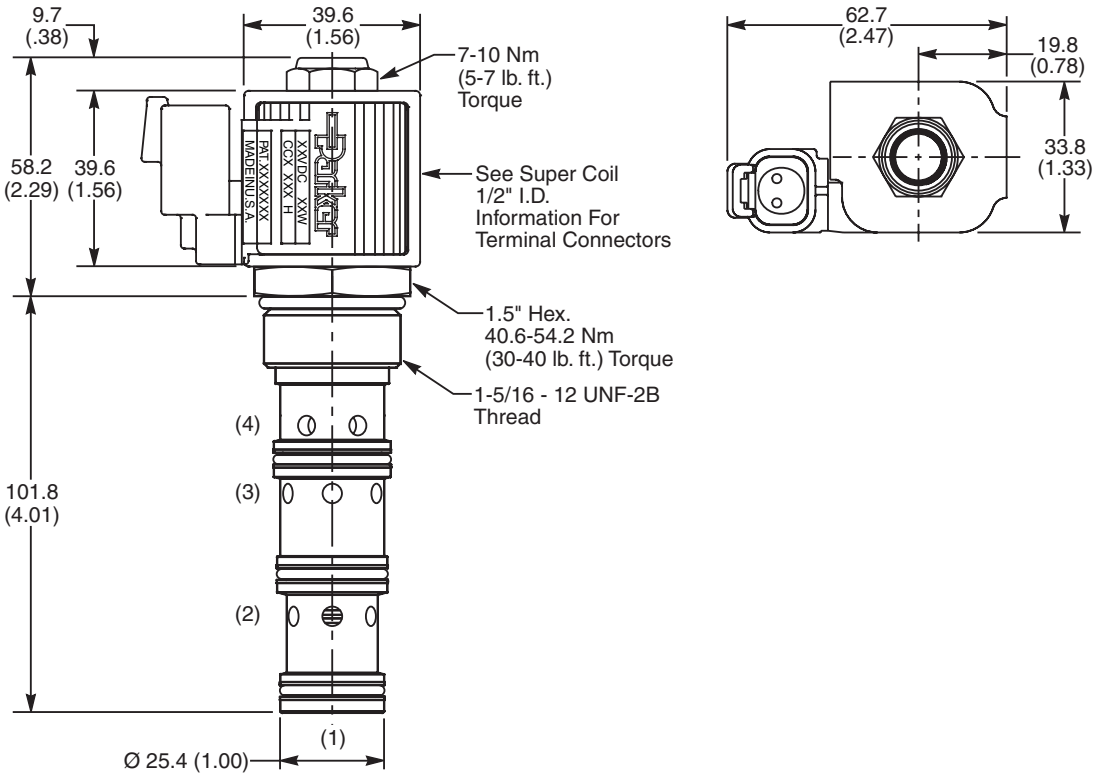
Pressure Drop vs. Flow (Through cartridge only)



Pressure Drop vs. Flow (Through cartridge only)

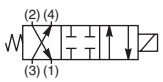
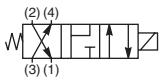


Dimensions Millimeters (Inches)



Ordering Information

DSH164		N
16 Size Solenoid Valve	Style	Seals

Code	Style
H	
HR	

Code	Seals / Kit No.	Operating Temp.
N	Nitrile / (SK16-4N)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

B16	—	4	—	16B
16 Size		4-Way Cavity		Port Size

Port Size
1″ BSP

Body Material
Steel

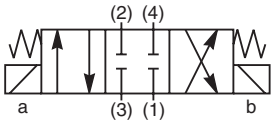
General Description

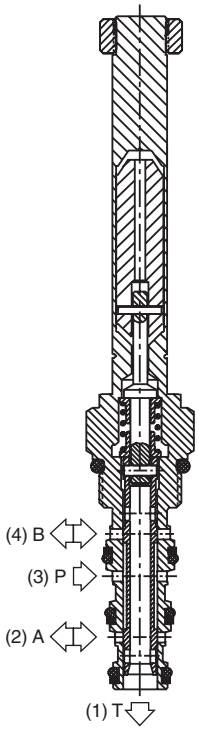
4-Way, 3 Position, Closed Center Spool Valve.
For additional information see Technical Tips on pages SV1-SV6.

Features

- Designed to operate double acting cylinders, pilot circuits and bi-directional motors, etc.
- High flow capacity with reduced space requirements
- High pressure capability to 350 Bar (5000 PSI)
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Manual override available





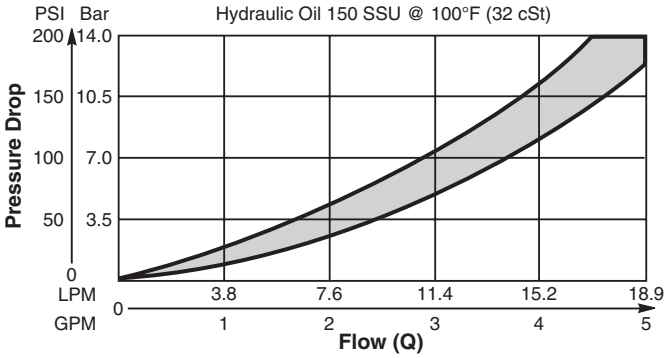


Specifications

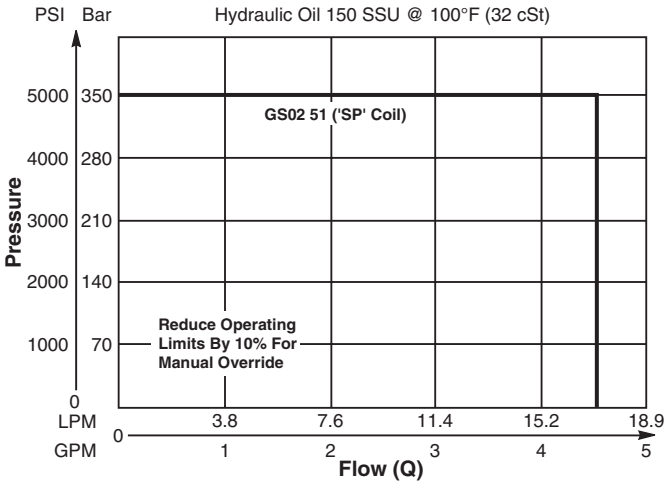
Rated Flow	**High Flow/Pressure (CCP Coil)** 17 LPM (4.5 GPM)
Maximum Inlet Pressure	**CCP Coil** 350 Bar (5000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Campatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/ 16/13, SAE Class 4
Approx. Weight	.18 kg (.40 lbs.)
Cavity	C08-4 (See BC Section for more details)

Performance Curves

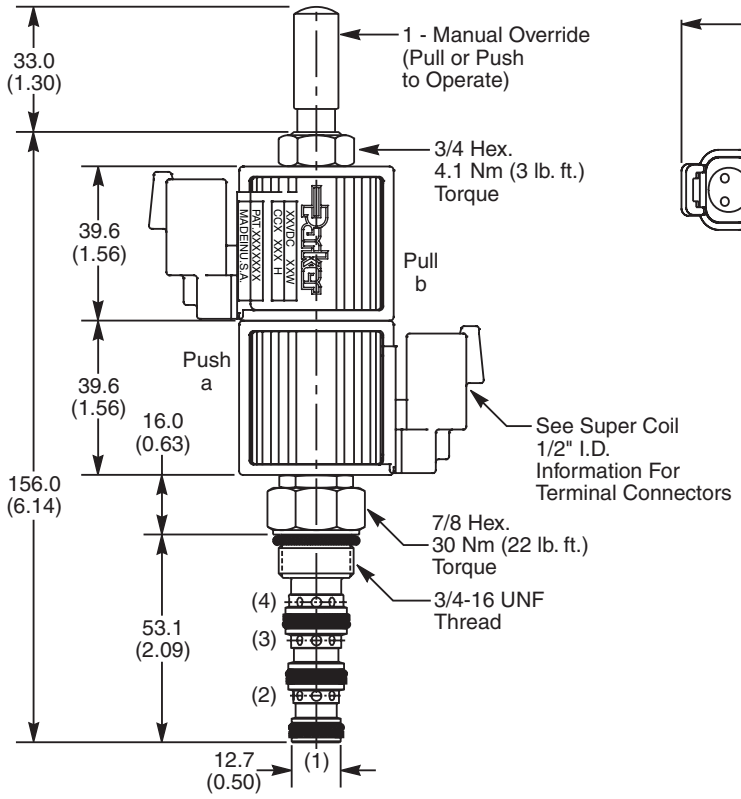
Pressure Drop vs. Flow (Through cartridge only)



Operating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)



Ordering Information

GS02	51			N
08 Size Solenoid Valve	Style	Override Option	Screen	Seals

Code	Style
51	High Flow and Pressure (CCP Coil)

Code	Override Options
0	Not Required
1	Manual Override
2	Detented M.O.

Code	Screen
0	Not Available

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30078N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

B08	—	4	—	6B
08 Size		4-Way Cavity		Port Size

Port Size
3/8" BSP

Body Material
Steel

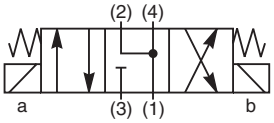
General Description

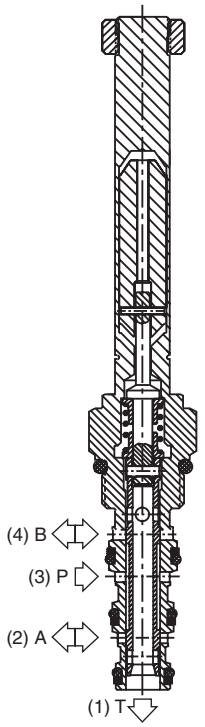
4-Way, 3 Position, Floating Center Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- Designed to operate double acting cylinders, pilot circuits and bi-directional motors, etc.
- High flow capacity with reduced space requirements
- High pressure capability to 350 Bar (5000 PSI)
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Manual override available





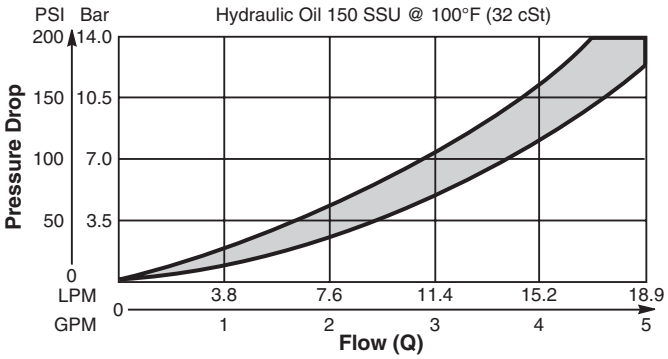


Specifications

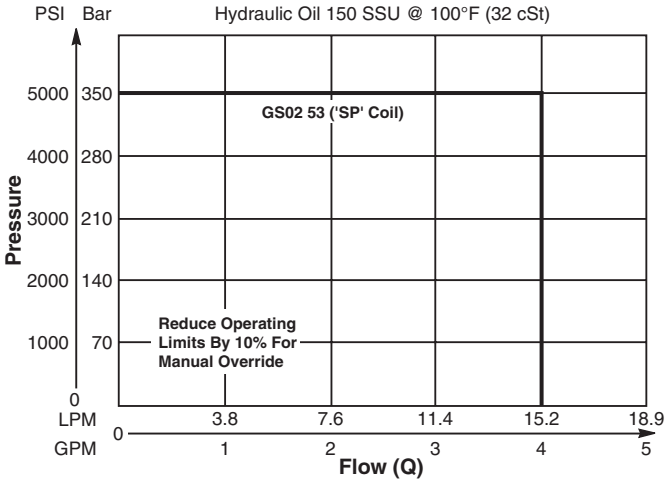
Rated Flow	**High Flow/Pressure (CCP Coil)** 15 LPM (4.0 GPM)
Maximum Inlet Pressure	**CCP Coil** 350 Bar (5000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.18 kg (.40 lbs.)
Cavity	C08-4 (See BC Section for more details)

Performance Curves

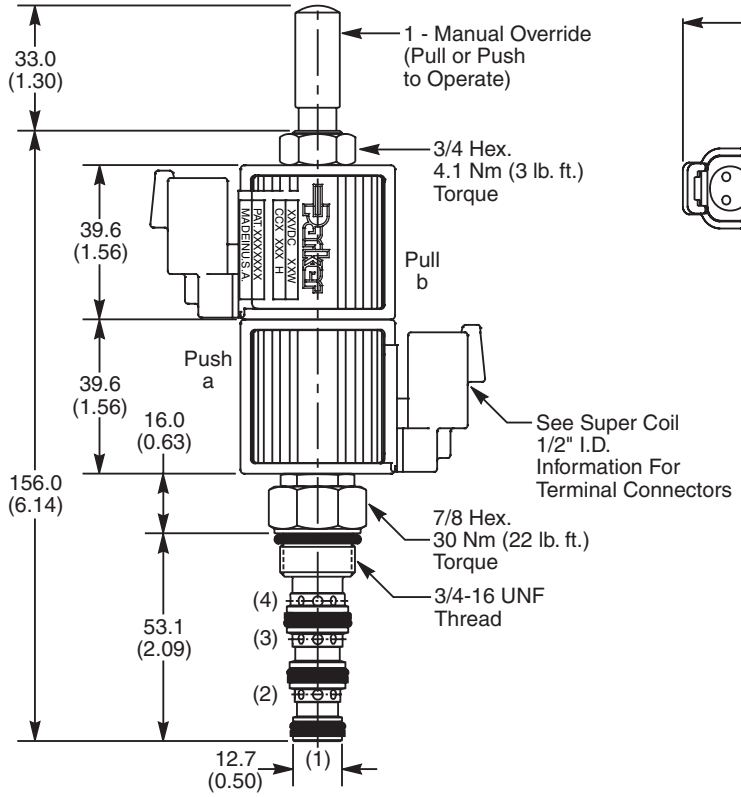
Pressure Drop vs. Flow (Through cartridge only)



Operating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)



Ordering Information

GS02	53			N
08 Size Solenoid Valve	Style	Override Option	Screen	Seals

Code	Style
53	High Flow and Pressure (CCP Coil)

Code	Override Options
0	Not Required
1	Manual Override
2	Detented M.O.

Code	Screen
0	Not Available

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30078N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

B08	—	4	—	6B
08 Size		4-Way Cavity		Port Size

Port Size
3/8" BSP

Body Material
Steel

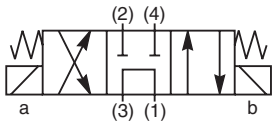
General Description

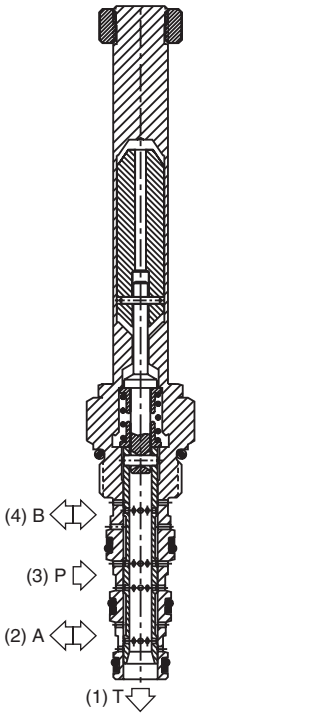
4-Way, 3 Position, Tandem Center Spool Valve.
For additional information see Technical Tips on pages SV1-SV6.

Features

- Designed to operate double acting cylinders, pilot circuits and bi-directional motors, etc.
- High flow capacity with reduced space requirements
- High pressure capability
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Manual override available





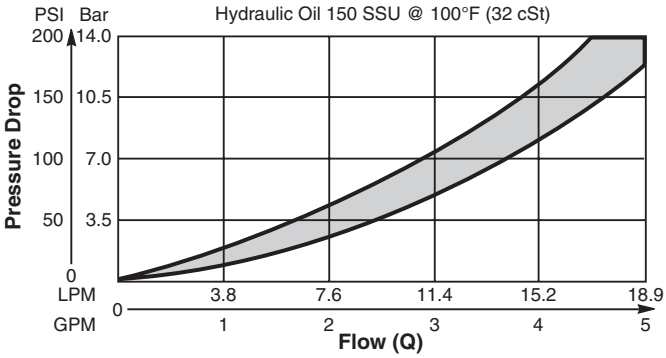


Specifications

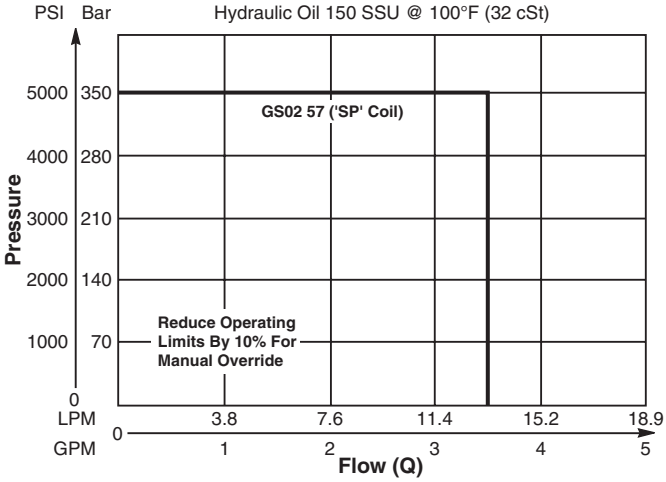
Rated Flow	13 LPM (3.5 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.18 kg (.40 lbs.)
Cavity	C08-4 (See BC Section for more details)

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

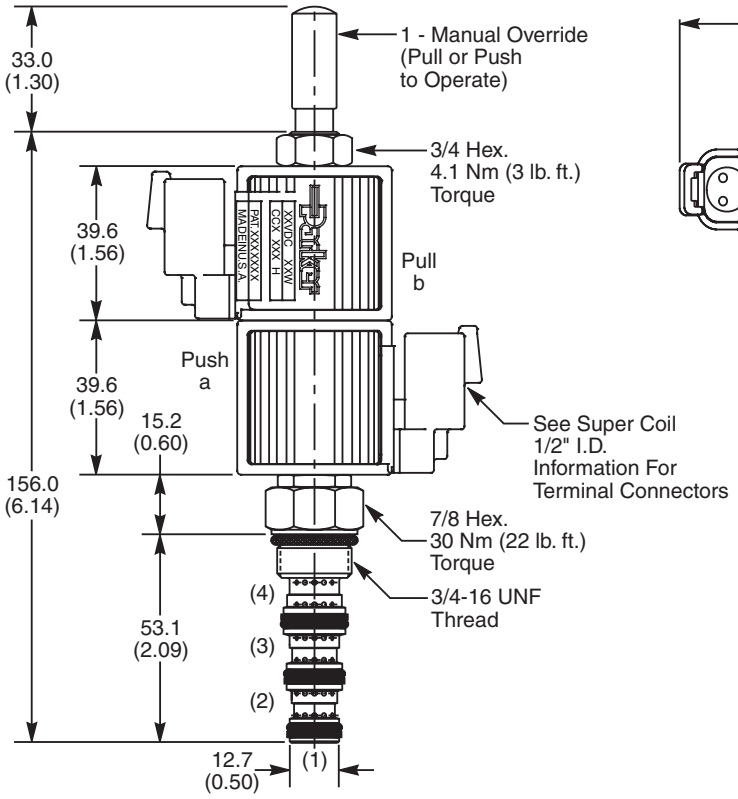


Operating Limits (Measured at 75% of Nominal Current)



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



Ordering Information

GS02	57			N
08 Size Solenoid Valve	Style	Override Option	Screen	Seals

Code	Style
57	High Flow (CCP Coil)

Code	Override Options
0	Not Required
1	Manual Override
2	Detented M.O.

Code	Screen
0	Not Available

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30078N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

B08	—	4	—	6B
08 Size		4-Way Cavity		Port Size

Port Size
3/8" BSP

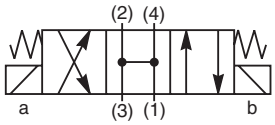
Body Material
Steel

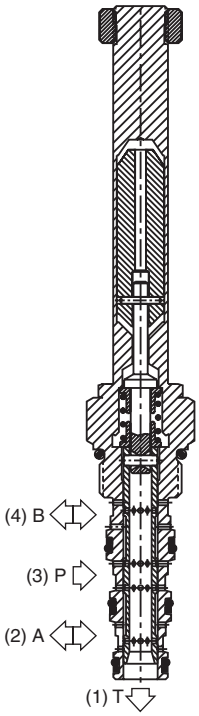
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

General Description

4-Way, 3 Position, Open Center Spool Valve.
For additional information see Technical Tips on pages SV1-SV6.







Features

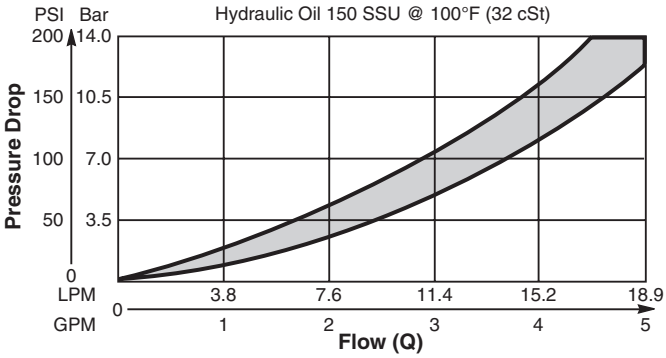
- Designed to operate double acting cylinders, pilot circuits and bi-directional motors, etc.
- High flow capacity with reduced space requirements
- High pressure capability
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Manual override available

Specifications

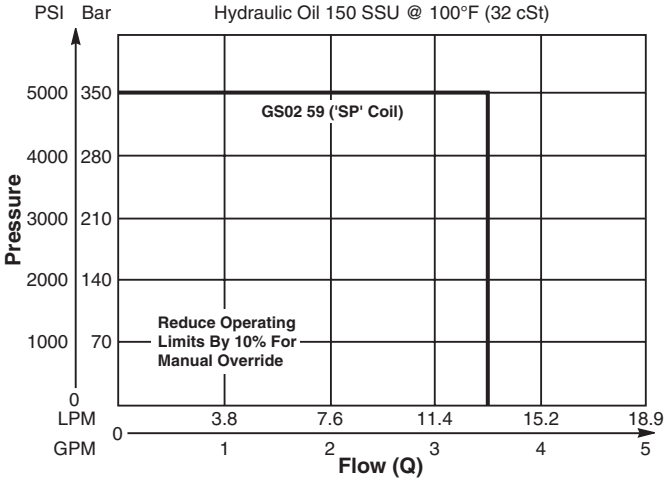
Rated Flow	13 LPM (3.5 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.18 kg (.40 lbs.)
Cavity	C08-4 (See BC Section for more details)

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

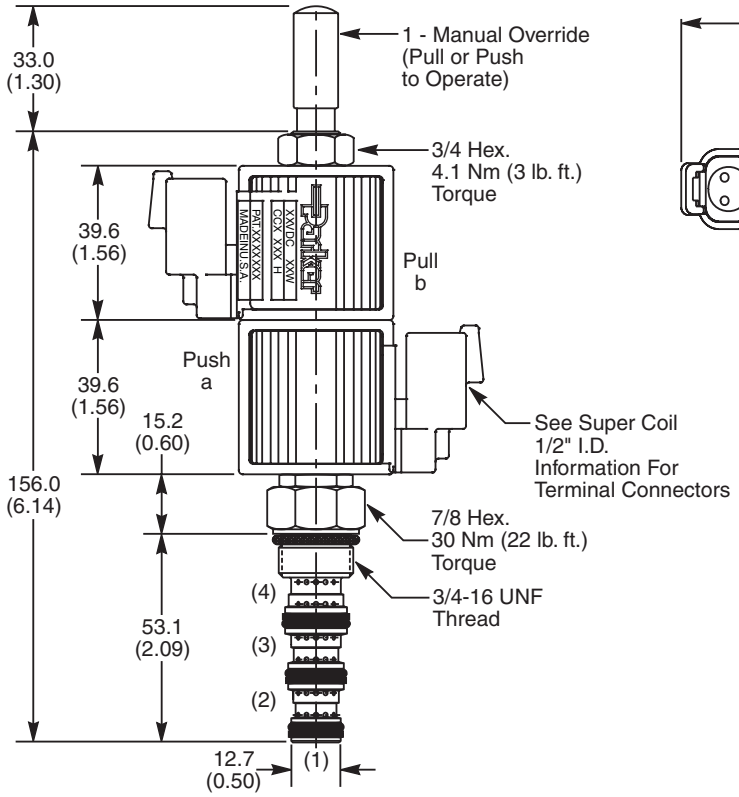


Operating Limits (Measured at 75% of Nominal Current)



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



Ordering Information

GS02	59			N
08 Size Solenoid Valve	Style	Override Option	Screen	Seals

Code	Style
59	High Flow ('SP' Coil)

Code	Override Options
0	Not Required
1	Manual Override
2	Detented M.O.

Code	Screen
0	Not Available

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30078N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

B08	—	4	—	6B
08 Size		4-Way Cavity		Port Size

Port Size
3/8" BSP

Body Material
Steel

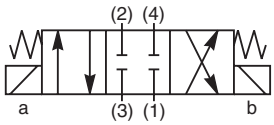
General Description

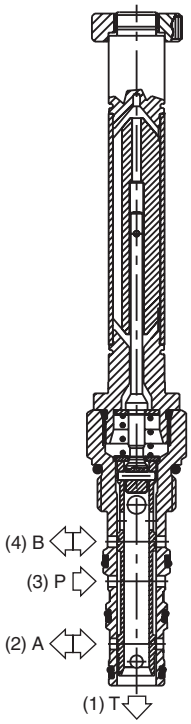
4-Way, 3 Position, Closed Center Spool Valve.
For additional information see Technical Tips on pages SV1-SV6.

Features

- Four way closed center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.





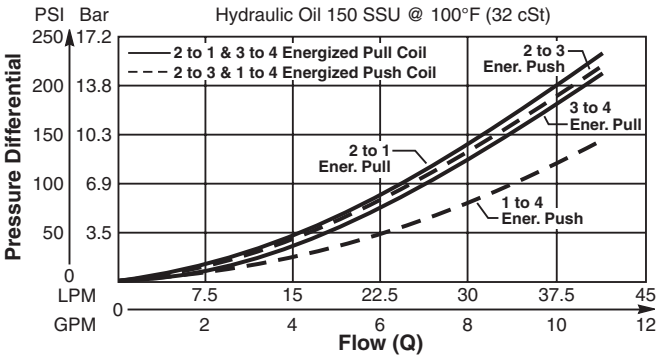


Specifications

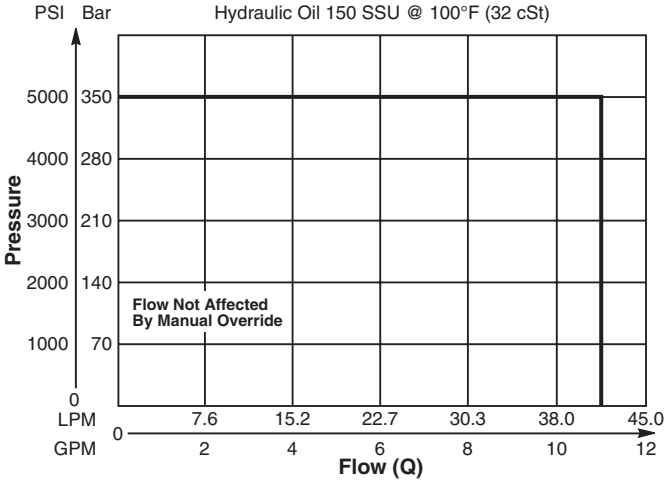
Rated Flow	42 LPM (11 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min @ 210 Bar (3000 PSI)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 30-60 ms **Close** 20-40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.26 kg (.58 lbs.)
Cavity	C10-4 (See BC Section for more details)

Performance Curves

Pressure Drop vs. Flow Energized - GS045250ND
(Through cartridge only)

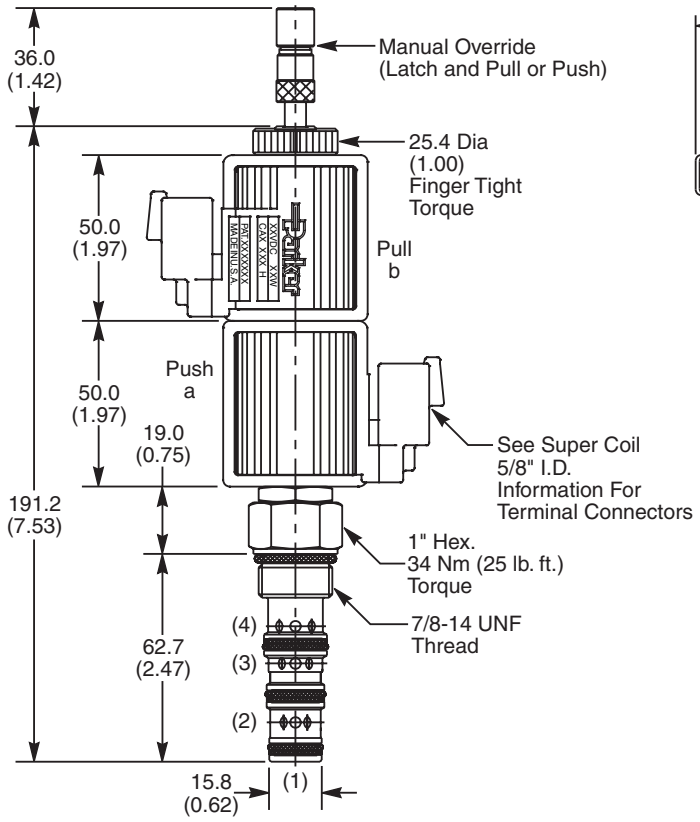


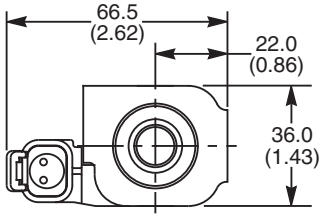
Operating Limits (Measured at 75% of Nominal Current)



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)





Ordering Information

GS04	52			N	D
10 Size Solenoid Valve	Style	Override Option	Screen	Seals	Design Level

Code	Style
52	High Flow and Pressure ('SP' Coil)

Code	Override Options
0	None
5	Standard - Center Detent only, Latch Operated, Push and Pull (*40 nt/9 lbs.)
6	Detented (all positions), Push and Pull

***Force to push at 210 Bar (3000 PSI). Less to Pull.**

Code	Screen
0	None (*Contact factory for OEM requirements*)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30506N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

Code	Design Level
D	Includes Industry Common Cavity

Order Bodies Separately
See section BC

B10	—	4	—	8B
10 Size		4-Way Cavity		Port Size

Port Size
1/2" BSP

Body Material
Steel

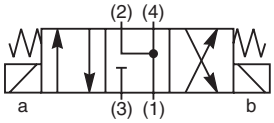
General Description

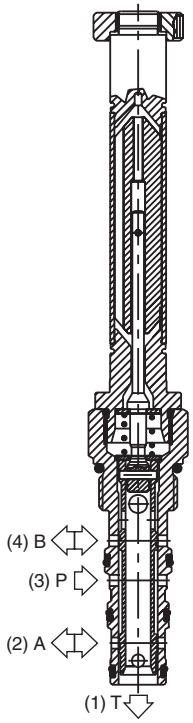
4-Way, 3 Position, Floating Center Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- Four way floating center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.





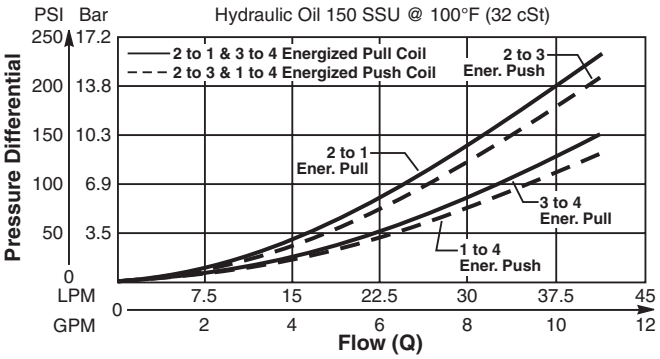


Specifications

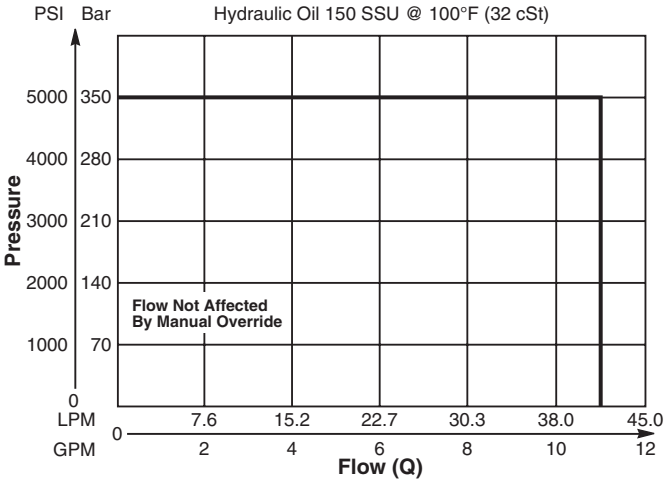
Rated Flow	42 LPM (11 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min @ 210 Bar (3000 PSI)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 30-60 ms **Close** 20-40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.26 kg (.58 lbs.)
Cavity	C10-4 (See BC Section for more details)

Performance Curves

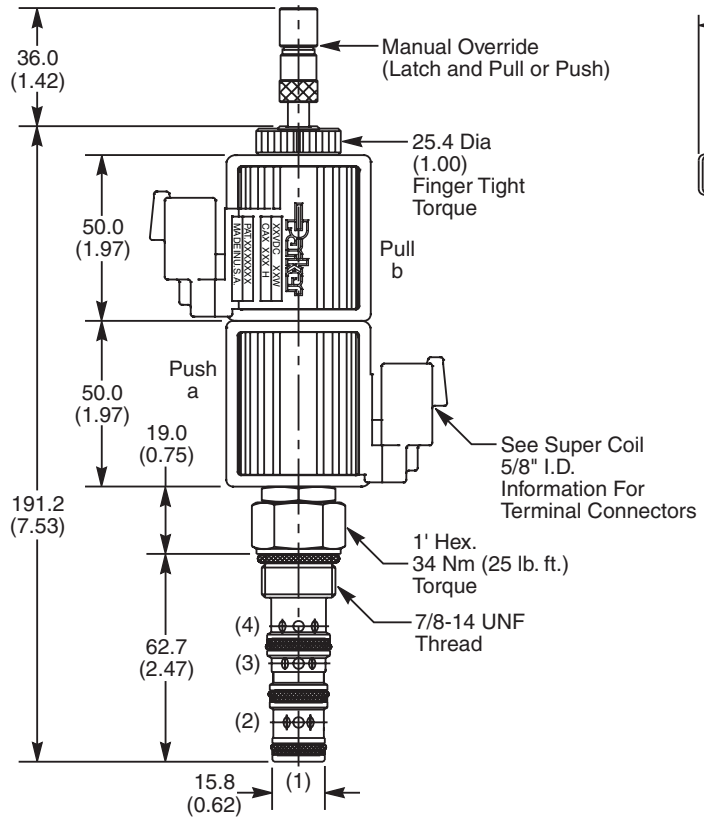
Pressure Drop vs. Flow Energized - GS045450ND
(Through cartridge only)

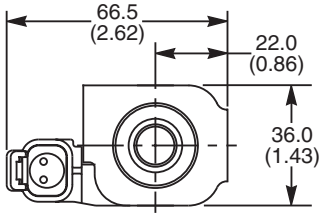


Operating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)





Ordering Information

GS04	54			N	D
10 Size Solenoid Valve	Style	Override Option	Screen	Seals	Design Level

Code	Style
54	High Flow and Pressure ('SP' Coil)

Code	Override Options
0	None
5	Standard - Center Detent only, Latch Operated, Push and Pull (*40 nt/9 lbs.)
6	Detented, (all positions), Push and Pull

***Force to push at 210 Bar (3000 PSI). Less to Pull.**

Code	Screen
0	None (*Contact factory for OEM requirements*)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30506N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

Code	Design Level
D	Includes Industry Common Cavity

Order Bodies Separately
See section BC

B10	—	4	—	8B
10 Size		4-Way Cavity		Port Size

Port Size
1/2" BSP

Body Material
Steel

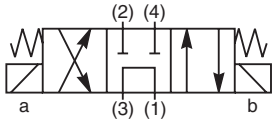
General Description

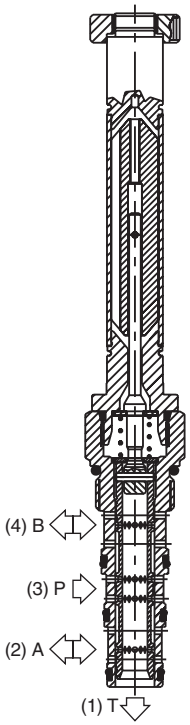
4-Way, 3 Position, Tandem Center Spool Valve.
For additional information see Technical Tips on pages SV1-SV6.

Features

- Four way tandem center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.





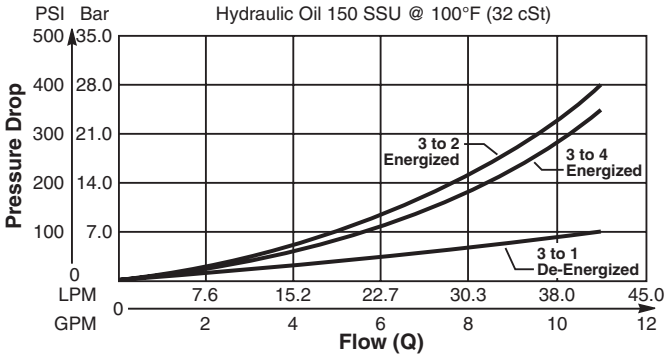


Specifications

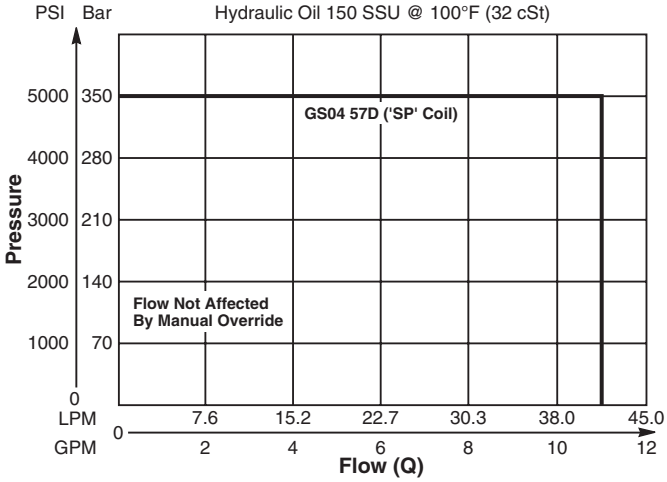
Rated Flow	42 LPM (11 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min @ 210 Bar (3000 PSI)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 30-60 ms **Close** 20-40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.26 kg (.58 lbs.)
Cavity	C10-4 (See BC Section for more details)

Performance Curves

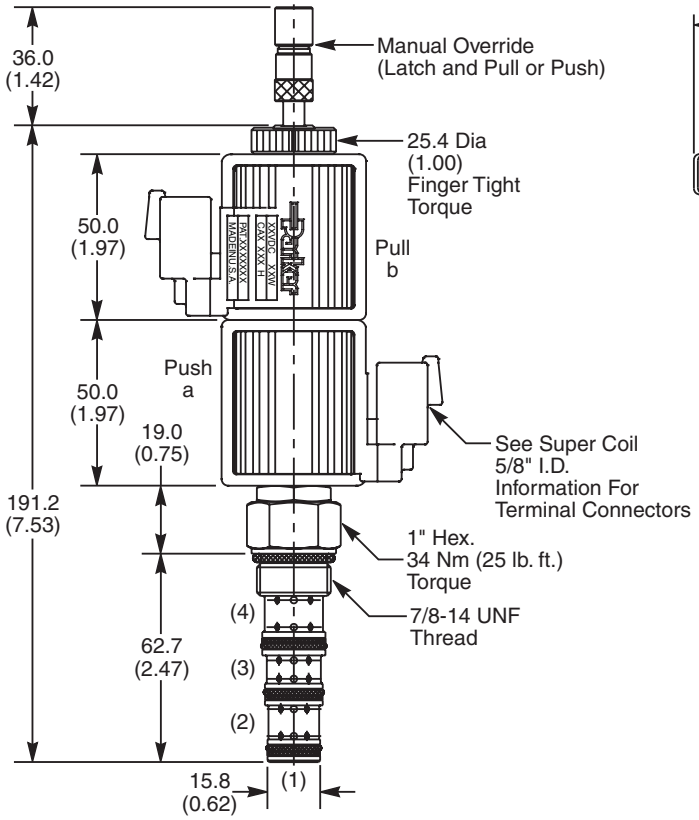
Pressure Drop vs. Flow (Through cartridge only)

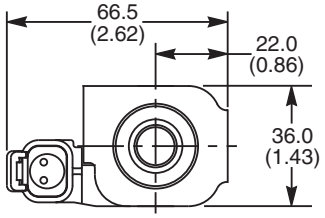


Operating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)





Ordering Information

GS04	57			N	D
10 Size Solenoid Valve	Style	Override Option	Screen	Seals	Design Level

Code	Style
57	High Flow and Pressure ('SP' Coil)

Code	Override Options
0	None
5	Standard - Center Detent only, Latch Operated, Push and Pull (*40 nt/9 lbs.)
6	Detented (all positions), Push and Pull

***Force to push at 210 Bar (3000 PSI). Less to Pull.**

Code	Screen
0	None (*Contact factory for OEM requirements*)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30506N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

Code	Design Level
D	Includes Industry Common Cavity

Order Bodies Separately
See section BC

B10	—	4	—	8B
10 Size		4-Way Cavity		Port Size

Port Size
1/2" BSP

Body Material
Steel

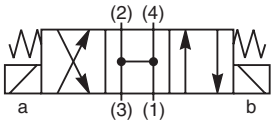
General Description

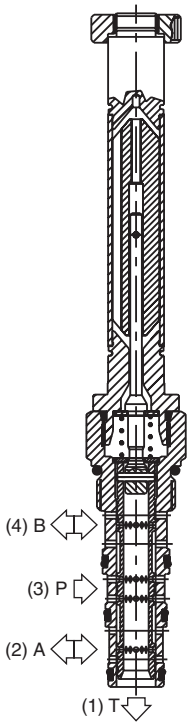
4-Way, 3 Position, Open Center Spool Valve.
For additional information see Technical Tips on pages SV1-SV6.

Features

- Four way open center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.





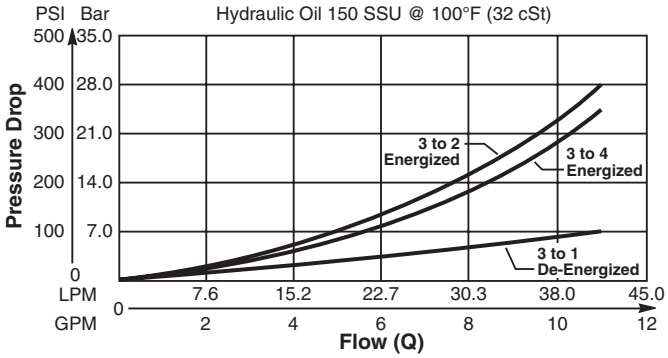


Specifications

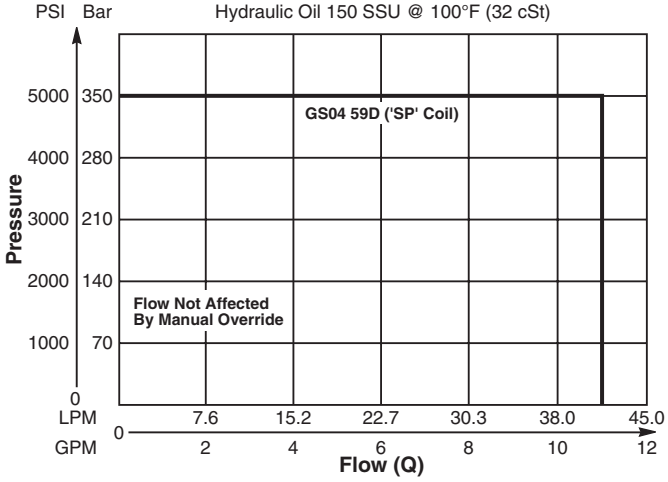
Rated Flow	42 LPM (11 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min @ 210 Bar (3000 PSI)
Minimum Operating Voltage	85% of rated voltage at 20°C (72°F).
Response Time	**Open** 30-60 ms **Close** 20-40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.26 kg (.58 lbs.)
Cavity	C10-4 (See BC Section for more details)

Performance Curves

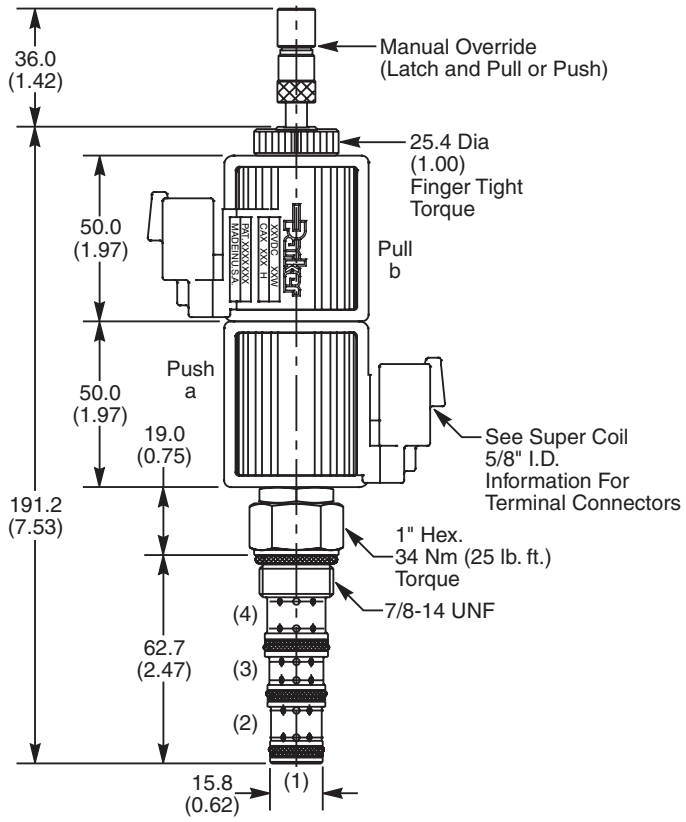
Pressure Drop vs. Flow (Through cartridge only)

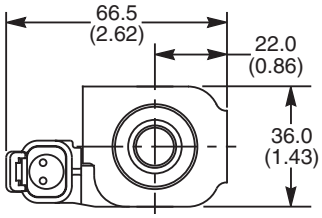


Operating Limits (Measured at 75% of Nominal Current)



Dimensions Millimeters (Inches)





Ordering Information

GS04	59			N	D
10 Size Solenoid Valve	Style	Override Option	Screen	Seals	Design Level

Code	Style
59	High Flow and Pressure ('SP' Coil)

Code	Override Options
0	None
5	Standard - Center Detent only, Latch Operated, Push and Pull (*40 nt/9 lbs.)
6	Detented (all positions), Push and Pull

***Force to push at 210 Bar (3000 PSI). Less to Pull.**

Code	Screen
0	None (*Contact factory for OEM requirements)*

Code	Seals / Kit. No.
N	Nitrile / Buna-N (SK30506N-1)

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

Code	Design Level
D	Includes Industry Common Cavity

Order Bodies Separately
See section BC

B10	—	4	—	8B
10 Size		4-Way Cavity		Port Size

Port Size
1/2" BSP

Body Material
Steel

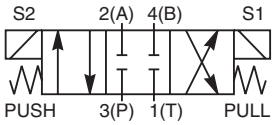
General Description

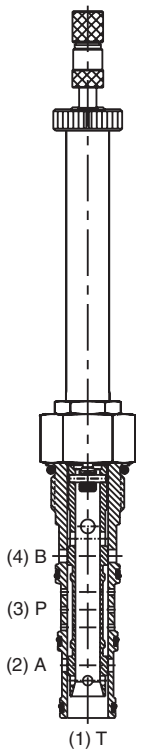
4-Way, 3 Position, Closed Center Spool Valve.
For additional information see Technical Tips on pages SV1-SV6.

Features

- Four way closed center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated







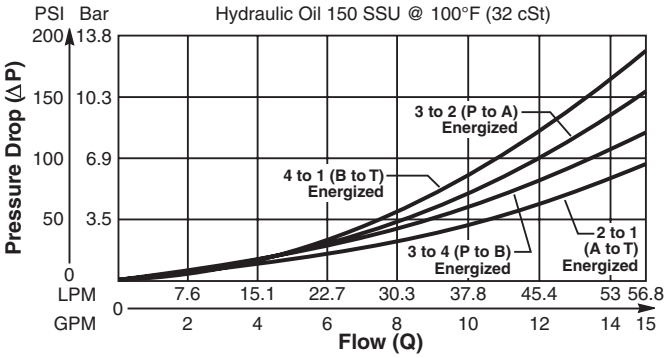
Specifications

Rated Flow	57 LPM (15 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min @ 210 Bar (3000 PSI)
Minimum Operating Voltage	75% of rated voltage at 20°C (72°F).
Response Time	**Energized** 30-60 ms **De-Energized** 20-40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.45 kg (1.0 lbs.)
Cavity	C12-4L (See BC Section for more details)

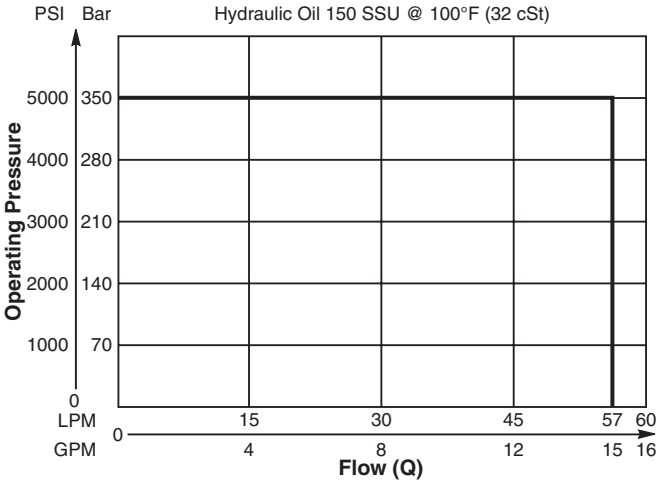
Performance Curves

Pressure Drop vs. Flow

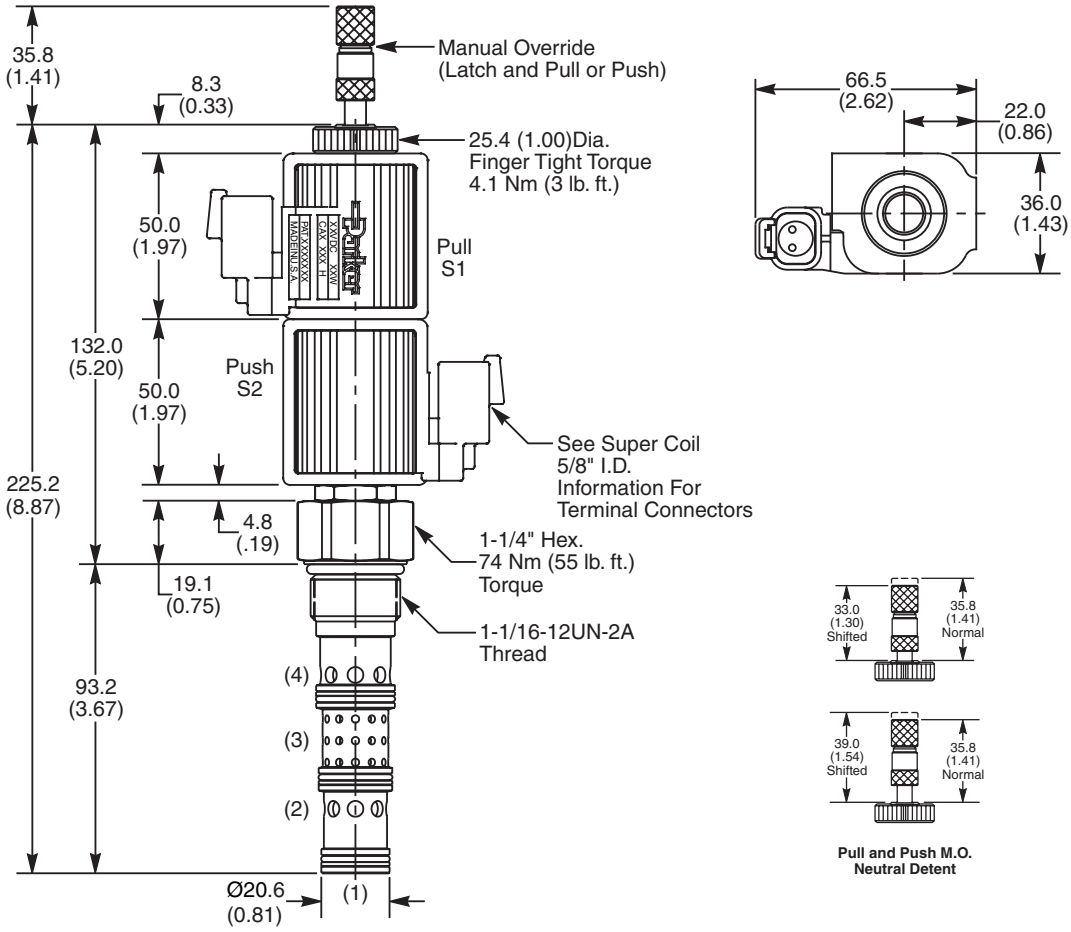
(Through cartridge only)



Shift Limit Characteristics (Min. Operating Voltage)



Dimensions Millimeters (Inches)



Ordering Information

DSH125	52		N
12 Size Solenoid Valve	Style	Override Option	Seals

Code	Style
52	High Flow ('SP' Coil)

Code	Override Options
Omit	None
DN	Latch Operated**

***40 nt/9 lbs.*

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK12-4LN)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

Order Bodies Separately
See section BC

B12	—	4L	—	12T
12 Size		4-Way Cavity		Port Size

Port Size
SAE 12

Body Material
Steel

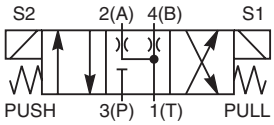
General Description

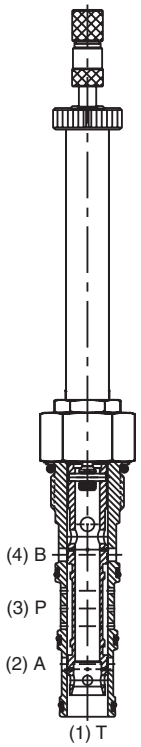
4-Way, 3 Position, Floating Center Spool Valve.
For additional information see Technical Tips on pages SV1-SV6.

Features

- Four way floating center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated





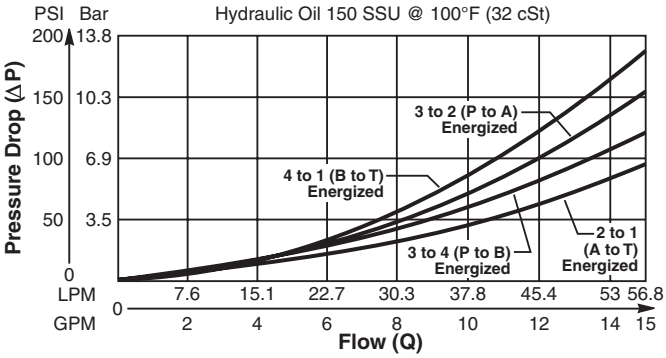


Specifications

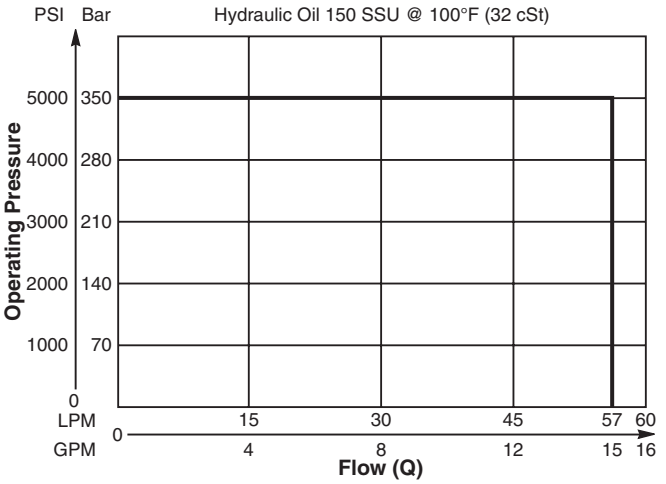
Rated Flow	57 LPM (15 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min @ 210 Bar (3000 PSI)
Minimum Operating Voltage	75% of rated voltage at 20°C (72°F).
Response Time	**Energized** 30-60 ms **De-Energized** 20-40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.45 kg (1.0 lbs.)
Cavity	C12-4L (See BC Section for more details)

Performance Curves

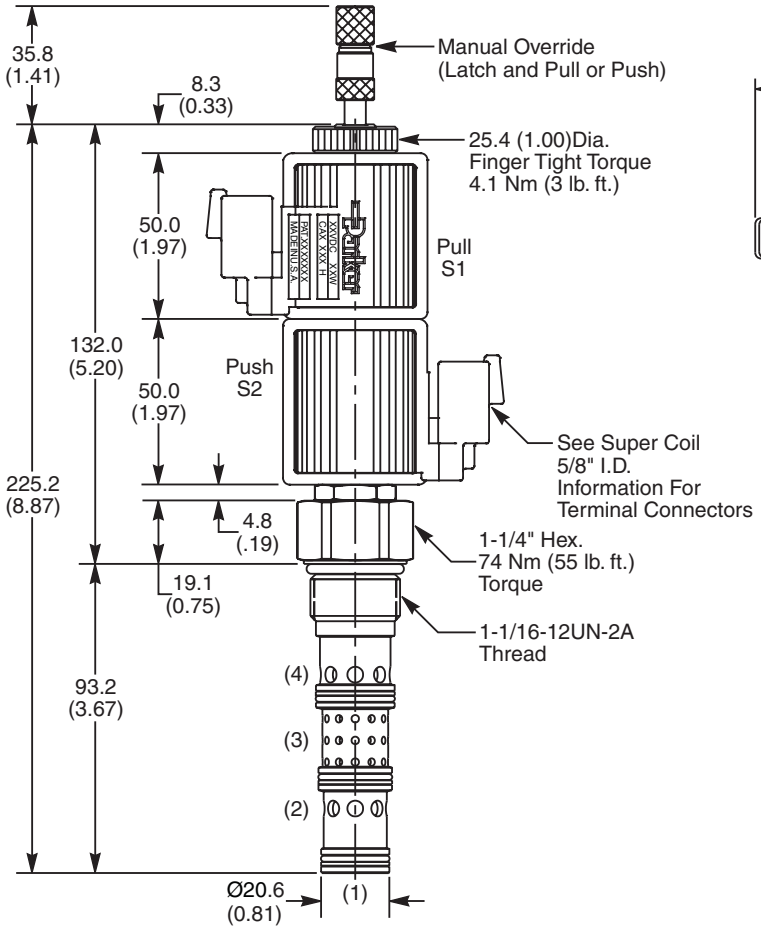
Pressure Drop vs. Flow
(Through cartridge only)

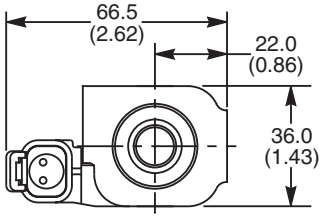


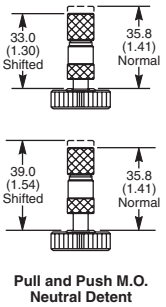
Shift Limit Characteristics (Min. Operating Voltage)



Dimensions Millimeters (Inches)







Pull and Push M.O.
Neutral Detent

Ordering Information

DSH125	54		N
12 Size Solenoid Valve	Style	Override Option	Seals

Code	Style
54	High Flow ('SP' Coil)

Code	Override Options
Omit	None
DN	Latch Operated**

40 nt/9 lbs.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK12-4LN)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

Order Bodies Separately
See section BC

B12	—	4L	—	12T
12 Size		4-Way Cavity		Port Size

Port Size
SAE 12

Body Material
Steel

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Mobile Hydraulic Systems Division Europe

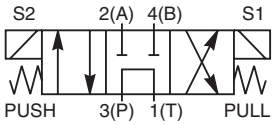
General Description

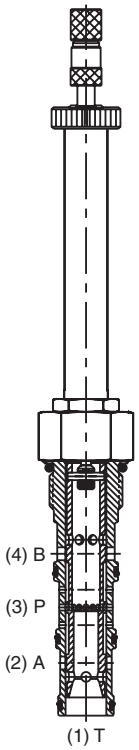
4-Way, 3 Position, Tandem Center Spool Valve.
For additional information see Technical Tips on pages SV1-SV6.

Features

- Four way tandem center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated







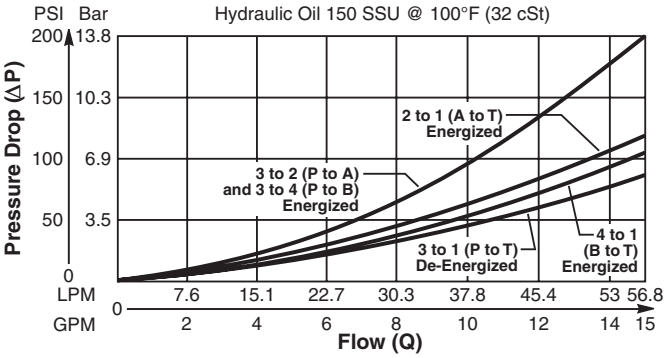
Specifications

Rated Flow	57 LPM (15 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min @ 210 Bar (3000 PSI)
Minimum Operating Voltage	75% of rated voltage at 20°C (72°F).
Response Time	**Energized** 30-60 ms **De-Energized** 20-40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.45 kg (1.0 lbs.)
Cavity	C12-4L (See BC Section for more details)

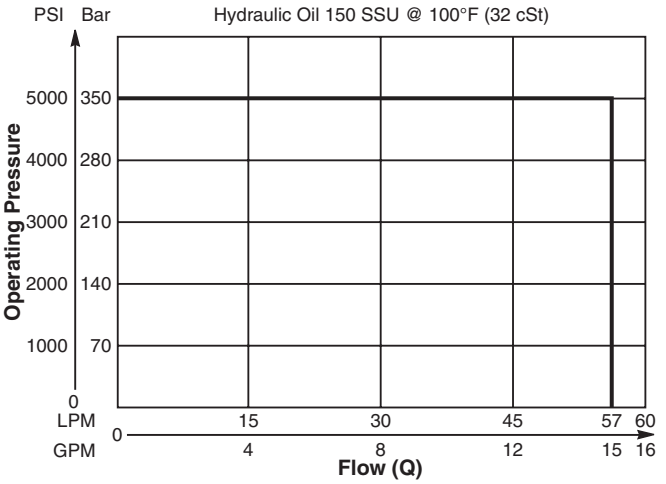
Performance Curves

Pressure Drop vs. Flow

(Through cartridge only)

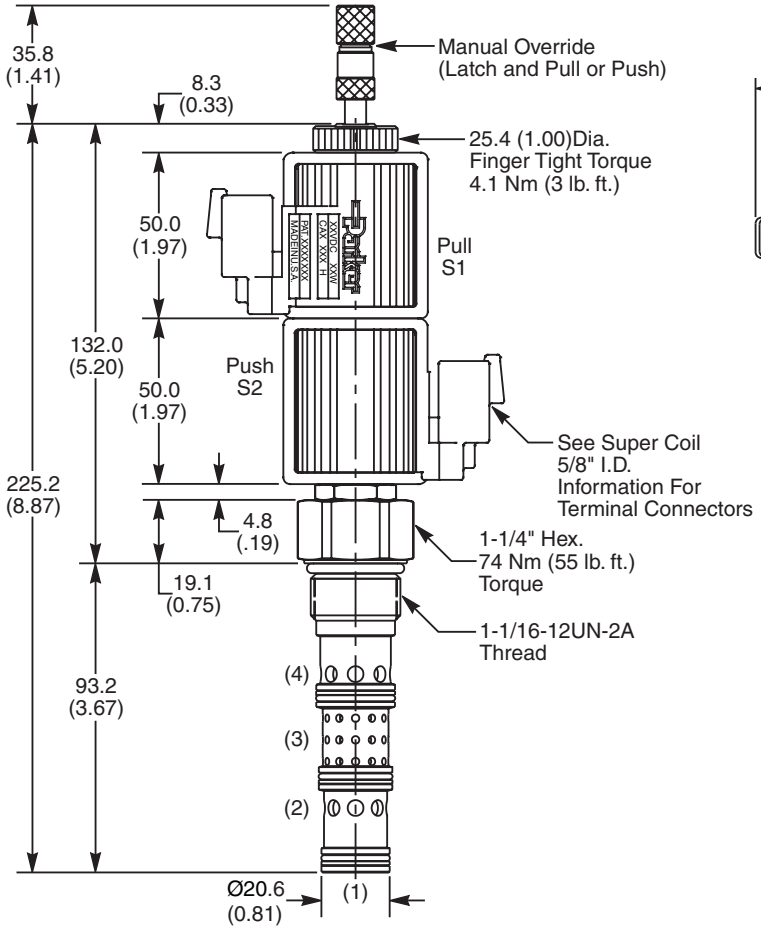


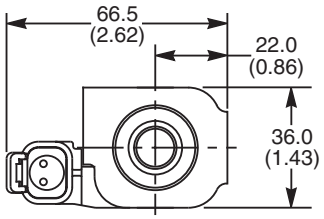
Shift Limit Characteristics (Min. Operating Voltage)

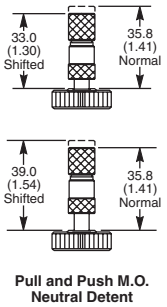


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Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)







Pull and Push M.O.
Neutral Detent

Ordering Information

DSH125	57		N
12 Size Solenoid Valve	Style	Override Option	Seals

Code	Style
57	High Flow ('SP' Coil)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK12-4LN)	-34°C to +121°C (-30°F to +250°F)

Code	Override Options
Omit	None
DN	Latch Operated**

40 nt/9 lbs.

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

Order Bodies Separately
See section BC

B12	—	4L	—	12T
12 Size		4-Way Cavity		Port Size

Port Size
SAE 12

Body Material
Steel

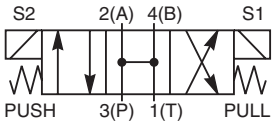
General Description

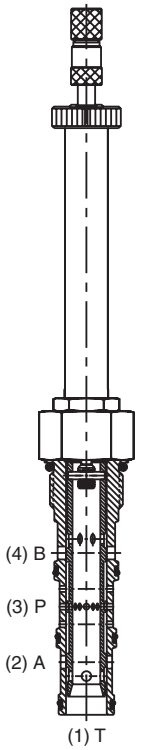
4-Way, 3 Position, Open Center Spool Valve.
For additional information see Technical Tips on pages SV1-SV6.

Features

- Four way open center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated







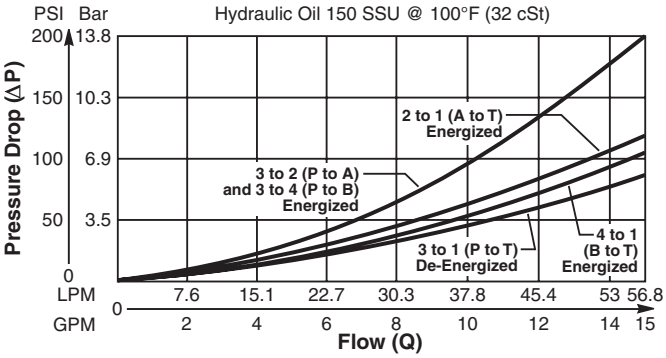
Specifications

Rated Flow	57 LPM (15 GPM)
Maximum Inlet Pressure	350 Bar (5000 PSI)
Maximum Tank Pressure	210 Bar (3000 PSI)
Leakage at 150 SSU (32 cSt)	160 cc/min @ 210 Bar (3000 PSI)
Minimum Operating Voltage	75% of rated voltage at 20°C (72°F).
Response Time	**Energized** 30-60 ms **De-Energized** 20-40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO 4406 18/16/13, SAE Class 4
Approx. Weight	.45 kg (1.0 lbs.)
Cavity	C12-4L (See BC Section for more details)

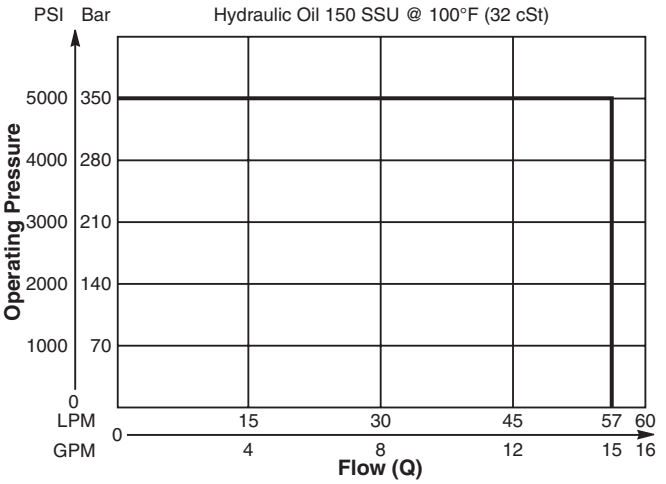
Performance Curves

Pressure Drop vs. Flow

(Through cartridge only)

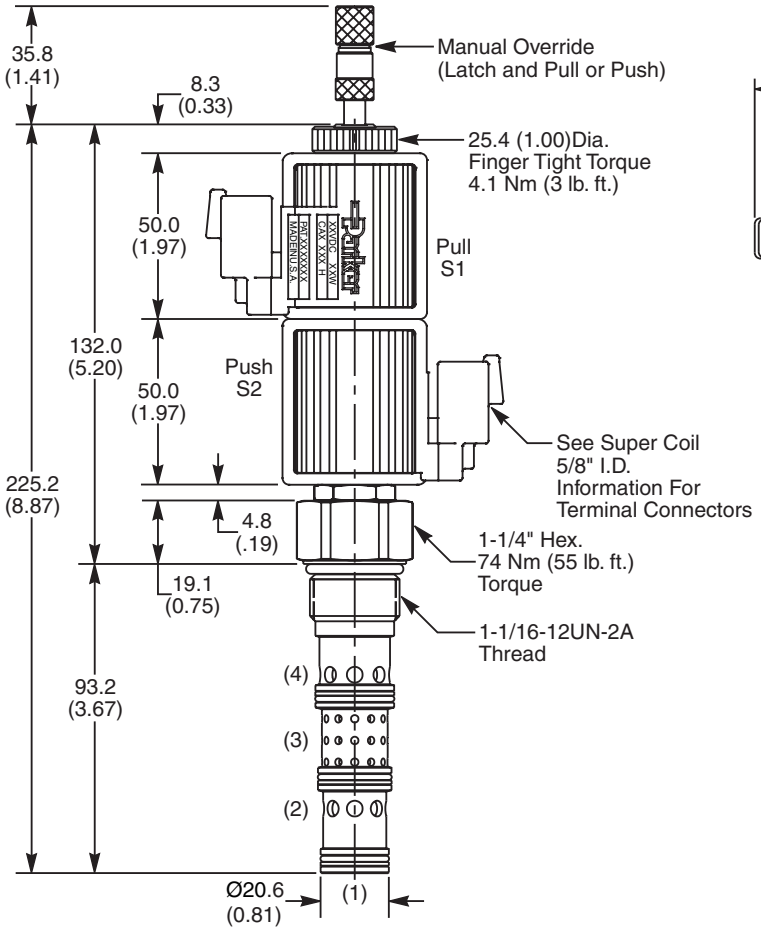


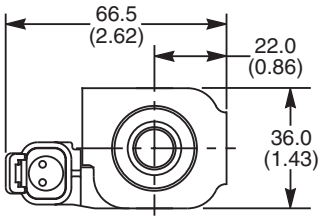
Shift Limit Characteristics (Min. Operating Voltage)

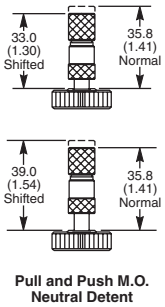


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Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)







Pull and Push M.O.
Neutral Detent

Ordering Information

DSH125	59		N
12 Size Solenoid Valve	Style	Override Option	Seals

Code	Style
59	High Flow ('SP' Coil)

Code	Override Options
Omit	None
DN	Latch Operated**

40 nt/9 lbs.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK12-4LN)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

Order Bodies Separately
See section BC

B12	—	4L	—	12T
12 Size		4-Way Cavity		Port Size

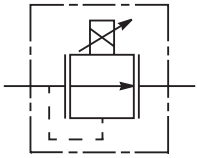
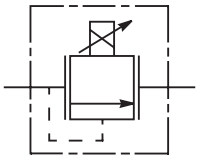
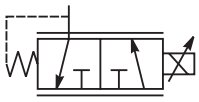
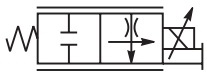
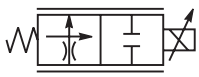
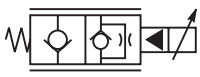
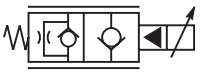
Port Size
SAE 12

Body Material
Steel

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Mobile Hydraulic Systems Division Europe

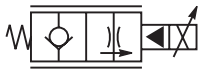
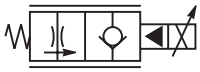
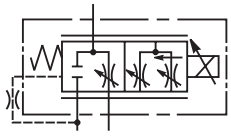
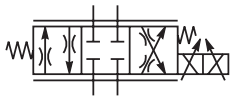
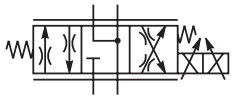
Contents

Proportional Valves

	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
	**PRESSURE RELIEVING**					
	AP02B2YP	C08-2	Increase Pressure/Increase Current	5.3/1.4	350/5000	PV7-PV8
	AP04G2YP	C10-2	Increase Pressure/Increase Current	95/25	350/5000	PV9-PV10
	AP02B2YR	C08-2	Decrease Pressure/Increase Current	5.3/1.4	350/5000	PV11-PV12
	PRD081CW	C08-2	Decrease Pressure/Increase Current	1.14/0.3	350/5000	PV13-PV14
	AP04G2YR	C10-2	Decrease Pressure/Increase Current	95/25	350/5000	PV15-PV16
	**PRESSURE REDUCING**					
	GP01 30	54-1	Pressure Reducing Valve	1.9/.5	210/3000	PV17-PV18
	GTP02 34	C08-3	Pressure Reducing Valve	19/5	210/3000	PV19-PV20
	EPR111C	C10-3L	Pressure Reducing/Relieving Valve	37.5/10	350/5000	PV21-PV22
	**FLOW CONTROLS, 2-WAY**					
	HP02C 21	2X	Flow Control, N.C.	23/6	210/3000	PV23-PV24
	JP02C 21	C08-3	Flow Control, N.C.	23/6	210/3000	PV25-PV26
	HP04C 21	C10-2	Flow Control, N.C.	36/9.5	210/3000	PV27-PV28
	JP04C 21	3X	Flow Control, N.C.	36/9.5	210/3000	PV29-PV30
	HP02P 21	2X	Flow Control, N.O.	19/5	210/3000	PV31-PV32
	JP02P 21	C08-3	Flow Control, N.O.	19/5	210/3000	PV33-PV34
	HP04P 21	C10-2	Flow Control, N.O.	30/8	210/3000	PV35-PV36
	JP04P 21	3X	Flow Control, N.O.	36/9.5	210/3000	PV37-PV38
	**POPPET TYPE, 2-WAY**					
	FAP081C	C08-2	2 Way, Normally Closed	27/7	210/3000	PV39-PV40
	FAP101C	C10-2	2 Way, Normally Closed	40/10.5	210/3000	PV41-PV42
	FAP121C	C12-2F	2 Way, Normally Closed	81.5/21.5	210/3000	PV43-PV44
	FAP161C	C16-2	2 Way, Normally Closed	106/28	210/3000	PV45-PV46
	FAP081N	C08-2	2 Way, Normally Open	40/10.5	210/3000	PV47-PV48
	FAP101N	C10-2	2 Way, Normally Open	55/14.5	210/3000	PV49-PV50
	FAP121N	C12-2F	2 Way, Normally Open	98.5/26	210/3000	PV51-PV52
	FAP161N	C16-2	2 Way, Normally Open	117/31	210/3000	PV53-PV54

Contents

Proportional Valves

	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.
	**POPPET TYPE, PRESSURE COMPENSATED, 2-WAY**					
	FAPC101C	3X	2 Way, Normally Closed	38/10	210/3000	PV55-PV56
	FAPC121C	C12-3L	2 Way, Normally Closed	57/15	210/3000	PV57-PV58
	FAPC161C	C16-3	2 Way, Normally Closed	83/22	210/3000	PV59-PV60
						
	FAPC101N	3X	2 Way, Normally Open	38/10	210/3000	PV61-PV62
	FAPC121N	C12-3L	2 Way, Normally Open	57/15	210/3000	PV63-PV64
	FAPC161N	C16-3	2 Way, Normally Open	83/22	210/3000	PV65-PV66
	**FLOW CONTROLS, 3-WAY**					
	JP04C 31	4C	Priority Flow Control, N.C.	30/8	210/3000	PV67-PV68
	**DIRECTIONAL CONTROL**					
	GP02 51	C08-4	4 Way, 3 Pos - Closed Center	13.3/3.5	350/5000	PV69-PV70
	GP02 52	C08-4	4 Way, 3 Pos - Closed Center	21/5.5	350/5000	PV69-PV70
	GP02 53	C08-4	4 Way, 3 Pos - Float Center	14/3.8	350/5000	PV71-PV72
	GP02 54	C08-4	4 Way, 3 Pos - Float Center	17/4.5	350/5000	PV71-PV72
	DSP105C1	C10-4	4 Way, 3 Pos - Closed Center	32/8.5	210/3000	PV73-PV75
	DSP105C4	C10-4	4 Way, 3 Pos - Float Center	32/8.5	210/3000	PV73-PV75

INTRODUCTION

This technical tips section is designed to help familiarize you with the Parker line of Proportional Valves. In this section we present common options, technical terms, as well as a brief synopsis of the operation and applications of the various products offered in this section. The intent of this section is to help you in selecting the best products for your application.

COMMON OPTIONS

As you will see, Parker offers a variety of Proportional Valve products. As such, some of the options mentioned below may not be available on all valves. Consult the model coding and dimensions for each valve for specifics. Here are some of the common options available.

Seals: The majority of the products are available in Nitrile or Fluorocarbon Seals. The Winner's Circle products feature a standard 4301 Polyurethane "D"-Ring. The "D"-Ring eliminates the need for backup rings. You should match the seal compatibility to the temperature and fluid being used in your application.

Overrides: Overrides are standard on many of the Parker proportional valves. The override is generally a push type that is flush with the end of the tube. Consult the individual catalog pages for more details.

TECHNICAL TERMS

To help in applying our proportional valve line of product, we have listed some technical terms below, as well as some helpful hints in applying our valves.

Ohm's Law: Electrical current is generated as a result of the relationship between input voltage and the resistance to the flow of electrical current. It is represented in equation form by I = V/R (or V=IR), where I is current, V is voltage and R is resistance. This is an important relationship to remember when dealing with any electrically operated valves. Proportional valves allow varying control of flow or pressure, dependant on the current signal provided. As coils heat up, their resistance rises. This means a higher voltage must be available to maintain the same amount of pressure or flow. Thus, the application needs to be designed such that the full on position is about 70% of the initial current draw. On the individual catalog pages a maximum control current is specified to help in applying our proportional valves.

PWM: Pulse Width Modulation (PWM) is the preferred signal for controlling electrical current. PWM is on / off voltage in a square wave form. The percent "on" time or duty cycle provides the average voltage. The valve driver adjusts the duty cycle to obtain current control. We recommend valve drivers with current control for optimum performance. PWM signals also usually provide dither for the proportional valve. Dither is a small back and forth movement of the valve spool around its set position. This rapid movement reduces the friction of the valve and leads to faster, more accurate response.

PWM Frequency: The frequency of a PWM signal is the rate at which the signal is turned on and off. Parker's analog proportional valves are designed to work with low frequency responses between 100-400 Hz. The performance curves on our catalog pages were performed with a PWM signal at 200 Hz.

Hysteresis: Due to various factors, the performance of a proportional valve will show a slightly different performance when the current signal is increasing than it will when the signal is being decreased. This difference is usually expressed as a percentage of total input change and is referred to as the hysteresis of the valve.

