PC25™ / PC55™ Series

Load-Sense Control Valve

Catalog HY14-2002/US

The Parker Hannifin Hydraulic Valve Division Assures:

- Consistent quality
- Technical innovation
- Premier customer service

Parker's technical resources provide the technologies needed to fulfill your product requirements. That's why thousands of manufacturers and equipment users around the world rely on Parker products and people.

Performance of the PC25 and PC55 is optimized when matched with Parker's new P2/P3 piston pumps and the bypass unloaders produced by the Gear Pump Division.

Refuse

Automated vehicles require the performance of load-sense pressure-compensated valves. Our Flow-Sharing feature ensures that cycles are never interrupted when the engine is run at idle (a pump over demand condition).

Construction

Machines requiring high productivity benefit with load-independent metering. Our Flow-Sharing feature enables the operator to maintain the rhythm of the machine during pump over demand conditions.

Forestry

The responsiveness and the Flow-Sharing feature of the PC25 and PC55 valves make them particularly well suited to the productivity and reliability requirements and demands of harvesting and loading equipment.

Snow & Ice

The inherent excellent performance of load-sense pressure-compensated valves assures load independent control. Flow-Sharing addresses and resolves the problems associated with the “dead stick” phenomenon.

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Hicksville, Ohio, USA

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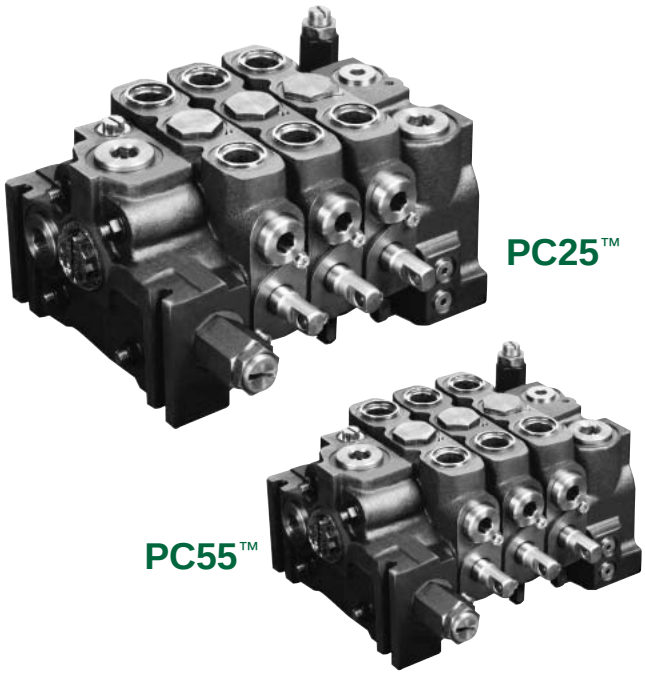

General Introduction

As an overview, load sensing or flow on demand systems employ a variable or fixed displacement pump. A piston pump will have a load-sense control mounted onto the pump that regulates the flow to the control valve by positioning the swashplate. The control mechanism is usually adjustable from 200-300 psi (14-20 bar). It will compare the pressure at the outlet of the pump to the load-sense pressure signal coming from the valve and will increase or decrease flow until it reaches equilibrium. Equilibrium is reached when the pressure differential between the outlet of the pump and load-sense signal of the valve reaches a pre-determined value referred to as margin pressure.

When a gear pump is used with a bypass unloader, the function of the unloader is similar to the load-sense control mechanism on the piston pump. The unloader senses the pressure at the output of the pump vs. the load-sense signal from the control valve. It's function is to regulate flow to the valve until the flow requirements as defined by the spool notch opening are met. Excess flow, however, is unloaded to tank at a pressure slightly higher than the operating pressure of the valve.

When the metering notches of the control valve spool are opened slightly, it does not take much flow to satisfy the margin pressure requirement. If the valve spool is stroked farther, the load-sense control on the pump will sense a drop in pressure and will bring the pump on stroke until the margin pressure requirement is satisfied. If the stroke of the spool is reduced, the load-sense control will sense an increase in pressure differential and will de-stroke the pump until the new flow requirement is met.

These are the main advantages of load-sensing pressure-compensated valves that positively impacts the performance of your machine.

- metering is independent of load. Changes in pressure due to load variation do not affect the output flow of the valve. This provides predictable speed control and makes the operator's job easier.
- simultaneous metering is generally unaffected by changes in pressure due to load changes. Therefore, the operator does not waste time throttling flow to two functions with changes in load. This improves productivity and reduces operator fatigue.
- lower flow forces translate into lighter lever efforts. For manually operated valves, this reduces operator fatigue.
- flow forces within the valve are more linear vs. spool stroke, resulting in lower hysterisis for pilot-operated control valves. This improves the predictability of actuator speed vs. operator command.
- horsepower consumption is optimized when interfaced with a piston pump, because only the flow requested by the valve is delivered.

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Introduction

PC25 4000 psi (275 bar), 45 gpm (170 lpm) nominal
PC55 4000 psi (275 bar), 70 gpm nominal (265 lpm)

The **PC25** and **PC55** are load-sense pressure-compensated valves.They employ contemporary technology which assures that the selected functions get flow during a pump overdemand conditon. This flow-sharing principle is generally instrumental in improving machine productivity.

The **PC25** and **PC55** also have a **patented,** dual-check arrangement. This was designed to improve valve response and the efficiency of the section compensator.

Key Features of PC25™ and PC55™:

- Flow Sharing principle responds to pump-overdemand, by reducing flow to the selected functions - while maintaining the speed relationship between those functions.
- Its **patented** dual-check system ensures that a clean, crisp load-sense signal is sent to the pump. This makes for a very responsive machine, even in cold weather.
- Compensator efficiency is excellent. This means that the selected flow does not, generally, vary with changes in load.
- The compensator can efficiently process flows at least equal to the maximum rated flow of the valve.
- Can accommodate induced loads.
- Symmetrical work-section housing enables the spool to be inserted into either end of the spool bore.
- Uses the same port accessories and spool positioners as their open-center counterparts.

Product Availability

- Clipper relief valves in inlets.
- PC25 inlet has option for integrated pressure-reducing valve to support Electro-Hydraulic operation.
- PC55 inlet with a bypass unloader.
- Work-Sections (3) position, (4) position float and (4) position regeneration.
- Spool Positioners - spring-return, three position detent, spring-return/detent, pneumatic, on/off and proportional solenoid and hydraulic-remote. Stroke limiters available with hyraulic-remote and solenoid caps.
- Port Accessories - relief valves, lockout relief valves, relief valves/anti-cav's, anti-cav's, unloading valves and port restrictors.
- Full flow and limited flow spools
- PC25 porting (max):
  - Inlet – SAE 16
  - Section – SAE 12
  - Outlet – SAE 20
- PC55 porting (max):
  - Inlet – SAE 20
  - Section – SAE 16
  - Outlet – SAE 24

Specifications

Nominal Flow Ratings:

PC25 - 45 gpm (170 lpm)

PC55 – 70 gpm (265 lpm)

Operating Pressure - 4000 psi (275 bar)

Exhaust Pressure - 300 psi (21 bar)

Margin Pressure - 250 psi (17bar) - recommended

Filtration Required (nominal) - ISO 18/14

Fluid - Mineral Based Hydraulic Oil

Fluid Temperature and Viscosity Range - 20 to 200 F (-29 C to 150 C)

Number of Work-Sections -10

Weight lbs. (approximate):

	PC25	PC55
Inlet with rv	16	25
Outlet	15	23
Work-Section		
- manual	14	19
- hydralic remote	16	24
- solenoid	22	30

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Load-Sense Pressure Compensated Control Valves

Flow (gpm) Max.	PC25	PC55
GPM/LPM	**45/170**	**70/265**
PSI/BAR	**4000/275**	**4000/265**
Maximum Porting		
Inlet	SAE 16	SAE 20
Work Section	SAE 12	SAE 16
Outlet	SAE 20	SAE 24
Equivalent BSP & Metric Porting Available		
SAE 8, M18		
SAE 10, BSP 1/2, M22		
SAE 12, BSP 3/4, M26		
SAE 16, BSP 1, M33		
SAE 20, BSP 1 1/4, M42		
SAE 24, BSP 1 1/2, M48		
Circuitry		
Parallel	Yes	Yes
(4) Position Float	Yes	Yes
(4) Position Regeneration	Yes	Yes
Spools Available		
Double Acting Cylinder	Yes	Yes
Double Acting Motor	Yes	Yes
Single Acting Cylinder @ Port B	Yes	Yes
Single Acting Motor @ Port B	Yes	Yes
Double Acting Cylinder, 4th Position Float	Yes	Yes
Double Acting Cylinder, 4th Position Regen.	Yes	Yes
Symmetrical Work Section Housing		
Backups		
Spring Return	Yes	Yes
(3) Position Detent	Yes	Yes
Detent Spool In, Spring Return Spool Out	Yes	No
Detent Spool Out, Spring Return Spool In	Yes	No
Spring Return with 4th Position Detent	Yes	No
Electro Magentic Detent	Yes	No
Pneumatic, Single Ended	Yes	Yes
Hydraulic Remote (Metered & On/Off)	Yes	Yes
Stroke Limiters for Hydraulic Remote	Yes	Yes
Hydraulic Remote (Metered with 4th Position Float)	Yes	Yes
Hydraulic Remote (Metered with 4th Position Regen.)	Yes	Yes
Solenoid (On/Off & Proportional), Double Ended	Yes	Yes
Stroke Limiters for Solenoid operation	Yes	Yes
Port Accessories		
R/V (Shim Adjustable)	Yes	Yes
R/V (Screw Adjustable)	Yes	Yes
R/V-A/C (Screw Adjustable)	Yes	Yes
A/C	Yes	Yes
Unloading Valve	Yes	Yes
Handles		
Vertical	Yes	Yes
Boot	Yes	No
Mechanical Joystick	Yes	No

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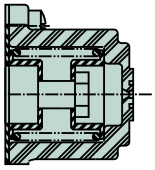
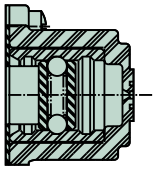
PC25™ and PC55™ Spool Positioning Options

Codes A and E - Manual Spring-Return



A spring in the end cap of this standard spool operator returns the spool to neutral from either work position when the control handle is released.

