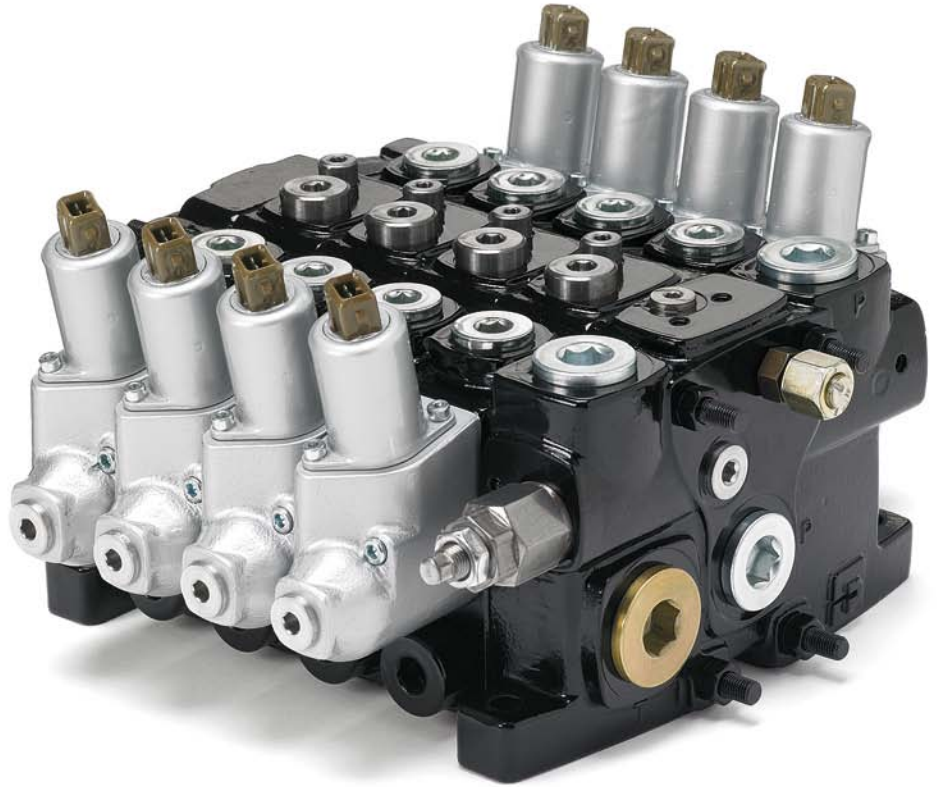




aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



Parker VP120 Series Load-Sense Directional Control Valve Catalog



ENGINEERING YOUR SUCCESS.

Contents

Technical Information

General Description4

Operation4

Benefits5

Definitions, Conversion Factors6

Specifications7

Weights7

Connections7

Performance Curves 8-9

Major Valve Options10

Schematic Circuit Types11

Ordering Information

How to Configure a Valve Assembly12

Inlet Attributes 13-14

Outlet Attributes15

Work Sections 16-21

Special Inlets/Outlets 22-23

Dimensions

Combination Inlet / Combination Outlet24

Combination Inlet / Simple Outlet25

Accessories

Stud Assemblies.....26

Assembly Configuration Form27

General Description

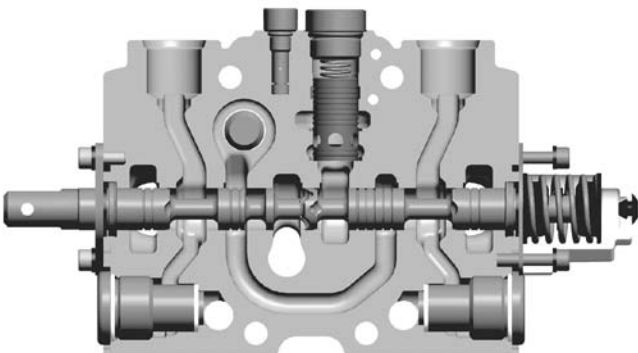
The VP120 can be configured either as pressure-compensated load-sense (PCLS) or as load-sense (LS). Both have the flexibility of sectional construction. The PCLS work section has its own compensator, so that speed control of multiple functions is achieved, regardless of changes in pressure or engine rpm's. The key technology integrated into the VP120 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.

A new technology available in the VP120 is pressure-limiting. This feature allows for selected functions to limit pressure level lower than load-sense relief-valve setting. The advantage of using pressure limiters to accomplish this vs. port relief-valves is that less flow is lost – which means less heat generation.

Another new technology developed for the VP120 is the Margin Control, which can be used to selectively boost or reduce the flow out of a work-section.

The combination inlet/outlet can be installed on both ends of the valve, facilitating the routing of pump flow to both ends of the valve.

The valve can be operated manually, hydraulic-remote and with solenoids. The same solenoid is used for on/off and proportional control. A bypass compensator is available for use with fixed displacement pumps. Also, priority flow control is an option for steering requirements. In addition, low pressure regeneration is an option designed to overcome the damaging affects of cavitation – namely premature component wear and spongy operation.



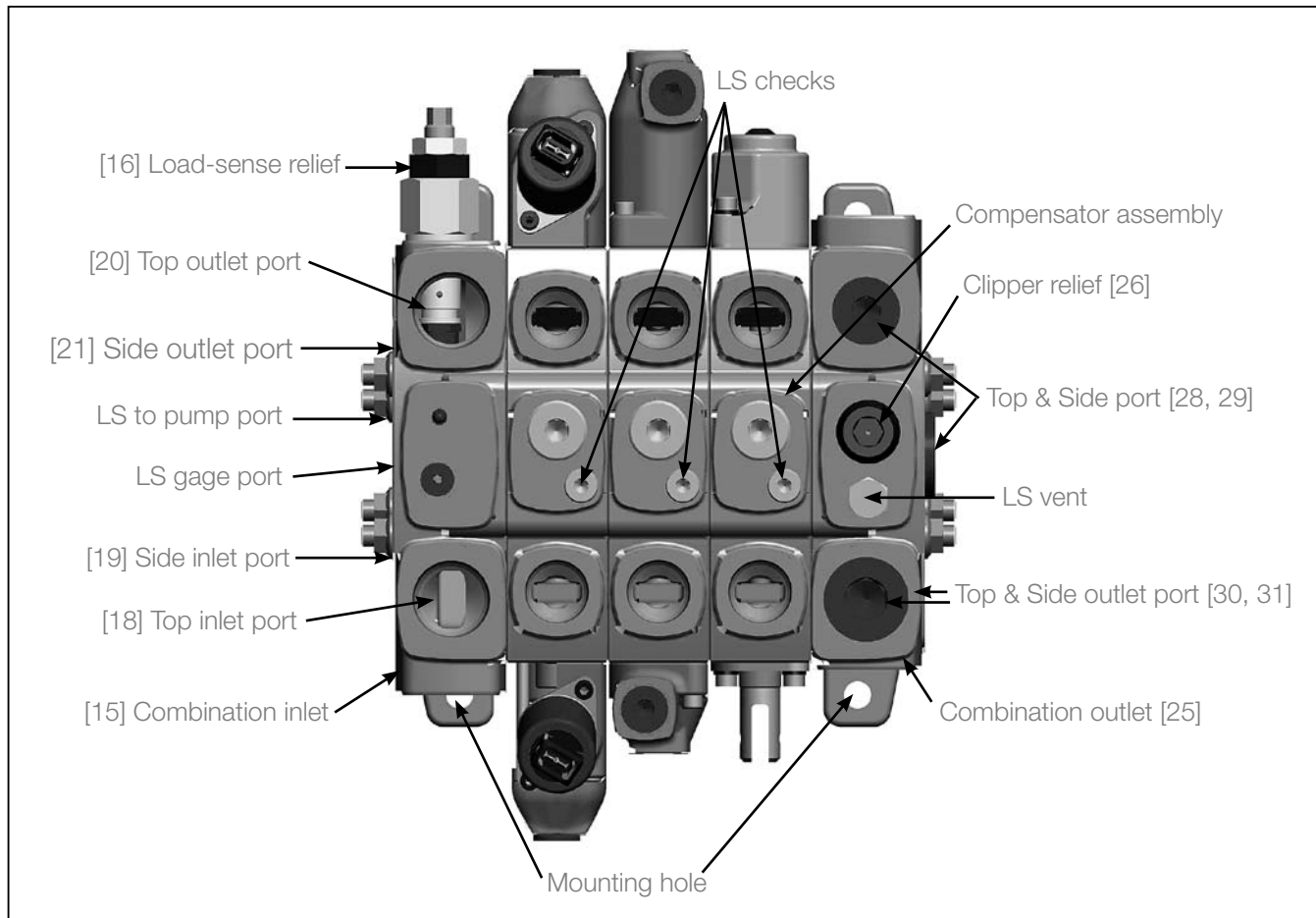
The VP120 uses the same port accessories, load-sense relief valve and pressure-reducing valve that are used in our other valves. The standard spool types are 3-way, 4-way and 4-position float. A full range of flow limited spools are available.

