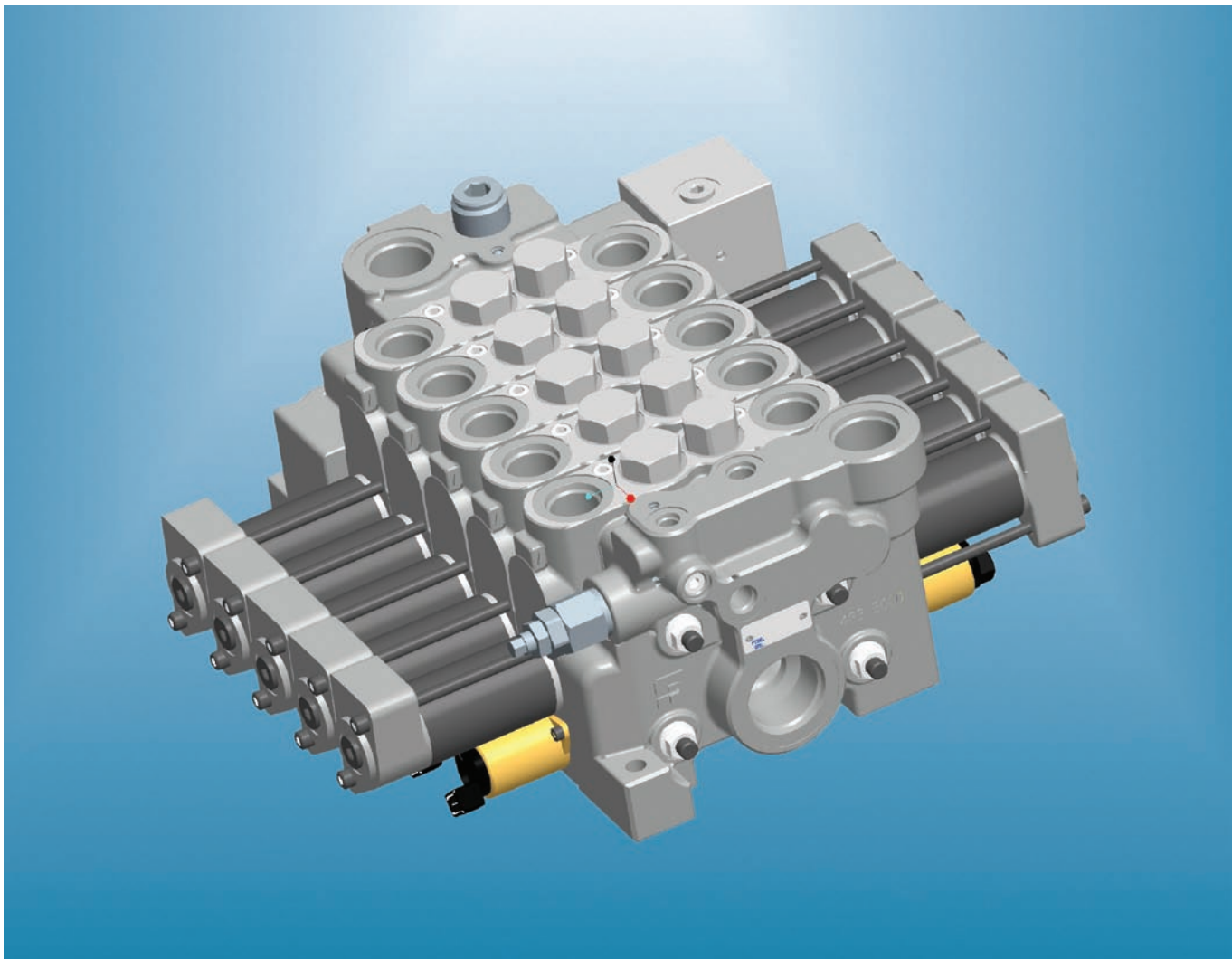




Directional Control Valve VP170

***Proportional, Load-Sensing,
Pressure Compensated***

Catalog HY14-2006/US



 **WARNING**

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Offer of Sale

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

© Copyright 2006 Parker Hannifin Corporation, All Rights Reserved

Introduction	1-2
Technical Information	
General Description.....	3
Operation.....	3
Features, Benefits	4
Definitions, Conversion Factors.....	5
Specifications	6
Weights.....	6
Connections	6
Performance Curves.....	7-8
Major Valve Options.....	9
Schematic Circuit Types	10
Dimensions.....	11
Ordering Information	
How to Configure a Valve Assembly.....	12
Inlet Attributes	13-14
Outlet Attributes.....	15
Work Sections	16-21
Workport Accessories	22
Special Outlets	23
Stud Assemblies.....	24
Assembly Configuration Form	25
Offer of Sale	26

Breadth of Line

Parker Hannifin is a Fortune 300 company with sales of \$8 billion and over 400,000 customers in 46 countries. Parker is the world's leading supplier of motion control components and system solutions serving the mobile, industrial and aerospace markets.

Parker is your single source for any hydraulic valve requirement. We provide a wide selection of open-center and load-sense directional control valves for any construction, off-highway, or on-highway application. Many of our open-center valves can be adapted and used as closed-center, constant-pressure, and constant-pressure unloaded valves. Each of these technologies offers unique features for improved machine performance over traditional, open-center control valves.



When remote control is required, Parker provides a broad line of pilot controllers that are compact and pressure-matched with our control valves to provide consistent and optimized machine control. There are a variety of electric-switch handle options available for additional function control by the operator.

Parker's premier IQAN electronics packages range from simple stand-alone controllers to large, multiple CAN bus systems with color displays. For example, IQAN interfaces with new electronic diesel engines over the SAE J1939 CAN bus.

Package components are designed and tested for mobile applications to help increase machine uptime. The IQAN valve drivers offer superior control of proportional hydraulic functions resulting in increased machine productivity.

Non-programmers find IQAN's programming interface easy to use, reducing development time. Furthermore, excellent diagnostic tools and remote modem connection help cut field service time.

Total Machine Motion Control

You can turn to us for all your mobile motion control solutions. We offer stand-alone valves, as well as custom-designed manifolds with integrated directional control valves.

No matter what type of system you choose, Parker solutions provide top-notch performance and reliability. Our systems are optimized to reduce complexity, size, cost, and fluid leakage. Therefore, working with Parker can significantly cut your machine-build time.



State-of-the-Art Manufacturing

Parker is committed to using lean manufacturing to eliminate waste while streamlining processes. Lean technology helps us meet customer request dates quickly and cost-effectively. We also rely on state-of-the-art equipment and technology, such as computer-aided machining, to ensure product quality.

We regularly invest in our ISO 9001 certified manufacturing facilities because we are committed to meeting all international standards for safety and quality. The hydraulic valves we manufacture comply with relevant ISO, CSA, CE, and AMEX standards.

In addition, Parker hydraulic valves and valve manifolds are fully tested and certified before being released to the customer. You can expect Parker hydraulic valves to work the first time, every time.

Customer Service with a Global Reach

Parker's worldwide network of field sales engineers and Mobile Systems Engineers (MSEs) are the best in the business. A field sales engineer works closely with you, acting as a single point of contact to evaluate applications and design solutions. MSEs support field sales efforts by

managing difficult design problems and complex circuit design.

You also benefit from Parker Mobile Technology Centers (MTCs) that are staffed by specially trained distributors who provide only the highest levels of customer service. These one-stop shops offer complete hydraulic systems design for mobile applications, as well as technology services such as diagnostics, troubleshooting, computer design, testing, and integration of electronic controls.

Finally, our thousands of dependable distributors are strategically located in your markets. They carry inventory to meet specific, local market needs, and they ensure that products arrive when and where they are needed. You can count on Parker distributors to minimize downtime.

To locate your nearest distributor for the latest information on the VP170 Directional Control Valve, or our entire mobile valve line-up, visit us at www.parker.com.



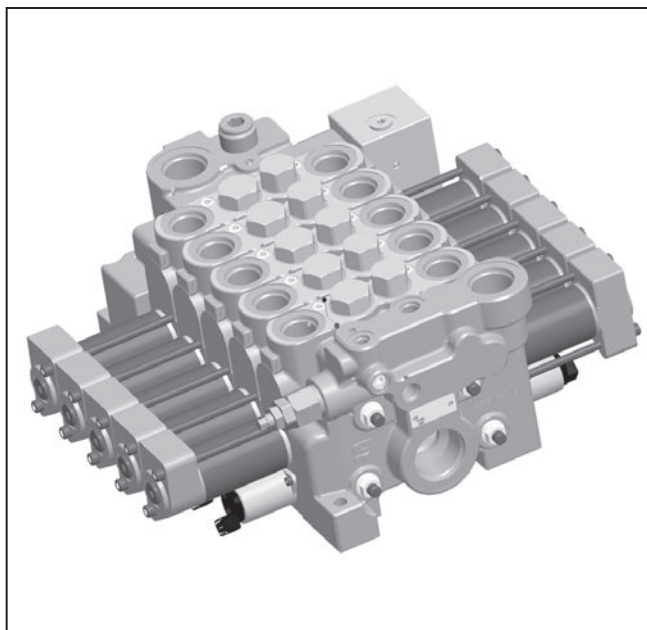
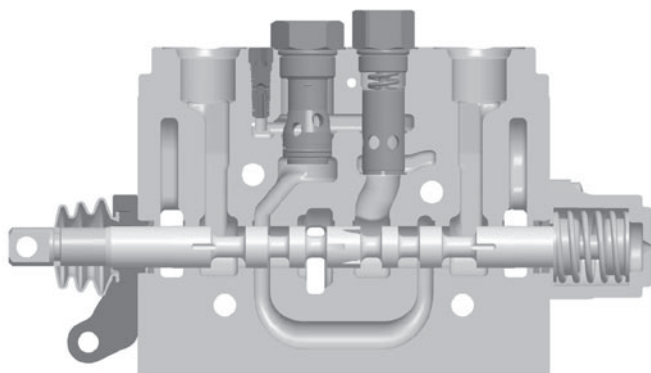
General Description

The VP170 can be configured either as pressure compensated load-sense (PCLS) or as load-sense (LS). Both have the flexibility of sectional construction. The PCLS work section has its own compensator, so that speed control of multiple functions is achieved, regardless of changes in pressure or engine rpms. The key technology integrated into the VP170 is flow-sharing. In pump over-demand conditions, flow-sharing benefits machine productivity by maintaining the speed relationship of the selected functions, but at a reduced speed. Thus, the operator can maintain the rhythm of the machine.

The design of the VP170 is modular, allowing for content to be added or taken out of the valve to better match its value to varying machine requirements. For example, it is available as a load-sense pressure compensated, load-sense only, and with and without induced-load protection.

The valve can be operated manually, pneumatically, hydraulic remote or with solenoids. The same solenoid is used for on/off and proportional control. A bypass unloader is available for use with fixed-displacement pumps. Also, a new, low-pressure regeneration feature has been designed to overcome the damaging affects of cavitation – premature component wear and spongy operation.

The VP170 uses the same spool positioners and port accessories as its open-center counterpart – VA/VG20. The standard spool types are 3-way, 4-way and 4-position float. The standard flow limited spools are |8, 16, 24, 32 and 45 GPM based upon a margin pressure of 250 PSI. There is also a standard spool that is not flow limited.

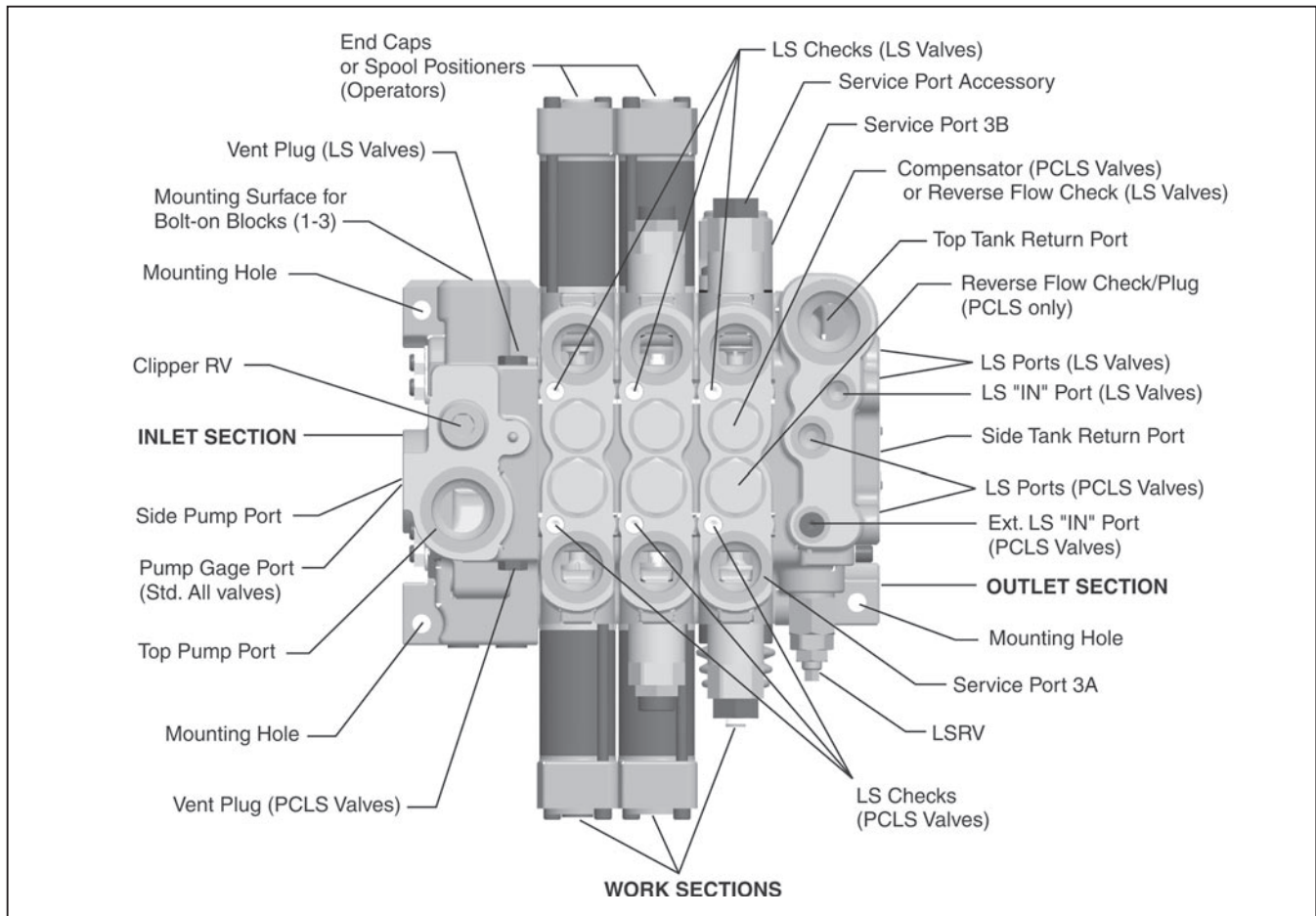


Operation

The VP170 (PCLS) is an individually compensated load-sense directional control valve. For optimum horsepower utilization and heat generation, it is normally used with a piston pump. However, it does have the flexibility to be interfaced with a fixed (gear or vane) displacement pump.