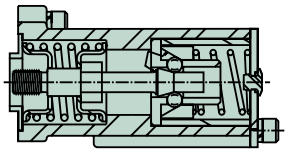
Codes B and F - (3) Position Detent



This option allows the spool to be detented in neutral and both of the power positions. Spool movement from one position to another is done manually.

Codes D and H - Detent-In, Spring-Return Out

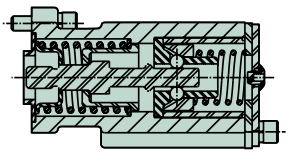
PC25 Only



This spool positioner is used on a (3) position spool. The spool is detented when pushed in and returned to neutral via a spring when pulled out.

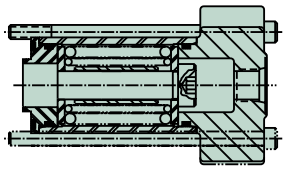
Code C - Detent-In, Spring-Return Out

PC25 Only



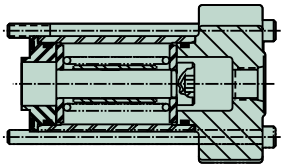
This spool positioner is used on a (4) position spool with the 4th position detented.

Code X - Hydraulic-Remote Proportional



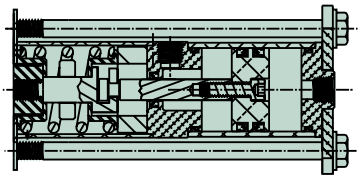
This spool positioner uses hydraulic pressure against the area of the spool, opposed by a spring, to achieve metering control. The design permits the constant transfer of oil from the cap to the tank core of the work section to help warm the oil during cold weather start-up. For optimum performance, it should be matched with a controller that has a spring pack of 95-400 psi (7-28 bar). Stroke limiters are available when the pilot ports are machined perpendicular to the spool.

Code XP - Hydraulic-Remote On/Off



This spool positioner uses hydraulic pressure against the area of the spool opposed by a spring. The design permits the constant transfer of oil from the cap to the tank core of the work section to help warm the oil during cold weather start-up. Recommended pilot pressure input is 300-500 psi (21-34 bar) above tank pressure.

Codes V and U - Single-Ended Pneumatic



This spool positioner uses air pressure plumbed to a double-acting piston on one end of the spool to shift the spool in both directions. The other end of the spool is available for alternate actuation methods. The pressure range is 100 psi min. (7 bar) and 150 psi max (10 bar). The approximate metering range is 15-75 psi (1-5 bar).

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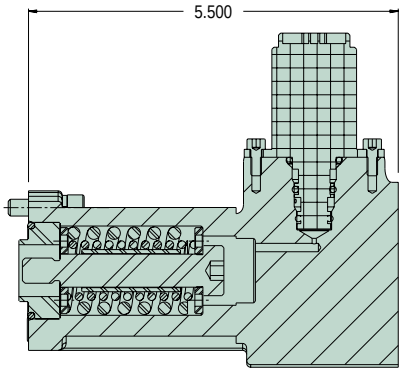
PC25™ and PC55™ Spool Positioning Options

Codes P2 and P4 - Solenoid End Cap

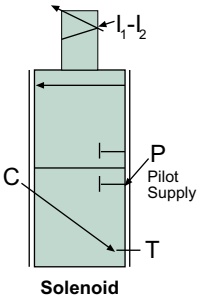


This spool positioner has a cap and solenoid on each end of the spool. The pilot and drain can be internal or external. This picture shows internal pilot and drain. The caps are also available with stroke limiters. The solenoids are available in 12V and 24V with the option of manual operation via a push-pin. The solenoid connector is AMP Junior. The same solenoid is used for on/off or proportional operation.

Standard Endcap Options Continued ElectroHydraulic Control

Specifications:

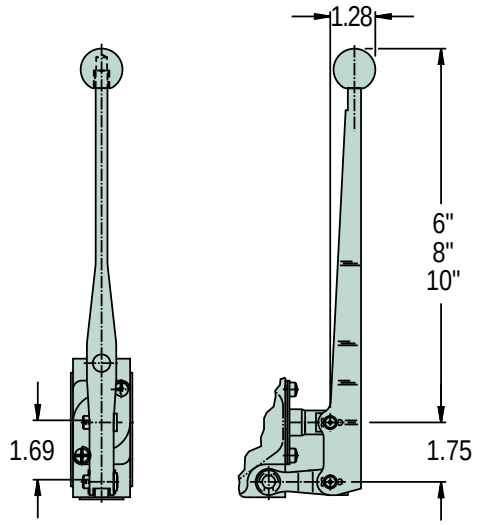
- 12 or 24 VDC systems
- P = 400-600 psi, 4-6 GPM supply (3-4 simultaneous functions)
- C = To endcap
- I = Solenoid current input range (see chart depending on 12 or 24 V system)
  PWM modulation frequency 100 Hz can be driven with Parker IQAN. Limit 1.5 A for 12 V, .75 A, 24 V.



- Insulation Material Class H
- Duty Cycle 100%
- R20 OHM = 5.3 (± 5%) for 12 V, 21.2 (± 5%) for 24 V
- Fluid cleanliness 17/14 per ISO4406
- Ambient temperature -22°F to 176°F
- Fluid temperature -4° F to 176° F
- Connector: AMP junior timer type C

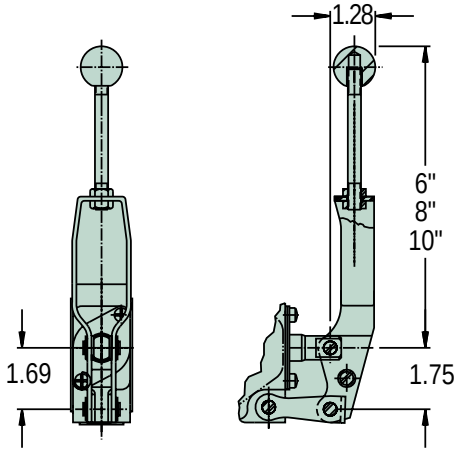
	System	
I *m* A	**12V**	**24V**
Start Shift	500	250
Full Shift	1250	625

PC25/55 Handles



PC25/55-HANDLES

Can only be used on sections without port accessories.



PC25/55-HANDLES

Can be used on sections with or without port accessories.

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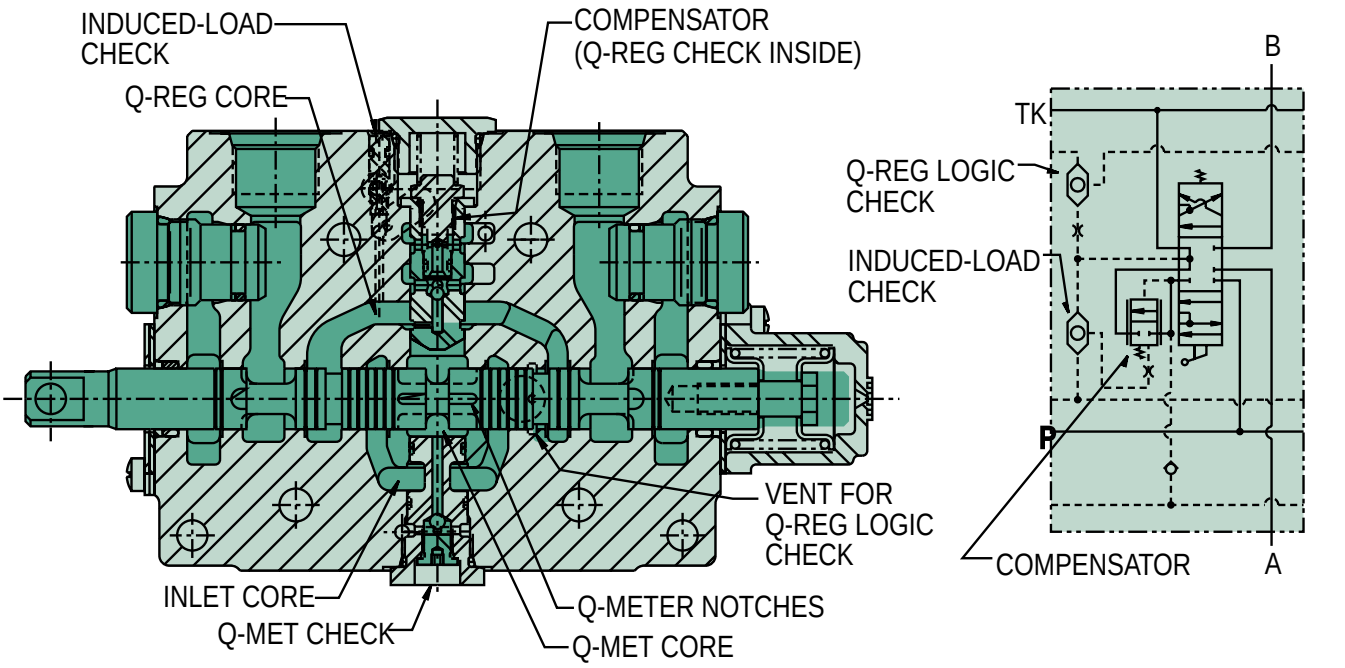
PC25™ and PC55™



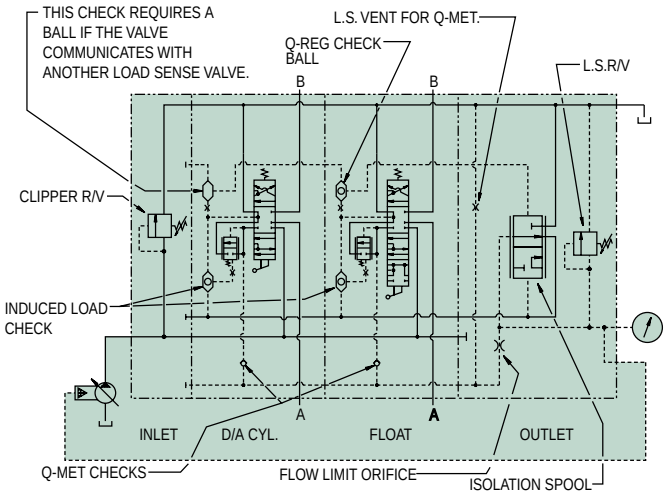
Description of Operation

When the spool is in neutral, the pump is connected to the inlet core which is deadblocked at the outlet of the valve. The load is being held by the spool and the pump is in a standy condition.