Operation

The VP120 (PCLS) is an individually pressure-compensated load-sense valve. For optimum horsepower utilization, it is normally used with a variable 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 work-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 changed in pressure and input flow. This enhances machine control, improves productivity and helps to make every operator an “expert” operator – all of which saves money.
- **Improved system efficiency** – optimized horsepower utilization and heat management are features that are inherent with load-sense pressure-compensated valves due to a closer match between horsepower consumption and horsepower demand. Fuel savings of up to 30% can be achieved vs. open-center type systems. Also, better horsepower utilization may enable the use of a smaller engine or elimination of a heat exchanger.
- **Enhanced machine productivity** – the VP120 incorporates flow-sharing technology. This means that during a pump over-demand condition the valve will automatically apportion the available flow to the selected functions, based upon the area openings of the spool notches. 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.
- **Enhanced speed control** – the optional Margin Control boosts or reduces flow of the selected work sections. This enables the hydraulic circuit designer to better utilize the available pump flow and possibly reduce the size of the engine.
- **Reduced heat generation** – pressure limiting is a feature not common on valves with flow sharing technology. This feature allows for selected functions to operate at a maximum pressure less than the setting of the load-sense relief-valve, while only passing a few liters of oil to tank. The alternative method for achieving this is with a port relief-valve. But they can pass a substantial amount of oil to tank.
- **Flexible design** – the VP120 is available as a pressure-compensated load-sense valve (PCLS) or just as a load-sense (LS) valve. The combination inlet/out casting can be installed on both ends of the valve, which means that pump and tank can be routed to any or both ends of the valve.
- **Ease of service** – the load-sense check and the compensator are located on the top of the work section, making them accessible for trouble-shooting without having to disassemble the valve bank.

Definitions

PCLS = Pressure Compensated Load-Sense, or load-sensing with pressure compensation.

LS = Load-Sensing.

LSRV = Load-Sense Relief Valve (PLM) sets maximum signal LS pressure.

Clipper RV = Pump Line Chock Valve (PA) 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 (stand by).

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.

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

EH = Electrohydraulic or solenoid controlled spool positioning.

Induced Load = Occurs when an actuator forces fluid into a valve workport.

Pressure Limiting = Port pressure is limited to a value less than the normal operating pressure. Flow loss during flow limiting is <2 LPM (.53 GPM).

PBL = Special Inlet Option - priority flow, bypass compensator, low pressure regen.

PRRV = Pilot Reducer Relief Valve.

GPM = US Gallons per minute.

LPM = Litres per minute.

Conversion Factors

1 kg = 2.2 lbs.

1 N = 0.225 lbs. force

1 Bar = 14.5 PSI

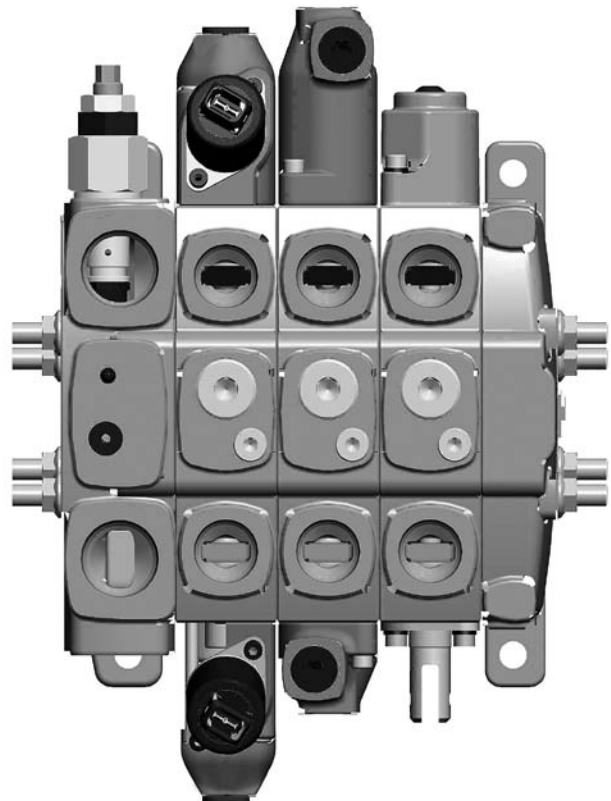
1 liter = 0.264 US gallon (G)

1 cm³ = 0.061 in³

1 m = 3.28 feet

1 mm = 0.039 inches

9/5 °C + 32 = °F



Specifications

Pressures	Pump inlets: 280 Bar (4060 PSI) Service Ports: 320 Bar (4640 PSI) Pilot-EH (input or internal supply): 35 Bar (508 PSI) Tank Return: 15 Bar (220 PSI) Recommended Solenoid Drain: 2 Bar (29 PSI) Pilot-Hydraulic Remote: 7-28 Bar (100-400 PSI)
Flow Rates	Pump Flow: 160 LPM (42 US GPM) Service Port Flow: 120 LPM (32 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. Thru Compensator Only: 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

Inlets/Outlets

Combination Inlet/Outlet	4.58 kg (10.1 lb)
EH Combination Inlet/Outlet	5.81 kg (12.8 lb)
Combination Inlet/Outlet with priority flow divider	6.89 kg (15.2 lb)
Combination Inlet/Outlet with bypass compensator	6.94 kg (15.3 lb)
Combination Inlet/Outlet with low pressure regeneration	6.85 kg (15.1 lb)
Simple turnaround cover	3.1 kg (6.8 lb)
Work Sections	
Manual with 2 port access.	4.17 kg (9.2 lb)
Hydraulic Remote with 2 port access.	4.58 kg (10.1 lb)
EH with 2 port access.	6.03 kg (13.3 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.

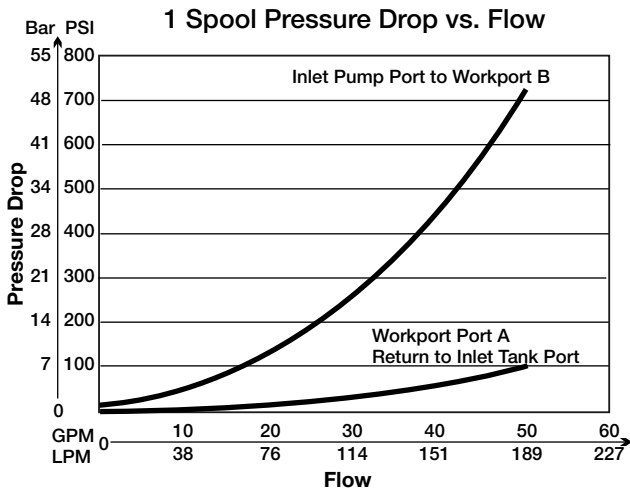
Connections

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

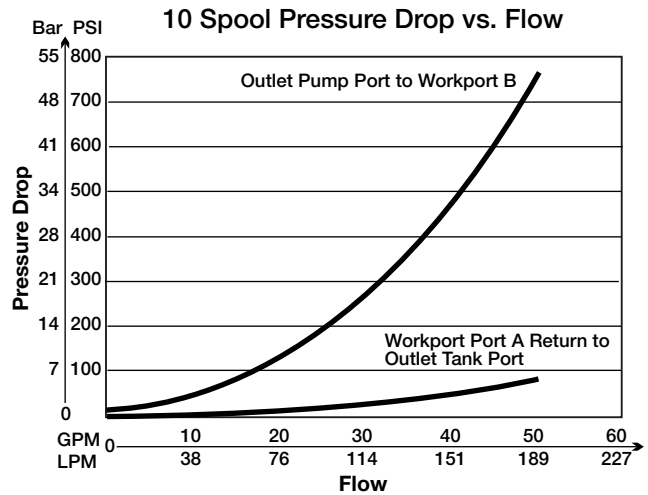
Description	SAE #	Thread Size	
		O-ring Boss (UNF)	BSPP
inlet, top	12	1 ¹ / ₁₆ -12	3/4"-14
inlet, side	12	1 ¹ / ₁₆ -12	3/4"-14
EH inlet, pilot	6	9/16-18	1/4"-19
outlet, top	12	1 ¹ / ₁₆ -12	3/4"-14
outlet, side	16	1 ⁵ / ₁₆ -12	1"-11
work section	10	7/8-14	1/2"-14