During single function use, the pump control will determine the flow to the valve, based upon the area opening of the spool notch and the load-sense signal being sent back to the pump.

During multi-function operation, the pump control will determine the flow for the highest loaded function, while the section compensator will control the flow for the lighter loaded function.



Benefits

- **Excellent machine controllability** – individual pressure compensation in each work section delivers predictable metering with single and multi-function operation, regardless of changes in pressure or input flow. This enhances machine control, improves productivity and helps to make every operator an “expert” operator -- all of which saves money. Also, this valve type lends itself to closed-loop control.
- **Improved system efficiency** – optimized horsepower utilization and heat management are inherent with load-sense pressure compensated valves. This is because of a closer match between horsepower consumption and horsepower demand. Fuel savings between 30-50% can be achieved vs. open-center type systems. Also, better horsepower utilization may enable the use of a smaller, less costly engine.
- **Enhanced machine productivity** – the VP170 incorporates flow-sharing technology. This means that during a pump over-demand condition the valve will automatically apportion the available pump flow to the selected functions, based upon control spool area openings. The selected functions will maintain their speed relationship, but at a lower overall speed. This automatic adjusting by the valve can improve machine productivity as much as 20% and reduce operator fatigue.
- **Flexible design** – the modular design of the VP170 enables the machine designer to add or remove content to achieve a better “value match” with the machine requirements. For example, the VP170 is available as load-sense pressure compensated, load-sense only, and with or without induced-load protection. Also, a full line of spool positioners and port accessories is available.
- **Wide flow range** – offers application potential across a family of machines. The VP170 can handle a pump input of 230 LPM (60 GPM) and work sections flows from 30-190 LPM (8-50 GPM).
- **Induced-load protection** – is available for machines whose duty cycles might generate induced loads greater than the load-sense relief valve setting. This is an important option for valves with flow-sharing technology and has the benefit of maintaining machine productivity.
- **Addresses cavitation and maintains system responsiveness** – a unique, optional low-pressure regeneration feature combats cavitation and the damage it causes to hydraulic components -- reducing warranty costs as much as 15%. This device assures there is hydraulic oil in the loop at all times.
- **Ease of service** – the load-sense check, compensator and transition check are located on top of each work section making it a “service friendly” design.

Definitions

PCLS = Pressure Compensated Load-Sense, or load-sensing with individual pressure compensation. Individual pressure compensation means each circuit (work section) has a pressure compensator. These pressure compensators reduce pressure to individual circuit needs resulting in flows for each circuit being proportional to spool stroke.

LS = Load-Sensing (no individual pressure compensators). Flow is proportional to spool stroke in the highest loaded function only.

LSRV = Load-Sense Relief Valve – normally a small RV that sets maximum LS pressure.

Clipper RV = “Clips” or reduces pressure spikes normally caused when flow demand decreases faster than the pump flow output can decrease.

Margin_{valve} = Pressure at valve inlet – pressure at valve LS port = M_v .

Margin_{pump} = Pressure at pump outlet – pressure at pump LS port = M_p .

Margin_{neutral} = M_v or M_p when all valve spools are in neutral.

Margin_{stall} = M_v or M_p when one valve function is deadheaded and the LSRV relieves.

FLO = Flow Limit Orifice, limits flow over LSRV. Normally it is 0.045" diameter.

Over-demand = When functions demand flow in excess of pump capacity.

EH = Electrohydraulic or solenoid controlled spool positioning.

Induced load = Occurs when an actuator tries to force fluid into a valve workport.

PRRV = Pressure Reducing and Relieving Valve.

Q = Flow or Flow rate.

LS vent = A small connection (0.014"/0.017" diameter) of the LS gallery to tank to “bleed down” the LS pressure to the tank level when LS pressure is not required.

LS check = Helps decide which circuit has the highest LS pressure.

Flow sharing = A valve arranged so available flow is shared between active circuits – also known as “post compensated”.

Conversion Factors:

1 kg = 2.2 lbs.

1 N = 0.225 lbs. force

1 Bar = 14.5 PSI

1 liter = 0.22 UK gallon

1 liter = 0.264 US gallon

1 cm³ = 0.061 in³

1 m = 3.28 feet

1 mm = 0.039 inches

9/5 °C + 32 = °F

Specifications

Pressures	Pump inlets: 350 Bar (5000 PSI) Service Ports: 350 Bar (5000 PSI) Pilot (input or internal supply): 35 Bar (508 PSI) Tank Return: 15 Bar (220 PSI) Solenoid Drain: 2 Bar (29 PSI)
Flow Rates	Maximum Input: 227 LPM (60 US GPM) Maximum Flow out of Service Ports: 190 LPM (50 US GPM) Max. Return to Service Port: 280 LPM (75 US GPM)
Leakage Performance With mineral oil, 100 SUS @ 120°F at 1100 PSI differential	Workport w/Steel Plug or no Accessory: 20 cc/min max. Workport w/RV or RV+AC: 24 cc/min max. Thru Reverse Flow Check: 180 cc/min max. Thru Compensator Only (no Reverse Flow Check): 1100 cc/min max.
Hydraulic Fluid	Mineral base oil. For other fluids consult factory. Viscosity, working range: 15-380mm ² /s (15-380 cSt).
Hydraulic Oil Temperature	Recommended Operating Range without Solenoid Operation: -30° to 90°C (-22° to 194°F) Recommended Operating Range with Solenoid Operation: -20° to 80°C (-4° to 176°F)
Filtration (ISO 4406)	20/18/14 in Main Flow Paths 18/16/13 Pilot Supply

Weights

Inlet w/o Bolt-on Block	9.53 kg (21 lb)
Inlet with Bolt-on Block	12.25 kg (27 lb)
Work Sections	
Manual	9.10 kg (20 lb)
Hydraulic Remote	9.53 kg (21 lb)
EH	9.98 kg (22 lb)
Outlets	
Standard	8.62 kg (19 lb)
LP Regen	10.43 kg (23 lb)
LS Unloader	10.43 kg (23 lb)

Mounting Surface

There is no restriction on orientation.
 Flatness should be at least 0.5 mm (0.020")
 Surface must be stable and not put stress on valve.

Connections

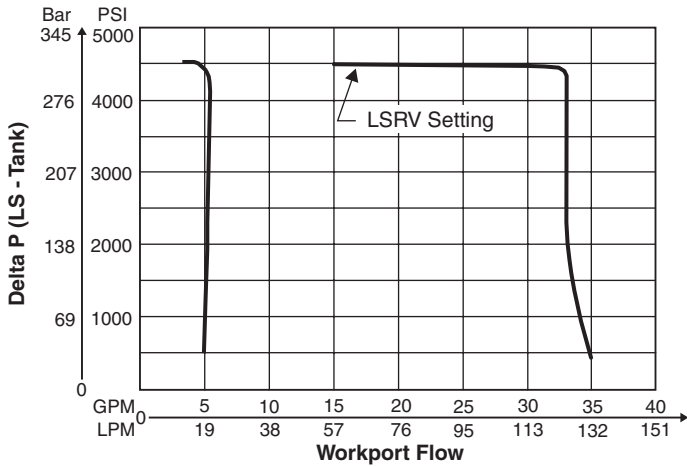
O-ring boss ports SAE-J1926-1
 BSPP ports ISO 1179-1
 Pump gage port standard
 o-ring boss 9/16"-18 UNF , BSPP ports 1/4"-19

Description	SAE #	Thread Size	
		O-ring Boss (UNF)	BSPP
inlet, top	16	1 ⁵ / ₁₆ -12	1"-11
inlet, top	12	1 ¹ / ₁₆ -12	3/4"-14
inlet, side	16	1 ⁵ / ₁₆ -12	1"-11
inlet, side	12	1 ¹ / ₁₆ -12	3/4"-14
EH inlet, pilot	6	9/16-18	1/4"-19
All block ports	6	9/16-18	1/4"-19
outlet, top	16	1 ⁵ / ₁₆ -12	1"-11
outlet, top	12	1 ¹ / ₁₆ -12	3/4"-14
outlet, side	16	1 ⁵ / ₁₆ -12	1"-11
outlet, side	12	1 ¹ / ₁₆ -12	3/4"-14
outlet, side	20	1 ⁵ / ₈ -12	1 ¹ / ₄ "-11
work section	8	3/4-16	(none)
work section	10	7/8-14	1/2"-14
work section	12	1 ¹ / ₁₆ -12	3/4"-14

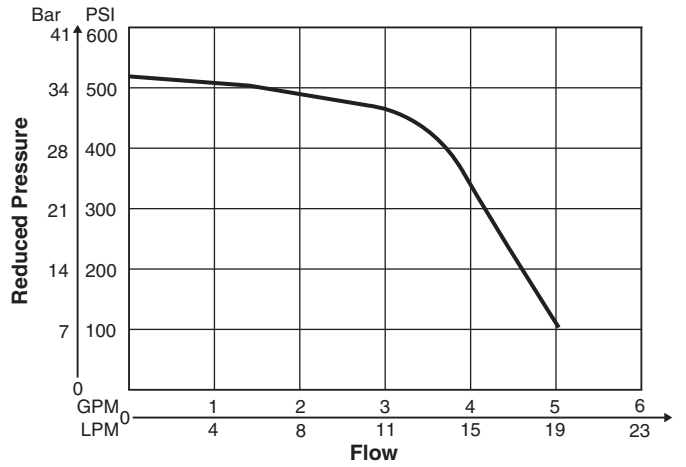
Solenoid Specifications

Voltage	12 or 24 VDC		
Pilot	35 Bar (508 PSI), 15-23 LPM (4-6 GPM)		
Current Input (I)	1.5A for 12 VDC 0.75A for 24 VDC		
Current (mA) for Spool Shift	Start Shift	12V 500	24V 250
	Full Shift	1250	625
Insulation Material	Class H		
Duty Cycle	100%		
R20 Ohm	5.3 (±5%) for 12 VDC 21.2 (±5%) for 24 VDC		
Fluid Cleanliness	17/14 per ISO 4406		
Ambient Temperature	-30° to 80°C (-22° to 176°F)		
Fluid Temperature	-20° to 80°C (-4° to 176°F)		