When the spool is actuated, pump flow goes across the spool notches, opens the compensator and connects the pump to the load. The load pressure is shuttled downstream to the outlet and sent to the pump via the load-sense port. Simultaneously, the load-sense signal is conditioned in the outlet and routed to the spring-end of the compensators. This enables a work-section to maintain it's selected flow regardless of changes in pressure.

As with all load-sense systems, venting of the load-sense signal is required when the valve spools are returned to neutral. All of this is accomplished within the PC25 and PC55 valves.

To optimize the performance of these valves, the load-sense relief-valve is located in the outlet. It is screw adjustable. It's setting determines the maximum pressure at which the valve will continue to provide flow to the selected functions.



The relief valve in the inlet is referred to as a clipper relief. It's purpose is the clip the spikes normally associated with the de-stroking of piston pumps. When the clipper relief valve opens, all of the pump flow is returned to tank. It should always be set at least 500 psi higher than the load-sense relief-valve to ensure optimum performance.

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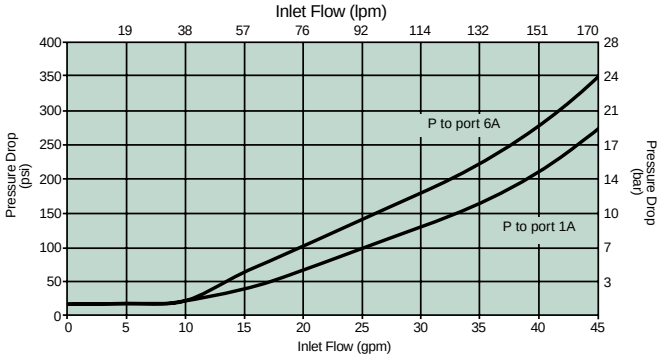
PC25™ Flow Curves

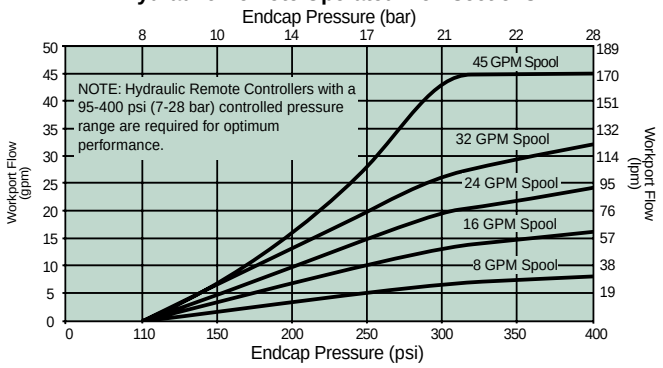
(tested @ 120° F (49° C) & 21cSt)

(All metering curves run based upon a margin pressure of 250 psi.)

Inlet To Workport Pressure Drop
{Standard 45 gpm (170 lpm) spool}

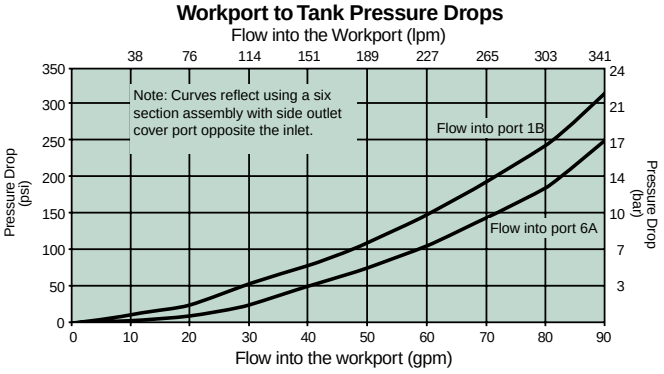


Meter - In Flow to Workport
Hydraulic Remote Operated Worksections

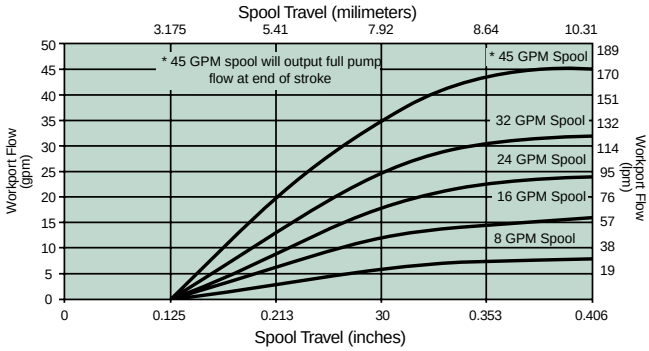


Note: Spools are rated at full stroke except 45 gpm spool, which will output full pump flow.

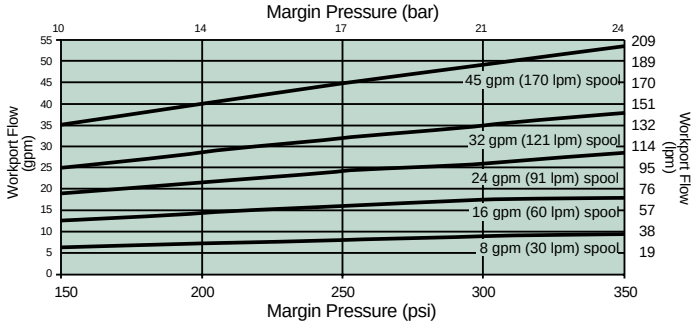
Workport to Tank Pressure Drops



Meter - In Flow to Workport
Manual Operated Worksections



Affects of Margin Pressure on Flow Output *



*assumes no Delta P from pump to valve

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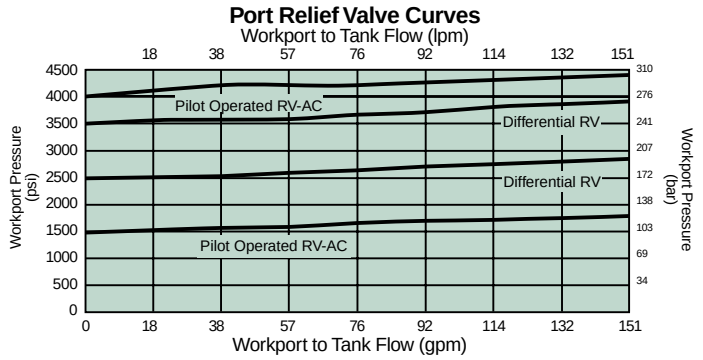
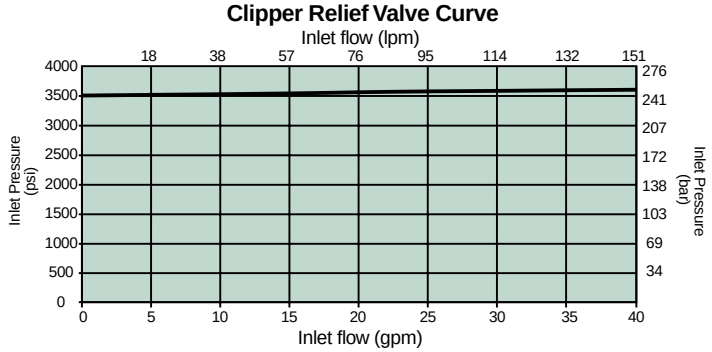
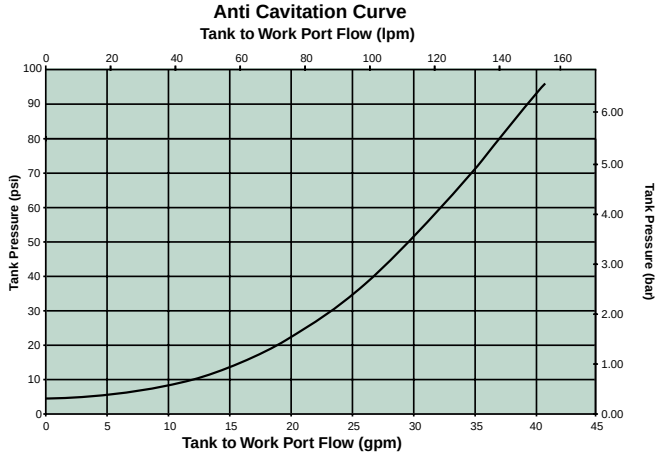
PC25™ Flow Curves
(tested @ 120° F (49° C) & 21cSt)