Solenoid Specifications

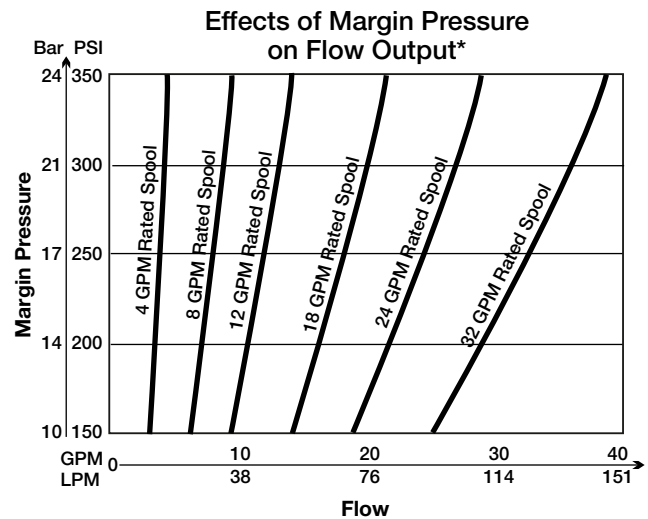
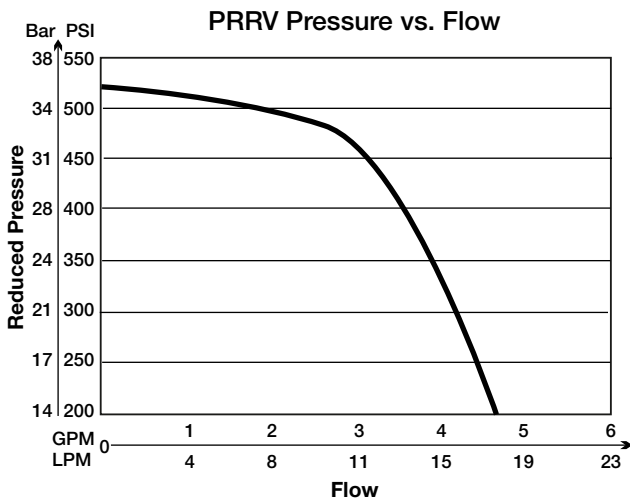
Voltage	12 or 24 VDC		
Pilot	35 Bar (508 PSI), 15-23 LPM (4-6 GPM)		
Current Input (I)	1.5A for 12 VDC 0.75A for 24 VDC		
Current (mA) for Spool Shift	Start Shift	12V 500	24V 250
	Full Shift	1250	625
Insulation Material	Class H		
Duty Cycle	100%		
R20 Ohm	5.3 (±5%) for 12 VDC 21.2 (±5%) for 24 VDC		
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)		



Roughly equivalent when plumbed to Outlet P and T Ports



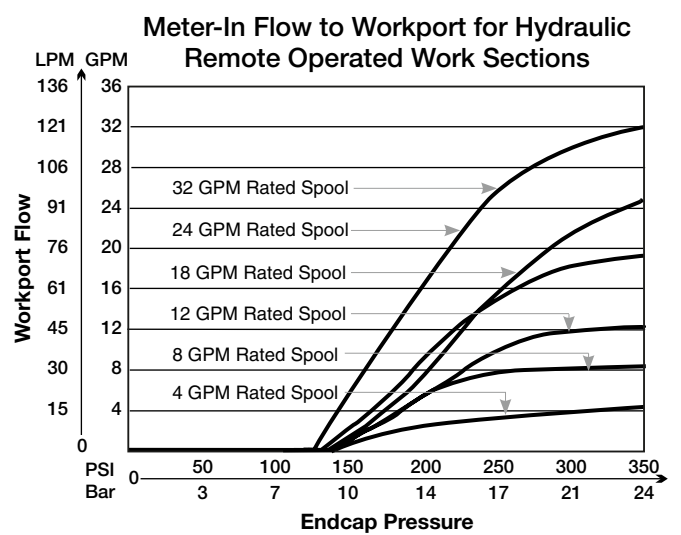
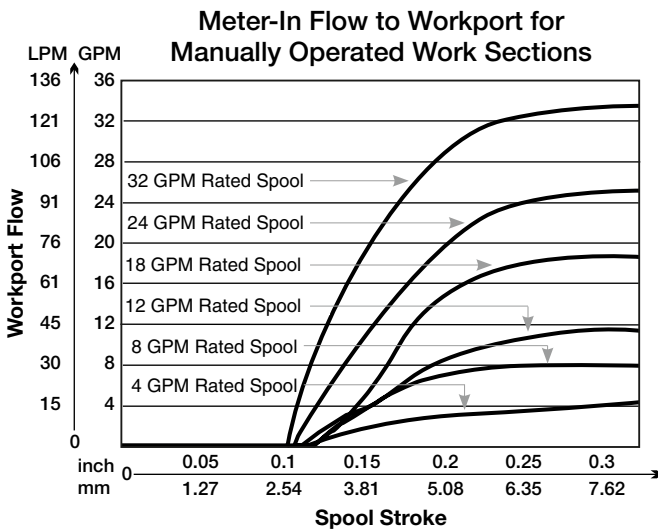
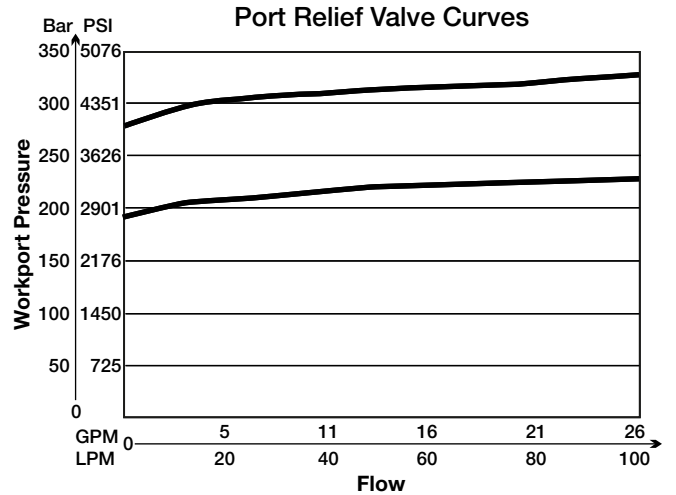
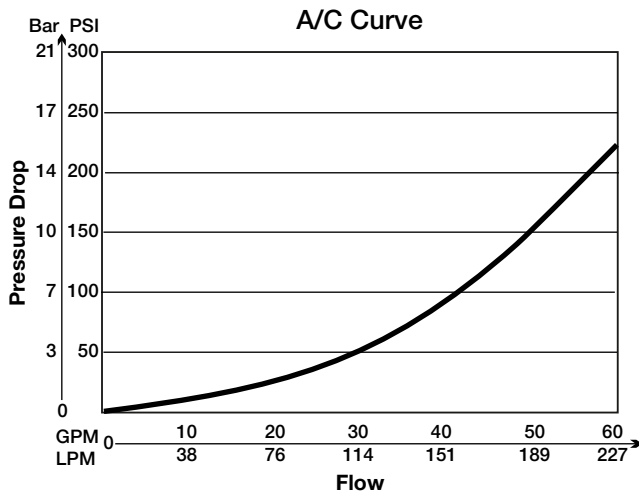
Roughly equivalent when plumbed to Inlet P and T Ports



* assumes no Delta P from pump to valve

- 4 GPM = 15 LPM
- 8 GPM = 30 LPM
- 12 GPM = 45 LPM
- 18 GPM = 68 LPM
- 24 GPM = 91 LPM
- 32 GPM = 121 LPM

Note:
 GPM = US Gallons per minute



- 4 GPM = 15 LPM
- 8 GPM = 30 LPM
- 12 GPM = 45 LPM
- 18 GPM = 68 LPM
- 24 GPM = 91 LPM
- 32 GPM = 121 LPM

Note:
 GPM = US Gallons per minute

Major Valve Options

I Circuits:

- A) LS – when individual pressure compensation isn't needed.
- B) PCLS with compensator. Also, both types of valves contain the load check which serves as a low leak transition check or when “induced loads”* are anticipated.

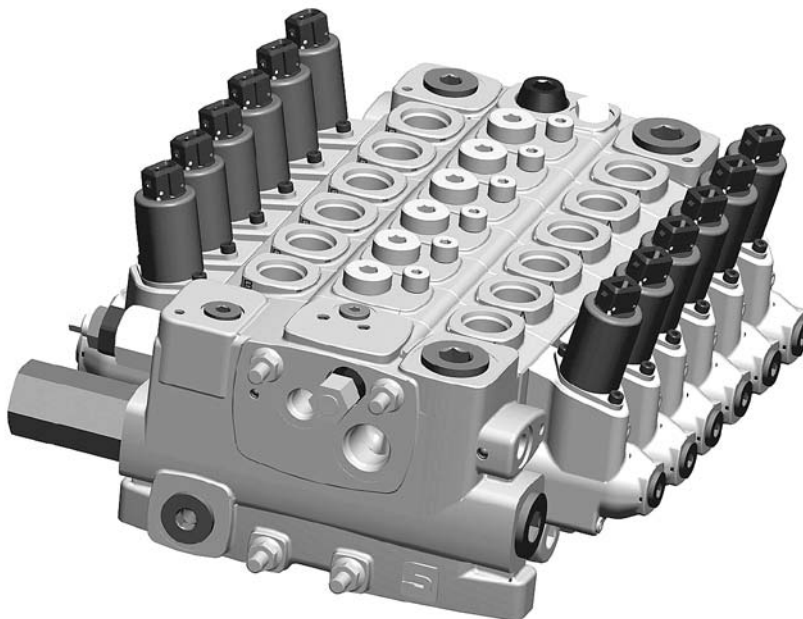
* Induced loads are generated when external loads on the actuators force fluid back into the valve.