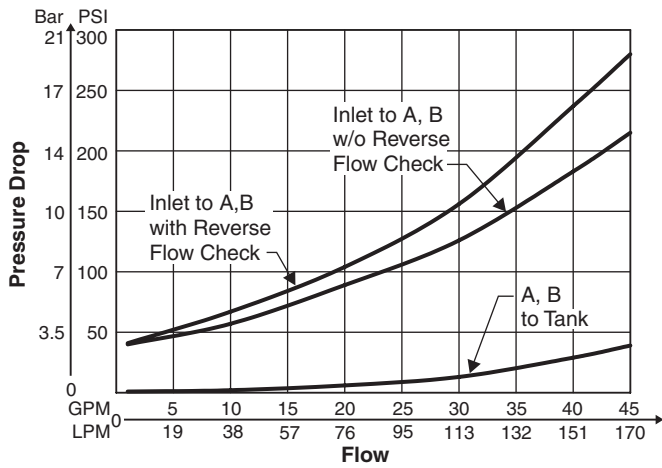
Compensator Performance



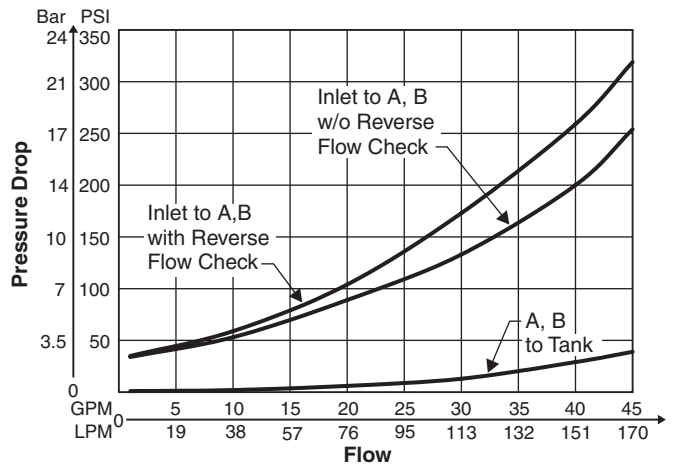
PRRV Pressure vs. Flow



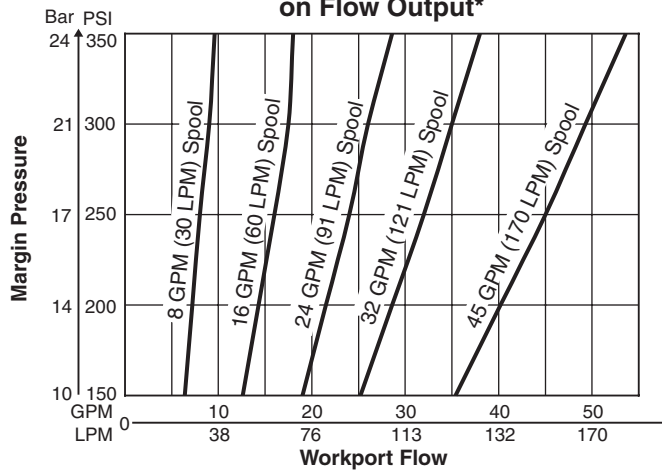
1 Spool Pressure Drop vs. Flow



7 Spool Pressure Drop vs. Flow

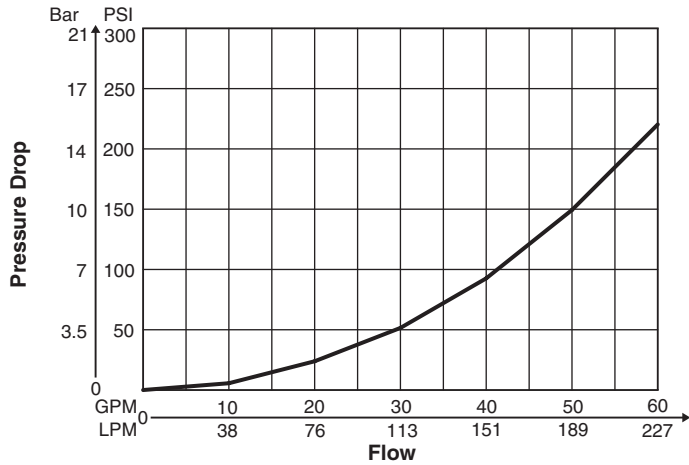


Effects of Margin Pressure on Flow Output*

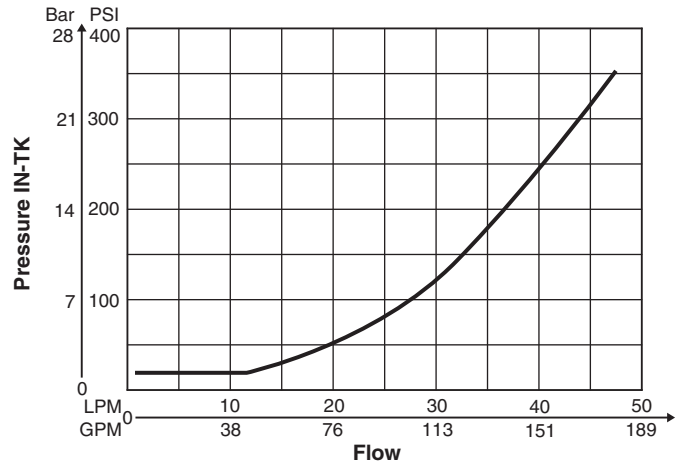


* assumes no Delta P from pump to valve

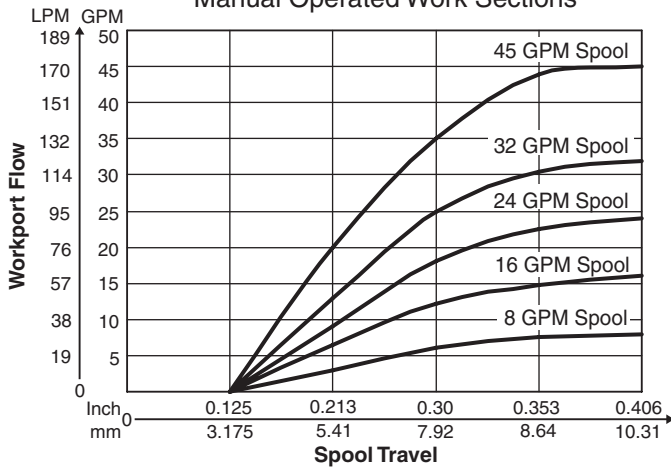
A/C Curve 355 9001 164



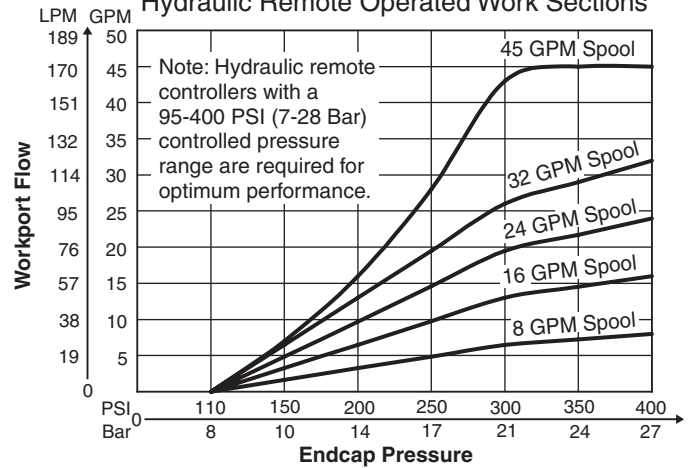
A/C Curve 355 9001 278



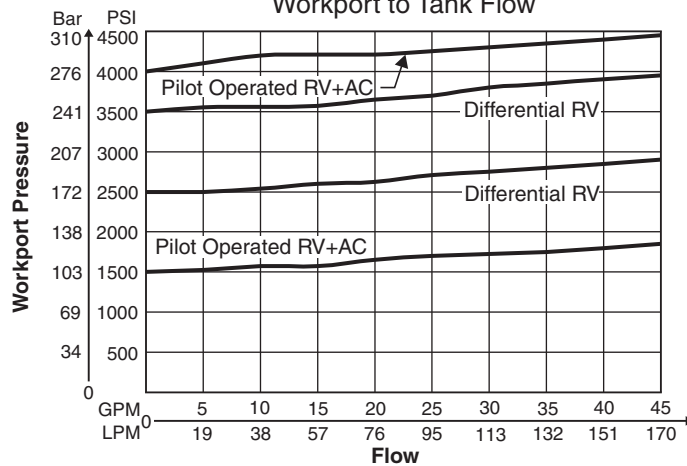
**Meter-In Flow to Workport
 Manual Operated Work Sections**



**Meter-In Flow to Workport
 Hydraulic Remote Operated Work Sections**



**Port Relief Valve Curves
 Workport to Tank Flow**



Major Valve Options

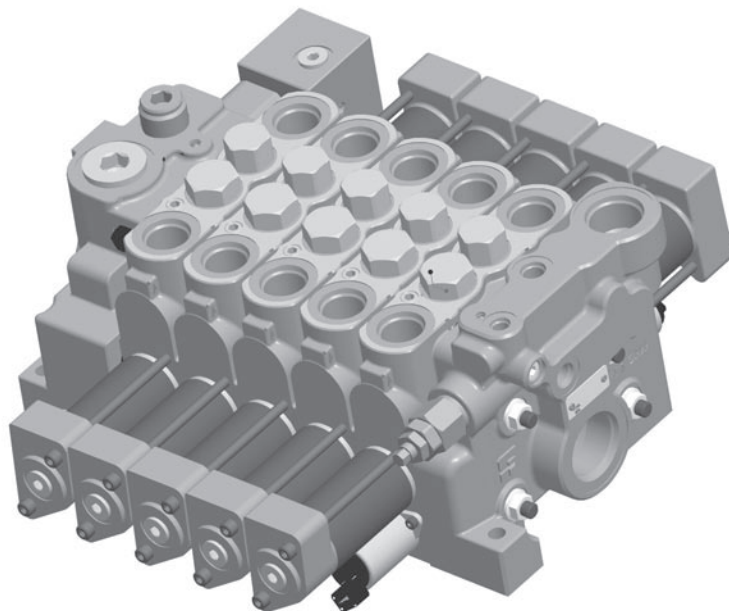
I Circuits:

- A) LS – when individual pressure compensation isn't needed.
- B) PCLS without reverse flow check – when “induced loads”* are not anticipated. Also, the check may be eliminated when load drift is not required.
- C) PCLS with reverse flow check – when “induced loads”* are anticipated. Also, the check serves as a low leak transition check.

* Induced loads are actuators trying to force fluid back into valve.

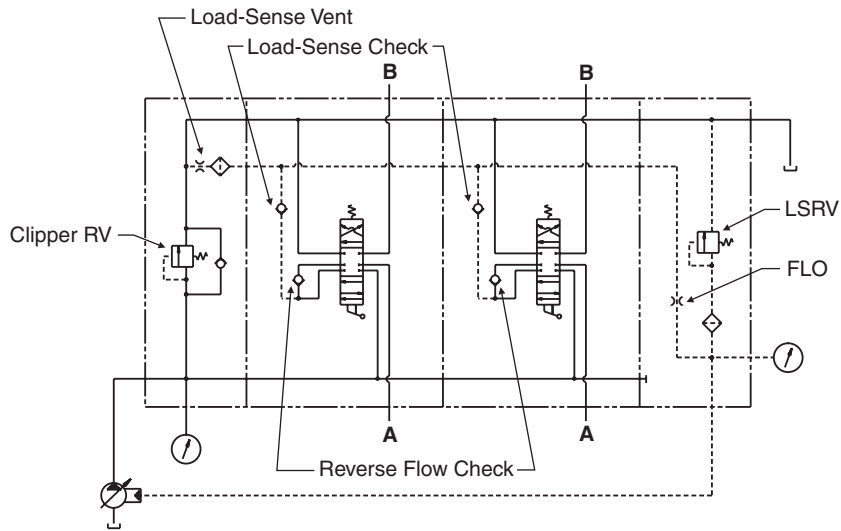
II Inlets:

- A) Standard - all spool operators except solenoid
 - B) “EH” - “external supply” to solenoids – port for connecting external supply to solenoids and drain port – 1.7 Bar (25 PSI) max
 - C) Inlet + block 1, 2, 3
 - Block 1: “Internal supply” – reduced PSI to solenoids via internal pilot gallery
Internal supply to solenoid operators.
 - Block 2: “Joystick supply” – reduced PSI to external port to supply joystick(s)
No internal pilot supply.
 - Block 3: “Kidney loop” – reduced PSI to an external pilot port. The signal can then be routed to a filter and back into the valve. The signal is then routed to the solenoids via internal pilot gallery.
- All 3 blocks have:
- a) PRRV and screen upstream of it
 - b) Accumulator port and check valve
 - c) Drain port for connection of solenoid drains and PRRV spring to tank – 1.7 Bar (25 PSI) max