Deadband: Cracking or deadband refers to the amount of the control signal that is needed to produce any movement of the spool. Thus, a 20% deadband means that 20% of the control signal is needed before the spool will move.

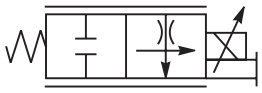
PRODUCT TYPES / APPLICATIONS

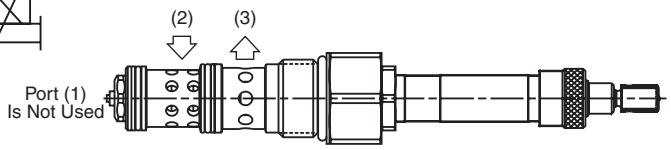
Proportional valves are nothing more than electrically adjustable hydraulic valves. They give the operator nearly infinite adjustment control and flexibility. Parker Hannifin offers various types of proportional flow control, pressure reducing, and relief valves.

Proportional Flow Control Valve

Proportional flow control valves provide pseudo pressure compensation and are used on systems requiring variable electronic control of flow. They allow the operator to vary the control signal to accelerate or decelerate an actuator. A compensator valve can be added to the circuit for enhanced compensation. Some typical applications would include the hoist control for a lift, or the speed control for a winch circuit. Parker offers both normally closed and normally open versions of proportional flow controls.

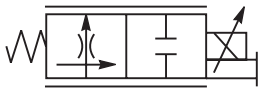
Normally Closed Proportional Flow Control

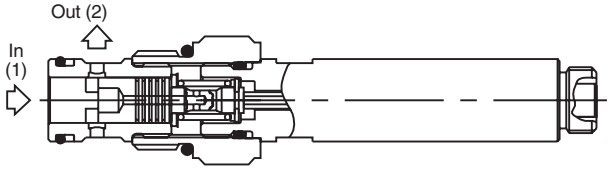




OPERATION - With the solenoid coil de-energized, the spool is held in a closed position by the spring force. When the solenoid coil is energized, the amperage of the signal moves the spool into an open position.
The spool is held in this position by a balance between spring force and electrical force. As the current increases, the spools opens further; allowing more flow. As the current decreases, the spool begins closing; allowing less flow. Pseudo compensation is obtained by the pressure drop across the orifices in the spool.

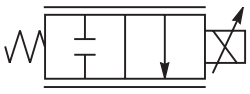
Normally Open Proportional Flow Control

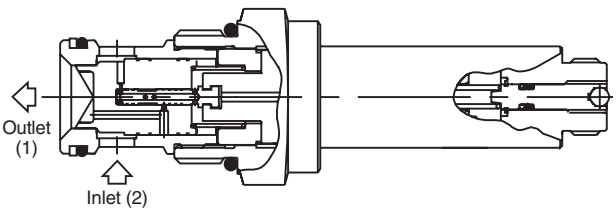




OPERATION - With the solenoid coil de-energized, the spool is held in an open position by spring force; allowing full flow to pass. As the solenoid coil is energized, the spool begins to move away from a full open position;
allowing less flow to pass. Once a full electronic signal is given, the spool is held in a closed position; allowing no flow to pass. As the electronic signal is then reduced, the spool begins to open; allowing flow to pass again. Once a constant electronic signal is given, the spool is held in that position by a balance between electronic force and spring force. Pseudo compensation is obtained by the pressure drop across the orifices in the spool.

Normally Closed Proportional Needle Valve

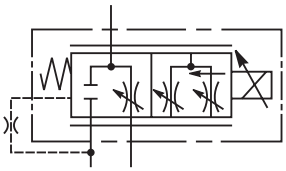


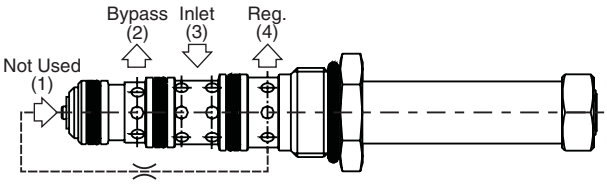


The proportional needle valves are electronic controlled variable needle valves. They are designed specifically for bleed off or unloading circuits as back pressure will affect performance.

OPERATION - With the solenoid de-energized, the main poppet is held in the closed position by spring force. When the solenoid is energized, the sensing spool moves into a partially open position relative to the percentage of rated current flowing through the coil. This action allows the main poppet to move away from the valve seat to a degree that corresponds to sensing spool position. The valve will maintain a fixed amount of opening as long as the electrical current remains constant and will vary proportionally with an increase or decrease in current.

Proportional Priority Bypass Flow Control

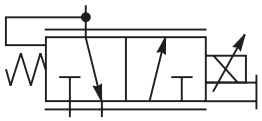


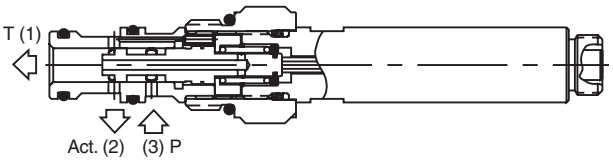


The proportional priority bypass flow controls allow electronic control of the flow setting for the priority flow circuit. The priority flow remains constant regardless of changes in load or pressure. The excess inlet flow is diverted or bypassed to tank. The bypass port must not have any restrictions or performance will be hindered.

OPERATION - Flow enters the valve through port 3. With the coil de-energized, flow is bypassed to port 2. When the coil is energized, the internal orifice is increased allowing pressure compensated flow to the priority port (port 4). The excess flow is bypassed to port 2. As input current is increased, the priority flow increases and the bypass flow decreases. As the current is decreased, priority flow decreases and bypass flow is increased.

Direct Acting, Normally Closed Proportional Pressure Reducing Valve





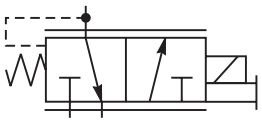
Direct acting, normally closed proportional pressure reducing valves are used to electronically reduce the inlet pressure to one leg of a hydraulic circuit. This valve is used when a fixed regulated pressure is required regardless of the inlet pressure. This valve could be used as a clutch control for power shift transmissions and PTO, or as a pilot control for directional control valves.

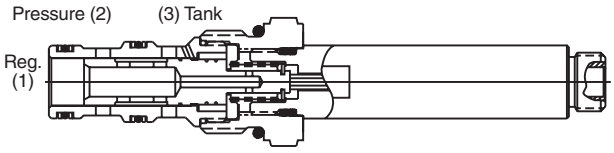
OPERATION - With the solenoid coil de-energized, the spool is held in a closed position by spring force. In this mode, the regulated pressure port is open to tank and the pressure inlet is blocked. As current is applied to the solenoid coil, the spool will begin to travel to a position where the pressure inlet port is connected to the regulated pressure port. At this point, reduced pressure becomes a function of the current signal. As long as the current signal is constant, the reduced pressure at the regulated pressure port will remain fixed regardless of any changes in inlet flow or inlet pressure. As the current signal increases or decreases, the reduced pressure at the regulated pressure port will change with respect to the changes in signal. Once the coil is fully energized, the reduced pressure of the regulated pressure port will be at the maximum reduced pressure for that valve.

Normally Closed Proportional Pressure Reducing / Relieving Valve

Normally Closed Proportional Pressure Reducing/Relieving Valves are used to electronically reduce the inlet pressure to one leg of a hydraulic circuit. In addition these valves act as a relief valve, relieving any shocks or surges that occur between its regulating port and the actuator. Parker offers direct acting and pilot operated versions of this valve. The direct acting valves are faster responding and generally have lower hysteresis, but are limited to smaller reduced pressures (generally below 800 psi depending on the valve.) Pilot operated are generally slower on response due to the two stage performance, but can have a reduced pressure as high as 3000 psi.

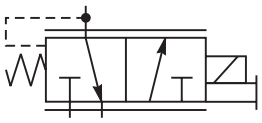
Direct Acting

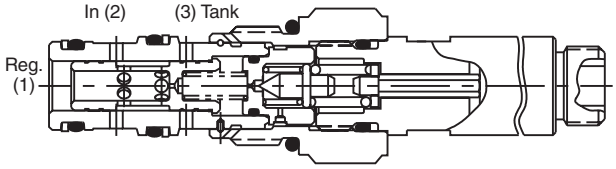




OPERATION - With the solenoid coil de-energized, the spool is held in a closed position by spring force. In this mode, the regulated pressure port is open to tank and the pressure inlet port is blocked. As an electronic signal is applied to the solenoid coil, the spool will begin to travel to a position where the pressure inlet port is connected to the regulated pressure port. At this point, reduced pressure becomes a function of the voltage signal. As long as the electronic signal is constant, the reduced pressure at the regulated pressure port will remain fixed regardless of any changes in inlet flow or inlet pressure. As the electronic signal increases or decreases, the reduced pressure at the regulated port will change with respect to the change in electronic signal. Once a full signal is given, the reduced pressure of the regulated pressure port will be at the maximum reduced pressure for that valve.

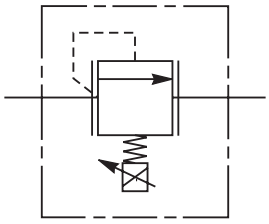
Pilot Operated

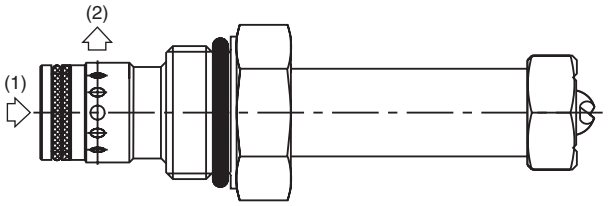




OPERATION - With the solenoid coil de-energized, the pilot dart is held open by the spring force. This allows the main spool to close and restricts flow from going from the inlet (2) port to the regulated port (1). As the electronic signal is applied to the coil, the pilot dart is moved towards the pilot seat restricting pilot flow. This restriction raises the effective pressure inside the chamber between the spool and the pilot seat, allowing the spool to travel away from the pilot seat to a position where the pressure at inlet (2) is connected to the regulated pressure port (1). At this point, reduced pressure becomes a function of the electronic signal. As long as the electronic signal is constant, the reduced pressure at the regulated pressure port (2) will remain fixed regardless of any changes in inlet flow or inlet pressure. As the electronic signal increases or decreases, the reduced pressure at port (1) will change with respect to the change in the electronic signal.

Normally Closed
Proportional Relief Valve

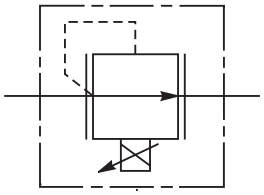


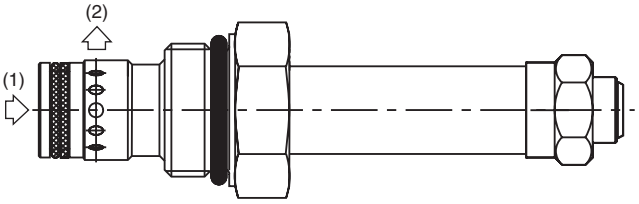


Normally closed proportional relief valves are used to electronically control the system pressure. These valves are ideal for circuits with varying system pressures demands. A small flow pilot version of the normally closed proportional relief is also offered for piloting a larger logic element or vented relief valve. The normally closed relief defaults to a maximum pressure setting (i.e. 3000 psi) when there is no current applied.

OPERATION - With the solenoid coil de-energized, the pilot dart is held closed by the spring. As current is applied to the coil, the pilot dart is moved creating less restriction of the pilot flow. As this restriction is reduced with the
increasing current, the pressure setting also decreases. Once a constant electronic signal is given, the pilot dart is held in a given position, holding the pressure setting. This is maintained by the balance between the electronic spring force and the inlet pressure.

Normally Open
Proportional Relief Valve





Normally open proportional relief valves are used to electronically control the system pressure. These valves are ideal for circuits with varying system pressure demands. A small flow pilot version of the normally open proportional relief is also offered for piloting a larger logic element or vented relief valve. The normally open relief defaults to minimum system pressure (i.e. 150 psi) when there is no current applied. Normally closed versions are also available upon request.

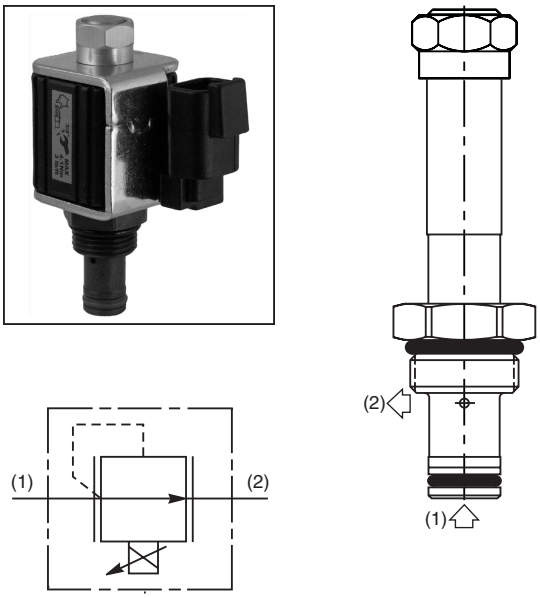
OPERATION - With the solenoid coil de-energized, the pilot dart is held open by the spring. This allows the main spool to open at minimum pressure 10.4 Bar (150 psi). As current is applied to the coil, the pilot dart is moved towards the pilot seat restricting pilot flow. This restriction raises the effective pressure setting of the valve. Once a constant electronic signal is given, the pilot dart is held in a given position, holding the pressure setting. This is maintained by a balance between electronic spring force and inlet pressure. As the electronic signal is reduced, the pilot dart is moved away from the pilot seat. This lowers the effective pressure setting of the valve.

General Description

Proportional Relief Valve. Increasing Pressure With Increasing Current. For additional information see Technical Tips on pages PV1-PV6.

Features

- Analog Proportional Relief Valve regulates pressure proportionally to the solenoid current
- Direct acting poppet design
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.



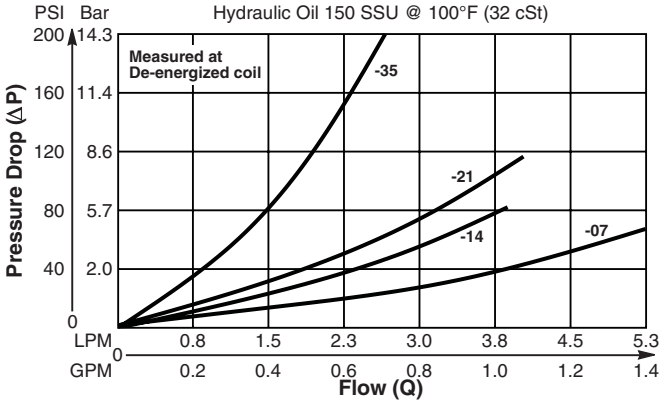
Specifications

Rated Flow (At 70 PSI ΔP)	**07C** 5.3 LPM (1.4 GPM) **14C** 3.4 LPM (0.9 GPM) **21C** 3.0 LPM (0.8 GPM) **35C** 1.3 LPM (.35 GPM)
Max. Pressure At Port 1 @ 75% Input Current	**07C** 70 Bar (1000 PSI) **14C** 140 Bar (2000 PSI) **21C** 210 Bar (3000 PSI) **35C** 350 Bar (5000 PSI)
Hysteresis @ 200 Hz PWM	5%
Cracking Pressure	**07C** .07 Bar (1 PSI) **14C** .14 Bar (2 PSI) **21C** .21 Bar (3 PSI) **35C** .35 Bar (4 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.06 kg (.14 lbs.)
Cavity	C08-2 (See BC Section for more details)

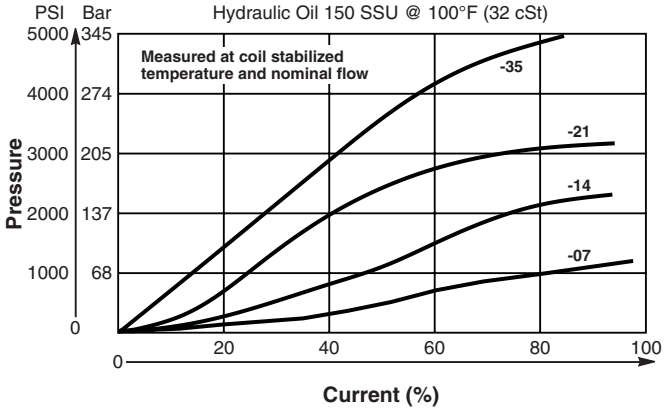
Performance Curves

▲PWM Current Regulator Recommended

Pressure Drop vs. Flow

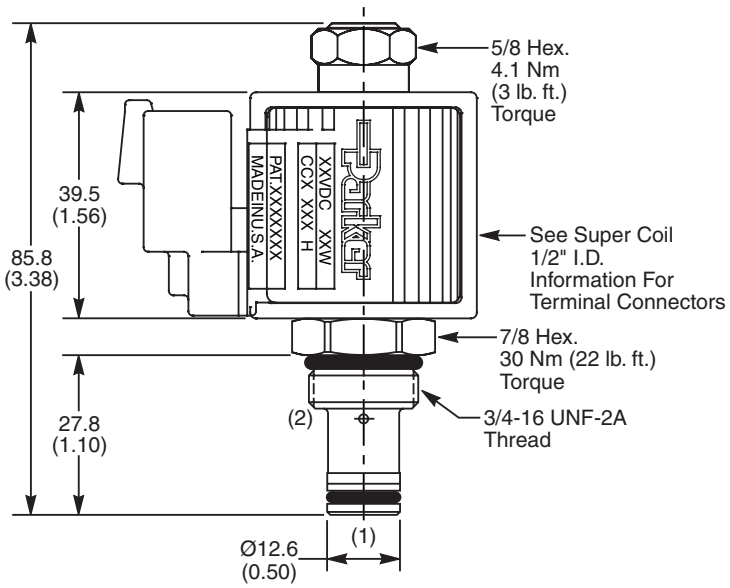


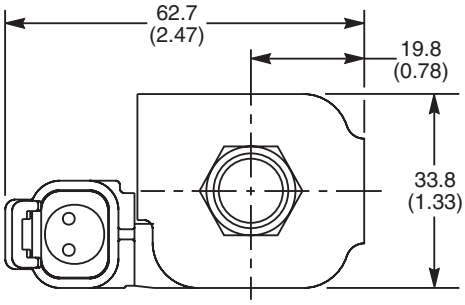
Pressure vs. Input Signal (Current)



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)





Ordering Information

AP02B2YP		
08 Size Proportional Relief Valve	Style	Seals

Code	Style (Maximum Relief Pressure)
07C	70 Bar (1000 PSI)
14C	140 Bar (2000 PSI)
21C	210 Bar (3000 PSI)
35C	350 Bar (5000 PSI)

Custom pressure setting available. Consult factory.

Code	Seals / Kit No.	Operating Temp.
Omit	"D" -Ring / (SK08-2)	-37°C to +93°C (-35°F to +200°F)
N	Nitrile / (SK08-2N)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Port Size
3/8" BSP

Body Material
Steel

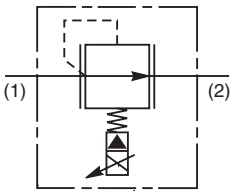
General Description

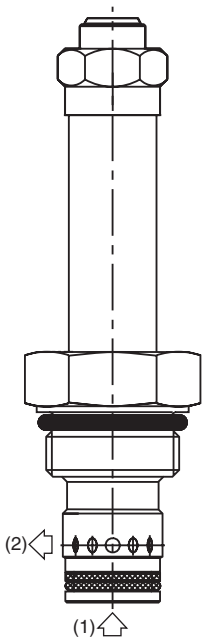
Proportional Relief Valve. Increasing Pressure With Increasing Current. For additional information see Technical Tips on pages PV1-PV6.

Features

- Pilot operated spool-type design fits industry common cavity (10-2)
- Relieving pressure output is proportional to DC current input
- Precise setting of factory preset pressure in energized mode
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.







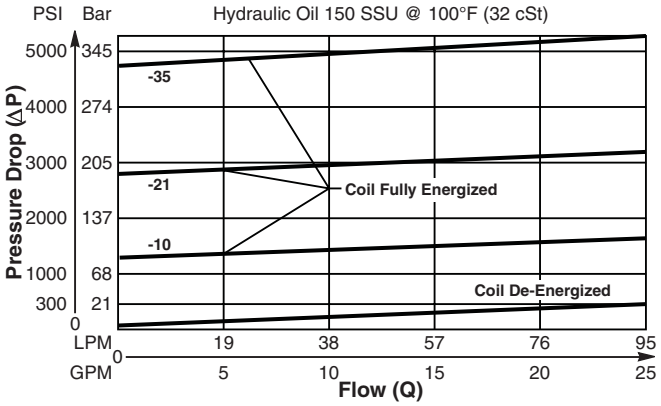
Specifications

Rated Flow (At 300 PSI ΔP) When Coil is Fully De-Energized	95 LPM (25 GPM)
Factory Set Relief Pressure When Coil De-Energized Measured at 45 LPM (12 GPM)	**10C** 103 Bar (1500 PSI) **21C** 210 Bar (3000 PSI) **35C** 350 Bar (5000 PSI)
Hysteresis @ 250 Hz PWM	< 7% of Maximum Pressure Setting
Response Time At 75% of Nominal Voltage Change (Measured To 90% of Press. Change)	**To Unload** 10ms **To Load** **10C** 45 ms **21C** 60 ms **35C** 80 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.14 kg (.31 lbs.)
Cavity	C10-2 (See BC Section for more details)

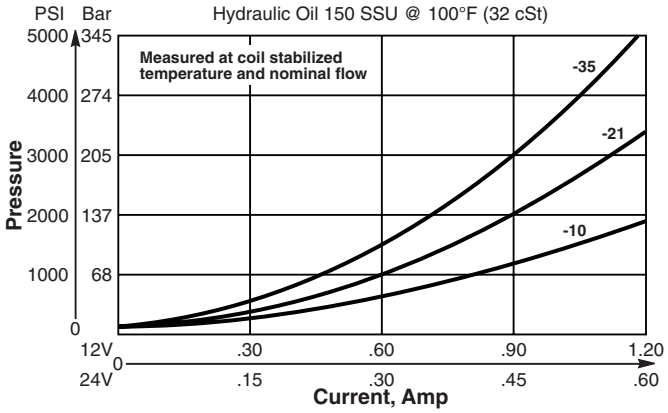
Performance Curves

▲PWM Current Regulator Recommended

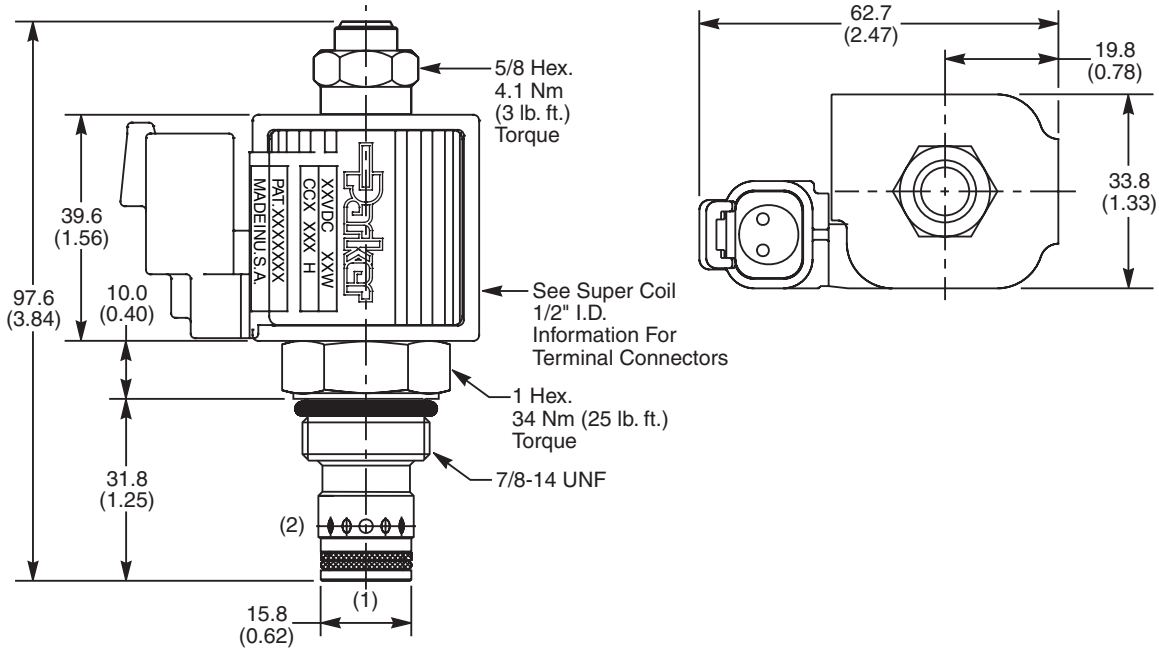
Relief Performance



Pressure vs. Input Current



Dimensions Millimeters (Inches)



Ordering Information

AP04G2YP		N
10 Size Proportional Relief Valve	Style	Seals

Code	Style (Maximum Relief Pressure)
10C	104 Bar (1500 PSI)
21C	210 Bar (3000 PSI)
35C	350 Bar (5000 PSI)

Custom pressure setting available. Consult factory.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30503N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

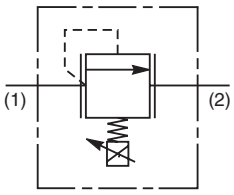
Port Size
1/2″ BSP

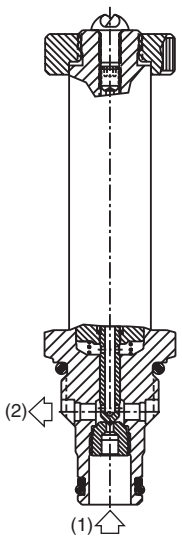
Body Material
Steel

General Description

Proportional Relief Valve. Decreasing Pressure With Increasing Current. For additional information see Technical Tips on pages PV1-PV6.







Features

- Analog Proportional Relief Valve regulates pressure proportionally to the input solenoid current
- Direct acting poppet design
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.

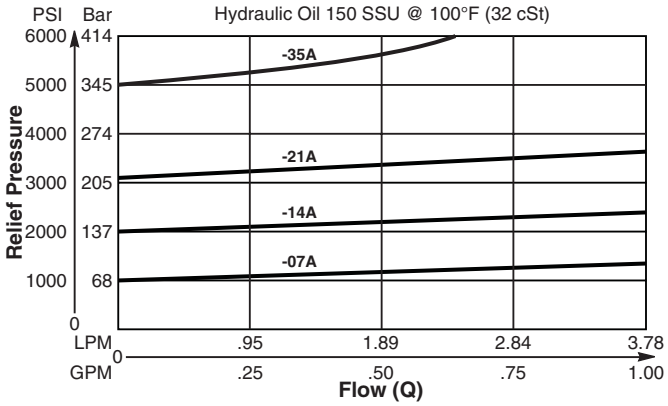
Specifications

Rated Flow (At 70 PSI ΔP)	**07A** 5.3 LPM (1.4 GPM) **14A** 3.4 LPM (0.9 GPM) **21A** 3.0 LPM (0.8 GPM) **35A** 1.9 LPM (0.5 GPM)
Factory Set Relief Pressure When De-Energized (±5% -Std. ±2% - Low Variation)	**07A** 70 Bar (1000 PSI) **14A** 140 Bar (2000 PSI) **21A** 210 Bar (3000 PSI) **35A** 350 Bar (5000 PSI)
Hysteresis @ 200 Hz PWM	< 10%
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.09 kg (.19 lbs.)
Cavity	C08-2 (See BC Section for more details)

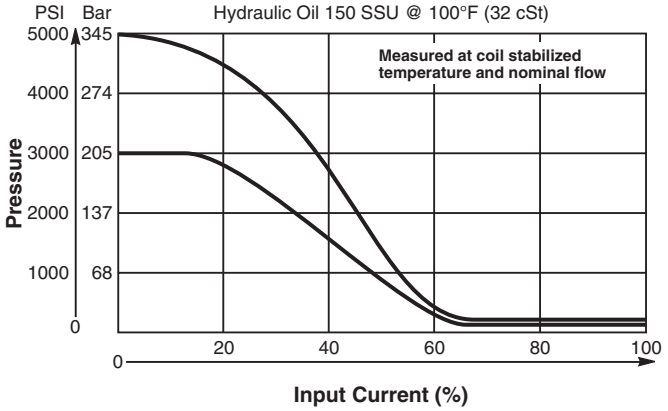
Performance Curves

▲PWM Current Regulator Recommended

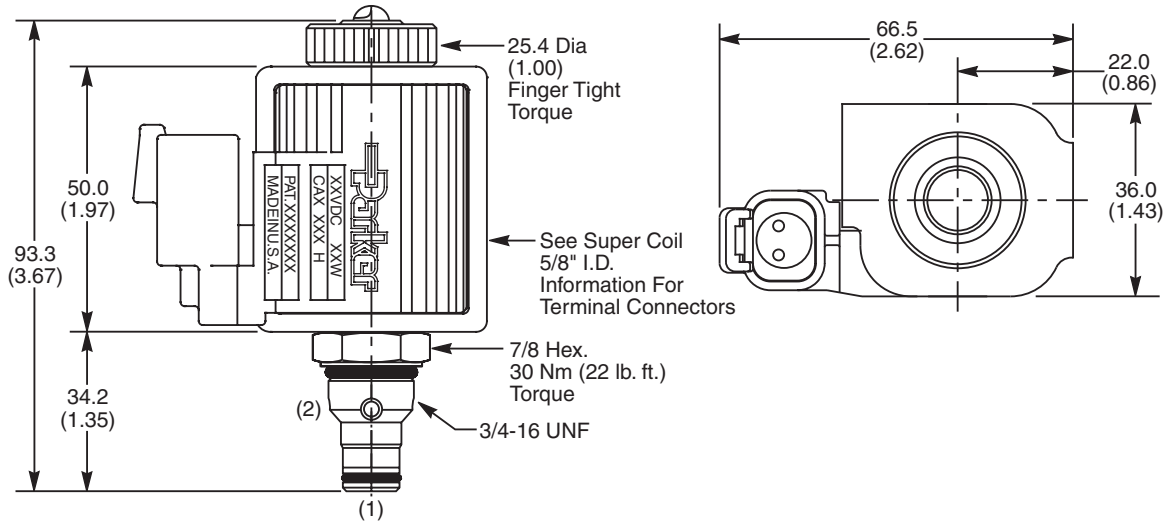
Relief Performance



Pressure vs. Input Current



Dimensions Millimeters (Inches)



Ordering Information

AP02B2YR			L
08 Size Proportional Relief Valve	Style	Seals	Low Variation Now Standard

Code	Style (Maximum Relief Pressure)
07A	70 Bar (1000 PSI)
14A	140 Bar (2000 PSI)
21A	210 Bar (3000 PSI)
35A	350 Bar (5000 PSI)

Custom pressure setting available. Consult factory.

Code	Seals / Kit No.	Operating Temp.
Omit	"D" -Ring / (SK08-2)	-37°C to +93°C (-35°F to +200°F)
N	Nitrile / (SK08-2N)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

Port Size
3/8″ BSP

Body Material
Steel

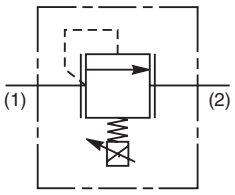
General Description

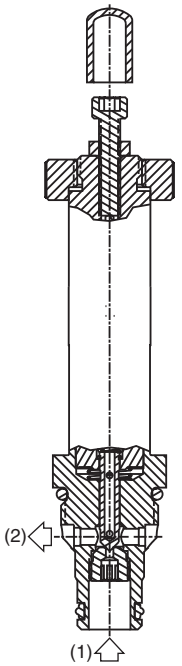
Proportional Relief Valve. Decreasing Pressure With Increasing Current. For additional information see Technical Tips on pages PV1-PV6.

Features

- Analog Proportional Relief Valve regulates pressure proportionally to the input solenoid current
- Direct acting poppet design
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance
- Factory set at maximum of pressure range allows for field adjustment of pressure
- Best used as a pressure control for piloting logic elements







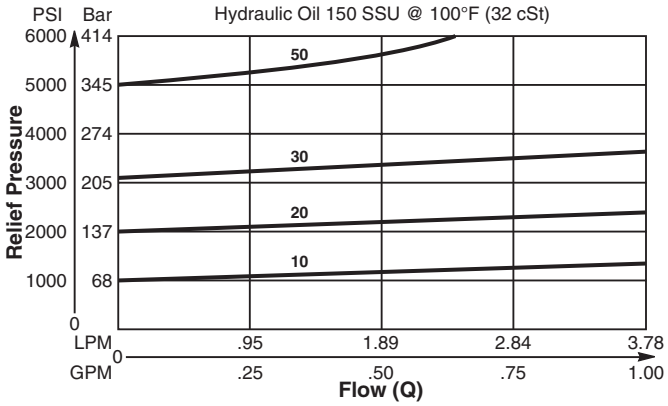
Specifications

Rated Flow (At 70 PSI ∆P)	1.14 LPM (0.3 GPM)
Recommended Pressure Adjust. Range Factory Set At Maximum of Range When De-energized (±5%)	**10** 28-70 Bar (400-1000 PSI) **20** 70-140 Bar (1000-2000 PSI) **30** 140-210 Bar (2000-3000 PSI) **50** 210-350 Bar (3000-5000 PSI)
Hysteresis @ 250 Hz PWM	< 10%
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.09 kg (.19 lbs.)
Cavity	C08-2 (See BC Section for more details)

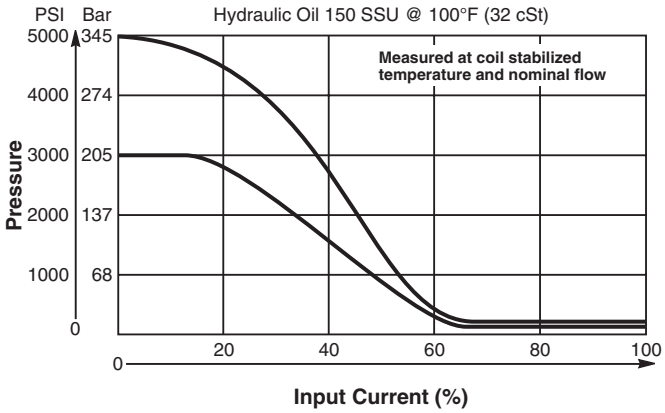
Performance Curves

▲PWM Current Regulator Recommended

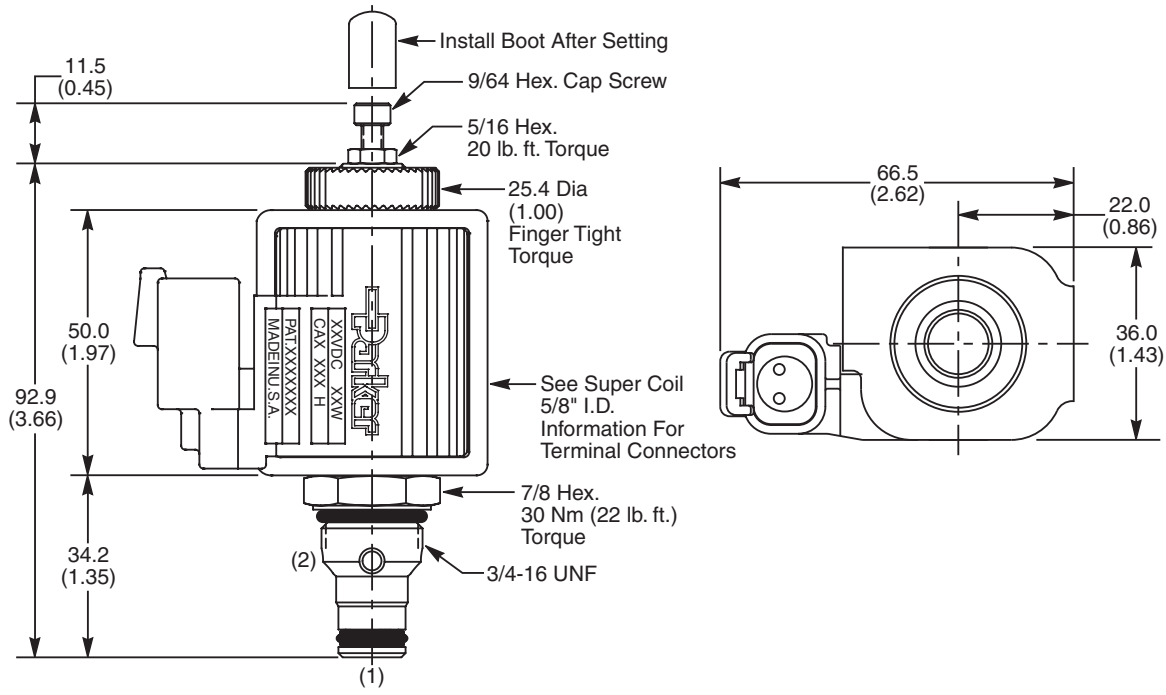
Relief Performance



Pressure vs. Input Current



Dimensions Millimeters (Inches)



Ordering Information

PRD081CW		
08 Size Proportional Relief Valve N.C.	Style	Seals

Code	Style (Maximum Relief Pressure)
10	70 Bar (1000 PSI)
20	140 Bar (2000 PSI)
30	210 Bar (3000 PSI)
50	350 Bar (5000 PSI)

Factory set at pressure indicated.

Code	Seals / Kit No.	Operating Temp.
Omit	"D" -Ring / (SK08-2)	-37°C to +93°C (-35°F to +200°F)
N	Nitrile / (SK08-2N)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

Port Size
3/8" BSP

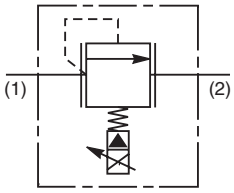
Body Material
Steel

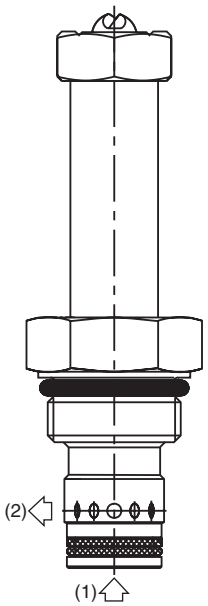
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

General Description

Proportional Relief Valve. Decreasing Pressure With Increasing Current. For additional information see Technical Tips on pages PV1-PV6.







Features

- Pilot operated spool-type design
- Precise setting of factory preset pressure in de-energized mode
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.

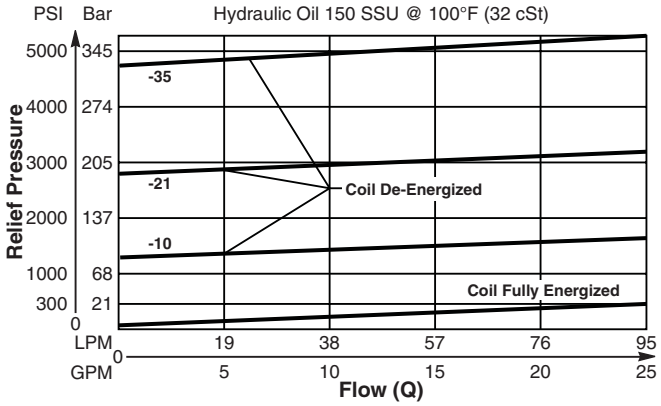
Specifications

Rated Flow (At 300 PSI ΔP) When Coil is Fully Energized	95 LPM (25 GPM)
Factory Set Relief Pressure When Coil De-Energized Measured at 45 LPM (12 GPM)	**10C** 103 Bar (1500 PSI) **21C** 210 Bar (3000 PSI) **35C** 350 Bar (5000 PSI)
Hysteresis @ 250 Hz PWM	< 7% of Maximum Pressure Setting
Response Time At 75% of Nominal Voltage Change (Measured To 90% of Press. Change)	**To Unload** 45ms **To Load** 25ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.14 kg (.30 lbs.)
Cavity	C10-2 (See BC Section for more details)

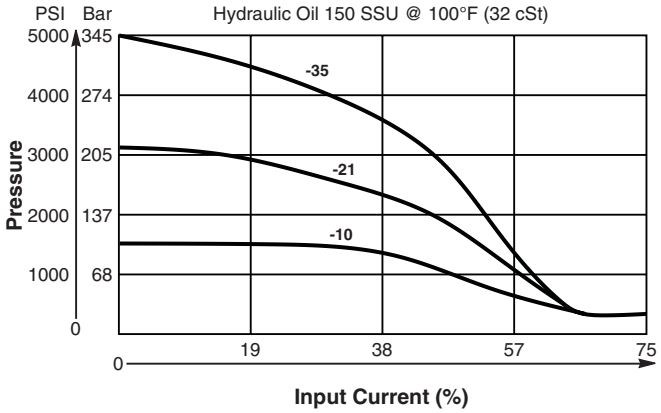
Performance Curves

▲PWM Current Regulator Recommended

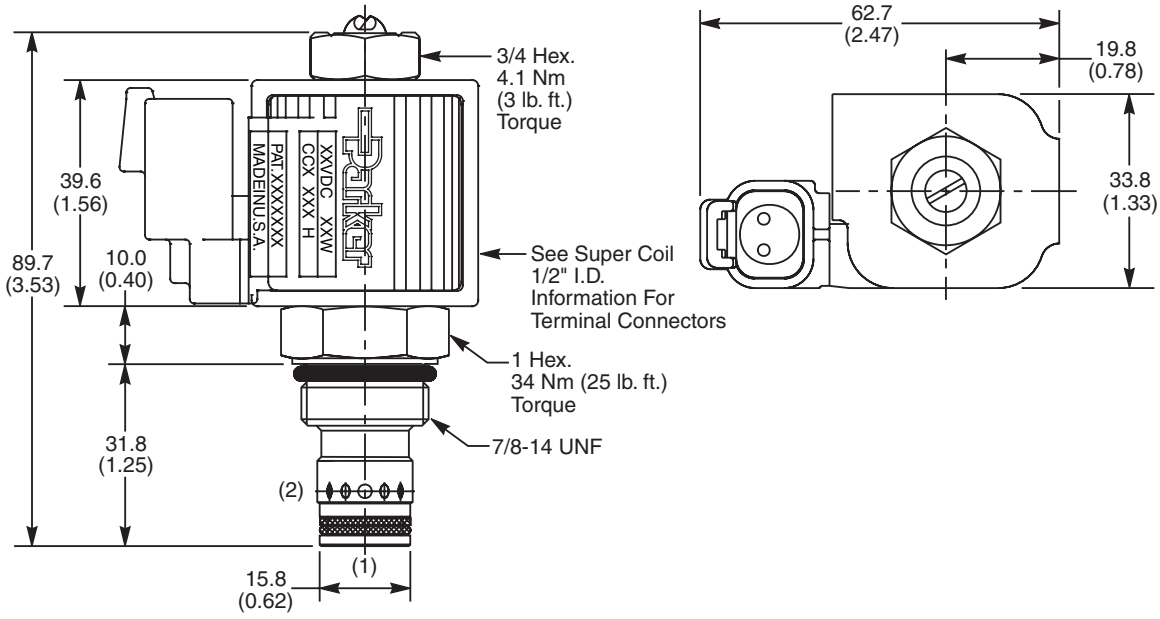
Relief Performance



Pressure vs. Input Current



Dimensions Millimeters (Inches)



Ordering Information

AP04G2YR		N
10 Size Proportional Relief Valve	Style	Seals

Code	Style (Maximum Relief Pressure)
10C	104 Bar (1500 PSI)
21C	210 Bar (3000 PSI)
35C	350 Bar (5000 PSI)

Custom pressure setting available. Consult factory.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30503N-1)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Port Size
1/2″ BSP

Body Material
Steel

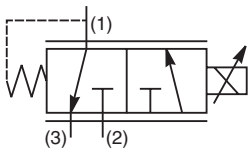
General Description

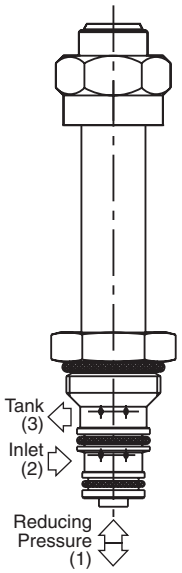
3 Way, 2 Position, Proportional Pressure Reducing Valve. Bottom Cylinder Port. For additional information see Technical Tips on pages PV1-PV6.

Features

- Designed for pilot control of directional valves
- Low Hysteresis
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.







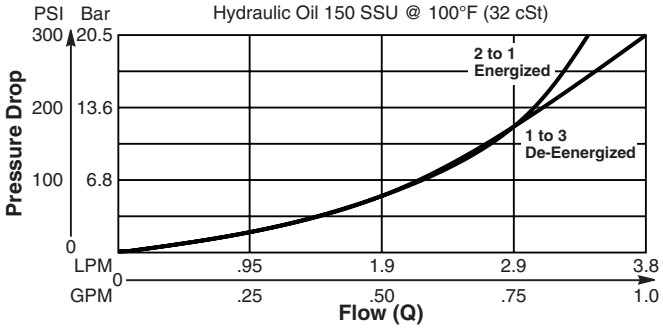
Specifications

Rated Flow (At 70 PSI ∆P)	1.9 LPM (0.5 GPM)
Max. Regulated Pressure @ 75% Current	**Standard** 17 Bar (250 PSI) **High Pressure** 22 Bar (320 PSI)
Max. Input Press. At Port 2	210 Bar (3000 PSI)
Max. Tank Press.	30 Bar (440 PSI)
Max. Drainage Flow In Regulating Zone	5 cc/min. When De-Energized 200 cc/min. In Regulating Zone At 68 Bar (1000 PSI) Input Pressure
Hysteresis @ 120 Hz PWM	2%
Dead End Response Time	t on = 30 ms t off = 10 ms At Step Signal 0 To 75% of Nominal Voltage
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.08 kg (.17 lbs.)
Cavity	54-1 (See BC Section for more details)

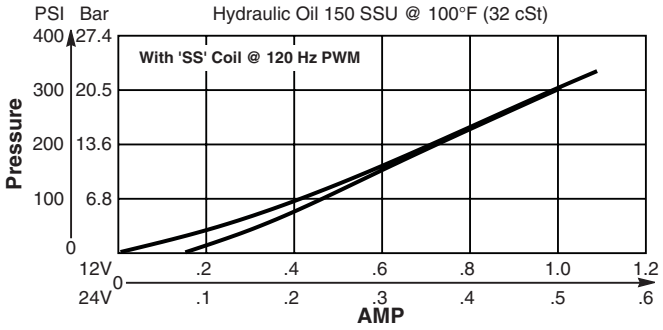
Performance Curves

▲PWM Current Regulator Recommended

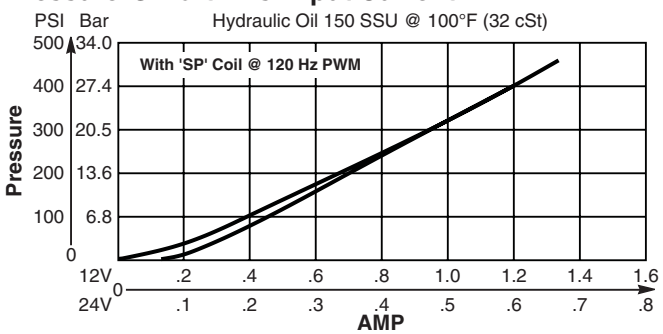
Pressure Drop vs. Flow



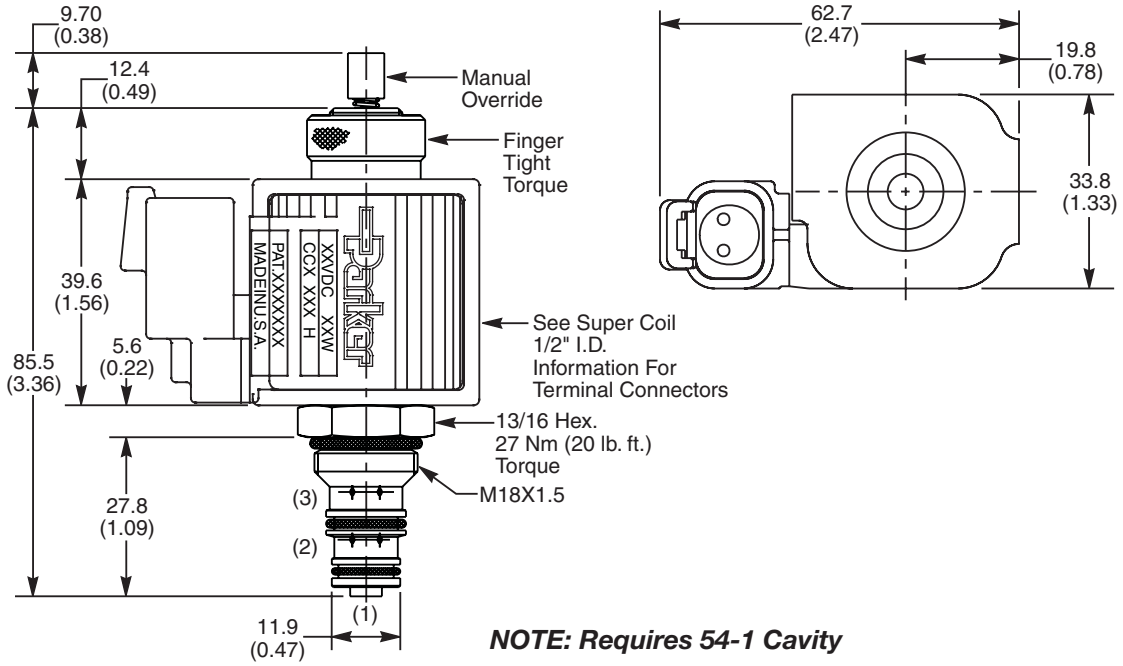
Pressure @ Port 1 vs. Input Current



Pressure @ Port 1 vs. Input Current



Dimensions Millimeters (Inches)



NOTE: Requires 54-1 Cavity

Ordering Information

GP01	30	1		N
08 Size Proportional Valve	Style	Override Option	Filter Screen	Seals

Code	Style
30	High Pressure ('SP' Coil)

Code	Override Option
Omit	If No M.O.
1	Manual Override

Code	Filter Screen
Omit	Not Required
F	60 Mesh Screen on Inlet Port

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30122N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

LB10	591	S
Line Body	Porting	Body Material

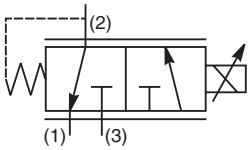
Code	Porting
591	1/4" SAE

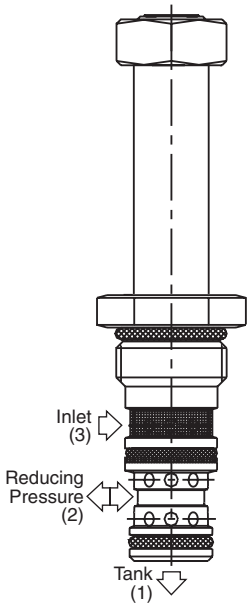
Code	Body Material
S	Steel

General Description

3 Way, 2 Position, Proportional Pressure Reducing Valve. Side Cylinder Port. For additional information see Technical Tips on pages PV1-PV6.







Features

- Minimal Hysteresis
- One piece cartridge housing ensures internal concentricity
- Coil: Waperproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly

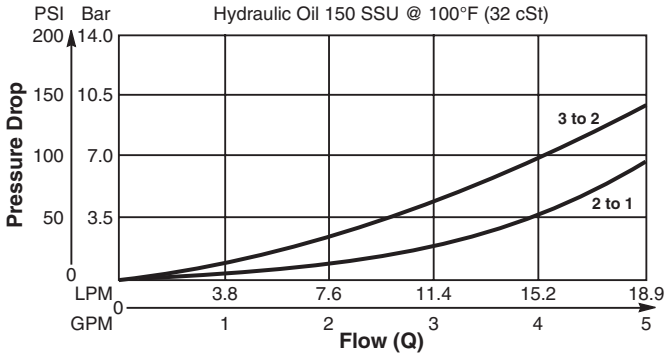
Specifications

Rated Flow (At 70 PSI ∆P)	19 LPM (5 GPM)
Max. Regulated Pressure @ 75% Current (Using 'SP' Coil)	**02** 12/17 Bar (180/240 PSI) **03** 19/26 Bar (270/375 PSI) **05** 31/40 Bar (450/580 PSI) **06** 41/51 Bar (600/740 PSI) **09** 65/79 Bar (940/1140 PSI) **18** 114/145 Bar (1650/2100 PSI)
Max. Input Press. At Port 3	210 Bar (3000 PSI)
Max. Drainage Flow In Regulating Zone	100 cc/min. When De-Energized 750 cc/min. In Regulating Zone At 21 Bar (300 PSI) Input Pressure
Hysteresis @ 100 Hz PWM	3.5%
Dead End Response Time	10 ms At Step Signal 0 To 75% of Nominal Voltage
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.08 kg (.17 lbs.)
Cavity	C08-3 (See BC Section for more details)

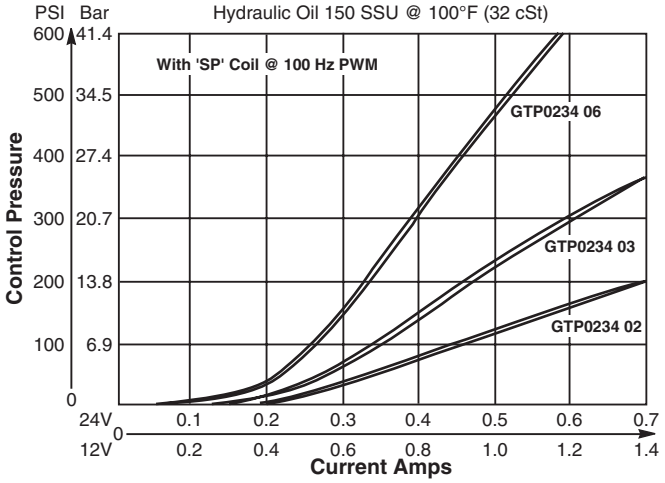
Performance Curves

▲PWM Current Regulator Recommended

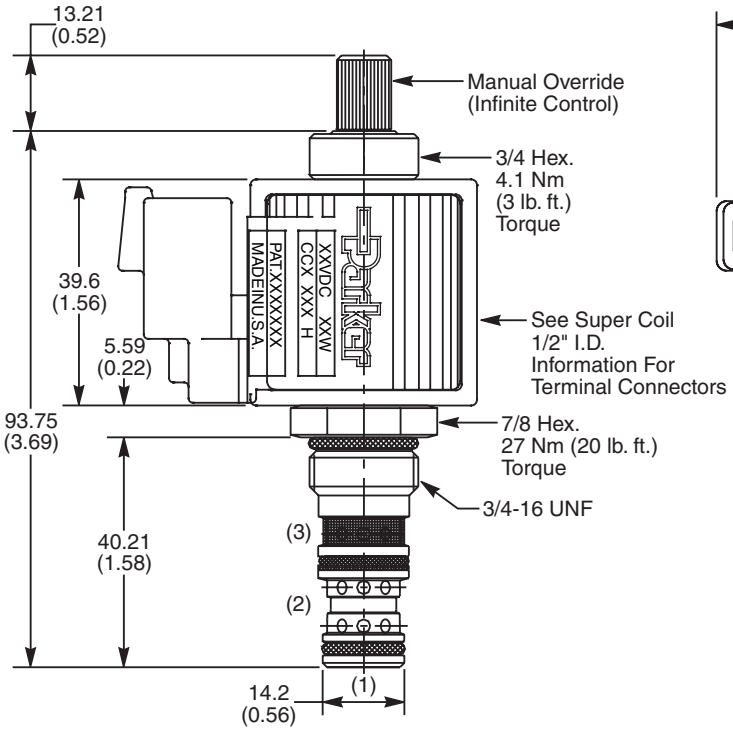
Pressure Drop vs. Flow

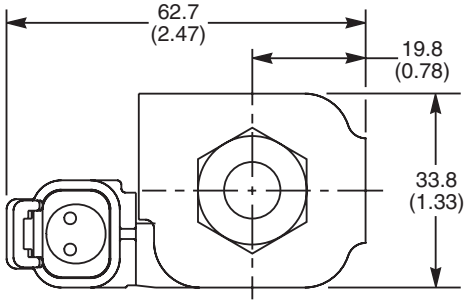


Pressure @ Port 2 vs. Input Current



Dimensions Millimeters (Inches)





Ordering Information

GTP0234			1	N
08 Size Proportional Valve	Style	Override Option	Filter Screen	Seals

Code	Style (Maximum Regulated Pressure Range - SP COIL)
03	19/26 Bar (270/375 PSI)
05	31/40 Bar (450/580 PSI)
06	41/51 Bar (600/740 PSI)
09	65/79 Bar (940/1140 PSI)
18	114/145 Bar (1650/2100 PSI)

Code	Override Option
0	Not Required
5	Infinite Control M.O.

Code	Filter Screen
1	60 Mesh Screen on Inlet Port

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30105N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

B08	—	3	—	6B
08 Size		3-Way Cavity		Port Size

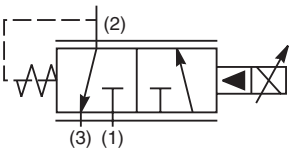
Port Size
3/8″ BSP

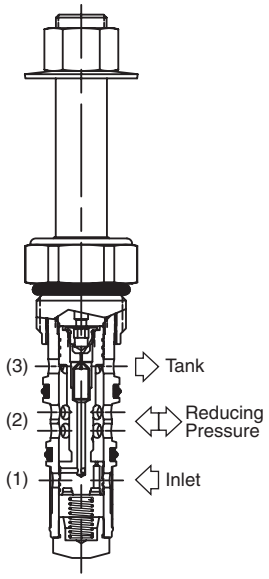
Body Material
Steel

General Description

Pilot Operated, Normally Closed, Proportional Pressure Reducing/Relieving Valve. For additional information see Technical Tips on pages PV1-PV6.







Features

- High flow capacity
- Low hysteresis
- 400 Hz PWM signal preferred
- No dynamic seals
- Polyurethane “D”-Ring eliminates need for backup rings

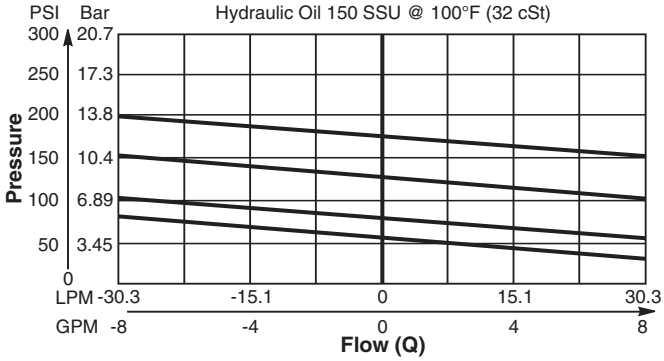
Specifications

Rated Flow	37.5 LPM (10 GPM)
Maximum Input Pressure at Port 1	350 Bar (5000 PSI)
Maximum Internal Leakage	.5 LPM (0.13 GPM) @ 20.7 Bar (300 PSI) .95 LPM (0.25 GPM) @ 207 Bar (3000 PSI)
Hysteresis @ 400 Hz PWM	4% with 60% duty cycle
Power Consumption	9 watts at max. reduced pressure
Frequency	200-600 Hz (PWM)
Maximum Control Current	**12 VDC** .90A **24 VDC** .45A
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.59 kg (1.3 lbs.)
Cavity	C10-3L (See BC Section for more details)

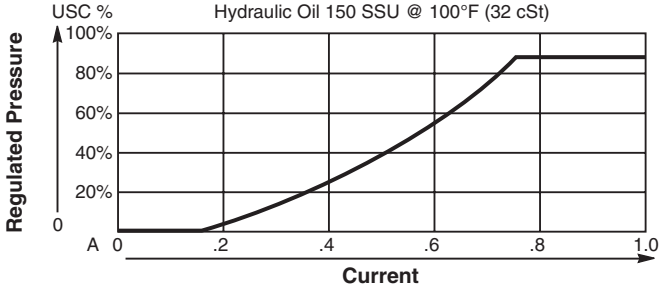
Performance Curves

▲PWM Current Regulator Recommended

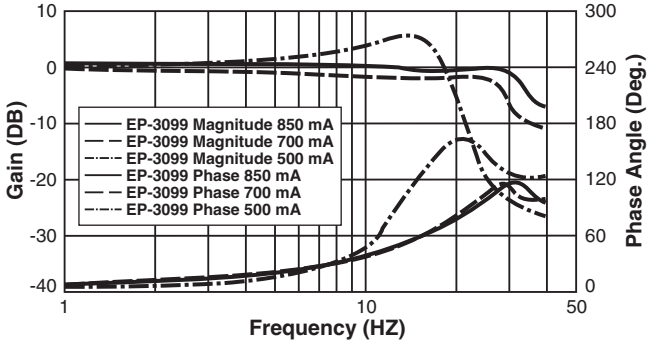
Flow vs. Regulated Pressure



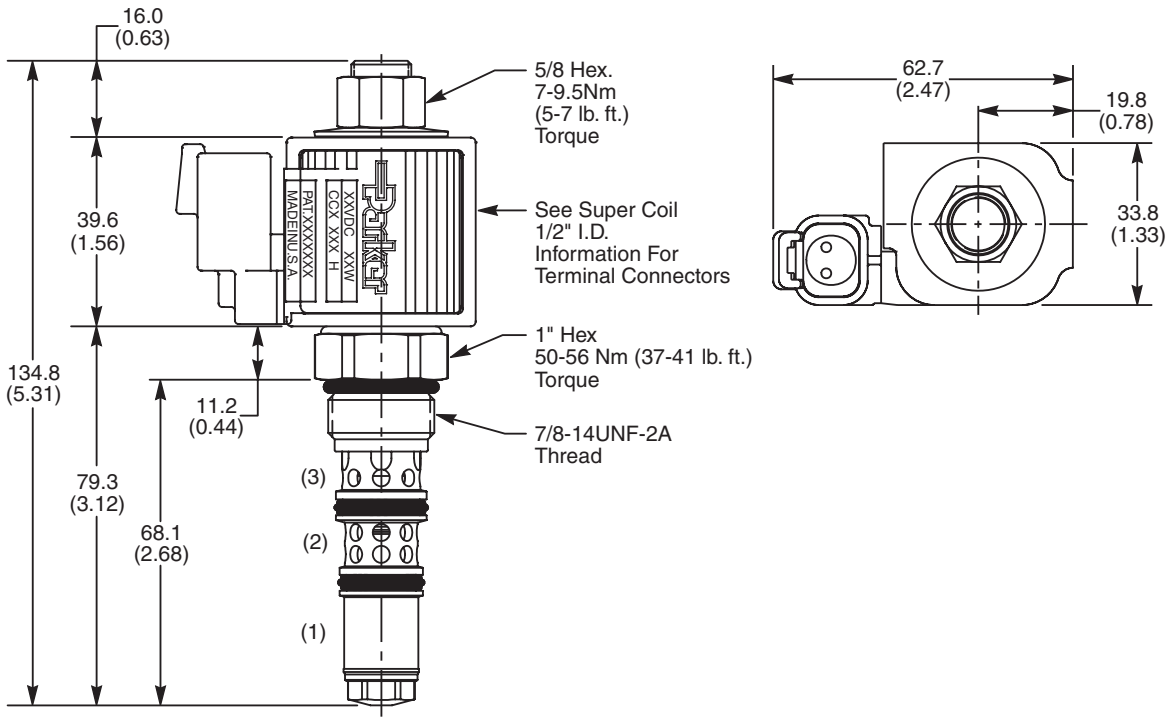
Pressure Gain



Press. Reducer Frequency Response: 290 PSI @ 12 VDC



Dimensions Millimeters (Inches)



NOTE: Requires C10-3L Cavity

Ordering Information

EPR111	C		
11 Size Proportional Red./Rel. Valve	Style	Pressure Range	Seals

Code	Style
C	Normally Closed, Pilot Operated

Code	Pressure Range
02	13.8 Bar (200 PSI)
03	20.7 Bar (300 PSI)
05	34.5 Bar (500 PSI)
10	68.9 Bar (1000 PSI)
20	138 Bar (2000 PSI)
30	207 Bar (3000 PSI)
40	276 Bar (4000 PSI)

Code	Seals / Kit No.	Operating Temp.
Omit	"D" -Ring / (SK10-3L)	-37°C to +93°C (-35°F to +200°F)
N	Nitrile / (SK10-3LN)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCS	Super Coil - 14w

Order Bodies Separately
See section BC

Special Body	Part No.
	4082075
10 Size	3-Way Cavity

Port Size
SAE 8

Body Material
Steel

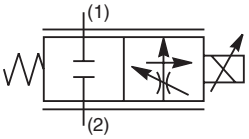
General Description

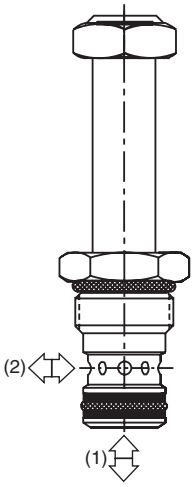
2 Way, Normally Closed, Proportional Flow Regulator Valve. Partially Pressure Compensated. For additional information see Technical Tips on pages PV1-PV6.

Features

- Analog Proportional Partially Pressure Compensated Flow Regulator regulates flow proportionally to the input solenoid current.
- A low cost valve designed to be used in applications where fine pressure compensation is not required.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- Factory-adjusted low variation option (Model "L") is available for applications where low variation of flow from valve to valve is essential at a given current or when an external pressure compensator is used.







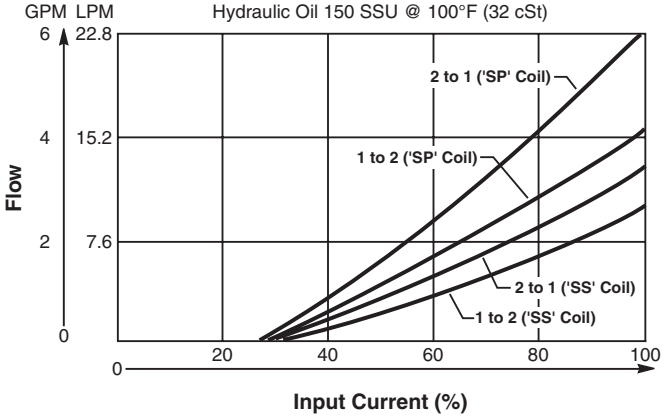
Specifications

Rated Flow @ 210 Bar (3000 PSI)	**Standard ('SS' Coil)** **2 to 1** 13.3 LPM (3.5 GPM) **1 to 2** 9.5 LPM (2.5 GPM) **High Flow ('SP' Coil)** **2 to 1** 22.8 LPM (6.0 GPM) **1 to 2** 15.0 LPM (4.0 GPM)
Preferable Input Port For Best Hysteresis	Port 1
Hysteresis @ 100 Hz PWM	<10%
Cracking Pressure	25% of Input Current
Variation of Flow @ 35% of Rated Current & Constant ΔP Maintained By Pressure Compensator	**Model "L"** ±7% Of Rated Flow
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.08 kg (.17 lbs.)
Cavity	2X (See BC Section for more details)

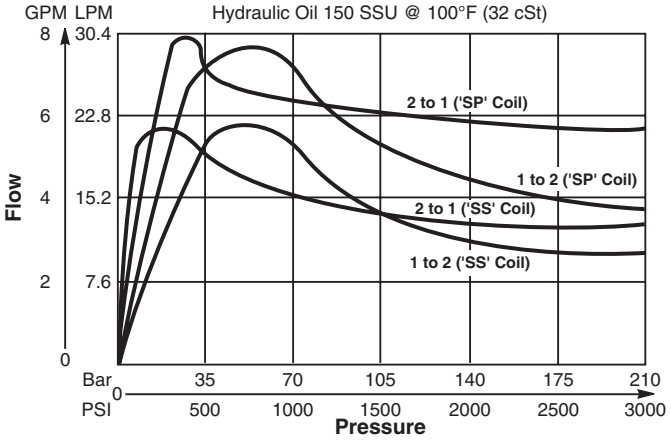
Performance Curves

▲PWM Current Regulator Recommended

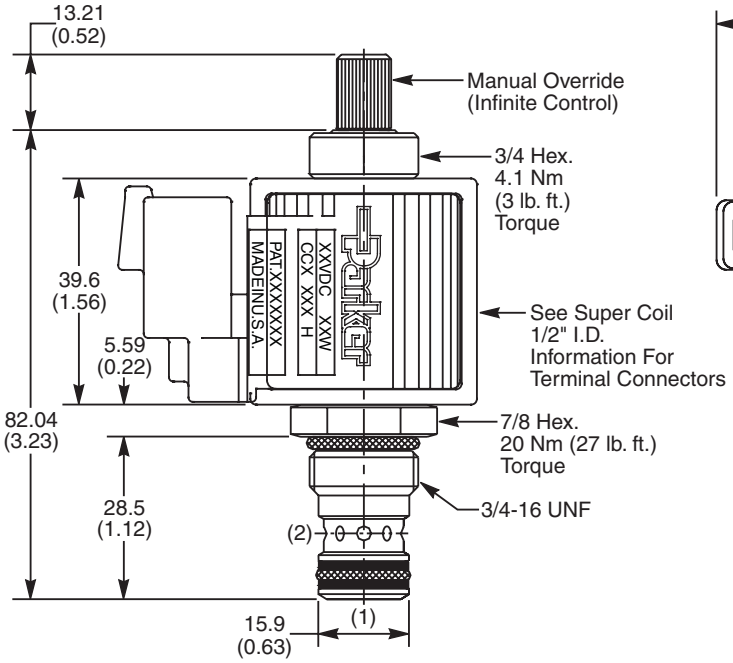
Flow vs. Input Current

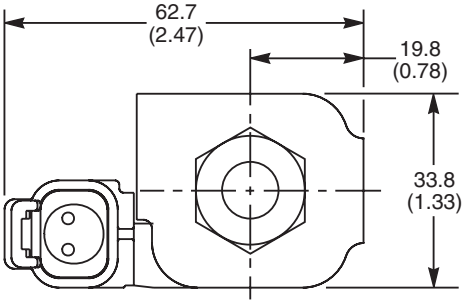


Flow Regulation (Measured at 75% of Rated Current)



Dimensions Millimeters (Inches)





NOTE: Requires 2X Cavity

Ordering Information

HP02C	21			N	L
08 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Flow Variation

Code	Seals / Kit No.
N	Nitrile / Buna-N (Std.) (SK30076N-1)

Code	Style (Maximum Regulated Flow)
21	Standard ('SS' Coil) 13.3 LPM (3.5 GPM)
21	High Flow ('SP' Coil) 22.8 LPM (6.0 GPM)

Code	Override Option
0	Not Required
5	Infinite Control M.O.

Code	Filter Screen
0	Not Available

Code	Flow Variation
L	Low Variation (±7% of Rated Flow)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30503N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCS	Super Coil - 14w
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

LB10	515	S
Line Body	Porting	Body Material

Code	Porting
515	1/4" BSP

Code	Body Material
S	Steel

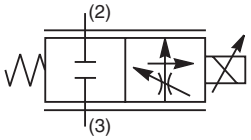
General Description

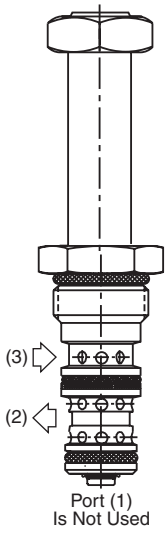
2 Way, Normally Closed, Proportional Flow Regulator Valve. Pressure Compensated. For additional information see Technical Tips on pages PV1-PV6.

Features

- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- Factory-adjusted low variation option (Model "L") is available for applications where low variation of flow from valve to valve is essential at a given current.







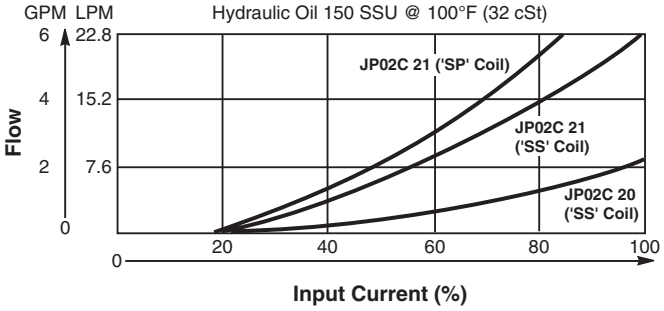
Specifications

Rated Flow	**20** 7.5 LPM (2 GPM) Low Flow ('SS' Coil) **21** 15 LPM (4 GPM) Standard ('SS' Coil) **21** 23 LPM (6 GPM) High Flow ('SP' Coil)
Maximum Input Pressure At Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	**21** 13.8 Bar (200 PSI) Standard **21** 20.7 Bar (300 PSI) High Flow
Maximum Internal Leakage	570 cc (35 cu. in.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<10% (Low Flow and Standard) <3% (High Flow)
Cracking Pressure	25% of Input Signal
Variation of Flow @ 35% of Rated Current	**Model "L"** ±7% Of Rated Flow
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.08 kg (.17 lbs.)
Cavity	C08-3 (See BC Section for more details)

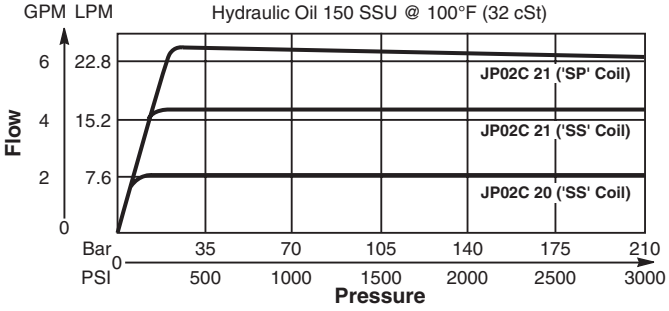
Performance Curves

▲PWM Current Regulator Recommended

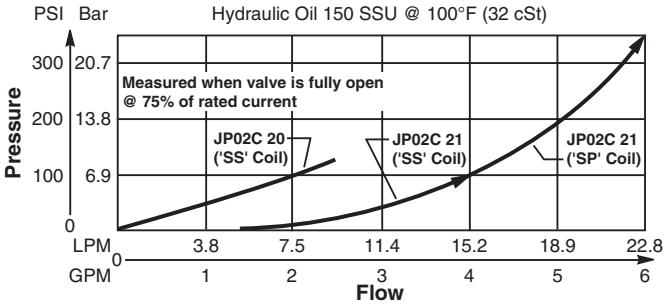
Flow vs. Input Current



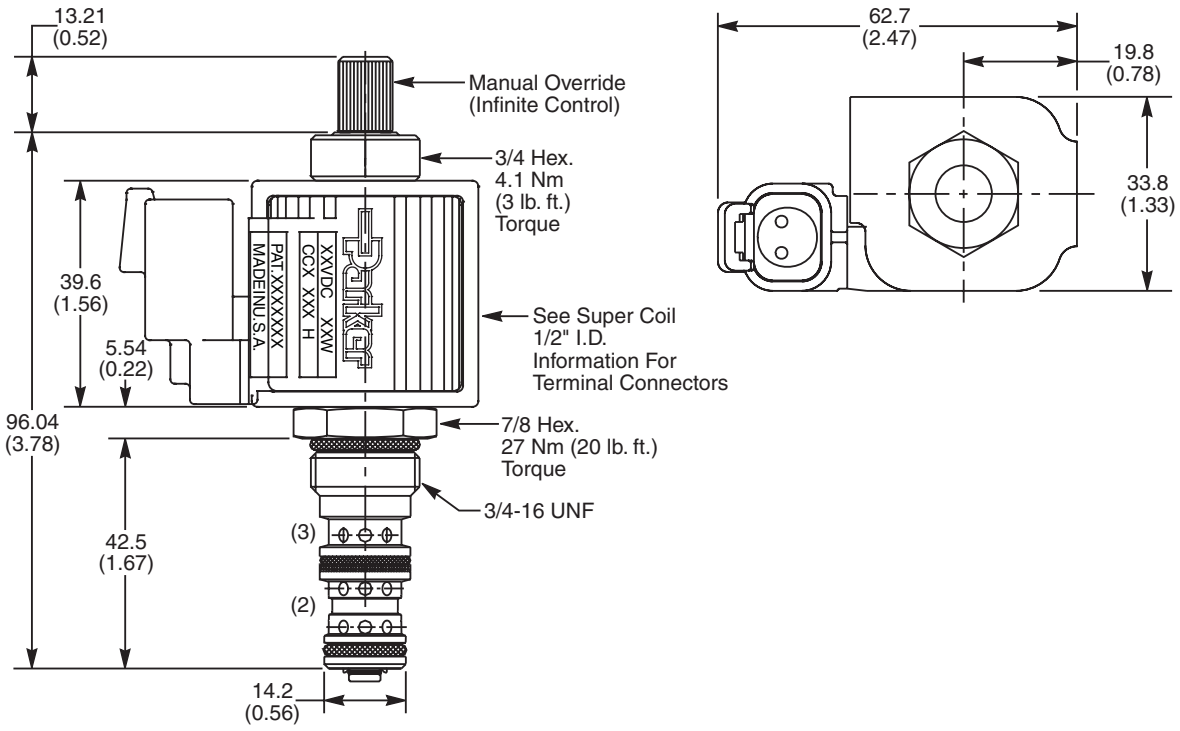
Flow Regulation (Measured 75% of Rated Current)



Pressure Drop vs. Flow



Dimensions Millimeters (Inches)



Ordering Information

JP02C				N	L
08 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Flow Variation

Code	Style (Maximum Regulated Flow)
21	Standard ('SS' Coil) 15 LPM (4 GPM)
21	High Flow ('SP' Coil) 23 LPM (6 GPM)

Code	Override Option
0	Not Required
5	Infinite Control M.O.

Code	Filter Screen
0	Not Available
1	60 Mesh Screen on Port 2

Code	Flow Variation
L	Low Variation (±7% of Rated Flow)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30105N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCS	Super Coil - 14w
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

B08	—	3	—	6B
08 Size		3-Way Cavity		Port Size

Port Size
3/8" BSP

Body Material
Steel

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

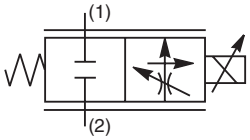
General Description

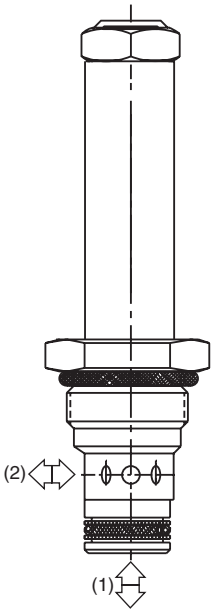
2 Way, Normally Closed, Proportional Flow Regulator Valve. Partially Pressure Compensated. For additional information see Technical Tips on pages PV1-PV6.

Features

- Analog Proportional Partially Pressure Compensated Flow Regulator regulates flow proportionally to the input solenoid current.
- A low cost valve designed to be used in applications where fine pressure compensation is not required.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- Factory-adjusted low variation option (Model "L") is available for applications where low variation of flow from valve to valve is essential at a given current or when an external pressure compensator is used.