II Inlets:

- A) Combination – all spool operators. This also has the option for an external pilot supply in port if there is pilot supply available external to the valve for the solenoids.
- B) “EH” – “external supply” to solenoids – port for connecting external supply to solenoids and drain port.
 - Internal supply – reduced pressure to solenoids via internal pilot gallery
 - internal supply to solenoid operators.
 - Joystick supply – reduced pressure to external port to supply joystick(s)
 - No internal pilot supply.
 - Kidney loop – reduced pressure to an external pilot port. The pilot flow can then be routed to a filter and back into the valve. The signal is then routed to the solenoids via internal pilot gallery.

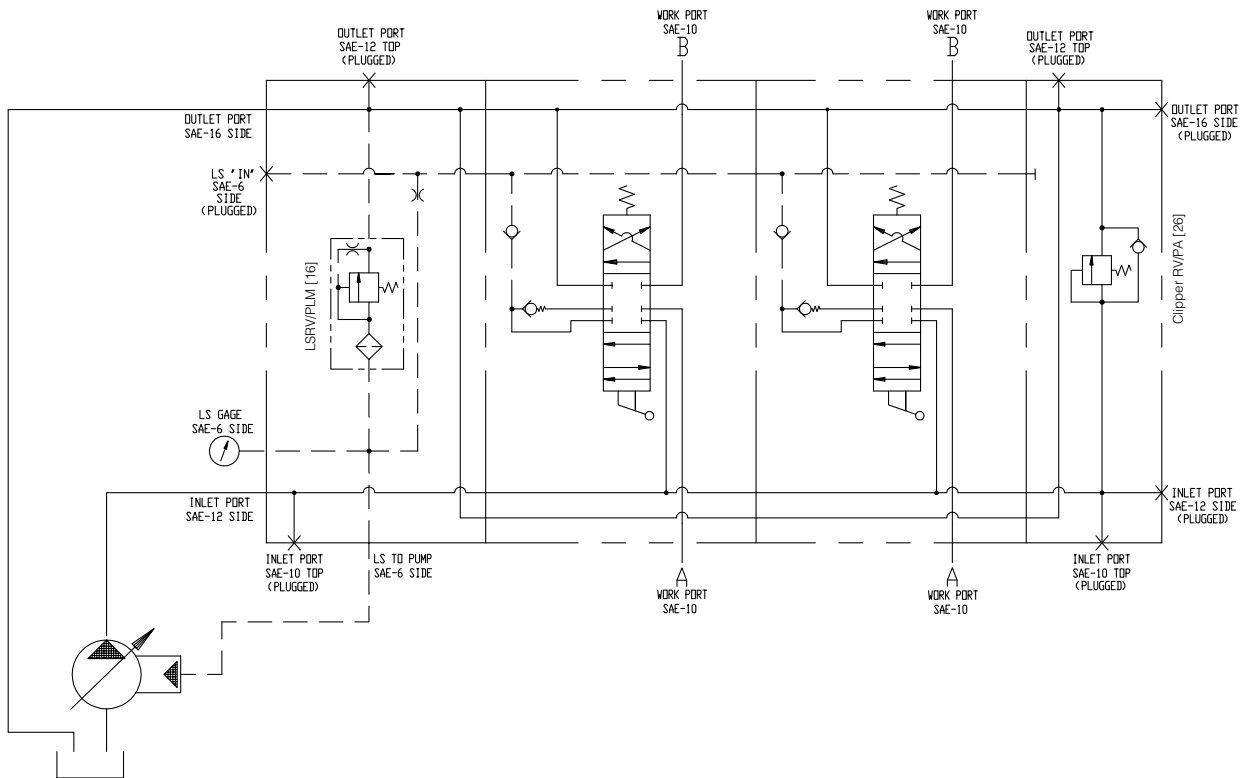
All 3 options have:

- 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 – 2 Bar (29 PSI)

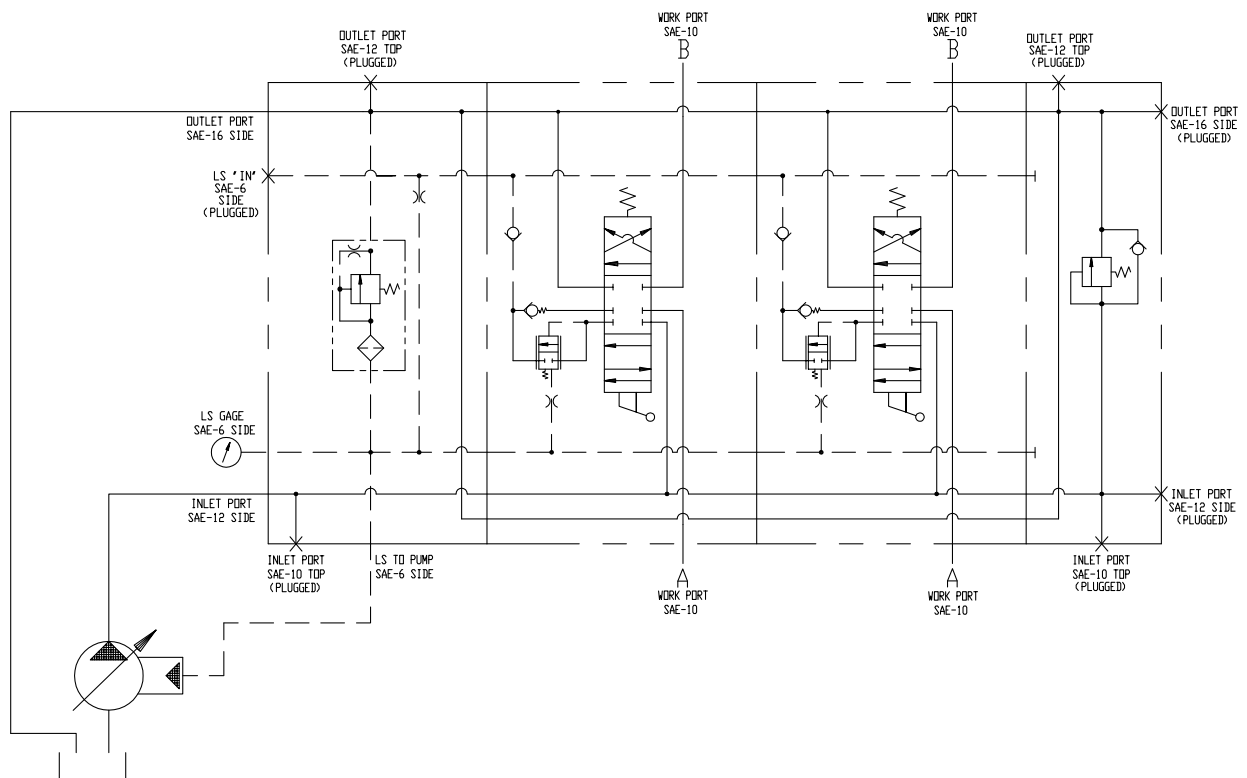


How VP120 May Be Arranged

Load-Sense Valve



Pressure Compensated Load-Sense (PCLS)



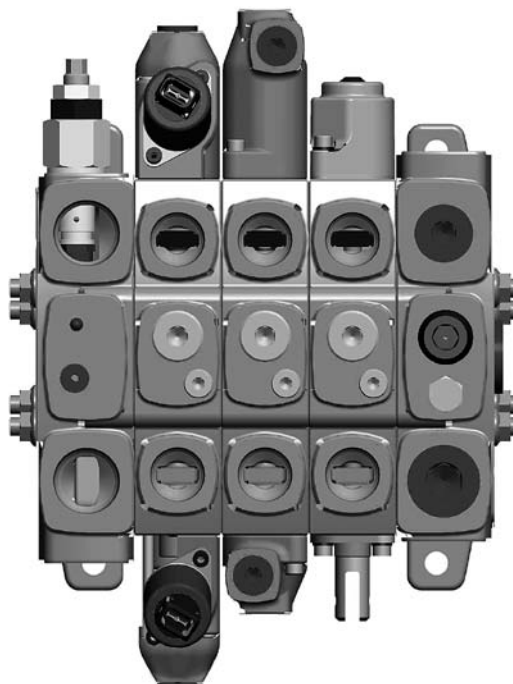
How to Configure a Valve Assembly

There are three choices available to configure a valve assembly: a hard copy specification sheet that is shown on page 27, 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
[02]	Port Type
U	UNF
G	BSPP
[03]	System Voltage
12	12 VDC
24	24 VDC
[04]	Connector Type
D	Deutsch
A	Amp
W	Weatherpack
[05]	Surface Treatment
X	No Paint
P	Black Primer
[06]	Customer Designated ID (pt no)
ID	Enter part number



Inlet Attributes

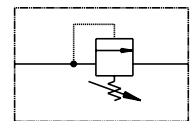
The Combination Inlet has high pressure P pump ports available on the top and side, low pressure T tank ports on the top and side. There are also external LS in port, LS out port and a gage port located on the side. An optional load-sense relief valve is positioned on the end and set @ 8 LPM (2 GPM).

- **IC Combination** – used with all spool actuators, except solenoid (EH).
- **IEH** – this inlet contains integrated pilot supply for internal/external supply of work sections. This also has a screen upstream of the PRRV, an accumulator port and check valve, a PRRV and a dedicated solenoid drain port.