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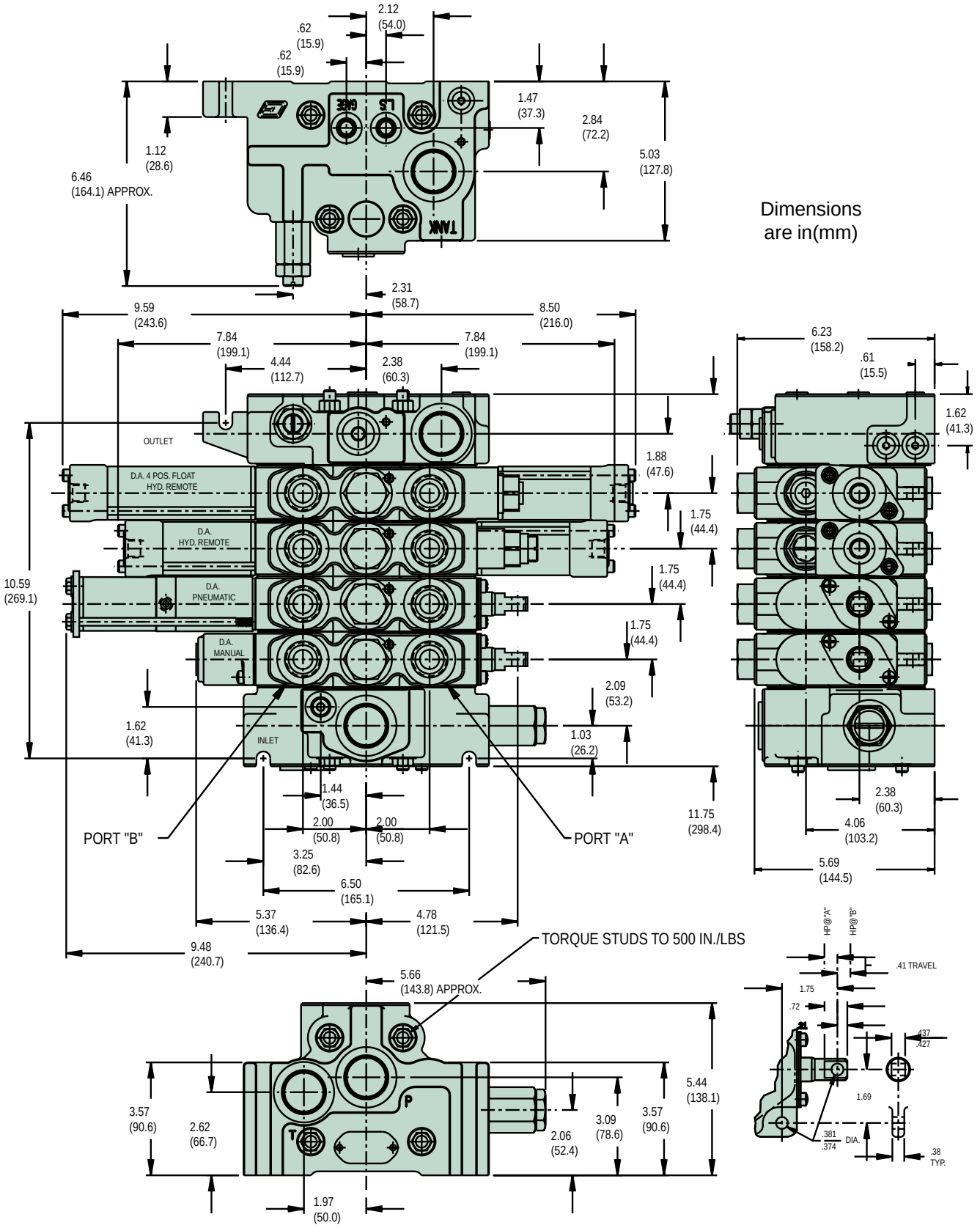
PC25™ Installation Drawing



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PC25™ Inlet Coding/How to Specify

Example:

Box (1)	Box (2)	Box (3)	Box (4)	Box (5)	Box (6)	Box (7)	psi setting
A	A	R	1	S	8	8	0	0	(3000)
									( )

Box 1: Description

AA	Inlet with R/V (Advise pressure setting)
CA	Inlet with R/V Plug

Box 2: Integrated Pressure Reducing Valve *(option)*

For internal/external pilot pressure requirements.

R1	Internal pilot A & B
R2	External pilot, thru filter*, back into inlet and internal for A & B
R3	External pilot,with a check for operation for an accumulator thru filter*, back into inlet and internal for A & B
R4	Internal pilot A&B with check for an accumulator*
R5	External pilot
R6	External pilot with check for an accumulator*

*note: customer supplied product

Box 3: Port Type Code

B	BSP
M	Metric
S	SAE

Box 4: High Pressure Top

No Port				
0				
BSP				
—	**3**	—	**7**	**8**
—	1/2”	—	3/4”	1”
Metric				
—	**3**	**4**	**7**	**8**
—	M18	M22	M26	M33
SAE				
—	**3**	**4**	**7**	**8**
—	SAE 8	SAE 10	SAE 12	SAE 16

Box 5: High Pressure Side

No Port				
0				
BSP				
—	**3**	—	**7**	**8**
—	1/2”	—	3/4”	1”
Metric				
—	**3**	**4**	**7**	**8**
—	M18	M22	M26	M33
SAE				
—	**3**	**4**	**7**	**8**
—	SAE 8	SAE 10	SAE 12	SAE 16

Box 6: Low Pressure Side

No Port				
0				
BSP				
—	**3**	—	**7**	**8**
—	1/2”	—	3/4”	1”
Metric				
—	**3**	**4**	**7**	**8**
—	M18	M22	M26	M33
SAE				
—	**3**	**4**	**7**	**8**
—	SAE 8	SAE 10	SAE 12	SAE 16

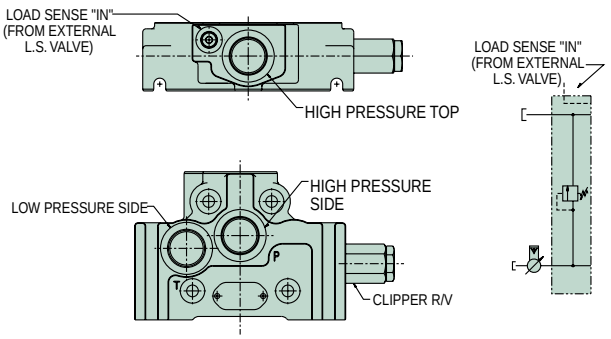
Box 7: Load-sense In *(from another valve)*

A port size must be coded if this valve communicates with another load-sense valve. Otherwise, do not code.

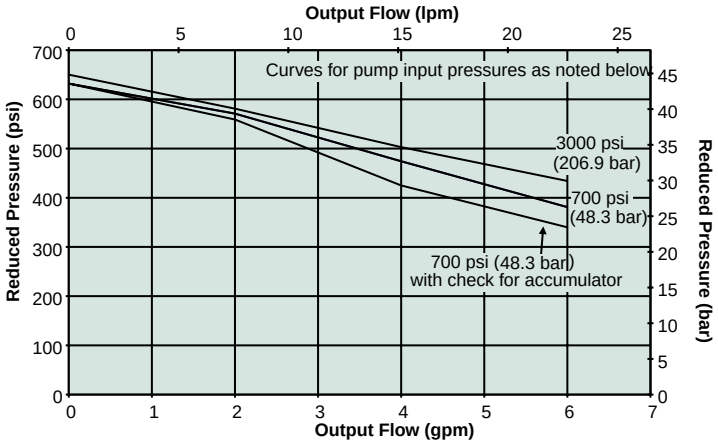
BSP	2-1/4”
Metric	2-M12
SAE	2-SAE 6

Note – if the PC25 is to be in parallel with any other load-sense valve, please contact the factory for proper installation procedures.

Inlet Port Locators



Performance Curve For Integrated Pressure-Reducing Valve In Inlets With Code R
(Code R options are shown on next page)



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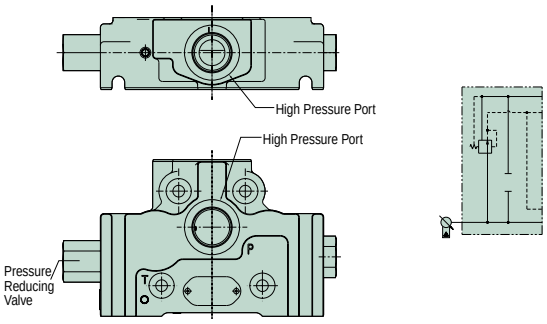
Hicksville, Ohio, USA

PC25™ Inlet Coding/How to Specify

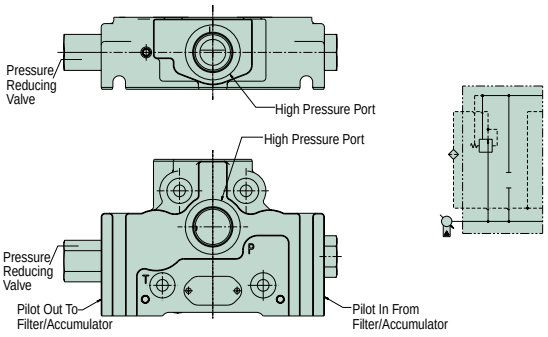
Inlets with the integrated pressure-reducing valve are denoted by the letter R in the 3rd space of the coding description - followed by a number (1-6) in the 4th space.

Code R1



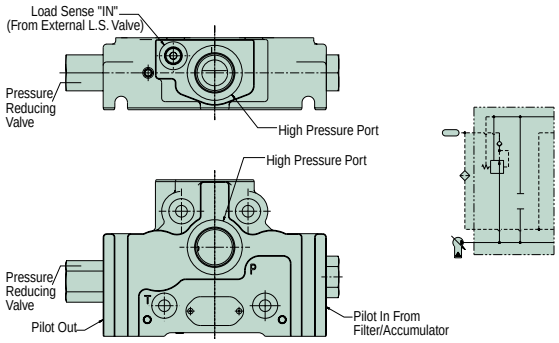
Internal pilot to A and B sides of the valve.

Code R2



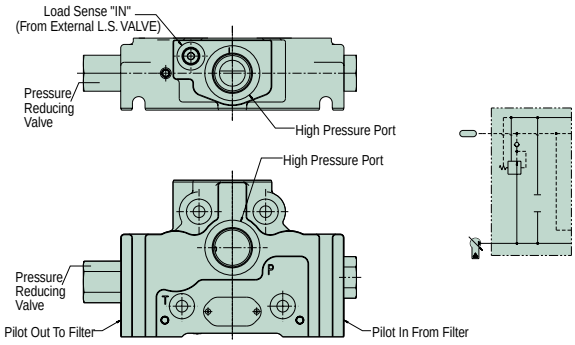
External pilot for the option of plumbing thru a filter (supplied by customer) and then back into the inlet. Pilot pressure is then internal to the A and B sides of the valve.

Code R3



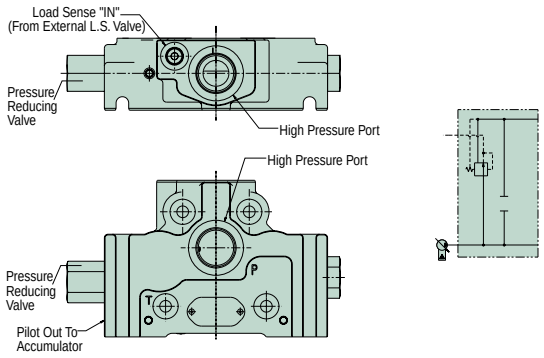
Same as Code R2, except has a check for operation with an accumulator (supplied by customer). When pressure falls below a defined level, the check closes and the accumulator supplies pilot pressure to the valve.