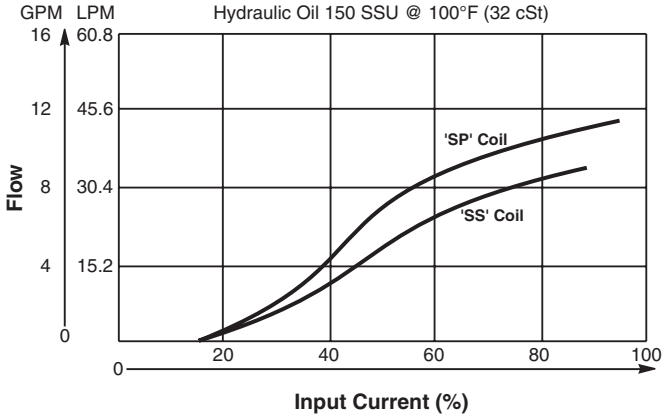
Specifications

Rated Flow 2 to 1 @ 210 Bar (3000 PSI)	**Standard ('SS' Coil)** 30 LPM (8 GPM) **High Flow ('SP' Coil)** 36 LPM (9.5 GPM)
Preferable Input Port For Best Hysteresis	Port 1
Hysteresis @ 100 Hz PWM	<10%
Cracking Pressure	21% of Rated Current (Standard) 17% of Rated Current (High Flow)
Variation of Flow @ 35% of Rated Current & Constant ΔP Maintained By Pressure Compensator	**Model "L"** ±2% Of Rated Flow
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.12 kg (.26 lbs.)
Cavity	C10-2 (See BC Section for more details)

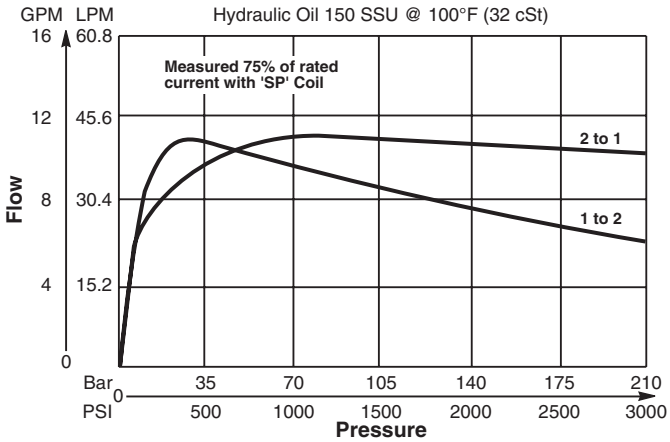
Performance Curves

▲PWM Current Regulator Recommended

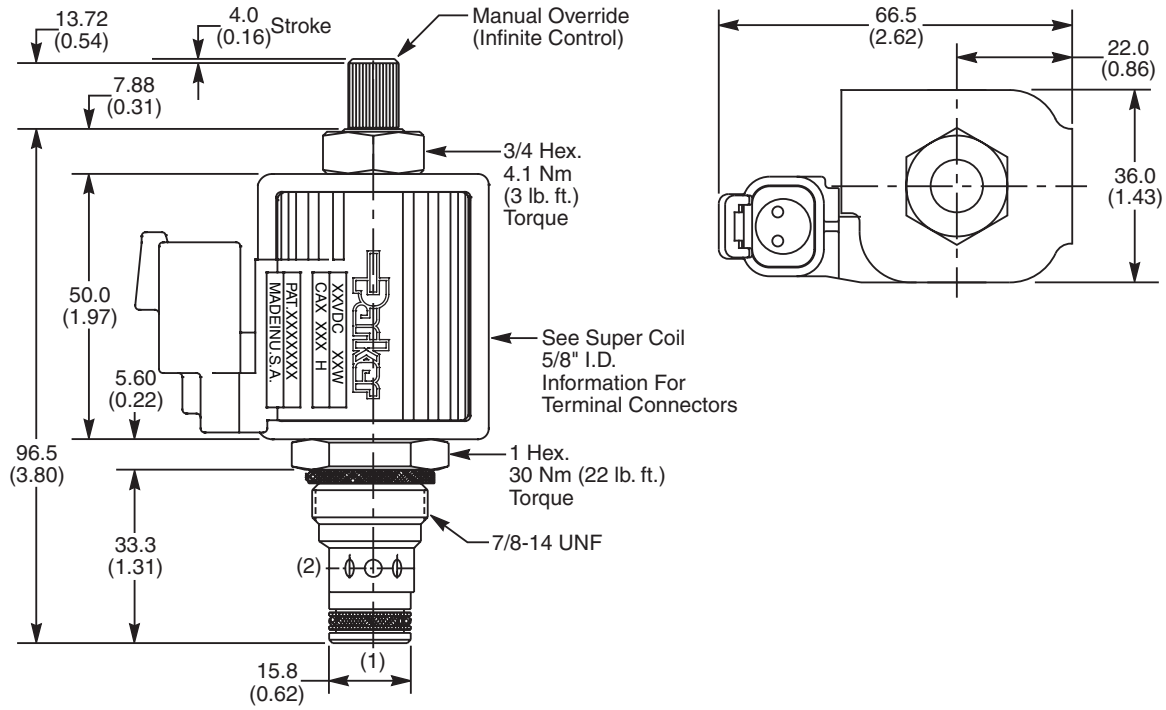
Flow vs. Input Current



Flow Regulation



Dimensions Millimeters (Inches)



Ordering Information

HP04C	21			N	L
10 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Opening Point Variation

Code	Style (Maximum Regulated Flow)
21	Standard ('SS' Coil) 30 LPM (8 GPM)
21	High Flow ('SP' Coil) 36 LPM (9.5 GPM)

Code	Override Option
0	Not Required
5	Infinite Control M.O.

Code	Filter Screen
0	Not Available

Code	Flow Variation
L	Low Variation (±2% of Current Flow)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30503N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAS	Super Coil - 18w
CAP	Super Coil - 28w

Order Bodies Separately
See section BC

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

Port Size
1/2" BSP

Body Material
Steel

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

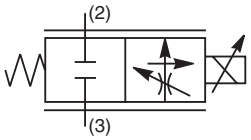
General Description

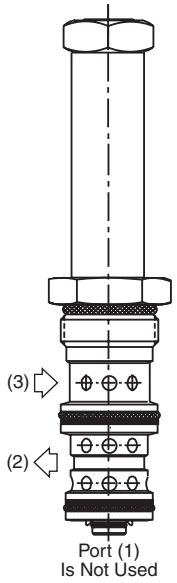
2 Way, Normally Closed, Proportional Flow Regulator Valve. Pressure Compensated. For additional information see Technical Tips on pages PV1-PV6.

Features

- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- Factory-adjusted low variation option (Model "L") is available for applications where low variation of flow from valve to valve is essential at a given current.







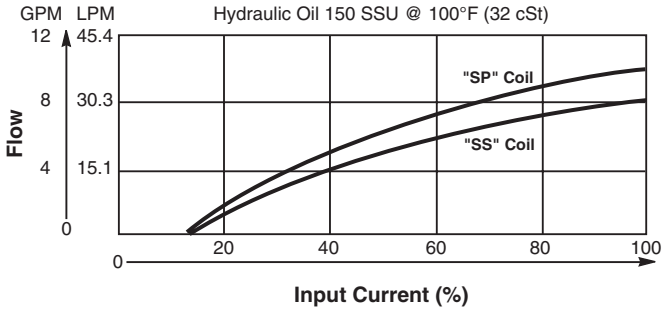
Specifications

Rated Flow	**21** 30 LPM (8 GPM) Standard ('SS' Coil) **21** 36 LPM (9.5 GPM) High Flow ('SP' Coil)
Maximum Input Pressure At Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	**21** 13.8 Bar (200 PSI) Standard **21** 20.7 Bar (300 PSI) High Flow
Maximum Internal Leakage	780 cc (46 cu. in.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	7%
Cracking Pressure	25% of Input Signal
Variation of Flow @ 35% of Rated Current	**Model "L"** ±7% Of Rated Flow
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.13 kg (.28 lbs.)
Cavity	3X (See BC Section for more details)

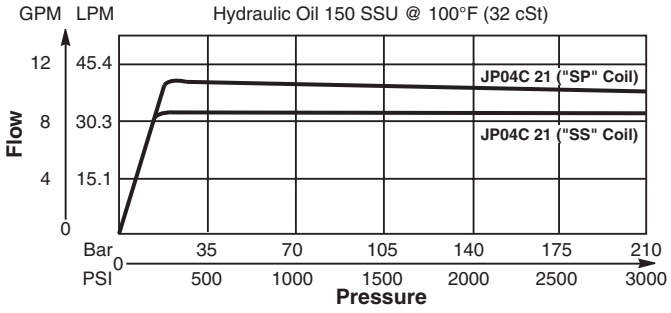
Performance Curves

▲PWM Current Regulator Recommended

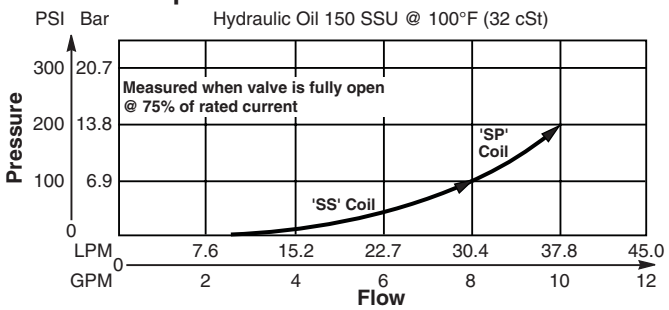
Flow vs. Input Signal



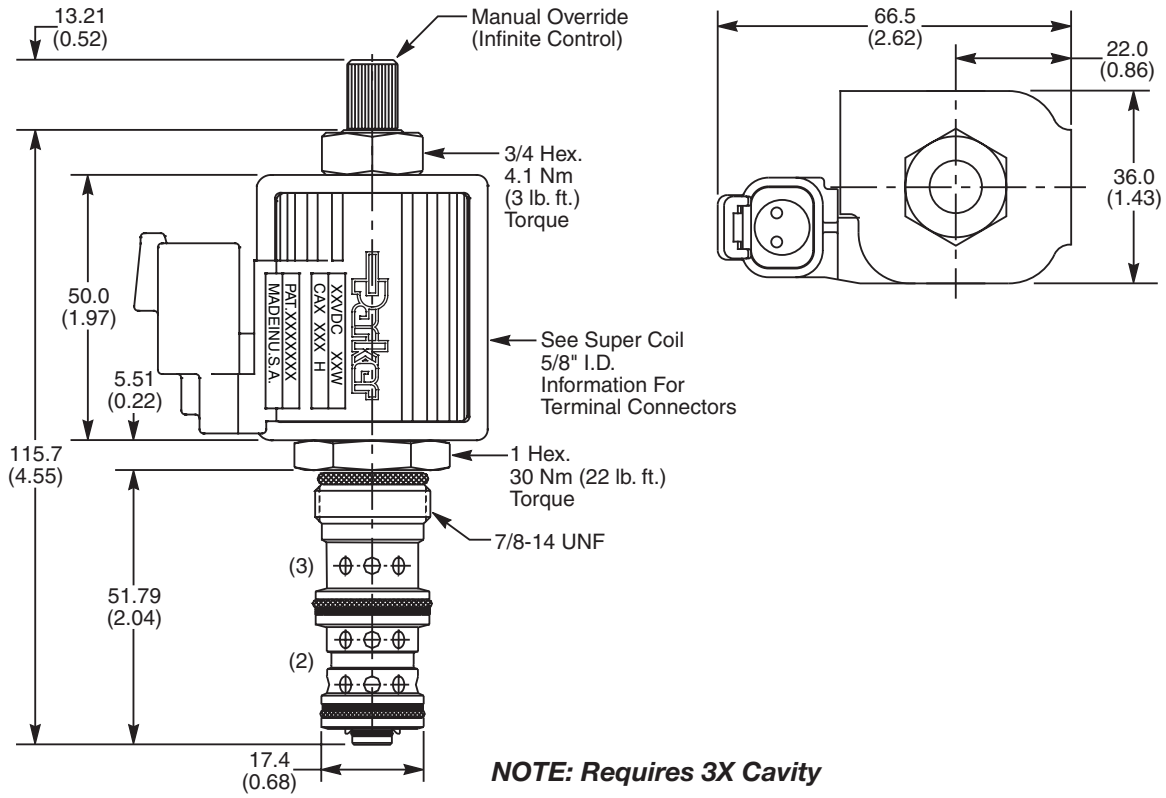
Flow Regulation (Measured 75% of Rated Current)



Pressure Drop vs. Flow



Dimensions Millimeters (Inches)



NOTE: Requires 3X Cavity

Ordering Information

JP04C	21			N	L
10 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Flow Variation

Code	Style (Maximum Regulated Flow)
21	Standard ('SS' Coil) 30 LPM (8 GPM)
21	High Flow ('SP' Coil) 36 LPM 9.5 GPM)

Code	Override Option
0	Not Required
5	Infinite Control M.O.

Code	Filter Screen
0	Not Required
1	60 Mesh Screen on Port 2

Code	Flow Variation
L	Low Variation (±7% of Rated Flow)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30106N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAS	Super Coil - 18w
CAP	Super Coil - 28w

Order Bodies Separately
See section BC

LB10	554	S
Line Body	Porting	Body Material

Code	Porting
554	3/8" BSP

Code	Body Material
S	Steel

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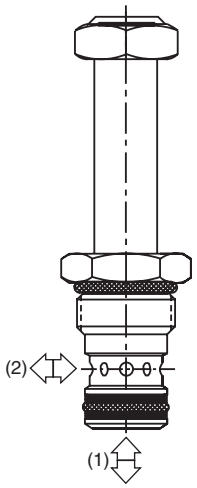
General Description

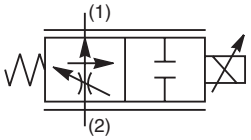
2 Way, Normally Open, Proportional Flow Regulator Valve. Partially Pressure Compensated. For additional information see Technical Tips on pages PV1-PV6.

Features

- Analog Proportional Partially Pressure Compensated Flow Regulator regulates flow proportionally to the input solenoid current
- The valve is designed to be used in applications where fine pressure compensation is not required and an economical solution is important
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- Factory-adjusted low variation option (Model "L") is available for applications where low variation of flow from valve to valve is essential at a given current or when an external pressure compensator is used.







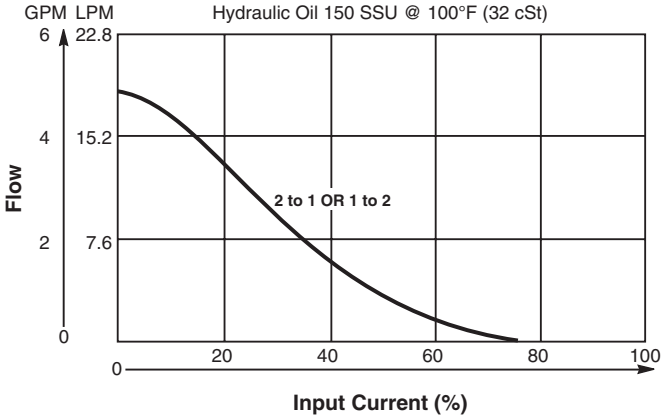
Specifications

Rated Flow @ 210 Bar (3000 PSI)	**2 to 1** 19 LPM (5 GPM)
Preferable Input Port For Best Hysteresis	Port 1
Hysteresis @ 100 Hz PWM	<10%
Variation of Flow @ 35% of Rated Current & Constant ΔP Maintained By Pressure Compensator	**Model "L"** ±7% Of Rated Flow
Maximum Input Pressure	210 Bar (3000 PSI)
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.08 kg (.17 lbs.)
Cavity	2X (See BC Section for more details)

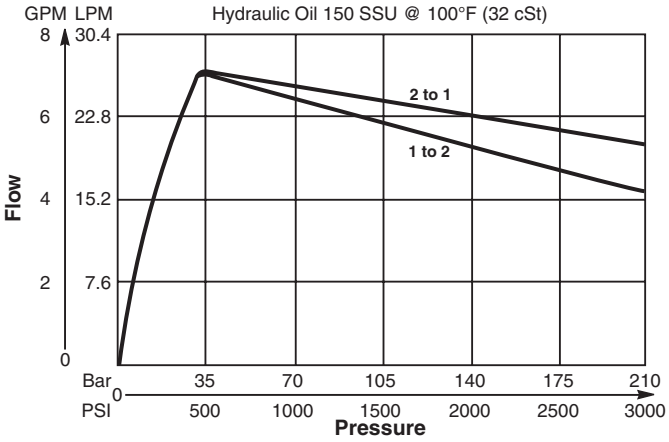
Performance Curves

▲PWM Current Regulator Recommended

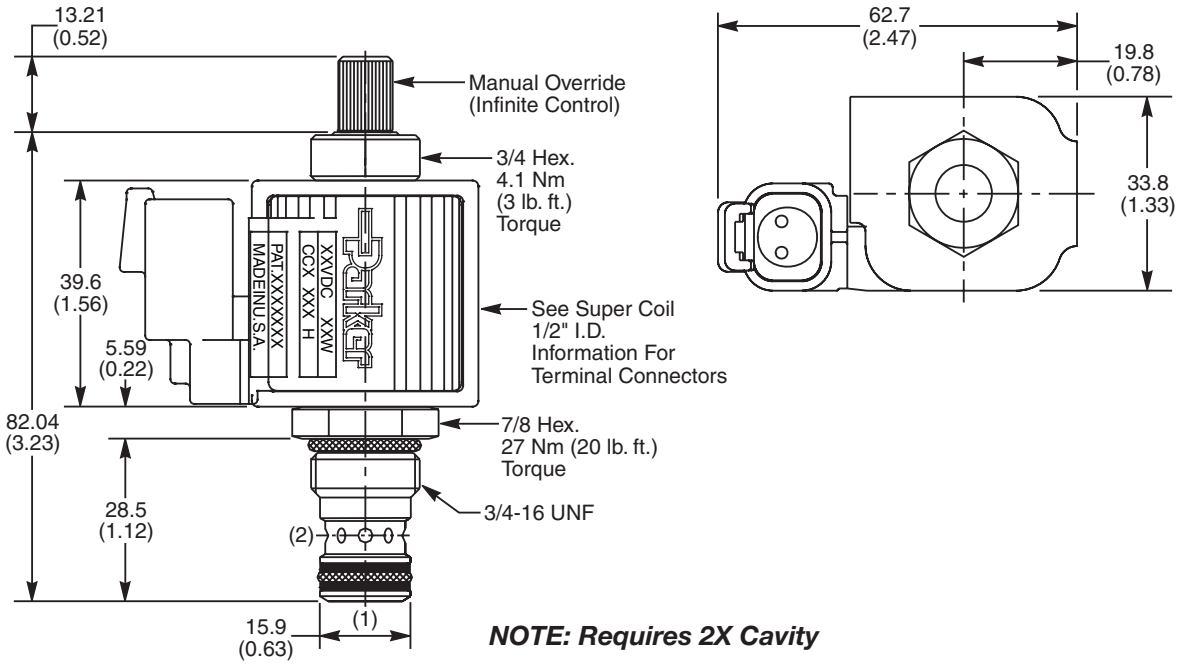
Flow vs. Input Current



Flow Regulation (Measured at De-Energized Coil)



Dimensions Millimeters (Inches)



NOTE: Requires 2X Cavity

Ordering Information

HP02P	21			N	L
08 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Flow Variation

Code	Style (Maximum Regulated Flow)
21	High Flow ('SP' Coil) 19 LPM (5 GPM)

Code	Override Option
0	Not Required
5	Infinite Control M.O.

Code	Filter Screen
0	Not Available

Code	Flow Variation
L	Low Variation (±7% of Rated Flow)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30076N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

LB10	515	S
Line Body	Porting	Body Material

Code	Porting
515	1/4" BSP

Code	Body Material
S	Steel

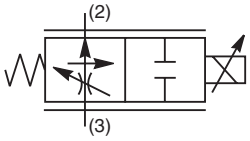
General Description

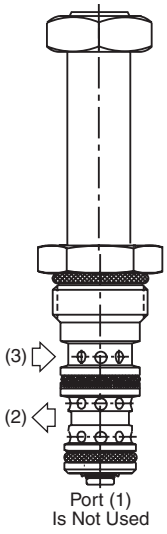
2 Way, Normally Open, Proportional Flow Regulator Valve. Pressure Compensated. For additional information see Technical Tips on pages PV1-PV6.

Features

- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- Factory-adjusted low variation option (Model "L") is available for applications where low variation of flow from valve to valve is essential at a given current.







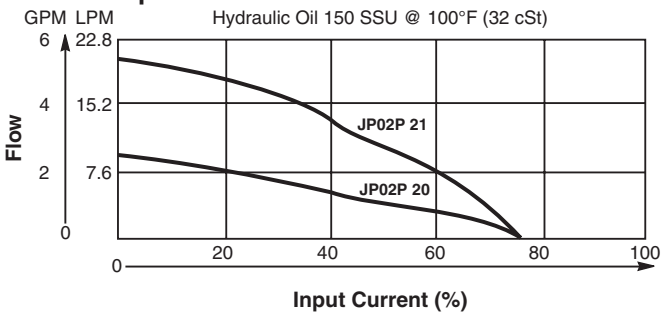
Specifications

Rated Flow	**21** 19 LPM (5 GPM) High Flow ('SP' Coil)
Maximum Input Pressure At Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	**21** 20.7 Bar (300 PSI) High Flow
Maximum Internal Leakage	570 cc (35 cu. in.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<3%
Variation of Flow @ 35% of Rated Current	**Model "L"** ±7% Of Rated Flow
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.08 kg (.17 lbs.)
Cavity	C08-3 (See BC Section for more details)

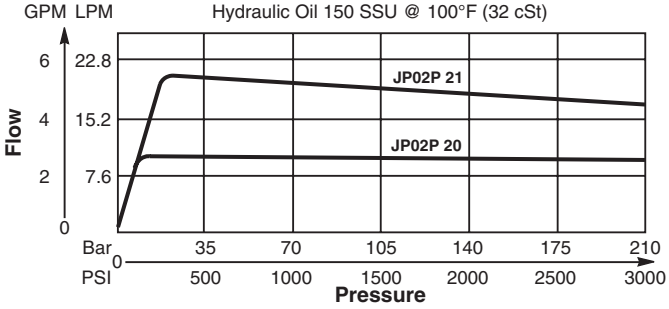
Performance Curves

▲PWM Current Regulator Recommended

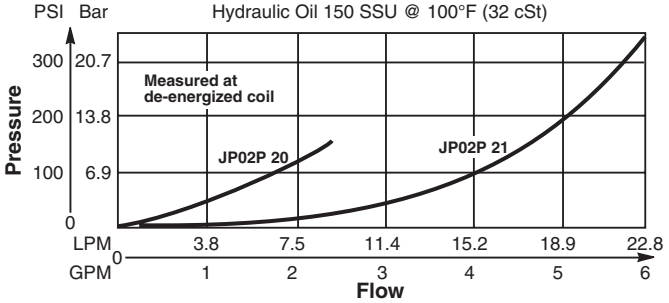
Flow vs. Input Current



Flow Regulation (Measured 75% of Rated Current)

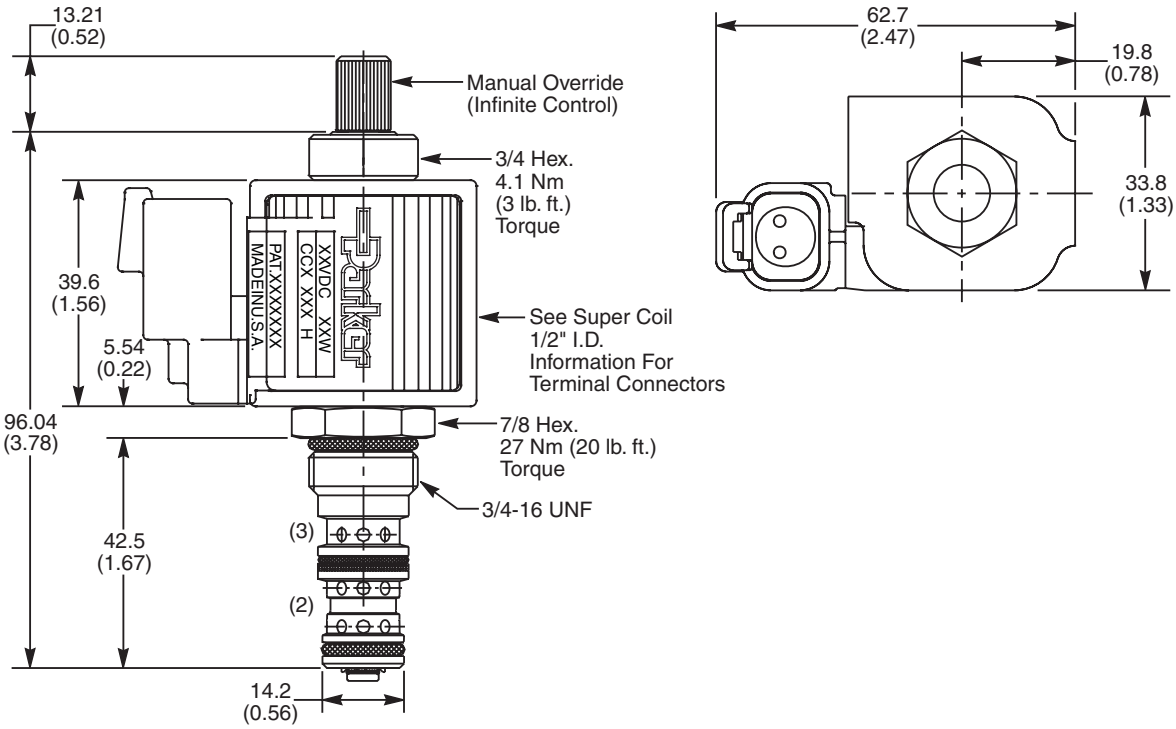


Pressure Drop vs. Flow



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



Ordering Information

JP02P				N	L
08 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Flow Variation

Code	Style (Maximum Regulated Flow)
21	High Flow (CCP Coil) 19 LPM (5 GPM)

Code	Override Option
0	Not Required
5	Infinite Control M.O.

Code	Filter Screen
0	Not Required
1	60 Mesh Screen on Port 2

Code	Flow Variation
L	Low Variation (±7% of Rated Flow)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30105N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

B08	—	3	—	6B
08 Size		3-Way Cavity		Port Size

Port Size
3/8″ BSP

Body Material
Steel

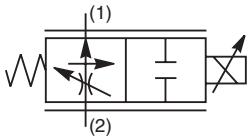
General Description

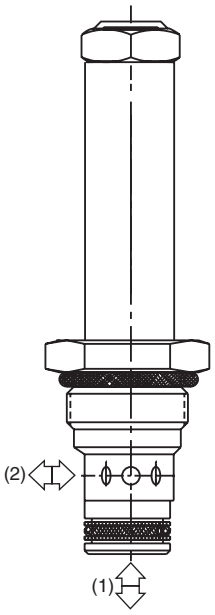
2 Way, Normally Open, Proportional Flow Regulator Valve. Partially Pressure Compensated. For additional information see Technical Tips on pages PV1-PV6.

Features

- Analog Proportional Partially Pressure Compensated Flow Regulator regulates flow proportionally to the input solenoid current
- The valve is designed to be used in applications where fine pressure compensation is not required and an economical solution is important
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- Factory-adjusted low variation option (Model "L") is available for applications where low variation of flow from valve to valve is essential at a given current or when an external pressure compensator is used.







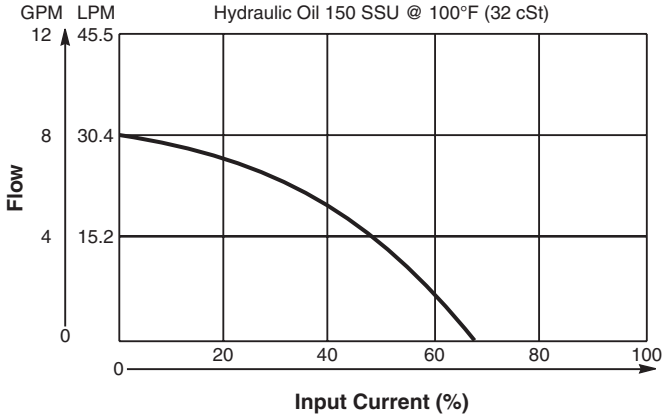
Specifications

Rated Flow @ 210 Bar (3000 PSI)	30 LPM (8 GPM)
Hysteresis @ 100 Hz PWM	<10%
Closing Point	65% of Rated Current
Variation of Closing Point	**Model "L"** ±2% Of Rated Current
Cartridge Material	All parts steel. All operating parts hardened steel.
Maximum Input Pressure	210 Bar (3000 PSI)
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.12 kg (.26 lbs.)
Cavity	C10-2 (See BC Section for more details)

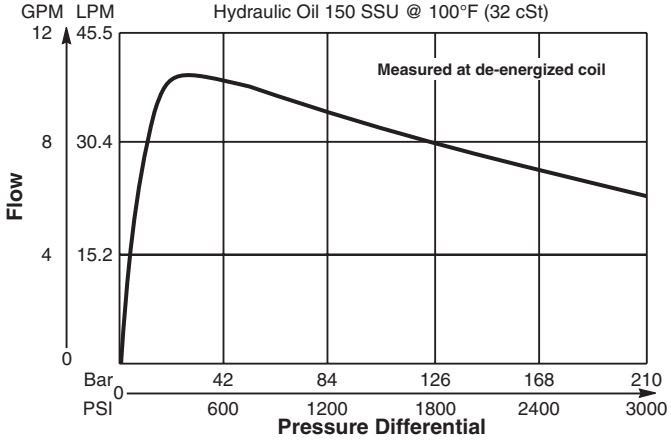
Performance Curves

▲PWM Current Regulator Recommended

Flow vs. Input Current

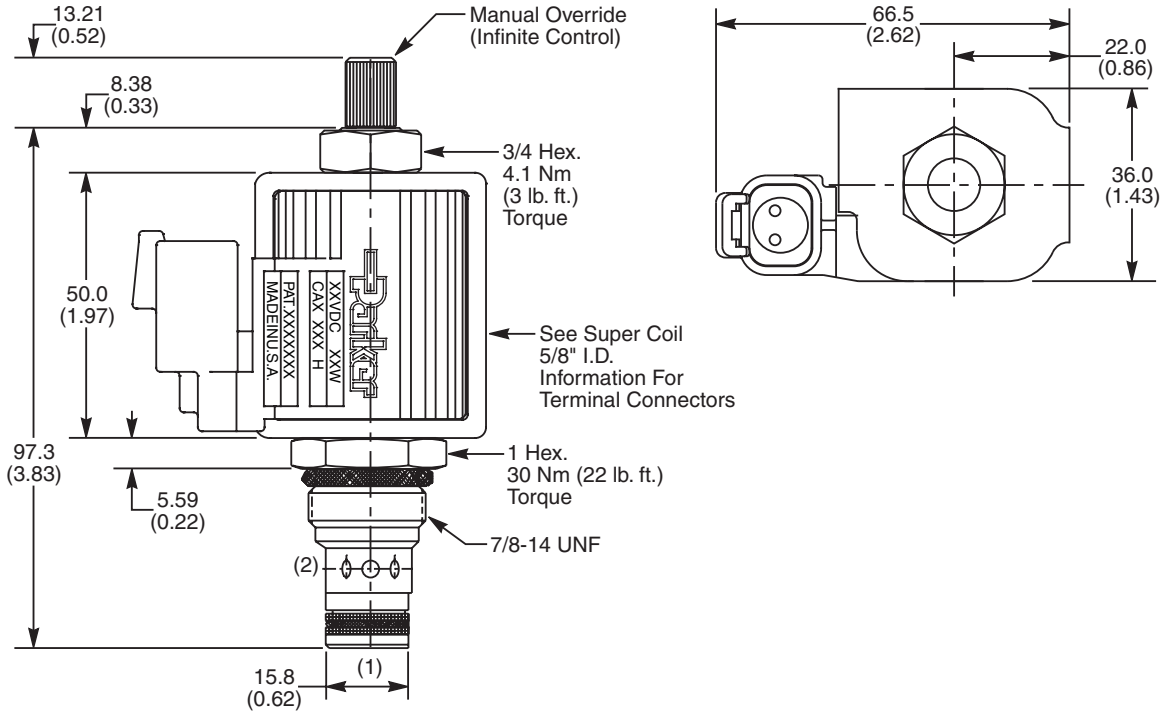


Flow Regulation



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



Ordering Information

HP04P	21			N	L
10 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Opening Point Variation

Code	Style (Maximum Regulated Flow)
21	High Flow ('SP' Coil) 30 LPM (8 GPM)

Code	Override Option
0	Not Required
5	Infinite Control M.O.

Code	Filter Screen
0	Not Available

Code	Flow Variation
L	Low Variation (±2% of Current Flow)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30503N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

Order Bodies Separately
See section BC

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

Port Size
1/2″ BSP

Body Material
Steel

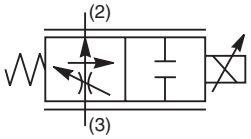
General Description

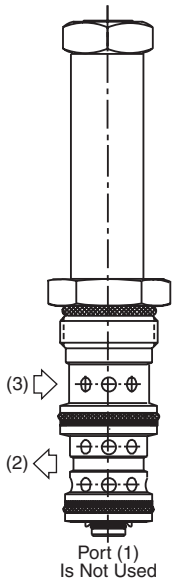
2 Way, Normally Open, Proportional Flow Regulator Valve. Pressure Compensated. For additional information see Technical Tips on pages PV1-PV6.

Features

- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- Factory-adjusted low variation option (Model "L") is available for applications where low variation of flow from valve to valve is essential at a given current.







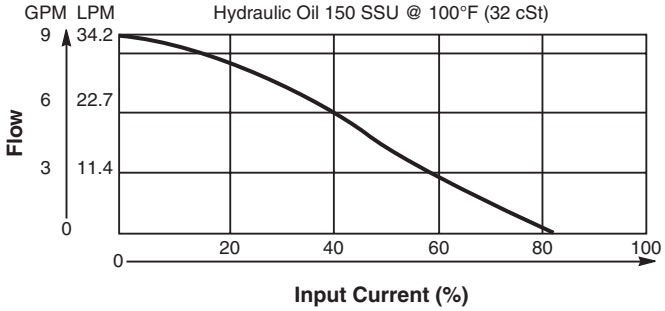
Specifications

Rated Flow	36 LPM (9.5 GPM) High Flow ('SP' Coil)
Maximum Input Pressure At Port 3	210 Bar (3000 PSI)
Minimum Pressure Differential	14 Bar (200 PSI)
Maximum Internal Leakage	780 cc (46 cu. in.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	7%
Variation of Flow @ 35% of Rated Current	**Model "L"** ±7% Of Rated Flow
Cartridge Material	Anodised Aluminium
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.13 kg (.28 lbs.)
Cavity	3X (See BC Section for more details)

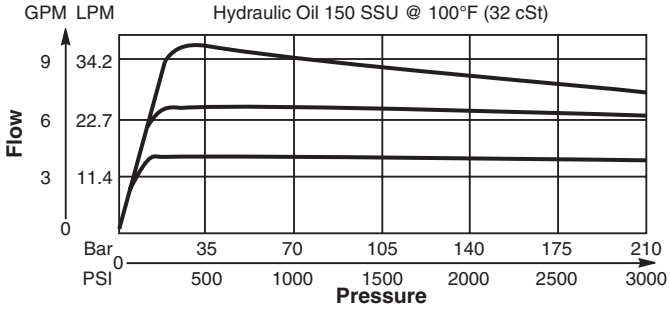
Performance Curves

▲PWM Current Regulator Recommended

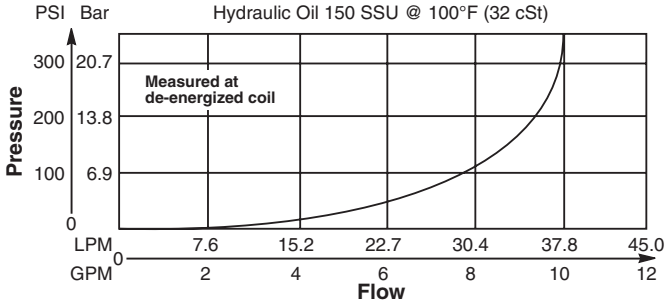
Flow vs. Input Current



Flow Regulation

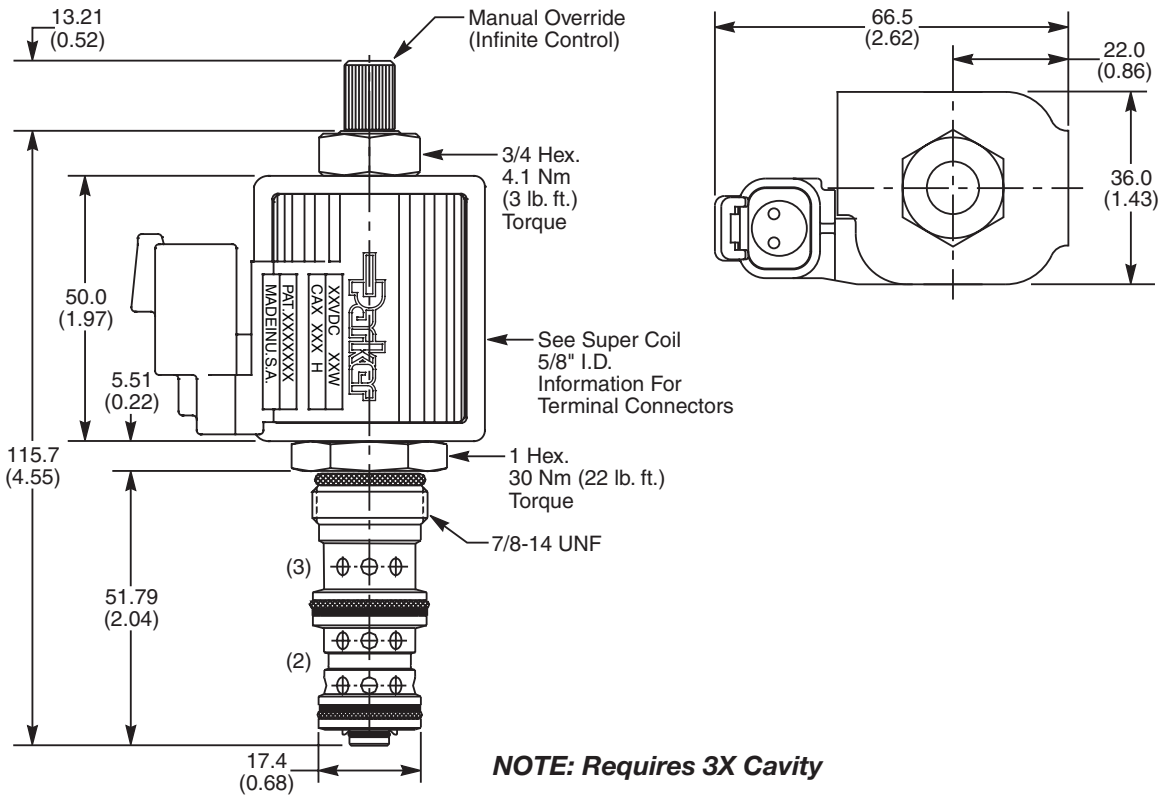


Pressure Drop vs. Flow



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



NOTE: Requires 3X Cavity

Ordering Information

JP04P	21			N	L
10 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Flow Variation

Code	Style (Maximum Regulated Flow)
21	High Flow ('SP' Coil) 36 LPM 9.5 GPM)

Code	Override Option
0	Not Required
5	Infinite Control M.O.

Code	Filter Screen
0	Not Required
1	60 Mesh Screen on Port 2

Code	Flow Variation
L	Low Variation (±7% of Rated Flow)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30106N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

Order Bodies Separately
See section BC

LB10	554	S
Line Body	Porting	Body Material

Code	Porting
554	3/8″ BSP

Code	Body Material
S	Steel

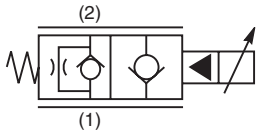
General Description

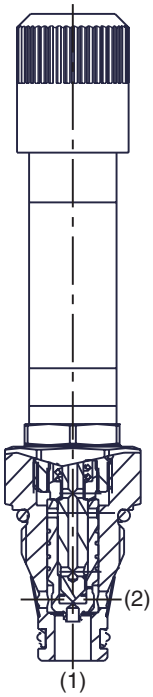
2 Way, Normally Closed, Proportional Poppet Valve. For additional information see Technical Tips on pages PV1-PV6.

Features

- One piece cartridge housing ensures internal concentricity
- Adjusted at factory for low variation
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Industry common cavity
- External surfaces plated
- Excellent low flow metering capability







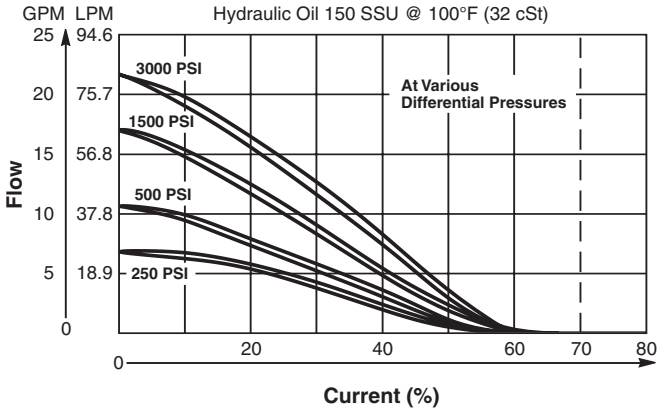
Specifications

All performance data with CAS coil.
Maximum current, 70% recommended.
Hydraulic oil 150 SSU @ 40°C (32 cSt)

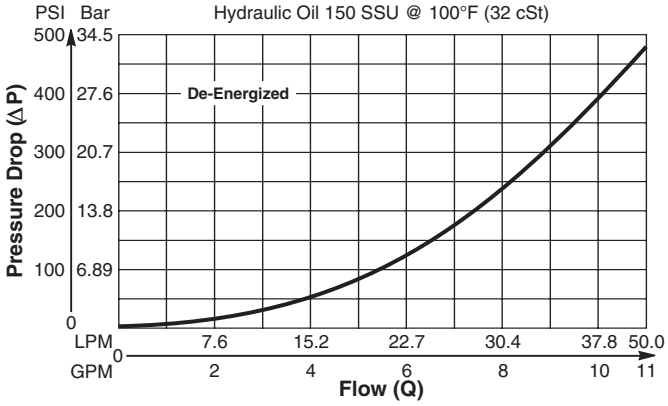
Rated Flow @ 70% of Full Current at ΔP 34.5 Bar (500 PSI)	27 LPM (7 GPM)
Maximum Input Pressure at Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	21 Bar (300 PSI)
Maximum Internal Leakage	5 drops/min. (.33 cc/min.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<15% *NOTE: Current regulated PWM recommended*
Cartridge Material	All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 18/16/13, SAE Class 4
Approx. Weight	.17 kg (.38 lbs.)
Cavity	C08-2 (See BC Section for more details)

Performance Curves

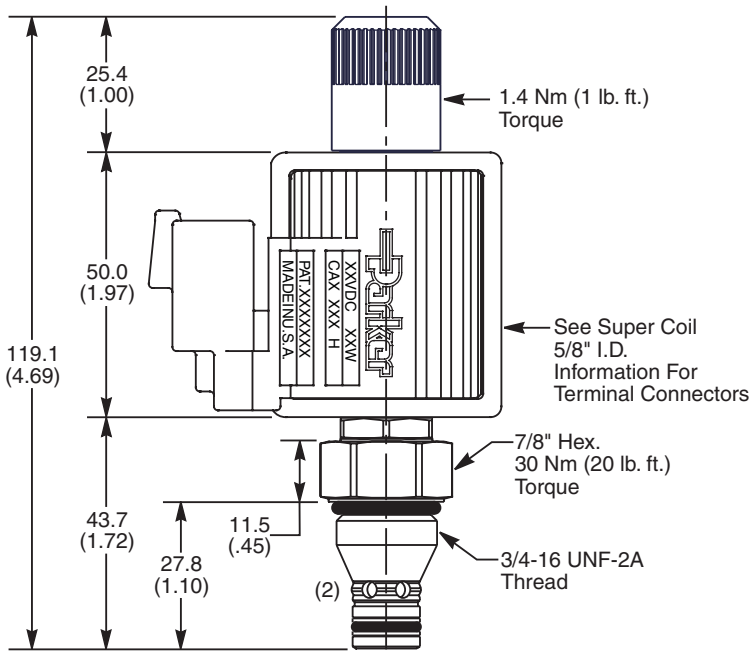
Flow vs. Input Current

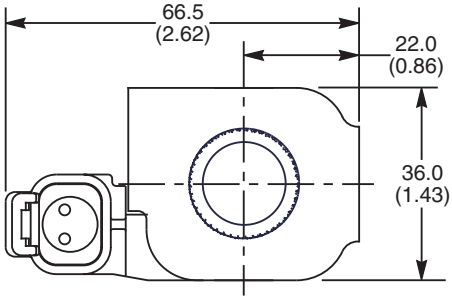


Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)





Ordering Information

FAP081	C	
08 Size Proportional Valve	Style	Seals

Code	Style
C	Normally Closed

Code	Seals / Kit No.	Operating Temp.
Omit	"D" -Ring / (SK08-2)	-37°C to +93°C (-35°F to +200°F)
N	Nitrile / (SK08-2N)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

Order Coils Separately
See section CE

Coil Type	
CAS	Super Coil - 18w

Port Size
3/8" BSP

Body Material
Steel

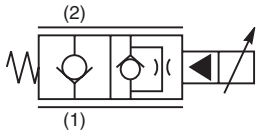
General Description

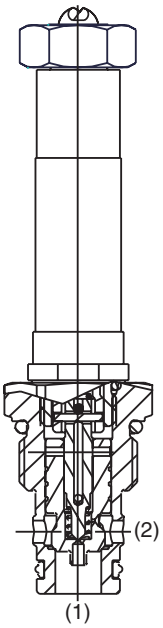
2 Way, Normally Closed, Proportional Poppet Valve. For additional information see Technical Tips on pages PV1-PV6.

Features

- One piece cartridge housing ensures internal concentricity
- Adjusted at factory for low variation
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Industry common cavity
- External surfaces plated
- Excellent low flow metering capability







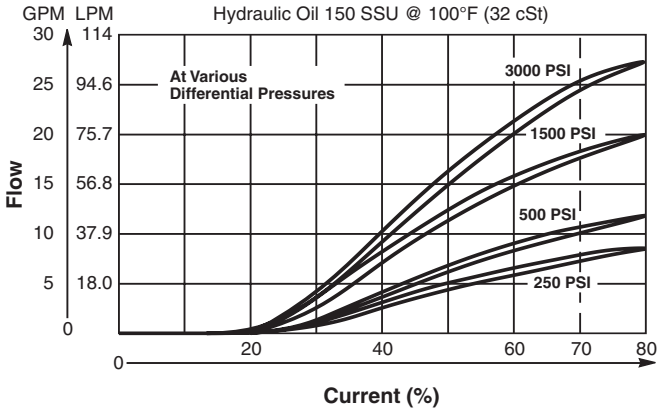
Specifications

All performance data with CAS coil.
Maximum current, 70% recommended.
Hydraulic oil 150 SSU @ 40°C (32 cSt)

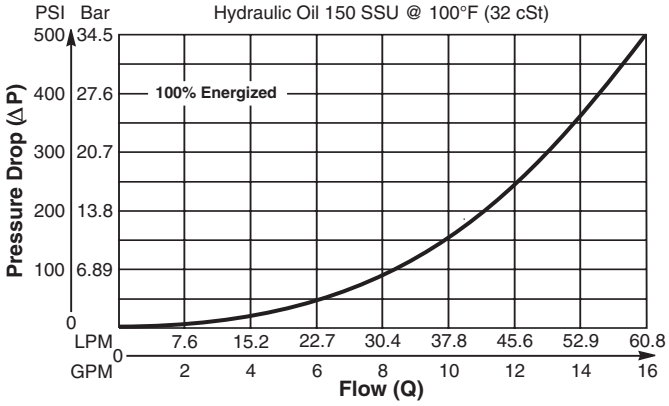
Rated Flow @ 70% of Full Current at ΔP 34.5 Bar (500 PSI)	40 LPM (10.5 GPM)
Maximum Input Pressure at Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	21 Bar (300 PSI)
Maximum Internal Leakage	5 drops/min. (.33 cc/min.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<15% ***NOTE: Current regulated PWM recommended***
Cartridge Material	All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 18/16/13, SAE Class 4
Approx. Weight	.19 kg (.42 lbs.)
Cavity	C10-2 (See BC Section for more details)

Performance Curves

Flow vs. Input Current

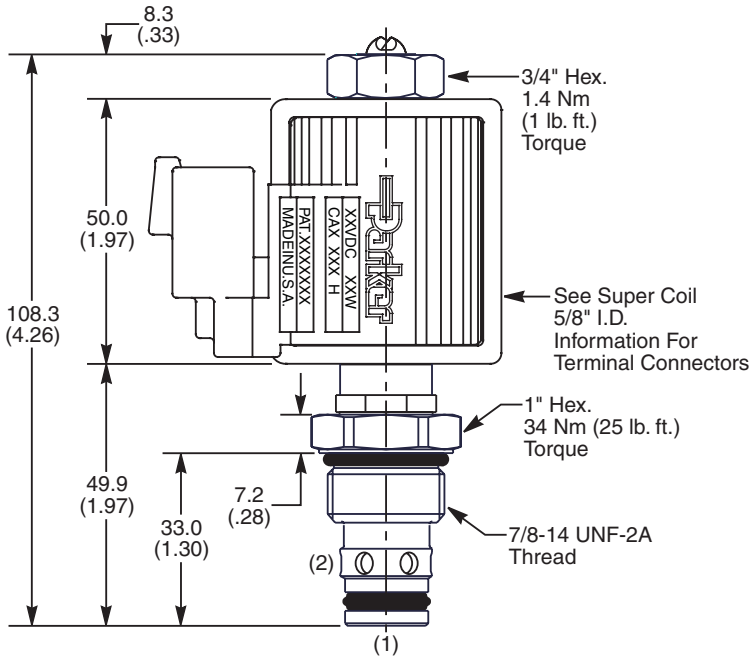


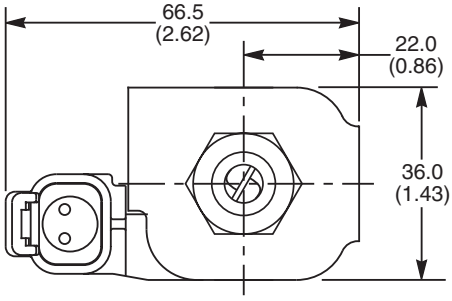
Pressure Drop vs. Flow (Through cartridge only)



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)





Ordering Information

FAP101	C	
10 Size Proportional Valve	Style	Seals

Code	Style
C	Normally Closed

Code	Seals / Kit No.	Operating Temp.
Omit	"D" -Ring / (SK10-2)	-37°C to +93°C (-35°F to +200°F)
N	Nitrile / (SK10-2N)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

Order Coils Separately
See section CE

Coil Type	
CAS	Super Coil - 18w

Port Size
1/2" BSP

Body Material
Steel

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

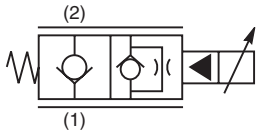
General Description

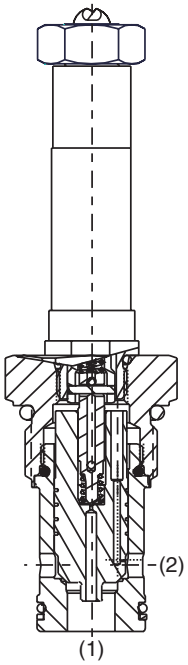
2 Way, Normally Closed, Proportional Poppet Valve. For additional information see Technical Tips on pages PV1-PV6.

Features

- Adjusted at factory for low variation
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Industry common cavity
- External surfaces plated
- Excellent low flow metering capability







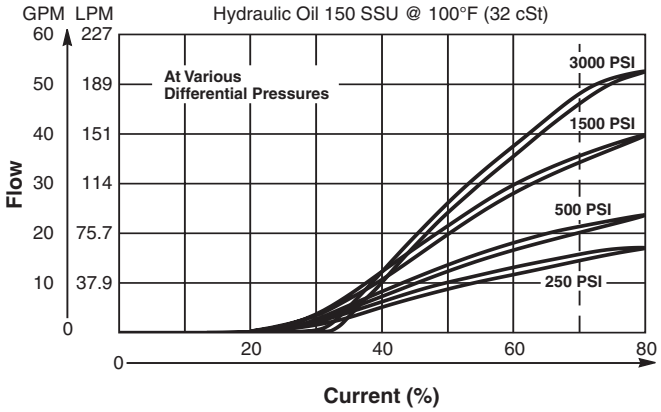
Specifications

All performance data with CAS coil.
Maximum current, 70% recommended.
Hydraulic oil 150 SSU @ 40°C (32 cSt)

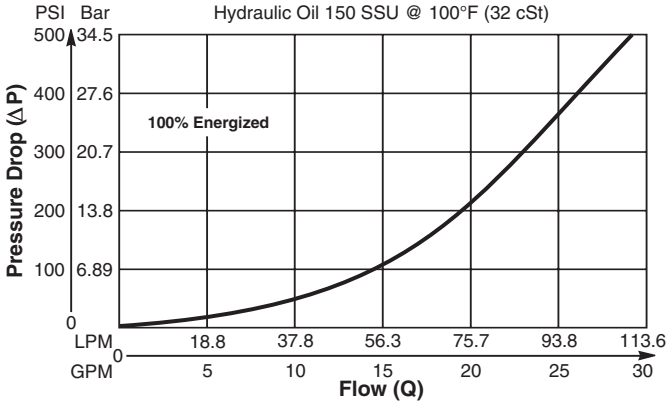
Rated Flow @ 70% of Full Current at ΔP 34.5 Bar (500 PSI)	81.5 LPM (21.5 GPM)
Maximum Input Pressure at Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	21 Bar (300 PSI)
Maximum Internal Leakage	5 drops/min. (.33 cc/min.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<15% ***NOTE: Current regulated PWM recommended***
Cartridge Material	All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 18/16/13, SAE Class 4
Approx. Weight	.30 kg (.65 lbs.)
Cavity	C12-2F (See BC Section for more details)

Performance Curves

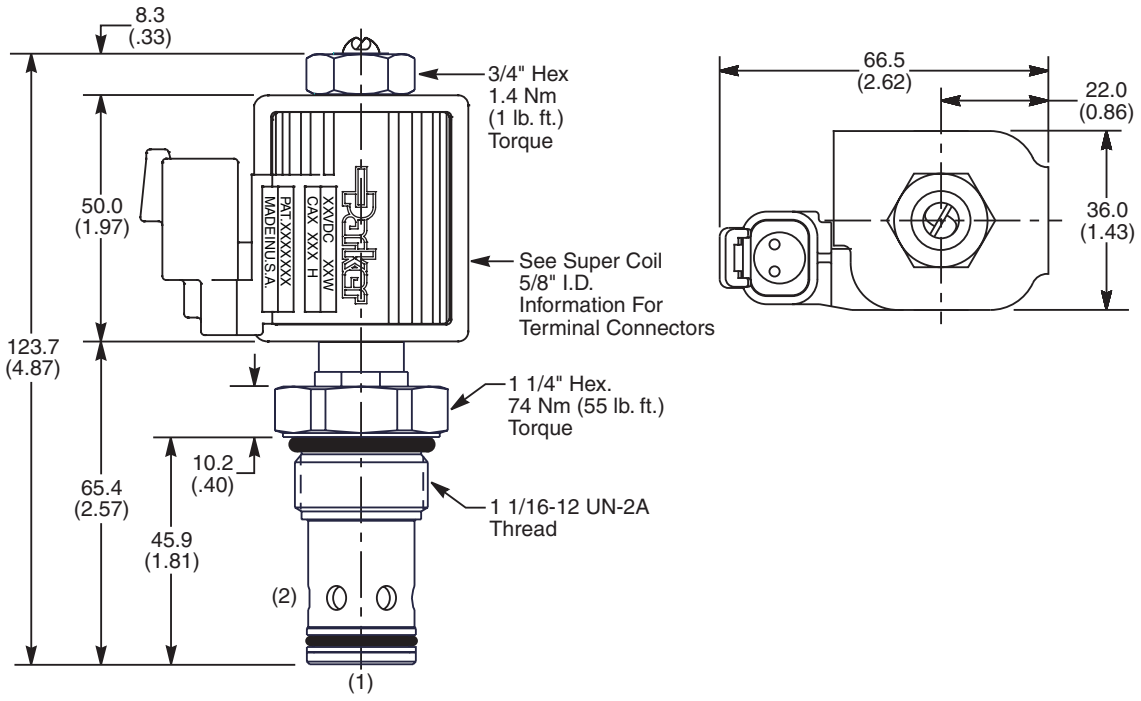
Flow vs. Input Current



Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

FAP121	C	N
12 Size Proportional Valve	Style	Seals

Code	Style
C	Normally Closed

Code	Seals / Kit No.	Operating Temp.
N	Nitrile / (SK2-12N)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAS	Super Coil - 18w

Order Bodies Separately
See section BC

B12	—	2F	—	12T
10 Size		3-Way Cavity		Port Size

Port Size
SAE 12

Body Material
Steel

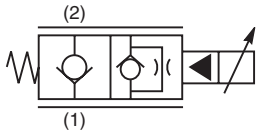
General Description

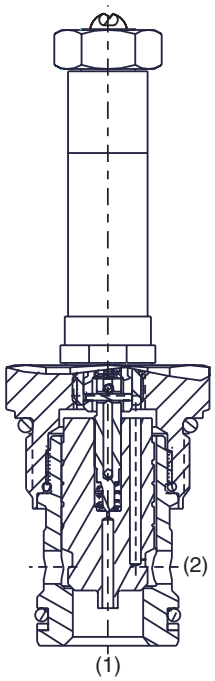
2 Way, Normally Closed, Proportional Poppet Valve. For additional information see Technical Tips on pages PV1-PV6.

Features

- Adjusted at factory for low variation
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Industry common cavity
- External surfaces plated
- Excellent low flow metering capability







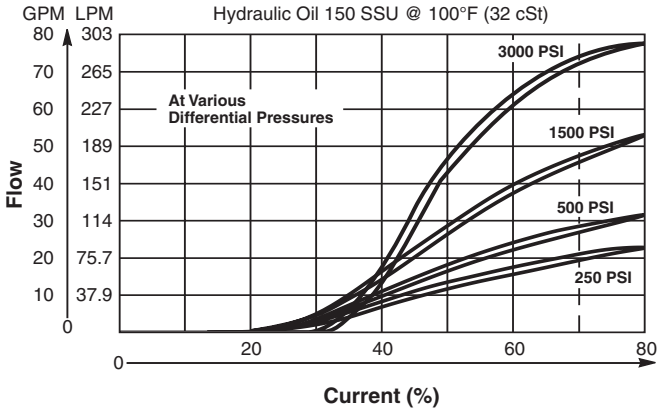
Specifications

All performance data with CAS coil.
Maximum current, 70% recommended.
Hydraulic oil 150 SSU @ 40°C (32 cSt)

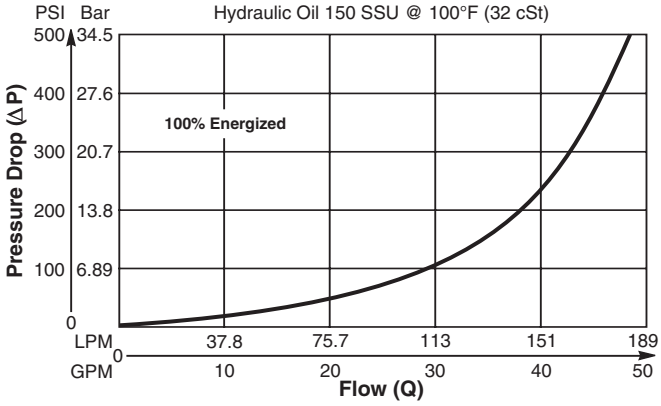
Rated Flow @ 70% of Full Current at ΔP 34.5 Bar (500 PSI)	106 LPM (28 GPM)
Maximum Input Pressure at Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	21 Bar (300 PSI)
Maximum Internal Leakage	5 drops/min. (.33 cc/min.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<15% *NOTE: Current regulated PWM recommended*
Cartridge Material	All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 18/16/13, SAE Class 4
Approx. Weight	.40 kg (.88 lbs.)
Cavity	C16-2 (See BC Section for more details)

Performance Curves

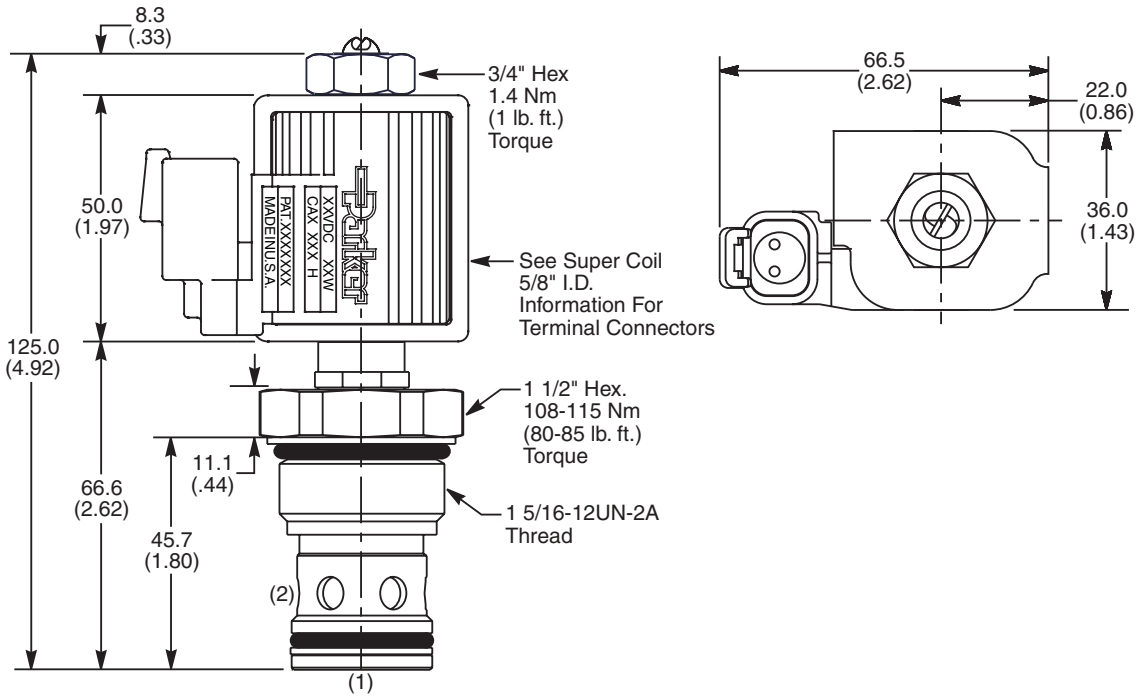
Flow vs. Input Current



Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

FAP161	C	N
16 Size Proportional Valve	Style	Seals

Code	Style
C	Normally Closed

Code	Seals / Kit No.	Operating Temp.
N	Nitrile / (SK16-2N)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B16	—	2	—	16B
16 Size		2-Way Cavity		Port Size

Order Coils Separately
See section CE

Coil Type	
CAS	Super Coil - 18w

Port Size
1″ BSP

Body Material
Steel

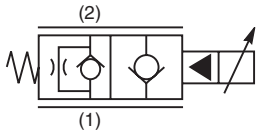
General Description

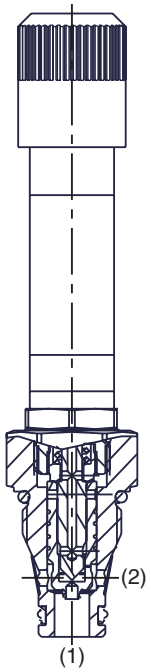
2 Way, Normally Open, Proportional Poppet Valve. For additional information see Technical Tips on pages PV1-PV6.

Features

- One piece cartridge housing ensures internal concentricity
- Adjusted at factory for low variation
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Industry common cavity
- External surfaces plated
- Excellent low flow metering capability







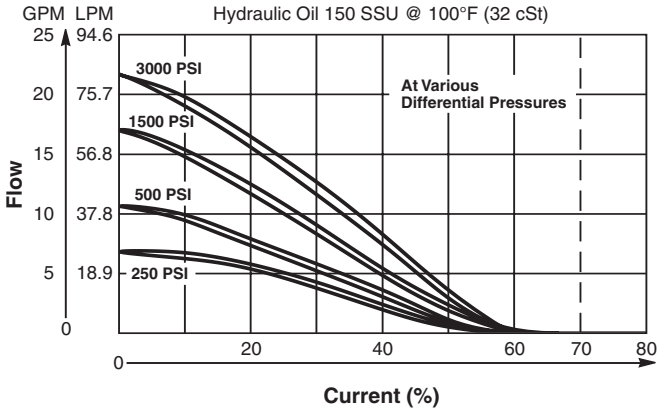
Specifications

All performance data with CAS coil.
Maximum current, 70% recommended.
Hydraulic oil 150 SSU @ 40°C (32 cSt)

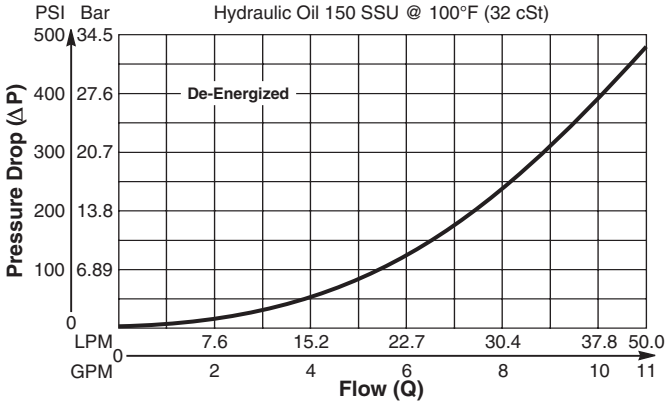
Rated Flow De-Energized at ΔP 34.5 Bar (500 PSI)	40 LPM (10.5 GPM)
Maximum Input Pressure at Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	21 Bar (300 PSI)
Maximum Internal Leakage	5 drops/min. (.33 cc/min.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<15% ***NOTE: Current regulated PWM recommended***
Cartridge Material	All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 18/16/13, SAE Class 4
Approx. Weight	.22 kg (.48 lbs.)
Cavity	C08-2 (See BC Section for more details)

Performance Curves

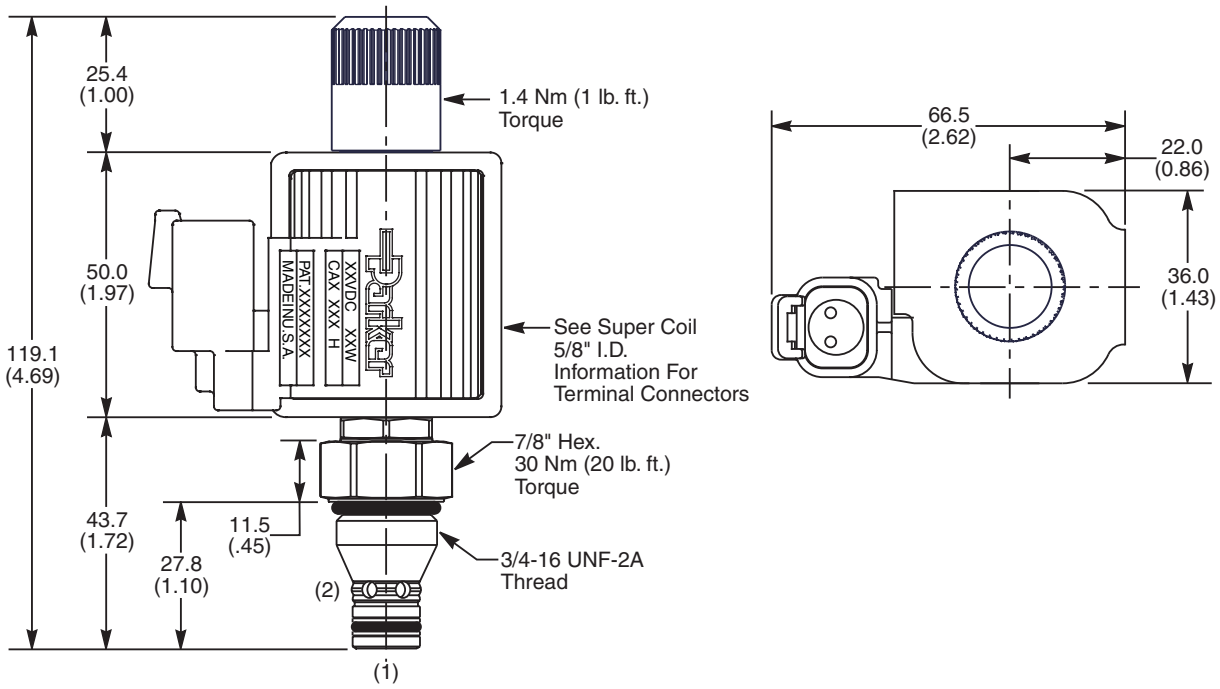
Flow vs. Input Current



Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

FAP081	N	
08 Size Proportional Valve	Style	Seals

Code	Style
N	Normally Open

Code	Seals / Kit No.	Operating Temp.
Omit	"D" -Ring / (SK08-2)	-37°C to +93°C (-35°F to +200°F)
N	Nitrile / (SK08-2N)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

Order Coils Separately
See section CE

Coil Type	
CAS	Super Coil - 18w

Port Size
3/8″ BSP

Body Material
Steel

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

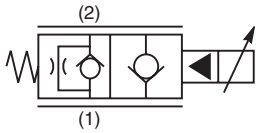
General Description

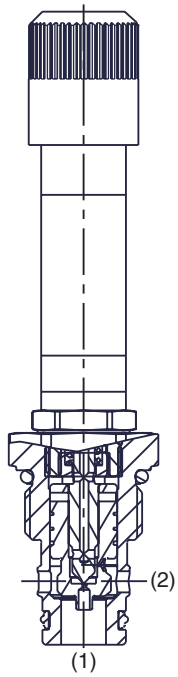
2 Way, Normally Open, Proportional Poppet Valve. For additional information see Technical Tips on pages PV1-PV6.

Features

- One piece cartridge housing ensures internal concentricity
- Adjusted at factory for low variation
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Industry common cavity
- External surfaces plated
- Excellent low flow metering capability







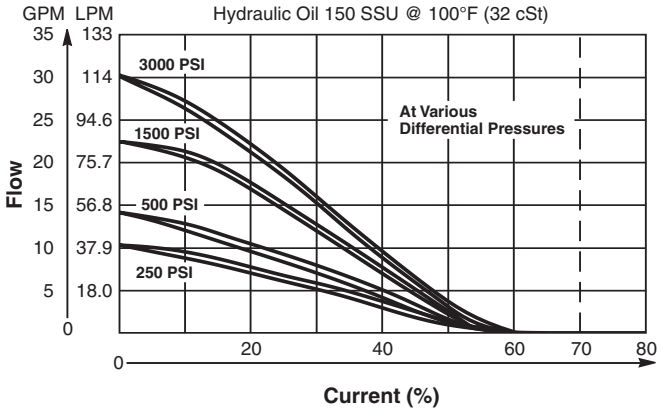
Specifications

All performance data with CAS coil.
Maximum current, 70% recommended.
Hydraulic oil 150 SSU @ 40°C (32 cSt)

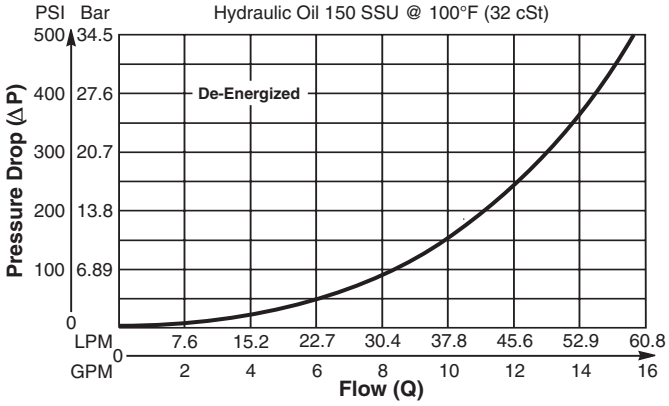
Rated Flow De-Energized at ΔP 34.5 Bar (500 PSI)	55 LPM (14.5 GPM)
Maximum Input Pressure at Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	21 Bar (300 PSI)
Maximum Internal Leakage	5 drops/min. (.33 cc/min.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<15% ***NOTE: Current regulated PWM recommended***
Cartridge Material	All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 18/16/13, SAE Class 4
Approx. Weight	.23 kg (.52 lbs.)
Cavity	C10-2 (See BC Section for more details)

Performance Curves

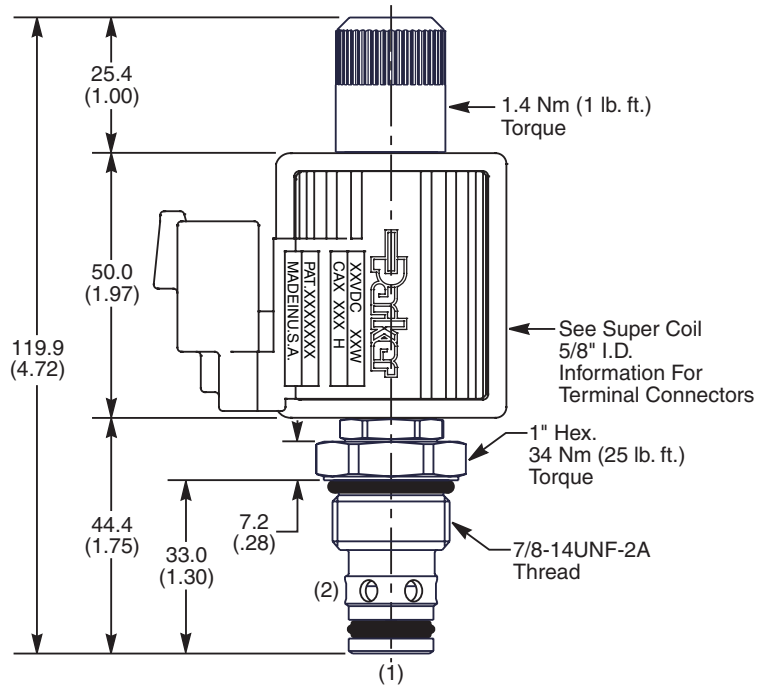
Flow vs. Input Current

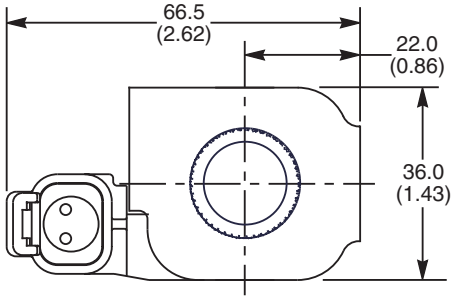


Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)





Ordering Information

FAP101	N	
10 Size Proportional Valve	Style	Seals

Code	Style
N	Normally Open

Code	Seals / Kit No.	Operating Temp.
Omit	"D" -Ring / (SK10-2)	-37°C to +93°C (-35°F to +200°F)
N	Nitrile / (SK10-2N)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

Order Coils Separately
See section CE

Coil Type	
CAS	Super Coil - 18w

Port Size
1/2″ BSP

Body Material
Steel

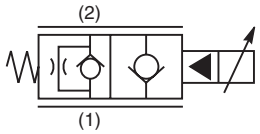
General Description

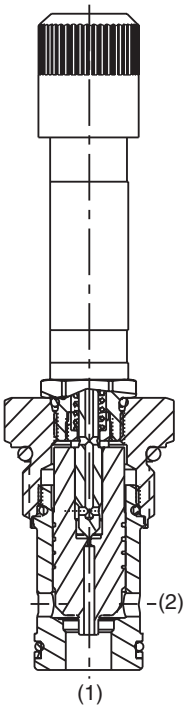
2 Way, Normally Open, Proportional Poppet Valve. For additional information see Technical Tips on pages PV1-PV6.

Features

- Adjusted at factory for low variation
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Industry common cavity
- External surfaces plated
- Excellent low flow metering capability







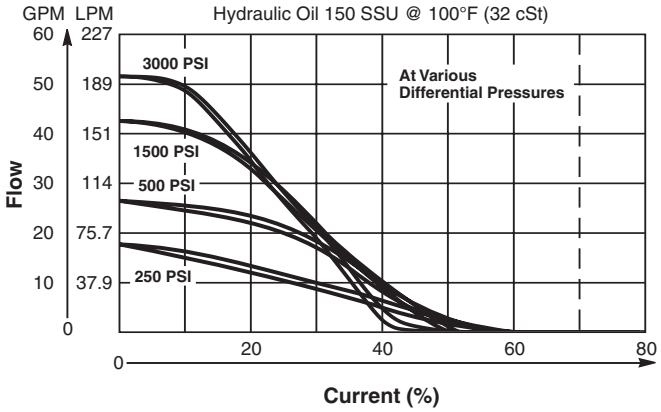
Specifications

All performance data with CAS coil.
Maximum current, 70% recommended.
Hydraulic oil 150 SSU @ 40°C (32 cSt)

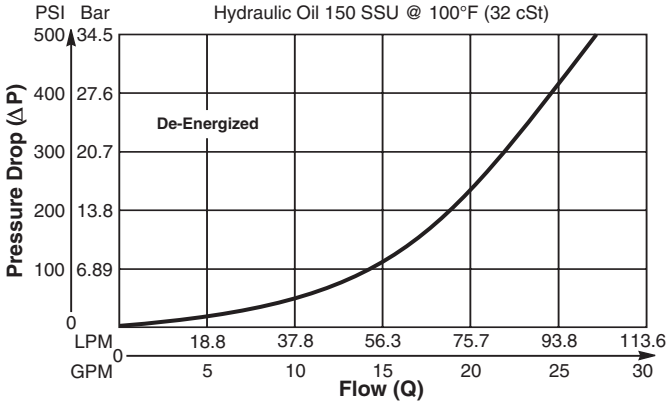
Rated Flow De-Energized at ΔP 34.5 Bar (500 PSI)	98.5 LPM (26 GPM)
Maximum Input Pressure at Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	21 Bar (300 PSI)
Maximum Internal Leakage	5 drops/min. (.33 cc/min.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<15% ***NOTE: Current regulated PWM recommended***
Cartridge Material	All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 18/16/13, SAE Class 4
Approx. Weight	.31 kg (.68 lbs.)
Cavity	C12-2F (See BC Section for more details)

Performance Curves

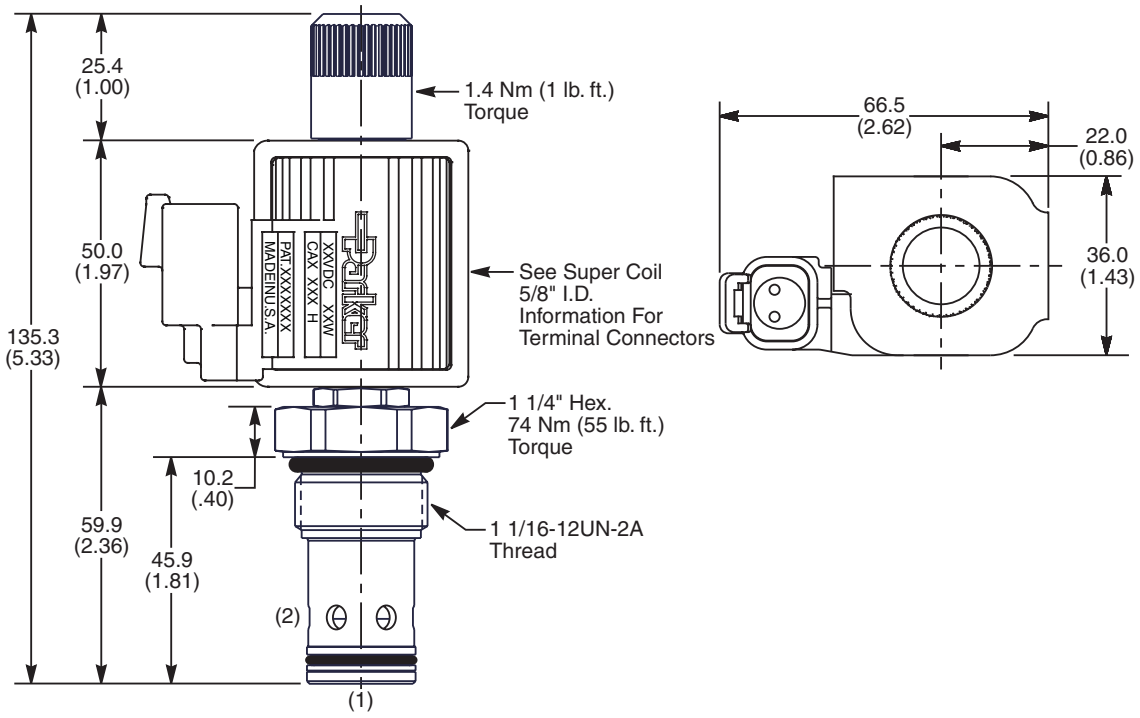
Flow vs. Input Current



Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

FAP121	N	N
12 Size Proportional Valve	Style	Seals

Code	Style
N	Normally Open

Code	Seals / Kit No.	Operating Temp.
N	Nitrile / (SK2-12N)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAS	Super Coil - 18w

Order Bodies Separately
See section BC

B12	—	2F	—	12T
12 Size		2-Way Cavity		Port Size

Port Size
SAE 12

Body Material
Steel

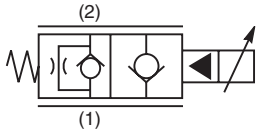
General Description

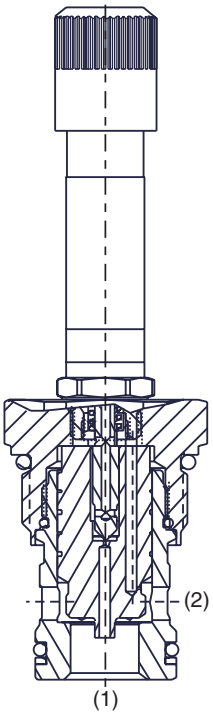
2 Way, Normally Open, Proportional Poppet Valve. For additional information see Technical Tips on pages PV1-PV6.