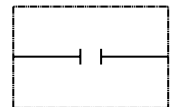
[15]	Inlet Section Type
IC	Combination Inlet
IEH	EH Inlet
[16]	Load-Sense RV Cavity
Y	Steel plug
LSRV	Load-sense relief valve
Z	Plastic closure
[17]	Load-Sense RV Setting
	179-280 Bar (2600-4060 PSI)
[18]	Top Inlet Port
1TOPB	SAE 12 or 3/4" BSPP with a steel plug
1TOP	SAE 12 or 3/4" BSPP open
[19]	Side Inlet Port
1SB	SAE 12 or 3/4" BSPP with a steel plug
1S	SAE 12 or 3/4" BSPP open
[20]	Top Outlet Port
1 TOPTB	SAE 12 or 3/4" BSPP with a steel plug
1 TOPT	SAE 12 or 3/4" BSPP open
[21]	Side Outlet Port
1STB	SAE 16 or 1" BSPP with a steel plug
1ST	SAE 16 or 1" BSPP open
[22]	External LS in Cavity
LSP	SAE 6 LS in port
LSPCK	SAE 6 LS in port with Check
LSPB	No LS in port
[23]	External Pilot in Cavity
PSP	SAE 6 External Pilot Supply in port
PSPB	No Pilot Supply in port

[16] LSRV Cavity

Code LSRV

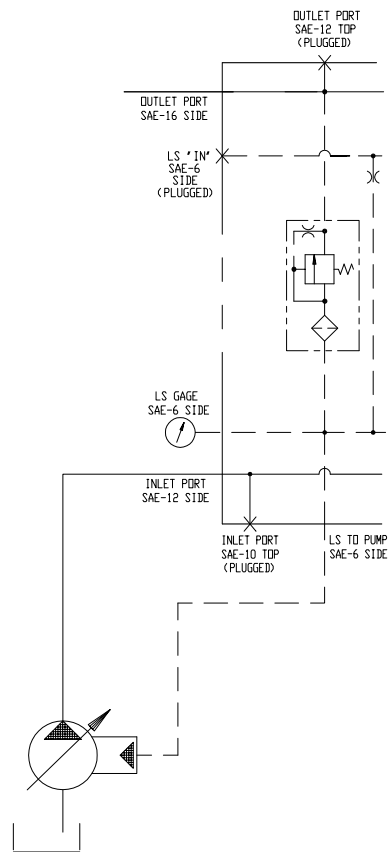


Code Y

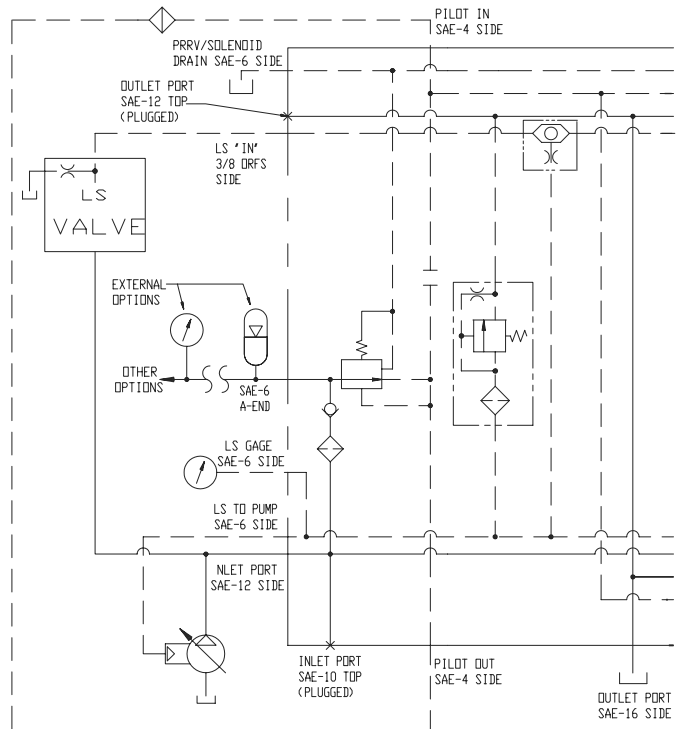
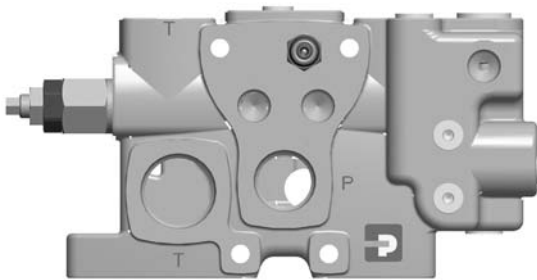


[15] Inlet Section Type

IC Combination Inlet



IEH Inlet - EH Inlet / EH Outlet



Outlet Attributes

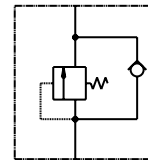
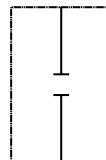
The outlet is available with low pressure ports (top & side), a load-sense relief valve, load-sense and gage ports and an optional port to accept a load-sense signal from an external load-sense valve.

[25]	Outlet Section Type
O	Simple Outlet
OC	Combination Outlet
OEH	EH Outlet
[26]	Clipper RV Cavity
Y	Steel plug
PA	Relief and Anti-cavitation Valve
Z	Plastic closure
[27]	Clipper RV Setting
[28]	Top Inlet Port
1TOPB	SAE 12 or 3/4" BSPP with a steel plug
1TOP	SAE 12 or 3/4" BSPP open
[29]	Side Inlet Port
1SB	SAE 12 or 3/4" BSPP with a steel plug
1S	SAE 12 or 3/4" BSPP open
[30]	Top Outlet Port
1TOPTB	SAE 12 or 3/4" BSPP with a steel plug
1TOPT	SAE 12 or 3/4" BSPP open
[31]	Side Outlet Port
1STB	SAE 16 or 1" BSPP with a steel plug
1ST	SAE 16 or 1" BSPP open

[25] Clipper RV Cavity

Code Y

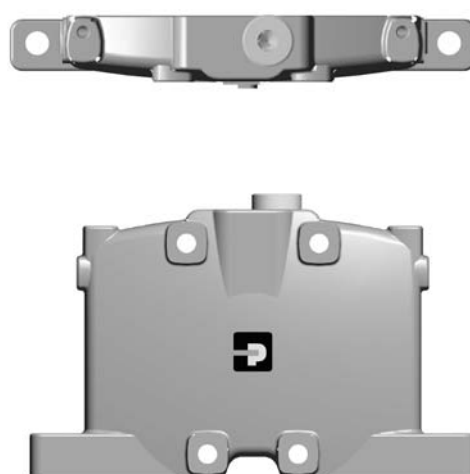
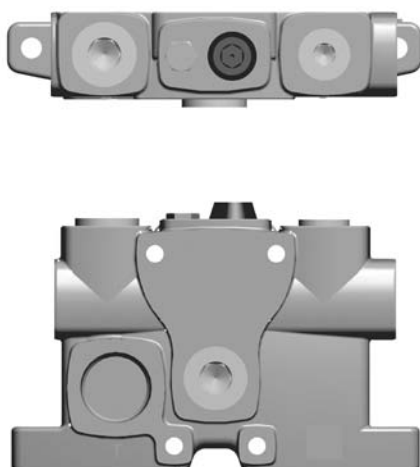
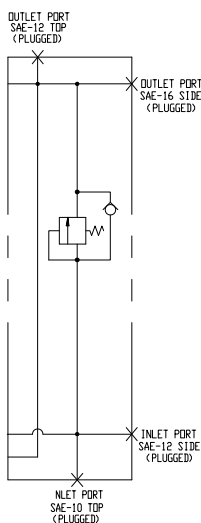
Code PA



PRESSURE SETTING Bar (PSI)	
25	(363)
32	(464)
40	(580)
50	(725)
63	(914)
80	(1160)
100	(1450)
125	(1813)
140	(2030)
160	(2320)
175	(2538)
190	(2755)
210	(3045)
230	(3335)
250	(3625)
280	(4060)
300	(4350)
330	(4785)
350	(5075)
380	(5510)
400	(5800)
420	(6090)
260	(3770)
270	(3915)
225	(3263)