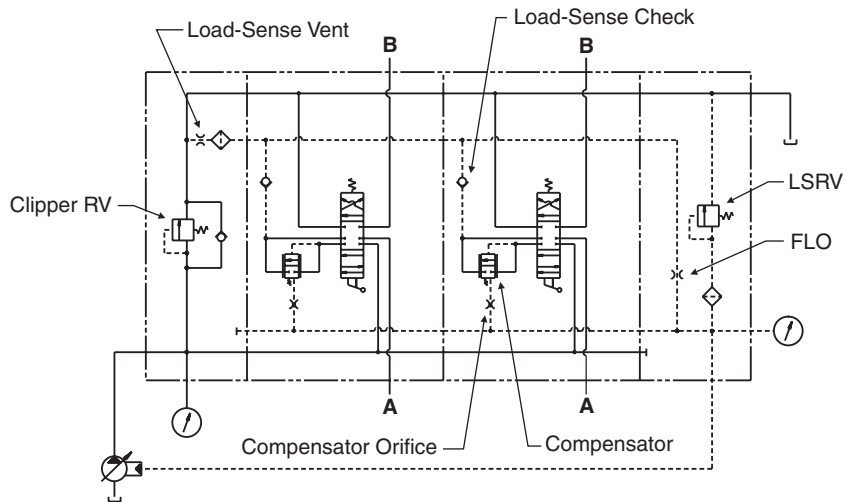


How VP170 May Be Arranged

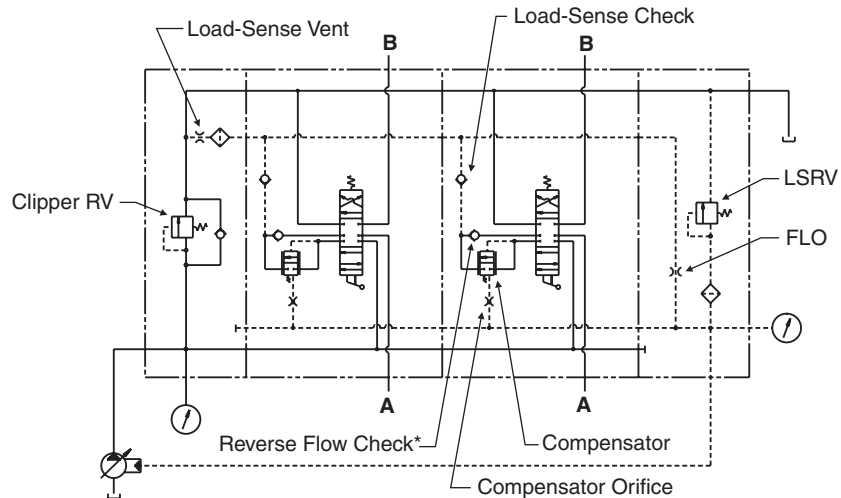
Load-Sense Valve



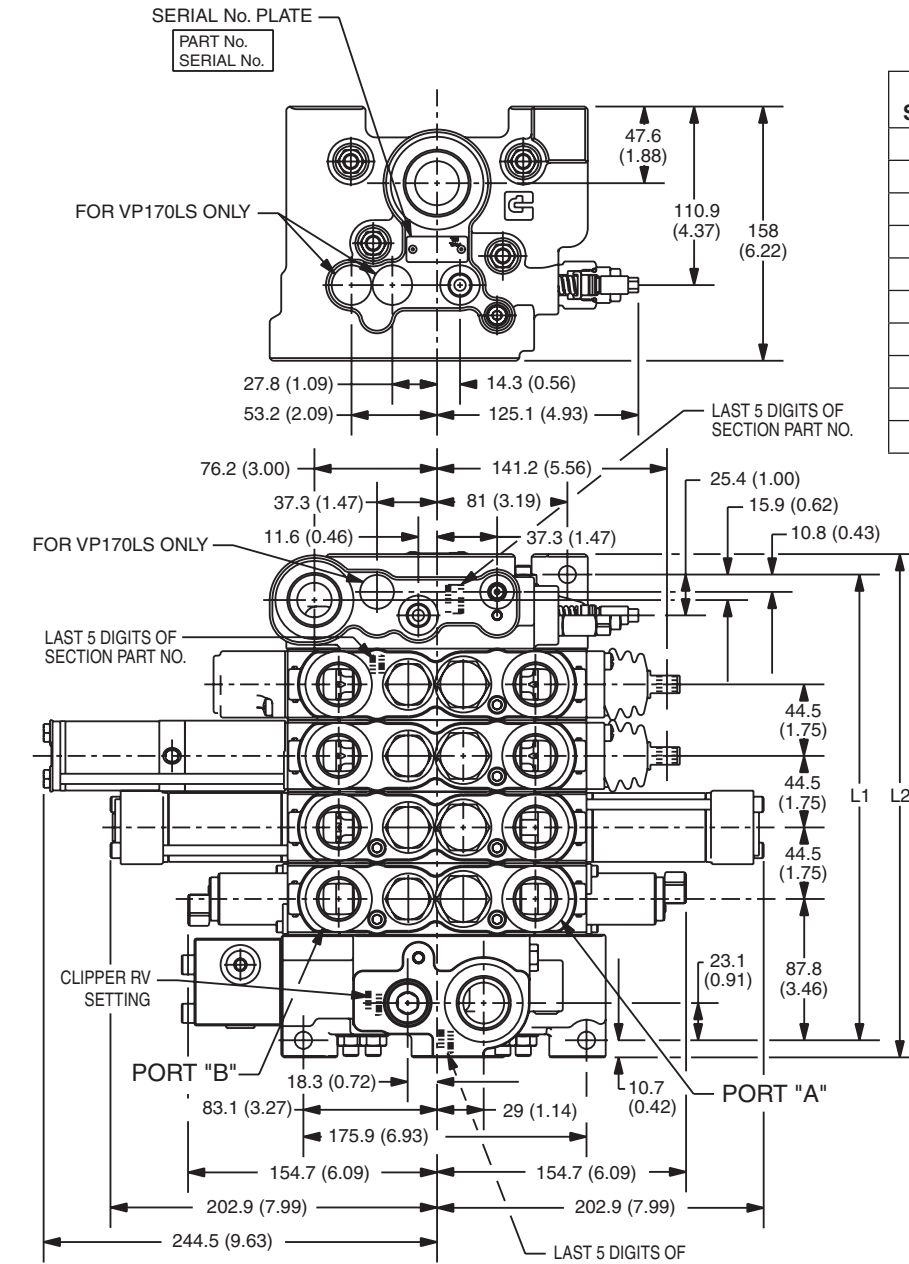
**Pressure Compensated Load-Sense (PCLS)
 without Reverse Flow check**



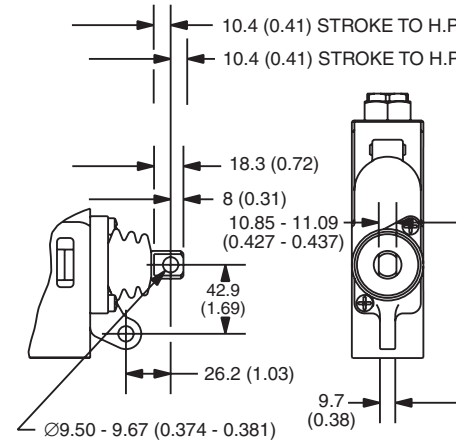
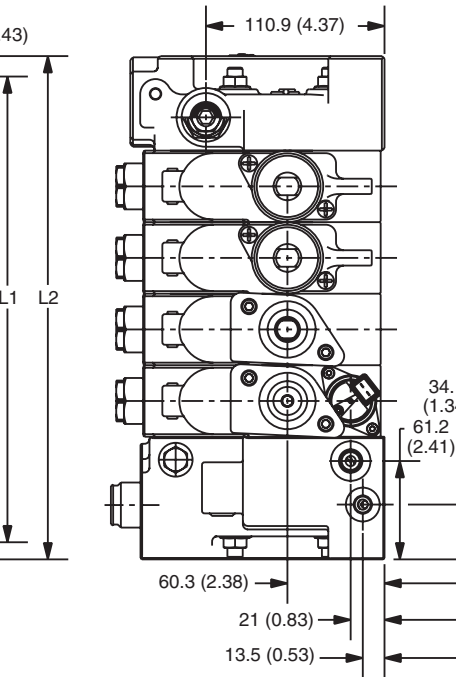
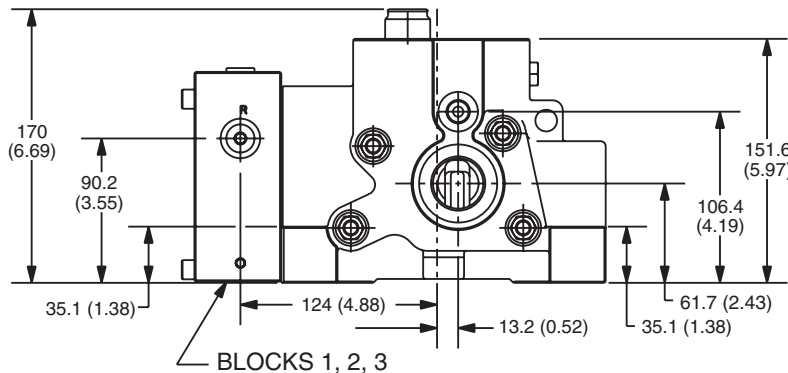
**Pressure Compensated Load-Sense (PCLS)
 with Reverse Flow Check*
 (Protects against Induced Loads)**



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



No. of Sections	L1	L2
1	156 (6.14)	179.3 (7.06)
2	200.4 (7.89)	223.8 (8.81)
3	244.9 (9.64)	269.2 (10.6)
4	289.3 (11.39)	313.7 (12.35)
5	333.8 (13.14)	358.1 (14.1)
6	378.2 (14.89)	402.6 (15.85)
7	422.7 (16.64)	447.0 (17.6)
8	467.1 (18.39)	491.5 (19.35)
9	511.6 (20.14)	535.9 (21.1)
10	556 (21.89)	580.4 (22.85)



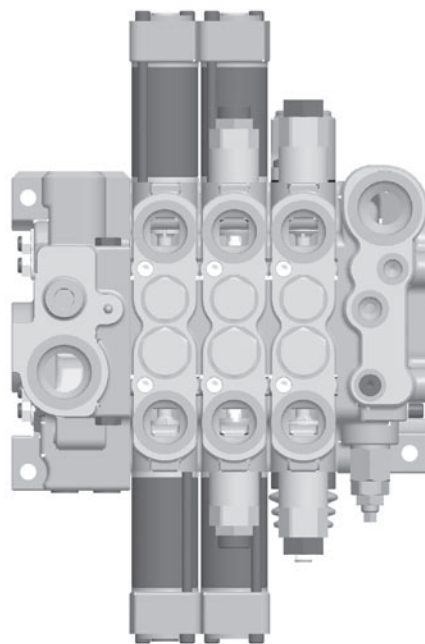
How to Configure a Valve Assembly

There are three choices available to configure a valve assembly: a hard copy specification sheet that is shown on page 25, an MS Excel spreadsheet version of this specification sheet and an eConfigurator that is web based. Please contact your Parker representative or local distributor for additional information regarding these options.

All of these choices involve selecting attributes or features for the system – inlet, work section and outlet. Each of the attributes is associated with a number or position that is shown in brackets [].

System Related Attributes

[Position] Codes	Description
[01]	Valve Type
PCLS	Pressure compensated load-sense
LS	Load-sense
[04]	Port Type
U	UNF
G	BSPP
[05]	System Voltage
12	12 VDC
24	24 VDC
[06]	Connector Type
D	Deutsch
A	Amp
W	Weatherpack (see below)
[07]	Surface Treatment
X	No Paint
P	Black
[08]	Customer Designated ID (pt no)
ID	Enter part number



Note: A jumper is available, Part 391 1823 417, that will connect a solenoid with an AMP connector to a Weatherpack connector on a machine.



Inlet Attributes

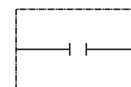
The standard inlet has high pressure ports available on the top and side, and a gage port is also located on the side. An optional clipper relief valve is positioned on the top and set @ 20 LPM (5.3 GPM).

- **Standard** – used with all spool operators, except solenoid.
- **EH** – this is the standard inlet and has machining for external pilot/drain. It also supplies internal pilot pressure to the work-sections.
- **Inlet + block 1, 2 or 3** - all three blocks have a screen upstream of the PRRV, an accumulator port and check valve, a PRRV and a dedicated solenoid drain port.

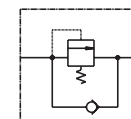
[15]	Inlet Section Type (See next page)
I	Standard
IEH	EH
I1 (block 1)	Internal pilot supply to ports A&B. It also has an optional port that provides a regulated signal out (with a steel plug).
I2 (block 2)	Supplies a regulated external signal to a hydraulic remote controller.
I3 (block 3)	Provides external pilot supply that can be routed thru an external filter and then back into the inlet, for internal supply to the work sections.
[16]	Clipper RV Cavity
Y	Steel plug
PA	RV+AC (non-adjustable)
Z	Plastic closure
[17]	Clipper RV setting (bar)
80	80 Bar (1160 PSI)
100	100 Bar (1450 PSI)
125	125 Bar (1813 PSI)
140	140 Bar (2030 PSI)
160	160 Bar (2320 PSI)
175	175 Bar (2540 PSI)
190	190 Bar (2755 PSI)
210	210 Bar (3045 PSI)
230	230 Bar (3335 PSI)
250	250 Bar (3625 PSI)
280	280 Bar (4060 PSI)
300	300 Bar (4350 PSI)
330	330 Bar (4785 PSI)
350	350 Bar (5075 PSI)
380	380 Bar (5510 PSI)
400	400 Bar (5800 PSI)
[26]	Top Inlet HP Port
1TOPB	SAE 16 or 1" BSPP with a steel plug
1TOP	SAE 16 or 1" BSPP open
[27]	Side Inlet HP Port
1SB	SAE 16 or 1" BSPP with a steel plug
1S	SAE 16 or 1" BSPP open

[16] Clipper RV Cavity

Code Y

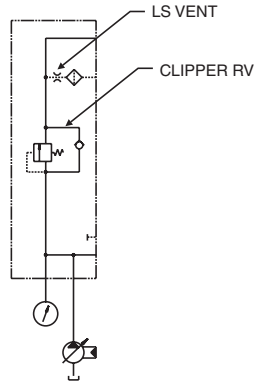
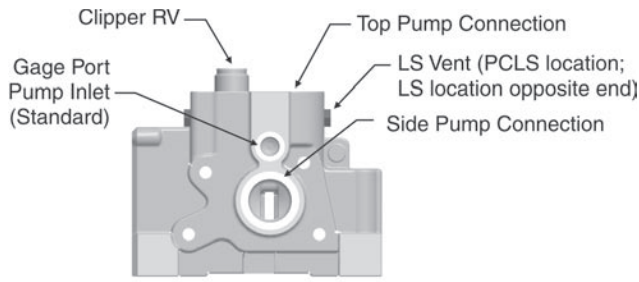