Features

- Adjusted at factory for low variation
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Industry common cavity
- External surfaces plated
- Excellent low flow metering capability







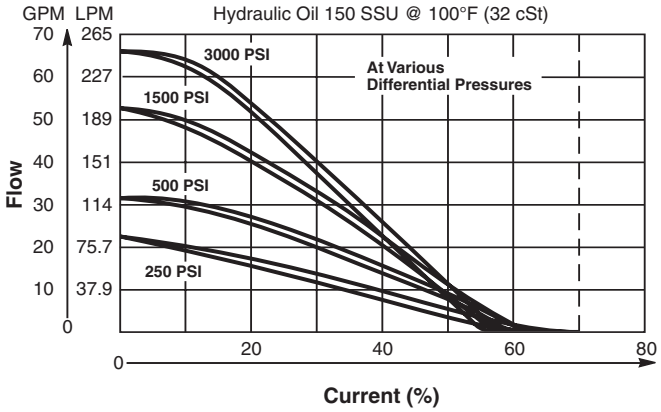
Specifications

All performance data with CAS coil.
Maximum current, 70% recommended.
Hydraulic oil 150 SSU @ 40°C (32 cSt)

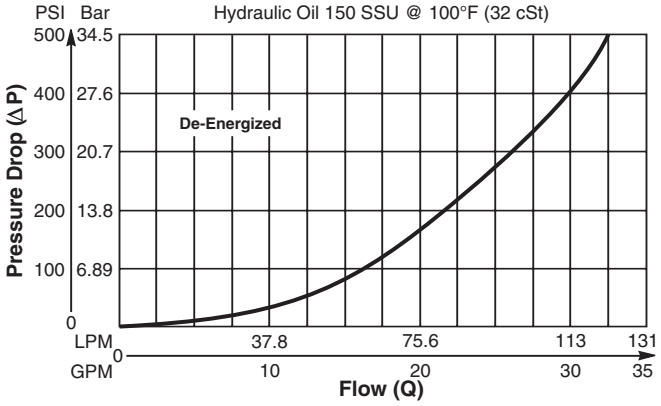
Rated Flow De-Energized at ΔP 34.5 Bar (500 PSI)	117 LPM (31 GPM)
Maximum Input Pressure at Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	21 Bar (300 PSI)
Maximum Internal Leakage	5 drops/min. (.33 cc/min.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<15% ***NOTE: Current regulated PWM recommended***
Cartridge Material	All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 18/16/13, SAE Class 4
Approx. Weight	.41 kg (.90 lbs.)
Cavity	C16-2 (See BC Section for more details)

Performance Curves

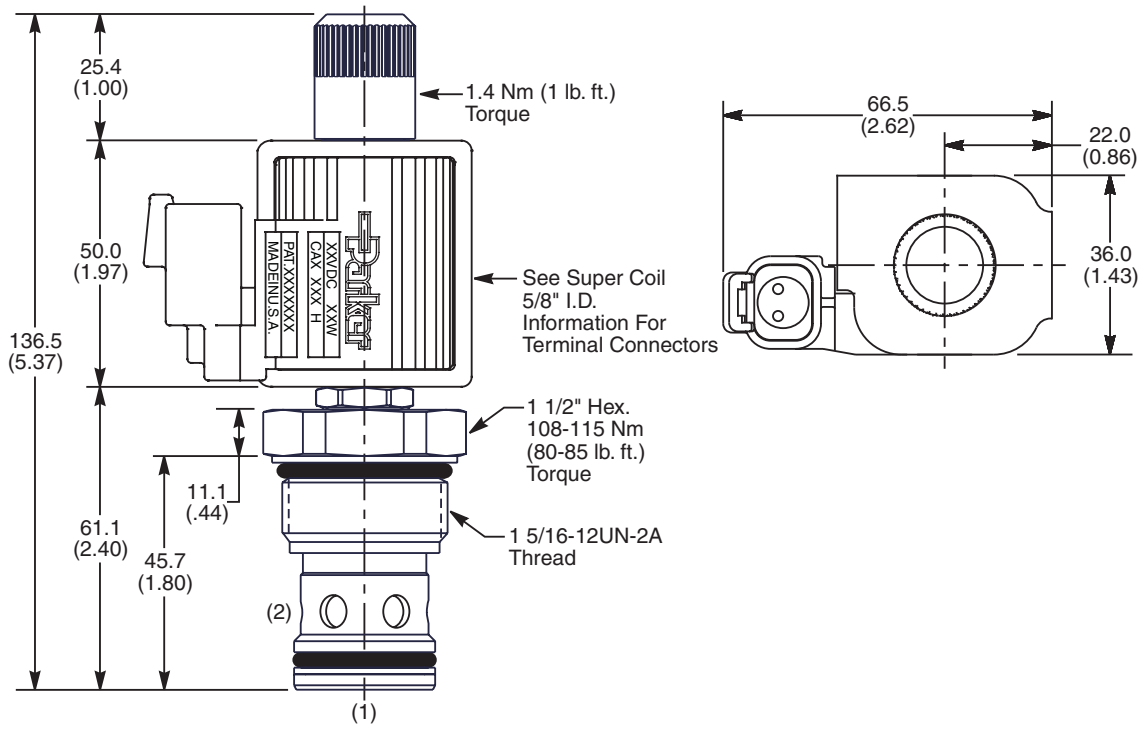
Flow vs. Input Current



Pressure Drop vs. Flow (Through cartridge only)



Dimensions Millimeters (Inches)



Ordering Information

FAP161	N	N
16 Size Proportional Valve	Style	Seals

Code	Style
N	Normally Open

Code	Seals / Kit No.	Operating Temp.
N	Nitrile / (SK16-2N)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B16	—	2	—	16B
16 Size		2-Way Cavity		Port Size

Order Coils Separately
See section CE

Coil Type	
CAS	Super Coil - 18w

Port Size
1″ BSP

Body Material
Steel

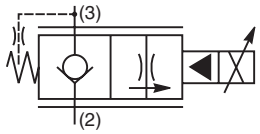
General Description

2 Way, Normally Closed, Proportional Poppet Valve with Pressure Compensation. For additional information see Technical Tips on pages PV1-PV6.

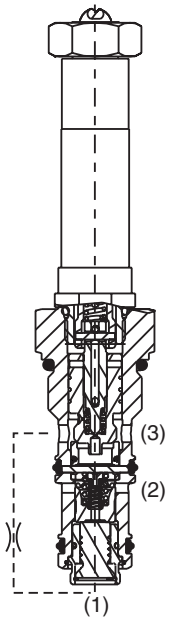
Features

- Low leakage poppet design with no dynamic seal to wear out on the compensator
- Adjusted at factory for low variation
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- External surfaces plated
- Excellent low flow metering capability





Note: *Always connect Port (3) to Port (1) through .031" orifice. For FAPC101 only.*



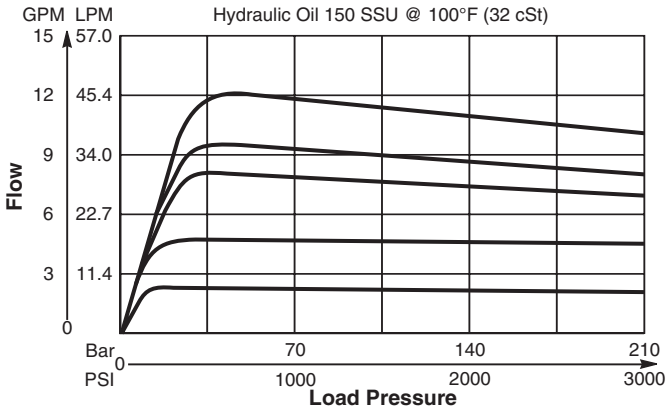
Specifications

All performance data with CAS coil.
Maximum current, 70% recommended.
Hydraulic oil 150 SSU @ 40°C (32 cSt)

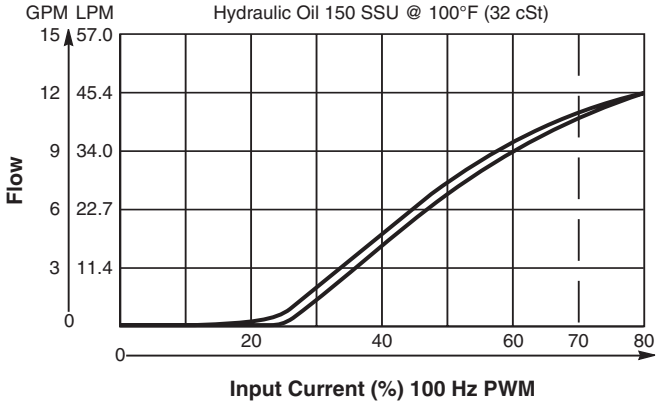
Rated Flow @ 70% of Full Current at ΔP 34.5 Bar (500 PSI)	38 LPM (10 GPM)
Maximum Input Pressure at Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	34 Bar (500 PSI)
Maximum Internal Leakage	5 drops/min. (.33 cc/min.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<10% ***NOTE: Current regulated PWM recommended***
Cartridge Material	All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 18/16/13, SAE Class 4
Approx. Weight	.24 kg (.52 lbs.)
Cavity	3X (See BC Section for more details)

Performance Curves

Pressure Compensation of Regulated Flow

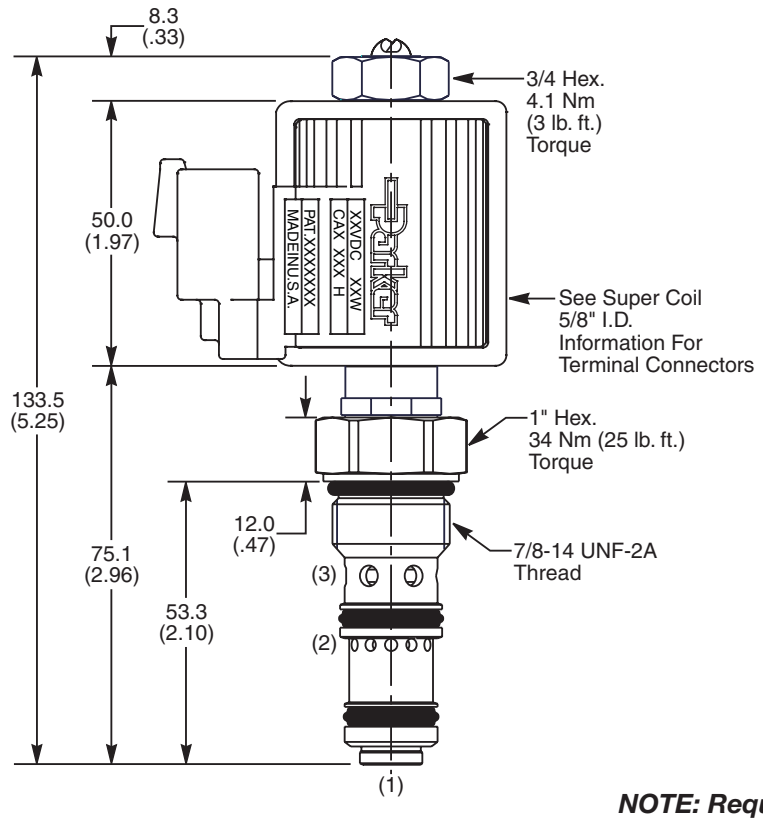


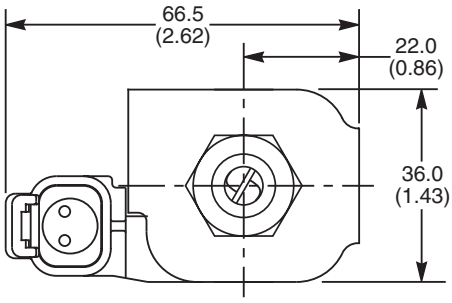
Flow vs. Input Current



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)





NOTE: Requires 3X Cavity

Always connect Port (3) to Port (1) through .031″ orifice.

Ordering Information

FAPC101	C	
10 Size Proportional Valve	Style	Seals

Code	Style
C	Normally Closed

Code	Seals / Kit No.	Operating Temp.
Omit	"D" -Ring / (SK10-3S)	-37°C to +93°C (-35°F to +200°F)
N	Nitrile / (SK10-3XN)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAS	Super Coil - 18w

Order Bodies Separately
See section BC

LB10	554	S
Line Body	Porting	Body Material

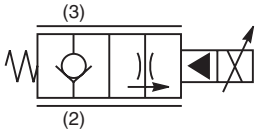
Code	Porting
554	3/8″ BSP

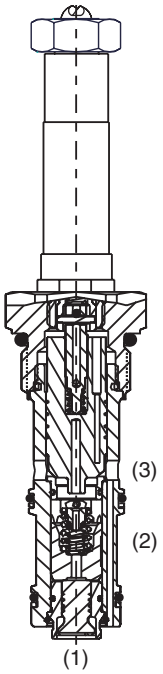
Code	Body Material
S	Steel

General Description

2 Way, Normally Closed, Proportional Poppet Valve with Pressure Compensation. For additional information see Technical Tips on pages PV1-PV6.







Features

- Low leakage poppet design with no dynamic seal to wear out on the compensator
- Adjusted at factory for low variation
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- External surfaces plated
- Excellent low flow metering capability

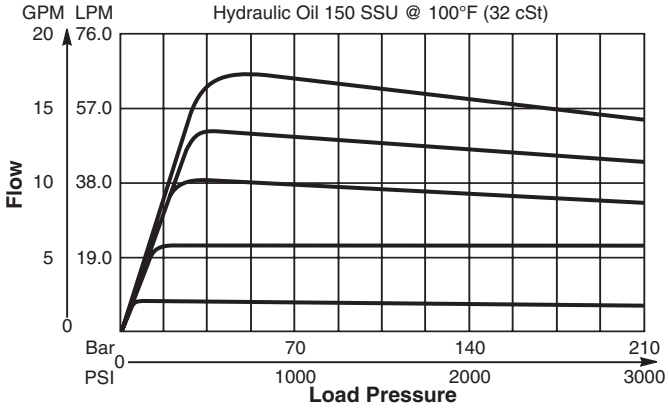
Specifications

All performance data with CAS coil.
Maximum current, 70% recommended.
Hydraulic oil 150 SSU @ 40°C (32 cSt)

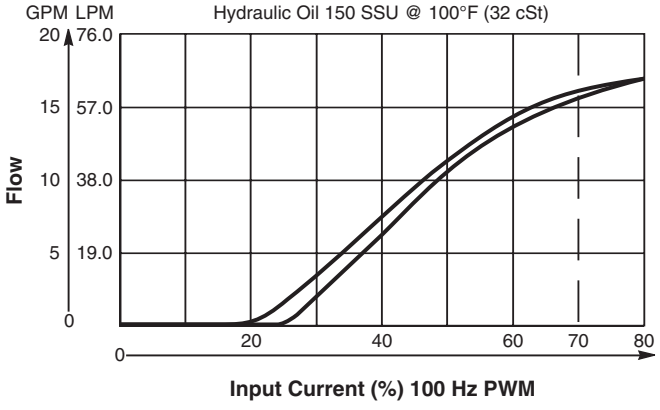
Rated Flow @ 70% of Full Current at ΔP 34.5 Bar (500 PSI)	57 LPM (15 GPM)
Maximum Input Pressure at Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	34 Bar (500 PSI)
Maximum Internal Leakage	5 drops/min. (.33 cc/min.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<10% ***NOTE: Current regulated PWM recommended***
Cartridge Material	All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 18/16/13, SAE Class 4
Approx. Weight	.36 kg (.79 lbs.)
Cavity	C12-3L (See BC Section for more details)

Performance Curves

Pressure Compensation of Regulated Flow

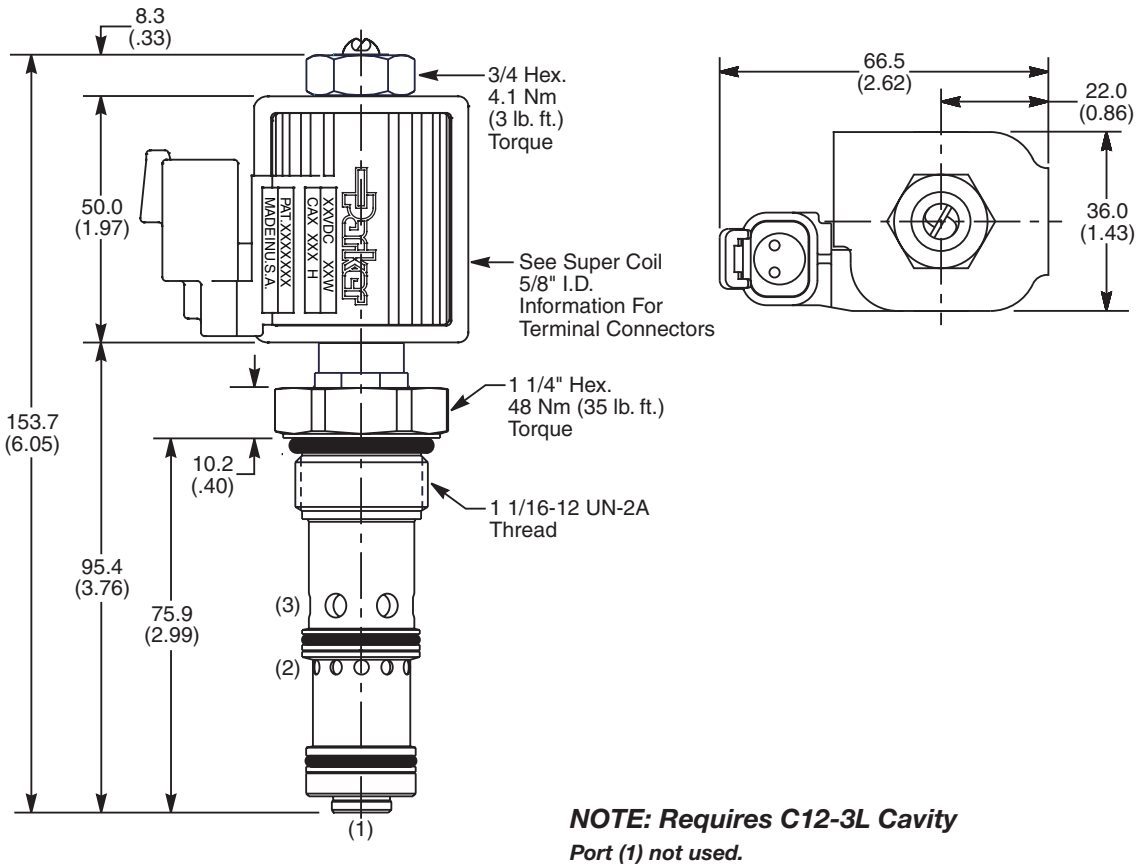


Flow vs. Input Current



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



NOTE: Requires C12-3L Cavity
Port (1) not used.

Ordering Information

FAPC121	C	N
12 Size Proportional Valve	Style	Seals

Code	Style
C	Normally Closed

Code	Seals / Kit No.	Operating Temp.
N	Nitrile / (SK12-3LN)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B12	—	3L	—	12T
10 Size		3-Way Cavity		Port Size

Order Coils Separately
See section CE

Coil Type	
CAS	Super Coil - 18w

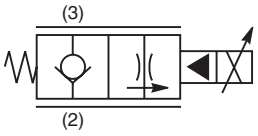
Port Size
SAE 12

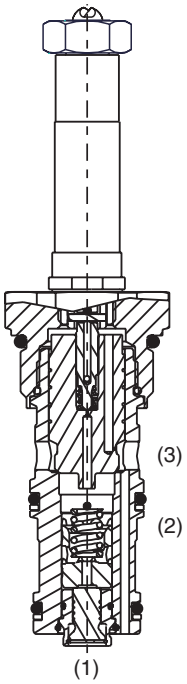
Body Material
Steel

General Description

2 Way, Normally Closed, Proportional Poppet Valve with Pressure Compensation. For additional information see Technical Tips on pages PV1-PV6.







Features

- Low leakage poppet design with no dynamic seal to wear out on the compensator
- Adjusted at factory for low variation
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Industry common cavity
- External surfaces plated
- Excellent low flow metering capability

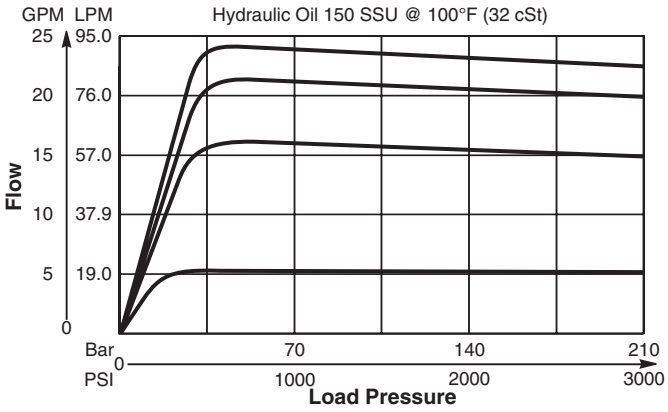
Specifications

All performance data with CAS coil.
Maximum current, 70% recommended.
Hydraulic oil 150 SSU @ 40°C (32 cSt)

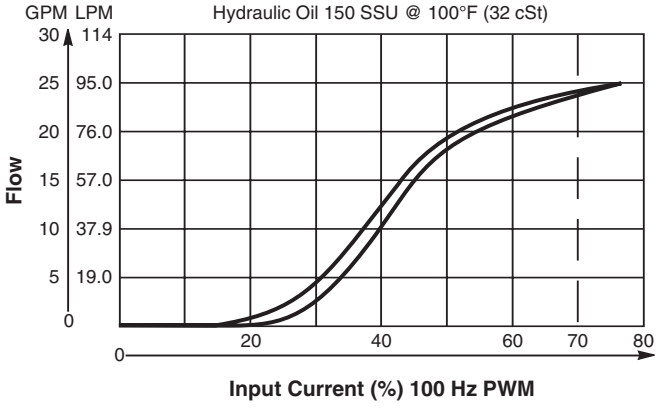
Rated Flow @ 70% of Full Current at ΔP 34.5 Bar (500 PSI)	83 LPM (22 GPM)
Maximum Input Pressure at Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	34 Bar (500 PSI)
Maximum Internal Leakage	5 drops/min. (.33 cc/min.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<10% ***NOTE: Current regulated PWM recommended***
Cartridge Material	All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 18/16/13, SAE Class 4
Approx. Weight	.48 kg (1.08 lbs.)
Cavity	C16-3 (See BC Section for more details)

Performance Curves

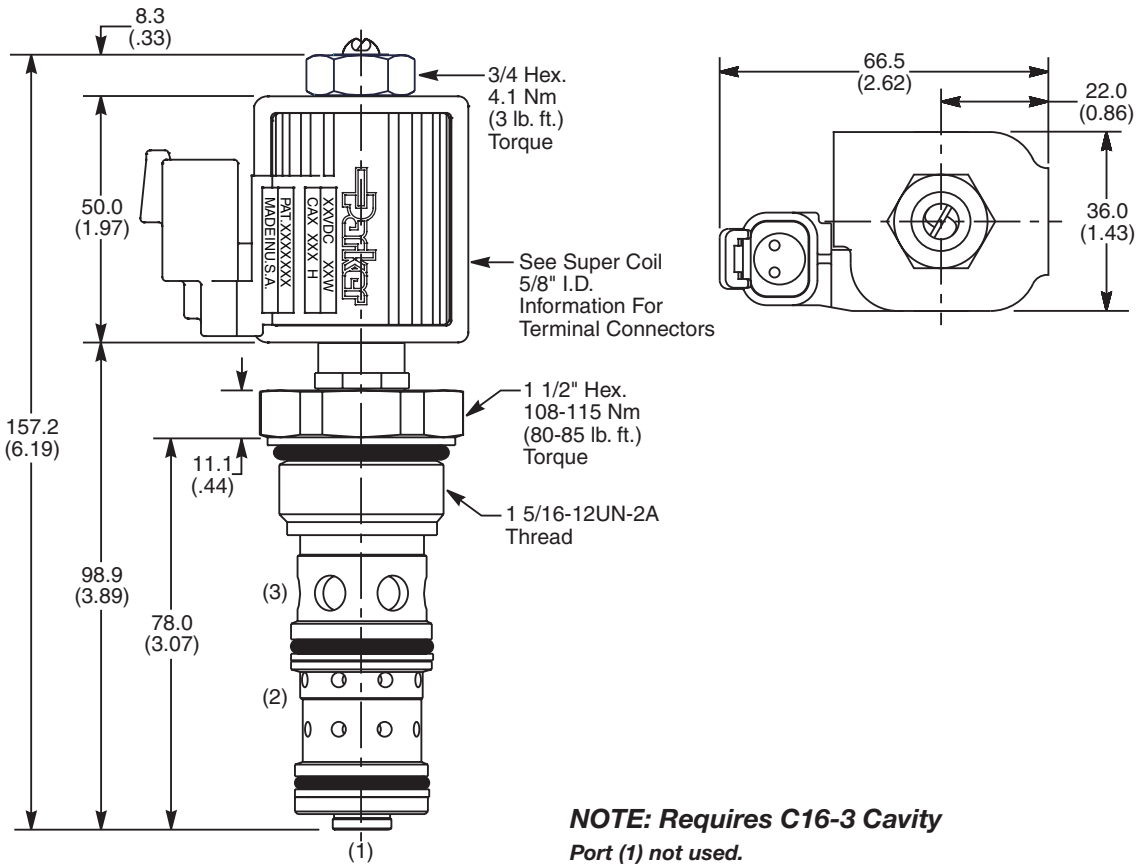
Pressure Compensation of Regulated Flow



Flow vs. Input Current



Dimensions Millimeters (Inches)



NOTE: Requires C16-3 Cavity
Port (1) not used.

Ordering Information

FAPC161	C	N
16 Size Proportional Valve	Style	Seals

Code	Style
C	Normally Closed

Code	Seals / Kit No.	Operating Temp.
N	Nitrile / (SK16-3N)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B16	—	3	—	16B
16 Size		3-Way Cavity		Port Size

Order Coils Separately
See section CE

Coil Type	
CAS	Super Coil - 18w

Port Size
1″ BSP

Body Material
Steel

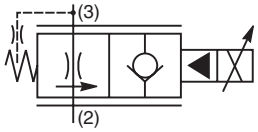
General Description

2 Way, Normally Open, Proportional Poppet Valve with Pressure Compensation. For additional information see Technical Tips on pages PV1-PV6.

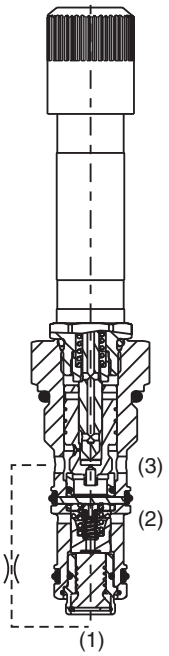
Features

- Low leakage poppet design with no dynamic seal to wear out on the compensator
- Adjusted at factory for low variation
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- External surfaces plated
- Excellent low flow metering capability





Note: *Always connect Port (3) to Port (1) through .031" orifice. For FAPC101 only.*



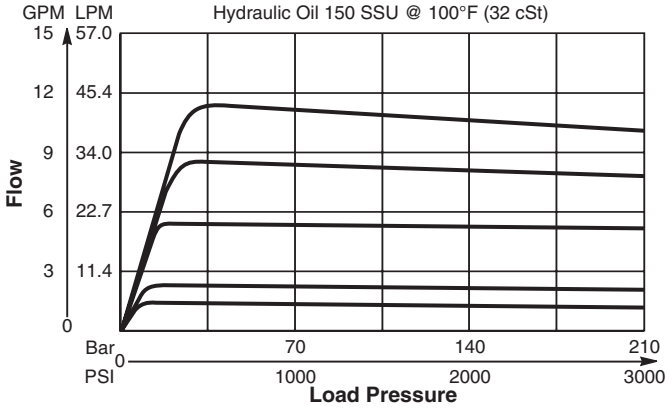
Specifications

All performance data with CAS coil.
Maximum current, 70% recommended.
Hydraulic oil 150 SSU @ 40°C (32 cSt)

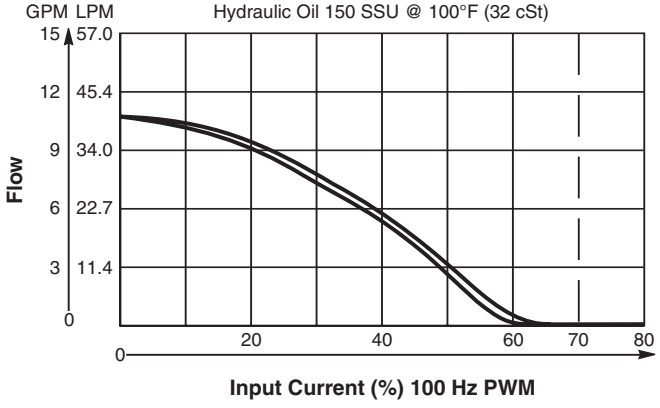
Rated Flow De-Energized at ΔP 34.5 Bar (500 PSI)	38 LPM (10 GPM)
Maximum Input Pressure at Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	34 Bar (500 PSI)
Maximum Internal Leakage	5 drops/min. (.33 cc/min.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<10% ***NOTE: Current regulated PWM recommended***
Cartridge Material	All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 18/16/13, SAE Class 4
Approx. Weight	.24 kg (.53 lbs.)
Cavity	3X (See BC Section for more details)

Performance Curves

Pressure Compensation of Regulated Flow

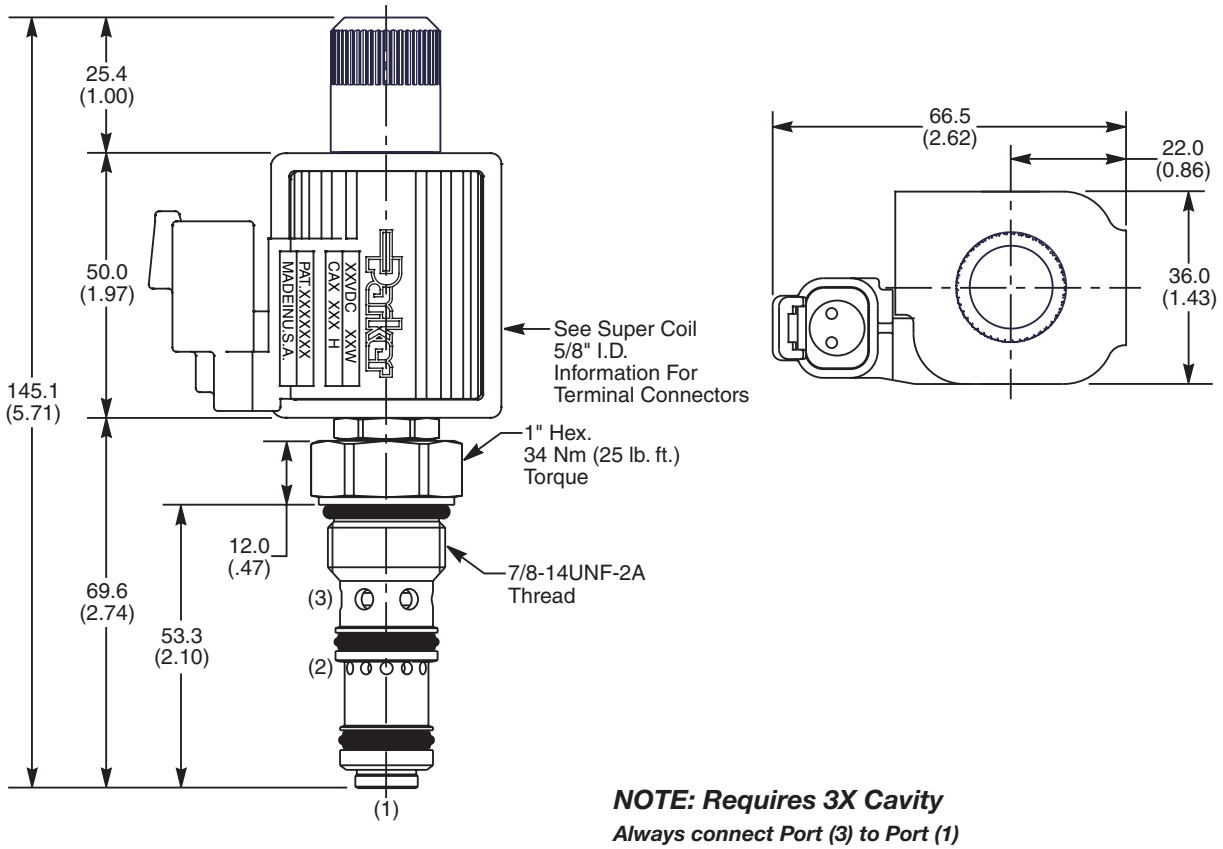


Flow vs. Input Current



Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



NOTE: Requires 3X Cavity
Always connect Port (3) to Port (1) through .031″ orifice.

Ordering Information

FAPC101	N	
10 Size Proportional Valve	Style	Seals

Code	Style
N	Normally Open

Code	Seals / Kit No.	Operating Temp.
Omit	"D" -Ring / (SK10-3S)	-37°C to +93°C (-35°F to +200°F)
N	Nitrile / (SK10-3XN)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAS	Super Coil - 18w

Order Bodies Separately
See section BC

LB10	554	S
Line Body	Porting	Body Material

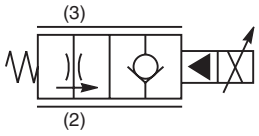
Code	Porting
554	3/8″ BSP

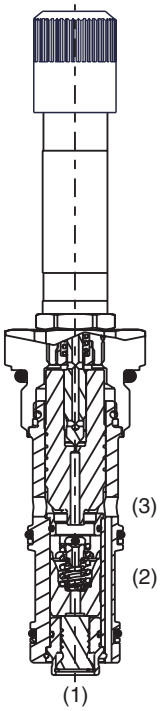
Code	Body Material
S	Steel

General Description

2 Way, Normally Open, Proportional Poppet Valve with Pressure Compensation. For additional information see Technical Tips on pages PV1-PV6.







Features

- Low leakage poppet design with no dynamic seal to wear out on the compensator
- Adjusted at factory for low variation
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- External surfaces plated
- Excellent low flow metering capability

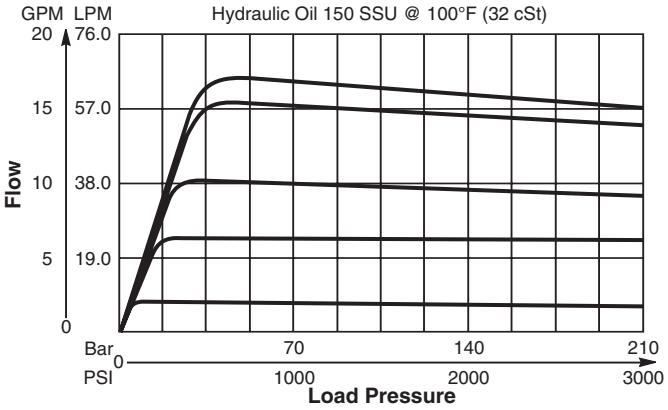
Specifications

All performance data with CAS coil.
Maximum current, 70% recommended.
Hydraulic oil 150 SSU @ 40°C (32 cSt)

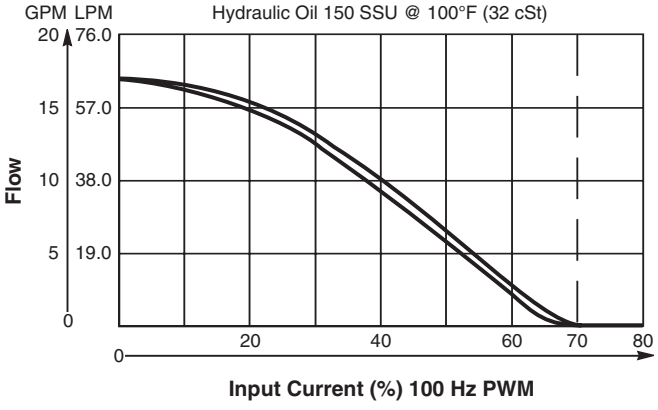
Rated Flow De-Energized at ΔP 34.5 Bar (500 PSI)	57 LPM (15 GPM)
Maximum Input Pressure at Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	34 Bar (500 PSI)
Maximum Internal Leakage	5 drops/min. (.33 cc/min.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<10% ***NOTE: Current regulated PWM recommended***
Cartridge Material	All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 18/16/13, SAE Class 4
Approx. Weight	.36 kg (.79 lbs.)
Cavity	C12-3L (See BC Section for more details)

Performance Curves

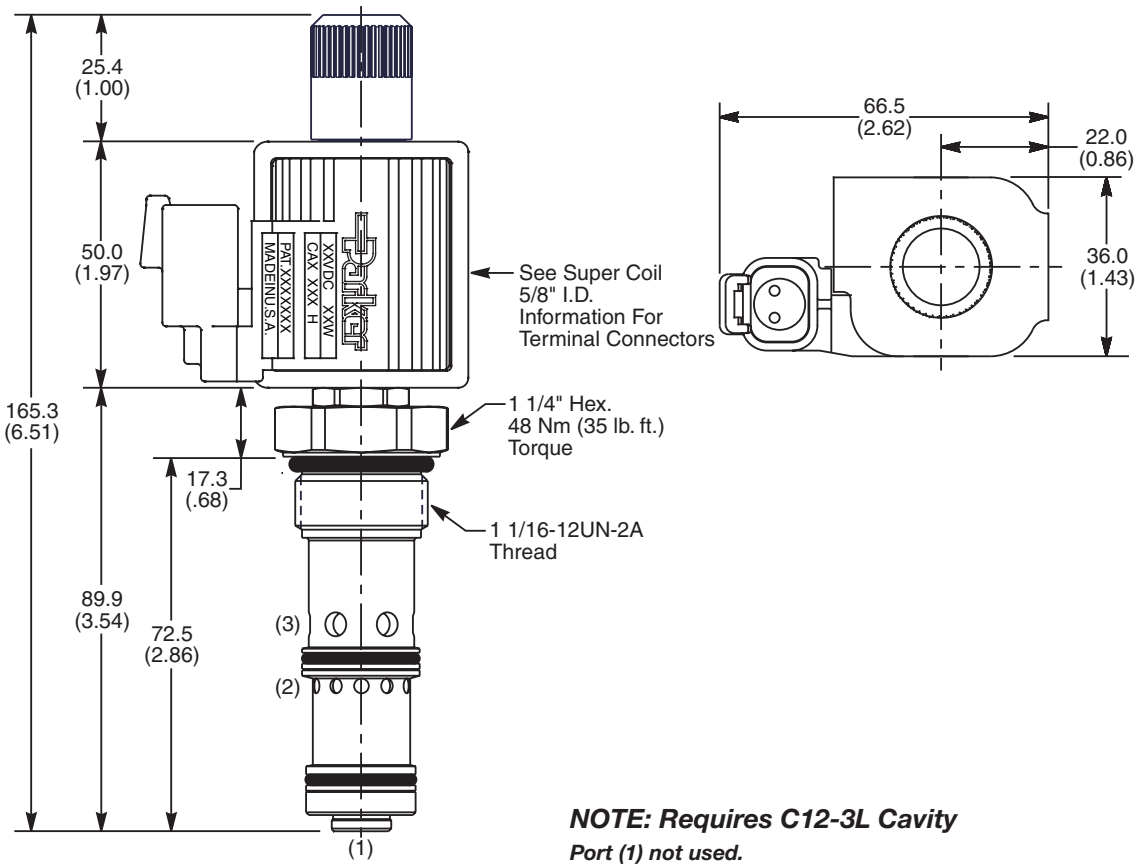
Pressure Compensation of Regulated Flow



Flow vs. Input Current



Dimensions Millimeters (Inches)



NOTE: Requires C12-3L Cavity
Port (1) not used.

Ordering Information

FAPC121	N	N
12 Size Proportional Valve	Style	Seals

Code	Style
N	Normally Open

Code	Seals / Kit No.	Operating Temp.
N	Nitrile / (SK12-L3N)	-34°C to +121°C (-30°F to +250°F)

Order Bodies Separately
See section BC

B12	—	3L	—	12T
12 Size		3-Way Cavity		Port Size

Order Coils Separately
See section CE

Coil Type	
CAS	Super Coil - 18w

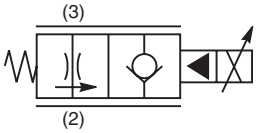
Port Size
SAE 12

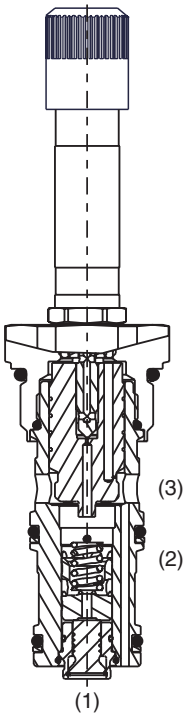
Body Material
Steel

General Description

2 Way, Normally Open, Proportional Poppet Valve with Pressure Compensation. For additional information see Technical Tips on pages PV1-PV6.







Features

- Low leakage poppet design with no dynamic seal to wear out on the compensator
- Adjusted at factory for low variation
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Industry common cavity
- External surfaces plated
- Excellent low flow metering capability

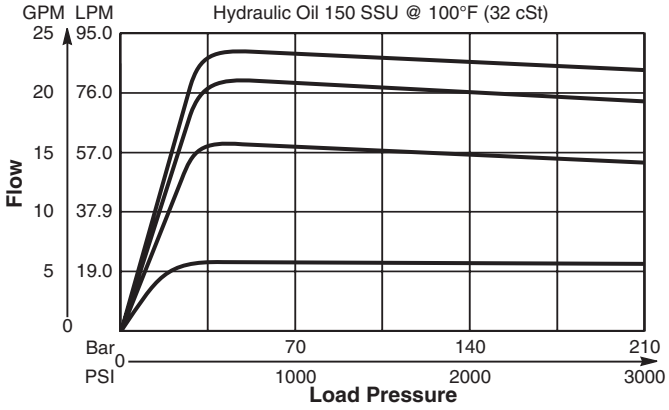
Specifications

All performance data with CAS coil.
Maximum current, 70% recommended.
Hydraulic oil 150 SSU @ 40°C (32 cSt)

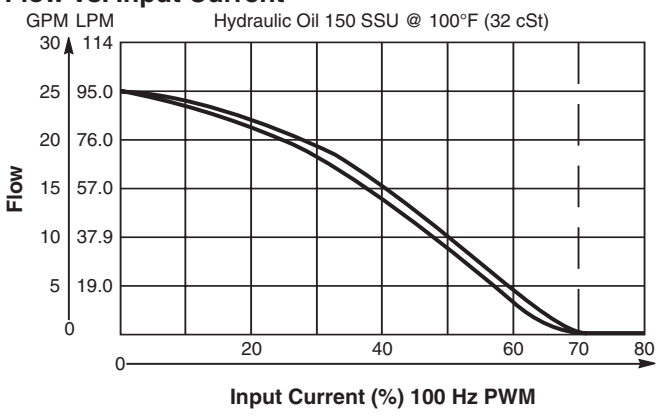
Rated Flow De-Energized at ΔP 34.5 Bar (500 PSI)	83 LPM (22 GPM)
Maximum Input Pressure at Port 2	210 Bar (3000 PSI)
Minimum Pressure Differential	34 Bar (500 PSI)
Maximum Internal Leakage	5 drops/min. (.33 cc/min.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<10% ***NOTE: Current regulated PWM recommended***
Cartridge Material	All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO Code 18/16/13, SAE Class 4
Approx. Weight	.49 kg (1.09 lbs.)
Cavity	C16-3 (See BC Section for more details)

Performance Curves

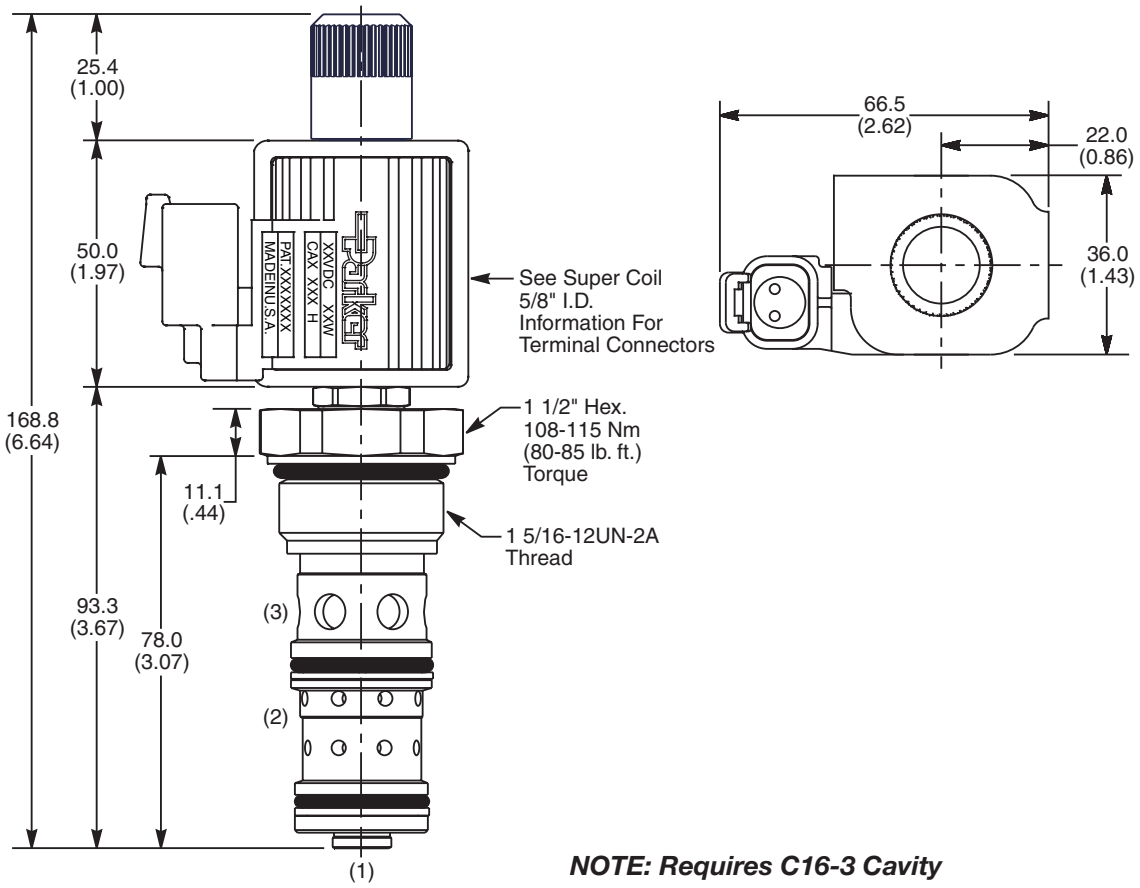
Pressure Compensation of Regulated Flow



Flow vs. Input Current



Dimensions Millimeters (Inches)



NOTE: Requires C16-3 Cavity
Port (1) not used.

Ordering Information

FAPC161	N	N
16 Size Proportional Valve	Style	Seals

Code	Style
N	Normally Open

Code	Seals / Kit No.	Operating Temp.
N	Nitrile / (SK16-3N)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAS	Super Coil - 18w

Order Bodies Separately
See section BC

B16	—	3	—	16B
16 Size		3-Way Cavity		Port Size

Port Size
1″ BSP

Body Material
Steel

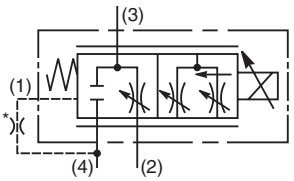
General Description

3 Way, Normally Closed, Proportional Flow Regulator Valve. Pressure Compensated. For additional information see Technical Tips on pages PV1-PV6.

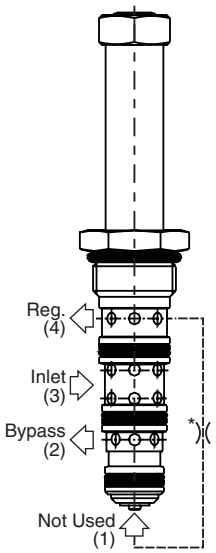
Features

- Analog proportional pressure compensated flow control valve regulates flow proportionally to the input solenoid current
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- Nonmagnetic spool and housing assembly
- Factory-adjusted low variation option (Model "L") is available for applications where low variation of flow from valve to valve is essential at a given current.





*Always connect Port (1) to Port (4) through .039" orifice.



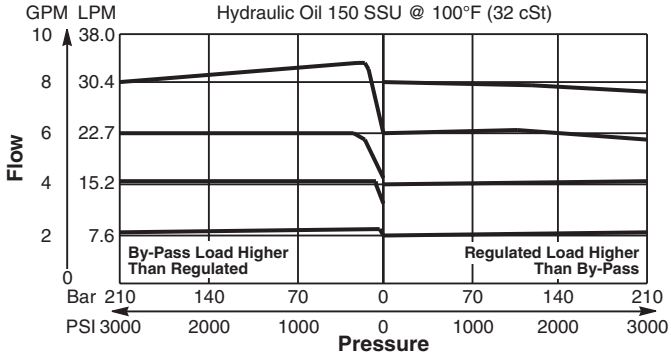
Specifications

Rated Inlet Flow	60 LPM (16 GPM)
Rated Regulated Flow	**31** 26 LPM (7 GPM) Standard ('SS' Coil) **31** 30 LPM (8 GPM) High Flow ('SP' Coil)
Maximum Input Pressure At Port 3	210 Bar (3000 PSI)
Minimum Pressure Differential	**31** 13.8 Bar (200 PSI) Standard **31** 20.7 Bar (300 PSI) High Flow
Maximum Internal Leakage	780 cc (46 cu. in.) @ 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	7%
Opening Point	**Standard** 21% of Nominal Amperage **High Flow** 17% of Nominal Amperage
Variation of Opening Point	**Model "L"** ±20% Of Amperage
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.14 kg (.31 lbs.)
Cavity	4C (See BC Section for more details)

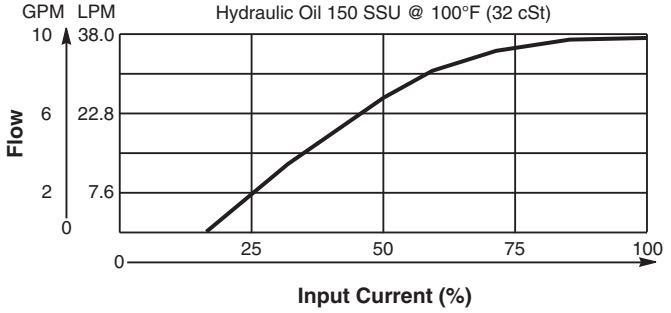
Performance Curves

▲PWM Current Regulator Recommended

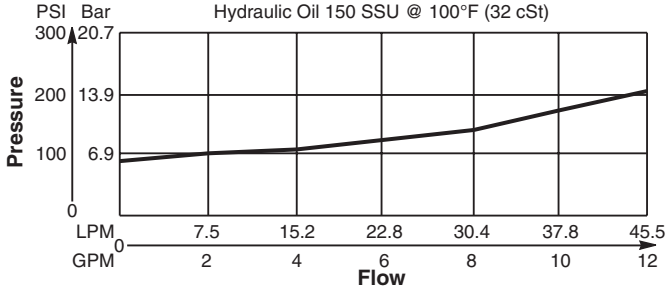
Pressure Compensation of Regulated Flow (Port 4)



Regulated Flow vs. Input Current Stabilized

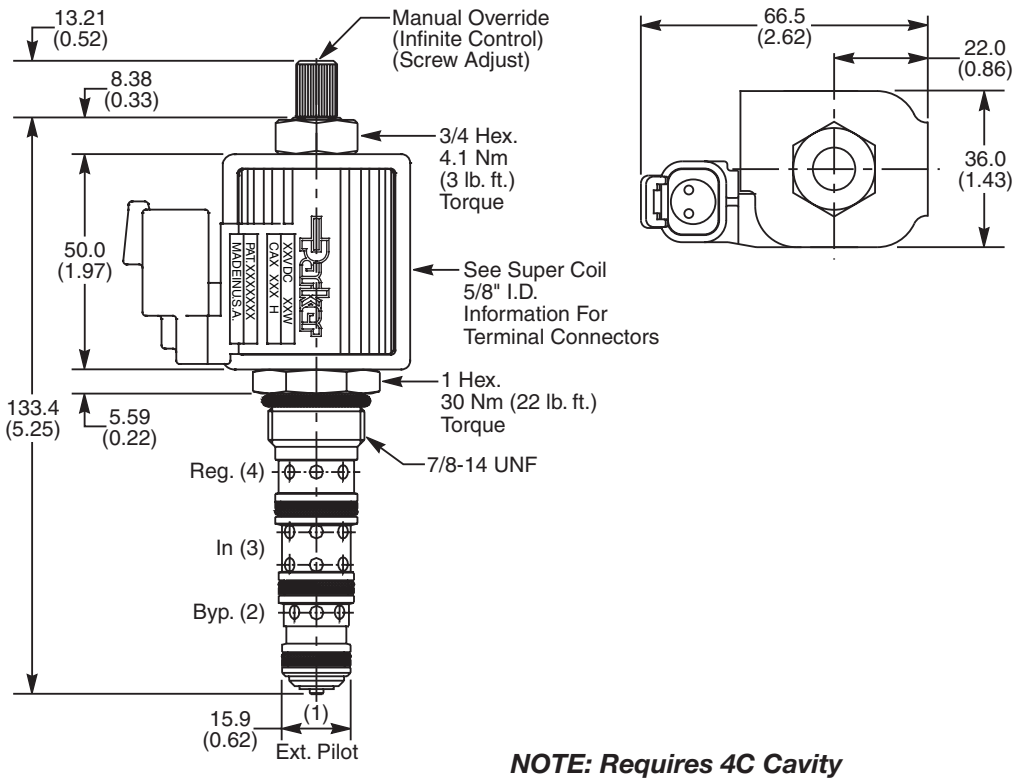


Pressure Drop vs. Flow at Coil Fully Energized



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Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)



NOTE: Requires 4C Cavity

Ordering Information

JP04C	31			N	L
10 Size Proportional Valve	Style	Override Option	Filter Screen	Seals	Flow Variation

Code	Style (Maximum Regulated Flow)
31	Standard ('SS' Coil) 26 LPM (7 GPM)
31	High Flow ('SP' Coil) 30 LPM (8 GPM)

Code	Override Option
0	Not Required
5	Screw Adjust (Infinite Control)

Code	Filter Screen
0	Not Available

Code	Flow Variation
L	Low Variation (±20% of Opening Amps)

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30082N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAS	Super Coil - 18w
CAP	Super Coil - 28w

Order Bodies Separately
See section BC

LB10	563	S
Line Body	Porting	Body Material

Code	Porting
563	3/8" BSP

Code	Body Material
S	Steel

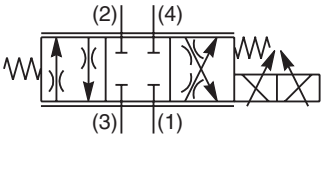
General Description

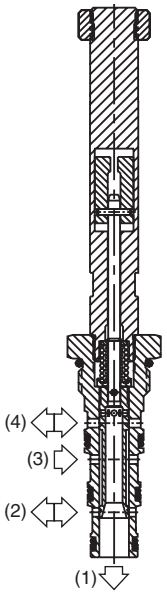
4 Way, 3 Position, Proportional Directional Control Valve. Closed Center Spool. For additional information see Technical Tips on pages PV1-PV6.

Features

- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.







Specifications

Operating Pressure	**Ports 2, 3 and 4** 350 Bar (5000 PSI) **Port 1** 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<6%
Cracking Flow	25% to 30% of Input Signal
Variation of Flow	±15% @ 75% of Nominal Current and Constant ΔP Maintained by Pressure Compensator
Port to Port Leakage	10 cu. in. @ 3000 PSI
Step Response Time at 75% of Amps	On 50 ms Off 40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.15 kg (.34 lbs.)
Cavity	C08-4

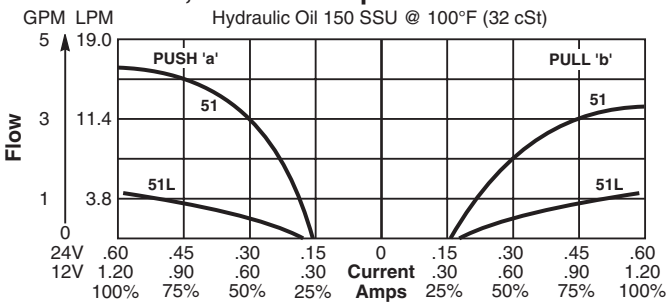
Typical Performance

SPOOL TYPE AND FLOW	RATED FLOW AT 75% OF NOMINAL CURRENT LPM - (GPM)		SUPER COIL TYPE		Compensator ΔP Bar (PSI)
	'a' SOLENOID PUSH P to A, B to T	'b' SOLENOID PULL P to B, A to T	PUSH	PULL	
51L Low Flow	5.3 - (1.4)	5.3 - (1.4)	CCP	CCP	10 (150)
	3.4 - (0.9)	3.4 - (0.9)	CCS	CCS	5 (75)
51 Standard	13.3 - (3.5)	17 - (4.5)	CCP	CCP	15 (220)
	11.4 - (3.0)	15.2 - (4.0)	CCS	CCS	15 (220)
52 High Flow	21 - (5.5)	17 - (4.5)	CCP	CCP	20 (290)
	17.4 - (4.5)	13 - (3.5)	CCP	CCP	15 (220)

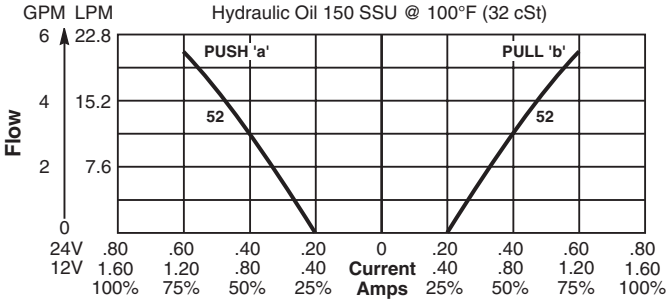
Performance Curves

▲PWM Current Regulator Recommended

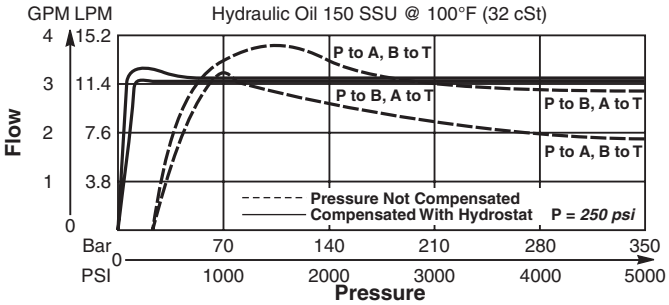
51L With 5 Bar, 75 PSI Compensator
51 With 15 Bar, 220 PSI Compensator and SS Coil



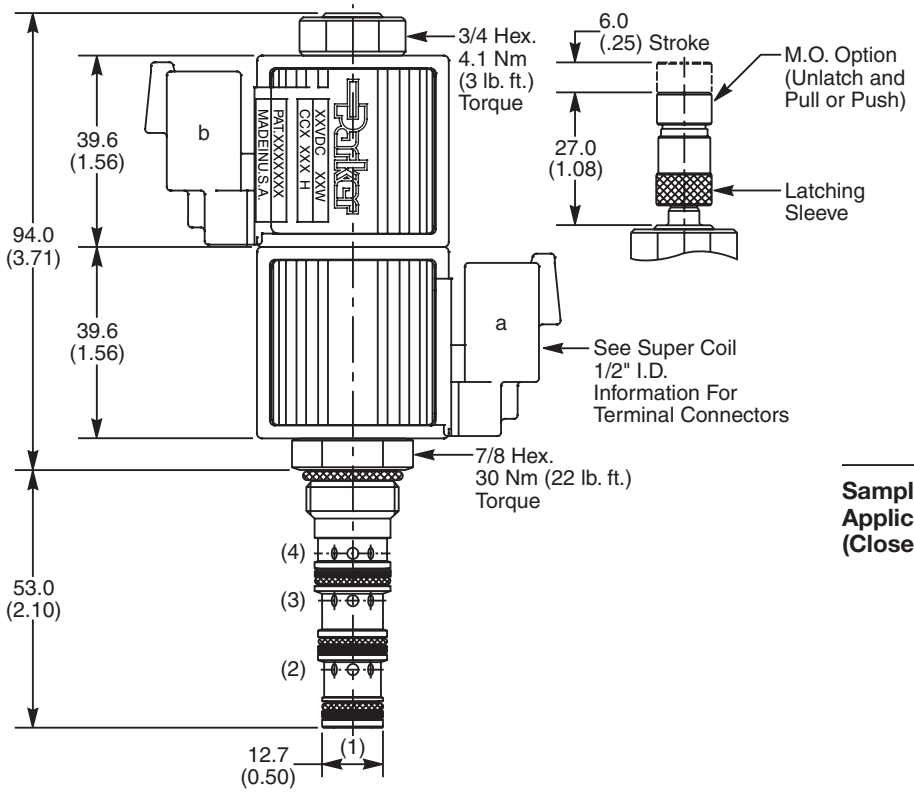
52 With 20 Bar, 290 PSI Compensator and SP Coil

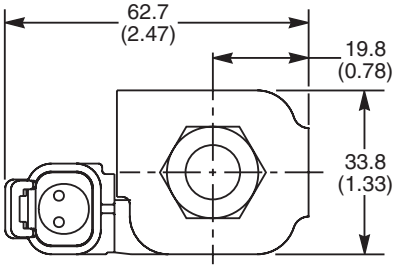


Flow vs. Load

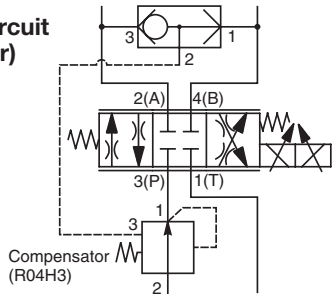


Dimensions Millimeters (Inches)





Sample Application Circuit (Closed Center)



Ordering Information

GP02			N
08 Size Proportional Valve	Style	Override Option	Seals

Code	Style - Closed Center (Flow Pressure and Performance)
51	Standard
51L	Low Flow
52	High Flow

Code	Override Option
Omit	Not Required
1	Manual Override
2	Detented M.O.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30078N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCS	Super Coil - 14w
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

B08	—	4	—	6B
08 Size		4-Way Cavity		Port Size

Port Size
3/8″ BSP

Body Material
Steel

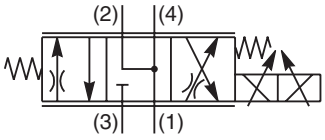
General Description

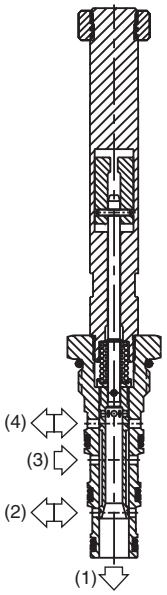
4 Way, 3 Position, Proportional Directional Control Valve. Floating Center Spool. For additional information see Technical Tips on pages PV1-PV6.

Features

- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.







Specifications

Operating Pressure	**Ports 2, 3 and 4** 350 Bar (5000 PSI) **Port 1** 210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<6%
Cracking Flow	25% to 30% of Input Signal
Variation of Flow	±15% @ 75% of Nominal Current and Constant ΔP Maintained by Pressure Compensator
Port to Port Leakage	10 cu. in. @ 3000 PSI
Step Response Time at 75% of Amps	On 50 ms Off 40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscosity	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.15 kg (.34 lbs.)
Cavity	C08-4

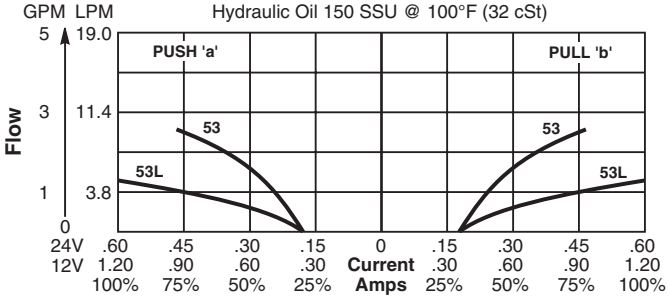
Typical Performance

SPOOL TYPE AND FLOW	RATED FLOW AT 75% OF NOMINAL CURRENT LPM - (GPM)		SUPER COIL TYPE		Compensator ΔP Bar (PSI)
	'a' SOLENOID PUSH P to A, B to T	'b' SOLENOID PULL P to B, A to T	PUSH	PULL	
53L Low Flow	5.3 - (1.4)	5 - (1.4)	CCP	CCP	10 (150)
	4 - (1.0)	4 - (1.0)	CCS	CCS	5 (75)
53 Standard	14 - (3.8)	15 - (4.0)	CCP	CCP	10 (150)
	9 - (2.5)	10 - (2.7)	CCS	CCS	5 (75)
54 High Flow	17 - (4.5)	19 - (5.0)	CCP	CCP	20 (290)
	15 - (4.0)	15 - (4.0)	CCS	CCS	15 (220)

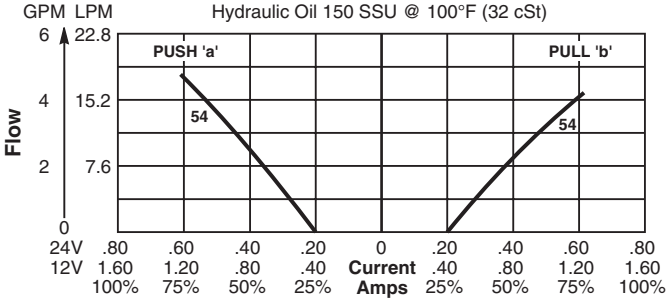
Performance Curves

▲PWM Current Regulator Recommended

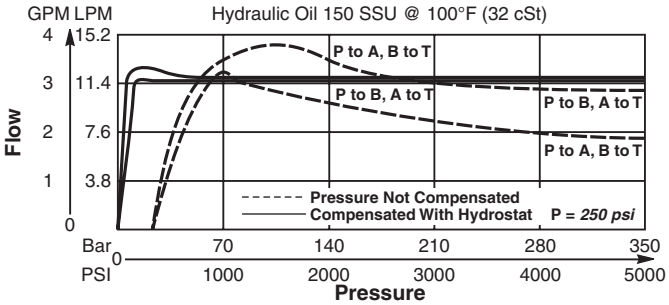
53 and 53L With 5 Bar, 75 PSI Compensator and SS Coil



54 With 20 Bar, 290 PSI Compensator and SP Coil

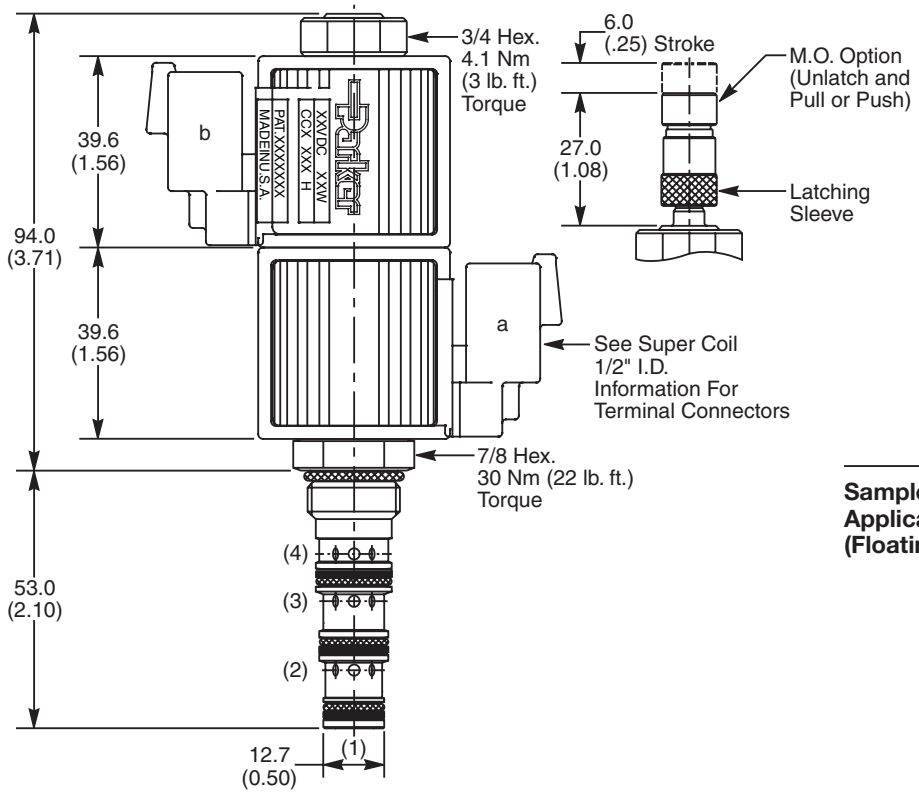


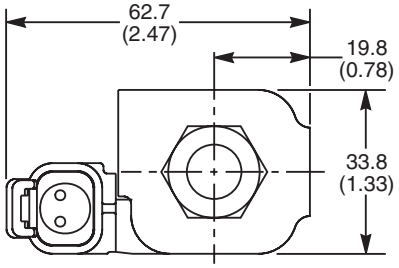
Flow vs. Load



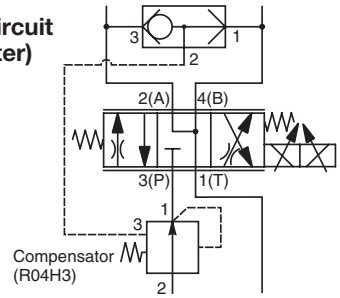
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

Dimensions Millimeters (Inches)





Sample Application Circuit (Floating Center)



Ordering Information

GP02			N
08 Size Proportional Valve	Style	Override Option	Seals

Code	Style - Floating Center (Flow Pressure and Performance)
53	Standard
53L	Low Flow
54	High Flow

Code	Override Option
Omit	Not Required
1	Manual Override
2	Detented M.O.

Code	Seals / Kit No.	Operating Temp.
N	Nitrile, Buna-N / (SK30078N-1)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CCS	Super Coil - 14w
CCP	Super Coil - 19w

Order Bodies Separately
See section BC

B08	—	4	—	6B
08 Size		4-Way Cavity		Port Size

Port Size
3/8" BSP

Body Material
Steel

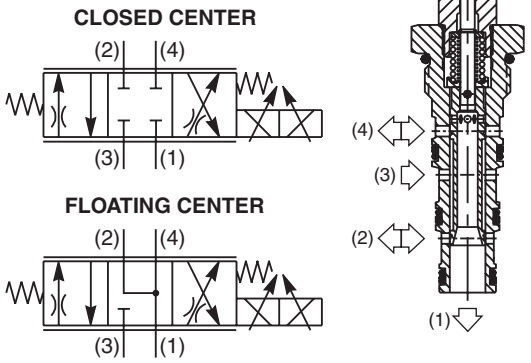
General Description

4 Way, 3 Position, Proportional Directional Control Valve. Closed Center or Floating Center Spool. For additional information see Technical Tips on pages PV1-PV6.

Features

- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O'Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated



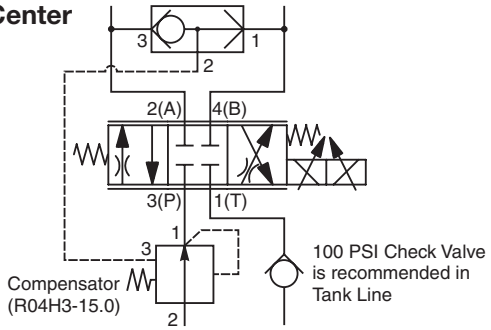


Specifications

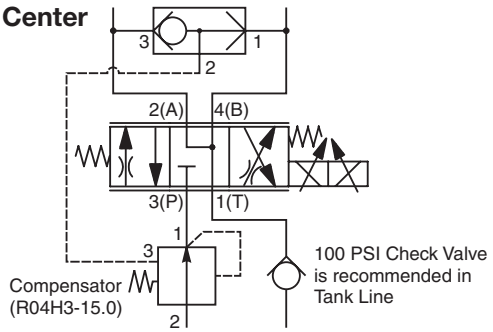
Operating Pressure	210 Bar (3000 PSI)
Hysteresis @ 100 Hz PWM	<6%
Cracking Flow	25% to 30% of Input Signal
Variation of Flow	±15% @ 75% of Nominal Current and Constant ΔP Maintained by Pressure Compensator
Port to Port Leakage	10 cu. in. @ 3000 PSI
Step Response Time at 75% of Amps	On 50 ms Off 40 ms
Cartridge Material	All parts steel. All operating parts hardened steel.
Fluid Compatibility/ Viscostiy	Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
Filtration	ISO-4406 18/16/13, SAE Class 4
Approx. Weight	.28 kg (.57 lbs.)
Cavity	C10-4

Sample Application Circuit

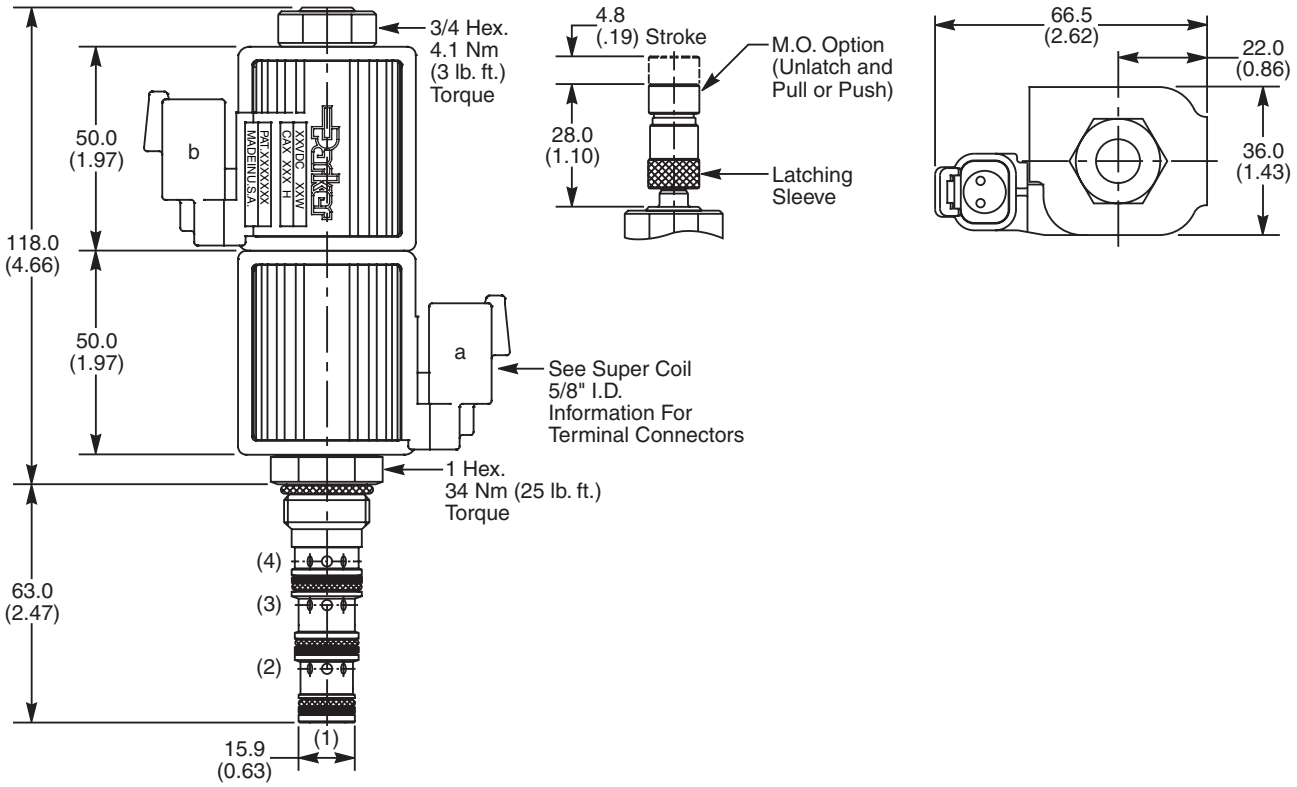
Closed Center



Floating Center

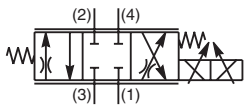
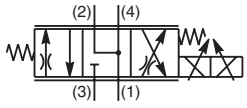


Dimensions Millimeters (Inches)



Ordering Information

DSP105			
10 Size Proportional Valve	Style	Override Option	Seals

Code	Style
C1	
C4	

Code	Override Option
Omit	None
M	Push/Pull

Code	Seals / Kit No.	Operating Temp.
Omit	"D" -Ring / (SK10-4)	-37°C to +93°C (-35°F to +200°F)
N	Nitrile / (SK10-4N)	-34°C to +121°C (-30°F to +250°F)

Order Coils Separately
See section CE

Coil Type	
CAP	Super Coil - 28w

Order Bodies Separately
See section BC

B10	—	4	—	8B
10 Size		4-Way Cavity		Port Size

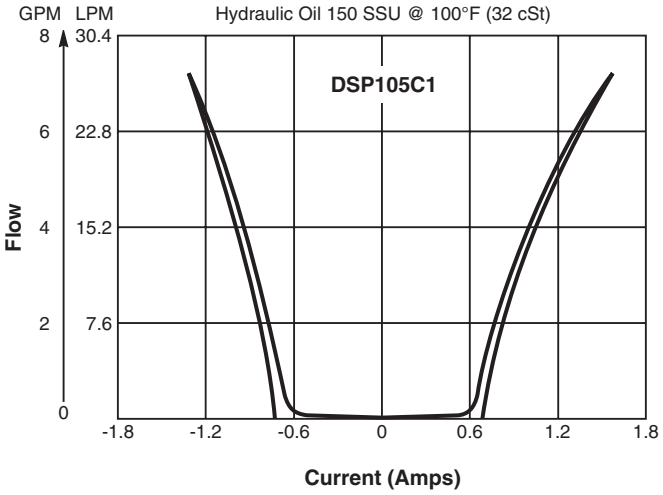
Port Size
1/2" BSP

Body Material
Steel

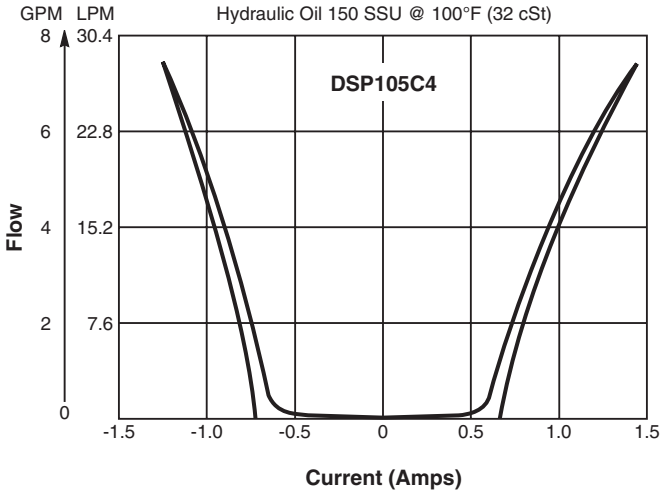
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

▲PWM Current Regulator Recommended

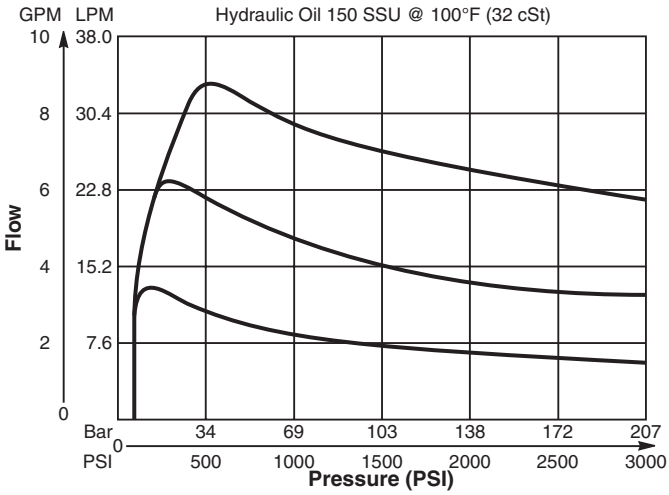
C1 With 15 Bar, 220 PSI Compensator and SP Coil



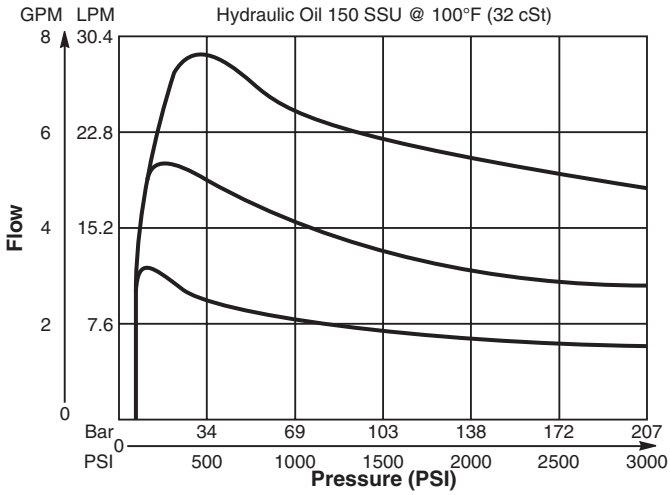
C4 With 15 Bar, 220 PSI Compensator and SP Coil



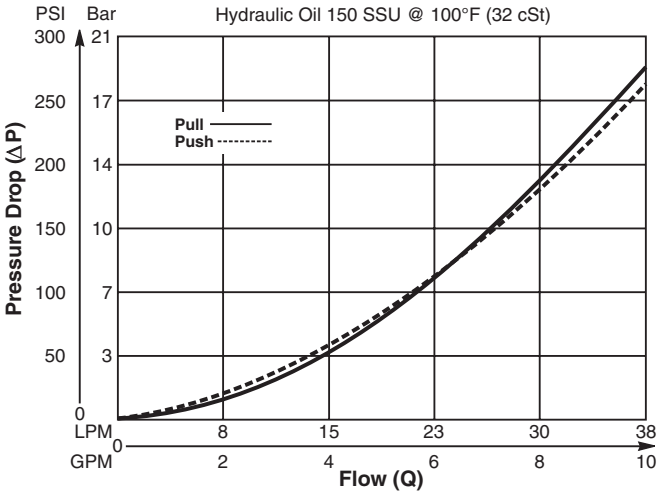
Pressure Compensation Pull Coil Inlet to Work Port



Pressure Compensation Push Coil Inlet to Work Port

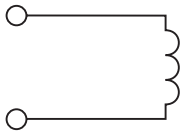
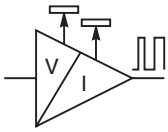
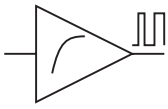
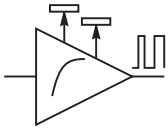
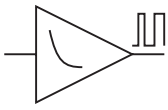


C1 Spool Port 3 to 4



Contents

Coils and Electronics

	SERIES	DESCRIPTION	PAGE NO.
	**SUPER COILS**		
	CC	1/2″ Solenoid Tubes	CE3-CE4
	CA	5/8″ Solenoid Tubes	CE5-CE6
	HLC	5/8″ Hazardous Location	CE7-CE8
	STANDARD COILS		
	DS	1″ Solenoid Tubes	CE9
	**ELECTRONICS**		
	XPRO902rid	12 VDC PWM Controller, 95-230Hz, 19W, Multi-adj.	CE10-CE11
	XPRO932rid	12 VDC PWM Controller, 95-230Hz, 30W, Multi-adj.	CE10-CE11
	XPRO904rid	24 VDC PWM Controller, 95-230Hz, 19W, Multi-adj.	CE10-CE11
	XPRO934rid	24 VDC PWM Controller, 95-230Hz, 30W, Multi-adj.	CE10-CE11
	XPRO704	Soft Start Valve Controller, 12/24 VDC	CE12
	XPRO704b	Soft Start and Stop Valve Controller, 12/24 VDC	CE13
	XPRO804	Power Saver Controller, 12/24 VDC PWM	CE14

INTRODUCTION

This technical tips section is designed to help familiarize you with the Parker line of Coils. In this section we highlight the features and discuss some of the available options. We also use this section to present some common terminology related to coil and coil technology.