Code R4



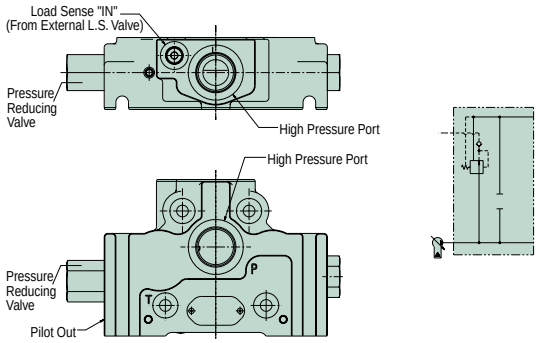
Internal pilot to A and B sides of the valve with a check for operation with an accumulator (supplied by customer).

Code R5



External pilot only.

Code R6



External pilot only with a check for operation with an accumulator (supplied by customer).

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Hydraulic Valve Division
Hicksville, Ohio, USA

PC25™ Work Section Coding/How to Specify

Example:

Box (1)	Box (2)			Box (3)	Box (3A)	Box (3B)	Box (4)		Box (5A)	Box (5B)	Box (6)	psi setting for ports A & B
H	1	4	5	A			S	7	1	1	A	(2000 / 1500)
												(/)

Box 1: Description

H	Double Acting Cylinder
L	Double Acting Motor
J	Single Acting Cylinder (port B)
N	Single Acting Motor (port B)
G	Double Acting Cyl. 4th Pos. Float (IN)
R	Double Acting Cyl. 4th Pos. Regen. (IN) (available in code X - hydraulic remote operator only)

Note - Codes G and R are available as left-handed sections only.

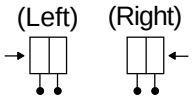
Box 2: Spool Flow

GPM (The last two digits denotes flow @ full stroke, except 45 gpm spool will output full pump flow. Margin pressure 250 psi/17 bar.)

Double Acting Cylinder **145**, **132**, **124**, **116**, **108**
Double Acting Motor **245**, **232**, **224**, **216**, **208**
Single Acting Cylinder (port B) **345**, **332**, **324**, **316**, **308**
Single Acting Motor (port B) **445**, **432**, **424**, **416**, **408**
Dbl. Act. Cyl. 4th Pos. Float (IN) **545, 532**

Box 3: Operator (Spool Positioning)

(Left or right handed section)



	Left	Right
Spring Return	**A**	**E**
(3) Position Detent	**B**	**F**
Spring Return with 4th Pos. Detent (IN)	**C**	**-**
(Left-handed assembly only) Spring Return Out/Detent In	**D**	**H**
D. E. Solenoid On/Off or Proportional 12V	**P2**	**-**
D. E. Solenoid On/Off or Proportional 24V	**P4**	**-**
Single Ended Pneumatic	**V**	**U**
Hydraulic Remote, Proportional	**X**	**-**
Hydraulic Remote, On/Off	**XP**	**-**

Note: Codes P must have pilot and drain codes from Box 3A.

Box 3A: Optional Pilot and Drain for P2 & P4

Available Codes

A	External Pilot and Drain
B	External Pilot and Internal Drain
C	Internal Pilot and Drain
D	Internal Pilot and External Drain

Box 3B: Optional Stroke Limiter for P2 & P4

For A & B	**1**
For A Only	**2**
For B Only	**3**

Porting (Box 4)

No Port			
0			
BSP			
—	**B3**	—	**B7**
—	1/2"	—	3/4"
Metric			
—	**M3**	**M4**	**M7**
—	M18	M22	M26
SAE			
—	**S3**	**S4**	**S7**
—	SAE 8	SAE 10	SAE 12

Box 5A & 5B: Port A & B Accessory

(Apply a code for each port)

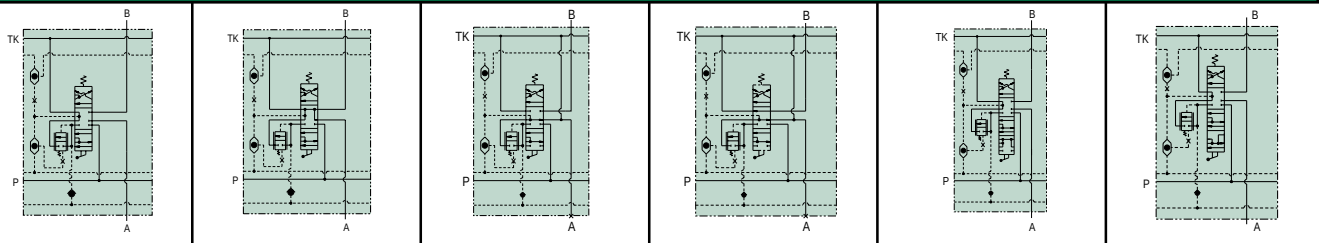
0	Not Machined
1	R/V-A/C Screw Adjustable
2	Anti-cavitation Check
3	R/V Shim Adjustable
5	Plastic Closure
6	R/V Screw Adjustable
9	Steel Plug

Box 6: Q Reg. Check Ball

(Section next to inlet does not take a ball unless it communicates with another load-sense valve)

A	No Ball
B	Ball

Function Schematics



H
Double Acting Cylinder

L
Double Acting Motor

J
Single Acting Cylinder (port B)

N
Single Acting Motor (port B)

G
Double Acting Cylinder 4th Position Float (IN)

R
Double Acting Cylinder 4th Pos. Regen. (IN)

Parker Hannifin Corporation
Hydraulic Valve Division
Hicksville, Ohio, USA

PC25™ Outlet Coding/How to Specify

Example:

	Box (1)	Box (2)	Box (3)	Box (4)	Box (5)	Box (6)	Optional Box (7)	psi setting
	Z	L	I	S	8	9	2	0	(3500)

	Box (1)	Box (2)	Box (3)	Box (4)	Box (5)	Box (6)	Optional Box (7)	psi setting
								( )

Box 1: Description

ZLI	L/S R/V (Advise pressure setting)

Box 2: Port Type Code

B	BSP
M	Metric
S	SAE

Box 3: Low Pressure Top

No Port				
0				
BSP				
—	**3**	—	**7**	**8**
—	1/2”	—	3/4”	1”
Metric				
—	**3**	**4**	**7**	**8**
—	M18	M22	M26	M33
SAE				
—	**3**	**4**	**7**	**8**
—	SAE 8	SAE 10	SAE 12	SAE 16

Box 4: Low Pressure Side

No Port				
0				
BSP				
3	—	**7**	**8**	
1/2”	—	3/4”	1”	
Metric				
3	**4**	**7**	**8**	**9**
M18	M22	M26	M33	M42
SAE				
3	**4**	**7**	**8**	**9**
SAE 8	SAE 10	SAE 12	SAE 16	SAE20

Box 5: Load-sense (to pump)

BSP	**2**-1/4”
Metric	**2**-M12
SAE	**2**-SAE 6

Box 6: Load-sense (gauge)

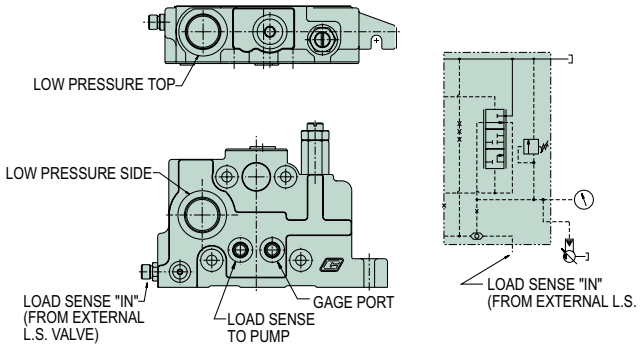
O	O-gauge port with SAE-6 steel plug
2	2-1/4” BSP port with steel plug
2	2-M12 Metric port with steel plug

Box 7: Load-sense In (from another valve) (Optional)

A port size must be coded if this valve is in parallel with another load-sense valve. Otherwise, do not code.

BSP	**1**-1/8”
Metric	**1**-M10
SAE	**1**-Male JIC 37° for 3/8” O.D. Tube

Outlet Port Locations



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Hicksville, Ohio, USA

PC25™ Frequently Asked Specification Questions

1. Does the pump have a load-sense vent and can it be plugged? The vent can be either internal or external to the valve, but internal vent is preferred. The Q Met. vent is sized for approximately 1.1 gpm at 3000 psi (4.2 lpm at 207 bar).

2. Does the pump control have an orifice which restricts the load-sense signal into the control? What is the length and diameter of the load-sense line? (This impacts the system response time.) Recommended size is SAE 4 or 6, BSP 1/8" or 1/4", M10 or M12. If the length of the line exceeds 20 feet (6 meters) please contact our factory.

3. Are there any elements in the circuit between the pump and the PC25 valve which could restrict pump flow to the valve; including other valves, high-pressure filters or the plumbing itself? Any restrictions cause pressure drop which consumes part of the margin pressure and could impact full flow potential to the PC25 valve. It could also affect the responsiveness of the system. Ideally the anticipated pressure-drop between the pump and the valve should be specified. (Our standard spools are designed for a margin pressure of 250 psi.)

4. What devices are in the tank return line downstream of the PC25 outlet? What is the expected tank return pressure, measured at the outlet, when the valve is in neutral?

5. Clipper relief valves or pump pressure limiters used in conjunction with load-sense relief valves should be set 500 psi higher (14-21 bar) to prevent flow loss. This allows the load-sense relief valve to control the maximum pressure and reduces any potential for chatter between the relief valves.

6. What is the pump displacement compared to the total flow requirement of the system? As with all pressure-compensated valves, quiescent flow loss (parasitic) occurs and should be taken into account when sizing the pump. The Q Met. vent is sized for about 1.1 gpm at 3000 psi (4.2 lpm at 207 bar).

7. Is there another load-sense valve in parallel or series with the PC25? Please contact the factory if another load sense valve is in parallel with the PC25.