Code PA

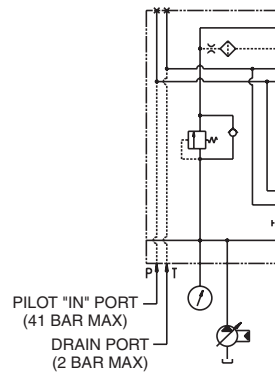
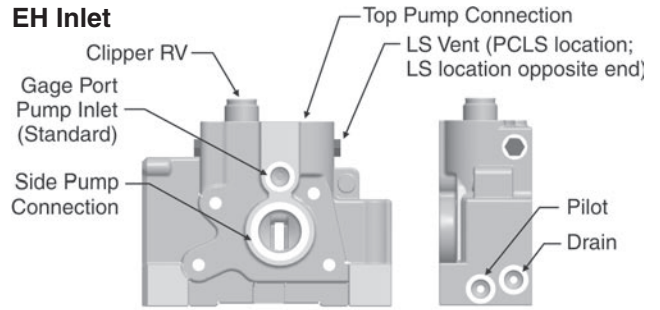


[15] Inlet Section Type

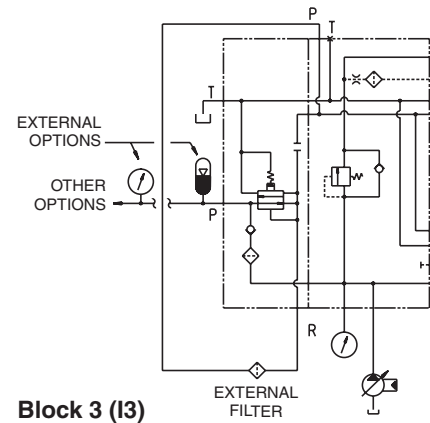
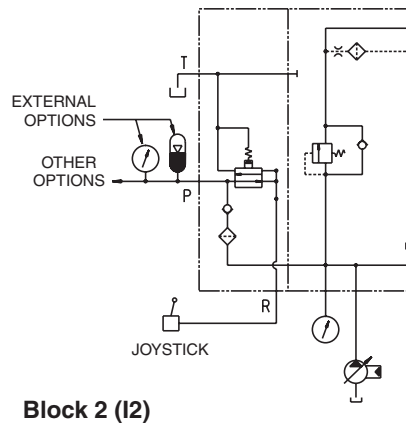
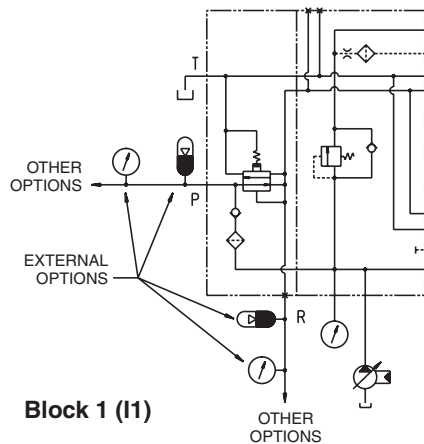
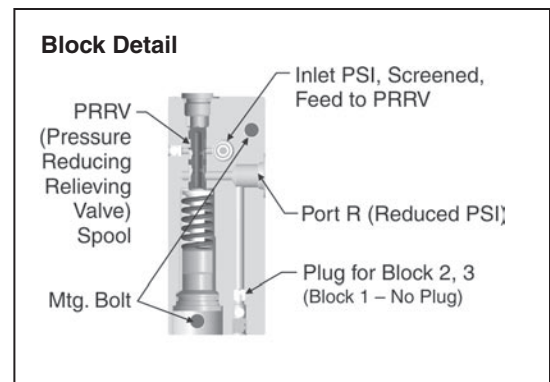
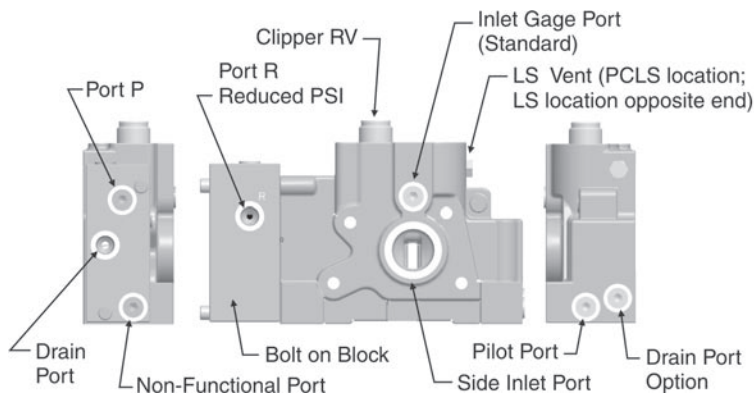
Standard Inlet



EH Inlet



Inlet with Bolt on Block



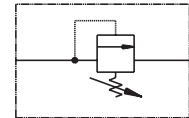
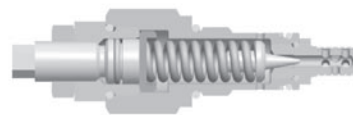
Outlet Attributes

The outlet is available with low pressure ports (top & side), a load-sense relief valve, load-sense and gage ports and an optional port to accept a load-sense signal from an external load-sense valve.

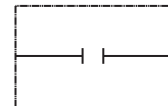
[31]	Top load-sense IN port
LSP	Yes
LSPB	No
[34]	Top tank return port
1 TOPTB	SAE 16 or 1" BSPP with a steel plug
1TOPT	SAE 16 or 1" BSPP open
[33]	Side tank return port
1STB	SAE 16 or 1" BSPP with a steel plug
1ST	SAE 16 or 1" BSPP open
2 STB	SAE 20 or 1 ¼" BSPP with a steel plug
2 ST	SAE 20 or 1 ¼" BSPP open
[41]	LSRV Cavity
LSRV	Load-sense relief valve
Y	Steel plug
[43]	Load-sense RV setting (Bar)
Bar	Enter setting. If none, omit

[41] LSRV Cavity

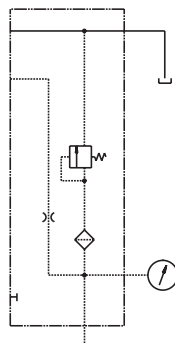
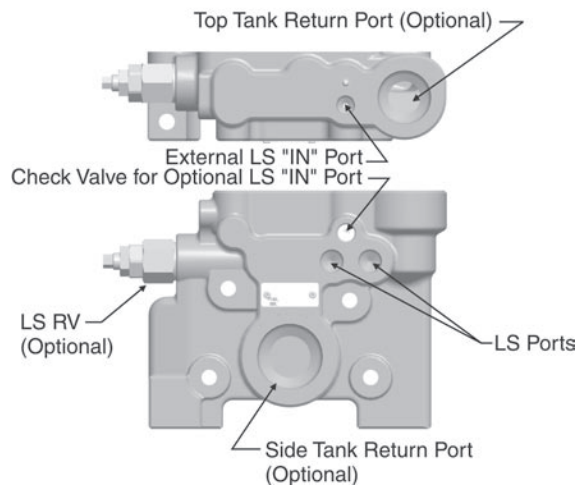
Code LSRV



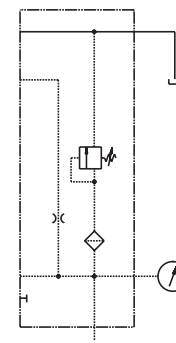
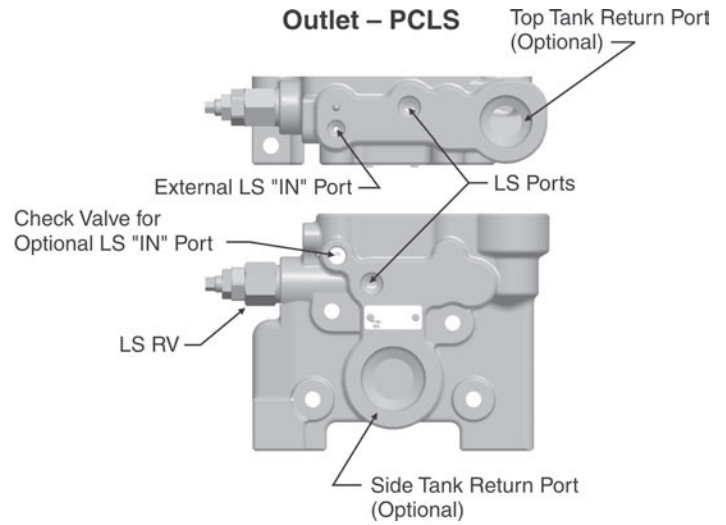
Code Y



Outlet – Load Sense



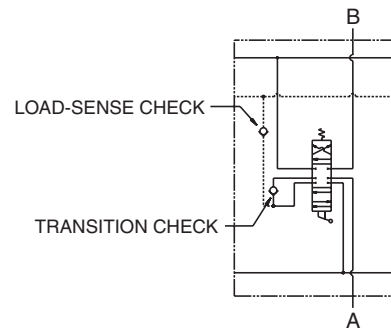
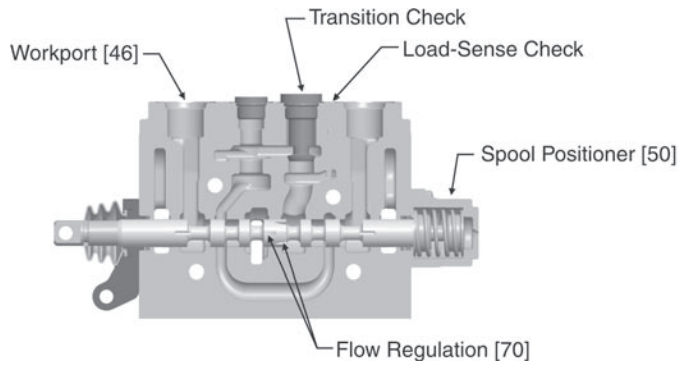
Outlet – PCLS



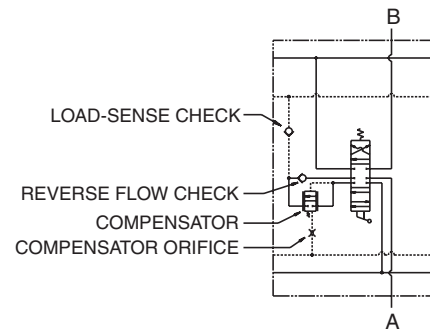
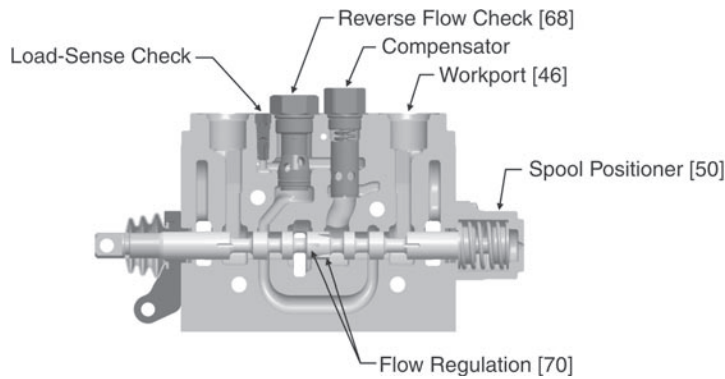
Work Section Attributes

Work sections are available in 3-way, 3-position (cylinder & motor), a 4-way, 3-position (cylinder & motor), and a 4-position float. There are six flow ranges available for each spool type. These spools are based upon a valve margin pressure of 17 Bar (250 PSI). Spool positioners are manual, pneumatic, hydraulic remote and solenoid.

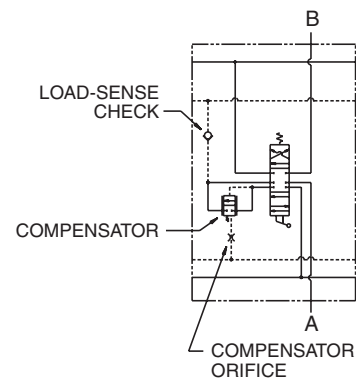
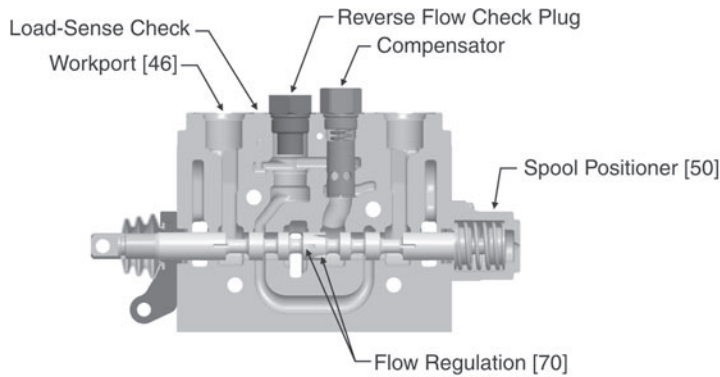
Load-Sensing Work Section



PCLS Work Section with Reverse Flow Check



PCLS Work Section w/o Reverse Flow Check



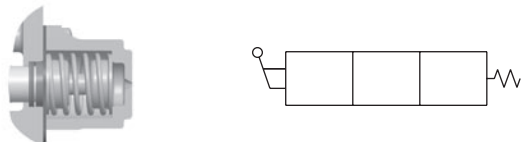
Work-Section Attributes

[46]	Size of work ports
WP2001	SAE 10 or 1/2" BSPP
WP2002	SAE 12 or 3/4" BSPP
[50]	Spool Positioner (See below and next page)
C1	Manual, 3-position
CB	Manual, 4-position, detent in 4th position float
B3	Manual, 3-position detent
3SD	Manual, 3-position, detent IN, spring-return OUT
ACP	Pneumatic, 3-position
PC	Hydraulic-remote, 3-position
PCA	Hydraulic-remote, 3-position, adjusted spool stroke
PCF	Hydraulic-remote, 4-position float
EC	Solenoid, 3-position
ECA	Solenoid, 3-position, adjusted spool stroke
ECF	Solenoid, 4-position float

[50] Work Section Spool Positioner

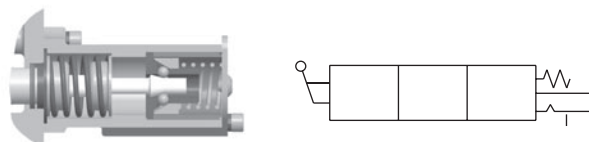
Code C1 = Spring Return

Basic Function:
Return spool to neutral position from either work position when handle is released. Manual handle operation.