Parker *SUPER COIL*

Class N Magnetic Wire
Internal wires have a class N rating, providing longer life at typical temperatures.

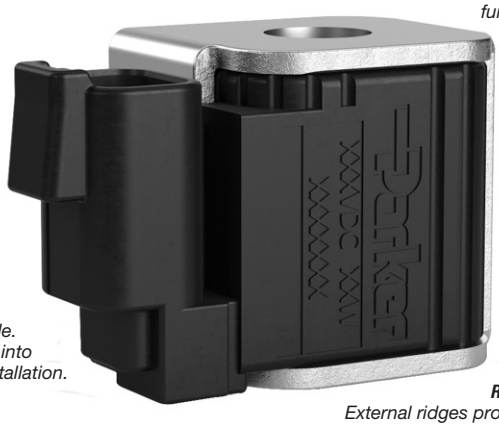
DC Windings
All coils are DC wound. An internal full wave rectifier is added for AC current, eliminating inrush current, and allowing for voltage interchangeability.

Variety of Terminations
Coils are offered in a wide variety of terminations, including integrally molded connectors and voltages to meet your system requirements.

Rugged Thermoplastic Encapsulation
Coil is encased in a thermoplastic polyester resin. This allows for higher temperature exposure and less flexural creep. Also, this resin is resistant to moisture, caustic solutions, and fungus providing protection for coil windings.



Low Carbon Steel Frame
Zinc plated low carbon steel frame surrounds coil, increasing flux density. Low carbon steel provides better magnetic properties and greater permeability.



Diodes
Internally molded diodes are available. Polarity is molded into coil for ease of installation.

Ribbed Surface
External ridges provide a larger coil surface area, which allows for better heat dissipation.

****Exceeds IP69k Specifications***

After exhaustive testing, the new Super Coil has clearly distanced itself from the competition. This coil was subjected to the rigors of this environmental standard and the results were excellent. This coil stands up to most rugged of environmental conditions including weather, dust, and extreme temperature variations.

****Water Dunk Test Qualified***

The Super Coil was taken to task in a repeated water dunk thermal cycle test program with alternate exposure to high and low temperature, only to perform with outstanding results.

****Endurance Tested***

The goal of this test was to cycle the coil to high temperature extremes in order to validate the coils ability to perform in extreme temperature environments.

****Water Spray and Chemical Solvent Compatibility***

The Super Coil was subjected to numerous chemical solvents in a rigorous test which established the fact that these coils can withstand harsh and unusual environments. Also, the coils were subjected to a high pressure water spray test. Once again, the Super Coil passed this test.

****Deutsch molded connector is highly recommended.***

COMMON OPTIONS

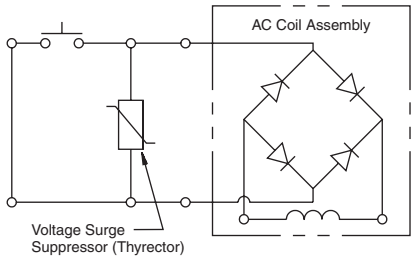
Below are some of the common options to the Super Coil product offering.

Continuous Duty: Parker's standard line of coils are rated for continuous duty operation. This means the coil can be left on continuously without fear of the magnet wire insulation breakdown, when used in standard climate conditions. The Super Coils are made of a high quality Class N magnet wire. This Class N rating signifies the internal wires are rated to 200°C (392°F).

Continuous duty does not mean the coil will have the same amount of power after hours of operation as it had at initial actuation. Coils do heat up during use. This internal heat rise increases the resistance of the coil and thus, decreases the current (V = IR). The performance curves presented on the solenoid valve pages are based on a coil at room temperature and 85% of voltage. Thus, when using a valve in continuous duty applications, you may need to derate the performance. In short, the continuous duty rating signifies that while the coil will get hot during use and resistance will increase, it will not generate enough heat to damage the coil.

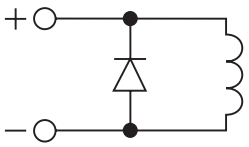
Terminations: Parker offers a wide variety of coil terminations for all coils to meet the demands of your application. Over the years, the dual lead wire and dual spade offerings have been popular due to their ease of installation and availability. In the past few years, the demand for more secure termination connections has increased. In addition, the integral connectors reduce cost and improve integrity by reducing the number of connections. As such, the Amp Junior, Weatherpack, Metri-Pack, and Deutsch have increased in popularity.
We offer these connectors on a lead wire coil, as well as an internally molded version of the DIN, Amp Junior, and Deutsch coils. If you do not find your desired coil termination in our catalog, contact your factory sales representative.

Current Types: Both direct current (DC) and alternating current (AC) versions are available for the Parker line of coils. The AC versions are essentially DC coils with a full wave rectifier integrally molded into the coil. The rectifiers are rated for voltage peaks up to 1000 volts maximum. For voltage transients greater than 1000 volts, a Harris Thyrector is recommended. The AC coils operate at 50/60 cycles (Hz). Since the AC versions are rectified DC coils, there is no inrush current like with "true" AC coils. It also means DC coils and AC coils are interchangeable.



Voltages: Parker has a wide selection of coils available to meet your needs. Most coil terminations are available with our standard voltages of 12V and 24V in DC, and 115V and 230V in AC. Voltages 18V and 48V DC and 440V AC are also available for many termination types at a slight premium. Contact your Parker representative should your application call for voltages other than our standard offering.

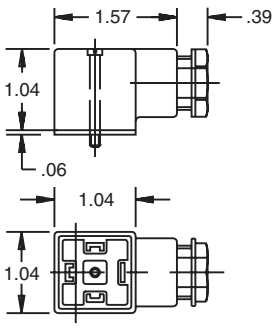
Diodes: The Parker Coils can be ordered with a diode molded internally. Parker Unicoils use a IN5062 diode. The Super Coils use a IN5627 diode. Diodes are sometimes used to protect sensitive, downstream electrical components from potential surges from the coil. By internally molding the diode into the coil, you can reduce the assembly time and cost associated with externally wiring a diode. One should be careful not to switch the polarity ("+" and "-" terminals), when wiring a coil with an internal diode. If these terminals are switched, the first time voltage is applied to the coil; the short circuit will destroy the diode and render the coil use-less. Parker coils with diodes have "+" and "-" molded near the termination outlet to help identify polarity.



DIN Connectors: Parker does offer connectors for use with the DIN style coils. As shown below, the DIN connectors are available in both rectified and non-rectified forms. The cable gland versions can be ordered for type PG9 or PG11.

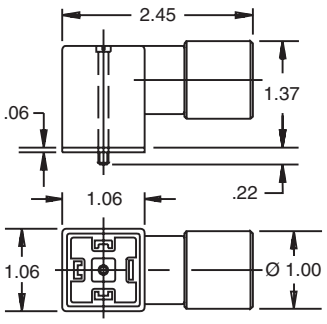
Cable Gland

Type	Non-Rectified	Rectified
PG9	710549-00	712126-01
PG11	710549-01	712126-00



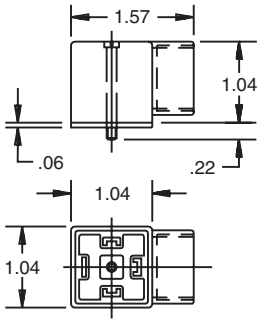
Conduit

Rectified
712704-00



Conduit

Non-Rectified
710549-02



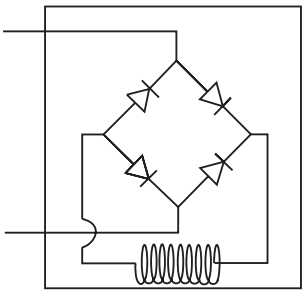
Features

- **Integral Deutsch connector coil exceeds IP69K standards**
- Integral Deutsch connector coil thermal shock dunk test rated
- Integral Amp Jr. coil exceeds IP67 standards for thermal shock, water resistance and “dunk capability”
- Universal 50/60 Hz operation
- Waterproof coil hermetically sealed, requires no O-rings or waterproofing kits
- External plated steel flux-carrying band (unlike encapsulated band) enables coil to withstand severe thermal shocks without cracking
- Symmetrical coil can be reversed without affecting performance

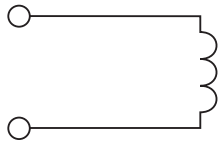
Specifications

Coil Type	**S** Standard **P** Puissant
Nominal Wattage (See Ordering Information For Exact Wattage)	**S** 14 Watts **P** 19 Watts
Duty Cycle	Continuous @ 100% voltage
Magnetic Wire Insulation Class	‘N’ Rated at 200°C (392°F)
Temperature Range	-40°C to +200°C (-40°F to +392°F)
Temperature Rise At Nominal Voltage And Natural Ventilation	**S** 75°C (135°F) **P** 95°C (172°F)
Dielectric Strength Maximum Current Leakage (Amps)	.0005 In dry lab condition at 1000V AC for 30 seconds .001 After being immersed in 23°C (77°F) water with waterproof connector for 24 hours at 500V AC
Encapsulating Material	Glass filled rynite
Color Identification On The Terminal Boss	**S** Black Ring **P** Red Ring
Weight	0.20 kg (0.44 lbs.)

AC Coil Assembly







Ordering Information

CC			
Super Coil 1/2″ I.D.	**Wattage**	**Voltage**	**Termination**

Code	Wattage
S	Standard
P	Puissant

Code	Voltage						
		Watts		Amps		Ohms**	
	Volts	S	P	S	P	S	P
012*	12 VDC	14	19	1.15	1.58	10.43	7.58
018	18 VDC	14	19	0.77	1.06	23.48	17.05
024*	24 VDC	14	19	0.58	0.79	41.74	30.30
048	48 VDC	14	19	0.29	0.40	167.0	121.3
115*	115 VAC	16	19	0.17	0.20	680	576
230	230 VAC	17	22	0.09	0.12	2596	1919

***Standard Voltages** ****Resistance ±10% at 68°F**

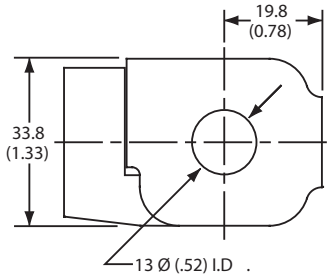
Code	Termination
A	Amp Jr. (DC Only)
AD	Amp Jr. with 3 Amp Diode (DC Only)
***D**	DIN 43650 (AC or DC, Supplied without DIN Connector)
H	Integral Deutsch
HE	Integral Deutsch with 3 Amp Diode
***L**	Double Lead (DC Only)

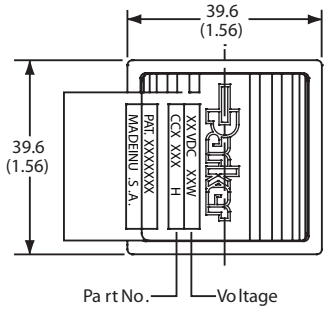
***UL listed 12/24/48 VDC only.**

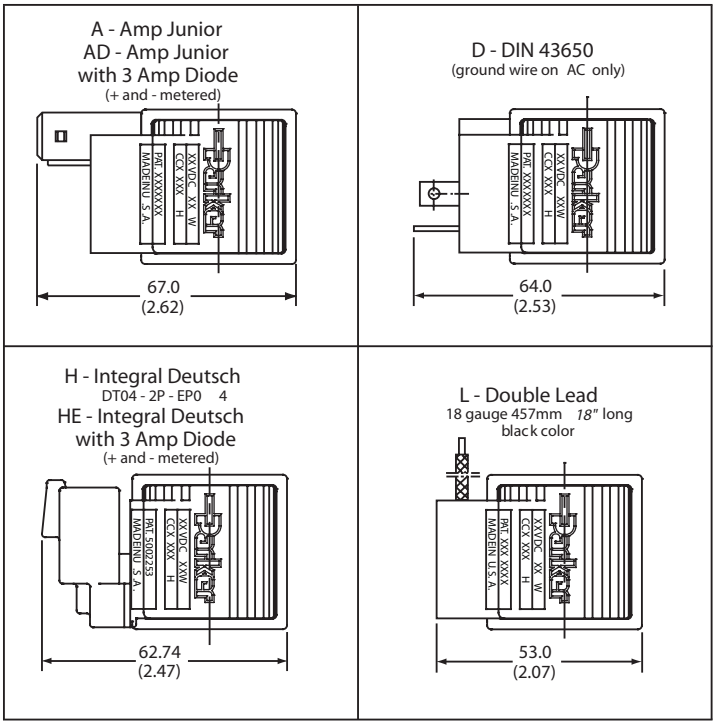
***Note:** Additional voltages and other terminals are available. Some coils are UL approved. For details please consult factory.*

DIN Female Mating Connector: See page CE2
Deutsch Mating Connector: # DT06-2S

Terminal Styles and Dimensions







NOTES:
1. The standard A.C. coil includes a molded-in full wave rectifier rated for 800 peak reverse voltage.
2. All P Puissant (high wattage) coils use a red ring as an indiction marker on the terminal boss.

718164 - Wire connector assembly with 36" leads for Super Coils with Integral Deutsch connectors.



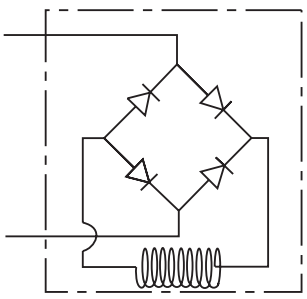
Features

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- Integral Deutsch connector coil thermal shock dunk test rated
- Integral Amp Jr. coil exceeds IP67 standards for thermal shock, water resistance and “dunk capability”
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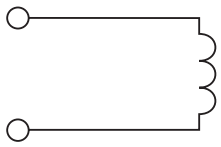
Specifications

Coil Type	**S** Standard **P** Puissant
Nominal Wattage (See Ordering Information For Exact Wattage)	**S** 18 Watts **P** 28 Watts
Duty Cycle	Continuous @ 100% voltage
Magnetic Wire Insulation Class	‘N’ Rated at 200°C (392°F)
Temperature Range	-40°C to +200°C (-40°F to +392°F)
Temperature Rise At Nominal Voltage And Natural Ventilation	**S** 75°C (135°F) **P** 95°C (172°F)
Dielectric Strength Maximum Current Leakage (Amps)	.0005 In dry lab condition at 1000V AC for 30 seconds .001 After being immersed in 23°C (77°F) water with waterproof connector for 24 hours at 500V AC
Encapsulating Material	Glass filled rynite
Color Identification On The Terminal Boss	**S** Black Ring **P** Red Ring
Weight	0.29 kg (0.64 lbs.)

AC Coil Assembly







Ordering Information

CA			
Super Coil 5/8″ I.D.	Wattage	Voltage	Termination

Code	Wattage
S	Standard
P	Puissant

Code	Voltage						
		Watts		Amps		Ohms**	
	Volts	S	P	S	P	S	P
012*	12 VDC	18	28	1.50	2.33	8.00	5.14
018	18 VDC	18	28	1.00	1.56	18.0	11.6
024*	24 VDC	18	28	0.75	1.17	32.0	20.6
048	48 VDC	18	28	0.38	0.58	128.0	82.3
115*	115 VAC	18	28	0.20	0.26	554	417
230	230 VAC	18	28	0.10	0.15	2100	1430

***Standard Voltages** ****Resistance ±10% at 68°F**

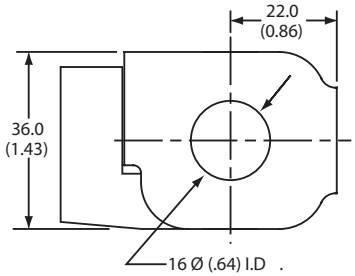
Code	Termination
A	Amp Jr. (DC Only)
AD	Amp Jr. with 3 Amp Diode (DC Only)
*D	DIN 43650 (AC or DC, Supplied without DIN Connector)
H	Integral Deutsch
HE	Integral Deutsch with 3 Amp Diode
HS	Integral Deutsch with Internal Seal
*L	Double Lead (DC Only)

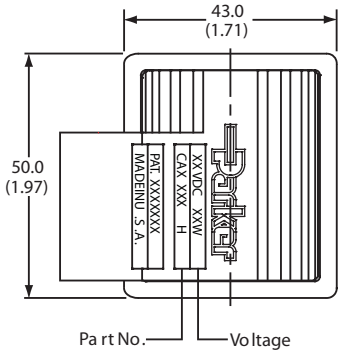
UL listed 12/24/48 VDC only.

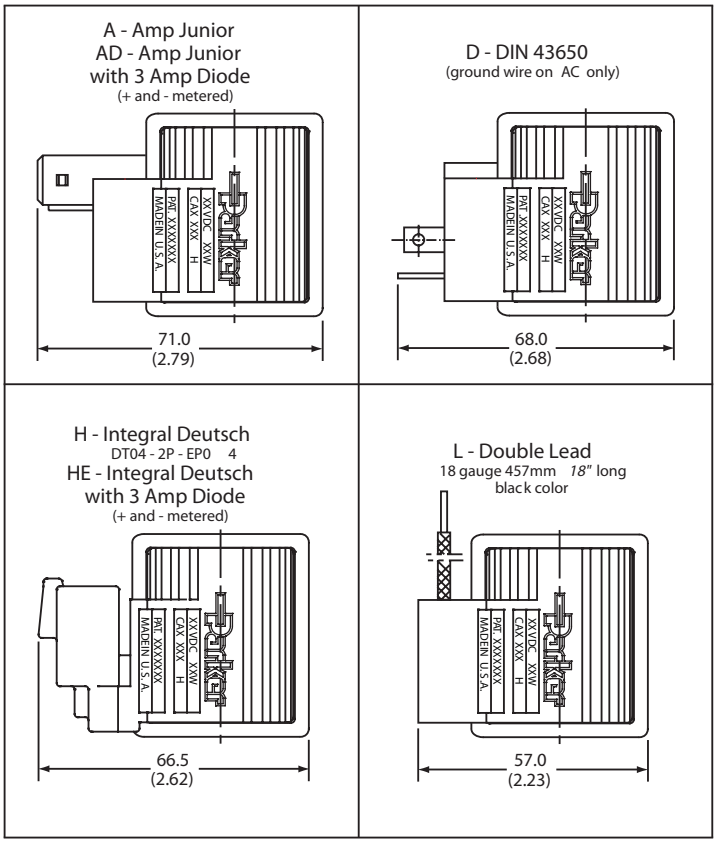
***Note:** Additional voltages and other terminals are available. Some coils are UL approved. For details please consult factory.*

DIN Female Mating Connector: See page CE2
Deutsch Mating Connector: # DT06-2S

Terminal Styles and Dimensions







NOTES:
1. The standard A.C. coil includes a molded-in full wave rectifier rated for 800 peak reverse voltage.
2. All P Puissant (high wattage) coils use a red ring as an indiction marker on the terminal boss. (No ring on Integral Deutsch connector.)

718164 - Wire connector assembly with 36" leads for Super Coils with Integral Deutsch connectors.



General Description

The HLC is a solenoid coil designed for use with cartridge valves for applications in potentially hazardous or explosive environments.

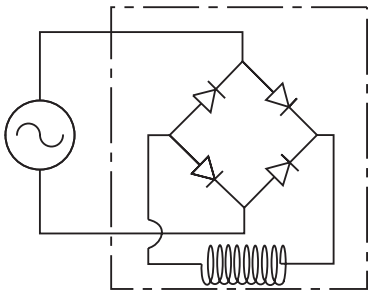
Features

- Fits standard 2 position on/off solenoid products
- Includes terminal block for 1/2″ NPT or M20 x 1.5 conduit connections
- Modular design for multiple valve options
- Meets multiple global certifications for regional flexibility
- Corrosion resistant up to 1,000 hour salt spray per ISO9227 and/or ASTM B 117.
- Conduit cover may be rotated to four directions and is removable for ease of installation and service

Specifications

Core Tube	0.630″ (16.1mm)
Voltage	12 and 24 VDC and Onboard Rectifier for 120 VAC Circuits
Wattage Range	19 - 30 Watts
Duty Cycle	100% Continuous Duty
Corrosion Resistance	Up to 1,000 Hours Salt Spray
Ambient Temperature	-40°C to +80°C (T4) -40°F to +176°F
Ingress Protection Rating	IP66
Dust Temperature Class	T135
Gas Temperature Class	T4
Weight	0.88 kg (1.95 lbs.)

AC Coil Assembly







Ordering Information

HLC10			
Hazardous Location Coil 5/8″ I.D.	Wattage	Voltage	Termination

Code	Wattage
L	Low Watt
H	High Watt

Code	Voltage				
	Volts	Wattage	Voltage (Volts Max.)	Ohms*	Ambient Temp.
D012	12 VDC	Low 21.2	14.3	6.8	-40°C to 70°C -40°F to 158°F
		High 29.6	13.5	4.9	-40°C to 50°C -40°F to 122°F
D024	24 VDC	Low 21.4	28.6	26.9	-40°C to 70°C -40°F to 158°F
		High 29.9	27	19.3	-40°C to 50°C -40°F to 122°F
A120	120 VAC	Low 19.3	140	602	-40°C to 80°C -40°F to 176°F
		High NA	NA	NA	NA

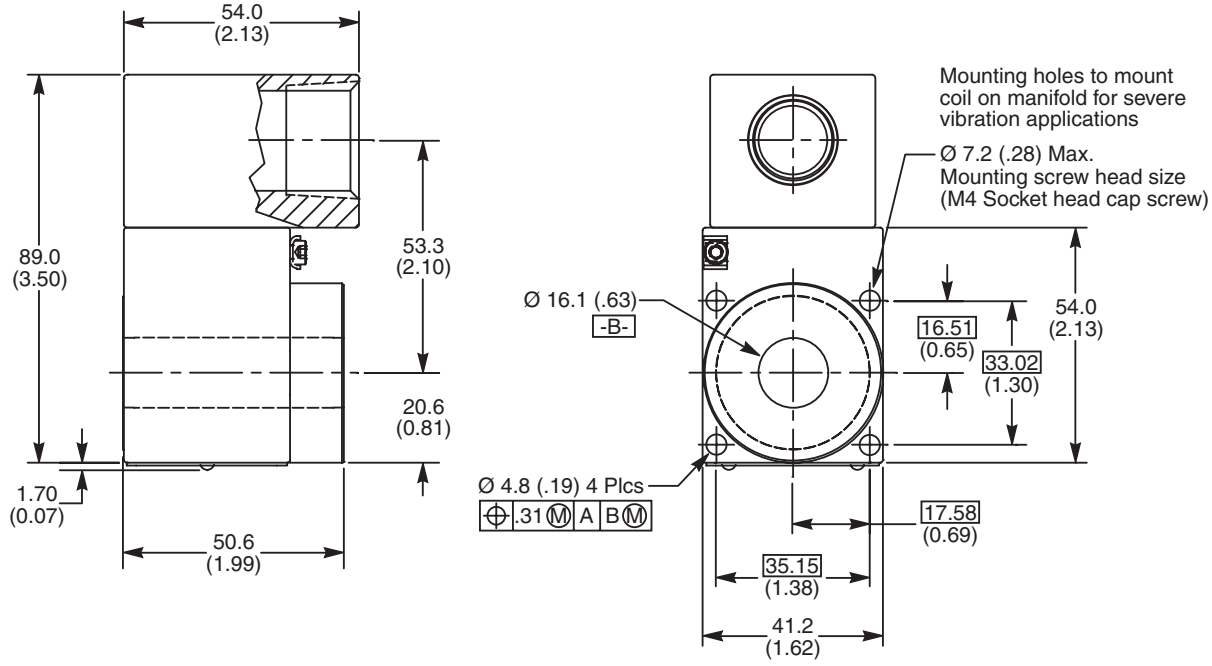
**±5% at 20°F*

Code	Thread
JN	1/2 NPT
JA	M20 x 1.5 Metric

Notes:

- *HLC Series performance varies from the standard Super Coil. Consult factory for valve performance in applying the HLC series coil.*
- *HLC Series is designed for two position, on-off solenoid products in the standard catalog. Consult factory for applications utilizing other products.*

Dimensions Millimeters (Inches)



Hazardous Certifications Table

Protection Method	Hazardous Code	Hazardous Detail	Certification Agency	Location
Explosion Proof	XP	Class I, Div 1 GRP B,C,D	CSA (C & US)	North America
Flame Proof	Ex db	Zone 1, 2G IIC	ATEX IECEx	Europe International
Dust Ignition	DIP	Class II, Div 1, GRP E,F,G	CSA (C & US)	North America
Dust-tight Enclosure	Ex tb	Zone 21, 2D, IIIC	ATEX IECEx	Europe International

Hazardous Certifications

Complies with IEC 60079-0:2011, IEC 60079-1:2007, IEC 60079-31:2013

Ex db IIC Gb
Ex tb IIIC Db IP66
IECEx CSA 16.0013X

ATEX: EN60079-0, EN60079-1, EN60079-31

CE 1180 Ex II 2G SIRA16ATEX1091X

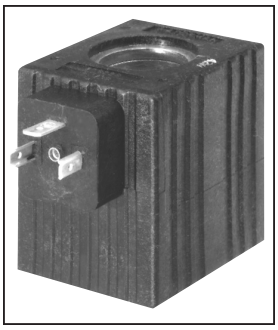
CSA 22.2 No. 60079-0:07, E60079-1:07 and UL60079-0:05, UL60079-1:05

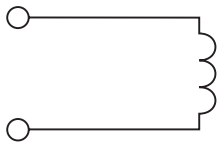
CSA LISTED TO U.S. and CANADA SAFETY STANDARDS.
REPORT: 70039028

Ex d IIC, AEx d IIC for CLASS I ZONE 1
CLASS I DIV 1 GRP. B, C & D
CLASS II DIV 1 GRP. E, F & G

Features

- Compact one piece encapsulated design
- Numerous terminals and voltages
- Heavy gauge color coded lead wire with built-in strain relief
- 200°C Class N wire standard
- U.L. recognized on most DC coils (consult factory)



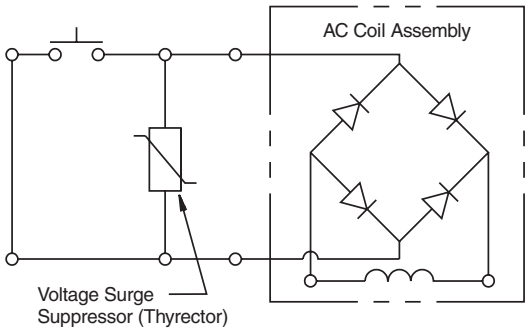


Specifications

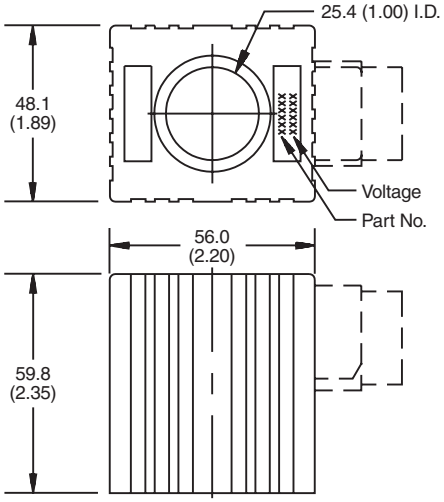
Wattage	42 Watts — Standard 30 Watts — Low Watt
Duty Rating	Continuous @ 100% voltage
Wire Class	Class N for all voltages
Lead Wire	18 gauge 24″ long, 600 volt rating
Lead Wire Strain Relief	34 kg (75 lbs.) @ 21°C (70°F) & 18 kg (40 lbs.) @ 93°C (200°F)
Encapsulating Material	Glass filled nylon, resistant to moisture, caustic solutions, fungus, and temperatures from -40°C (-40°F) to 200°C (392°F)
Color	Black

AC Coil Assembly

No inductive or capacitive loads can be installed between surge suppressor and rectified valves.



Terminal Styles and Dimensions

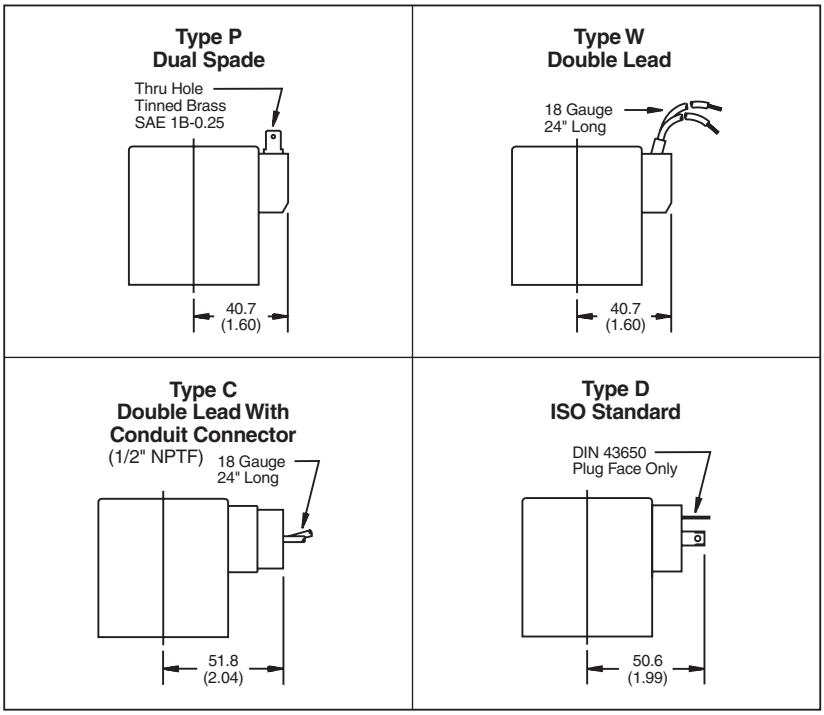


NOTES:

1. Coil to be installed with part number on nut side.

2. For additional terminals, voltages and wattages, consult factory for details.

3. Consult factory for availability. Minimum quantity may apply.



Coil Part Numbers

Wattage	Voltage	Type P Double Spade	Type W Double Lead	Type D ISO STANDARD	Type C Conduit	Amps	Lead Wire Color
42 Watts	12 VDC	851060-012*	851062-012*	851058-012*	-	3.53	Red
42 Watts	24 VDC	851060-024*	851062-024*	851058-024*	-	1.79	Blue
55 Watts	120 VAC	-	-	851058-120	851057-120	48.0	Brown
30 Watts	12 VDC	853496-012	853497-012	853495-012	-	2.50	Red
30 Watts	24 VDC	853496-024	853497-024	853495-024	-	1.25	Blue

*UL Listed

Notes

General Description

Proportional Valve Controllers. 12 and 24 Volts, PWM with Multiple Adjustments. For additional information see Technical Tips on pages CE1-CE2.

Operation

The 902rid/932rid and 904rid/934rid are valve top mounted PWM controllers for proportional control valves. They can be used with an external potentiometer to give accurate current control using the units internal reference voltage. Alternatively these controllers can be used with a 0-10V command signal from a PLC or engine management system.

'I' Max adjustment is provided to allow the maximum output current to be set via a 12 turn potentiometer. Turn clockwise to increase the output current.

Ramp Up and Ramp Down adjustments provide independent, linear control of the time it takes, to reach 'I' Max and to switch off, up to 8 seconds of delay. Turn clockwise for slower ramps.

'I' Min adjustment Pot sets the minimum current the controller will jump to when a command signal is present, used to eliminate dead band in a slow ramp. Turn clockwise for a higher 'I' Min setting.

Dither adjustment Pot is used to alter the PWM frequency of the controller from 95 HZ to 230 Hz. By changing the frequency this pot controls the amount of dither imposed on the valve. Lower frequency = more dither, higher frequency = less dither. Turn clockwise to increase frequency.

Notes:

XPRO902rid and XPRO932rid

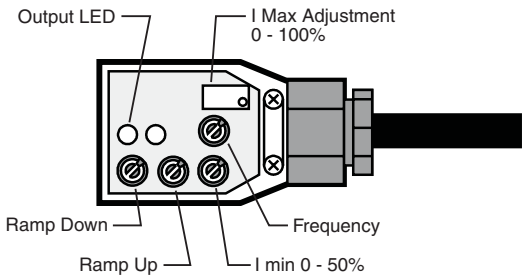
In order to avoid damaging a controller the +8V (yellow) lead must not be shorted to the +12V (red) lead or to the 0V (blue) lead.

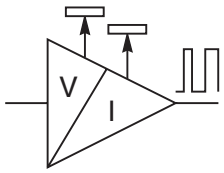
XPRO904rid and XPRO934rid

In order to avoid damaging a controller the +15V (yellow) lead must not be shorted to the +24V (red) lead or to the 0V (blue) lead.

Specifications

Nominal Voltage	**XPRO902rid & 932rid** 12V DC **XPRO904rid & 934rid** 24V DC
Maximum Power	**XPRO902rid & 904rid** 19W **XPRO932rid & 934rid** 30W
(IP) Rating	IP 65
Maximum Current	**XPRO902rid** 1.6A **XPRO932rid** 2.6A **XPRO904rid** 1.0A **XPRO934rid** 1.4A
Command Voltage	0 - 10V
Input Resistance	10K ohms
Refference Voltage	**XPRO902rid & 932rid** +8V (2mA) **XPRO904rid & 934rid** +15V (2mA)
Cable Length	1 meter
Ramp Up/Down	200ms - 8s



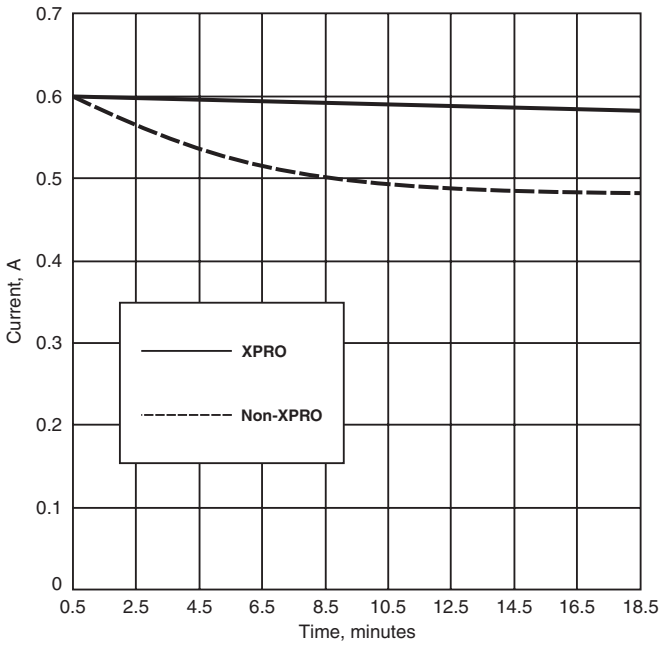


Features

- Self contained DIN 'Plug Top'
- High impact resistant molded ABS
- Complies with current CE regulations

Output Regulation

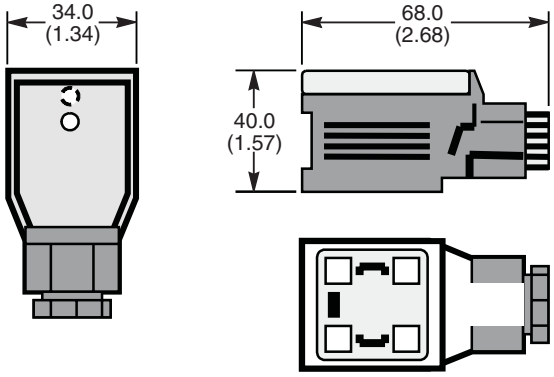
(Curve shows coil temperature compensation)



Application

For use with most proportional valves. GP, HP, JP, GTP and AP series valves.

Dimensions Millimeters (Inches)



Ordering Information

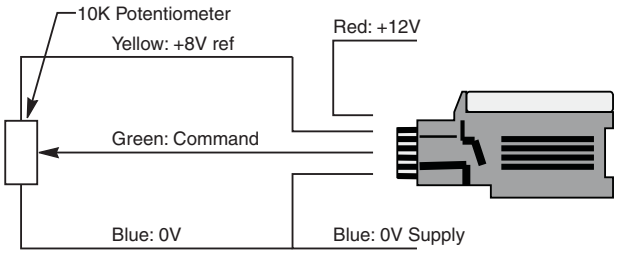
XPRO	
Controller	Maximum Current

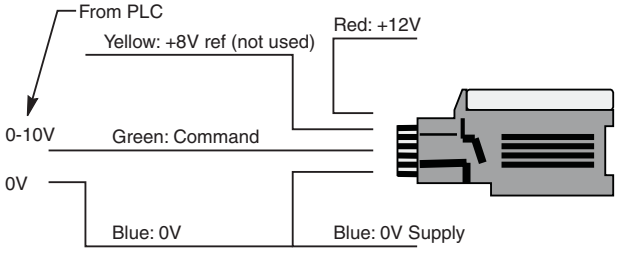
Code	Maximum Current
902rid	1.6A
932rid	2.6A
904rid	1.0A
934rid	1.4A

Setting for standard:
Dither frequency: 110 HZ

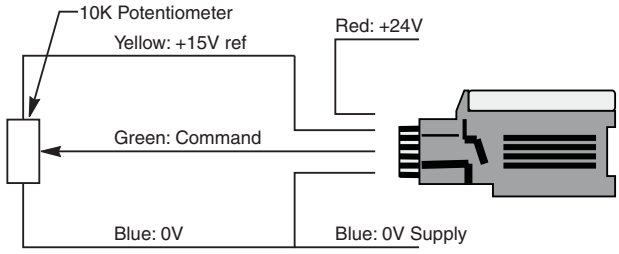
Connection Details

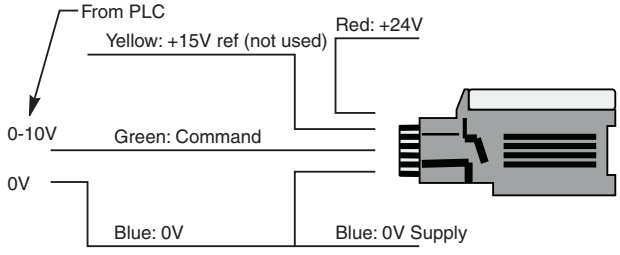
XPRO902rid and XPRO932rid





XPRO904rid and XPRO934rid





Controller / Coil Combination

Coil	Controller	
	XPRO 902rid	XPRO 932rid
CCS012D	X	
CCP012D	X	
CAS012D	X	
CAP012D		X

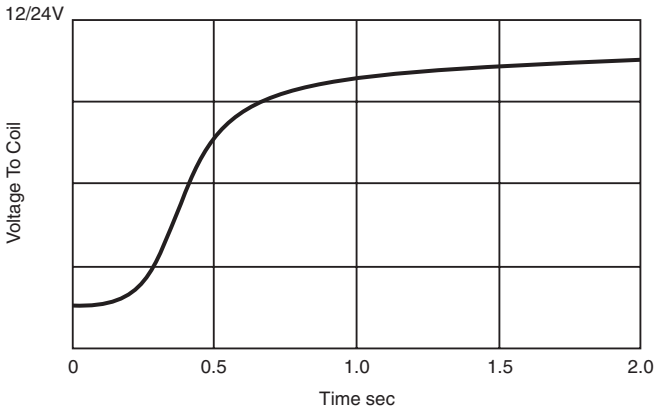
Coil	Controller	
	XPRO 904rid	XPRO 934rid
CCS024D	X	
CCP024D	X	
CAS024D	X	
CAP024D		X

General Description
Soft Start Valve Controller. 12 and 24 Volt PWM. For additional information see Technical Tips on pages CE1-CE2.

Features
- Self contained DIN PWM 'Plug Top'
- High impact resistant moulded ABS
- Supplied with approximately 1 meter of two color coded cables
- Can be used with 12V DC and 24V DC coils
- Fixed I-second ramp upon engagement

Operation
The 704 is a soft start plug top PWM controller used for reducing the hydraulic pressure peaks produced when a hydraulic valve is operated. It can simply be used in place of a standard DIN connector.

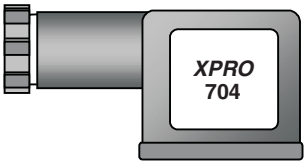
Output Voltage

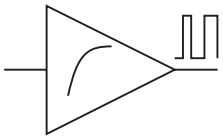


Application
For use with most proportional valves. GP, HP, JP, GTP and AP series valves.

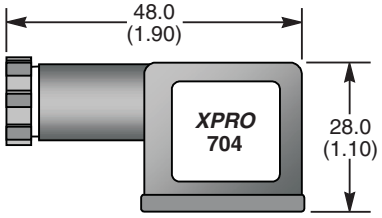
Specifications

Nominal Voltage	12V DC and 24V DC
Maximum Power	36W
(IP) Rating	IP 65
Maximum Current	3.0A
Coil Resistance	4.5 - 30 ohms
Ramp Up	Fixed 1000ms

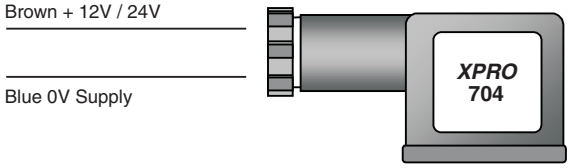




Dimensions Millimeters (Inches)



Connection Details



Controller / Coil Combination
XPRO 704 can be used with all 12V DC and 24V DC DIN coils.

Ordering Information

XPRO	704
Controller	Plug Type

Code	Plug Type
704	Soft Start

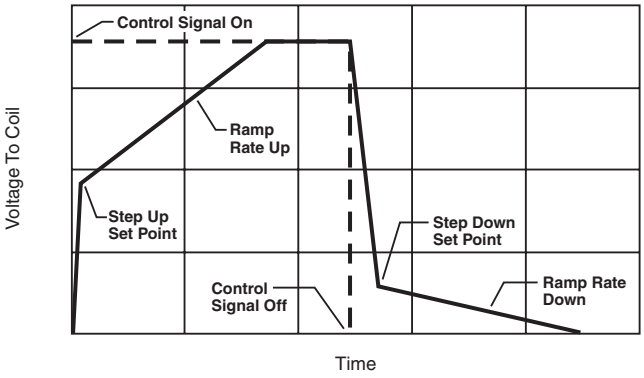
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

General Description
Soft Start/Stop Valve Controller. 12 and 24 Volts, PWM with Adjustable Ramps. For additional information see Technical Tips on pages CE1-CE2.

Features
- Adjustable ramp to engage and disengage
- Self contained DIN 'Plug Top'
- High impact resistant moulded ABS

Operation
The 704b is a valve top mounted 'soft start, soft stop' controller for use with a range of valves.

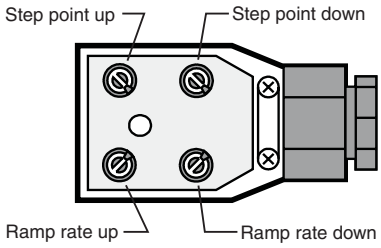
The controller can be set to jump to a preset 'step' voltage then ramp up to maximum at a preset rate. It can also be set to jump down to a preset 'step' voltage and ramp down to zero. This can be used to eliminate 'bangs' or hydraulic shocks associated with operating a hydraulic valve.

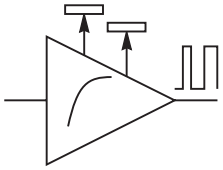
Output Voltage


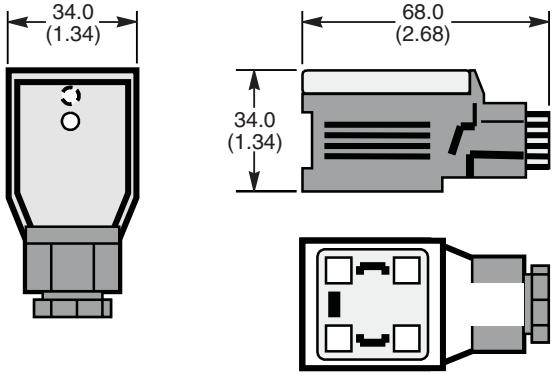
Application
For use with most proportional valves. GP, HP, JP, GTP and AP series valves.

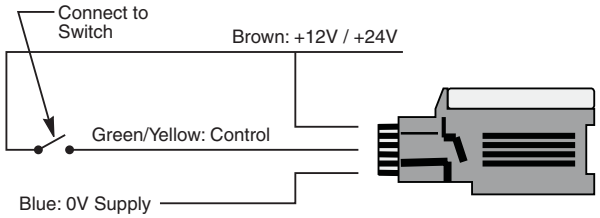
Specifications

Nominal Voltage	12V DC and 24V DC
Maximum Power	36W
(IP) Rating	IP 65
Maximum Current	3.0A
Coil Resistance	4.8 - 30 ohms
Coil Voltage	+V Supply
Control Resistance	820 ohms
Cable Length	1 meter
Step Up Adjust	10 - 80%
Step Down Adjust	10 - 80%
Ramp Up/Down	200ms - 4s





Dimensions Millimeters (Inches)


Connection Details


Controller / Coil Combination
XPRO 704b can be used with all 12V DC and 24V DC DIN coils.

Ordering Information

XPRO	704b
Controller	Plug Type

Code	Plug Type
704b	Soft Start, Soft Stop

General Description

Power Saver Controller. 12 and 24 Volt, PWM.
For additional information see Technical Tips on pages CE1-CE2.

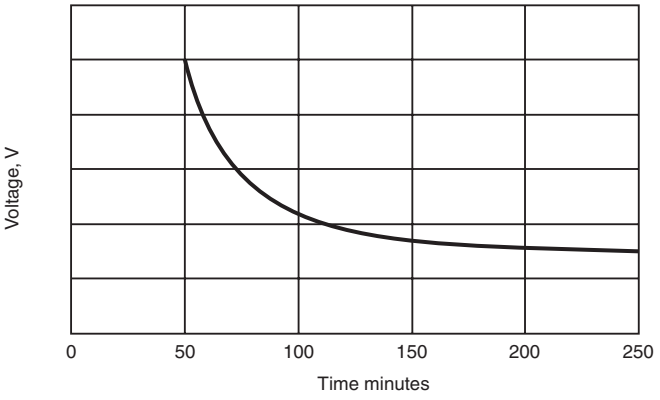
Features

- Reduced power consumption and heat generation
- Self contained DIN 'Plug Top'
- High impact resistant moulded ABS
- Supplied with approximately 1 meter of two color coded cables

Operation

The 804 is a power saver plug top PWM controller used for reducing the current consumption of a standard on/off valve. The plug will deliver full voltage to the valve for 50mS then drop down to a holding voltage of 30% of the applied voltage. This can be used where multiple valves are used and power consumption is a consideration. It can simply be used in place of a standard DIN connector.

Voltage Applied To Coil

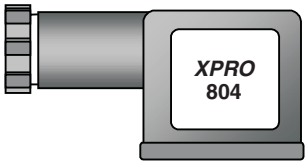


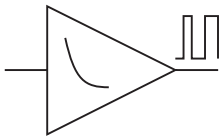
Application

For use with most on/off valves. GO, GS series valves.

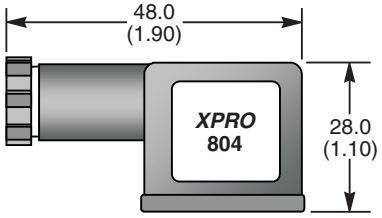
Specifications

Nominal Voltage	12V DC and 24V DC
Maximum Power	36W
(IP) Rating	IP 65
Maximum Current	3.0A
Coil Resistance	4.5 - 30 ohms
Current Reduction	30% of Max

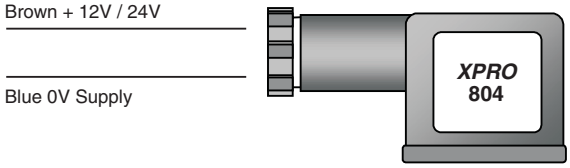




Dimensions Millimeters (Inches)



Connection Details



Controller / Coil Combination

XPRO 804 can be used with all 12V DC and 24V DC coils.

Ordering Information

XPRO	804
Controller	Plug Type

Code	Plug Type
804	Power Saver Plug

Notes

Notes

Contents

Bodies and Cavities

SERIES	DESCRIPTION	BODY NO.	PAGE NO.
PARKER STANDARD BODIES AND CAVITIES			
C08-2	08 Size, 2 Way	B08-2-6B	BC7
C08-3	08 Size, 3 Way	B08-3-6B	BC8
C08-4	08 Size, 4 Way	B08-4-6B	BC9
C09-2	09 Size, 2 Way	B09-2-6T	BC10
C10-2	10 Size, 2 Way	B10-2-8B	BC11
C10-3	10 Size, 3 Way	B10-3-8B	BC12
C10-3L	10 Size, 3 Way, L	4082075	BC13
C10-3S	10 Size, 3 Way, Short	LB10711S	BC14
C10-4	10 Size, 4 Way	B10-4-8B	BC15
C12-2	12 Size, 2 Way	B12-2-12B	BC16
C12-2F	12 Size, 2 Way (FAP121 Series)	B12-2F-12T	BC17
C12-3	12 Size, 3 Way	B12-3-12B	BC18
C12-3L	12 Size, 3 Way, Long	B12-3L-12T	BC19
C12-4	12 Size, 4 Way	B12-4-12T	BC20
C12-4L	12 Size, 4 Way, Long	B12-4L-12T	BC21
C16-2	16 Size, 2 Way	B16-2-16B	BC22
C16-3	16 Size, 3 Way	B16-3-16B	BC23
C16-3S	16 Size, 3 Way, Short	LB10726S	BC24
C16-4	16 Size, 4 Way	B16-4-16B	BC25
C20-2	20 Size, 2 Way	B20-2-20B	BC26
C20-3S	20 Size, 3 Way, Short	LB10746S	BC27
COUNTERBALANCE CAVITIES AND BODIES			
MHC-010	Single and Dual Counterbalance Bodies	MHC-010-*	BC28
MHC-022	Single and Dual Counterbalance Bodies	MHC-022-*	BC29
STANDARD CAVITY PLUGS			
Cavity Plugs			BC31
CARTPAK BODIES			
BD03-PN	P Port Interrupt, 2-Way, Body Only	BD03-PN-*	BC32
BD03-PN2	P Port Interrupt, 2-Way, Body Only	BD03-PN2-*	BC33
BD03-PNR	P Port Interrupt, Reducing Function, Body Only	BD03-PNR-*	BC34
BD03-PNS	P Port Interrupt, Sequencing Function, Body Only	BD03-PNS-*	BC35
BD03-PT	P to T, Body Only	BD03-PT-*	BC36
BD03-ABN	A and B Port Interrupt, Body Only	BD03-ABN-*	BC37
BD03-ABX	A and B Port Crossover, Body Only	BD03-ABX-*	BC38
BD03-ABT	A and B Ports to Tank, Body Only	BD03-ABT-*	BC39
BD03-DDX	Ports A and B Drain to Crossover Port, Body Only	BD03-DDX-*	BC40
BD03-BDA	B Port Drain to A, Body Only	BD03-BDA-*	BC41
BD03-ADB	A Port Drain to B, Body Only	BD03-ADB-*	BC42
BD03-POC	Dual P.O. Checks - A and B Ports to Tank	BD03-POC-*	BC43

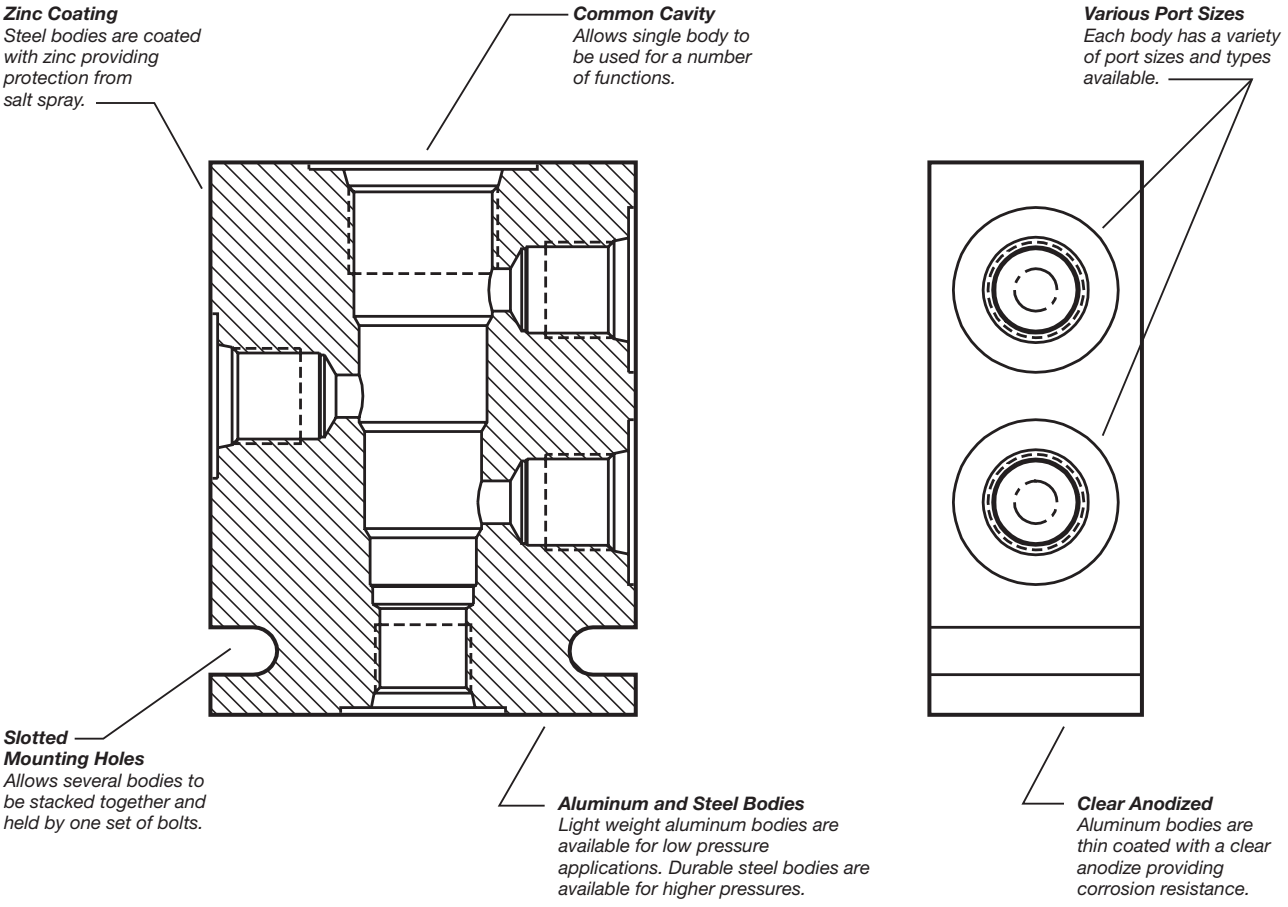
SERIES	DESCRIPTION	BODY NO.	PAGE NO.
SPECIAL BODIES AND CAVITIES			
CAV0W-2	2 Port	LB10796S	BC44
CAVSW-3	3 Port	LB10816S	BC45
2C	2 Port	LB10210S	BC46
2G	2 Port	LB10325S	BC47
2R	2 Port	LB10545S	BC48
2U	2 Port	LB10205S	BC49
2X	2 Port	LB10515S	BC50
3A	3 Port	LB10007S	BC51
3C	3 Port or 4 Port Dual	LB10039S / LB10034S	BC52
3K	3 Port	LB10089S	BC53
3M	3 Port or 4 Port Dual	LB10076S / LB10104S	BC54
3U	3 Port	LB10092S	BC55
3X	3 Port	LB10554S	BC56
3Z	3 Port	LB10313S	BC57
4C	4 Port	LB10563S	BC58
5A	5 Port	LB10314S	BC59
53-1	3 Port or 4 Port Dual	LB10310S / LB10312S	BC60
68-1	3 Port or 4 Port Dual	LB10251S / LB10259S	BC61
100-1	5 Port	LB10316S	BC62

INTRODUCTION

This Technical Tips section is split into three parts; Standard Line Bodies, Cavities, and Cartpaks. In the standard line bodies section, we highlight the features and options of our standard offering of line bodies. In the cavity section we discuss “common” cavities and form tools. In the Cartpak section, we present the features and options to Parker’s line of D03 style sandwich bodies. The Technical Tips are provided to help you become more familiar with Parker Hannifin’s line of product and assist you in applying our product.

STANDARD LINE BODIES

Parker offers standard line bodies for each valve and cavity size. Below are some of the features of Parker’s standard line bodies.



COMMON OPTIONS & FEATURES

Aluminum vs. Steel: Parker offers standard line bodies in both aluminum and steel. Aluminum bodies are most often used for general applications. They are lightweight and less costly than steel bodies. Parker’s aluminum bodies are coated with a clear anodize to provide a corrosion resistant protection. Aluminum bodies should never be used in applications above 210 bar (3000 psi.) Steel bodies are more durable and heavier than aluminum bodies. They are ideal for applications with elevated pressures or where rugged construction is desired. Steel bodies are suitable for applications up to 350 bar (5000 psi.) Parker’s steel bodies are coated with zinc providing corrosion resistance. Zinc even provides the steel body many hours of protection from salt spray.

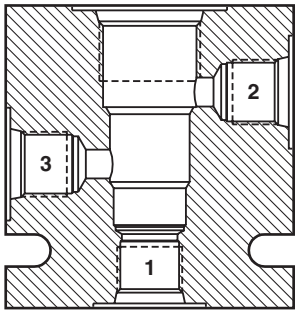
COMMON OPTIONS & FEATURES (Cont.)

Pressure Drop: The pressure drop through a line body is fairly minimal. Each catalog page shows a pressure drop curve. This should be added to the pressure drop through the cartridge when trying to estimate total pressure drop for a function.

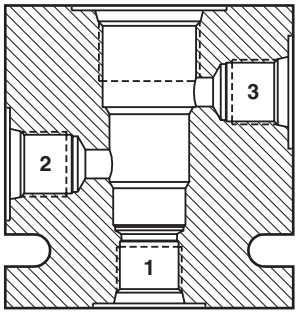
Porting: Parker offers a variety of port sizes and types for each line body. While NPT or pipe ports were once very popular and are still offered, we recommend SAE ports for new applications. SAE ports and fittings provide a more secure connection than pipe ports. BSPP ports are also available.

Port Numbering Change: With this catalog, we have re-numbered the ports on our 3-way line bodies. In the past, three way bodies were numbered with the nose being port 1, the middle port labeled (3), and the top port labeled (2). Over the years, this has caused some confusion, so we have relabeled the ports sequentially from the bottom. For identification, the current design will be marked with a Parker symbol like the one shown.





Previous Design



Current Design

CAVITIES

The hole that the cartridge valve is screwed into is called a cavity. Many cartridge producers manufacture valves that fit a “common” cavity. With a “common” cavity, a valve theoretically could be removed from a cavity and replaced by another manufacturer’s product. One should be careful though to check cross drill ports and thread depths when pursuing this activity. While it is true that many manufacturer’s products fit inside another’s cavity, the cross drills sometimes expose an o-ring to pressure, causing the o-ring to be extruded.

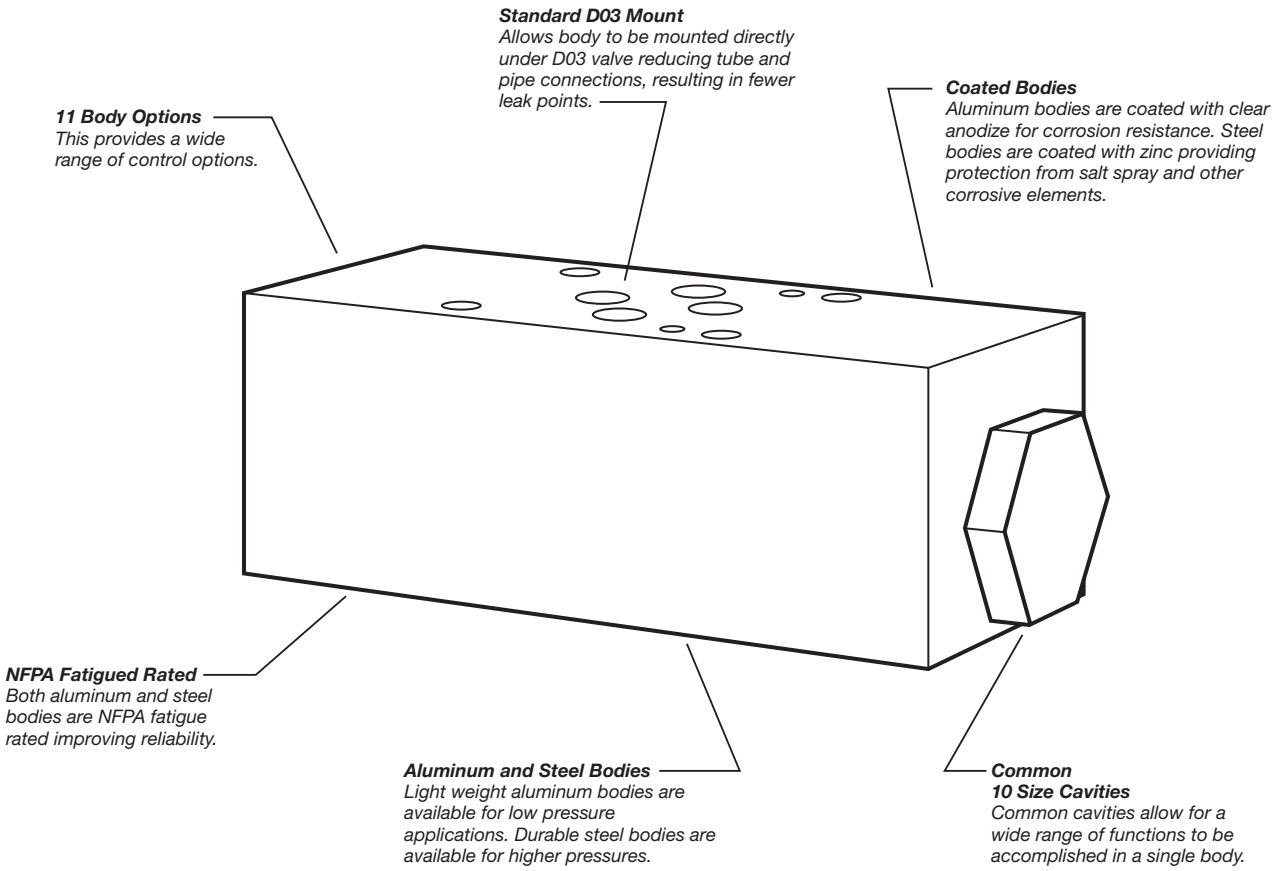
Valve / Cavity Compatibility Chart: Through acquisition, Parker Hannifin has accumulated a number of manufacturers with “common” cavities. To accommodate all of our product lines, we have released a new cavity for our Winner’s Circle product line. The cavities shown in this catalog are considered Winner’s Circle Cavities. The Winner’s Circle valves are downward and upward compatible with the Parker Series of product. On each catalog page, you will find a chart like the one shown on this page. The purpose of this chart is to help identify if a valve from one acquisition can be replaced by the Winner’s Circle valve, or another acquisition. The valves are designated by the columns of the chart and the cavities by the rows. If you have an existing cavity, you find it on the chart and follow across to see which valves you may put in the cavity. For instance, using the chart below, let’s say you have an existing manifold in which you had manufactured a FPS cavity (maybe you were using a SV2A-10). By finding the row labeled FPS and following across, you find that you could use the new Winner’s Circle product, an FPS product, or a CEC product of the same size in this cavity. A Parker or Waterman valve will not fit in this cavity without modifying the cavity. This chart is provided to help you in converting to the Winner’s Circle product line.

		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker	X	X		
	Waterman	X	X		
	FPS			X	X
	CEC			X	X

Cavity Tools: On each catalog page, cavity tools are listed for your use in creating special manifolds. More is discussed on manifold construction in the Technical Data section of this catalog. For 3-way and 4-way valves, you will find a roughing and a finishing tool. The rougher is a step drill used to prep the cavity for the finishing tool. The rougher removes the mass of material and is necessary because the finisher is not designed for primary forming. The finisher is a precision tool used to provide the final dimensions of the cavity. No rougher is offered for 2-way cavities because a standard drill bit can be used to remove the mass of material.

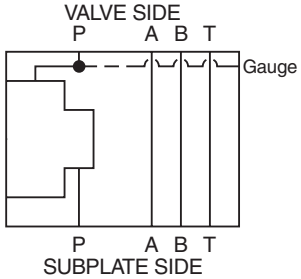
CARTPAK BODIES

Parker Cartpak sandwich mounted bodies are designed to be mounted under a standard ISO 4401-03, NFPA D03, CETOP 3 size valve, and provide a multitude of different functions. The bodies are designed to accept a common 10 size cartridge valve allowing the designer the flexibility to use a single body to provide pressure, directional, flow, or load control. One or more Cartpak bodies may be "sandwiched" underneath a Parker D1 Series directional valve to provide the control functions for all portions of a hydraulic circuit. The ISO standard fatigue rated bodies are available in either aluminum or ductile iron.



Catalog Pages: Each Cartpak catalog page is laid out in a similar format and is designed to help you select the proper body for your application. In the top left corner of the page there is a brief description and body schematic. The body schematic shows the cartridge cavity and the ports connecting to it. This schematic can be used to understand which valves can be used in the body. For instance, in the example shown here, flow from the subplate in port P is directed into the nose of the cartridge. The side port of the cartridge is connected to the valve side of port P. Thus, you want to choose cartridges providing the function desired, and use the nose as the inlet. For instance, a FC101 meters flow from its nose port to its side port and would be ideal for the p-port interrupt body shown.

UPRIGHT



In addition to the body schematic, we also provide a hydraulic schematic at the bottom of each catalog page. This schematic shows a variety of Parker cartridge part numbers that can be used with this body. This list is not intended to be comprehensive, but it is intended to show the wide variety of options that can be achieved with each body. You will also note, the product listing shows the orientation of the block (upright or inverted), the cavity for the cartridge, and cavity plugs (when necessary.) Once again, many options can be achieved with each body.

O-Ring Plates: Since many of the Cartpak bodies can be "flipped" to achieve extra functions, the faces of the bodies must be flat. Thus, an o-ring plate with o-rings must be used to seal the mounting surface. One plate with o-rings will be provided with any body that can be inverted. *Below are the kit numbers;*

Nitrile Kit - 717939 Fluorocarbon Kit - 717939V

Flipping Cartpaks: As mentioned before, many Cartpak bodies can be flipped to create extra options. The catalog pages show some of the functions that can be achieved by "flipping." The words "upright" and "inverted" are written on the bodies to help you identify which side you are looking at. To invert the body, while facing the long face of the body (in other words, the sides without any ports or cavities), rotate the valve 180 degrees away from your body in an upward fashion. By doing this, you have essentially switched the P port and T port.

Stacking Cartpaks: Cartpak bodies can be stacked on top of one another to provide a number of functions in a single assembly. When stacking Cartpak bodies though, you want to take some care in the order in which the bodies are stacked. In general, flow controls should be stacked as close to the subplate stack as possible, while pilot operated check valves or counterbalance valves should be stacked as close to the D03 valve as possible.

The D03 line of bodies has a common height of 40mm (1.58 in.). Below is a list of bolt kits available from Parker.

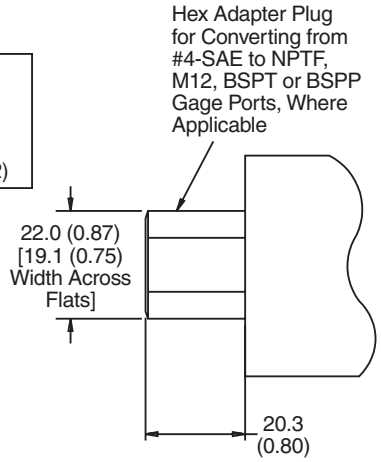
UNC Bolt Kits for use with D1V Directional Control Valves & Manapaks/Cartpaks (D1V*-75 Design, Solenoid Operated)					
	Number of Manapaks/Cartpaks @ 1.58" (40mm) thickness				
	0	1	2	3	4
D1V-75	BK209 1.25"	BK243 2.88"	BK225 4.38"	BK244 6.00"	BK245 7.50"
D1V-75 Plus Tapping Plate	BK176 2.25"	BK56 3.81"	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.)

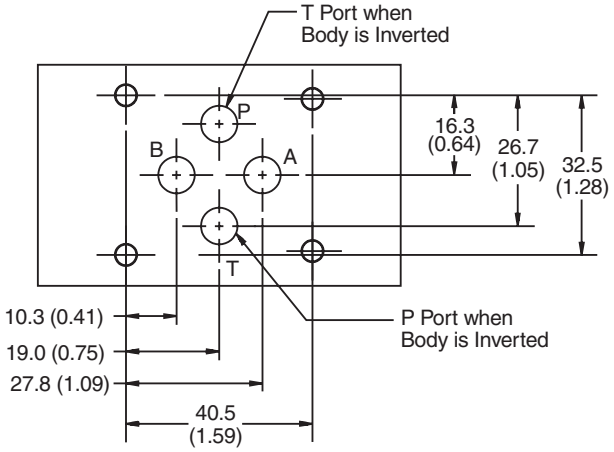
Gauge Ports: Several of the Cartpak bodies are equipped with a SAE #4 gauge port to assist the user during installation and troubleshooting. We offer hex adapter plugs, should your pressure gauge have a different thread type.

Hex Adapter Plug to convert from SAE #4

1830016	BSPP
1830017	BSPT
1830018	NPTF
1830019	Metric (M12)

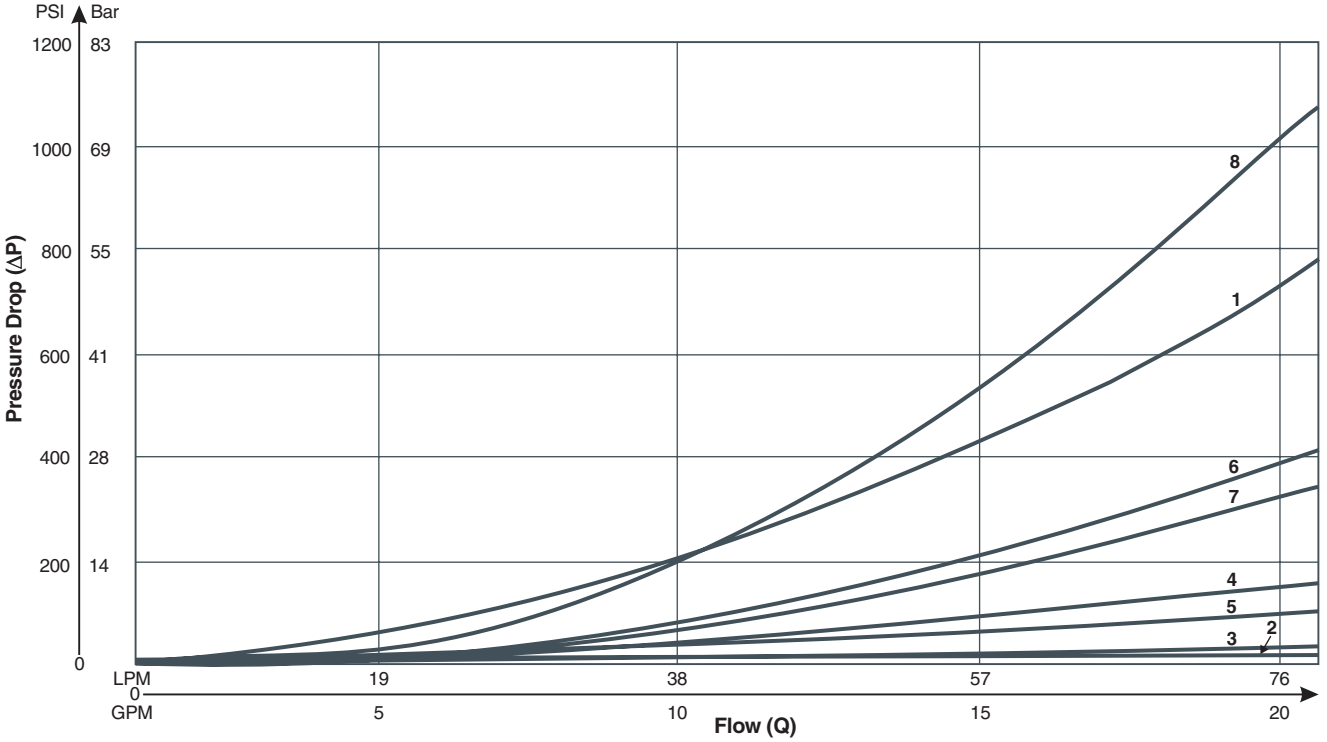


D03 Pad Dimensions: Below is the common dimensions of the standard D03 mount pad. Since these dimensions are common to all Cartpak bodies, we do not identify them on the individual valve pages.



PRESSURE DROP CHART

The following charts outline the pressure drop through the Parker Cartpak bodies.
The pressure drop is minus the cartridge valve.



Body	Orientation	P	T	A	B
BD03-PN	Upright Inverted	1 2	2 1	3 3	3 3
BD03-PT	Upright Inverted	3 3	3 3	3 3	3 3
BD03-ABN	Upright Inverted	3 3	3 3	4 4	4 4
BD03-ABT	Upright Inverted	3 3	3 3	3 3	3 3
BD03-ABX	Upright	5	5	3	3
BD03-PNR	Upright	6	3	3	3
BD03-PNS	Upright	7	3	3	3
BD03-DDX	Upright	3	3	1	1
BD03-BDA	Upright	6	3	3	3
BD03-ADB	Upright	6	3	3	3
BD03-PN2	Upright Inverted	8 3	3 8	3 3	3 3

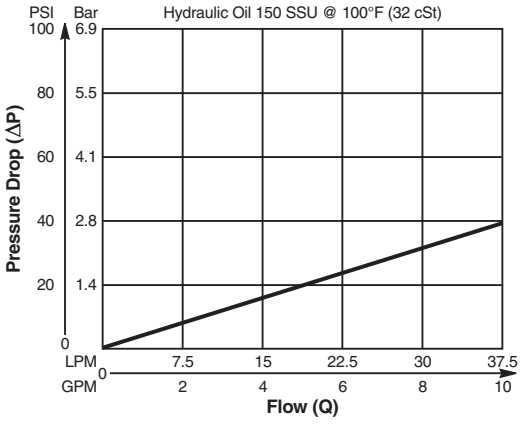
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker	X	X	X	X
	Waterman	X	X	X	X
	FPS	X	X	X	X
	CEC	X	X	X	X

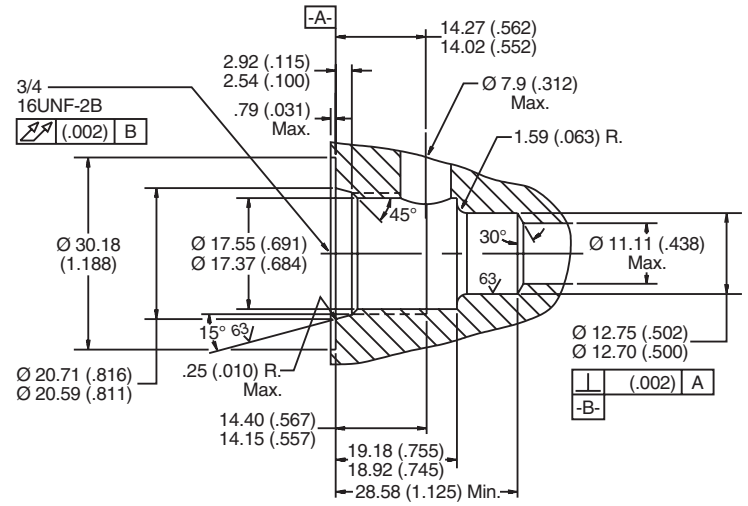
Performance Curve

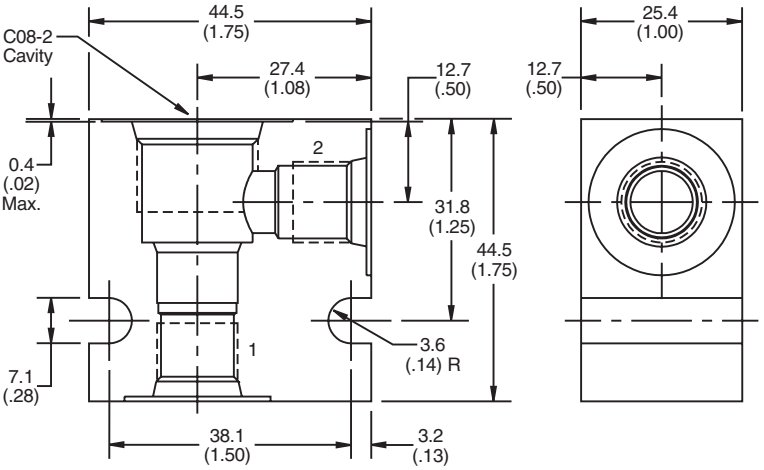
Pressure Drop vs. Flow



Dimensions

Millimeters (Inches)





Ordering Information

B08	—	2	—	6B
08 Size		2-Way Cavity		Port Size

Port Size
3/8″ BSP

Body Material
Steel

Form Tool: Rougher None
Finisher NFT08-2F

Weight: .11 kg (.25 lbs.)