Combination Outlet

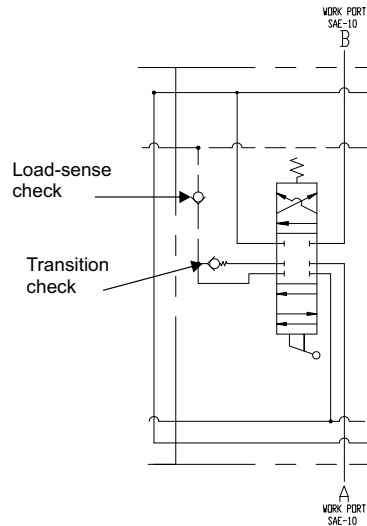
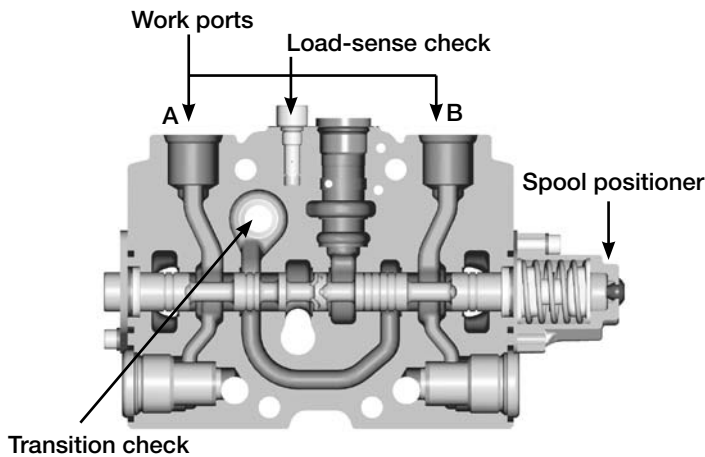
Simple Outlet



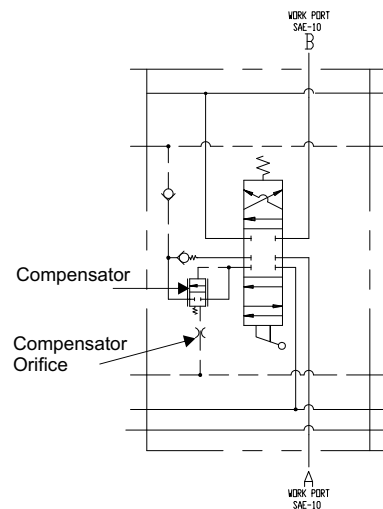
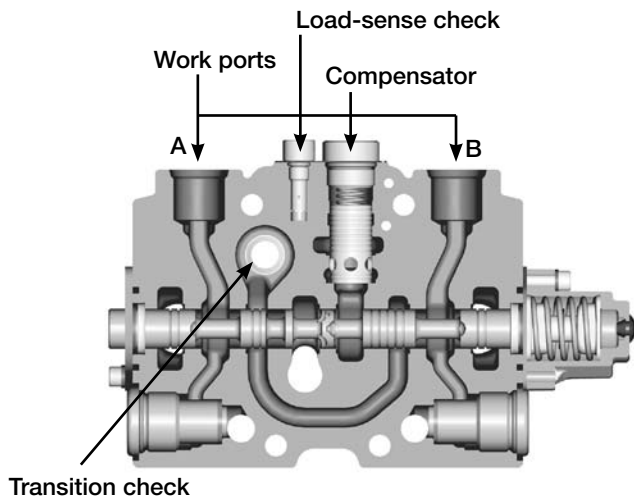
Work Section Attributes

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 (pump regulator setting) of 17 Bar (250 PSI). Spool positioners are manual, hydraulic remote and electro-hydraulic remote.

Load-Sensing Work Section



PCLS Work Section with Transition Check



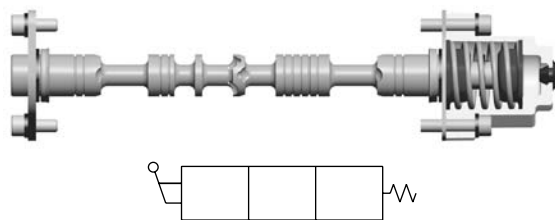
Work Section Attributes

[32]	Size of Work Ports
WP2001	SAE 10 or 1/2" BSPP
[33]	Spool Positioner (See below and next page)
C1	Manual, 3 position
PC	Hydraulic-remote, 3 position
EC	Electro-hydraulic remote, 3 position
PCF	Hydraulic-remote, 4 th position Float
ECF	Electro-hydraulic remote, 4 th position Float

[33] Work Section Spool Positioner

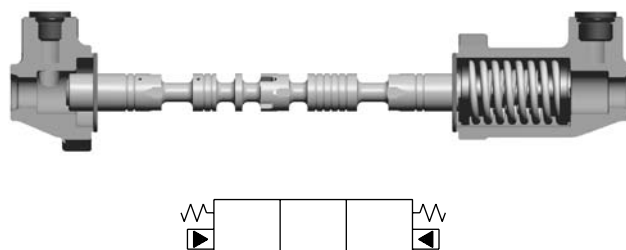
Code C1 = Spring Return

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



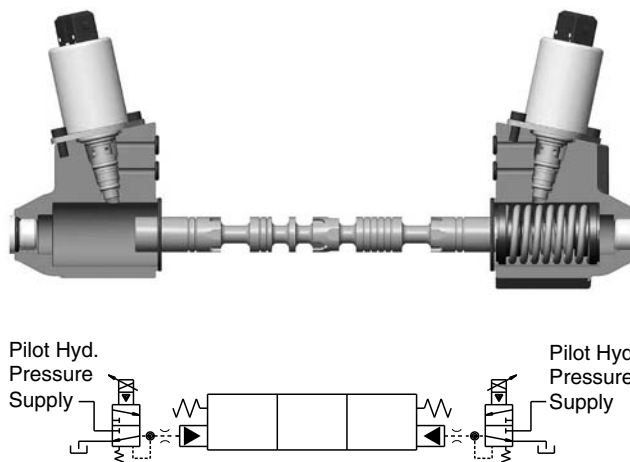
Code PC = Hydraulic Remote (Proportional)

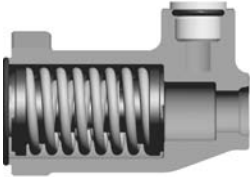
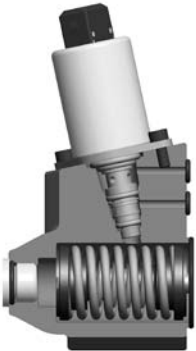
Basic Function:
 Proportional hydraulic pilot pressure is admitted to port (PCL4) and balances against metering/return springs. Use metering band of PCL4 for best match.



Code EC = Proportional Electro-hydraulic remote, 3-Position

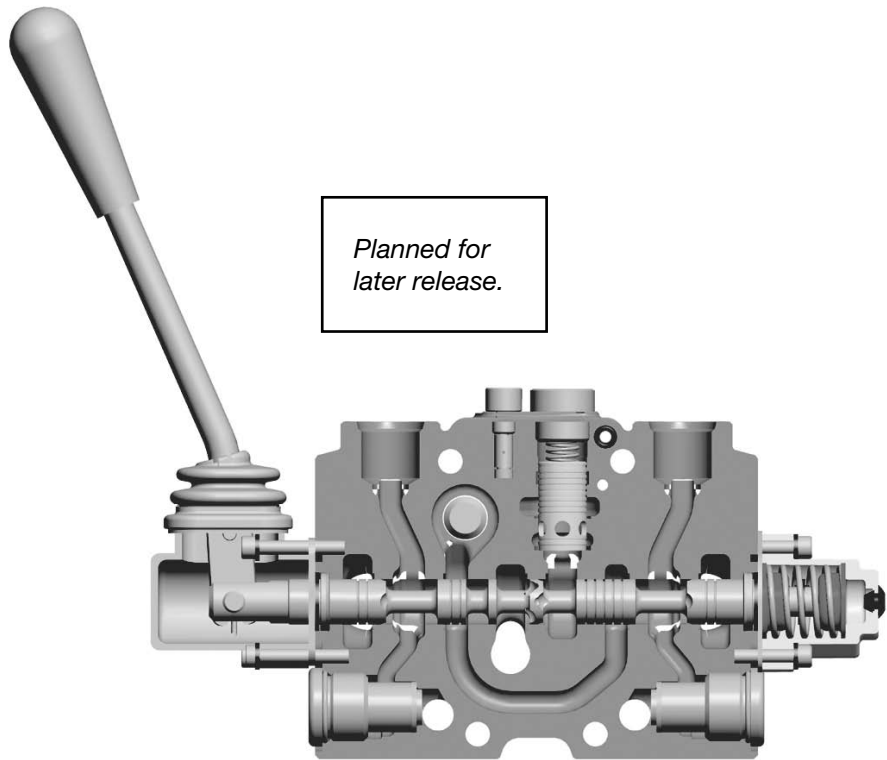
Basic Function:
 Proportional spool movement via proportional current to solenoid (ref. IQAN).