Seal Repair Kits

Inlet	391 1823 320
Complete Work Section (manual)	391 1823 280
Complete Work Section (hyd. remote)	391 1823 292
Work Section Only	391 1823 397
Spacer Plate Only	391 1823 398
Spool Seals	391 1803 846
Q Met/Q Reg./ Induced Load Checks	391 1823 281
Q Met Check	391 1823 329
Outlet Plug (all SAE plugs)	391 1823 293
Clipper R.V. & Clipper Plug	391 1823 288
Load-Sense R.V. & L.S. Plug This repair kit is for 355 9001 303	391 1823 290
Load-Sense R.V. & L.S. Plug This repair kit is for 355 9001 355	396 1823 028

Clipper Relief Valves

355 9001 305	800-2500 PSI	(55-172 bar)
355 9001 306	2501-4400 PSI	(172-303 bar)

Load-Sense Relief Valve

355 9001 303 500-4000 PSI (34-276 bar)
Production before January, 2002
355 9001 355 500-4000 PSI (34-276 bar)
Production as of January, 2002

Parker Hannifin Corporation
Hydraulic Valve Division
Hicksville, Ohio, USA

PC25™ Valve Specification Sheet

Date: _____

Customer: _____ City: _____ State: ___ Zip: _____

Application: _____ Annual Usage: _____

Pump Type: _____ Pump Control: _____ Stand-by psi/bar: _____ Margin psi/bar: ____

Filtration: _____ ISO ☐ Bypass ☐ Non Bypass

Pilot Filtration: _____ ISO ☐ Bypass ☐ Non Bypass

Primary gpm/lpm Input: _____ @ _____ psi/bar Operating Temp: _____ F/C

Max. Temp: _____ F/C Viscosity: _____ SSU @ 100F/cFp@38C Oil Type: _____

Spool Type

DAC	Double Acting Cylinder
DAM	Double Acting Motor
SAC	Single Acting Cylinder
DAF	Double Acting 4 POS Float
DAR	Double Acting 4 POS Regen
SAM	Single Acting Motor

Spool Operation

SR	Spring Return
DT	3 Position Detent
SRDT	Spring Return In, Detent Out
DES	Double Ended Solenoid 12/24 VDC
HRM	Hydraulic Remote Metered
HRNM	Hydraulic Remote No Metering
A	Air

Port Accessories

RV3	Relief Valve Shim Adjust
RV6	Relief Valve Screw Adjust
RVAC	Relief Valve/Anti-Cav. Screw Adjust
AC	Anti-Cavitation

Flow @ Full Stroke

(based on 250 psi margin pressure)

gpm 45 -32 - 24 - 16 - 8

lpm 170 - 121 - 91 - 61 - 30

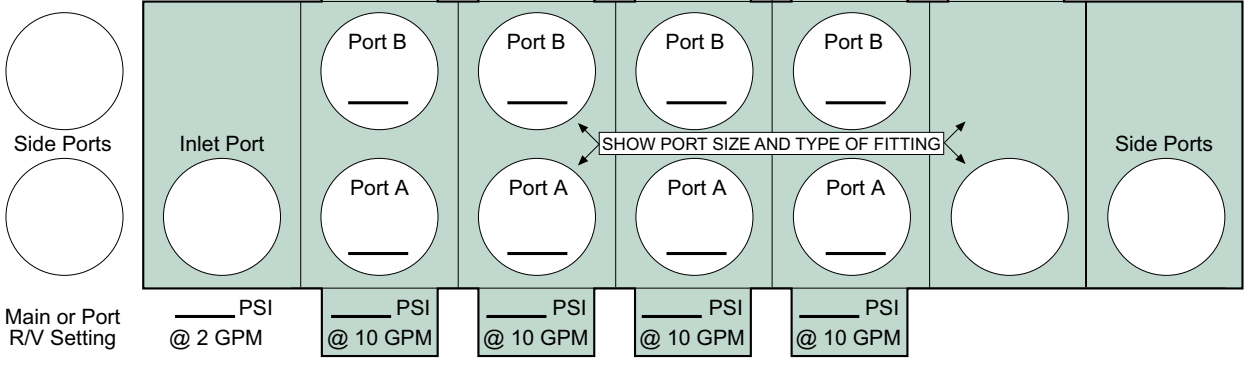
Note: The 45 gpm spool will output full pump displacement at full stroke.

☐ Left-hand Assembly (Left)

☐ Right-hand Assembly (Right)

SPOOL TYPE...	DAC DAM SAC DAF DAR SAM	DAC DAM SAC DAF DAR SAM	DAC DAM SAC DAF DAR SAM	DAC DAM SAC DAF DAR SAM
SPOOL OPER...	SR DT SRDT DES HRM HRNM A	SR DT SRDT DES HRM HRNM A	SR DT SRDT DES HRM HRNM A	SR DT SRDT DES HRM HRNM A
FLOW...	45 32 24 16 8	45 32 24 16 8	45 32 24 16 8	45 32 24 16 8
PORT A...	RV3 RV6 RVAC AC	RV3 RV6 RVAC AC	RV3 RV6 RVAC AC	RV3 RV6 RVAC AC
PORT B...	RV3 RV6 RVAC AC	RV3 RV6 RVAC AC	RV3 RV6 RVAC AC	RV3 RV6 RVAC AC
HANDLES...	6" 8" 10"	6" 8" 10"	6" 8" 10"	6" 8" 10"

Specify High Pressure & Low Pressure Ports



Section Function _____ _____ _____ _____

Code _____ _____ _____ _____ _____ _____ _____

Parker Hannifin Corporation
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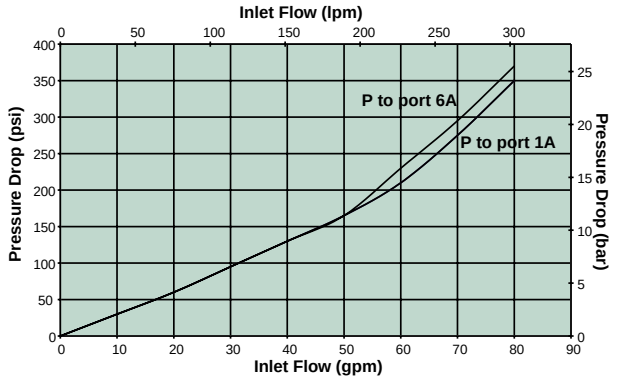
Hicksville, Ohio, USA

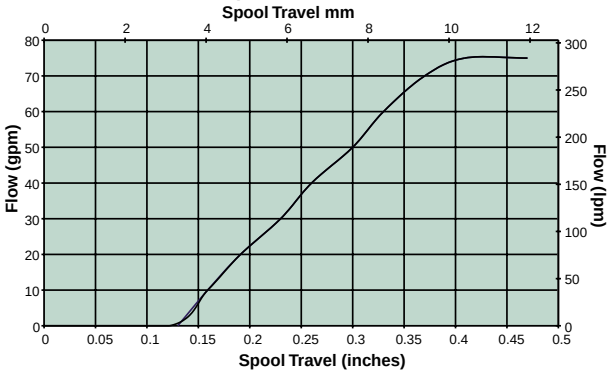
PC55™ Flow Curves

(tested @ 120° F (49° C) & 2cSt)

Inlet To Workport Pressure Drop

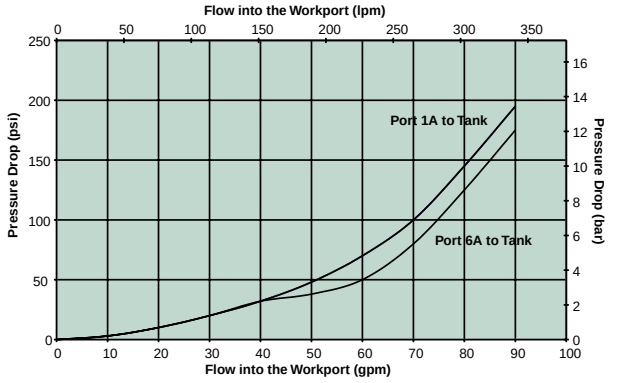


Meter-In Flow to Workport
Manual Operated Worksections

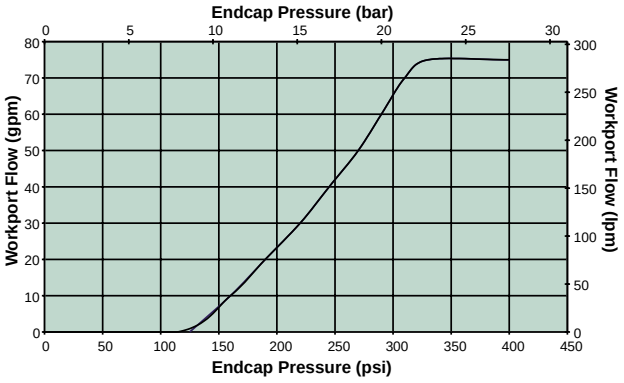


Metering curves based upon a margin psi of 250psi

Workport to Tank Pressure Drops



Meter-In Flow to Workport
Hydraulic Remote Operated Worksections



Metering curves based upon a margin psi of 250psi

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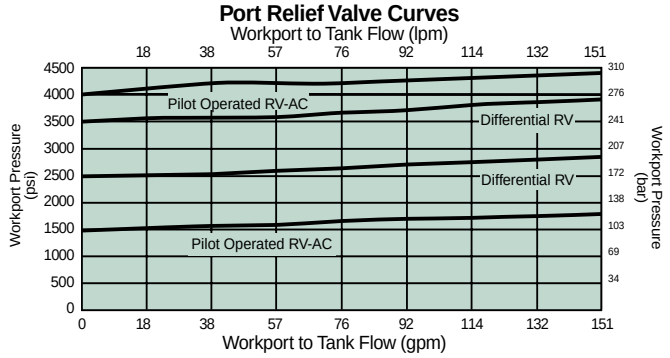
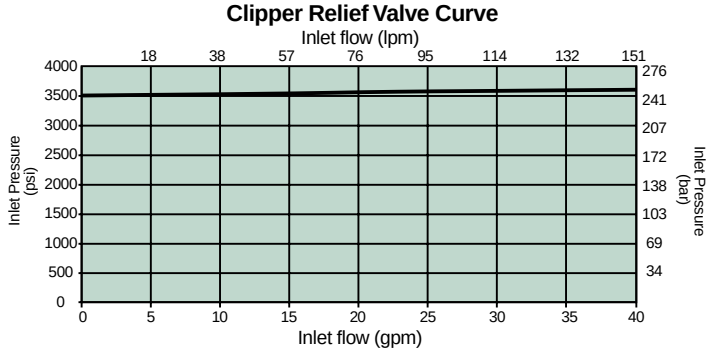
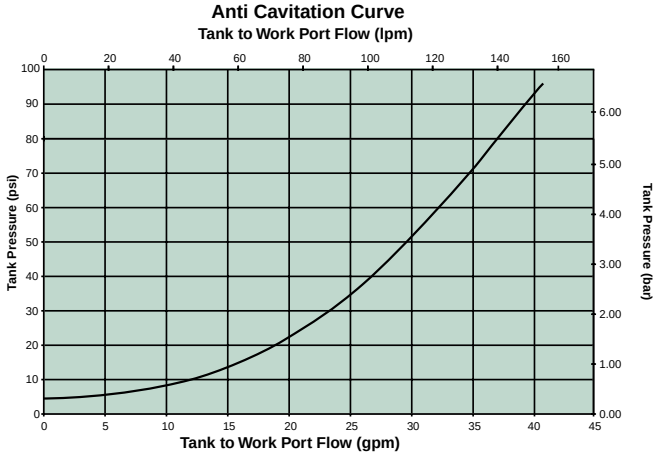
Hydraulic Valve Division
Hicksville, Ohio, USA