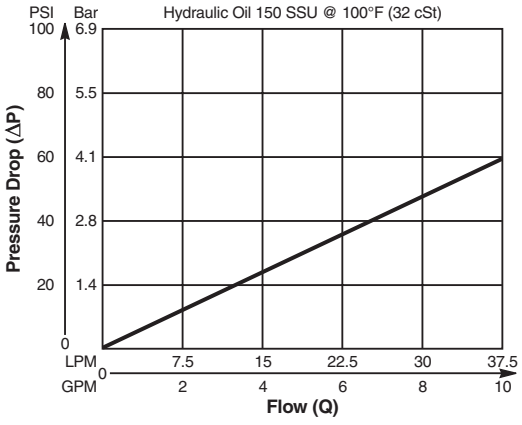
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker	X	X		
	Waterman	X	X		
	FPS			X	X
	CEC			X	X

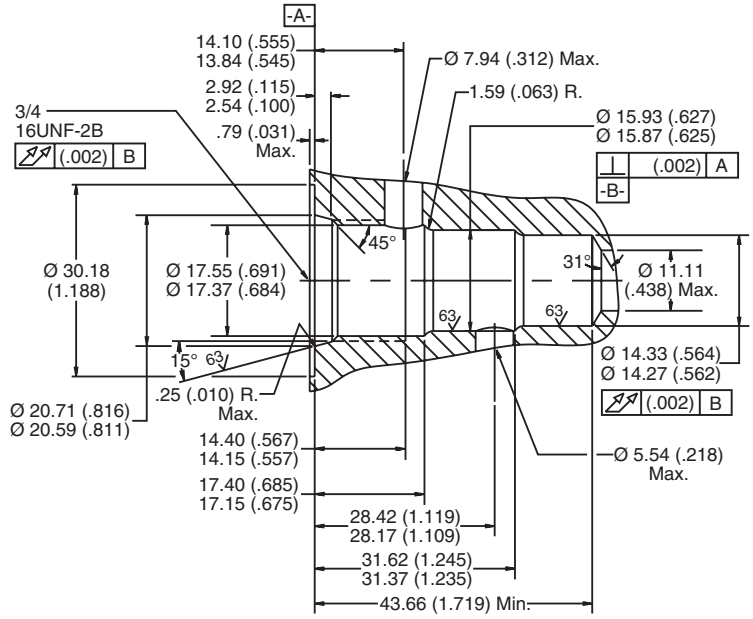
Performance Curve

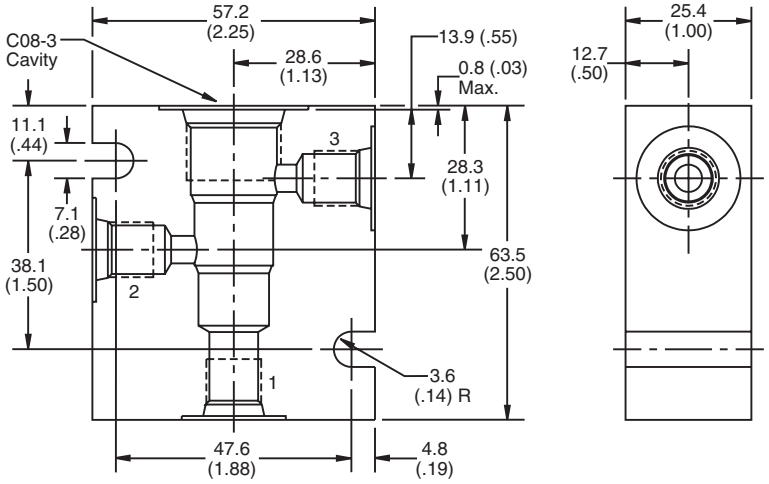
Pressure Drop vs. Flow



Dimensions

Millimeters (Inches)





Ordering Information

B08	—	3	—	6B
08 Size		3-Way Cavity		Port Size

Port Size
3/8″ BSP

Body Material
Steel

Form Tool: Rougher NFT08-3R
Finisher NFT08-3F

Weight: .27 kg (.60 lbs.)

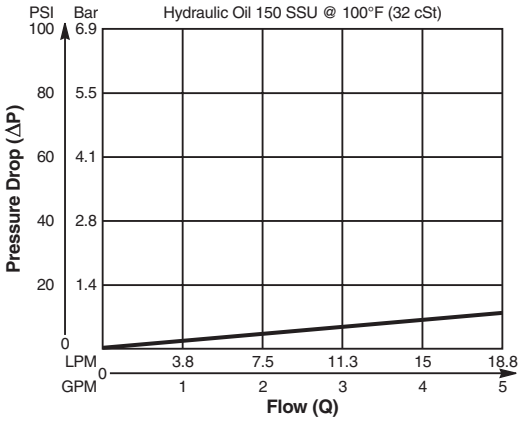
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker	X	X		
	Waterman	X	X		
	FPS			X	
	CEC				

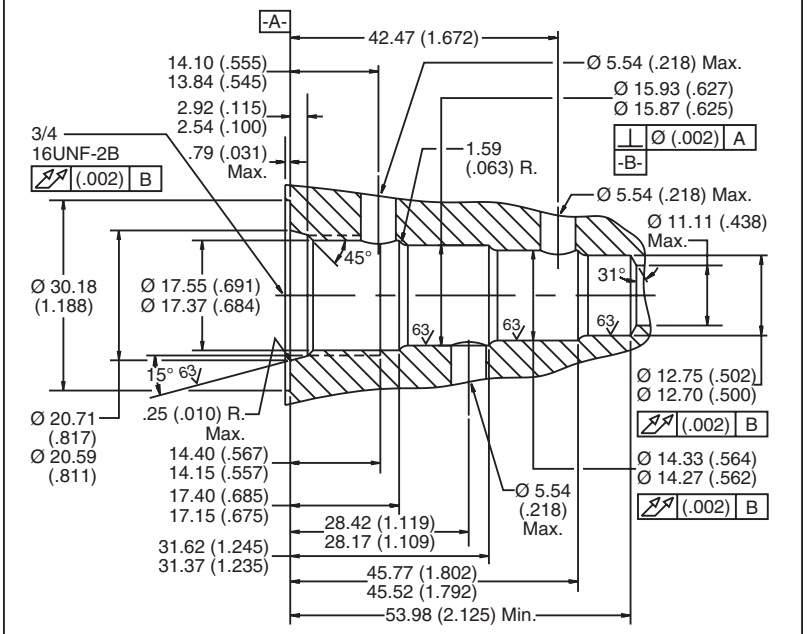
Performance Curve

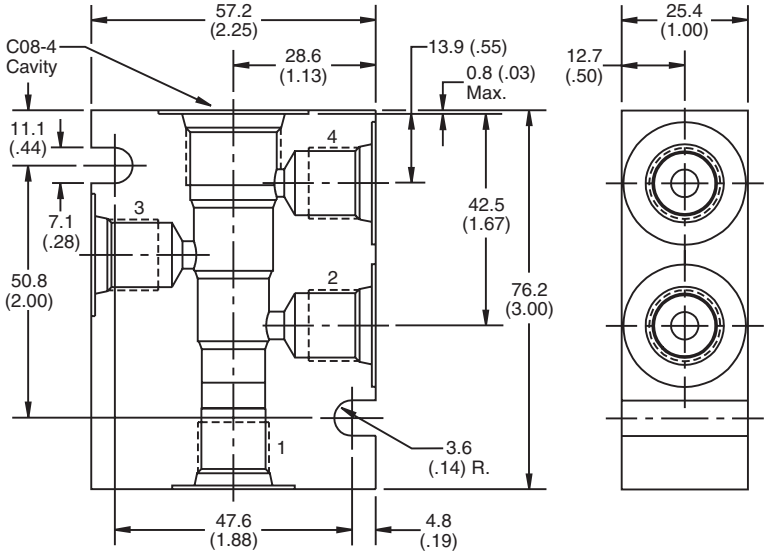
Pressure Drop vs. Flow



Dimensions

Millimeters (Inches)





Ordering Information

B08	—	4	—	6B
08 Size		4-Way Cavity		Port Size

Port Size
3/8″ BSP

Body Material
Steel

Form Tool: Rougher NFT08-4R
Finisher NFT08-4F

Weight: .45 kg (1.0 lbs.)

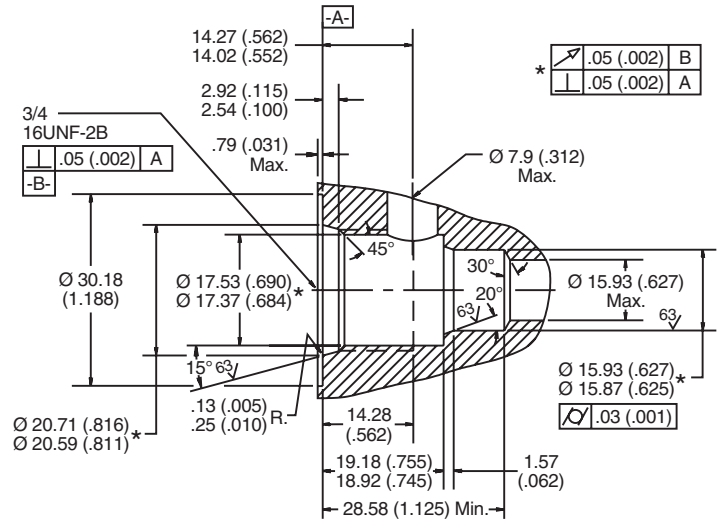
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker	X	X		
	Waterman	X	X		
	FPS				
	CEC				

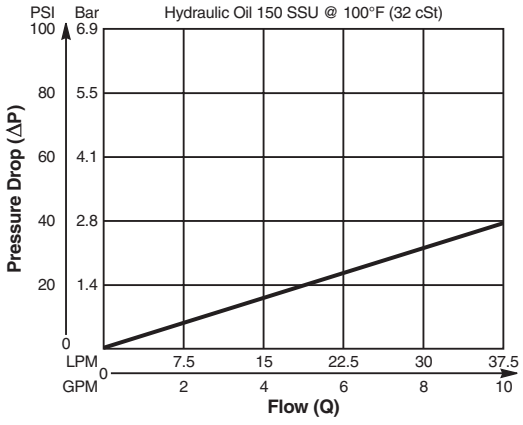
Dimensions

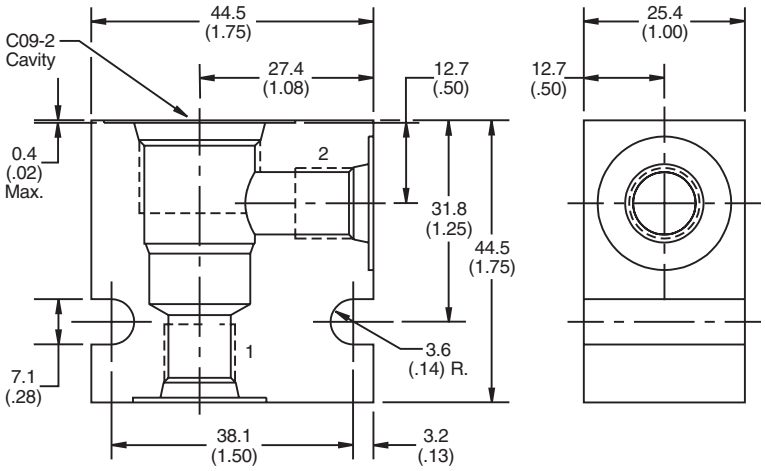
Millimeters (Inches)



Performance Curve

Pressure Drop vs. Flow





Ordering Information

B09	—	2	—	6B
09 Size		2-Way Cavity		Port Size

Port Size
3/8″ BSP

Body Material
Steel

Form Tool: Rougher None
Finisher FT09-2

Weight: .11 kg (.25 lbs.)

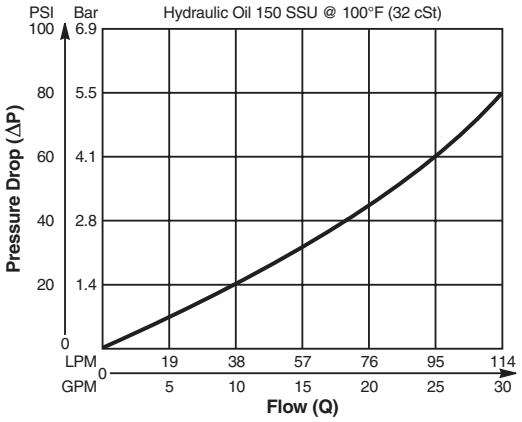
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker	X	X		
	Waterman	X	X		
	FPS			X	X
	CEC			X	X

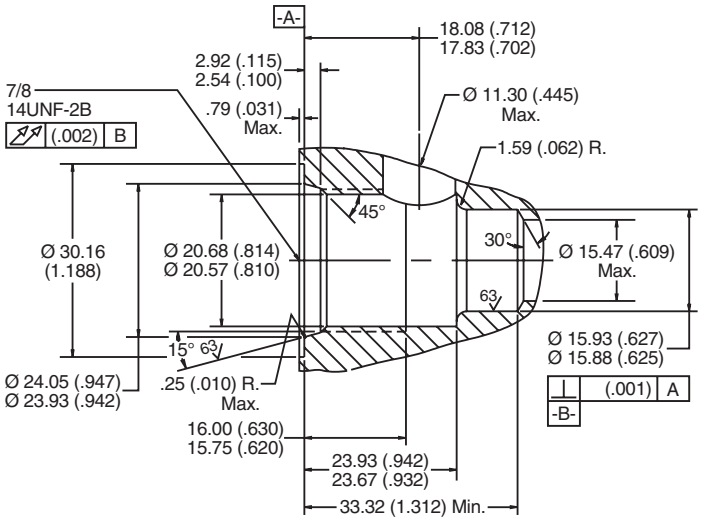
Performance Curve

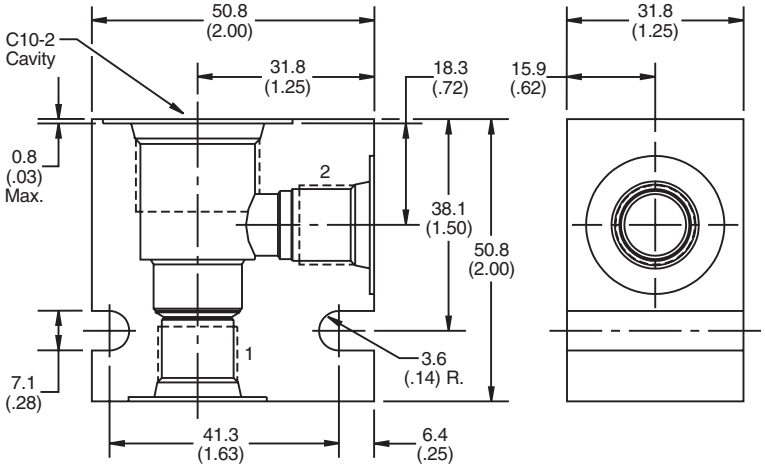
Pressure Drop vs. Flow



Dimensions

Millimeters (Inches)





Ordering Information

B10	—	2	—	8B
10 Size		2-Way Cavity		Port Size

Port Size
1/2″ BSP

Body Material
Steel

Form Tool: Rougher None
Finisher NFT10-2F

Weight: .45 kg (1.0 lbs.)

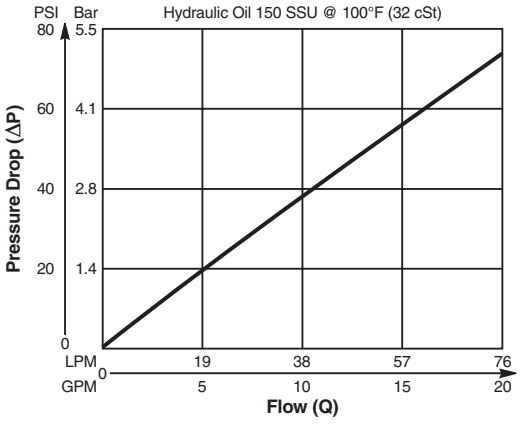
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

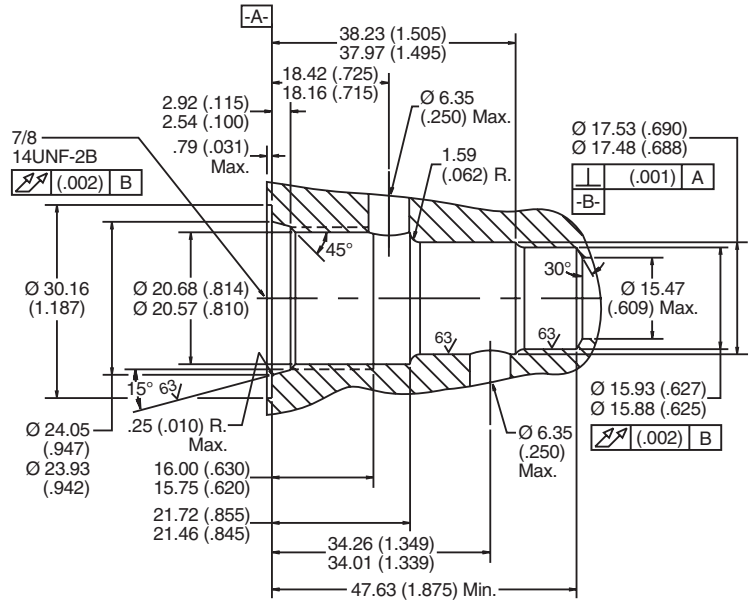
		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker	X	X	X	X
	Waterman	X	X	X	X
	FPS	X	X	X	X
	CEC	X	X	X	X

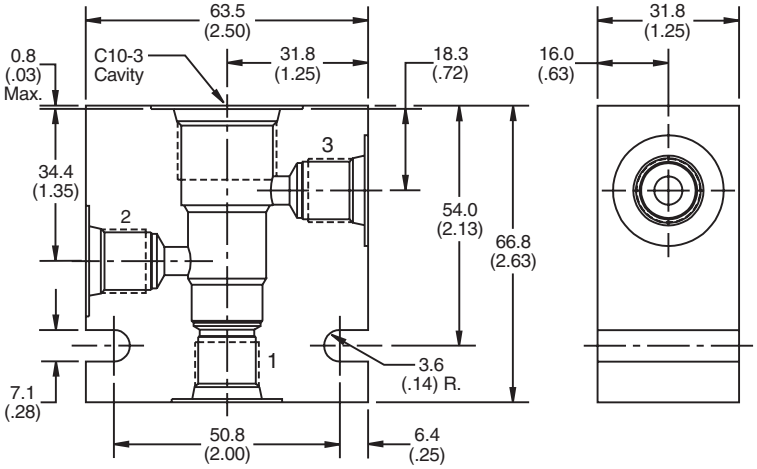
Performance Curve

Pressure Drop vs. Flow



Dimensions Millimeters (Inches)





Ordering Information

B10	—	3	—	8B
10 Size		3-Way Cavity		Port Size

Port Size
1/2″ BSP

Body Material
Steel

Form Tool: Rougher NFT10-3R
Finisher NFT10-3F
Weight: .77 kg (1.7 lbs.)

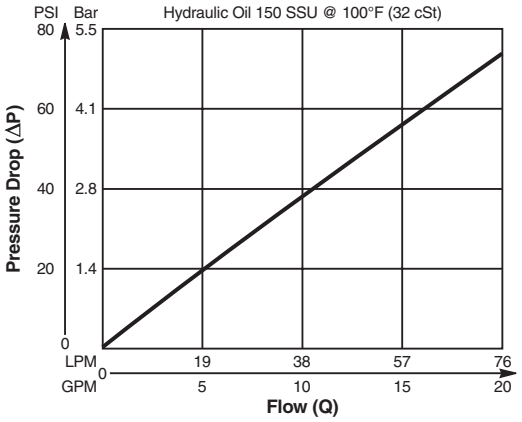
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker	X	X	X	
	Waterman	X	X	X	
	FPS	X	X	X	
	CEC				

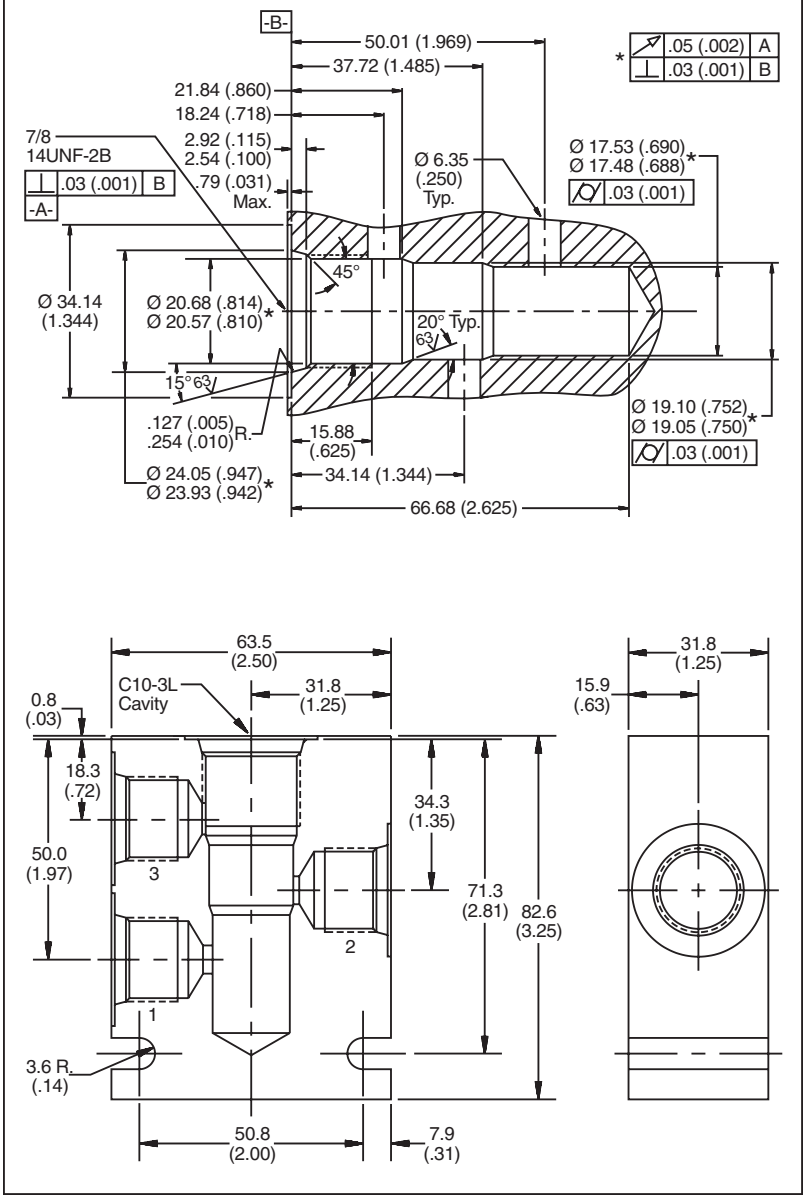
Performance Curve

Pressure Drop vs. Flow



Dimensions

Millimeters (Inches)



Ordering Information

Part Number = 4082075

Port Size
SAE-8

Body Material
Steel

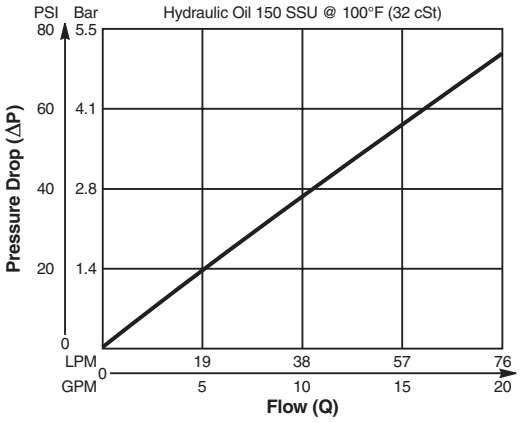
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

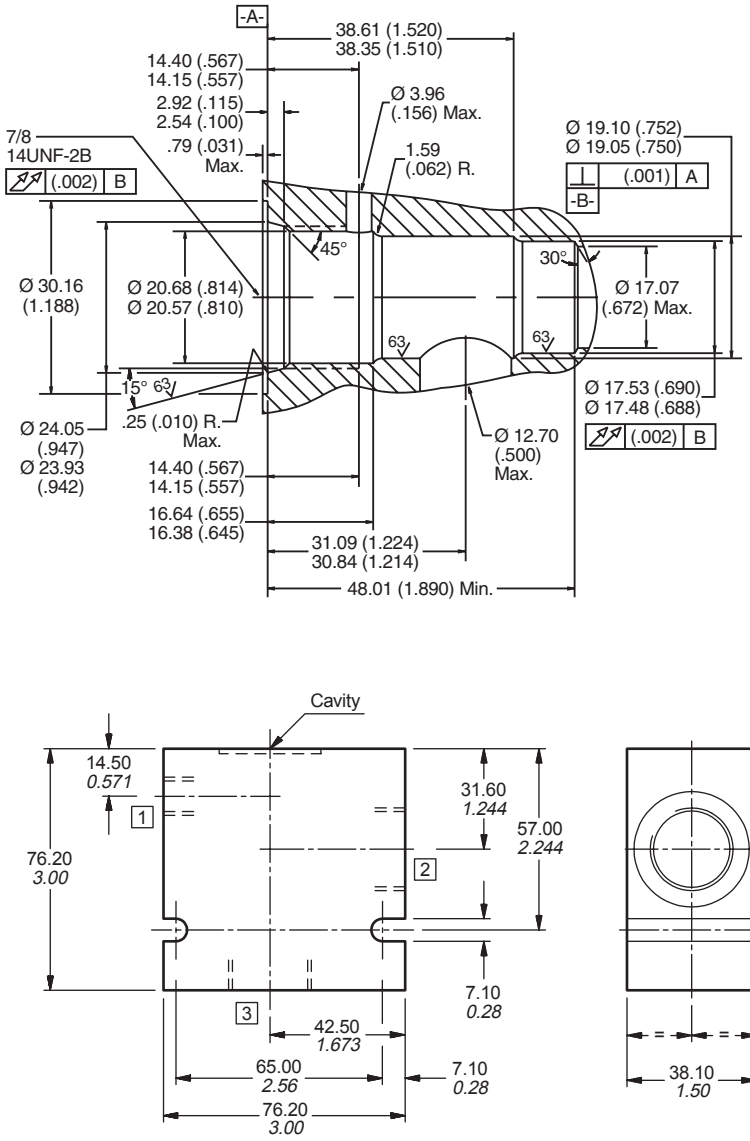
		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker	X	X	X	X
	Waterman	X	X	X	X
	FPS	X	X	X	X
	CEC	X	X	X	X

Performance Curve

Pressure Drop vs. Flow



Dimensions Millimeters (Inches)



Ordering Information

LB10	711	S
Line Body	Porting	Body Material

Code	Porting
711	1/2″ BSP

Code	Body Material
S	Steel

Form Tool: Rougher NFT10S-3R
Finisher NFT10S-3F
Weight: .77 kg (1.7 lbs.)

Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

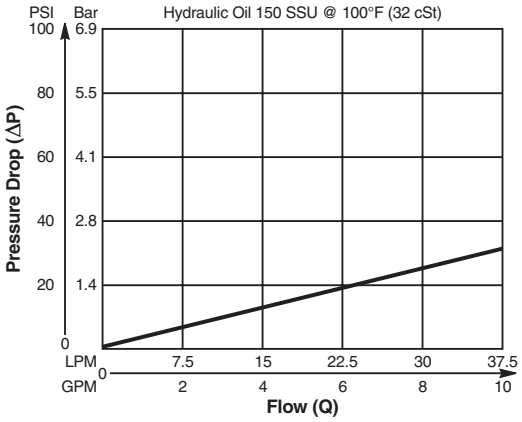
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker	X	X	X	X
	Waterman	X	X	X	X
	FPS	X	X	X	X
	CEC	X	X	X	X

Performance Curve

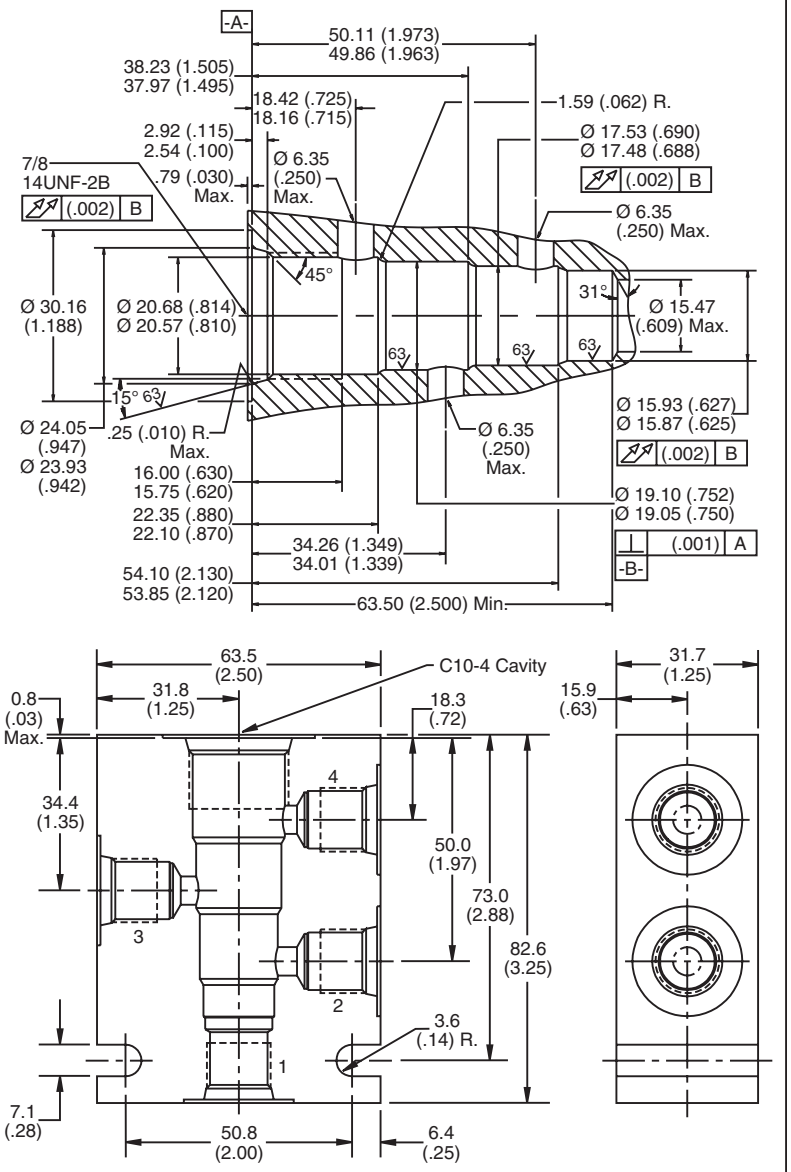
Pressure Drop vs. Flow



NOTE:
When machining for use with DF102P, Ports 1 and 4 must be connected in the manifold/block.

Dimensions

Millimeters (Inches)



Ordering Information

B10	—	4	—	8B
10 Size		4-Way Cavity		Port Size

Port Size
1/2″ BSP

Body Material
Steel

Form Tool: Rougher NFT10-4R
Finisher NFT10-4F
Weight: .90 kg (2.0 lbs.)

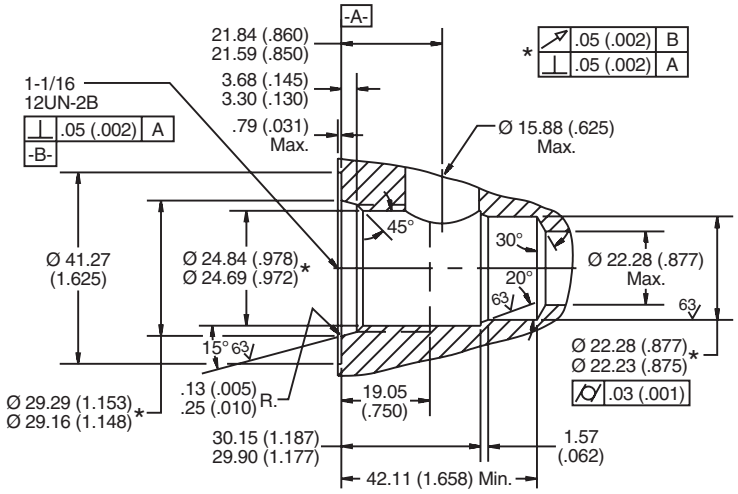
Valve/Cavity Compatibility

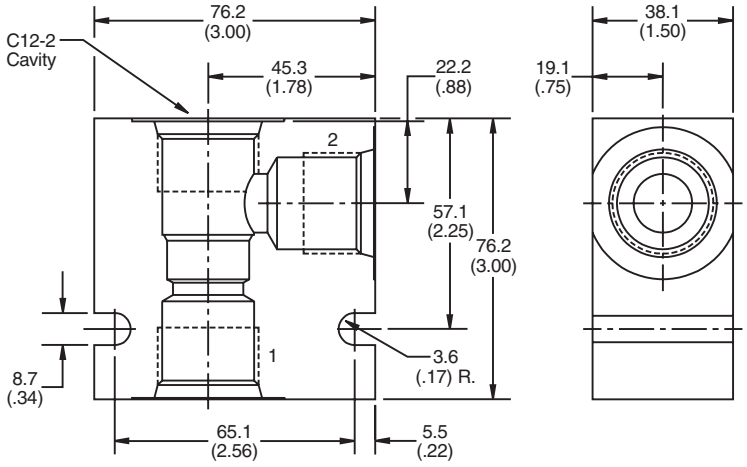
For additional information see Technical Tips on pages BC1-BC6.

		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker	X	X		
	Waterman	X	X		
	FPS				
	CEC				X

Dimensions

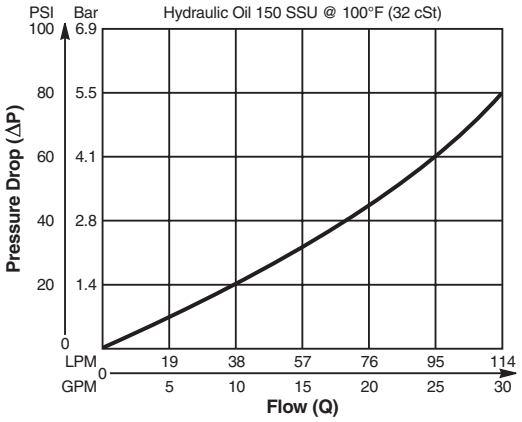
Millimeters (Inches)





Performance Curve

Pressure Drop vs. Flow



Ordering Information

B12 — **2** — **12B**

12 Size | **2-Way Cavity** | **Port Size**

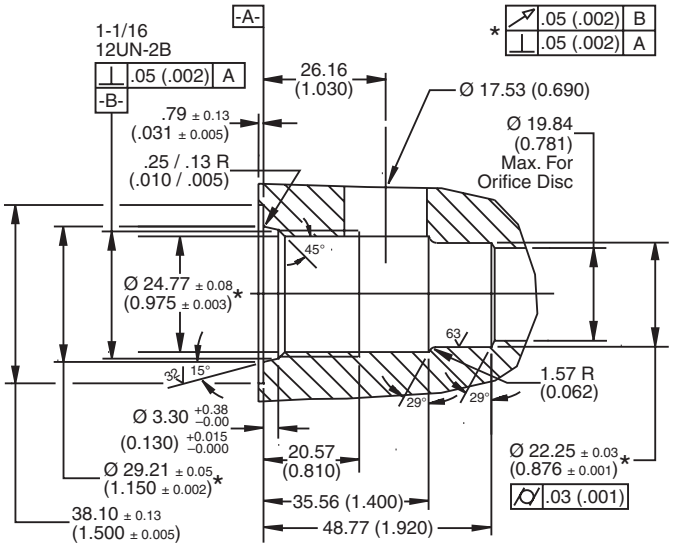
Port Size
3/4″ BSP

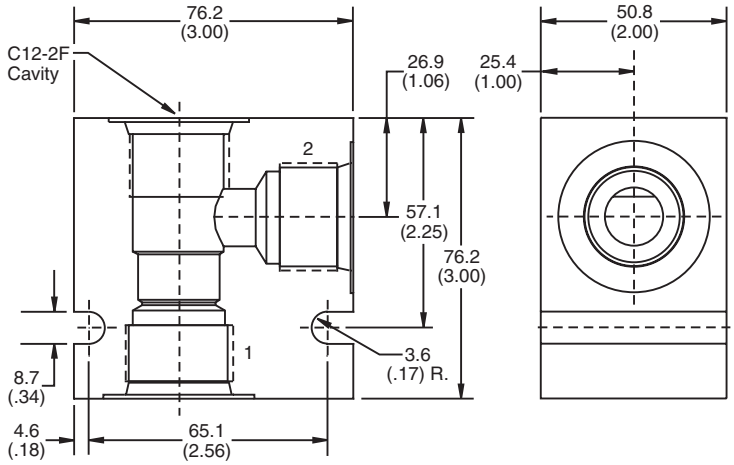
Body Material
Steel

Form Tool: Rougher None
Finisher NFT12-2F

Weight: .45 kg (1.0 lbs.)

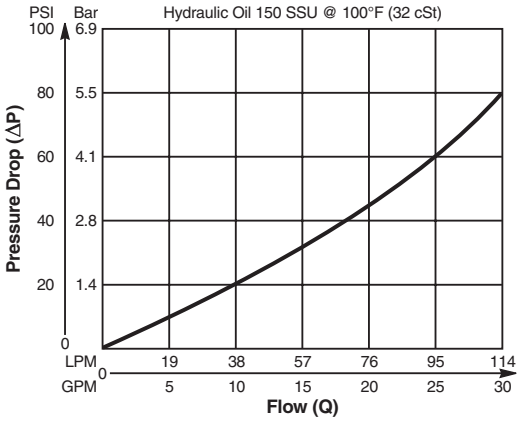
Dimensions Millimeters (Inches)





Performance Curve

Pressure Drop vs. Flow



Ordering Information

B12	—	2F	—	12T
12 Size		2-Way Cavity		Port Size

Port Size
SAE-12

Body Material
Steel

Form Tool: Rougher None
Finisher NFT12-2F

Weight: .30 kg (.65 lbs.)

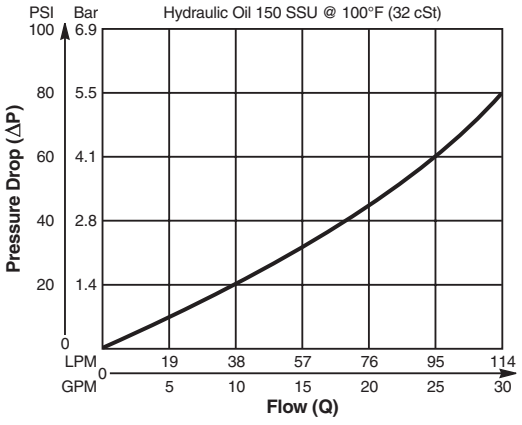
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker	X	X		
	Waterman	X	X		
	FPS	X	X		
	CEC				X

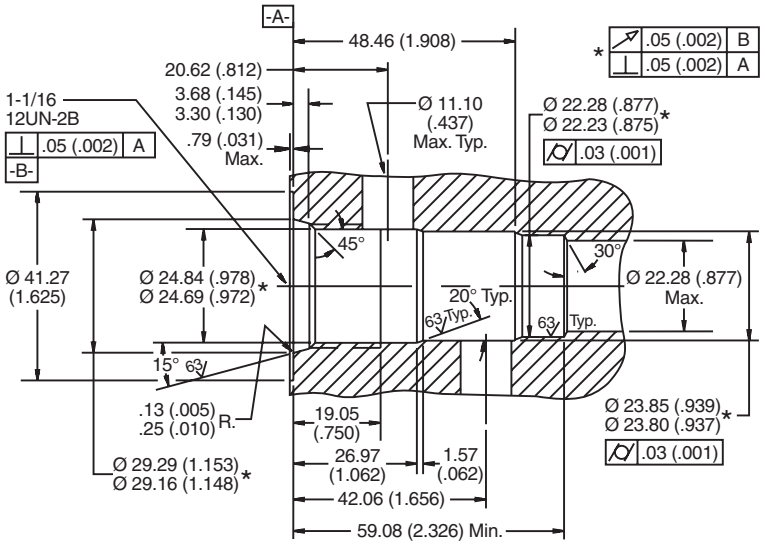
Performance Curve

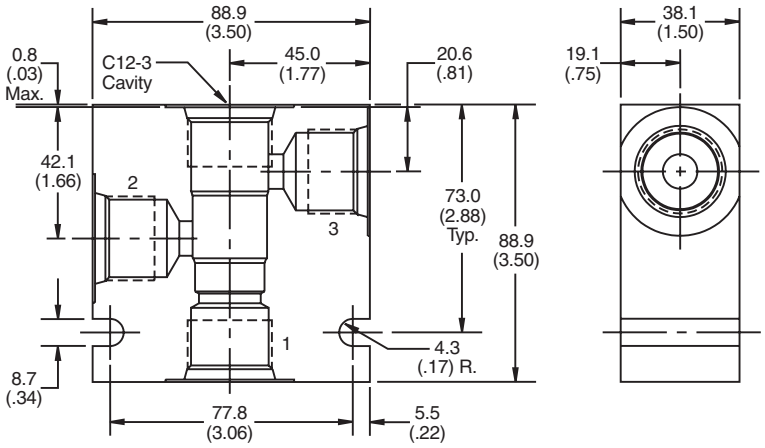
Pressure Drop vs. Flow



Dimensions

Millimeters (Inches)





Ordering Information

B12	—	3	—	12B
12 Size		3-Way Cavity		Port Size

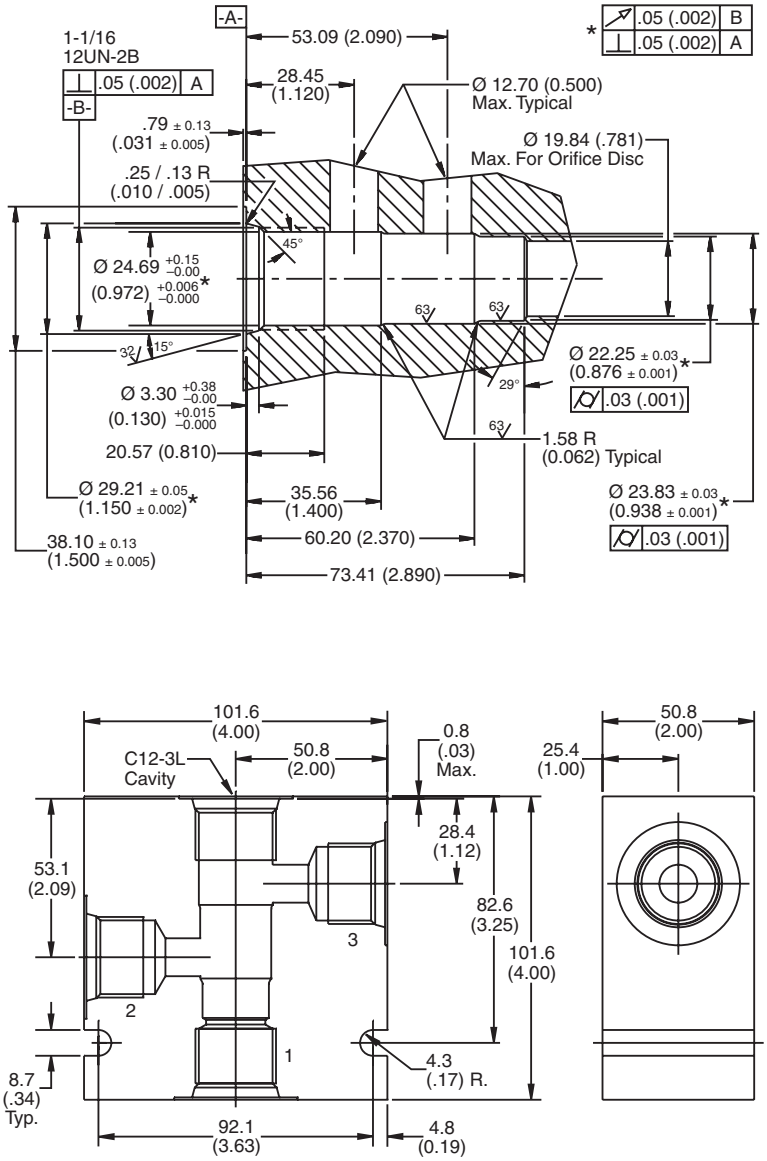
Port Size
3/4″ BSP

Body Material
Steel

Form Tool: Rougher NFT12-3R
Finisher NFT12-3F

Weight: 2.0 kg (4.5 lbs.)

Dimensions Millimeters (Inches)



Ordering Information

B12	—	3L	—	12T
12 Size		3-Way Long Cavity		Port Size

Port Size
SAE-12

Body Material
Steel

Form Tool: Rougher NFT12L-3R
Finisher NFT12L-3F

Weight:

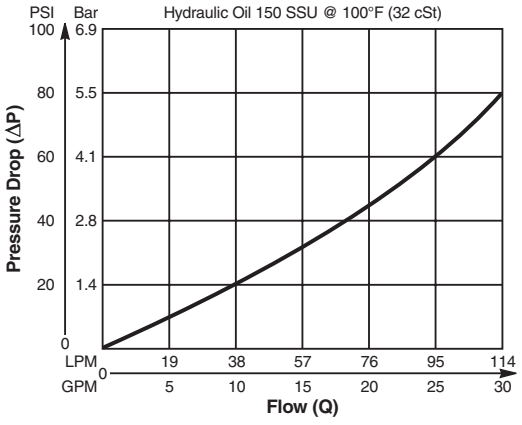
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker	X	X		
	Waterman	X	X		
	FPS				
	CEC				X

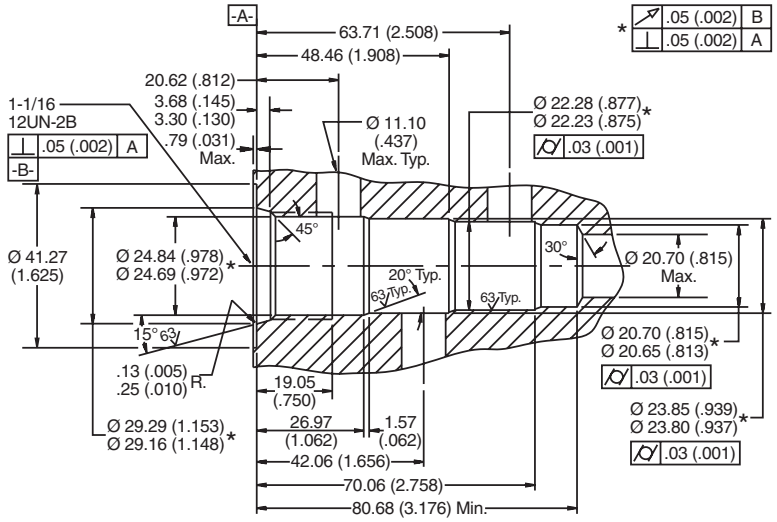
Performance Curve

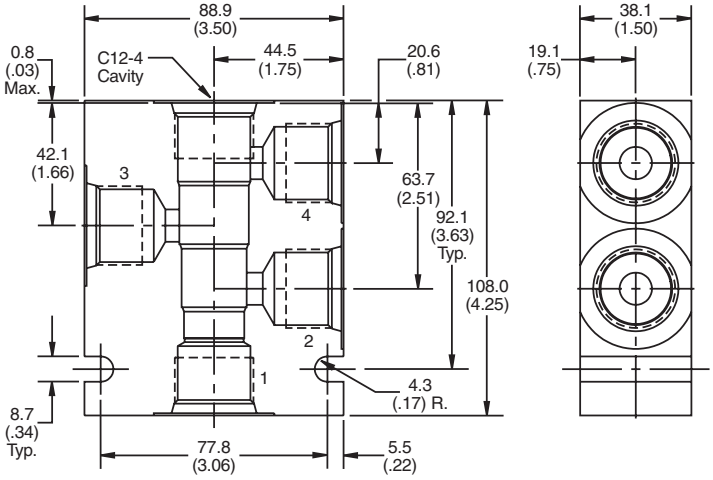
Pressure Drop vs. Flow



Dimensions

Millimeters (Inches)





Ordering Information

B12	—	4	—	12T
12 Size		4-Way Cavity		Port Size

Port Size
SAE-12

Body Material
Steel

Form Tool: Rougher NFT12-4R
Finisher NFT12-4F

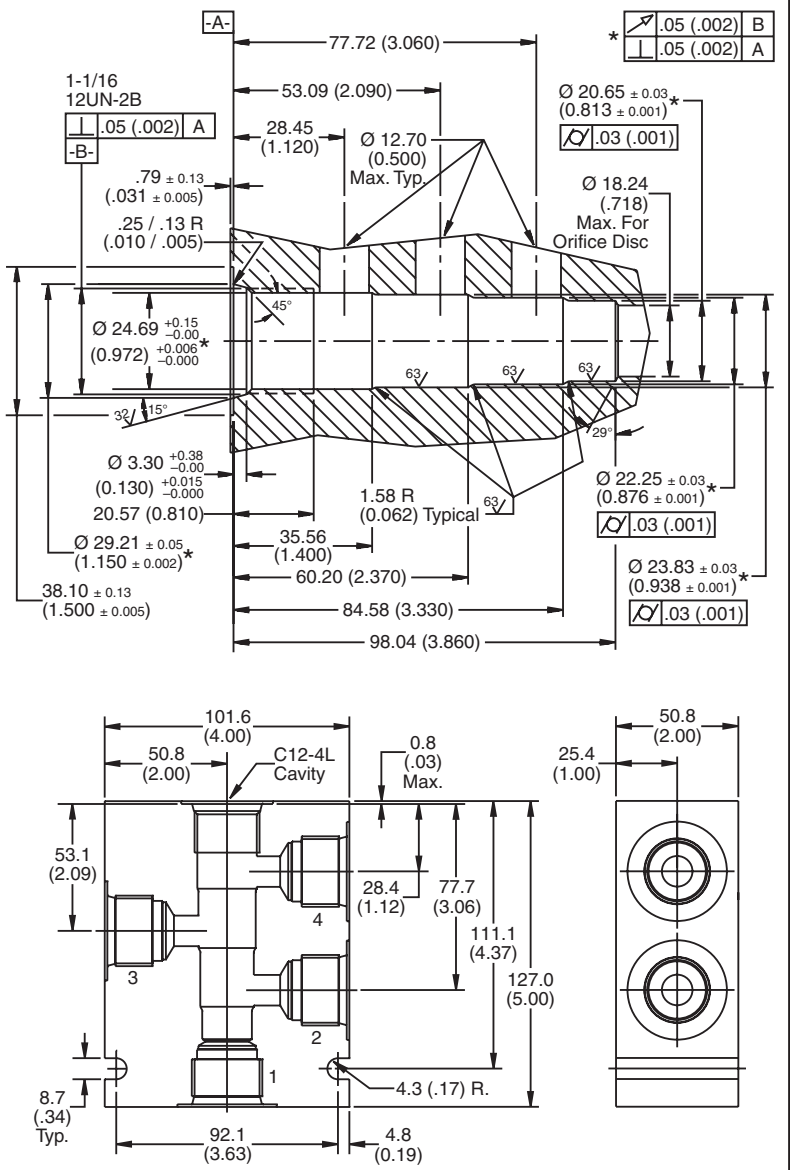
Weight: 3.3 kg (7.3 lbs.)

Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Performance Curve

Pressure Drop vs. Flow

Ordering Information

B12	—	4L	—	12T
12 Size		4-Way Long Cavity		Port Size

Port Size
SAE-12

Body Material
Steel

Form Tool: Rougher NFT12L-4R
Finisher NFT12L-4F

Weight:

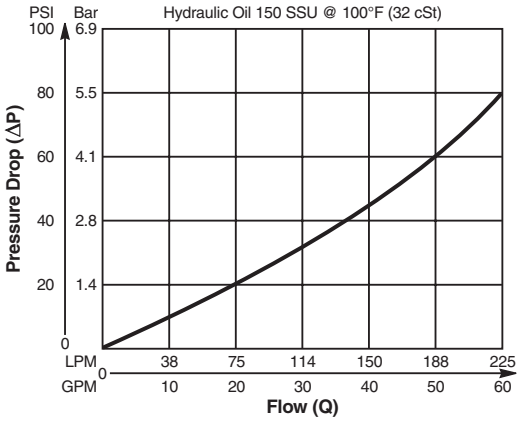
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

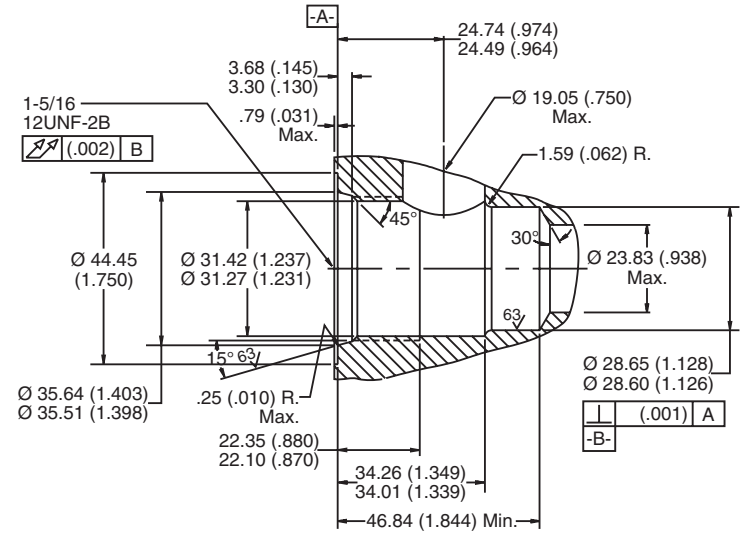
		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker	X	X		
	Waterman	X	X		
	FPS			X	X
	CEC			X	X

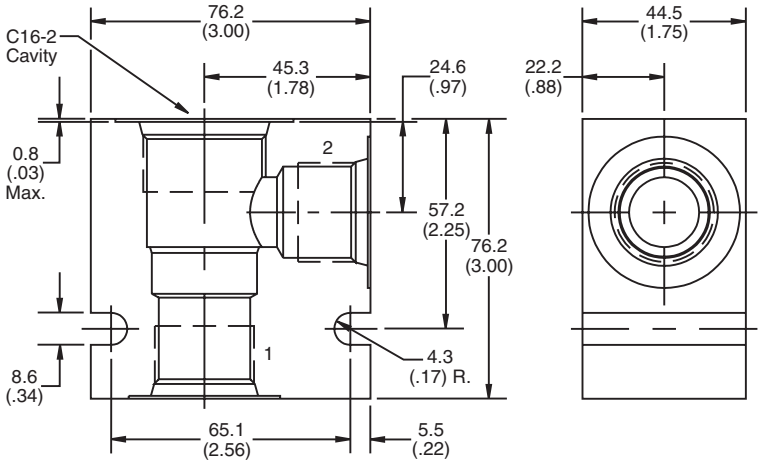
Performance Curve

Pressure Drop vs. Flow



Dimensions Millimeters (Inches)





Ordering Information

B16	—	2	—	16B
16 Size		2-Way Cavity		Port Size

Port Size
1″ BSP

Body Material
Steel

Form Tool: Rougher None
Finisher NFT16-2F

Weight: 1.5 kg (3.4 lbs.)

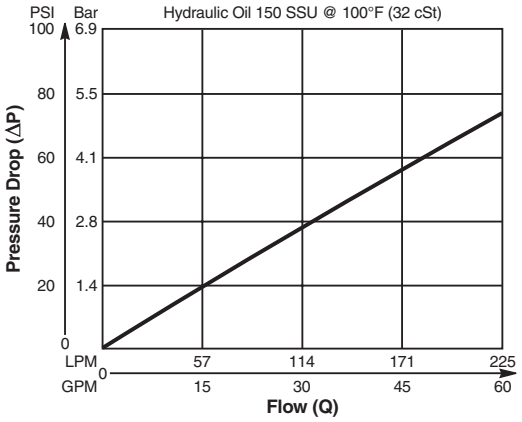
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker	X	X		
	Waterman	X	X		
	FPS			X	X
	CEC			X	X

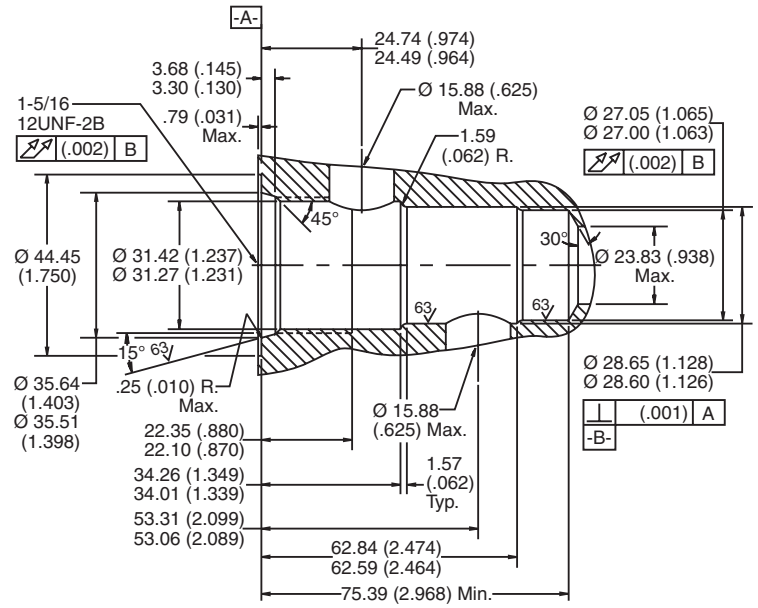
Performance Curve

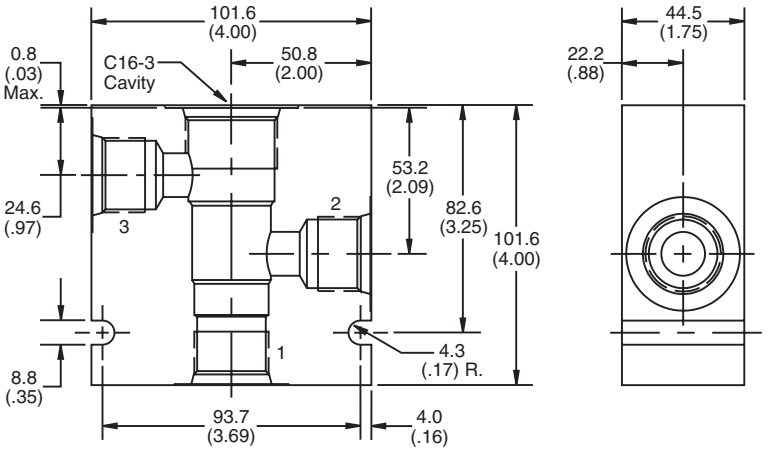
Pressure Drop vs. Flow



Dimensions

Millimeters (Inches)





Ordering Information

B16 — **3** — **16B**

16 Size | **3-Way Cavity** | **Port Size**

Port Size
1″ BSP

Body Material
Steel

Form Tool: Rougher NFT16-3R
Finisher NFT16-3F

Weight: 3.0 kg (6.5 lbs.)

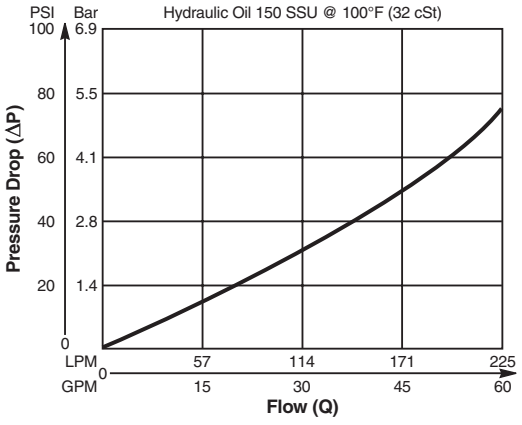
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

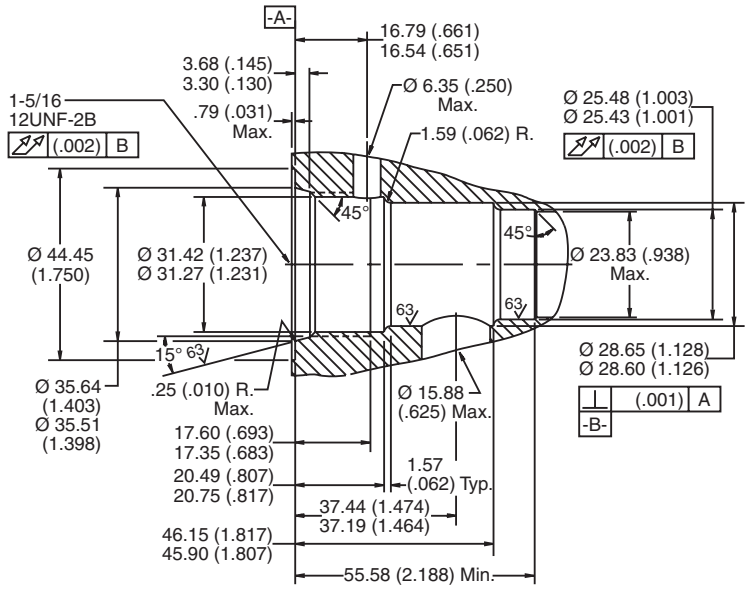
		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker	X	X	X	X
	Waterman	X	X	X	X
	FPS	X	X	X	X
	CEC	X	X	X	X

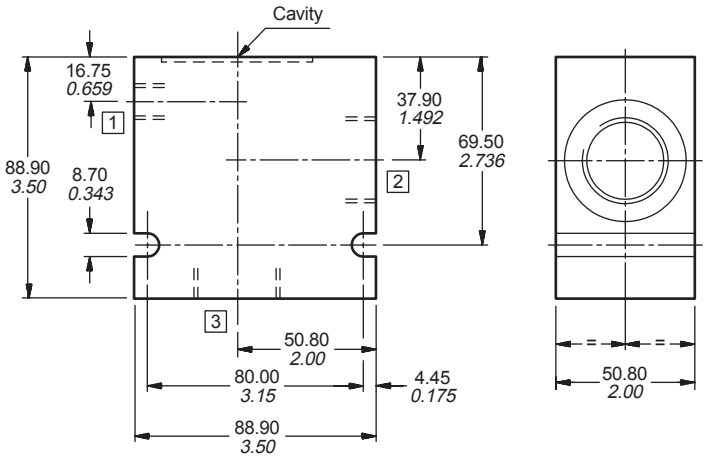
Performance Curve

Pressure Drop vs. Flow



Dimensions Millimeters (Inches)





Ordering Information

LB10	726	S
Line Body	Porting	Body Material

Code	Porting
726	1″ BSP

Code	Body Material
S	Steel

Form Tool: Rougher NFT16S-3R
Finisher NFT16S-3F
Weight: 2.4 kg (5.4 lbs.)

Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

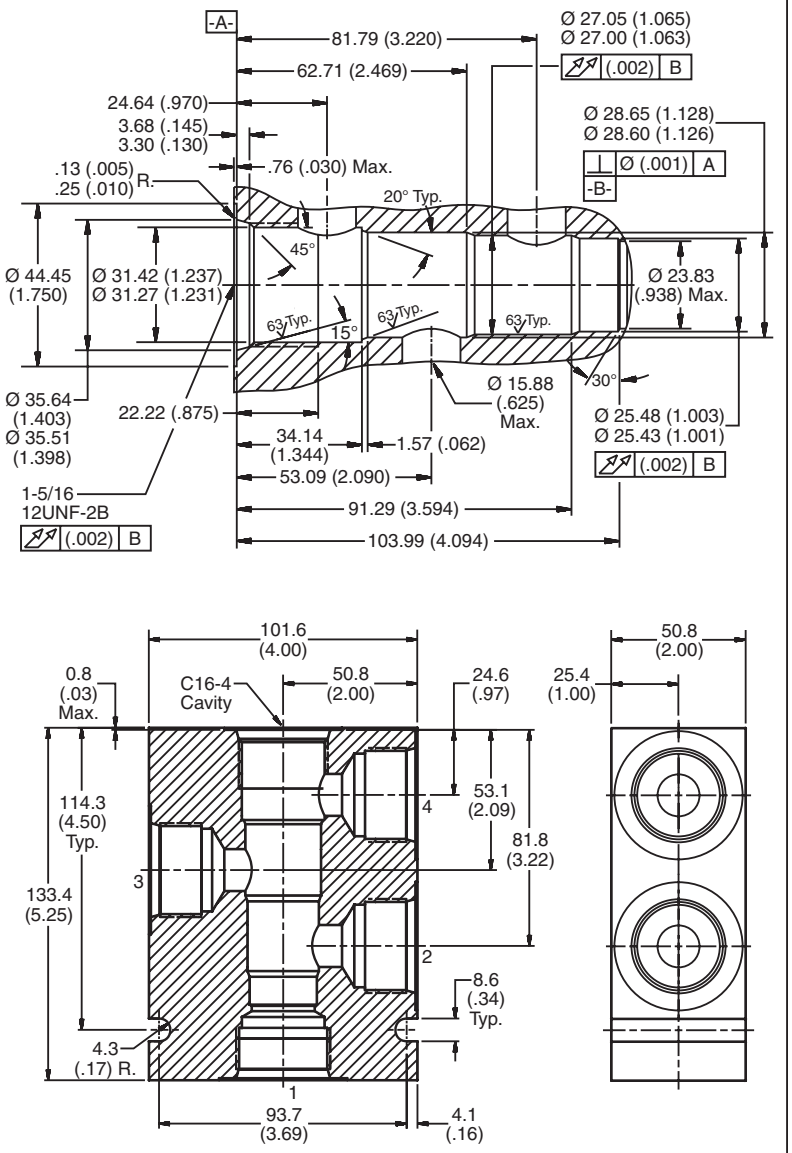
		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker	X	X		
	Waterman	X	X		
	FPS			X	X
	CEC			X	X

Performance Curve

Pressure Drop vs. Flow

Dimensions

Millimeters (Inches)



Ordering Information

B16 — **4** — **16B**

16 Size | **4-Way Cavity** | **Port Size**

Port Size
1″ BSP

Body Material
Steel

Form Tool: Rougher NFT16-4R
Finisher NFT16-4F

Weight: 3.75 kg (8.125 lbs.)

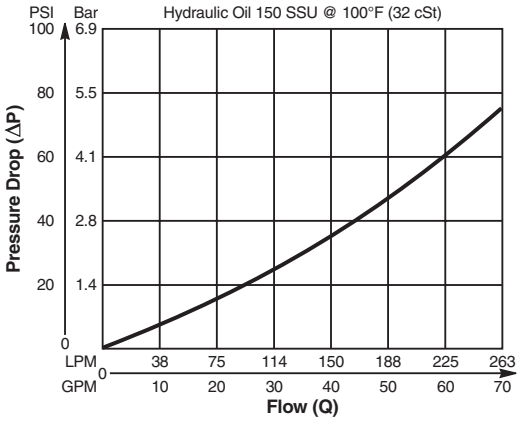
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker	X	X	X	X
	Waterman	X	X	X	X
	FPS	X	X	X	X
	CEC	X	X	X	X

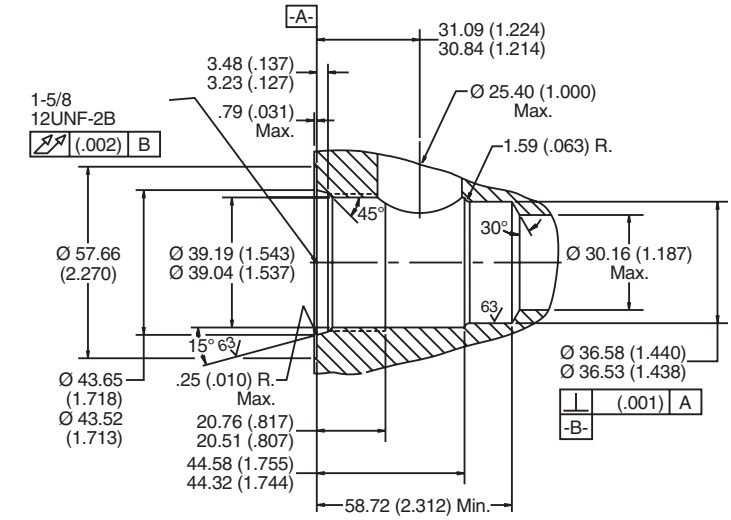
Performance Curve

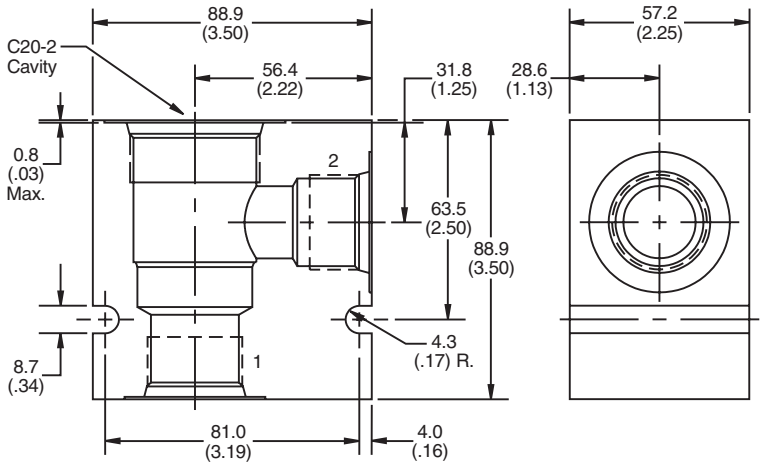
Pressure Drop vs. Flow



Dimensions

Millimeters (Inches)





Ordering Information

B20	—	2	—	20B
20 Size		2-Way Cavity		Port Size

Port Size
1. 1/4" BSP

Body Material
Steel

Form Tool: Rougher None
Finisher NFT20-2F

Weight: 6.3 kg (14 lbs.)

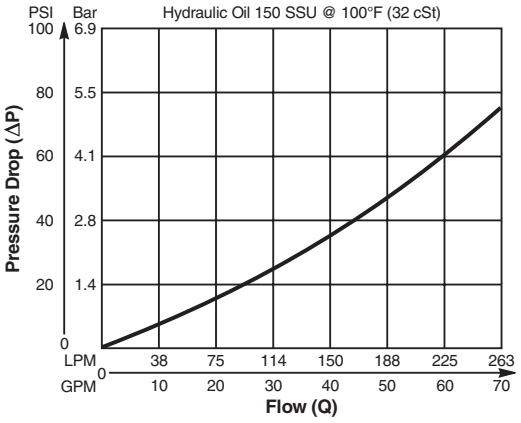
Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE			
		Parker	Waterman	FPS	CEC
CAVITY	Parker				
	Waterman				
	FPS				
	CEC				X

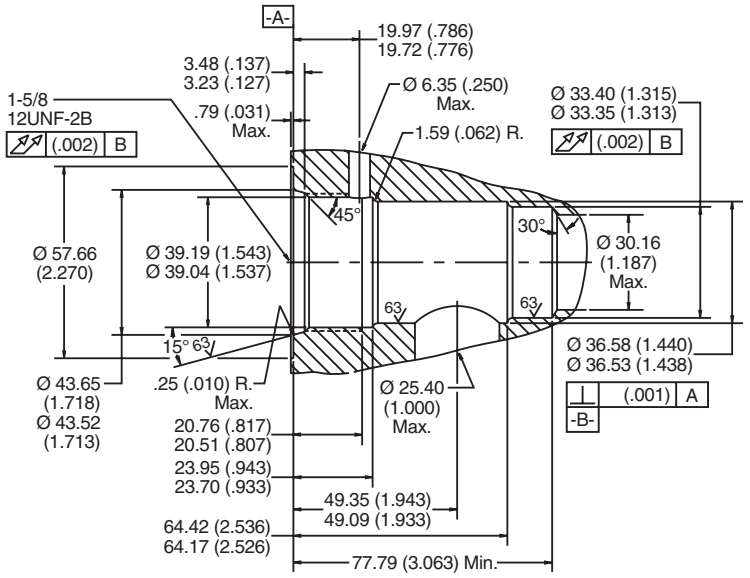
Performance Curve

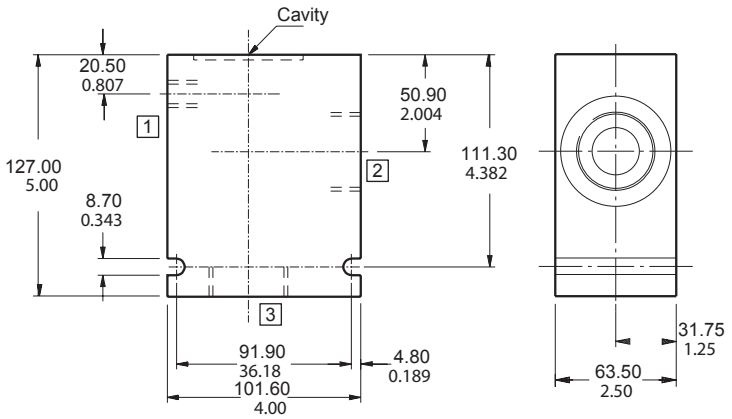
Pressure Drop vs. Flow



Dimensions

Millimeters (Inches)





Ordering Information

LB10	746	S
Line Body	Porting	Body Material

Code	Porting
746	1.1/4″ BSP

Code	Body Material
S	Steel

Form Tool: Rougher NFT20S-3R
Finisher NFT20S-3F
Weight: 10.8 kg (22.2 lbs.)

Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE	
		MHC-010	2-N-4*-10
CAVITY	MHC-010	X	X
	2-N-4*-10	X	X

Ordering Information

MHC	—	010	—		—	53
Counterbalance Cartridge Valve		Nominal Flow Rating		Body Type		Port Size

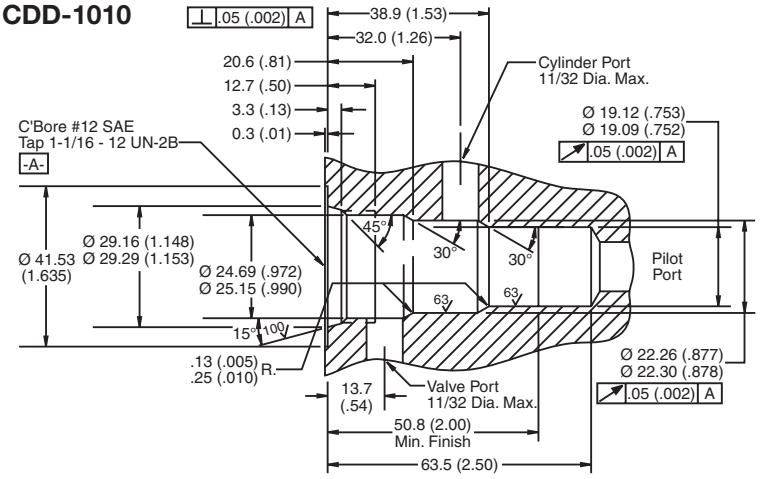
Code	Body Type
A	Single
D	Dual

Code	Port Size
53	SAE-10 through port

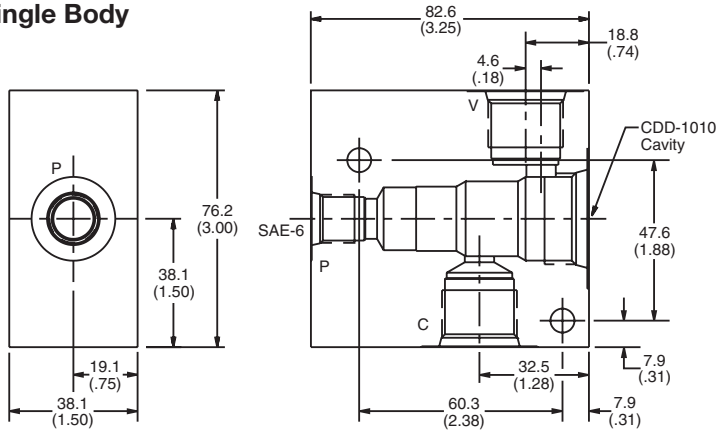
Form Tool: FR-500
Weight: Single 1.1 kg (2.25 lbs.)
Dual 1.9 kg (4.10 lbs.)

Dimensions Millimeters (Inches)

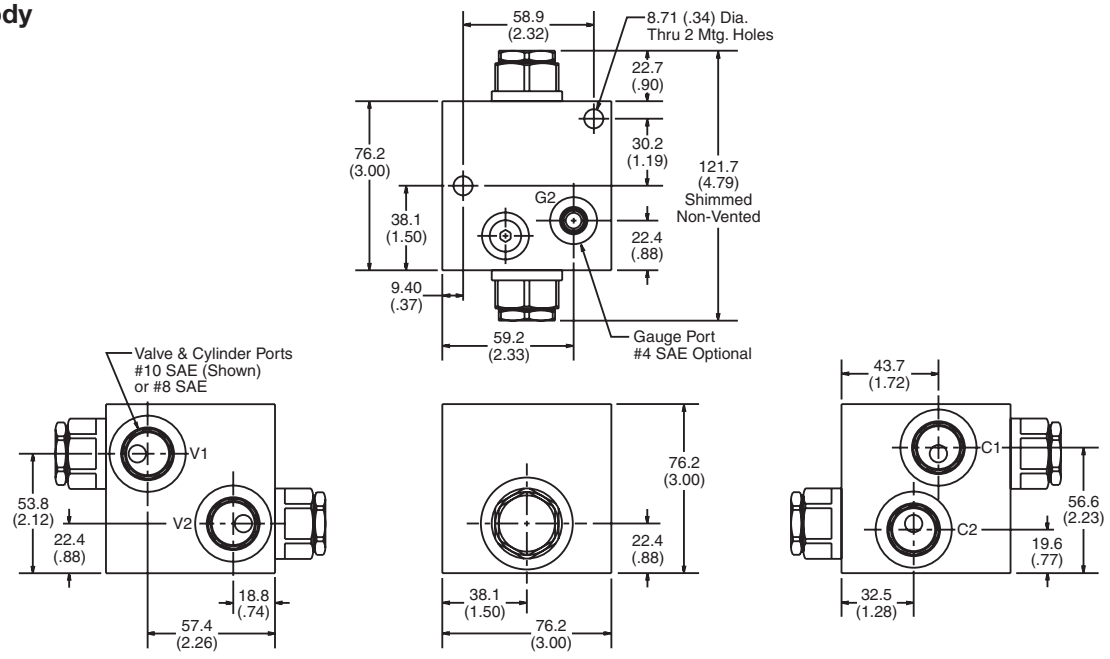
CDD-1010



Single Body



Dual Body



Valve/Cavity Compatibility

For additional information see Technical Tips on pages BC1-BC6.

		VALVE	
		MHC-022	2-N-4*-25
CAVITY	MHC-022	X	X
	2-N-4*-25	X	X

Ordering Information

MHC	—	022	—		—	53
Counterbalance Cartridge Valve		Nominal Flow Rating		Body Type		Port Size

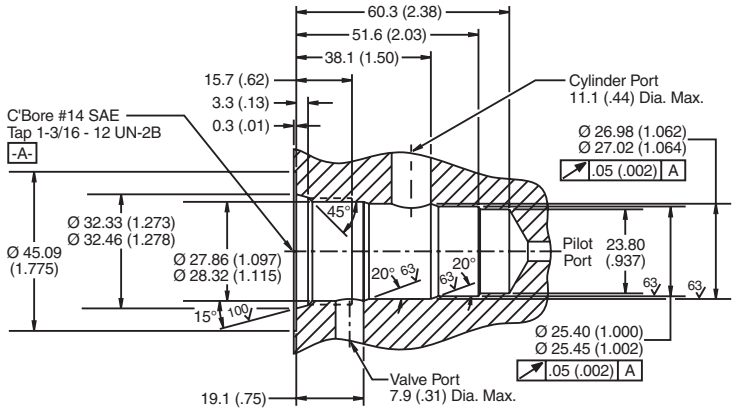
Code	Body Type
A	Single
D	Dual

Code	Port Size
53	SAE-10 through port

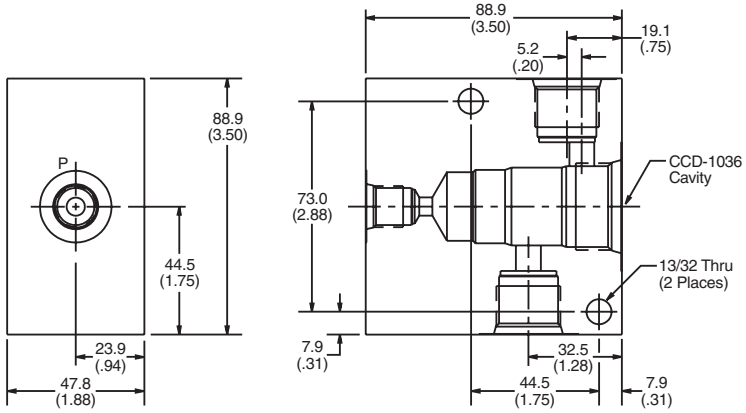
Form Tool: FR-501
Weight: Single 1.7 kg (3.75 lbs.)
Dual 2.7 kg (5.90 lbs.)