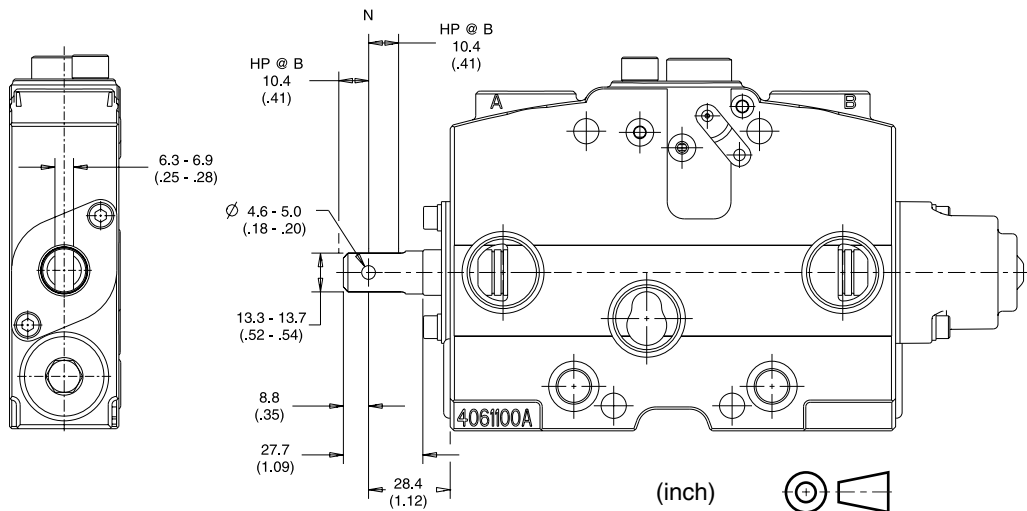
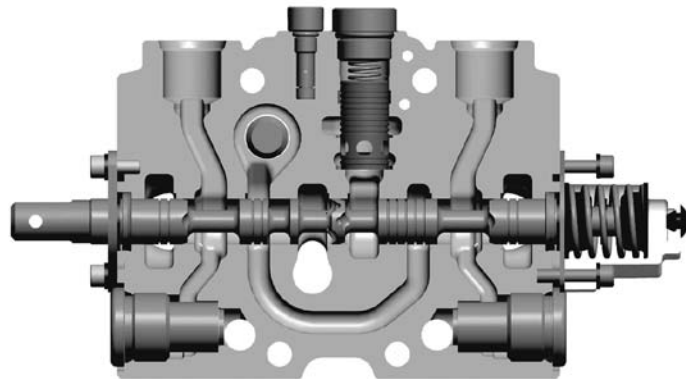
[34]	Manual Operator (See next page)	
L1	Type 1 with Handle Bracket	
L2	Type 2 with no Lever End	
[35A]	<p>Pilot orifice diameter for hydraulic remote. Controls shift to 'A' port – mm. This option is utilized when dampening is needed.</p>	
[35B]	<p>Pilot orifice diameter for hydraulic remote. Controls shift to 'B' port – mm. This option is utilized when dampening is needed.</p>	
[36A]	<p>Solenoid pilot orifice. Controls shift to 'A' port – mm. This option is utilized when dampening is needed. The standard size is 3mm.</p>	
[36B]	<p>Solenoid pilot orifice. Controls shift to 'B' port – mm. This option is utilized when dampening is needed. The standard size is 3mm.</p>	

Manual Operators

Type 1 Handle End



Type 2 with no Lever End

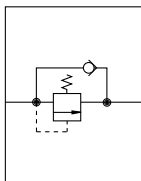
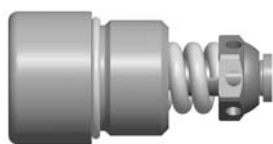


[38]	Spool Function	
D	Double-Acting Cylinder	
M	Double-Acting Motor	
DEB	Single-Acting Cylinder @ port B	
MEB	Single-Acting Motor @ port B	
F	4th Position Float Please consult factory for availability	
[38A]	Flow setting out of port 'A' with stroke limiter. For hydraulic remote or solenoid operation.	
LPM	Enter setting	
[38B]	Flow setting out of port 'B' with stroke limiter. For hydraulic remote or solenoid operation.	
LPM	Enter setting	
[39]	Spool Flow at Full Stroke – Ports 'A & B'. This is based upon a margin pressure of 17 Bar (250 PSI)	
15/4	15 LPM (4 GPM)	
30/8	30 LPM (8 GPM)	
45/12	45 LPM (12 GPM)	
68/18	68 LPM (18 GPM)	
90/24	90 LPM (24 GPM)	
120/32	120 LPM (32 GPM)	
Full	This spool will meter to approximately 75% of stroke. With further spool movement, the spool will come off the notch.	

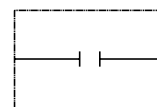
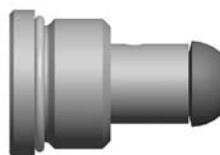
[76A] and [76B] – Workport Accessories

Port A	Description	Port B
[76A]	Description	[76B]
N2	Anticavitation check	N2
Y2	Steel Plug	Y2
C	Plastic Closure	C
25	25 Bar (363 PSI)	25
32	32 Bar (464 PSI)	32
40	40 Bar (580 PSI)	40
50	50 Bar (725 PSI)	50
63	63 Bar (914 PSI)	63
80	80 Bar (1160 PSI)	80
100	100 Bar (1450 PSI)	100
125	125 Bar (1813 PSI)	125
140	140 Bar (2030 PSI)	140
160	160 Bar (2320 PSI)	160
175	175 Bar (2538 PSI)	175
190	190 Bar (2755 PSI)	190
210	210 Bar (3045 PSI)	210
225	225 Bar (3263 PSI)	225
230	230 Bar (3335 PSI)	230
250	250 Bar (3625 PSI)	250
265	265 Bar (3843 PSI)	265
270	270 Bar (3915 PSI)	270
280	280 Bar (4060 PSI)	280
300	300 Bar (4350 PSI)	300
330	330 Bar (4785 PSI)	330
350	350 Bar (5075 PSI)	350
380	380 Bar (5510 PSI)	380
400	400 Bar (5800 PSI)	400
420	420 Bar (6090 PSI)	420

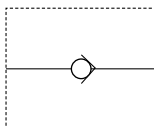
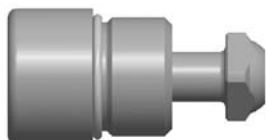
Code (Pressure) – Relief with Anticavitation Check



Code Y2 – Relief Cavity Plug



Code N2 – Anticavitation Check



Ordering Information – Special Inlets/Outlets

Margin Control

Please consult factory for availability

Planned for later release.

Flow Boost or Reduction

Fast winch up or slow track traverse speed

- Flow boost facilitates quickly raising an unloaded winch hook to a higher elevation
- Slowing track speed to make more flow available to boom, arm, and bucket functions is a benefit of flow reduction

Novice vs. Expert Control

Mini-excavator operation

- Pressure Gain Control + Margin Control work together to assist a novice operator with more forgiving operation. For the novice, Margin Control will limit the machine's maximum function speed while Pressure Gain Control cushions the fast reaction of machine controls. As a result, the mini-excavator is suitable for either the novice or expert operator.

Deactivation

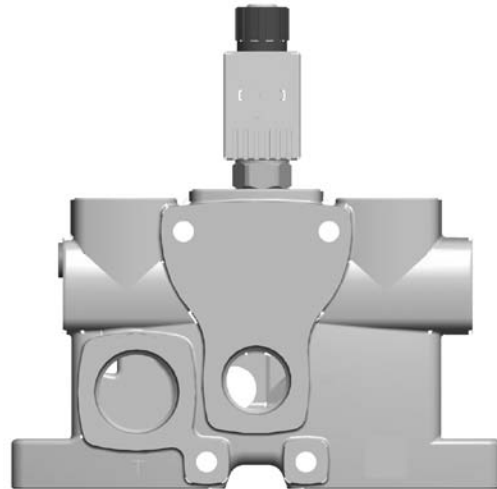
Disabling a machine function

- A machine may need one or more functions disabled for safety during a certain sequence of operations.

Priority

Wheel loader operation

- Margin Control can automatically give boom raise priority over bucket rollback.



Speed Sensing Power Control

Horsepower limitation

- Horsepower can be managed by reducing flow to certain or all functions during a machine cycle.

Hydraulic Cylinder damping

Programmed damping mode

- Automatic cylinder speed ramp down near the end of stroke extends the component and overall machine life.

Section Pressure Limitation

Please consult factory for availability

Planned for later release.

General Application Concept

Constant force or torque

- Any application that requires a constant force or torque via deadheading a workport can use PLQ. This assumes the PLQ regulated workport pressure is less than maximum system pressure. The PLQ work section only consumes a very insignificant flow of less than 2.84 LPM (0.75 GPM). Working at only the essential pressure and minimum flow maximizes energy efficiency.

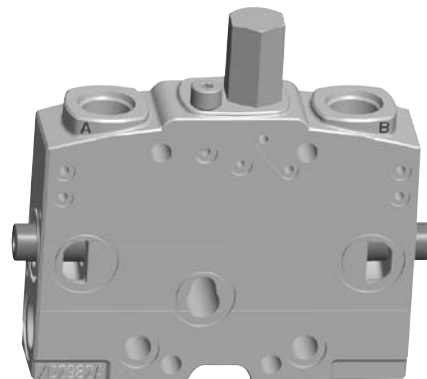
Snow Plow Salt Spreader Truck

Plow blade elevation

- Regulated pressure is required to generate upward force to counter gravity acting on the blade in order to maintain elevation.

Scraping with plow

- Regulated pressure is required to control the force of the plow blade against the ground.



Forestry - Log Skidder and Log Loader

Clamping and retaining logs

- Regulated pressure is required to control the clamping force of the tongs against the logs while they are being moved.