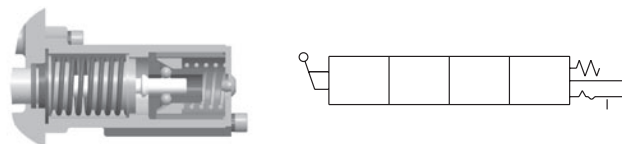
Code 3SD = Spring Return Out, Detent In

Basic Function:
Spool is detented when pushed IN. Spool is returned to neutral via spring when pulled OUT.



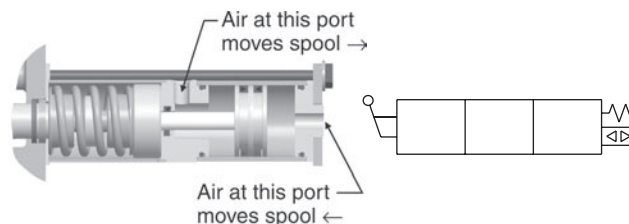
Code CB = Spring Return w/4th Position Detent

Basic Function:
Spring return from either work position. Detent in 4th position. Manual handle operation.



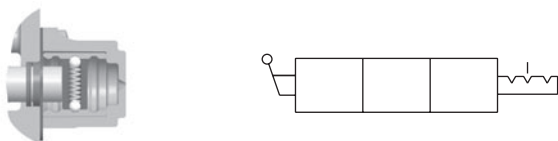
Code ACP = Single Ended Pneumatic

Basic Function:
Proportional air pilot PSI, admitted at either port, balances against spring.



Code B3 = 3-Position Detent

Basic Function:
Hold spool in neutral position or in either work position. Manual handle operation.



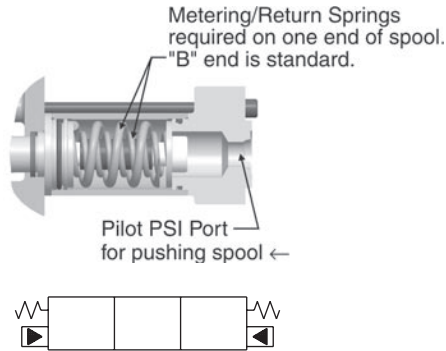
Continued on next page

[50] Work Section Spool Positioner (cont.)

Code PC = Hydraulic Remote (Proportional)

Basic Function:

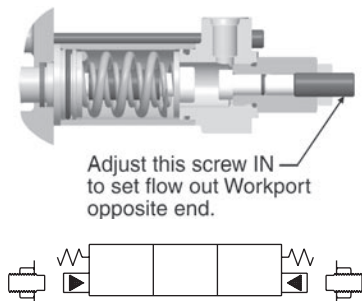
Proportional hydraulic pilot PSI is admitted to port (PCL4) and balances against metering/return springs. Use metering band of PCL4 for best match.



Code PCA = Hydraulic Remote, Adj. Spool Stroke

Basic Function:

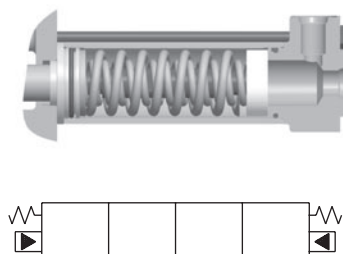
Reduce spool stroke thus reducing flow to service ports. Can reduce spool stroke from 0.406 to 0.094. Flow (Q) set at "A", "B" [61]



Code PCF = Hydraulic Remote, 4-Position Float

Basic Function:

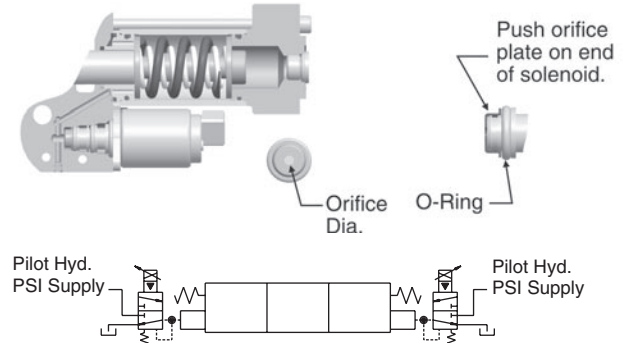
Proportional hydraulic pilot PSI admitted to ports from PCL4 moves spool proportionally to HP @ A, B or 4th position float.



Code EC = Proportional Solenoid, 3-Position

Basic Function:

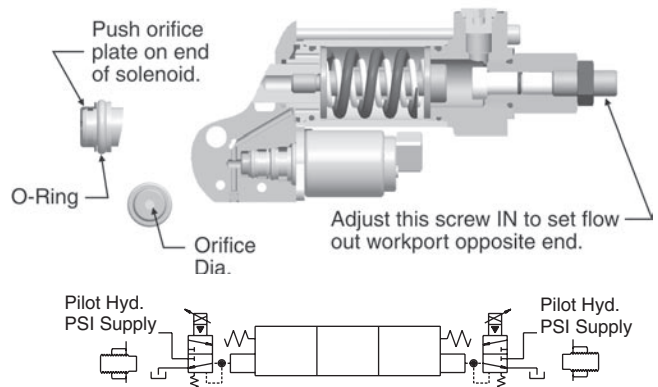
Proportional spool movement via proportional current to solenoid (ref. IQAN).



Code ECA = Proportional Solenoid, Adj. Spool Stroke

Basic Function:

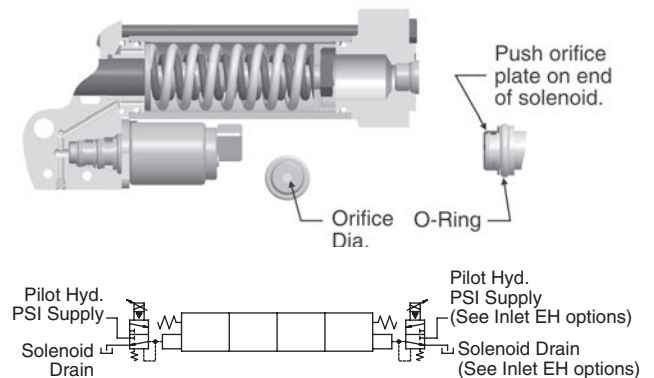
Reduce spool stroke thus reducing flow to service ports. Can reduce spool stroke from 0.406 to 0.094. Flow (Q) set at "A", "B" [61]

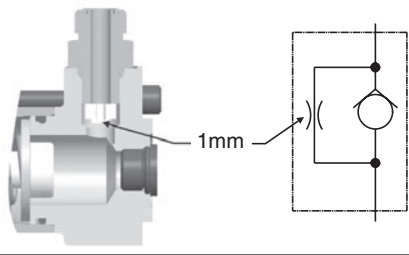
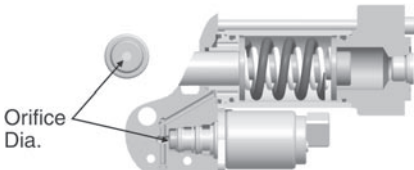
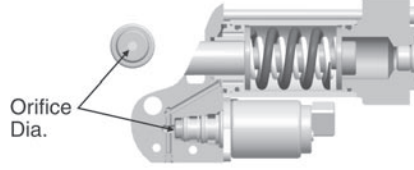


Code ECF = Proportional Solenoid, 4-Position Float

Basic Function:

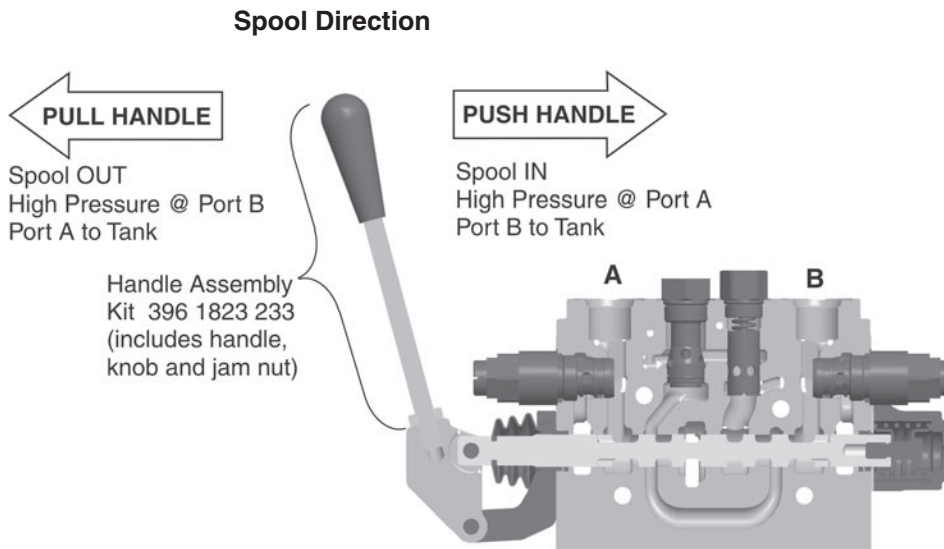
Solenoids use current proportioning to proportion hydraulic pilot PSI and balance it against metering/return springs for proportional spool movement.



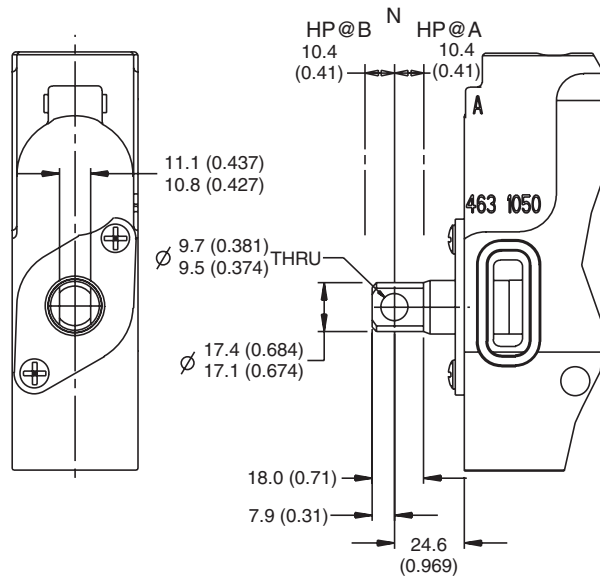
[51]	Manual Operator (See next page)	
L1	Type 1 Handle	
L2	Type 2 Lug End	
[55A]	Pilot orifice diameter for hydraulic remote. Controls shift to 'A' port – mm. This option is utilized, when dampening is needed.	
1	1 mm (0.039")	
0	None	
[55B]	Pilot orifice diameter. Controls shift to 'B' port – mm. This option is utilized, when dampening is needed.	
1	1 mm (0.039")	
0	None	
[56A]	Solenoid pilot orifice. Controls shift to 'A' port – mm. This option is utilized, when dampening is needed. The standard size is 3mm.	
.45	0.45	
.6	0.6	
.7	0.7	
0.8	0.8	
0.9	0.9	
1	1	
1.1	1.1	
1.2	1.2	
1.3	1.3	
1.4	1.4	
1.5	1.5	
2	2	
3	3	
[56B]	Solenoid pilot orifice. Controls shift to 'B' port - mm. This option is utilized, when dampening is needed. The standard size is 3mm.	
.45	0.45	
.6	0.6	
.7	0.7	
0.8	0.8	
0.9	0.9	
1	1	
1.1	1.1	
1.2	1.2	
1.3	1.3	
1.4	1.4	
1.5	1.5	
2	2	
3	3	


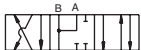
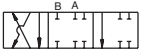
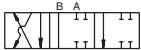

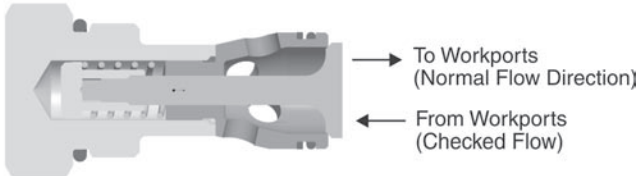
[51] Manual Operators

Type 1 Handle End



Type 2 Lug End



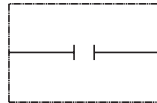
[57]	Diode (ports A and B)	
D1	Yes	
/	No	
[60]	Spool Function	
D	Double-Acting Cylinder	
M	Double-Acting Motor	
DEB	Single-Acting Cylinder @ port B	
MEB	Single-Acting Motor @ port B	
F	4th Position Float	
[61A]	Flow setting out of port 'A' with stroke limiter. For hydraulic remote or solenoid operation.	
LPM	Enter setting	
[61B]	Flow setting out of port 'B' with stroke limiter. For hydraulic remote or solenoid operation.	
LPM	Enter setting	
[68]	<p>Reverse Flow Check (applies to VP170 (PCLS) only. This feature addresses induced loads and also serves as a transition check. It is not needed if induced loads are not applicable OR the function has pilot-operated checks or counterbalance valves.</p>	
CV	Yes	
Y2	No	
[70]	Spool Flow at Full Stroke – Ports 'A & B'. This is based upon a margin pressure of 17 Bar (250 PSI)	
30/8	30 LPM/8 GPM	
61/16	61 LPM/16 GPM	
91/24	91 LPM/24 GPM	
121/32	121 LPM/32 GPM	
170/45	170 LPM/45 GPM	
Full	This spool will meter to approximately 75% of stroke. With further spool movement, the spool will come off the notch.	