Dimensions Millimeters (Inches)

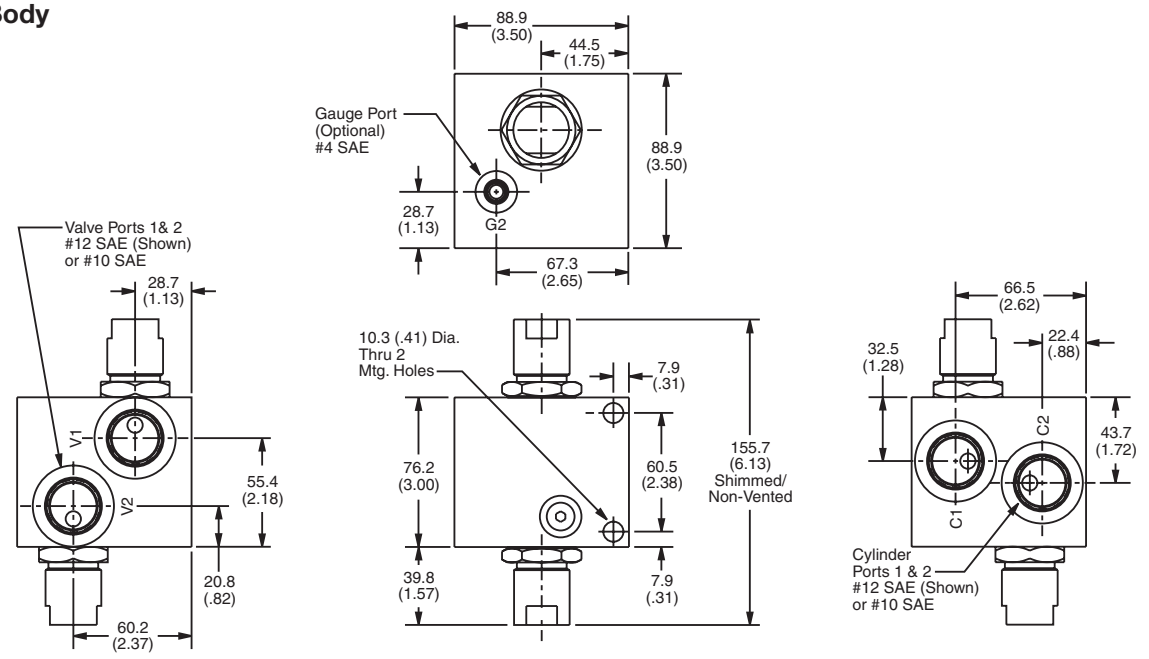
CDD-1036



Single Body



Dual Body



Notes

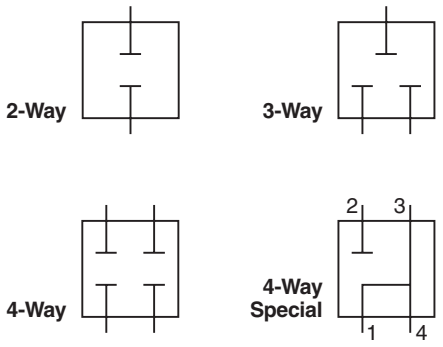
General Description

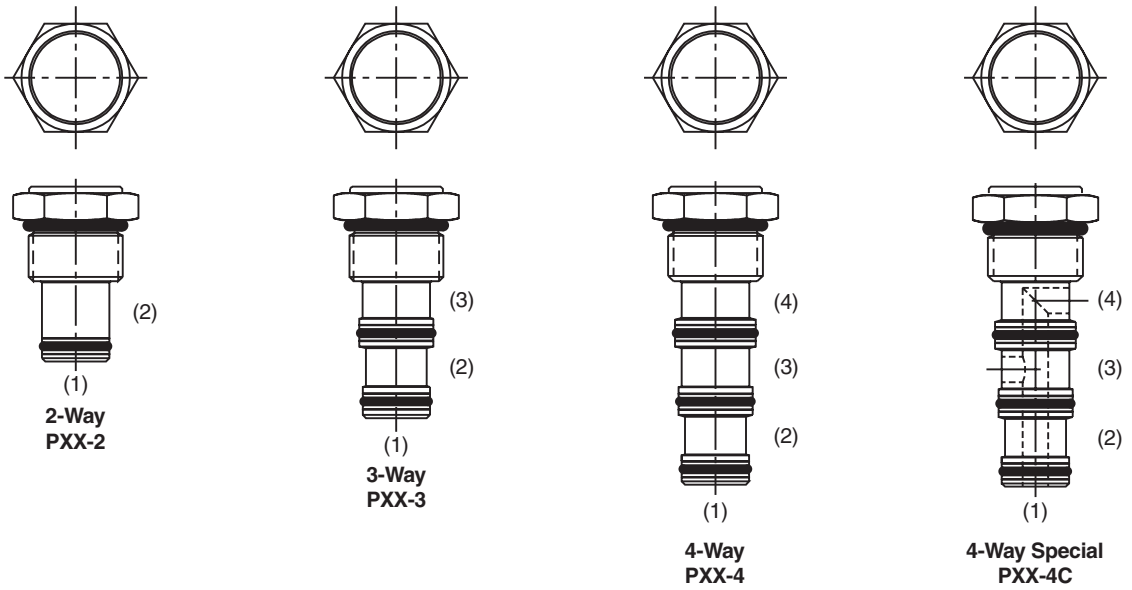
Parker cavity plugs can be used in any Integrated Hydraulic Circuit where one valve serves several machines and/or options. Two machines may have identical circuits except for one having a pressure reducing function, and the other not having this function. The machine that does not require this function can have the pressure reducing function replaced by a cavity plug; thereby utilizing a common body for both machines.

Specifications

Maximum Working Pressure - 350 Bar (5000 PSI)
Material - Steel

Symbols





Ordering Information

P		—			N
Plug	Cavity Plug Thread Size		Cavity Type	Type	Seals

Code	Cavity Plug Thread Size
08	3/4 - 16
10	7/8 - 14
12	1-1/16 - 12
16	1-5/16 - 12

Consult Factory for Shaded Areas.

Code	Cavity Type
2	Two Way
3	Three Way
4	Four Way
4C	Four Way Special

Type									
	Two Way		Three Way			Four Way			
Code	1	2	1	2	3	1	2	3	4
Omit	C	C	C	C	C	C	C	C	C
A			0	0	C	0	0	0	C
B			0	C	0	0	0	C	0
C			C	0	0	0	C	0	0
D						*0	*0	*C	*C
E						C	0	0	C

C = Blocked O = Open
** Only Available In Sizes 08 and 10.*
Consult Factory for Shaded Areas.

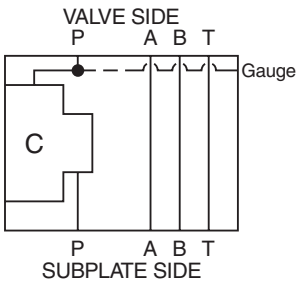
Code	Seals
Omit	Nitrile

General Description

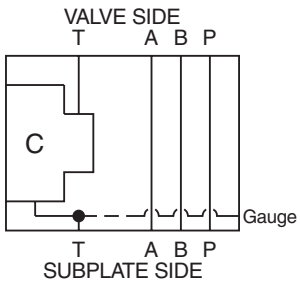
P Port Interrupt, 2-Way, D03 Cartpak Body.
For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



INVERTED



Ordering Information

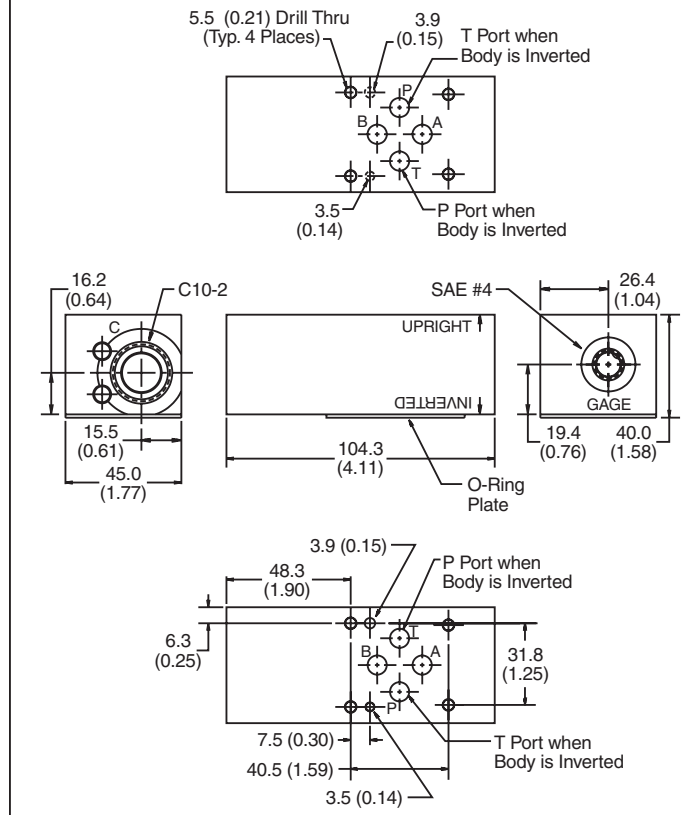
BD03	—	PN	—		
D03 Cartpak Body		P Port Interrupt 2-Way		Plug Seals	Body Material

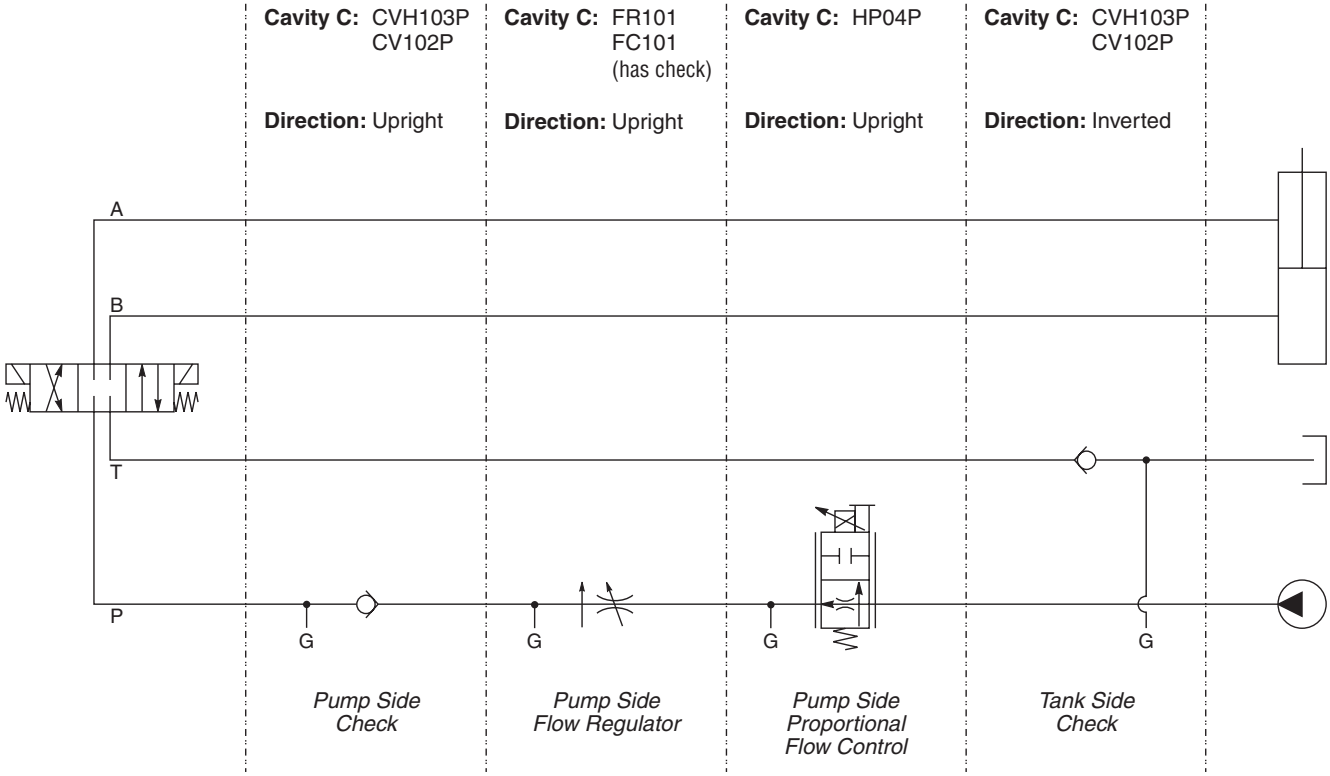
Code	Plug Seals
Omit	Nitrile

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
- Gage Port Plug Installed
- O-Ring Plate, O-Rings and Drive Pin Kit

Dimensions Millimeters (Inches)





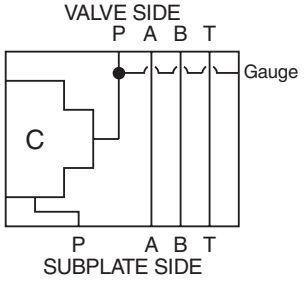
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

General Description

P Port Interrupt, 2-Way, D03 Cartpak Body.
For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



Ordering Information

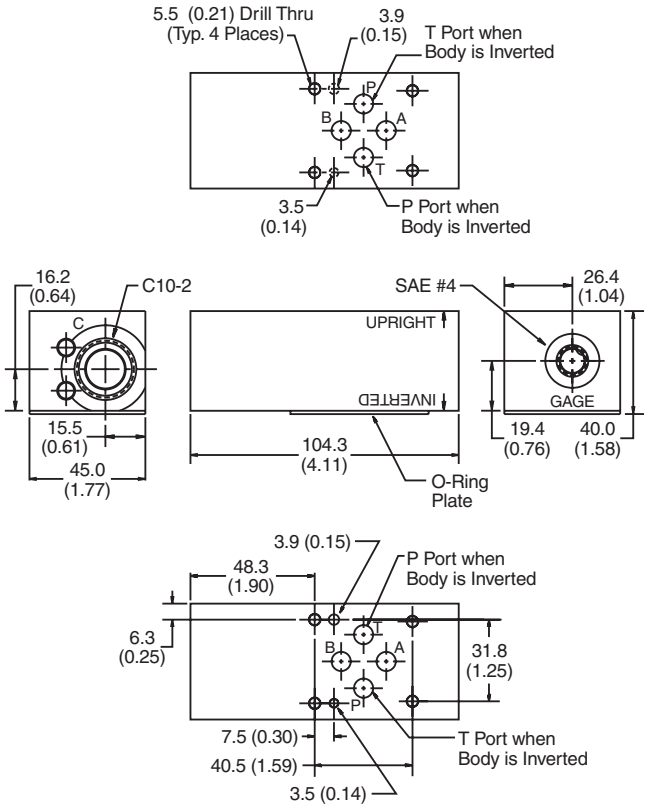
BD03	—	PN2	—		
D03 Cartpak Body		P Port Interrupt 2-Way		Plug Seals	Body Material

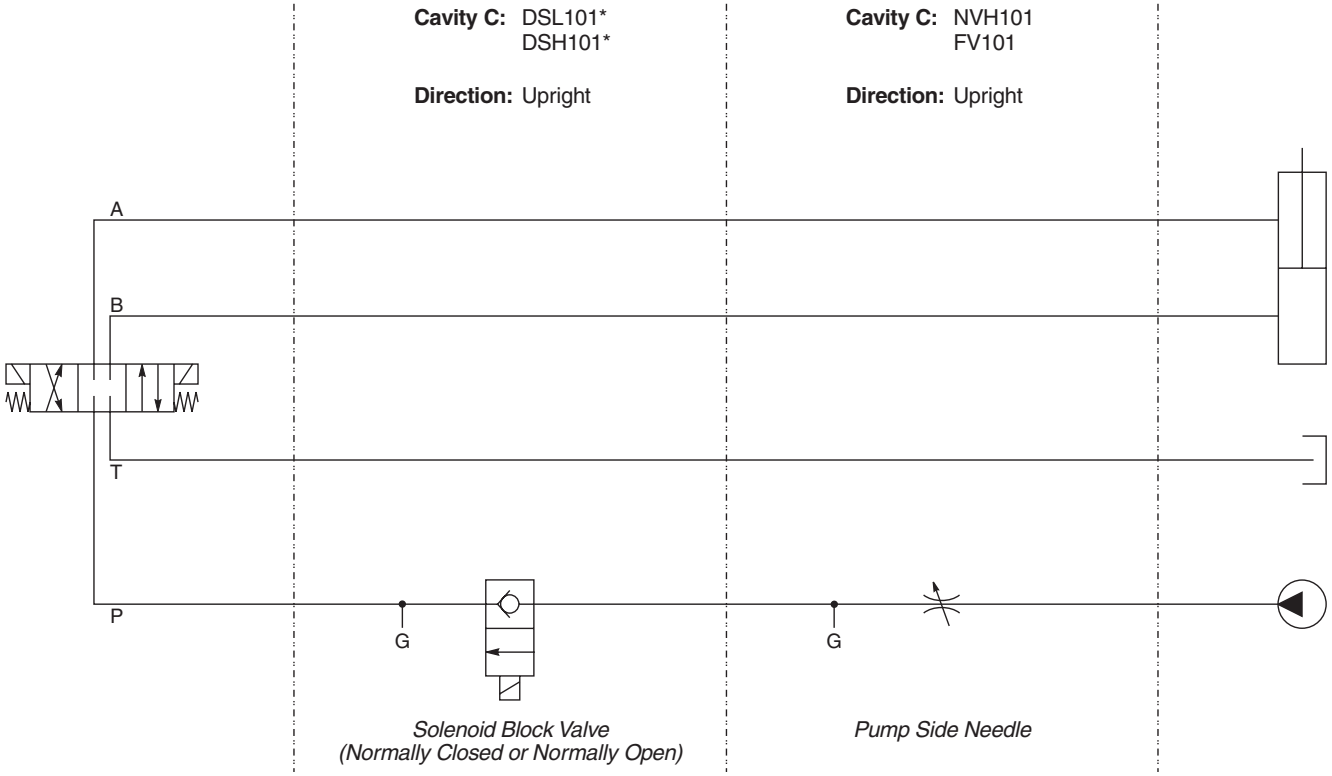
Code	Plug Seals
Omit	Nitrile

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
- Gage Port Plug Installed
- O-Ring Plate, O-Rings and Drive Pin Kit

Dimensions Millimeters (Inches)



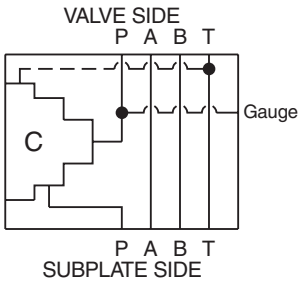


General Description

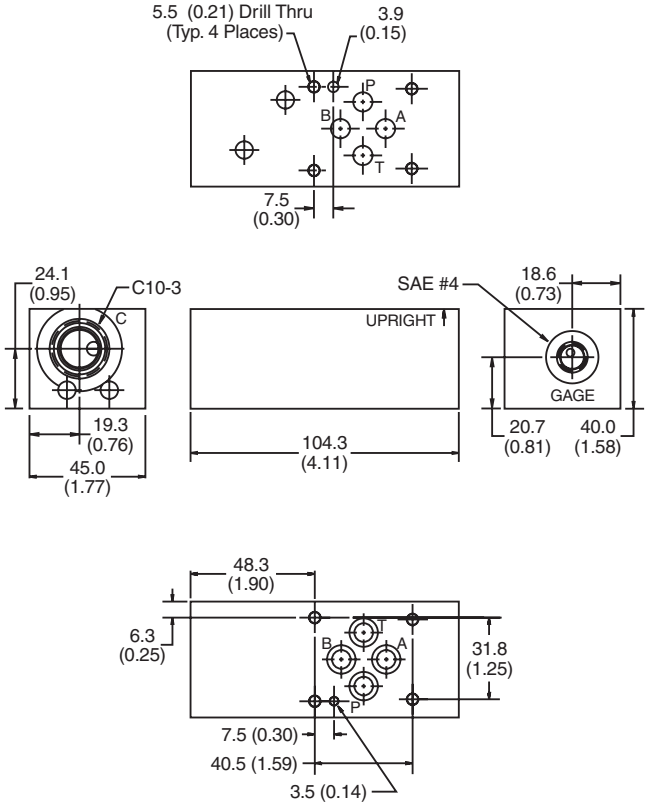
P Port Interrupt, Reducing Function, D03 Cartpak Body. For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



Dimensions Millimeters (Inches)



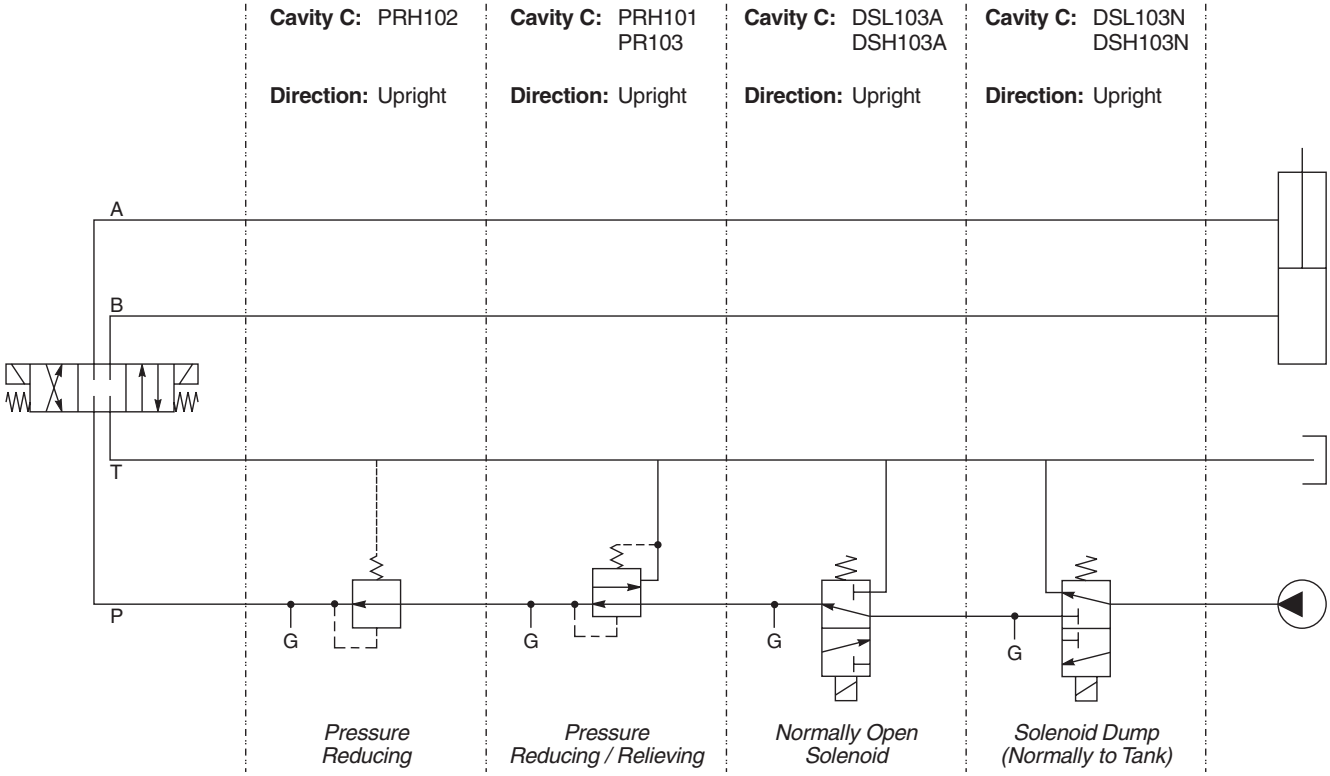
Ordering Information

BD03	—	PNR	—			
D03 Cartpak Body		**P Port Interrupt Reducing**		**Plug Seals**		**Body Material**

Code	Plug Seals
Omit	Nitrile

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
- Gage Port Plug Installed
- O-Rings and Drive Pin



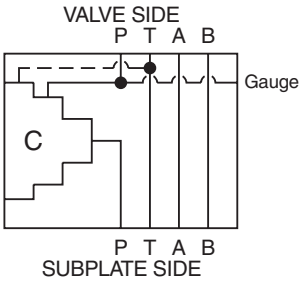
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

General Description

P Port Interrupt, Sequence Function, D03 Cartpak Body. For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



Ordering Information

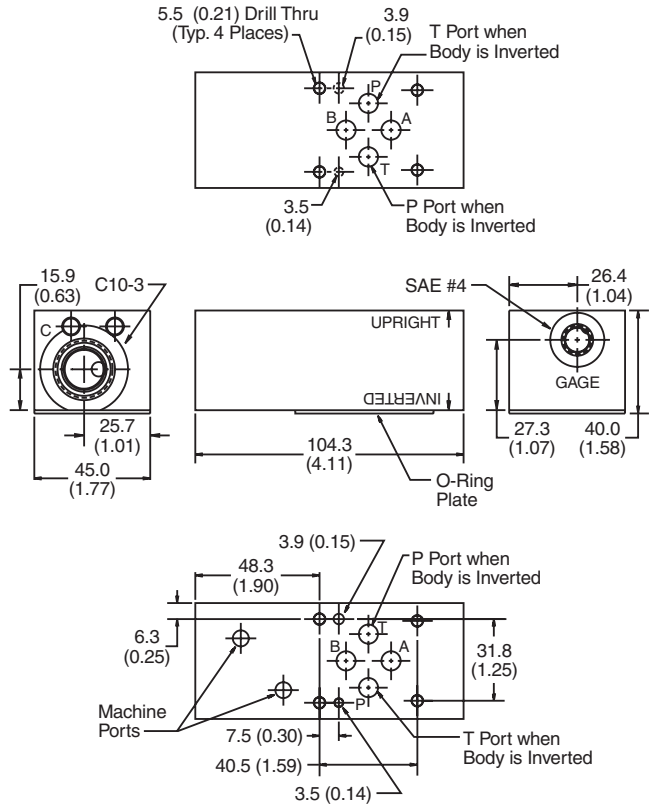
BD03	—	PNS	—		
D03 Cartpak Body		P Port Interrupt Sequence		Plug Seals	Body Material

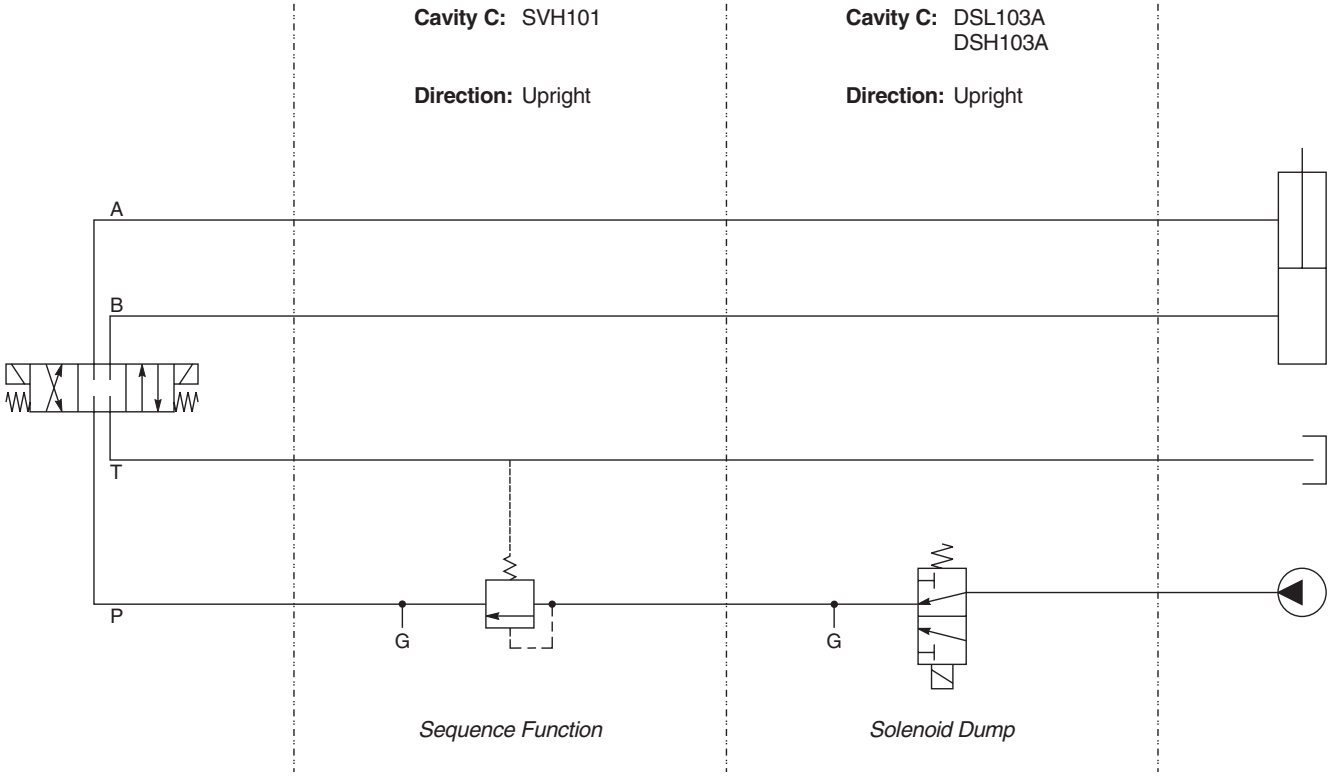
Code	Plug Seals
Omit	Nitrile

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
- Gage Port Plug Installed
- O-Ring Plate, O-Rings and Drive Pin Kit

Dimensions Millimeters (Inches)

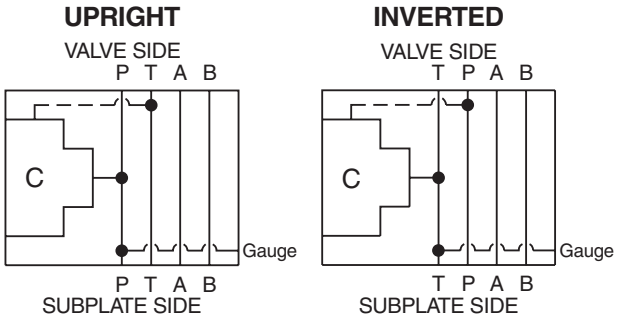




General Description

P to T D03 Cartpak Body.
For additional information see Technical Tips on pages BC1-BC6.

Body Schematic



Ordering Information

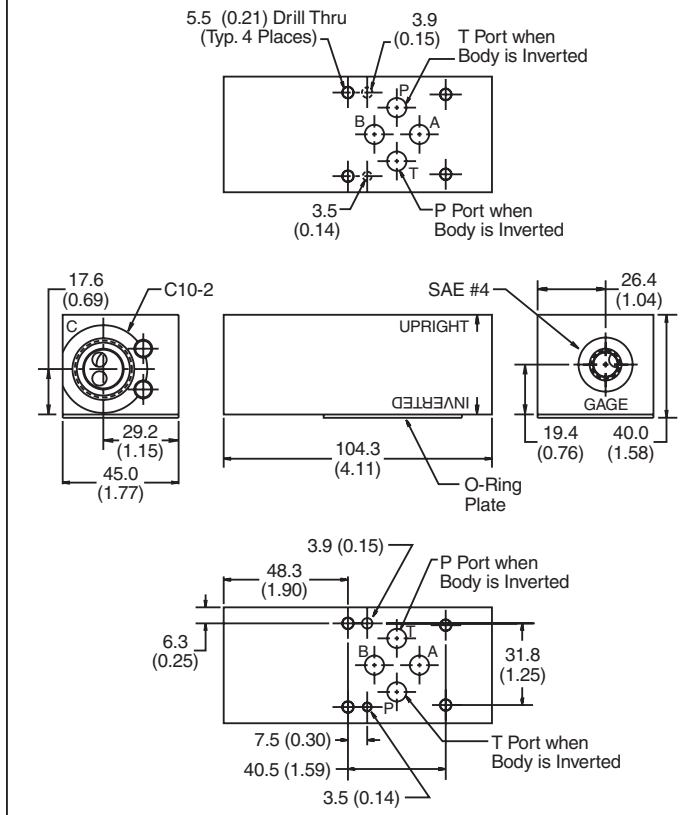
BD03	—	PT	—		
D03 Cartpak Body		P to T		Plug Seals	Body Material

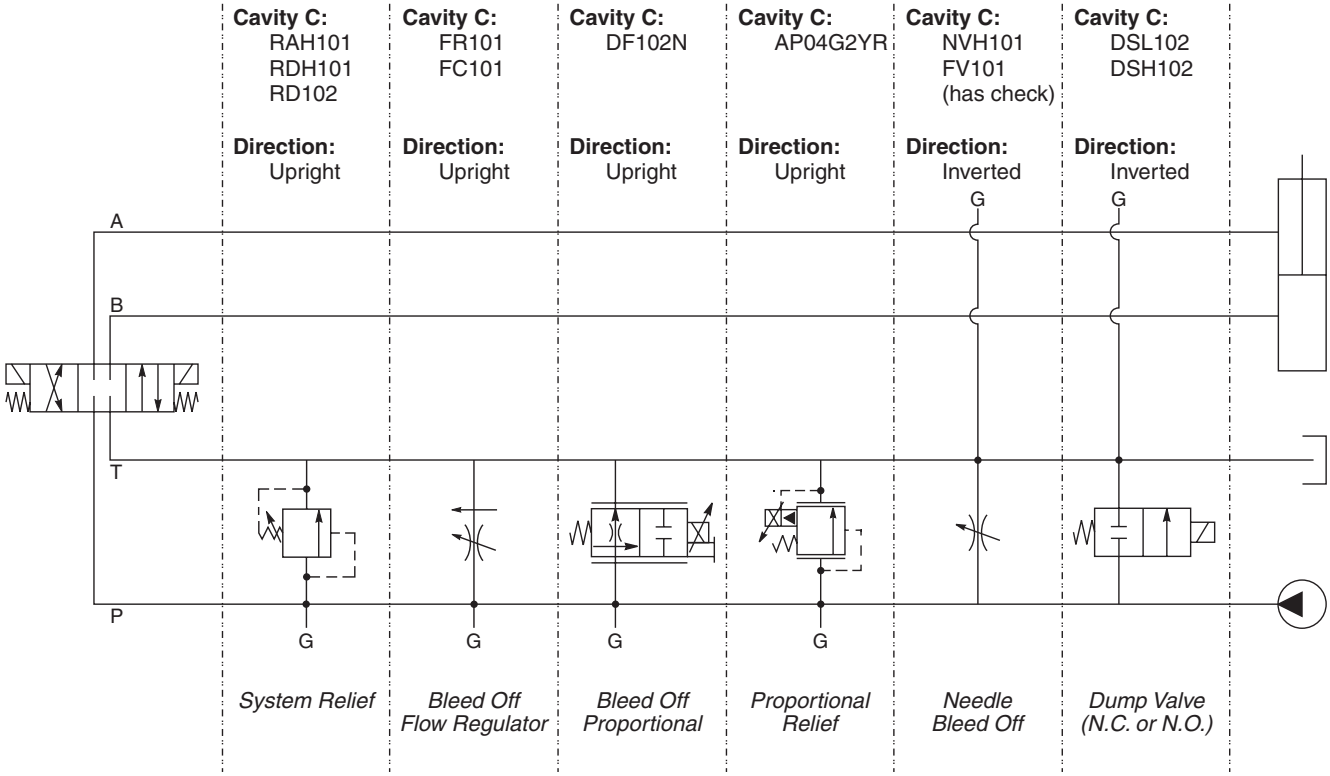
Code	Plug Seals
Omit	Nitrile

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
- Gage Port Plug Installed
- O-Ring Plate, O-Rings and Drive Pin Kit

Dimensions Millimeters (Inches)

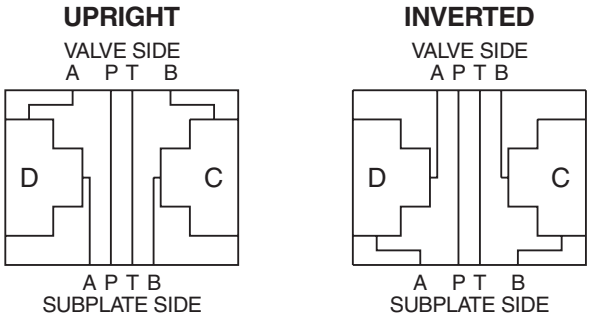




General Description

A and B Port Interrupt D03 Cartpak Body.
For additional information see Technical Tips on pages BC1-BC6.

Body Schematic



Ordering Information

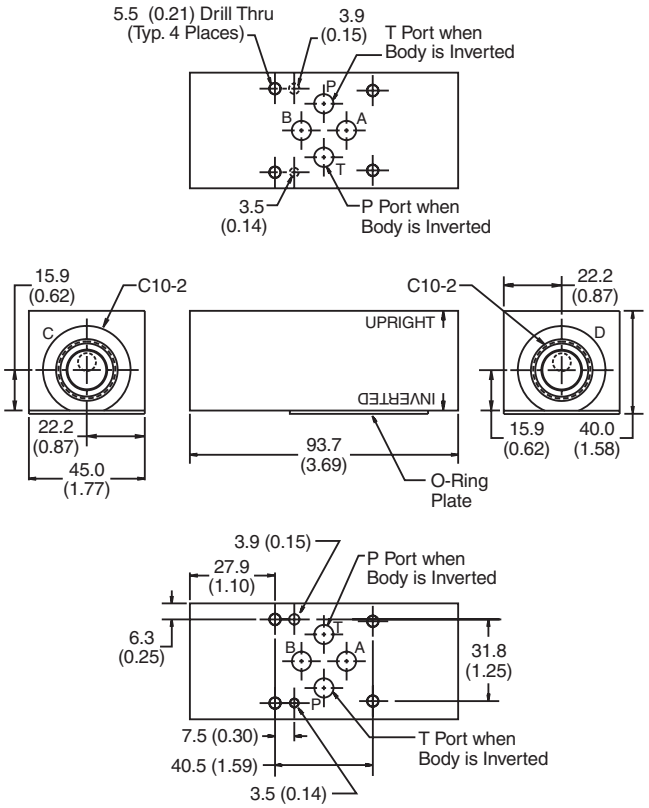
BD03	—	ABN	—			
D03 Cartpak Body		A & B Port Interrupt		Plug Seals		Body Material

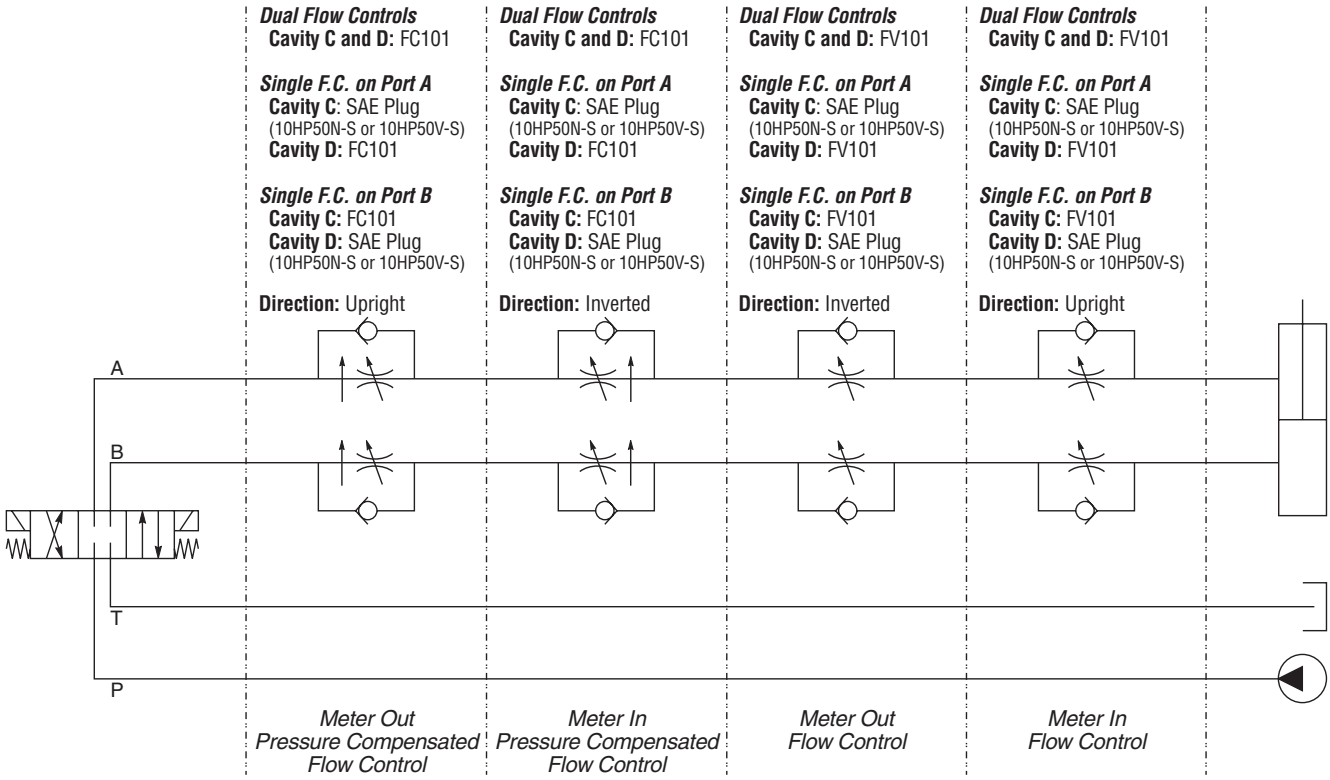
Code	Plug Seals
Omit	Nitrile

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
• O-Ring Plate, O-Rings and Drive Pin Kit

Dimensions Millimeters (Inches)



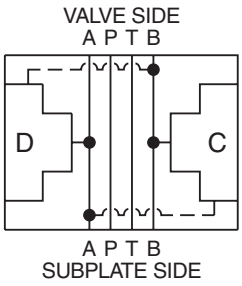


General Description

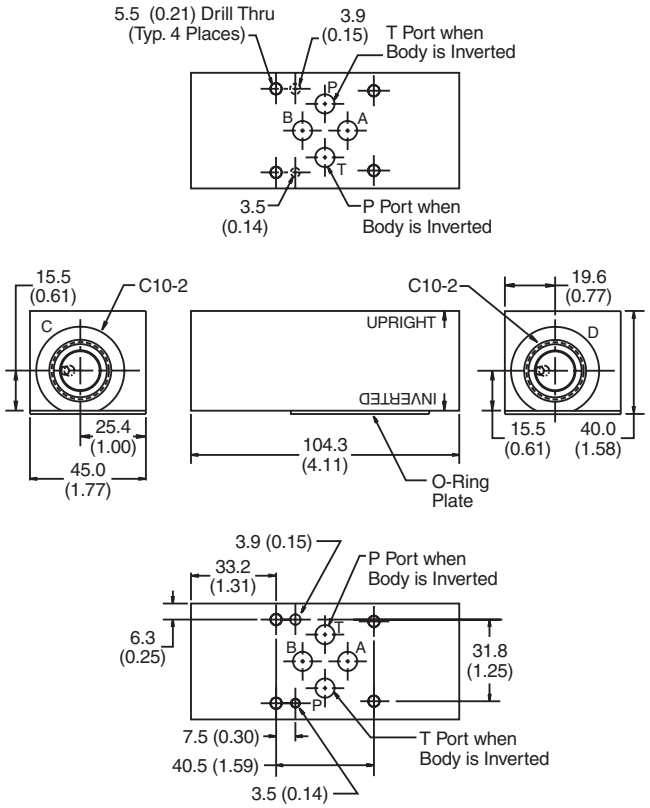
A and B Crossover D03 Cartpak Body.
For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



Dimensions Millimeters (Inches)



Ordering Information

BD03	—	ABX	—			
D03 Cartpak Body		A & B Crossover		Plug Seals		Body Material

Code	Plug Seals
Omit	Nitrile

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
• O-Ring Plate, O-Rings and Drive Pin Kit

Option 1
Cavity C: RAH101, RD102
Cavity D: RAH101, RD102

Option 2
Cavity C: RDH103
Cavity D: RDH103

Direction: Upright

Dual Crossover Relief

Option 1
Cavity C: P10-2
Cavity D: RDH103

Option 2
Cavity C: RAH101, RD102
Cavity D: P10-2

Direction: Upright

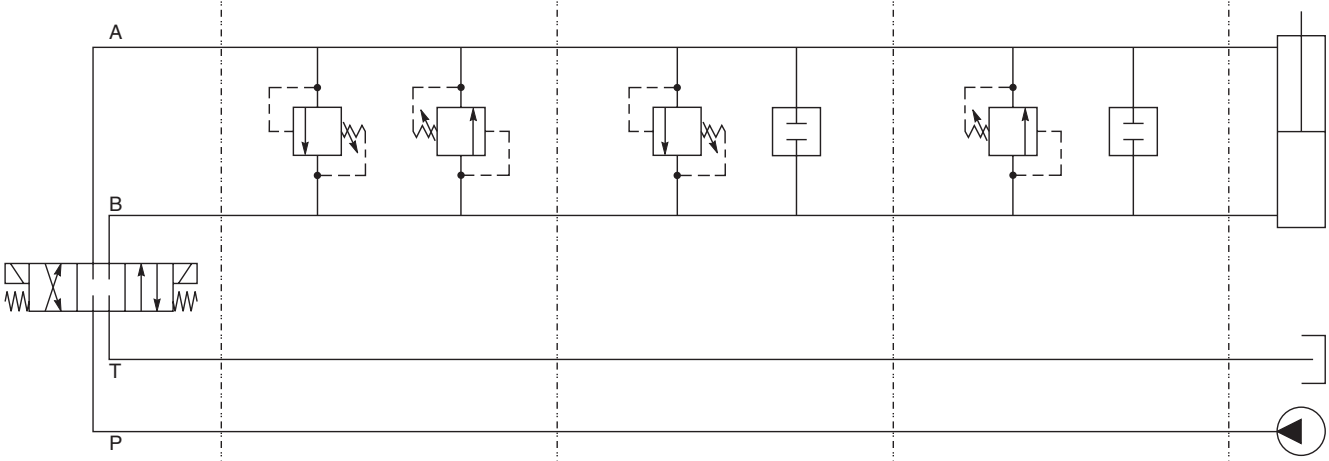
Relief In A Port

Option 1
Cavity C: RDH103
Cavity D: P10-2

Option 2
Cavity C: P10-2
Cavity D: RAH101, RD102

Direction: Upright

Relief In B Port

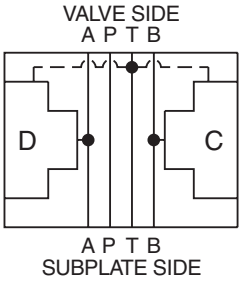


General Description

A and B Ports to Tank D03 Cartpak Body.
For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



Ordering Information

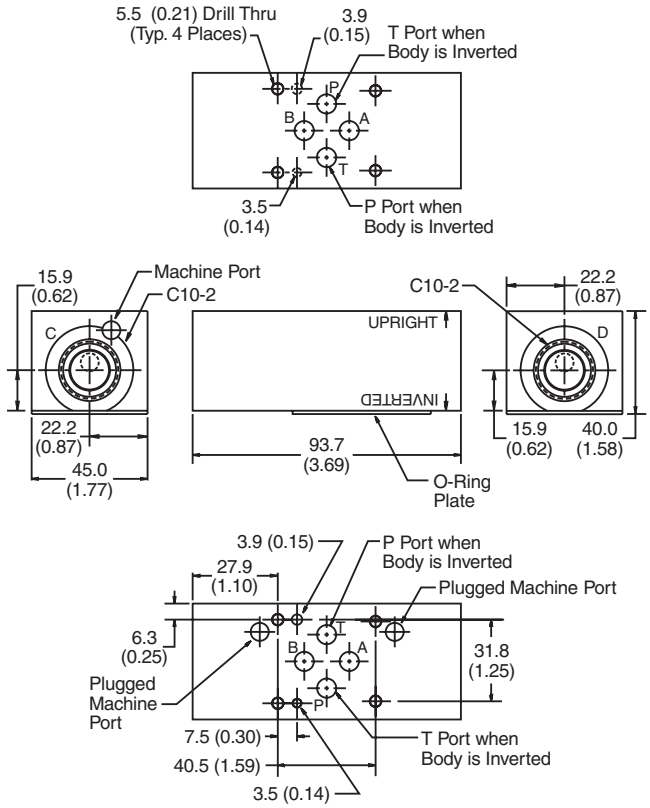
BD03	—	ABT	—			
D03 Cartpak Body		**A & B Ports to Tank**		**Plug Seals**		**Body Material**

Code	Plug Seals
Omit	Nitrile

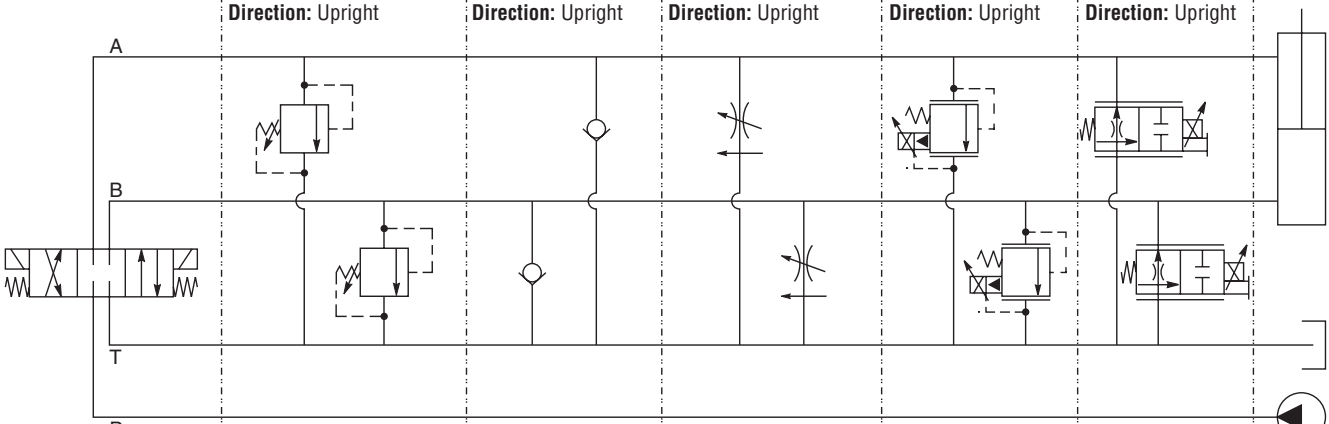
Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
• O-Ring Plate, O-Rings and Drive Pin Kit

Dimensions Millimeters (Inches)



Dual Relief **Cavity C and D:** RAH101, RD102	***Dual Makeup Checks*** **Cavity C and D:** CVH104P	***Dual Bleed Off*** **Cavity C and D:** FR101, FC101	***Dual Relief*** **Cavity C and D:** AP04G2YR	***Dual Bleed Off*** **Cavity C and D:** HP04P
Relief on Port A **Cavity C:** P10-2 **Cavity D:** RAH101, RD102	***Check on Port A*** **Cavity C:** P10-2 **Cavity D:** CVH104P	***Bleed Off on Port A*** **Cavity C:** P10-2 **Cavity D:** FR101, FC101	***Relief on Port A*** **Cavity C:** P10-2 **Cavity D:** AP04G2YR	***Bleed Off on Port A*** **Cavity C:** P10-2 **Cavity D:** HP04P
Relief on Port B **Cavity C:** RAH101, RD102 **Cavity D:** P10-2	***Check on Port B*** **Cavity C:** CVH104P **Cavity D:** P10-2	***Bleed Off on Port B*** **Cavity C:** FR101, FC101 **Cavity D:** P10-2	***Relief on Port B*** **Cavity C:** AP04G2YR **Cavity D:** P10-2	***Bleed Off on Port B*** **Cavity C:** HP04P **Cavity D:** P10-2
Direction: Upright	**Direction:** Upright	**Direction:** Upright	**Direction:** Upright	**Direction:** Upright



A and B Relief | *Makeup Checks* | *Flow Control A and B Bleed Off* | *Proportional Relief A and B* | *Proportional Bleed Off*

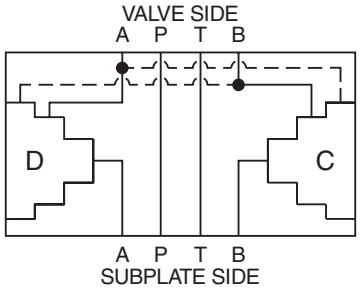
Parker Hannifin Corporation
Mobile Hydraulic Systems Division Europe

General Description

Dual (Ports A and B) Drain to Crossover Port D03 Cartpak Body. For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



Ordering Information

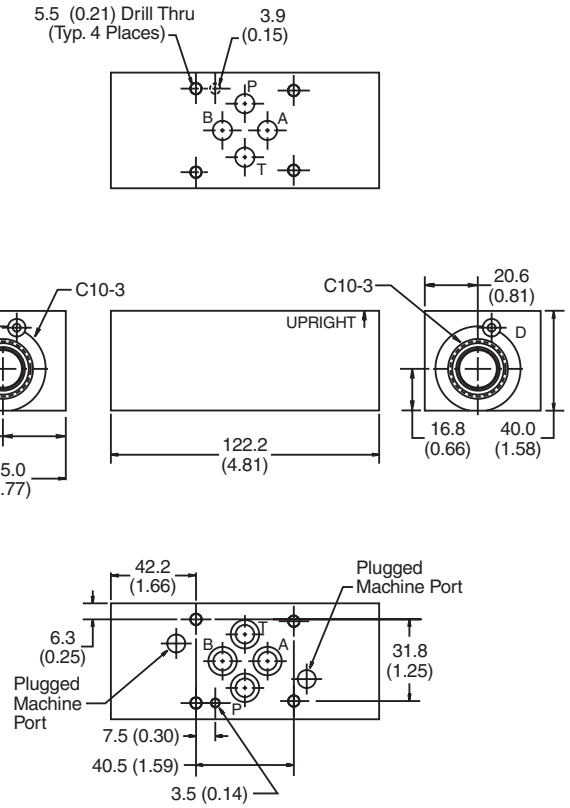
BD03	—	DDX	—			
D03 Cartpak Body		Dual (Ports A & B) Drain to Crossover		Plug Seals		Body Material

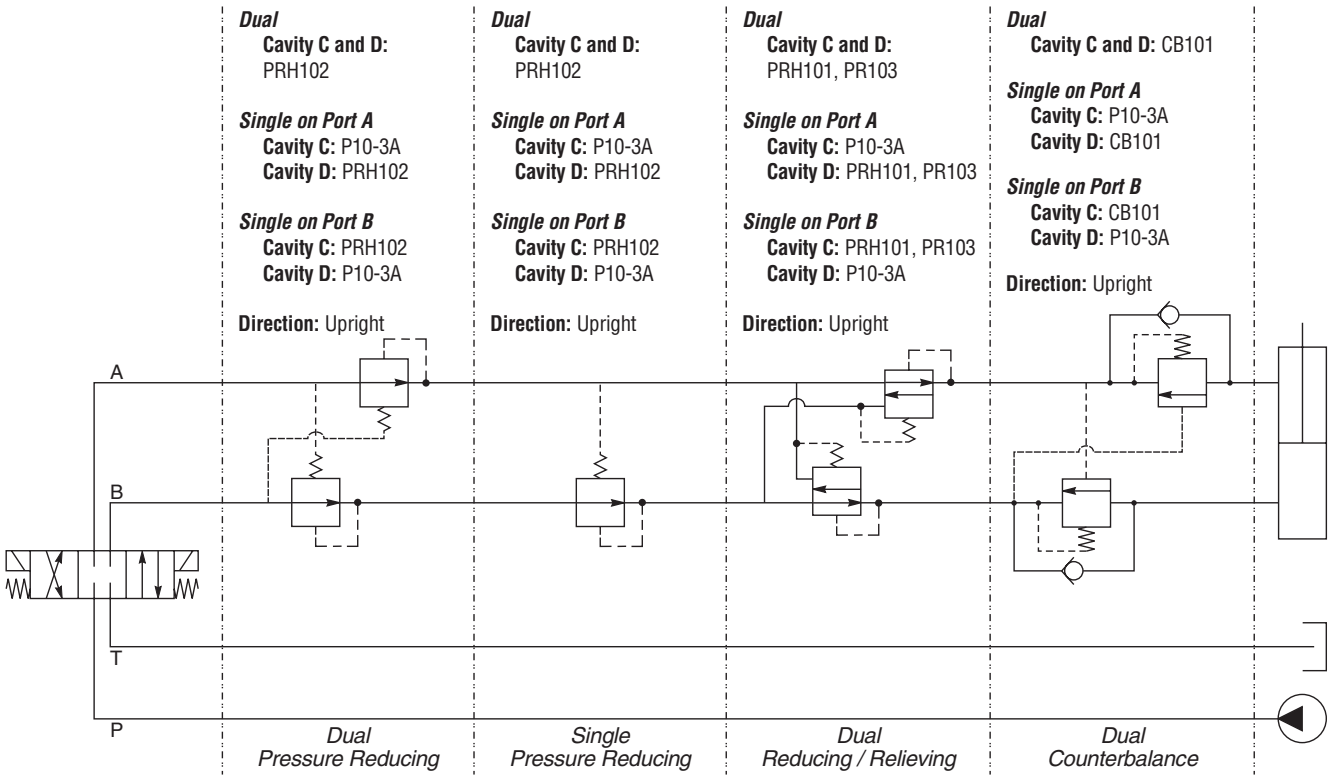
Code	Plug Seals
Omit	Nitrile

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
• O-Rings and Drive Pin

Dimensions Millimeters (Inches)



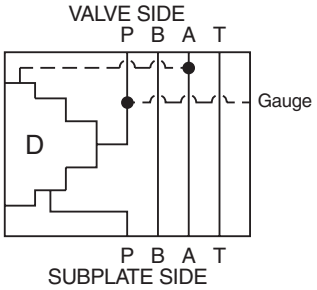


General Description

B Port Drain to A D03 Cartpak Body.
For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



Ordering Information

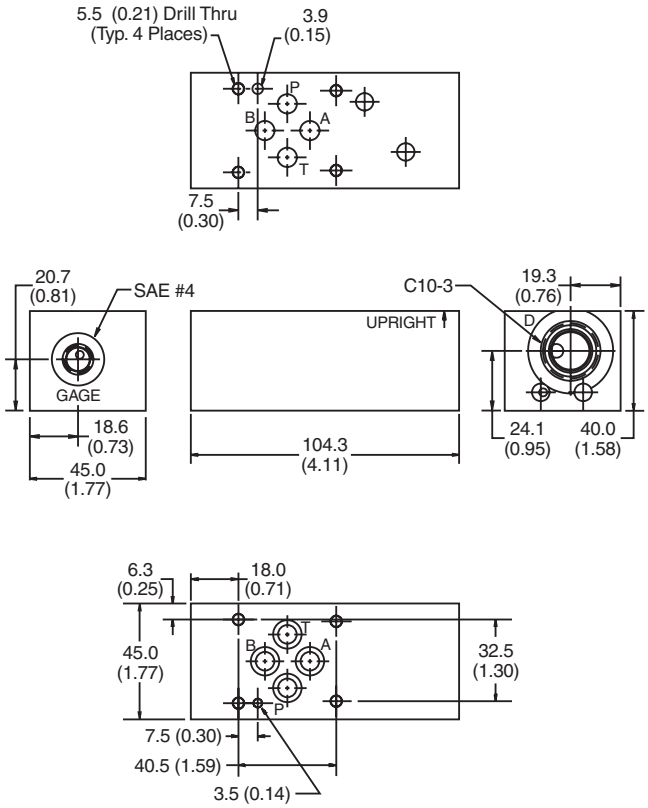
BD03	—	BDA	—		
D03 Cartpak Body		B Port Drain to A		Plug Seals	Body Material

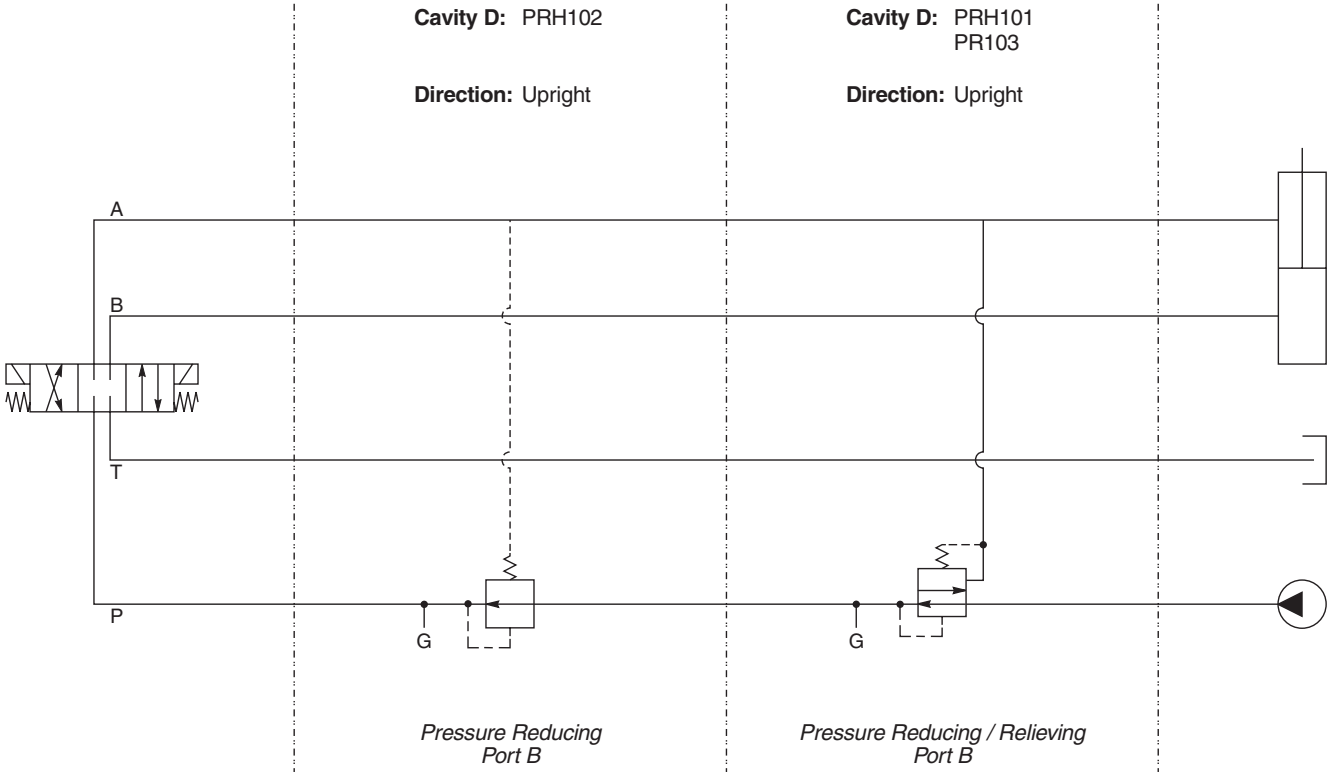
Code	Plug Seals
Omit	Nitrile

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
- Gage Port Plug Installed
- O-Rings and Drive Pin

Dimensions Millimeters (Inches)



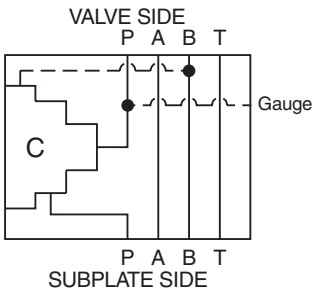


General Description

A Port Drain to B D03 Cartpak Body.
For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



Ordering Information

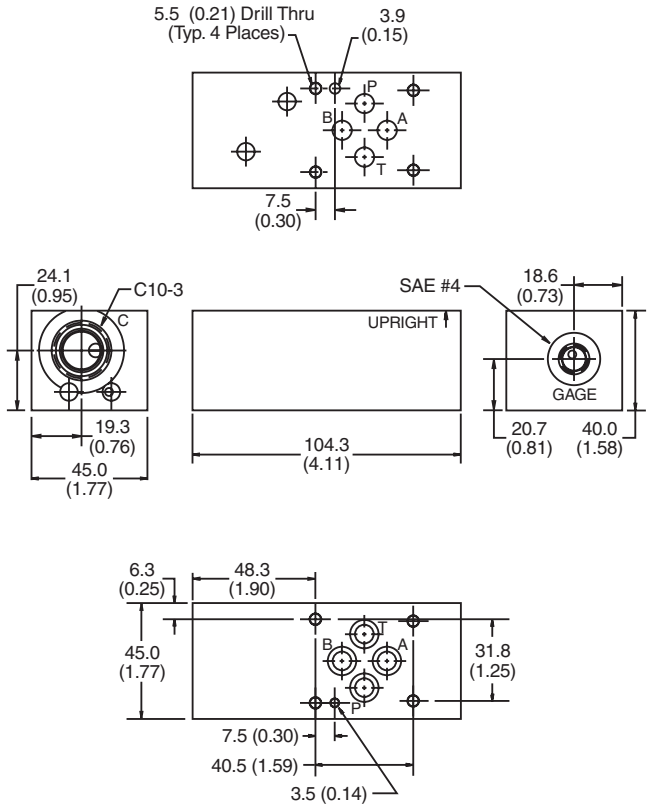
BD03	—	ADB	—		
D03 Cartpak Body		A Port Drain to B		Plug Seals	Body Material

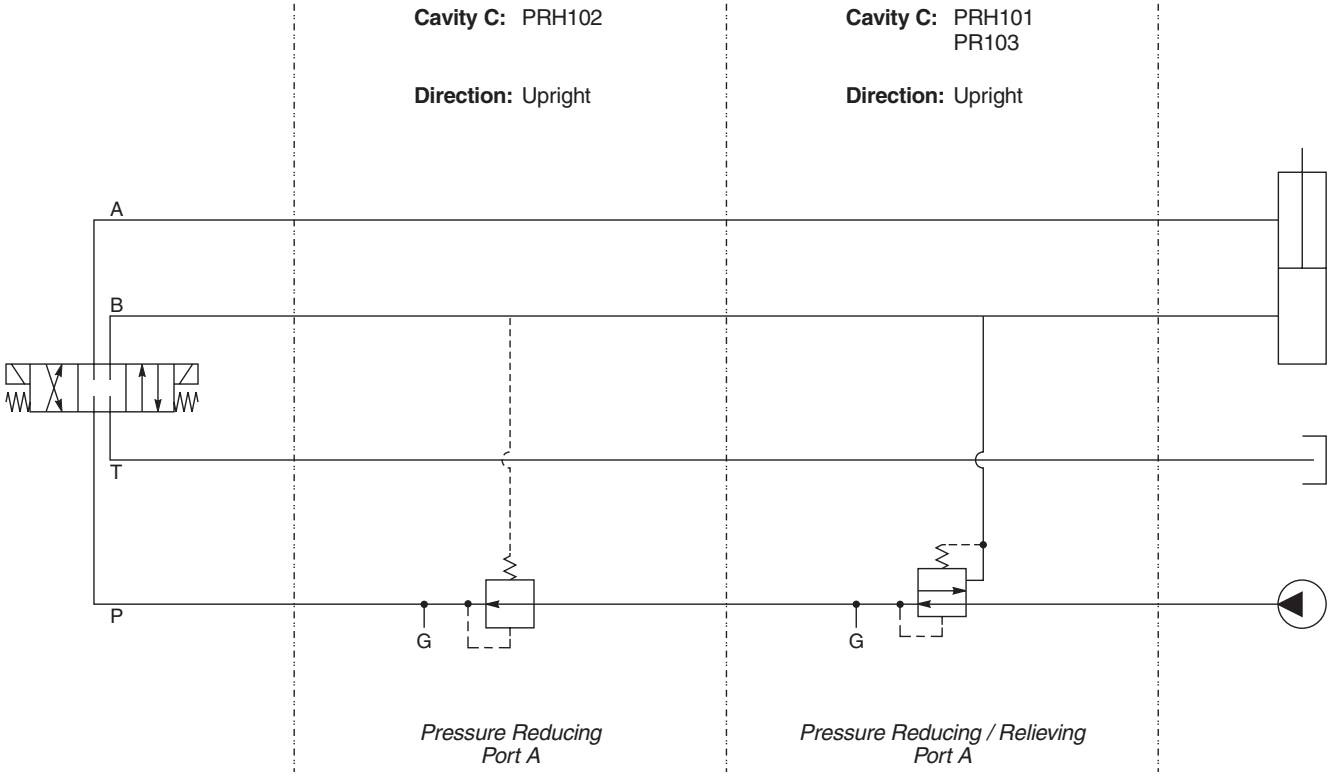
Code	Plug Seals
Omit	Nitrile

Code	Body Material
A	Aluminum
S	Steel (Ductile Iron)

Body supplied with:
- Gage Port Plug Installed
- O-Rings and Drive Pin

Dimensions Millimeters (Inches)



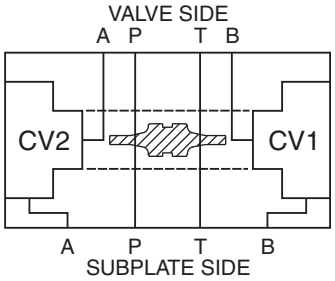


General Description

Dual P.O. Check D03 Cartpak Body.
For additional information see Technical Tips on pages BC1-BC6.

Body Schematic

UPRIGHT



Ordering Information

BD03	—	POC	—		
D03 Cartpak Body		A & B Ports to Tank		Plug Seals	Body Material

Code	Plug Seals
Omit	Nitrile

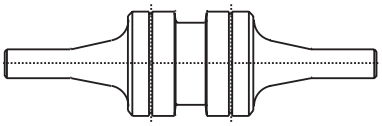
Code	Body Material
A	Aluminum

Body supplied with:
• O-Rings and Drive Pin Kit

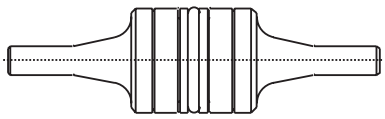
Functional assembly requires:
• CVH103P* - Check Valve - Qty. 2 - Ordered Separately
• 717917† - Pilot Piston - Qty. 1 - Ordered Separately

**** Indicates spring pressure option***
† Indicates seal option

Requires Dual Pilot Piston



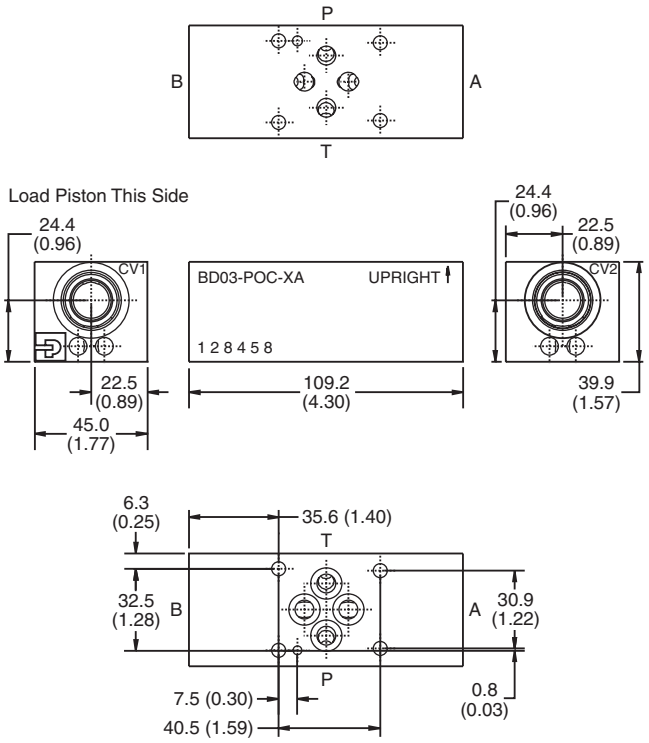
717917 Without Seal



717917N With Buna N Seal
717917V With Viton Seal

NOTE: *20 PSI check valve or higher recommended with sealed pilot piston.*

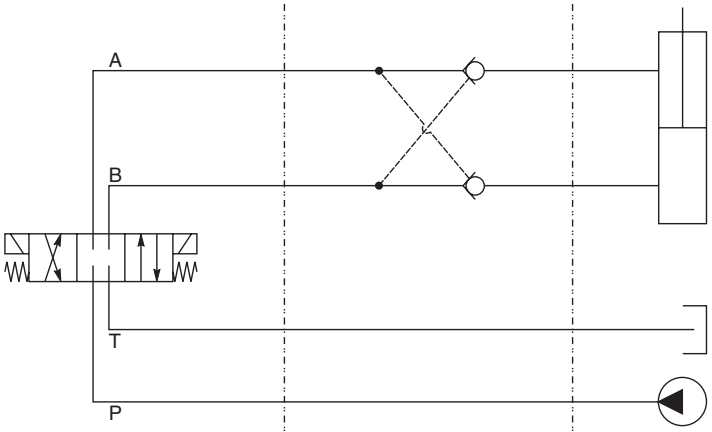
Dimensions Millimeters (Inches)



Dual Checks
Cavity CV1 and CV2:
CVH103P

Check on CV1
CVH103P
Load Piston This Side

Check on CV2
CVH103P

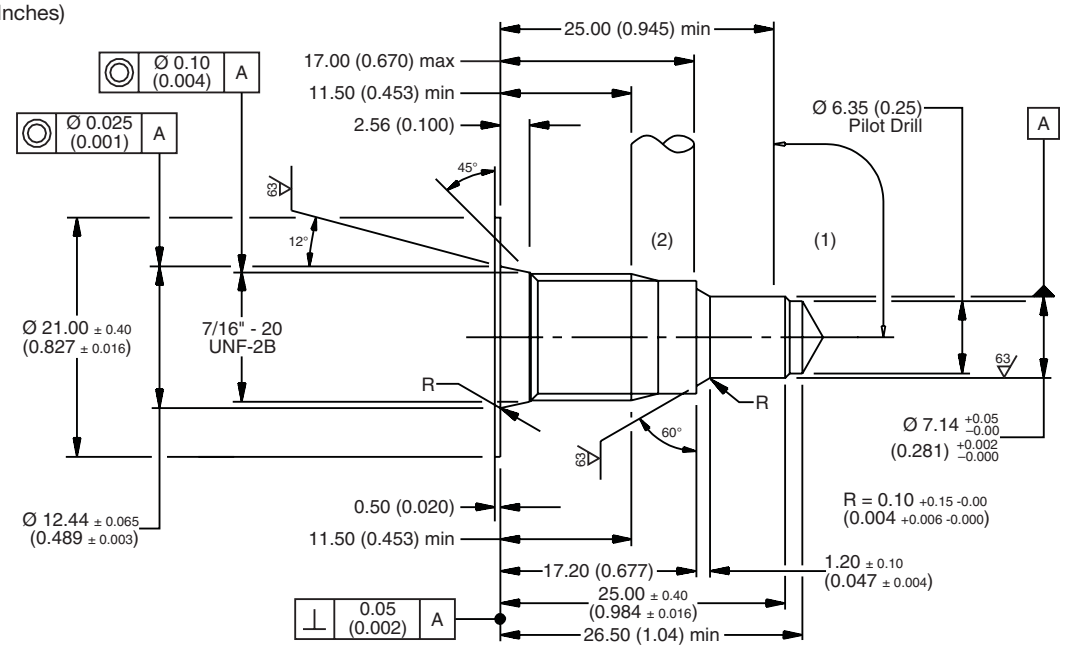


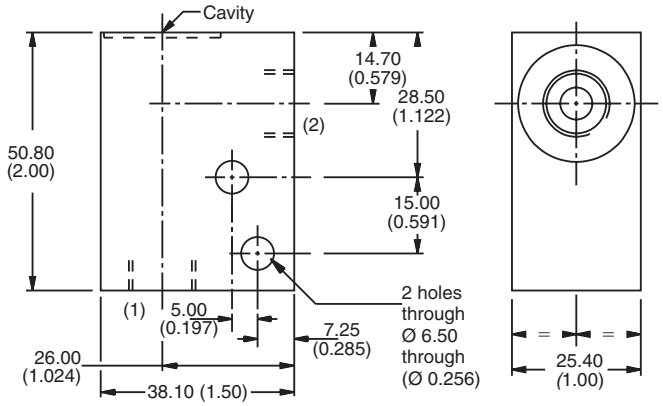
Dual Pilot Operated Check Valve

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)





Ordering Information

LB10	796	S
Line Body	Port Size	Body Material

Code	Porting
796	1/4″ BSP

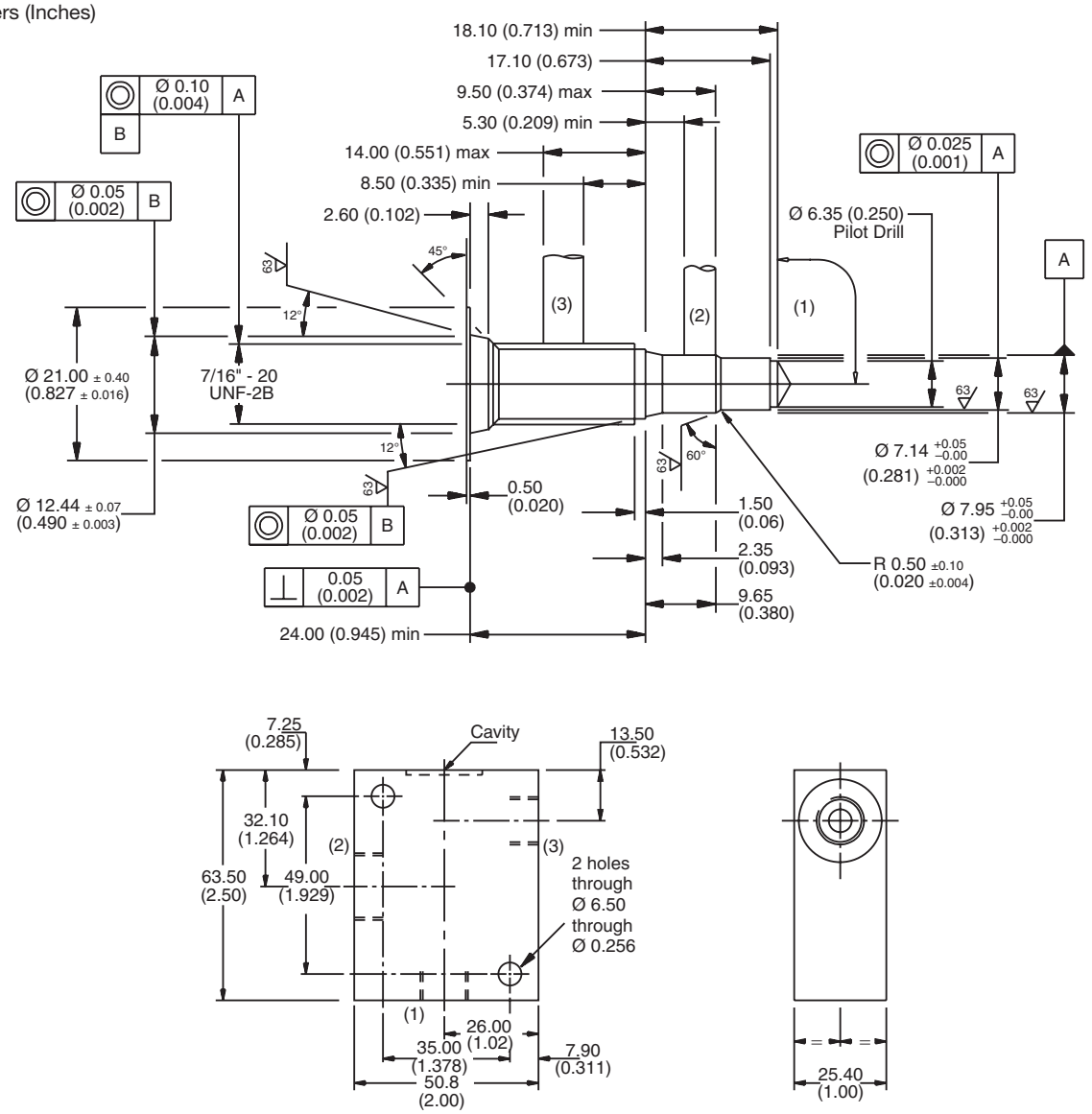
Code	Body Material
S	Steel

Cavity Tooling For CAV0W-2	
Pilot Drill Ø	6.35 (0.25)
Step Drill	8DS31369
Reamer (Alum)	8RM31082A
Reamer (Steel	8RM31082S
Counterbore	—
Tap	8TP31221

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10	816	S
Line Body	Port Size	Body Material

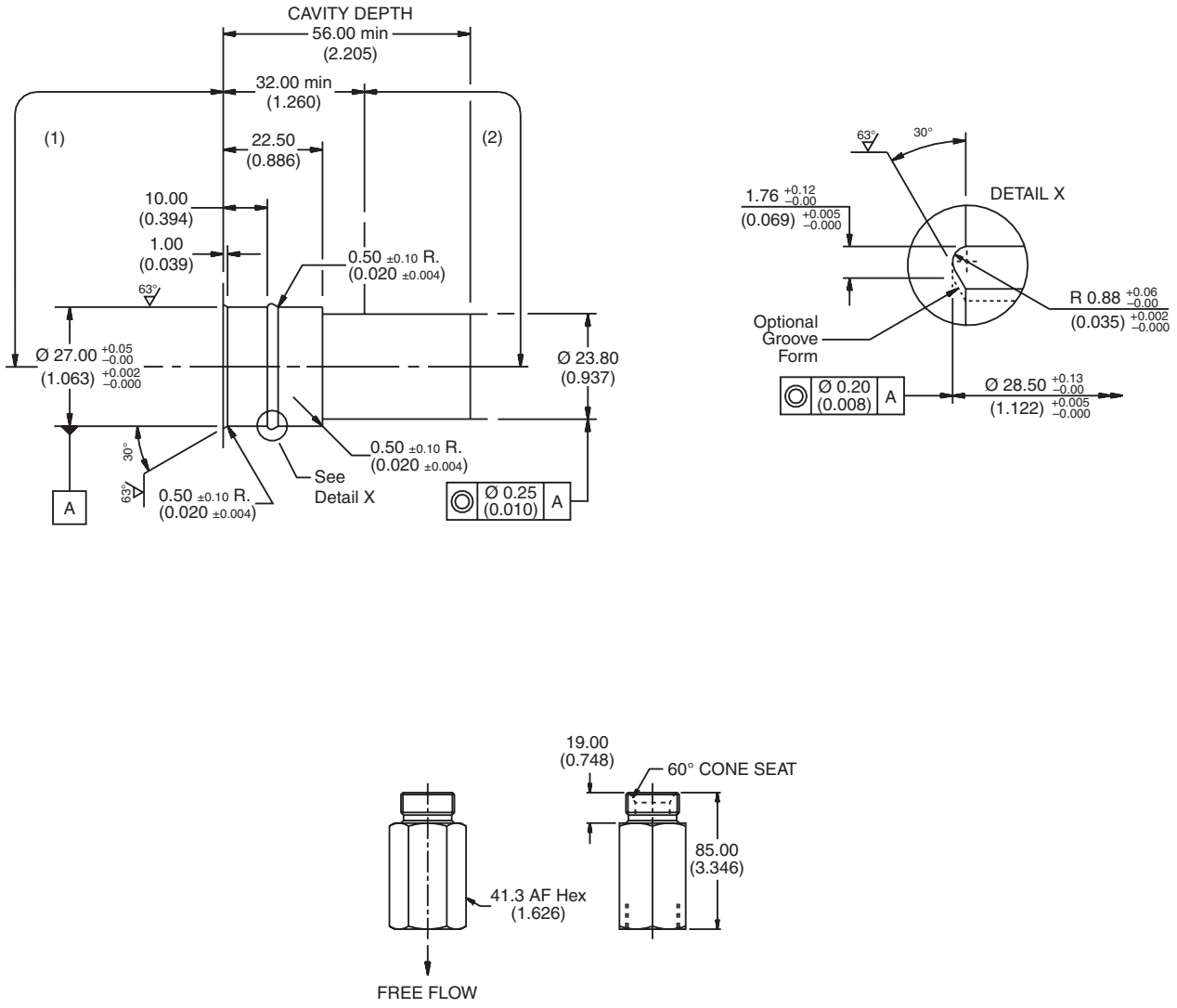
Code	Porting
816	1/4″ BSP

Code	Body Material
S	Steel

Cavity Tooling For CAVSW-3	
Pilot Drill Ø	6.35 (0.25)
Step Drill	8DS31378
Reamer (Alum)	8RM31086A
Reamer (Steel	8RM31086S
Counterbore	—
Tap	8TP31221

For additional information see Technical Tips on pages BC1-BC6.