Stamping, Molding Machines

Maximum press

- Regulated pressure is required to control the force of a ram against the part being made.

Swing Stability

Please consult factory for availability

Planned for later release.

Load-sense signal conditioning

Winch stability

- Encourages the actuator to maintain a velocity which minimizes instability during initial function movement by creating an artificial load-sense signal greater than the actual load pressure.
- Specially applicable to high inertial loads

Force Feedback

Swing control

- Provides more control during swing acceleration to minimize lurching by routing the work port pressure thru an orifice to the opposite pilot cap.

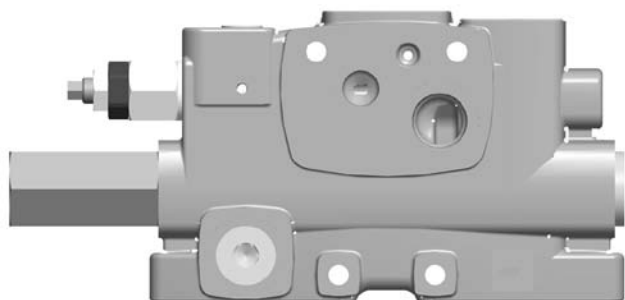
Priority Flow

Please consult factory for availability

Planned for later release.

Priority Flow for Steering

This inlet feature always provides a regulated output flow for a steering function. This can be used with a simple, Bypass unloading or a Low pressure regeneration type of outlet.



Low Pressure Regeneration

Please consult factory for availability

Planned for later release.

Cavitation

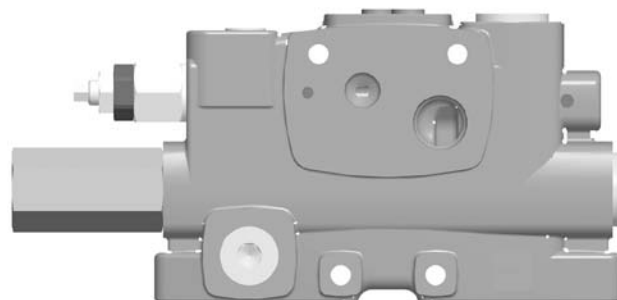
To combat cavitation, this outlet is designed to always keep oil in the loop between the valve and the actuator. When a function is cavitating, it will force oil across any anti-cavitation checks in the valve. If there is still a void in the hydraulic loop (valve to actuator) after the spools are returned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



Bypass Compensator

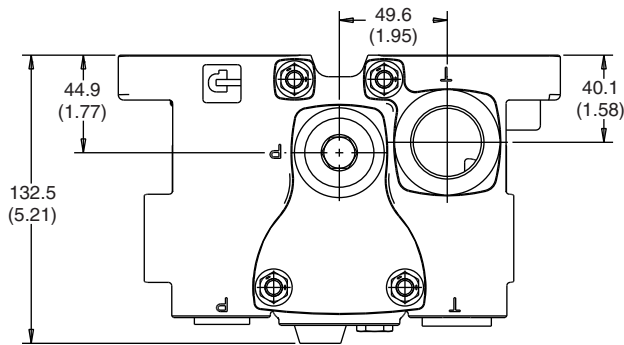
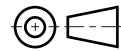
Fixed Displacement Pumps

This feature allows for the VP120 to operate with fixed displacement pumps.

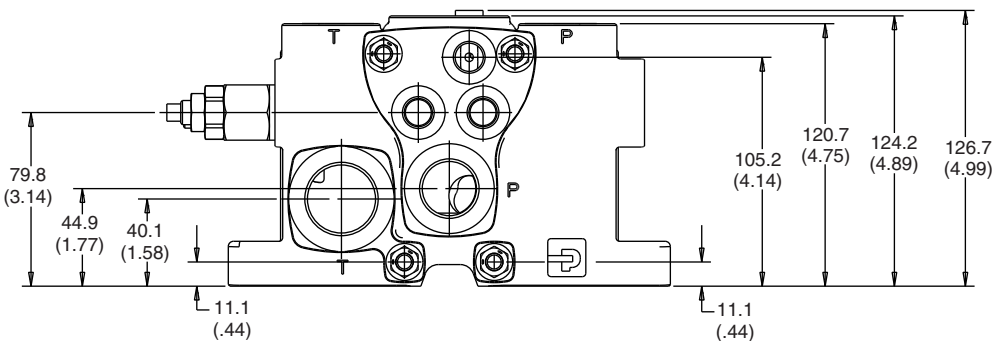
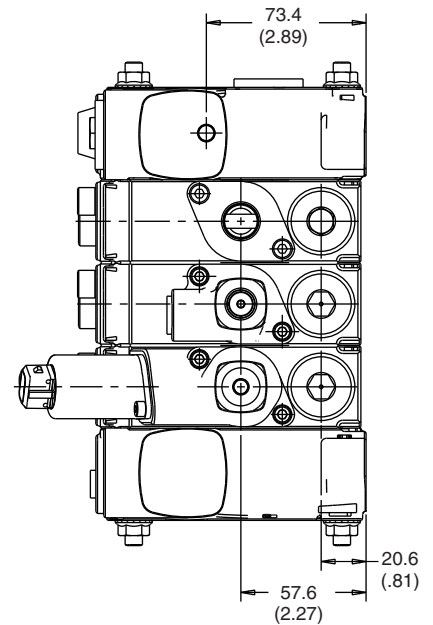
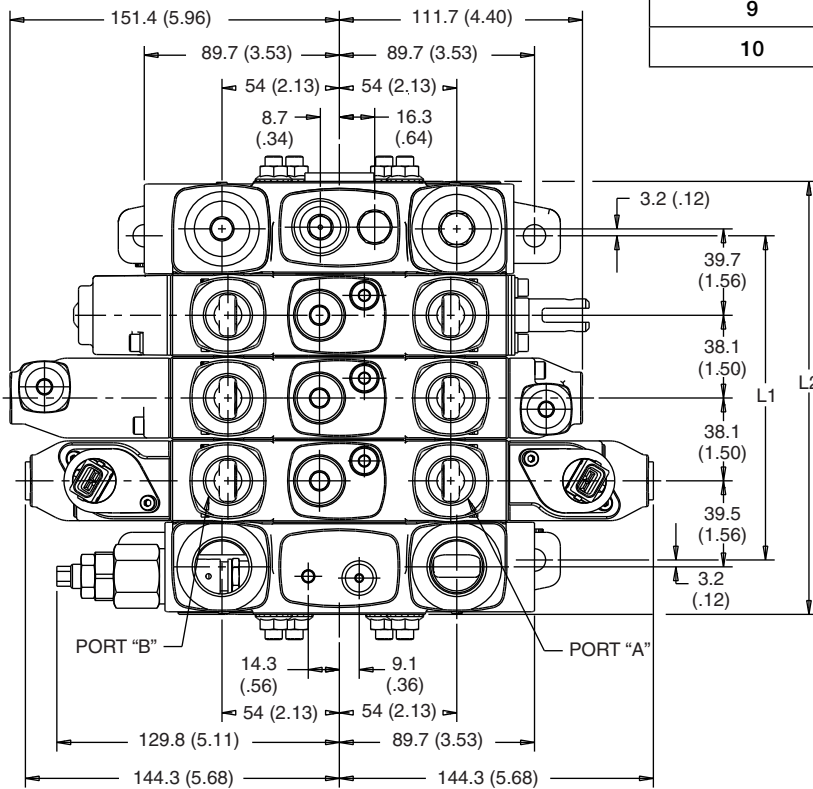


VP120 with Combination Inlet / Combination Outlet

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

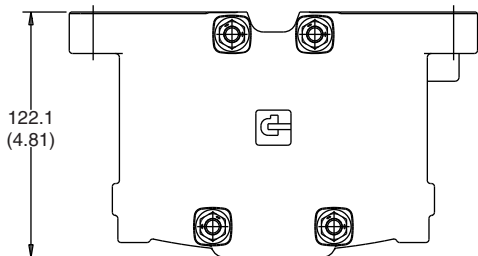
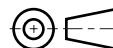


No. Of Sections	L1 mm [inch]	L2 mm [inch]
1	73 [2.87]	123 [4.83]
2	111 [4.37]	161 [6.33]
3	149 [5.87]	199 [7.83]
4	187 [7.37]	237 [9.33]
5	225 [8.87]	275 [10.83]
6	263 [10.37]	313 [12.33]
7	301 [11.87]	351 [13.83]
8	340 [13.37]	390 [15.33]
9	378 [14.87]	428 [16.83]
10	416 [16.37]	466 [18.33]



VP120 with Combination Inlet / Simple Outlet

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



No. Of Sections	L1 mm [inch]	L2 mm [inch]
1	70 [2.77]	109 [4.29]
2	109 [4.27]	147 [5.79]
3	147 [5.77]	185 [7.29]
4	185 [7.27]	223 [8.79]
5	223 [8.77]	261 [10.29]
6	261 [10.27]	299 [11.79]
7	299 [11.77]	338 [13.29]
8	337 [13.27]	376 [14.79]
9	375 [14.77]	414 [16.29]
10	413 [16.27]	452 [17.79]