Workport Accessories – Select one for each port

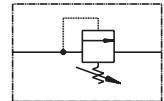
Port A	Accessory (See below for details)	Port B
[76A]	Accessory (See below for details)	[76B]
Y2	Steel Plug	Y2
C	Plastic Closure	C
PS	RV/AC, screw adjustable, 35-345 Bar (500-5000 PSI)	PS
RV1	RV, screw adjustable, 35-86 Bar (500-1250 PSI)	RV1
RV2	RV, screw adjustable, 86-183 Bar (1251-2650 PSI)	RV2
RV3	RV, screw adjustable, 183-269 Bar (2651-3900 PSI)	RV3
RV4	RV, shim adjustable, 35-69 Bar (500-1000 PSI)	RV5
RV5	RV, shim adjustable, 69-172 Bar (1001-2500 PSI)	RV6
RV6	RV, shim adjustable, 172-241 Bar (2501-3500 PSI)	RV7
N2	Anti-Cav	N2
Bars	R/V Setting – enter in Bars	Bars

[76A] and [76B] – Workport Accessories

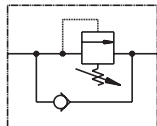
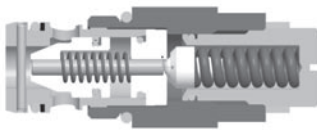
Code Y2



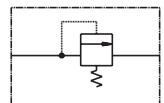
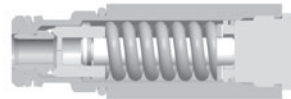
Code RV1, RV2, RV3



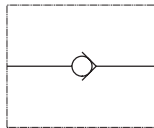
Code PS



Code RV4, RV5, RV6



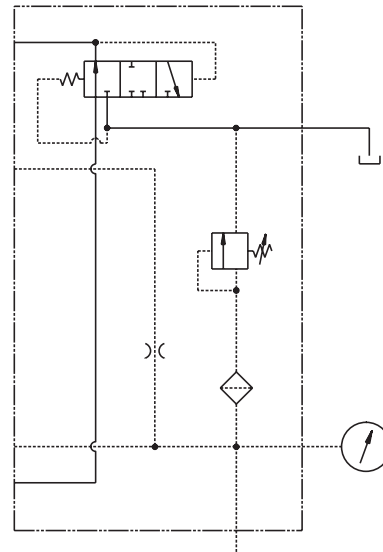
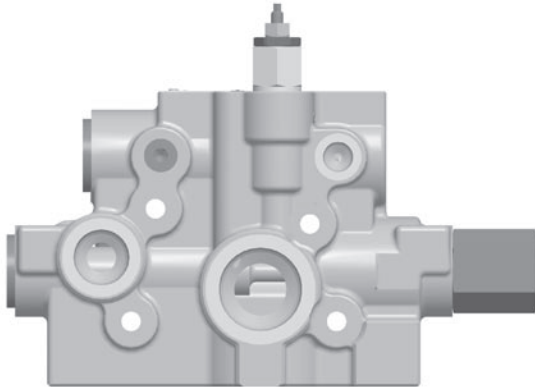
Code N2



Low Pressure Regeneration

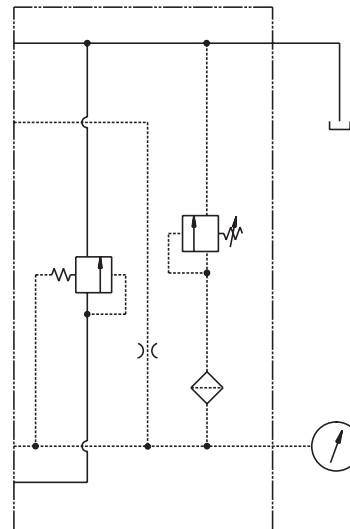
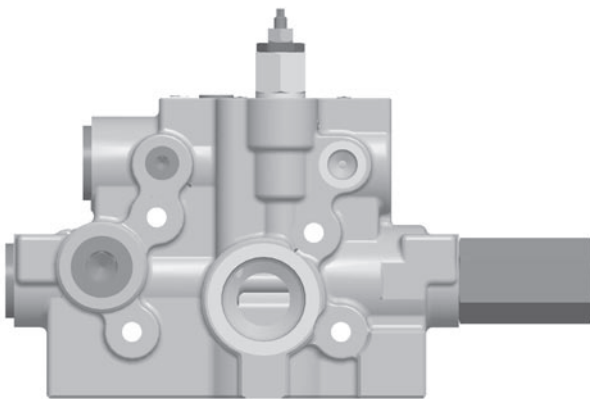
For combatting cavitation

To combat cavitation, this outlet is designed to always keep oil in the loop between the valve and the actuator. When a function is cavitating, it will force oil across any anti-cavitation checks in the valve. If there is still a void in the hydraulic loop (valve to actuator) after the spools are returned to neutral, it will keep the piston pump on stroke until that void is eliminated.

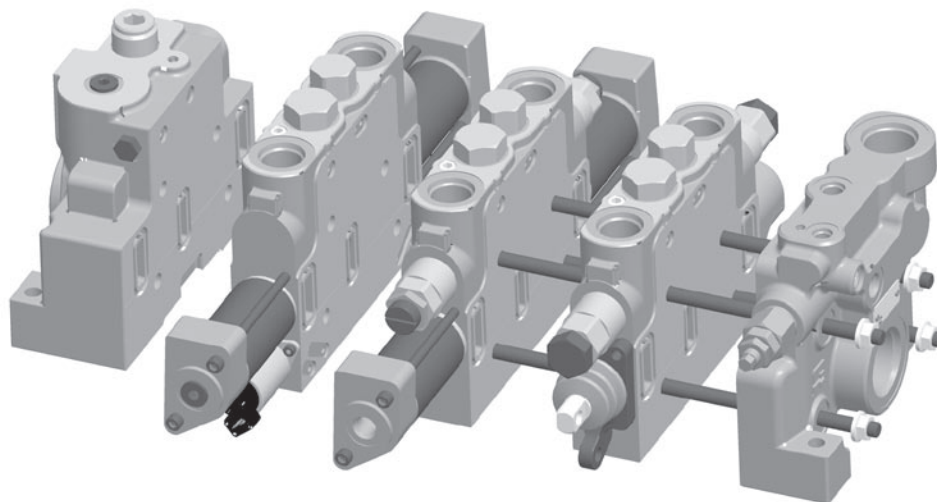


LS Unloader

Operates with fixed displacement pumps



Stud Assemblies



# Sections	Stud assembly	Stud	Length (in)
1	391 9425 108	391 1425 378	6.75
2	391 9425 107	391 1425 377	8.50
3	391 9425 085	391 1425 425	10.25
4	391 9425 109	391 1425 382	12.00
5	391 9425 111	391 1425 388	13.75
6	391 9425 121	391 1425 404	15.50
7	391 9425 122	391 1425 405	17.25
8	391 9425 123	391 1425 406	19.00
9	391 9425 124	391 1425 407	20.75

Offer of Sale

The items described in this document and other documents or descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors are hereby offered for sale at prices to be established by Parker Hannifin Corporation, its subsidiaries and its authorized distributors. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any such items, when communicated to Parker Hannifin Corporation, its subsidiary or an authorized distributor ("Seller") verbally or in writing, shall constitute acceptance of this offer.

1. Terms and Conditions of Sale: All descriptions, quotations, proposals, offers, acknowledgments, acceptances and sales of Seller's products are subject to and shall be governed exclusively by the terms and conditions stated herein. Buyer's acceptance of any offer to sell is limited to these terms and conditions. Any terms or conditions in addition to, or inconsistent with those stated herein, proposed by Buyer in any acceptance of an offer by Seller, are hereby objected to. No such additional, different or inconsistent terms and conditions shall become part of the contract between Buyer and Seller unless expressly accepted in writing by Seller. Seller's acceptance of any offer to purchase by Buyer is expressly conditional upon Buyer's assent to all the terms and conditions stated herein, including any terms in addition to, or inconsistent with those contained in Buyer's offer. Acceptance of Seller's products shall in all events constitute such assent.

2. Payment: Payment shall be made by Buyer net 30 days from the date of delivery of the items purchased hereunder. Amounts not timely paid shall bear interest at the maximum rate permitted by law for each month or portion thereof that the Buyer is late in making payment. Any claims by Buyer for omissions or shortages in a shipment shall be waived unless Seller receives notice thereof within 30 days after Buyer's receipt of the shipment.

3. Delivery: Unless otherwise provided on the face hereof, delivery shall be made F.O.B. Seller's plant. Regardless of the method of delivery, however, risk of loss shall pass to Buyer upon Seller's delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.

4. Warranty: Seller warrants that the items sold hereunder shall be free from defects in material or workmanship for a period of 18 months from date of shipment from Parker Hannifin Corporation. **THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO ITEMS PROVIDED HEREUNDER. SELLER MAKES NO OTHER WARRANTY, GUARANTEE, OR REPRESENTATION OF ANY KIND WHATSOEVER. ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR PURPOSE, WHETHER EXPRESS, IMPLIED, OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING ARE HEREBY DISCLAIMED. NOTWITHSTANDING THE FOREGOING, THERE ARE NO WARRANTIES WHATSOEVER ON ITEMS BUILT OR ACQUIRED WHOLLY OR PARTIALLY, TO BUYER'S DESIGNS OR SPECIFICATIONS.**

5. Limitation Of Remedy: SELLER'S LIABILITY ARISING FROM OR IN ANY WAY CONNECTED WITH THE ITEMS SOLD OR THIS CONTRACT SHALL BE LIMITED EXCLUSIVELY TO REPAIR OR REPLACEMENT OF THE ITEMS SOLD OR REFUND OF THE PURCHASE PRICE PAID BY BUYER, AT SELLER'S SOLE OPTION. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND OR NATURE WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOST PROFITS ARISING FROM OR IN ANY WAY CONNECTED WITH THIS AGREEMENT OR ITEMS SOLD HEREUNDER, WHETHER ALLEGED TO ARISE FROM BREACH OF CONTRACT, EXPRESS OR IMPLIED WARRANTY, OR IN TORT, INCLUDING WITHOUT LIMITATION, NEGLIGENCE, FAILURE TO WARN OR STRICT LIABILITY.