PC55™ Flow Curves

(tested @ 120° F (49° C) & 21cSt)







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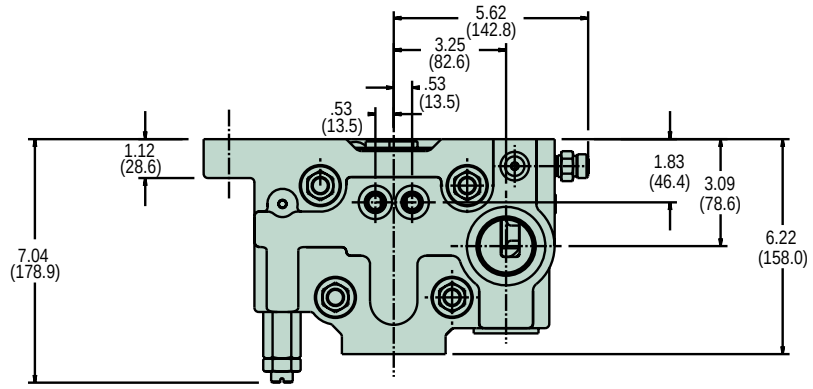
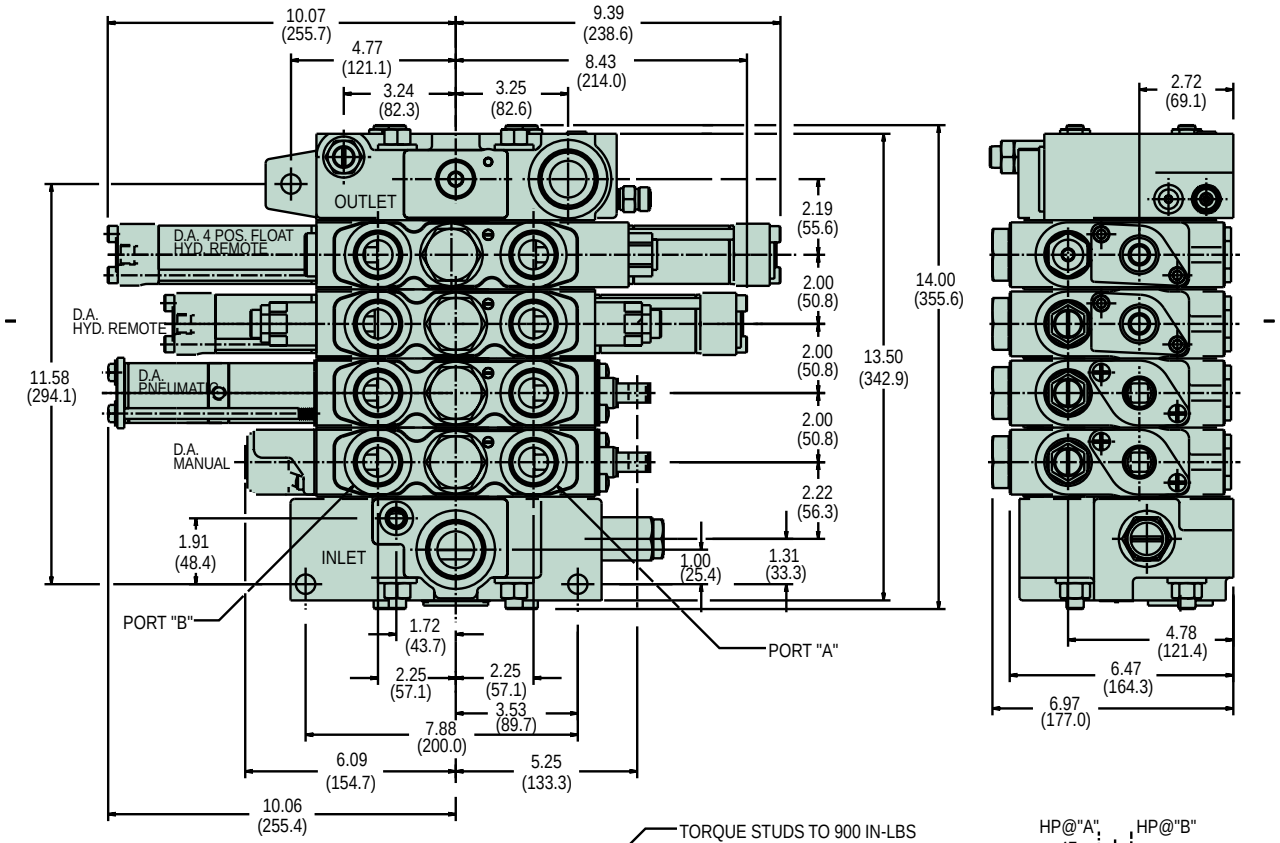
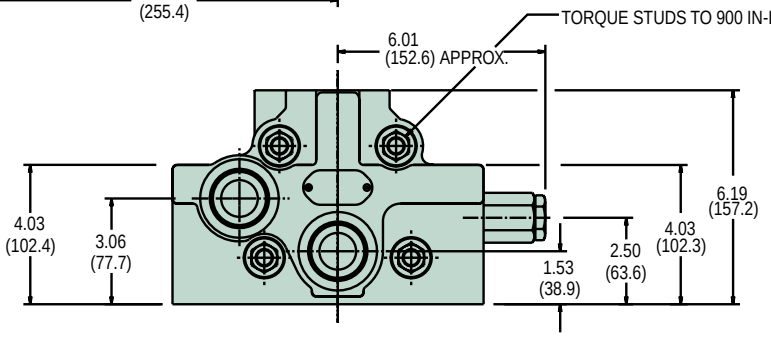
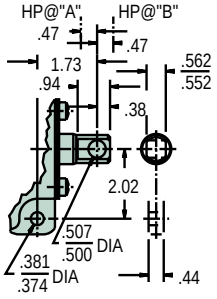
PC55™ Installation Drawing



Dimensions
are in(mm)







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Hydraulic Valve Division
Hicksville, Ohio, USA

PC55™ Inlet Coding/How to Specify

Example:

Box (1)	Box (2)	Box (3)	Box (4)	Box (5)	Box (6)	psi setting
A	A	S	8	8	0	0	(3500)

Box (1)	Box (2)	Box (3)	Box (4)	Box (5)	Box (6)	psi setting
							( )

Box 1: Description

AA	Inlet with R/V (Advise pressure setting)
CA	Inlet with R/V Plug

Box 2: Port Type Code

B	BSP
M	Metric
S	SAE

Box 3: High Pressure Top

No Port				
0				
BSP				
—	**7**	**8**	**9**	
—	3/4"	1"	1¼"	
Metric				
—	**7**	**8**	**9**	
—	M26	M33	M42	
SAE				
—	**7**	**8**	**9**	
—	SAE 12	SAE 16	SAE 20	

Box 4: High Pressure Top

No Port				
0				
BSP				
—	**7**	**8**	**9**	
—	3/4"	1"	1¼"	
Metric				
—	**7**	**8**	**9**	
—	M26	M33	M42	
SAE				
—	**7**	**8**	**9**	
—	SAE 12	SAE 16	SAE 20	

Box 5: Low Pressure Side

No Port					
0					
BSP					
—	**7**	**8**	**9**	**10**	
—	3/4"	1"	1¼"	1½	
Metric					
—	**7**	**8**	**9**	**10**	
—	M26	M33	M42	M48	
SAE					
—	**7**	**8**	**9**	**10**	
—	SAE 12	SAE 16	SAE 20	SAE 24	

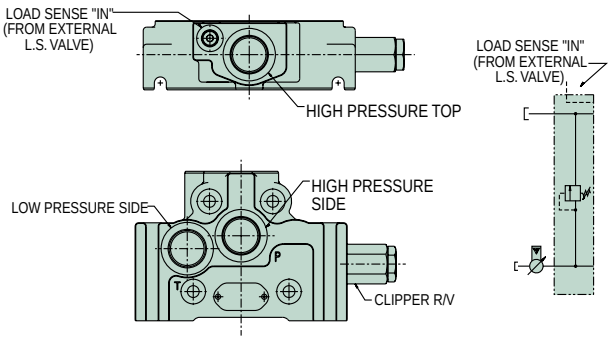
Box 6: Load-sense In *(from another valve)*

A port size must be coded if this valve communicates with another load-sense valve. Otherwise, do not code.

BSP	2-1/4"
Metric	2-M12
SAE	2-SAE 6

Note – if the PC55 is to be in parallel with any other load-sense valve, please contact the factory for proper installation procedures.