Dimensions
Millimeters (Inches)



Ordering Information

LB10	210	S
Line Body	Port Size	Body Material

Code	Porting
210	1″ BSP

Code	Body Material
S	Steel

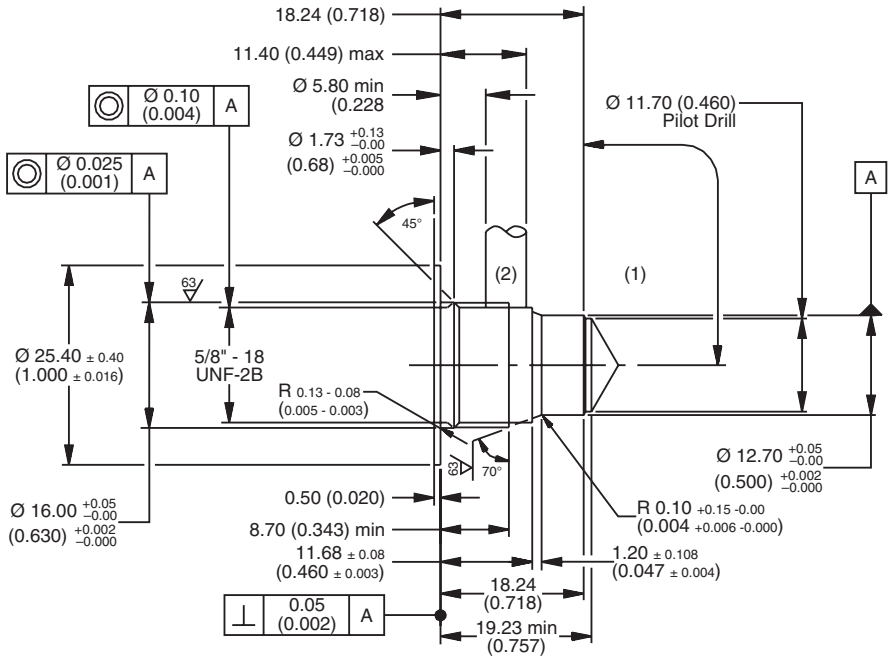
Cavity Tooling For 2C	
Pilot Drill Ø	—
Step Drill	—
Reamer (Alum)	—
Reamer (Steel	—
Counterbore	—
Tap	—

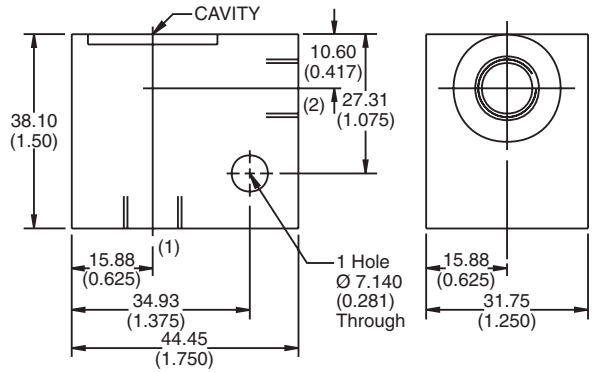
CV Check Valves
SH Shuttle Valves
LM Load/Motor Controls
FC Flow Controls
PC Pressure Controls
LE Logic Elements
DC Directional Controls
SV Solenoid Valves
PV Proportional Valves
CE Coils & Electronics
BC Bodies & Cavities
TD Technical Data

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)





Ordering Information

LB10	325	S
Line Body	Port Size	Body Material

Code	Porting
325	1/4" BSP

Code	Body Material
S	Steel

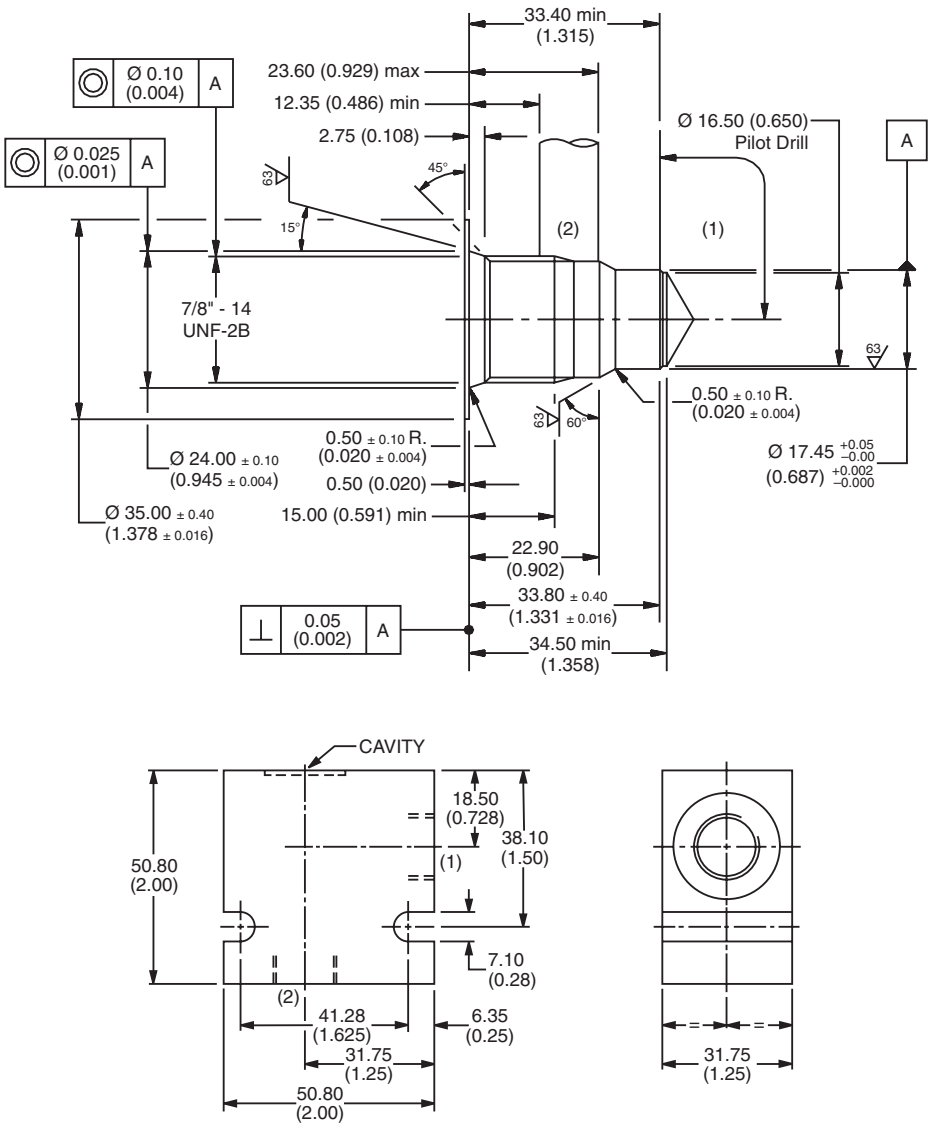
Cavity Tooling For 2G	
Pilot Drill Ø	11.70 (0.46)
Step Drill	8DS31384
Reamer (Alum)	8RM31092A
Reamer (Steel	8RM31092S
Counterbore	—
Tap	8TP31223

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For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10	545	S
Line Body	Port Size	Body Material

Code	Porting
545	1/2″ BSP

Code	Body Material
S	Steel

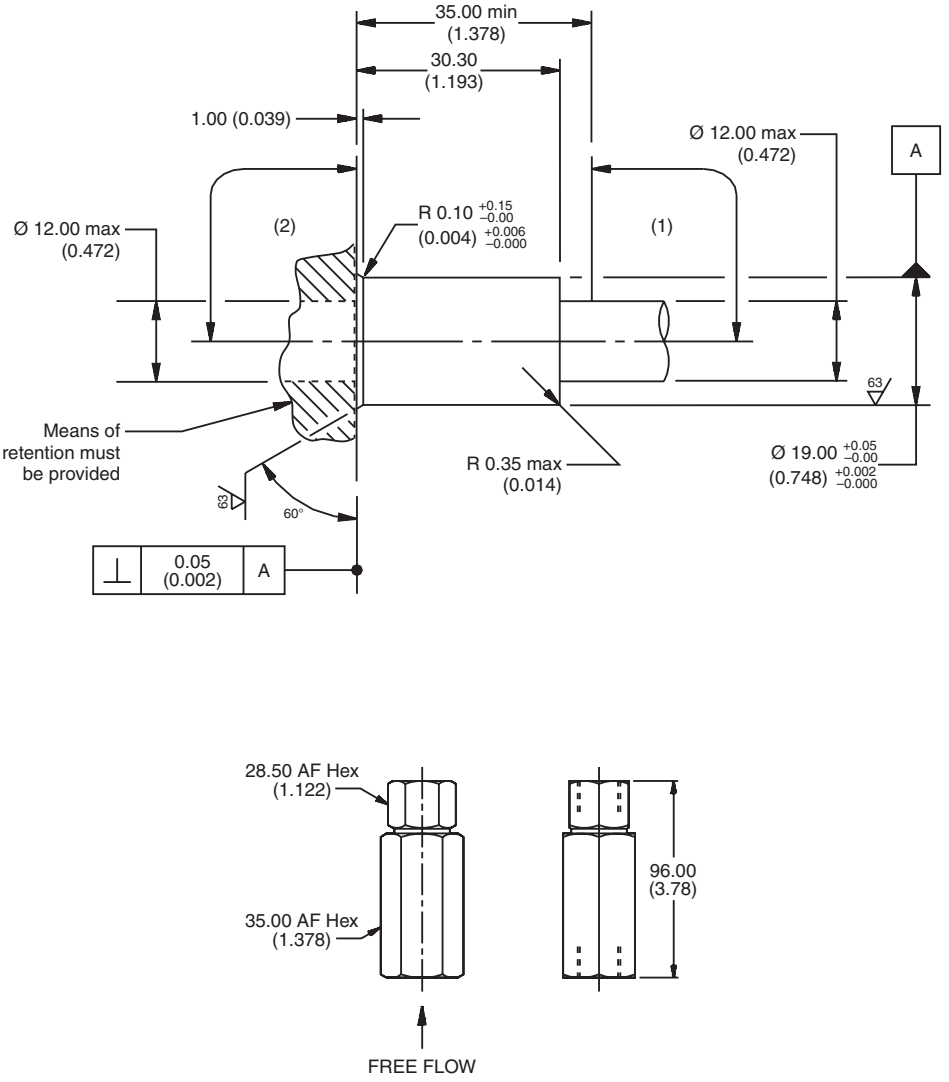
Cavity Tooling For 2R
Pilot Drill Ø
Step Drill
Reamer (Alum)
Reamer (Steel
Counterbore
Tap

CV Check Valves
SH Shuttle Valves
LM Load/Motor Controls
FC Flow Controls
PC Pressure Controls
LE Logic Elements
DC Directional Controls
SV Solenoid Valves
PV Proportional Valves
CE Coils & Electronics
BC Bodies & Cavities
TD Technical Data

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10	205	S
Line Body	Port Size	Body Material

Code	Porting
205	1″ BSP

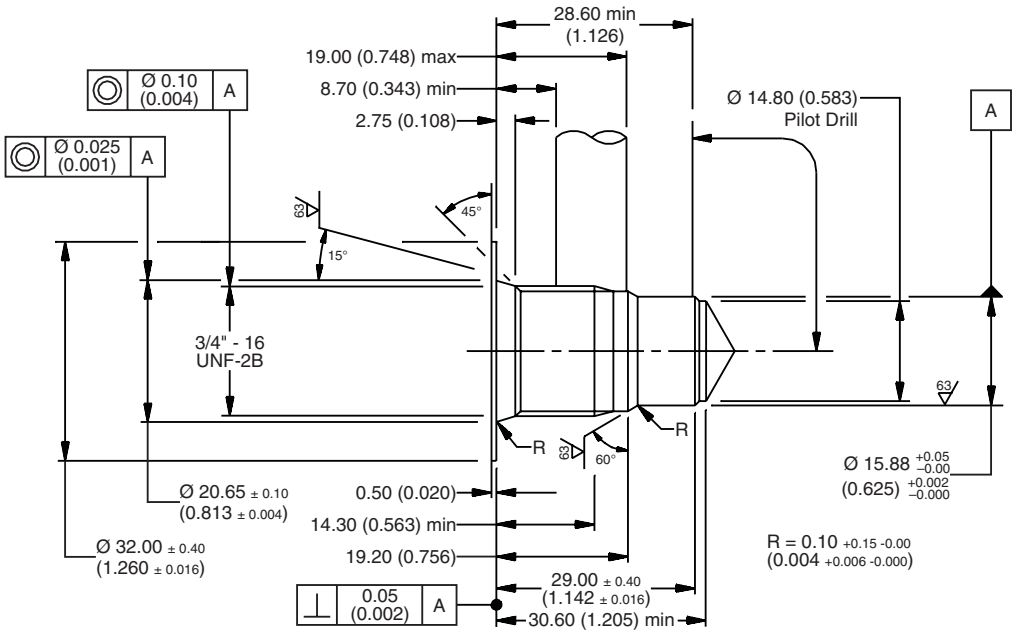
Code	Body Material
S	Steel

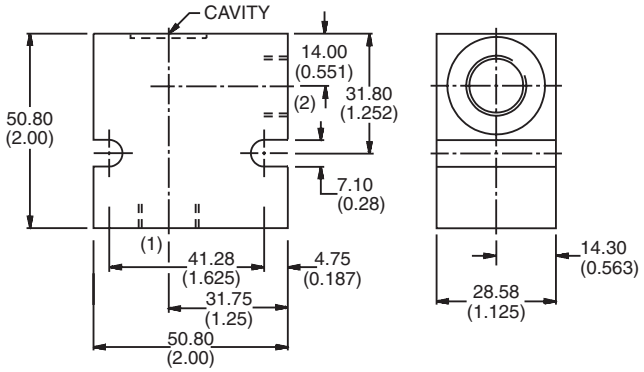
Cavity Tooling For 2U	
Pilot Drill Ø	—
Step Drill	—
Reamer (Alum)	—
Reamer (Steel	—
Counterbore	—
Tap	—

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For additional information see Technical Tips on pages BC1-BC6.

Dimensions
Millimeters (Inches)





Ordering Information

LB10	515	S
Line Body	Port Size	Body Material

Code	Porting
515	1/4" BSP

Code	Body Material
S	Steel

NOTE:
Use parker C09-2 cavity and body.

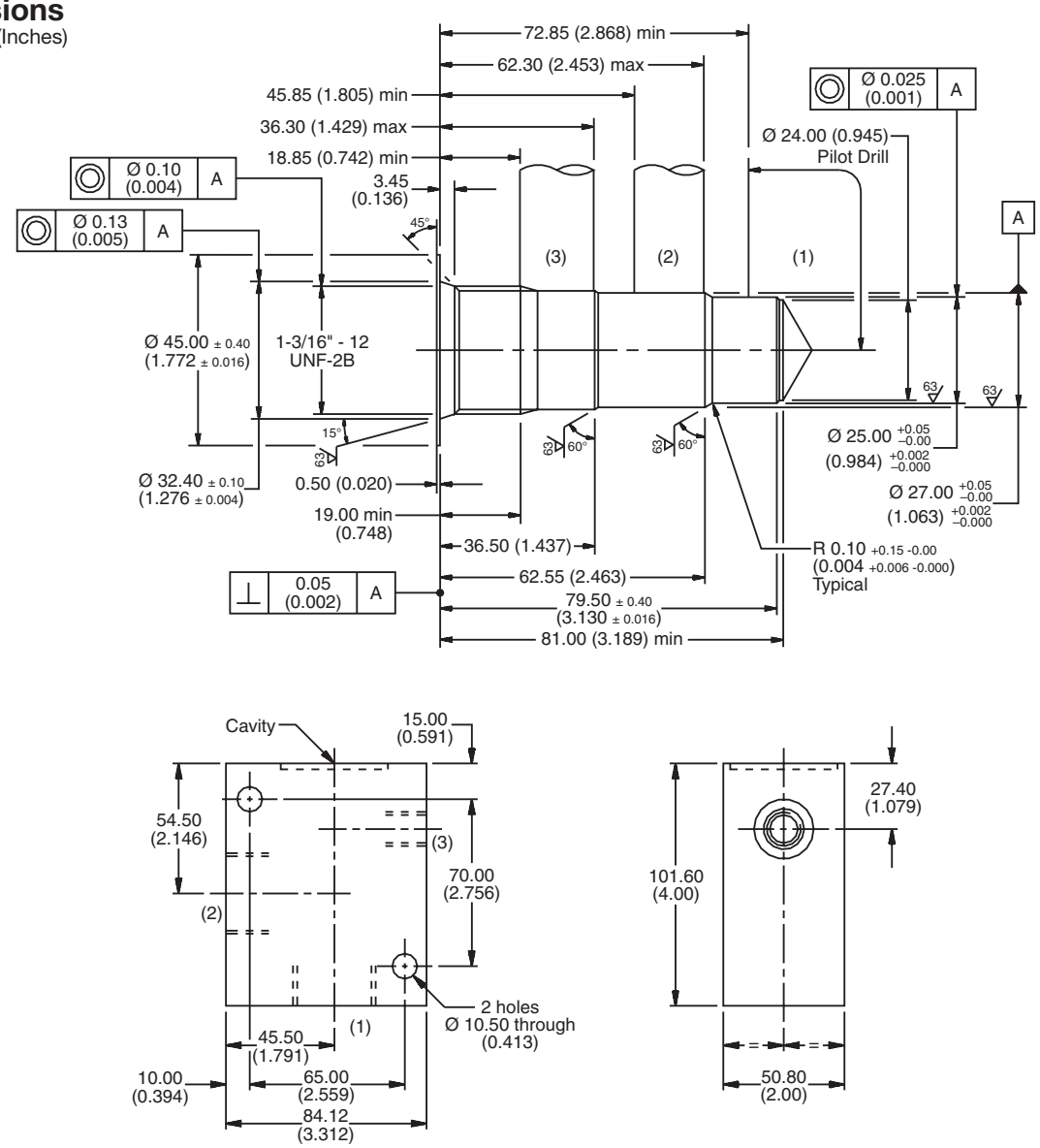
Cavity Tooling For 2X	
Pilot Drill Ø	14.80 (0.583)
Step Drill	8DS31344
Reamer (Alum)	8RM31057A
Reamer (Steel	8RM31057S
Counterbore	—
Tap	8TP31202

CV Check Valves
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For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10	007	S
Line Body	Port Size	Body Material

Code	Porting
007	3/4" BSP

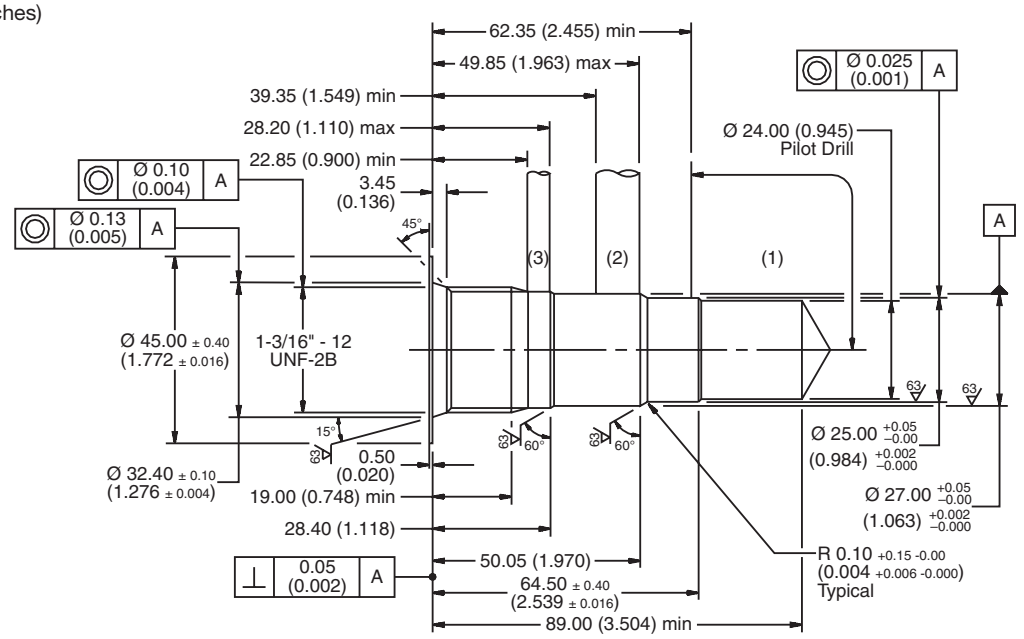
Code	Body Material
S	Steel

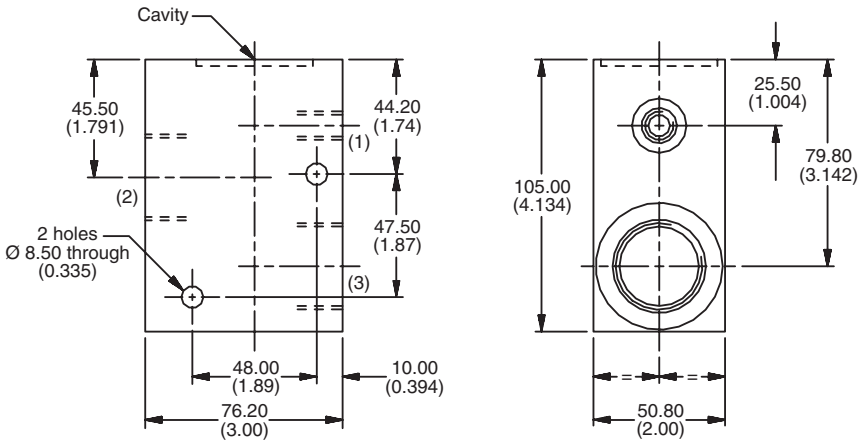
Cavity Tooling For 3A	
Pilot Drill Ø	24.00 (0.94)
Step Drill	8DS31303
Reamer (Alum)	8RM31003A
Reamer (Steel	8RM31003S
Counterbore	8CB31100
Tap	8TP31200

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)





Ordering Information

LB10		S
Line Body	Port Size	Body Material

Code	Porting
034	3/4″ BSP (Dual Cavity)
039	3/4″ BSP (Main) 1/4″ BSP (Aux)

Code	Body Material
S	Steel

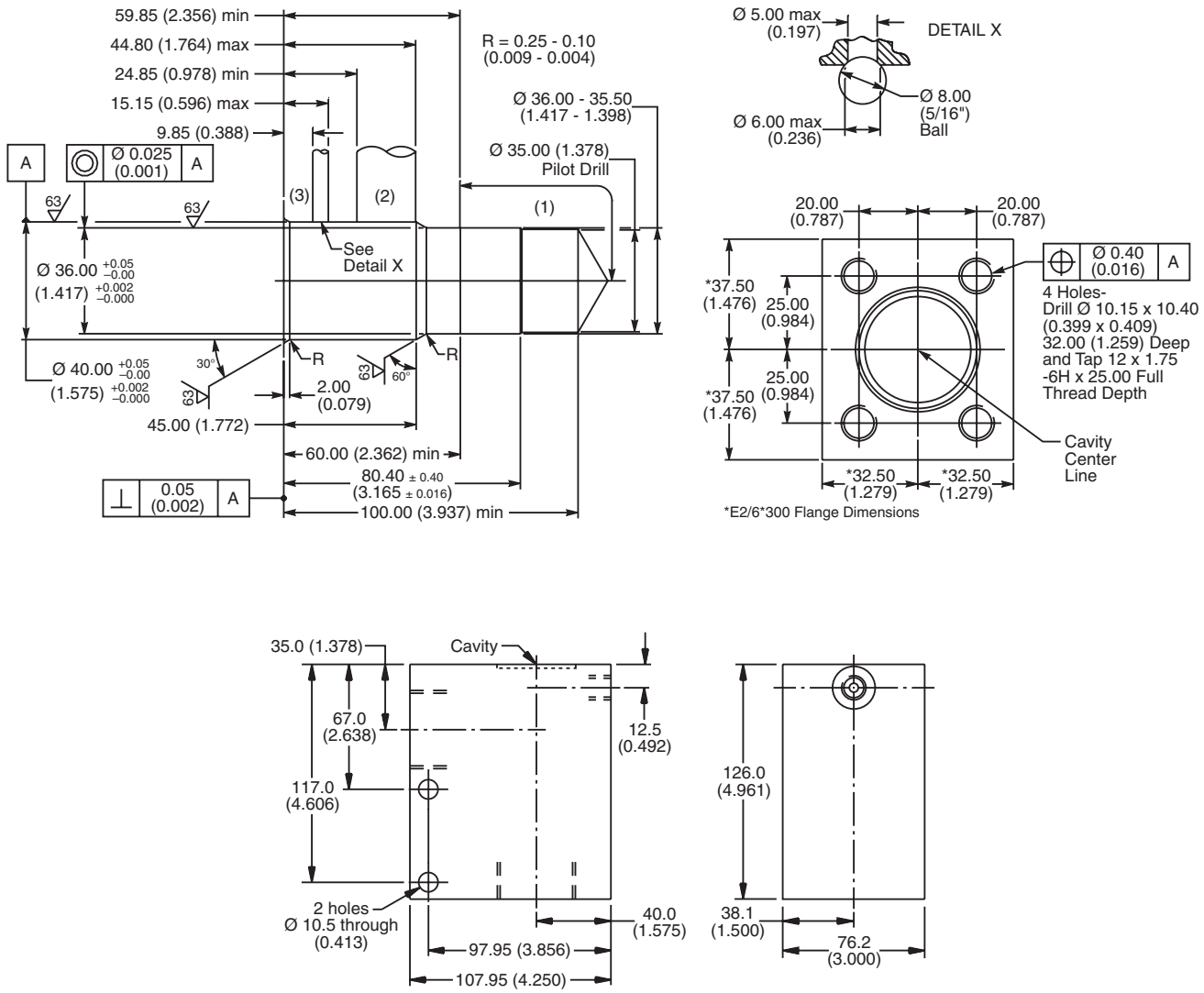
Cavity Tooling For 3C	
Pilot Drill Ø	24.00 (0.94)
Step Drill	8DS31305
Reamer (Alum)	8RM31005A
Reamer (Steel	8RM31005S
Counterbore	8CB31100
Tap	8TP31200

CV Check Valves
SH Shuttle Valves
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CE Coils & Electronics
BC Bodies & Cavities
TD Technical Data

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10	089	S
Line Body	Port Size	Body Material

Code	Porting
089	1 1/4″ BSP (Main) 1/4″ BSP (Aux)

Code	Body Material
S	Steel

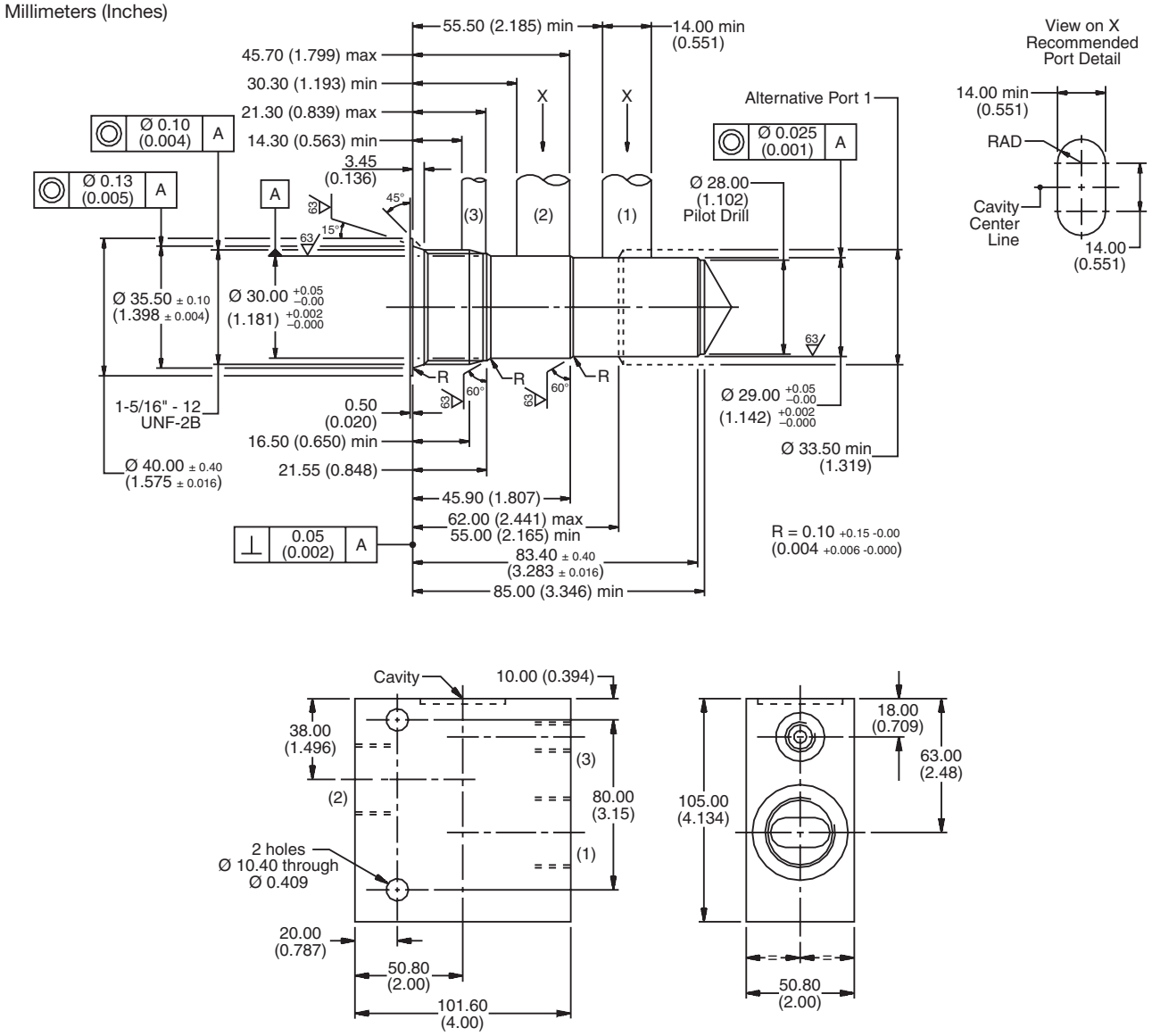
Cavity Tooling For 3K	
Pilot Drill Ø	35.00 (1.38)
Step Drill	8DS31310
Reamer (Alum)	8RM31010A
Reamer (Steel	8RM31010S
Counterbore	—
Tap	8TP31215

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For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10		S
Line Body	Port Size	Body Material

Code	Porting
076	1″ BSP (Main) 1/4″ BSP (Aux)
104	1″ BSP (Dual Cavity)

Code	Body Material
S	Steel

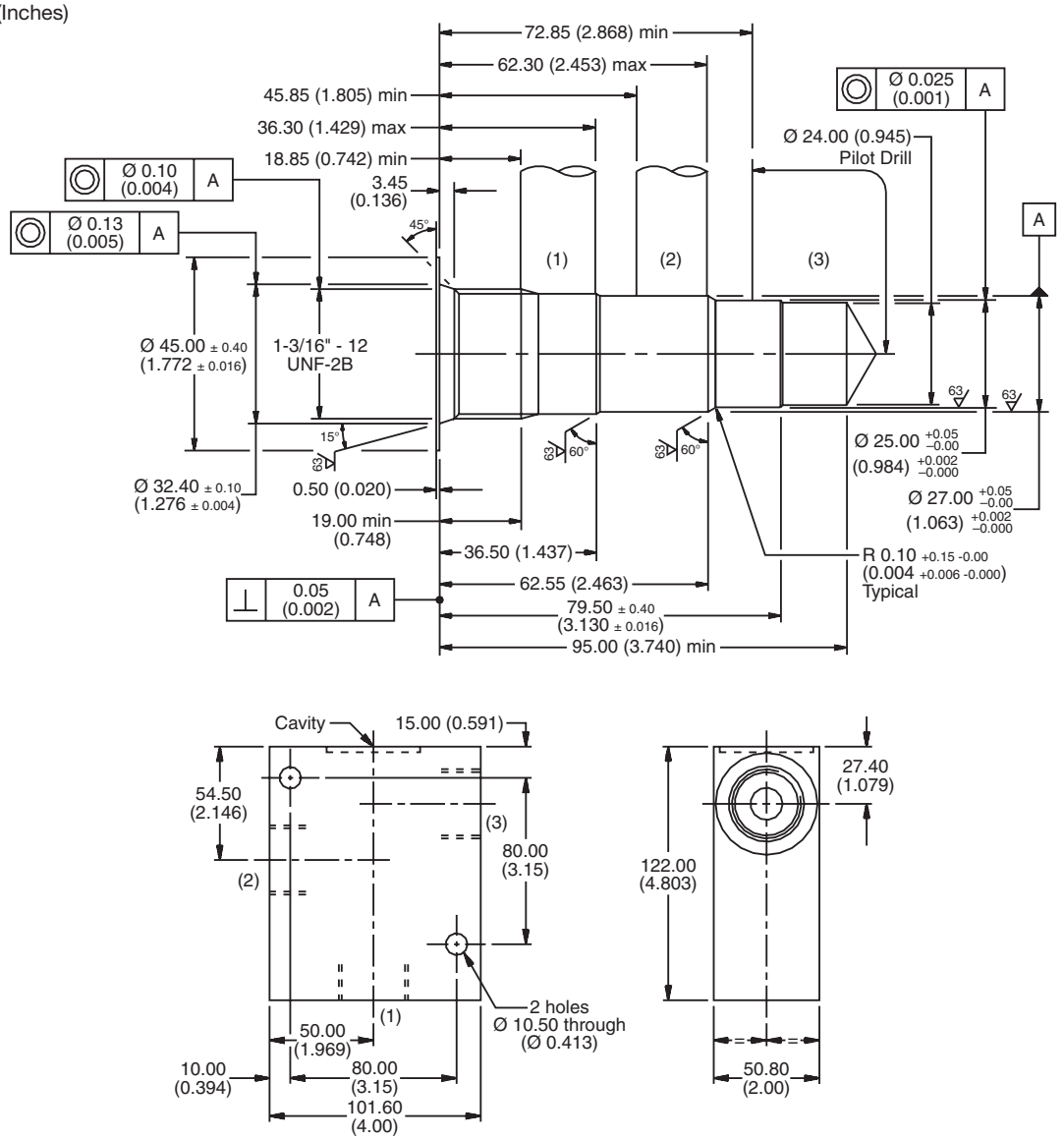
Cavity Tooling For 3M	
Pilot Drill Ø	28.00 (1.10)
Step Drill	8DS31311
Reamer (Alum)	8RM31011A
Reamer (Steel	8RM31011S
Counterbore	8CB31103
Tap	8TP31203

CV Check Valves
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For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10	092	S
Line Body	Port Size	Body Material

Code	Porting
092	3/4" BSP

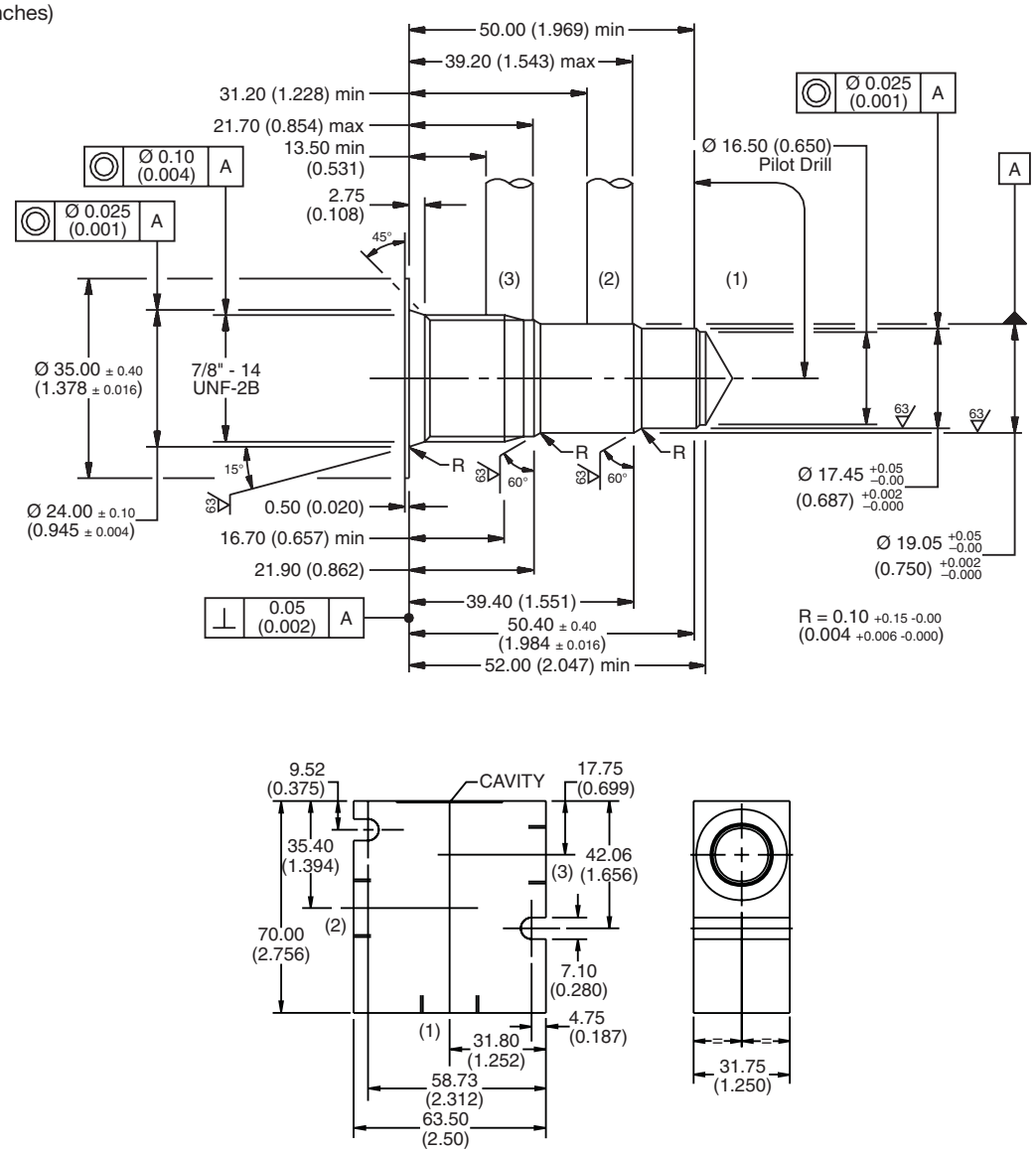
Code	Body Material
S	Steel

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For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10	554	S
Line Body	Port Size	Body Material

Code	Porting
554	3/8″ BSP

Code	Body Material
S	Steel

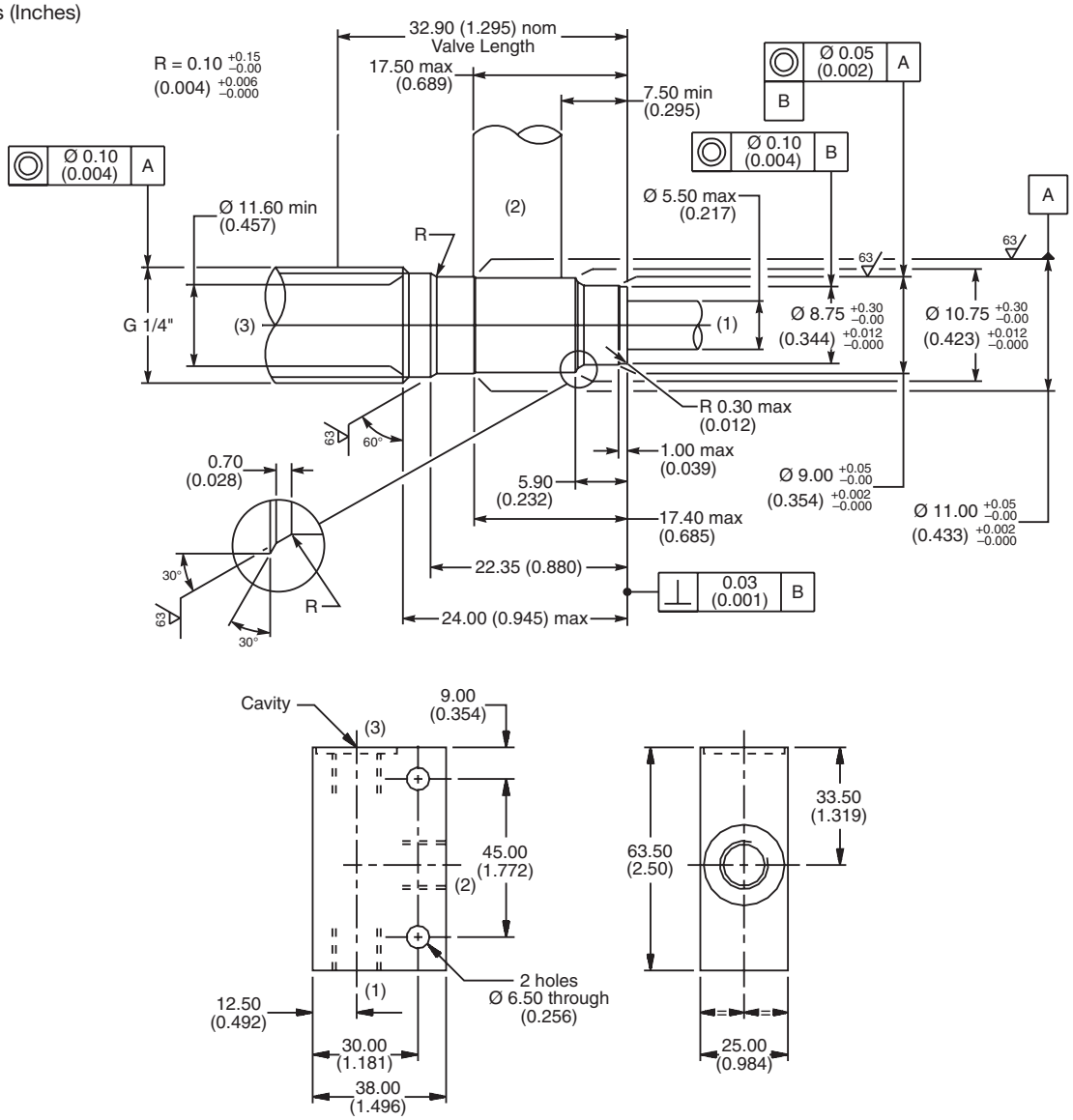
Cavity Tooling For 3X	
Pilot Drill Ø	16.50 (0.650)
Step Drill	8DS31343
Reamer (Alum)	8RM31062A
Reamer (Steel	8RM31062S
Counterbore	—
Tap	8TP31201

CV Check Valves
SH Shuttle Valves
LM Load/Motor Controls
FC Flow Controls
PC Pressure Controls
LE Logic Elements
DC Directional Controls
SV Solenoid Valves
PV Proportional Valves
CE Coils & Electronics
BC Bodies & Cavities
TD Technical Data

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10	313	S
Line Body	Port Size	Body Material

Code	Porting
313	1/4″ BSP

Code	Body Material
S	Steel

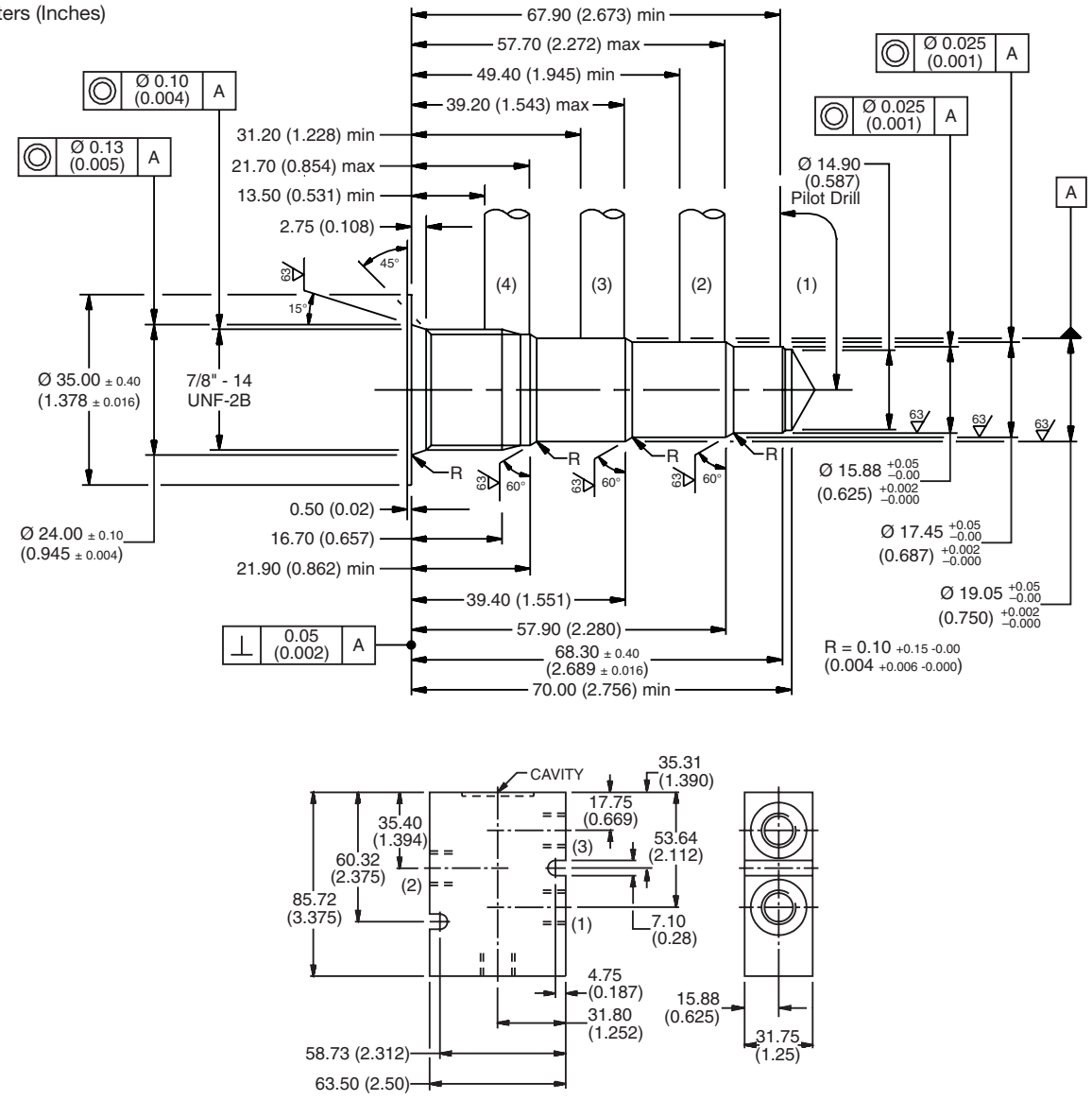
Cavity Tooling For 3Z	
Pilot Drill Ø	8.50 (0.335)
Step Drill	8DS31355
Reamer (Alum)	8RM31055A
Reamer (Steel	8RM31055S
Counterbore	—
Tap	8TP31219

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For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10	563	S
Line Body	Port Size	Body Material

Code	Porting
563	3/8″ BSP

Code	Body Material
S	Steel

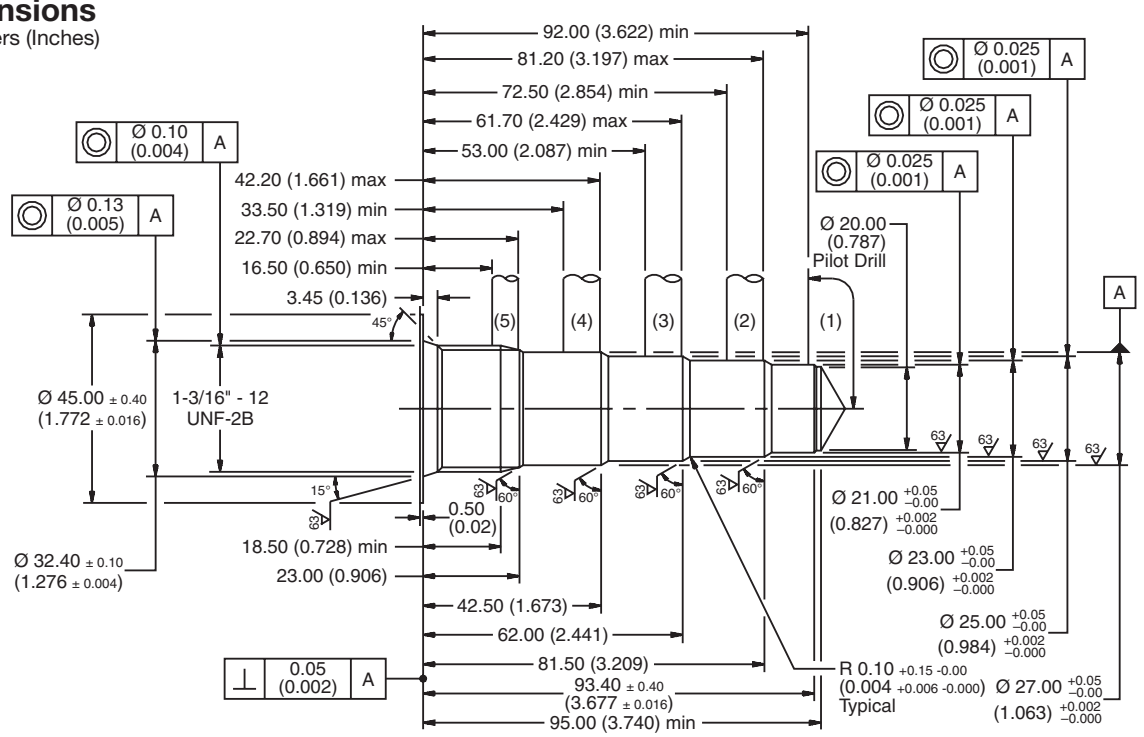
Cavity Tooling For 4C	
Pilot Drill Ø	14.90 (0.587)
Step Drill	8DS31346
Reamer (Alum)	8RM31063A
Reamer (Steel	8RM31063S
Counterbore	—
Tap	8TP31201

CV Check Valves
SH Shuttle Valves
LM Load/Motor Controls
FC Flow Controls
PC Pressure Controls
LE Logic Elements
DC Directional Controls
SV Solenoid Valves
PV Proportional Valves
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BC Bodies & Cavities
TD Technical Data

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10	314	S
Line Body	Port Size	Body Material

Code	Porting
314	3/4″ BSP (Main)
	1/4″ BSP (Aux)

Code	Body Material
S	Steel

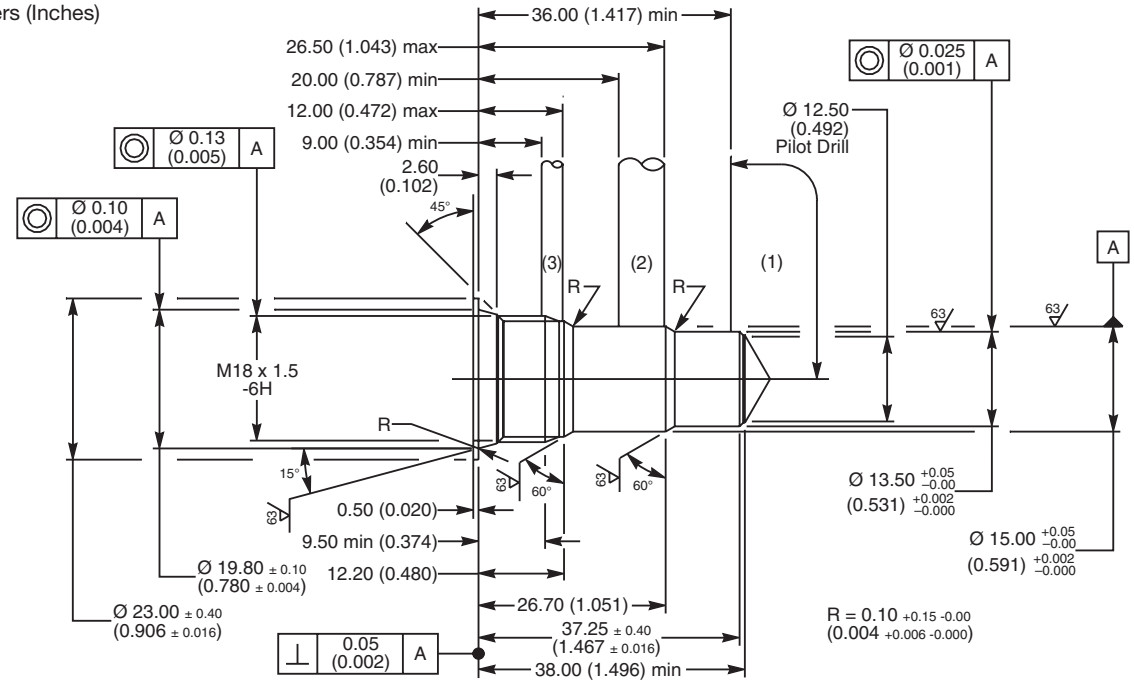
Cavity Tooling For 5A	
Pilot Drill Ø	20.00 (0.78)
Step Drill	8DS31353
Reamer (Alum)	8RM31053A
Reamer (Steel	8RM31053S
Counterbore	8CB31100
Tap	8TP31200

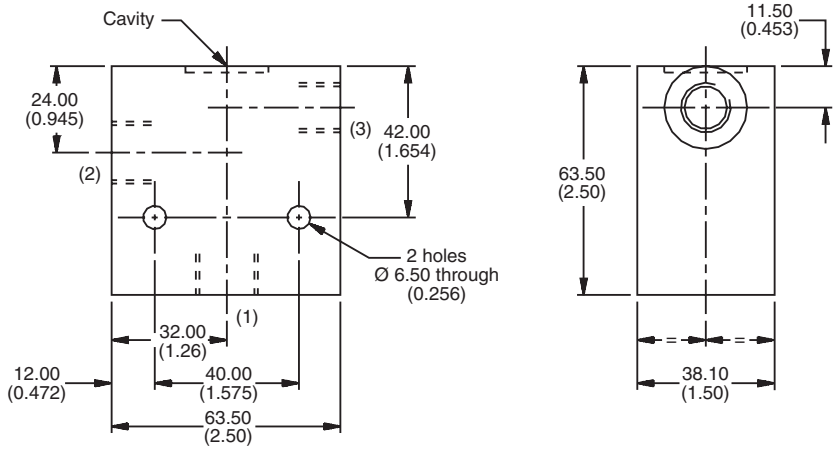
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For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)





Ordering Information

LB10		S
Line Body	Port Size	Body Material

Code	Porting
312	3/8″ BSP (Dual Cavity)
310	3/8″ BSP (Main) 1/4″ BSP (Aux)

Code	Body Material
S	Steel

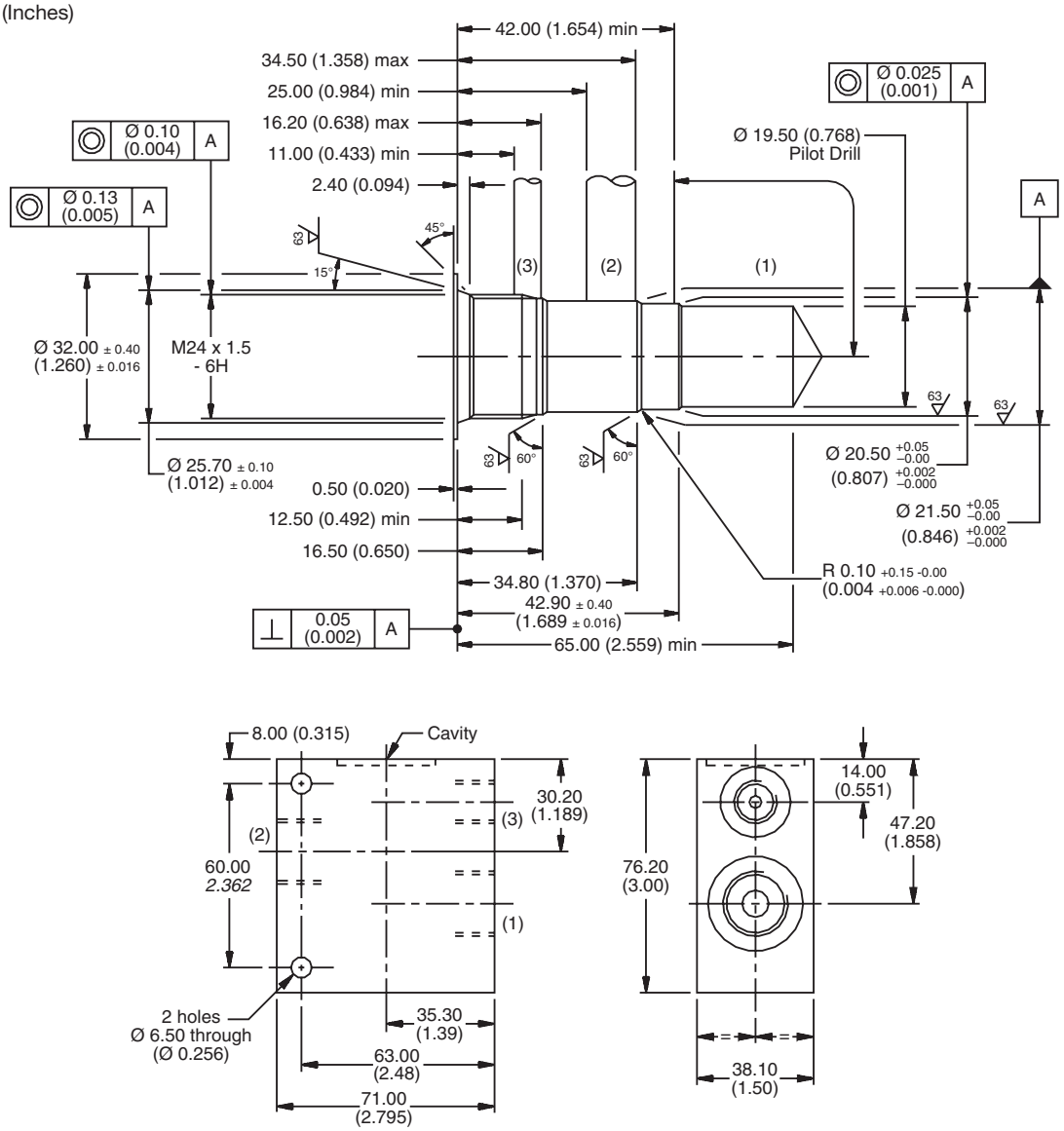
Cavity Tooling For 53-1	
Pilot Drill Ø	12.50 (0.49)
Step Drill	8DS31349
Reamer (Alum)	8RM31081A
Reamer (Steel	8RM31081S
Counterbore	—
Tap	8TP31207

CV Check Valves
SH Shuttle Valves
LM Load/Motor Controls
FC Flow Controls
PC Pressure Controls
LE Logic Elements
DC Directional Controls
SV Solenoid Valves
PV Proportional Valves
CE Coils & Electronics
BC Bodies & Cavities
TD Technical Data

For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10		S
Line Body	Port Size	Body Material

Code	Porting
259	1/2″ BSP (Dual Cavity)
251	1/2″ BSP (Main) 1/4″ BSP (Aux)

Code	Body Material
S	Steel

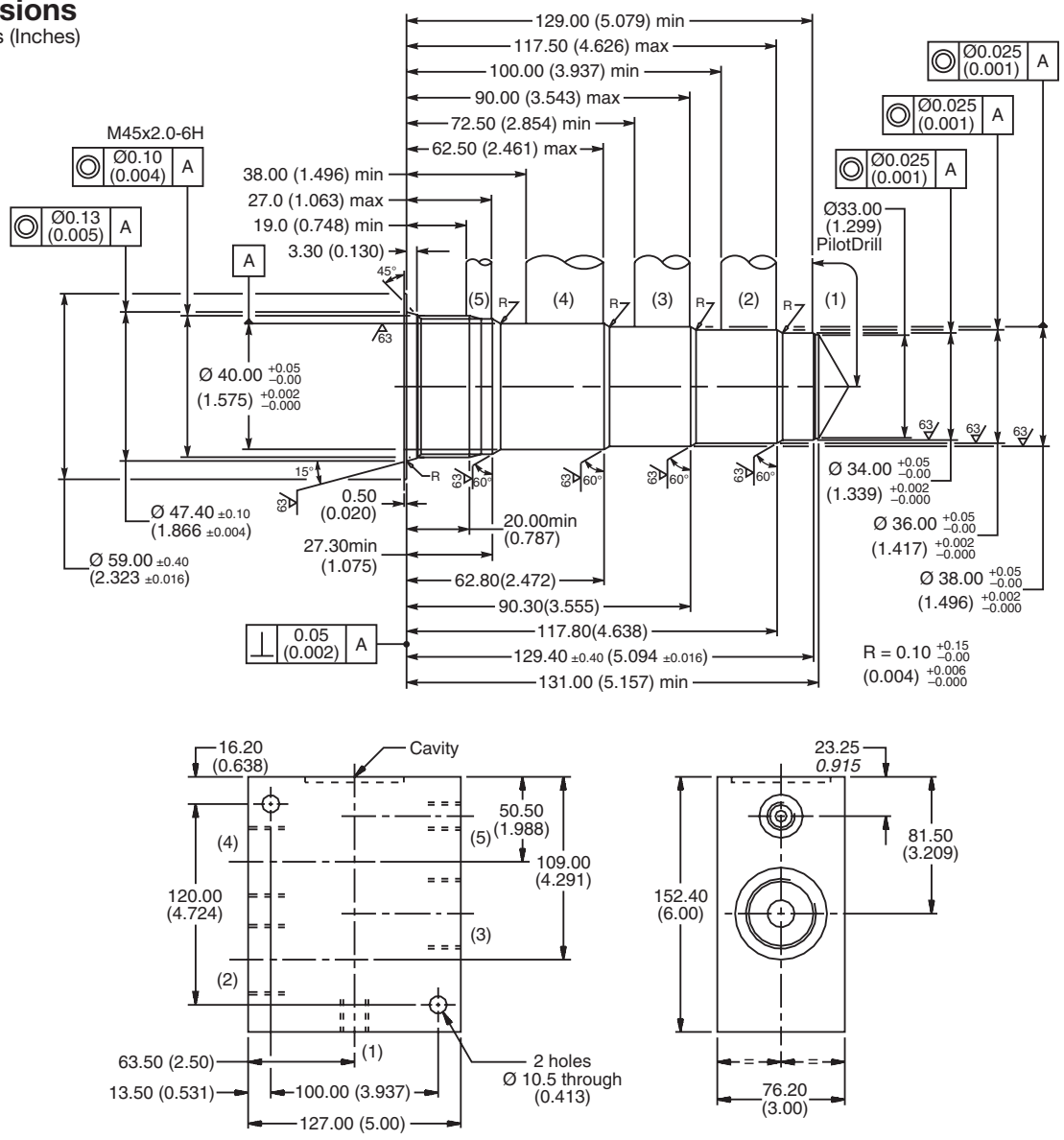
Cavity Tooling For 68-1	
Pilot Drill Ø	19.50 (0.77)
Step Drill	8DS31341
Reamer (Alum)	8RM31041A
Reamer (Steel	8RM31041S
Counterbore	8CB31116
Tap	8TP31216

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For additional information see Technical Tips on pages BC1-BC6.

Dimensions

Millimeters (Inches)



Ordering Information

LB10	316	S
Line Body	Port Size	Body Material

Code	Porting
316	1 1/4″ BSP (Main) 3/8″ BSP (Aux)

Code	Body Material
S	Steel

Cavity Tooling (100-1 Cavity)	
Pilot Drill Ø	33.00 (1.30)
Step Drill	8DS31350
Reamer (Alum)	8RM31050A
Reamer (Steel	8RM31050S
Counterbore	8CB31119
Tap	8TP31218

Notes

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Temperature Ratings	TD1
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INTRODUCTION

In this section you will find a variety of technical information pertinent to general hydraulics as well as cartridge valve technology.

HYDRAULIC FORMULAS

Below are a few of the common hydraulic formulas to assist you in calculating the requirements for your system:

Voltage = *Current × Resistance*

Flow = *Volume ÷ Unit of Time*

Pressure = *Force ÷ Area*

Horsepower = *Flow × Pressure ÷ (1714 × Efficiency)*

$$\textbf{Hydraulic power (kW)} = \frac{\Delta p \text{ (Bar) x flow rate (LPM)}}{600}$$

where Δp = pressure drop

$$\textbf{Hydraulic power (HP)} = \frac{\Delta p \text{ (PSI) x flow rate (GPM)}}{1714}$$

RATINGS & TESTING

All Parker cartridge valve products have been performance tested with the results shown on the individual valve catalog pages. The performance data shown represents typical operation characteristics of the product. In addition, our valves are endurance tested. Validation is conducted by testing or similarity in designs.
Note: Not every cartridge option is endurance tested. In other words, one three way spool is endurance tested, and the others are assumed by similarity.

TEMPERATURE RATINGS

Product operating limits are broadly in the range -30°C to 150°C (-20°F to 300°F) but satisfactory operation within the specification may not be accomplished. Leakage and response will be affected when used at temperature extremes and it is the user's responsibility to determine acceptability at these levels.

Seals used in these products generally have the following temperature limitations:

Nitrile (Buna N)	-34°C to 121°C (-30°F to 250°F)
Fluorocarbon	-26°C to 204°C (-15°F to 400°F)
Hytrel	-54°C to 135°C (-65°F to 275°F)
GTPFE	-30°C to 150°C (-20°F to 300°F)

VISCOSITY

Catalog data is from tests conducted on mineral oil at a viscosity of 32 cSt (150 SSU) using an ISO 32 fluid at 100 degrees F.

Product should ideally be used at viscosities in the range of 15 to 50 cSt (80 to 230 SSU).

Product will perform with reduced efficiency in the ranges, 5 to 15 cSt (42 to 80 SSU) and 50 to 500 cSt (230 to 2300 SSU). These extreme conditions must be evaluated by the user to establish suitability of the product's performance.

PRESSURE RATINGS

Unless otherwise stated, all Parker cartridges have a continuous duty pressure ratings as shown in the catalog. All pressure ratings are based on the cartridge
valve only. Exposure to elevated pressures may affect the performance and fatigue life of the product. The material chosen for the body or carrier may affect the pressure rating we recommend. Parker does not recommend the use of cartridge valves in aluminum bodies at pressures above 207 bar (3000 psi).

THERMAL SHOCK

It is unreasonable to expect product to withstand rapid temperature changes - this could affect both performance and life and care should be taken to protect the product from such situations.

SERVICE & COMPONENTS

One of the advantages of integrated hydraulic circuits is their serviceability. Should a valve need to be replaced for any reason, a user only needs to unscrew the valve from the manifold and screw the replacement into the cavity. As such, there are few replacement parts available for the Parker cartridge products. As with any hydraulic system, the operator should bleed off any trapped pressure and consult machine service manuals prior to service. Parker does not offer any service parts for internal components, but external components such as coils, knobs, and seals are available.

LIMITATIONS IN USE

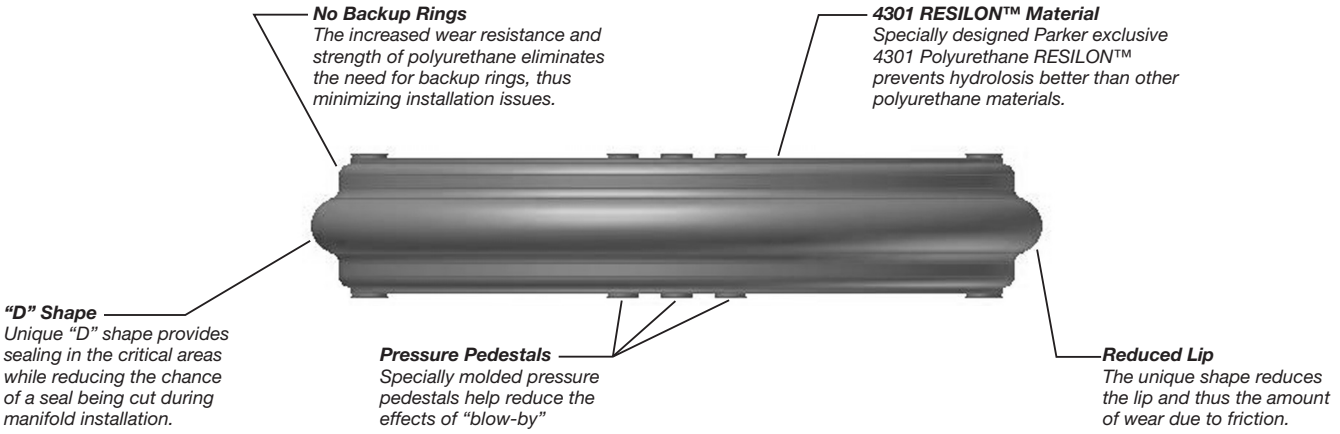
Parker cartridge valves are designed for a wide variety of industrial and mobile applications. Despite their flexibility, Parker Hannifin does not recommend or support the use of our cartridge valves in any on highway or aerospace applications. We also do not recommend our products for use in the transport of explosive products or in hazardous environments.

SEAL MATERIAL SELECTION

You should match the seal compatibility to the temperature and fluid being used in your application. Parker offers three seal materials to meet your application requirements. Parker's standard material is a 4301 Polyurethane RESILON™ material "D"-Ring. We also offer Fluorocarbon and Nitrile seals. A brief synopsis of each seal material is given below to help you choose the best seal for your application.

"D"-Ring (4301 Polyurethane RESILON™ Material)
The "D"-Ring is the standard seal material on the Winner's Circle threaded cartridge valves. The "D"-Ring is molded of a special 4301 Polyurethane RESILON™. Polyurethane materials exhibit better wear resistance and tensile strength than standard Nitrile or Fluorocarbon material. In addition, it has an excellent resistance to compression set. This increased strength eliminates the need for back-rings and simplifies installation.

The 4301 compound is a Parker exclusive material designed to prevent hydrolysis at high temperatures. Thus, the "D"- ring outperforms standard polyurethane o-rings, especially when using high water content fluids at elevated temperatures. The "D"-Ring is compatible with most water-glycol, water/oil emulsions, and high grade petroleum based hydraulic fluids at temperatures between -45°C to +132°C (-50°F to +270°F) The unique shape of the Parker "D"-Ring also provides a variety of design advantages. The seal is molded into a "D" shape where the seal is higher in the middle and lower on the ends. This prevents the seal edge from folding over on a corner inside the manifold during installation. In addition, this design has a minimal lip, thus, friction is reduced. Another unique feature of the "D"-Ring is its symmetrical design, resulting in no performance degradation from the reverse direction, or worry of backward installation. The "D"-Ring is also equipped with "pressure pedestals" to reduce the ffects of "blow-by" common in reverse cycling. The pressure pedestals increase the sealing capability of the "D"-Ring, by reducing the radial pressure forces that compress the sealing face of the o-ring. The drawing below depicts the shape and highlights the features.



Nitrile
Nitrile o-rings are also compatible with most water-glycol, water/oil emulsions, and high grade petroleum based hydraulic fluids. Parker only recommends Nitrile o-rings for temperatures between -34°C to +121°C (-30°F to +250°F). Nitrile o-rings do require a full back-up ring, or two half back-ups.

Fluorocarbon
Fluorocarbon o-rings are compatible with most phosphate ester fluids and phosphate ester blends. Parker only recommends Fluorocarbon seals for temperatures between -26°C to +204°C (-15°F to +400°F). Fluorocarbon o-rings do require a full back-up ring, or two half back-ups.

HYDRAULIC FLUIDS

Parker recommends using top-quality mineral based or
synthetic hydraulic fluids with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt) at 38°C (100°F). The absolute viscosity range 80 to 1000 SSU (16 to 220 cSt.). Fluids should have high anti-wear characteristics and be treated to protect against oxidation.

HYDRAULIC FILTRATION

Hydraulic systems that include Parker valves should be carefully protected against fluid contamination. The proper cleanliness level for Parker cartridge valves should be maintained at an ISO cleanliness level of 18/16/13.

75% of all system failures are a direct result of contamination. Contamination interferes with four functions of hydraulic fluids.

1. To act as an energy transmission medium.

2. To lubricate internal moving parts of components.

3. To act a heat transfer medium.

4. To seal clearances between moving components.

A properly selected filter will provide adequate protection and reduce operating cost. This is achieved by increasing the expected life of the valves and reducing the cost of maintenance and repairs. Operation will be smoother and more precise.

There is no direct correlation between using a specific ISO cleanliness classification. Numerous other variables should be considered such as particulate ingression, actual flow through filters, and filter location.

A number of interrelated system factors combine to determine proper media and filter combinations. To accurately determine which combination is ideal for your system, all these factors need to be accounted for. With the development of filtration sizing software such as Parker inPHorm, this information can be used to compute the optimal selection. In many instances the information available may be limited. In these cases, “rules of thumb” based on empirical data and proven examples are applied to get an initial starting point.

APPLICATION OF PRODUCT

CAUTION - It is important to note that the Parker Hydraulic Cartridge Systems Division makes a variety of valves, many of which fit into the same cavity. However, their functionality may differ considerably from one valve type to another. **Accordingly *fit* interchangeability does not necessarily mean *form* or *function* interchangeability.** Users should ensure that the appropriate valve is installed in the cavity by cross checking the part number stamped on the valve with that published in approved service literature or in the installation drawing.

Offer of Sale

The goods, services or work (referred to as the "Products") offered by **Parker-Hannifin Corporation**, its subsidiaries, groups, divisions, and authorized distributors ("Seller") are offered for sale at prices indicated in the offer, or as may be established by Seller. The offer to sell the Products and acceptance of Seller's offer by any customer ("Buyer") is contingent upon, and will be governed by all of the terms and conditions contained in this Offer of Sale. Buyer's order for any Products specified in Buyer's purchase document or Seller's offer, proposal or quote ("Quote") attached to the purchase order, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer.

1. Terms and Conditions. Seller's willingness to offer Products for sale or accept an order for Products is subject to the terms and conditions contained in this Offer of Sale or any newer version of the same, published by Seller electronically at www.parker.com/saleterms/. Seller objects to any contrary or additional terms or conditions of Buyer's order or any other document or other communication issued by Buyer.

2. Price; Payment. Prices stated on Seller's Quote are valid for thirty (30) days, except as explicitly otherwise stated therein, and do not include any sales, use, or other taxes or duties unless specifically stated. Seller reserves the right to modify prices to adjust for any raw material price fluctuations. Unless otherwise specified by Seller, all prices are F.C.A. Seller's facility (INCOTERMS 2010). Payment is subject to credit approval and payment for all purchases is due thirty (30) days from the date of invoice (or such date as may be specified by Seller's Credit Department). 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.

3. 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 stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyers' request beyond the respective dates indicated 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.

4. Warranty. Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of twelve (12) months from the date of delivery or 2,000 hours of normal use, whichever occurs first. 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 PROVIDED. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING DESIGN, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

5. 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. No other claims against Seller will be allowed unless asserted in writing within thirty (30) days after delivery. Buyer shall notify Seller of any alleged breach of warranty within thirty (30) days after the date the defect 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.

6. LIMITATION OF LIABILITY. IN THE EVENT OF A BREACH OF WARRANTY, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE 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, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, 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 OF THE PRODUCTS.**

7. User Responsibility. The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.

8. Loss to Buyer's Property. Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, will be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer ordering the items 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. A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus 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. Buyer's Obligation; Rights of Seller. To secure payment of all sums due or otherwise, Seller retains a security interest in all Products delivered to Buyer and this agreement 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. Improper Use and Indemnity. 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, patent, trademark or copyright 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 purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Products; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

12. Cancellations and Changes. Buyer may not cancel or modify or cancel 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 may change Product features, specifications, designs and availability.

13. Limitation on Assignment. Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

14. 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 (hereinafter "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.

15. Waiver and Severability. Failure to enforce any provision of this agreement 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 this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

16. Termination. Seller may terminate this agreement for any reason and at any time by giving Buyer thirty (30) days prior written notice. Seller may immediately terminate this agreement, in writing, if Buyer: (a) breaches any provision of this agreement (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.

17. Governing Law. This agreement 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 this agreement.

18. 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 except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and refund the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller is not liable for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

19. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged. The terms contained herein may not be modified unless in writing and signed by an authorized representative of Seller.

20. Compliance with Laws. Buyer agrees to comply with all applicable laws, regulations, and industry and professional standards of care, including those of the United Kingdom, the United States of America, and the country or countries in which Buyer may operate, including without limitation the U. K. Bribery Act, the U.S. Foreign Corrupt Practices Act ("FCPA"), the U.S. Anti-Kickback Act ("Anti-Kickback Act") and the U.S. Food Drug and Cosmetic Act ("FDCA"),each as currently amended, and the rules and regulations promulgated by the U.S. Food and Drug Administration ("FDA"), and agrees to indemnify and hold harmless Seller from the consequences of any violation of such provisions by Buyer, its employees or agents. Buyer acknowledges that it is familiar with the provisions of the U. K. Bribery Act, the FCPA, the FDA, and the Anti-Kickback Act, and certifies that Buyer will adhere to the requirements thereof. In particular, Buyer represents and agrees that Buyer will not make any payment or give anything of value, directly or indirectly to any governmental official, any foreign political party or official thereof, any candidate for foreign political office, or any commercial entity or person, for the purpose of influencing such person to purchase Products or otherwise benefit the business of Seller.

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