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

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

discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

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

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

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

If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgments resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

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

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

9/91-P

cat hy14-2006.indd, m&a



Parker Hydraulics International Sales Offices

North America

Hydraulics Group Headquarters

6035 Parkland Boulevard
Cleveland, OH 44124-4141 USA
Tel: 216-896-3000
Fax: 216-896-4031

Motion & Control Sales Division

651 Robbins Drive, PO Box 3500
Troy, MI 48007-3500 USA
Tel: 248-589-2400
Fax: 248-577-4890

Parker Hannifin Canada

Motion & Control Division – Milton

160 Chisholm Drive Milton
Ontario Canada L9T 3G9
Tel: 905-693-3011
Fax: 905-876-0788

Motion & Control Division – Montreal

2001 rue de l'aviation
Dorval, Quebec, H9P 2X6
Tel: 514-684-3000
Fax: 514-684-4191

Motion & Control Division – Calgary

3141B – 18th Street N.E.
Calgary, Alberta T2E 7K8
Tel: 403-291-9284
Fax: 403-291-9285

Mexico

Parker Hannifin de Mexico, S.A. C.V

Via de Ferrocarril a Matamoros 730
Apodaca, N.L. C.P. 66600, Mexico
Tel: 01-8181-566036 y 96

Parker Hannifin de México

Av eje uno norte num 100
Parque Industrial Toluca 2000
Toluca, Mex C.P. 50100
Tel: 52 722 2754200
Fax: 52 722 2799308

Mobile Sales

Mobile Systems Division

595 Schelter Road
Suite 100
Lincolnshire, IL 60069 USA
Tel: 847-821-1500
Fax: 847-821-7600

Pacific Region

8460 Kass Drive
Buena Park, CA 90621
Tel: 714-228-2510
Fax: 714-228-2511

Great Plains Region

931 Alice Court
St. Charles, IL 60174 USA
Tel: 630-377-0271
Fax: 630-377-0271

Midwest Region

4494 32nd Street
Grinnell, IA 50112 USA
Tel: 641-236-3694
Fax: 641-236-8884

Southern Region

2300 Bush Circle
Carrollton, TX 75007 USA
Tel: 972-307-2949
Fax: 972-307-9410

Eastern Region

100 Corporate Drive
Lebanon, NJ 08833 USA
Tel: 610-330-0970
Fax: 925-396-6481

cat hy14-2006.indd, m&a

Europe

Europe Hydraulics Group

Parker Hannifin Corporation

Parker House
55 Maylands Avenue
Hemel Hempstead, Herts
HP2 4SJ England
Tel: 44 1442 458000
Fax: 44 1442 458085

Austria

Parker Hannifin GmbH
Badener Strasse 12
A-2700 Wiener Neustadt, Austria
Tel: 43 2622 23501-0
Fax: 43 2622 66212

Belgium

Parker Hannifin SA NV
Parc Industriel Sud, Zone II
Rue du Bosquet 23
B-1400 Nivelles, Belgium
Tel: 32 67 280900
Fax: 32 67 280999

Czech Republic

Parker Hannifin s.r.o.
Parkerova 623
250 67 Klecany, Czech Republic
Tel: 420 284 083 111
Fax: 420 284 083 112

Denmark

Parker Hannifin Denmark A/S
Industriparken 37
2750 Ballerup, Denmark
Tel: 45 43 56 04 00
Fax: 45 43 73 31 07

Finland

Parker Hannifin Oy
Ylästöntie 16
FIN-01510 Vantaa, Finland
Tel: 358 9 476 731
Fax: 358 9 4767 3200

France

Parker Hannifin France SAS
142, rue de la Foret
74130 Contamine sur Arve, France
Tel: 33 450 25 80 25
Fax: 33 450 03 67 37

Germany/Switzerland

Parker Hannifin GmbH & Co. KG
Pat-Parker-Platz 1
41564 Kaarst, Germany
Tel: 49 (0) 2131 4016 0
Fax: 49 (0) 2131 4016 9199

Greece

**Parker Hannifin Corporation
Athens Representative Office**
197 Syngrou Av.
171 21 Nea Smyrni, Athens, Greece
Tel: 0030 210 933-6450
Fax: 0030 210 933-6451

Hungary

**Parker Hannifin Corporation
Hungarian Trade Representative Office**
H-1149 Budapest
Egressy u. 100, Hungary
Tel: 36 12204155
Fax: 36 14221525

Ireland

Parker Hannifin Ireland Ltd.

Blackthorn Close,
Stillorgan Industrial Park
Blackrock, Co Dublin, Ireland
Tel: 353 1 293 9999
Fax 353 1 293 9900

Italy

Parker Hannifin S.p.A.
Via Privata Archimede 1
20094 Corsico (MI), Italy
Tel: 39 02 451921
Fax: 39 02 4479340

The Netherlands

Parker Hannifin B.V.
Edisonstraat 1
7575 AT Oldenzaal, The Netherlands
Tel: 31 541 585000
Fax: 31 541 585459

Norway

Parker Hannifin A/S
Berghagan
PO Box 3008
N-1402 Ski, Norway
Tel: 47 64 911000
Fax: 47 64 911090

Poland

Parker Hannifin Sp z o.o.
ul. Równolegla 8
PL 02-435 Warsaw, Poland
Tel: 48 22 573 24 00
Fax: 48 22 573 24 03

Portugal

Parker Hannifin Portugal, Lda.
Travessa da Bateria 184 R/C
Dto./1 Esq.
Leça da Palmeira-4450-625, Portugal
Tel: 351 22 9997360
Fax: 351 22 9961527

Romania

**Hidro Consulting Impex SRL
Bucaresti Parker Representative
Office**
Bld. Ferdinand nr. 27 Sector 2
RO-00001 Bucarest, Romania
Tel: 0040 21 252 1382
Fax: 0040 21 252 3381

Russia

Parker Hannifin LLC
Rossolimo st., 17, floor 4
119021 Moscow, Russia
Tel: 7 095 580 91 45
Fax: 7 095 580 91 45

Parker Hannifin LLC

Branch Office Sakhalin
Zheleznodorozhnaya str., 174-A
693008 Yuzhno-Sakhalinsk, Russia
Tel: 7 4242 77 95 48
Fax: 7 4242 77 27 42

Slovenia

Parker Hannifin Corporation
Vel. Bucna vas 7
SI-8000 Novo Mesto, Slovenia
Tel: 386 7337 6650
Fax: 386 7337 6651

(continued on next page)



Parker Hydraulics International Sales Offices

Europe

Spain

Parker Hannifin España SA
Parque Industrial Las Monjas
Calle Estaciones 8
28850 Torrejón de Ardoz
Madrid, Spain
Tel: 34 91 6757300
Fax: 34 91 6757711

Sweden

Parker Hannifin AB
Fagerstagatan 51
Box 8314
SE-163 08 Spånga, Sweden
Tel: 46 (0)8 59 79 5000
Fax: 46 (0)8 59 79 5110

Turkey

Parker Hannifin Corporation
Merter Is Merkezi
Gen. Ali Riza Gurcan Cad. No: 2 / 67
34067 Merter, Istanbul, Turkey
Tel: 90 212 482 91 06
Fax: 90 212 482 91 10

Ukraine

Parker Hannifin Corporation
Vul. Velyka Vasylkivska 9/2 Office 59
01004 Kiev, Ukraine
Tel: 380 44 494 2731
Fax: 380 44 494 2730

United Kingdom

Parker Hannifin plc
Tachbrook Park Drive
Tachbrook Park
Warwick, CV34 6TU, England
Tel: 44 1926 317878
Fax: 44 1926 317855

South Africa

Parker Hannifin Africa Pty Ltd.
Parker Place
10 Berne Avenue Aeroport
P.O. Box 1153
Kempton Park 1620,
Republic of South Africa
Tel: 27 11 9610700
Fax: 27 11 3927213

Middle East

Azerbaijan

Parker Hannifin plc
Azpar, Technical Representative
140 Alovst Guliyev St. Apt. 10
370000 Baku, Azerbaijan
Tel: 994 12 498 3966
Fax: 994 12 498 3966

Kazakhstan

Parker Hannifin
Gateway Ventures CA LTD, Representative
7A Kabanbai Batira
480100 Alamyty, Kazakhstan
Tel: 7 3272 505 800
Fax: 7 3272 505 801

United Arab Emirates

Parker Hannifin Corporation
PO Box 46451
Abu Dhabi, United Arab Emirates
Tel: 971 2 6788587
Fax: 971 2 6793812

Asia Pacific

Asia Pacific Headquarters

Parker Hannifin Hong Kong Ltd.
8/F, Kin Yip Plaza, 9 Cheung Yee Street
Cheung Sha Wan, Kowloon
Hong Kong
Tel: 852 2428 8008
Fax: 852 2480 4256

Australia Headquarters

Parker Hannifin Pty Ltd.
9 Carrington Road
Castle Hill, NSW 2154, Australia
Tel: 612 9634 7777
Fax: 612 9842 5111

China Headquarters

**Parker Hannifin Fluid Power Systems
& Components (Shanghai) Co., Ltd.**
280 Yunqiao Road,
Jinqiao Export Processing Zone
Shanghai 201206, China
Tel: 86 21 5031 2525
Fax: 86 21 5834 3714

Parker Hannifin Beijing Office

Suite B9-11, 21/F, Hanwei Plaza
No. 7 Guanghua Road
Chaoyang District
Beijing, 100004, China
Tel: 86 10 6561 0520
Fax: 86 10 6561 0526

India

Parker Hannifin India Pvt Ltd.
Plot No. EL-26, TTC Industrial Area
Mahape, Navi Mumbai 400 709, India
Tel: 0091 022 56137081/2/3/4
Fax: 0091 022 27686841, 27686618

Japan

Parker Hannifin Japan Ltd.
4-2-1 Tsujido-Shinmachi,
Fujisawa, Kanagawa, 251-0042, Japan
Tel: 81 466 35 3050
Fax: 81 466 35 2019

Korea Headquarters

Parker Hannifin Korea Ltd.
Daehwa Venture Plaza, 6F
169 Samsung-Dong
Kangnam-ku, Seoul, 135-090, Korea
Tel: 82 2 559 0400
Fax: 82 2 556 8187

Singapore

Parker Hannifin Singapore
No. 11, Fourth Chin Bee Road
Jurong Town, Singapore, 619702
Tel: 65 6887 6300
Fax: 65 6265 5125

Taiwan

Parker Hannifin Taiwan Co., Ltd.
No. 40, Wuchiuan 3rd Rd.,
Wuku Industrial Park
Taipei County, Taiwan 248, R.O.C.
Tel: 886 2 2298 8987
Fax: 886 2 2298 8982

Thailand

Parker Hannifin Thailand Co., Ltd.
1023, 3rd floor, TPS building
Pattanakarn Road, Suanluang
Bangkok 10250, Thailand
Tel: 662 717 8140
Fax: 662 717 8148

Latin America

Pan American Division

7400 NW 19th Street, Suite A
Miami, FL 33126 USA
Tel: 305-470-8800
Fax: 305-470-8808

Argentina

Parker Hannifin Argentina SAIC
Stephenson 2711 esq. Costa Rica
1667 Tortuguitas
Buenos Aires, Argentina
Tel: 54 3327 44 4129
Fax: 54 3327 44 4199

Brazil

Hydraulics Division
Parker Hannifin Ind. e Com. Ltda.
Av. FredericoRitter, 1100
Cachoeirinha RS, 94930-000 Brazil
Tel: 55 51 3470 9144
Fax: 55 51 3470 9281

Chile

Parker Hannifin Chile Ltd.a.
Av. Americo Vespucio 2760-E
Conchali - Santiago, Chile
Tel: 56-2-623-1216
Fax: 56-2-623-1421

Venezuela

Parker Hannifin de Venezuela, S.A.
Av. Principal con calle Miraima
Edificio Draza
Boleita Norte
Caracas, Venezuela
Tel: 58 212 238 5422
Fax: 58 212 239 2272

Extensive Hydraulic Product Offering

Accumulators



Piston, bladder and diaphragm type accumulators, gas bottles and KleenVent reservoir isolators.

www.parker.com/accumulator

Compact Hydraulics



Self-contained with a motor, gear pump, reservoir, internal valving, load hold checks and relief valves.

www.parker.com/oildyne

Cylinders



Standard and custom hydraulic cylinders for industrial and mobile applications.

www.parker.com/hydcyl

Electronics/Remote Controls



Parker's unique IQAN approach combines sturdy, well-tested hardware with intelligent, flexible computing power.

www.parker.com/iqan

Filtration



Pressure and return line filters enhances machine life, reduces maintenance and lowers costs.

www.parker.com/hydraulicfilter

Integrated Hydraulic Circuits



Solutions for complex circuits that include threaded cartridge valves integrated into a single manifold.

www.parker.com/ihd

Motors



Full line of high and low speed motors provides power up to 15,000 in-lbs of torque.

www.parker.com/pumpmotor

Power Take Off



Parker Chelsea leads the industry for engineering, innovation and performance in auxiliary power systems.

www.parker.com/chelsea

Power Units



The most complete line of standard, pre-engineered, cataloged hydraulic power units in the industry.

www.parker.com/pumpmotor

Pumps



Broad line of energy-efficient hydraulic pumps that includes piston, vane and gear pumps.

www.parker.com/mobpump

Rotary Actuator



Industry leader in the design and manufacture of hydraulic rack and pinion, and vane style rotary actuators.

www.parker.com/actuator

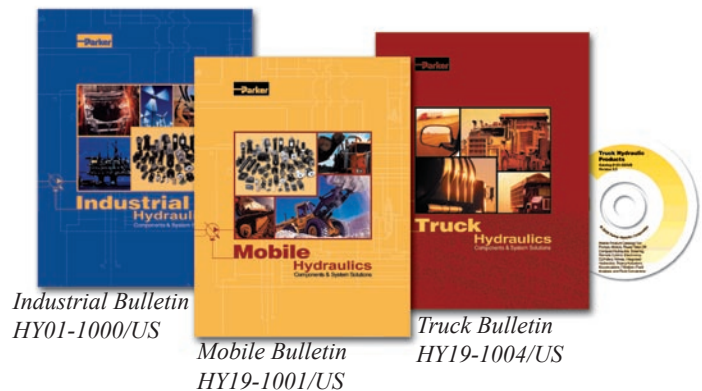
Valves and Controls



Hydraulic valves for virtually every hydraulic equipment application, from simple to precise control.

www.parker.com/hydraulicvalve

Covering the Industrial, Mobile and Truck markets, each catalog is paired with an interactive CD. Call for your comprehensive guides today. 1-800-CParker



Industrial Bulletin
HY01-1000/US

Mobile Bulletin
HY19-1001/US

Truck Bulletin
HY19-1004/US



Parker Hannifin Corporation
Hydraulic Valve Division
520 Ternes Avenue
Elyria, Ohio 44035 USA
Tel: (440) 366-5200
Fax: (440) 366-5253
www.parker.com/hydraulicvalve

Catalog HY14-2006/US,
3M, 9/06, MVI