Inlet Port Locations



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PC55™ Work Section Coding/How to Specify

Example:

Box (1)	Box (2)			Box (3)	Box (3A)	Box (3B)	Box (4)		Box (5A)	Box (5B)	Box (6)	psi setting for ports A & B
H	1	7	0	A			S	7	1	1	A	(2000 / 1500)
												(/)

Box 1: Description

H	Double Acting Cylinder
L	Double Acting Motor
J	Single Acting Cylinder (port B)
N	Single Acting Motor (port B)
G	Double Acting Cyl. 4th Pos. Float (IN)
R	Double Acting Cyl. 4th Pos. Regen. (IN) (available in code X - hydraulic remote operator only)

Note - Codes G and R are available as left-handed sections only.

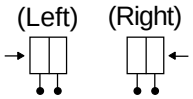
Box 2: Spool Flow

GPM (The last two digits denotes flow @ full stroke. Margin pressure 250 psi/17 bar.)
Double Acting Cylinder*
Double Acting Motor*
Single Acting Cylinder (port B)*
Single Acting Motor (port B)*
Dbl. Act. Cyl. 4th Pos. Float (IN)*

***Contact division for spool available.**

Box 3: Operator (Spool Positioning)

(Left or right handed section)



	Left	Right
Spring Return	**A**	**E**
(3) Position Detent	**B**	**F**
D. E. Solenoid On/Off or Proportional 12V	**P2**	**-**
D. E. Solenoid On/Off or Proportional 24V	**P4**	**-**
Single Ended Pneumatic	**V**	**U**
Hydraulic Remote, Proportional	**X**	**-**
Hydraulic Remote, On/Off	**XP**	**-**

Note: Codes P must have pilot and drain codes from Box 3A.

Box 3A: Optional Pilot and Drain for P2 & P4

A	External Pilot and Drain
B	External Pilot and Internal Drain
C	Internal Pilot and Drain
D	Internal Pilot and External Drain

Box 3B: Optional Stroke Limiter for P2 & P4

For A & B	**1**
For A Only	**2**
For B Only	**3**

Porting (Box 4)

No Port		
0		
BSP		
—	**B7**	**B8**
—	3/4"	1"
Metric		
—	**M7**	**M8**
—	M26	M33
SAE		
—	**S7**	**S8**
—	SAE 12	SAE 16

Box 5A & 5B: Port A & B Accessory

(apply a code for each port)

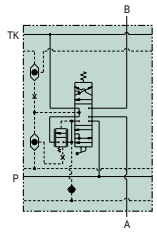
0	Not Machined
1	R/V-A/C Screw Adjustable
2	Anti-cavitation Check
3	R/V Shim Adjustable
5	Plastic Closure
6	R/V Screw Adjustable
9	Steel Plug

Box 6: Q Reg. Check Ball

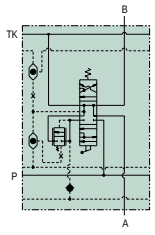
(section next to inlet does not take a ball unless it communicates with another load-sense valve)

A	No Ball
B	Ball

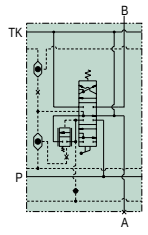
Function Schematics



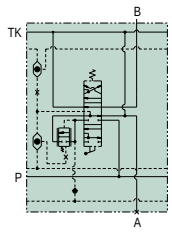
H
Double Acting Cylinder



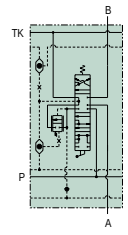
L
Double Acting Motor



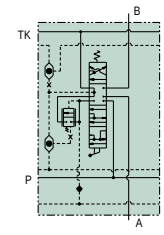
J
Single Acting Cylinder (port B)



N
Single Acting Motor (port B)



G
Double Acting Cylinder 4th Position Float (IN)



R
Double Acting Cylinder 4th Pos. Regen. (IN)

Parker Hannifin Corporation
Hydraulic Valve Division
Hicksville, Ohio, USA

PC55™ Outlet Coding/How to Specify

Example:

Box (1)	Box (2)	Box (3)	Box (4)	Box (5)	Box (6)	Box (7)
Z	L	I	S	8	9	2	0	1

Box (1)	Box (2)	Box (3)	Box (4)	Box (5)	Box (6)	Box (7)

Box 1: Description

ZLI	L/S R/V (Advise pressure setting)

Box 2: Port Type Code

B	BSP
M	Metric
S	SAE

Box 3: Low Pressure Top

No Port				
0				
BSP				
—	**7**	**8**	**9**	
—	3/4”	1”	1¼”	
Metric				
—	**7**	**8**	**9**	
—	M26	M33	M42	
SAE				
—	**7**	**8**	**9**	
—	SAE 12	SAE 16	SAE 20	

Box 4: Low Pressure Side

No Port					
0					
BSP					
3	**—**	**7**	**8**	**9**	
1/2”	—	3/4”	1”	1¼”	
Metric					
3	**4**	**7**	**8**	**9**	**10**
M18	M22	M26	M33	M42	M48
SAE					
3	**4**	**7**	**8**	**9**	**10**
SAE 8	SAE 10	SAE 12	SAE 16	SAE20	SAE24

Box 5: Load-sense (to pump)

BSP	**2**-1/4”
Metric	**2**-M12
SAE	**2**-SAE 6

Box 6: Load-sense (gauge)

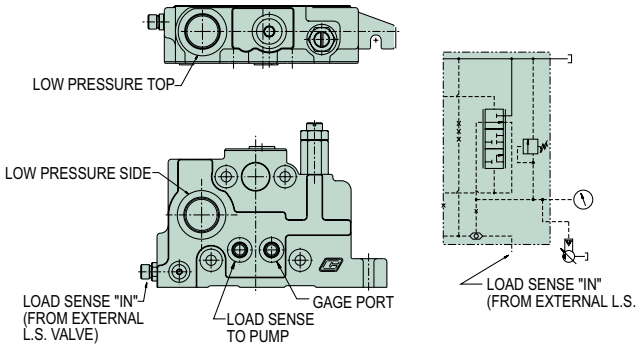
O	O-gauge port with SAE-6 steel plug
2	2-1/4” BSP port with steel plug
2	2-M12 Metric port with steel plug

Box 7: Load-sense (from another valve)

A port size must be coded if this valve is in parallel with another load-sense valve. Otherwise, do not code.

BSP	**1**-1/8”
Metric	**1**-M10
SAE	**1**-Male JIC 37° for 3/8” O.D. Tube

Standard Outlet



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Hydraulic Valve Division
Hicksville, Ohio, USA

PC55™ Frequently Asked Specification Questions

1. Does the pump have a load-sense vent and can it be plugged? The vent can be either internal or external to the valve, but internal vent is preferred. The Q Met. vent is sized for approximately 1.1 gpm at 3000 psi (4.2 lpm at 207 bar).

2. Does the pump control have an orifice which restricts the load-sense signal into the control? What is the length and diameter of the load-sense line? (This impacts the system response time.) Recommended size is SAE 4 or 6, BSP 1/8" or 1/4", M10 or M12. If the length of the line exceeds 20 feet (6 meters) please contact our factory.

3. Are there any elements in the circuit between the pump and the PC25 valve which could restrict pump flow to the valve; including other valves, high-pressure filters or the plumbing itself? Any restrictions cause pressure drop which consumes part of the margin pressure and could impact full flow potential to the PC25 valve. It could also affect the responsiveness of the system. Ideally the anticipated pressure-drop between the pump and the valve should be specified. (Our standard spools are designed for a margin pressure of 250 psi.)

4. What devices are in the tank return line downstream of the PC25 outlet? What is the expected tank return pressure, measured at the outlet, when the valve is in neutral?

5. Clipper relief valves or pump pressure limiters used in conjunction with load-sense relief valves should be set 500 psi higher (14-21 bar) to prevent flow loss. This allows the load-sense relief valve to control the maximum pressure and reduces any potential for chatter between the relief valves.

6. What is the pump displacement compared to the total flow requirement of the system? As with all pressure-compensated valves, quiescent flow loss (parasitic) occurs and should be taken into account when sizing the pump. The Q Met. vent is sized for about 1.1 gpm at 3000 psi (4.2 lpm at 207 bar).

7. Is there another load-sense valve in parallel or series with the PC55? Please contact the factory if another load sense valve is in parallel with the PC55.

Seal Repair Kits

Clipper R.V. & Clipper Plug	391 1823 288
Load-Sense R.V. & L.S. Plug	391 1823 290
This repair kit is for 355 9001 303	
Load-Sense R.V. & L.S. Plug	396 1823 028
This repair kit is for 355 9001 355	

Clipper Relief Valves

355 9001 305	800-2500 PSI	(55-172 bar)
355 9001 306	2501-4400 PSI	(172-303 bar)

Load-Sense Relief Valve

355 9001 303 500-4000 PSI (34-276 bar)
Production before January, 2002
355 9001 355 500-4000 PSI (34-276 bar)
Production as of January, 2002

Parker Hannifin Corporation
Hydraulic Valve Division
Hicksville, Ohio, USA

PC55™ Valve Specification Sheet

Date: _____

Customer: _____ City: _____ State: ___ Zip: _____

Application: _____ Annual Usage: _____

Pump Type: _____ Pump Control: _____ Stand-by psi/bar: _____ Margin psi/bar: ____

Filtration: _____ ISO ☐ Bypass ☐ Non Bypass

Pilot Filtration: _____ ISO ☐ Bypass ☐ Non Bypass

Primary gpm/lpm Input: _____ @ _____ psi/bar Operating Temp: _____ F/C

Max. Temp: _____ F/C Viscosity: _____ SSU @ 100F/cFp@38C Oil Type: _____

Spool Type

DAC	Double Acting Cylinder
DAM	Double Acting Motor
SAC	Single Acting Cylinder
DAF	Double Acting 4 POS Float
DAR	Double Acting 4 POS Regen
SAM	Single Acting Motor

Spool Operation

SR	Spring Return
DT	3 Position Detent
DES	Double Ended Solenoid 12/24 VDC
HRM	Hydraulic Remote Metered
HRNM	Hydraulic Remote No Metering
A	Air

Port Accessories

RV3	Relief Valve Shim Adjust
RV6	Relief Valve Screw Adjust
RVAC	Relief Valve/Anti-Cav. Screw Adjust
AC	Anti-Cavitation

Flow @ Full Stroke

(based on 250 psi margin pressure)

gpm 70

lpm 265

Contact valve division for availability of spool type vs. flow.

☐ Left-hand Assembly (Left)

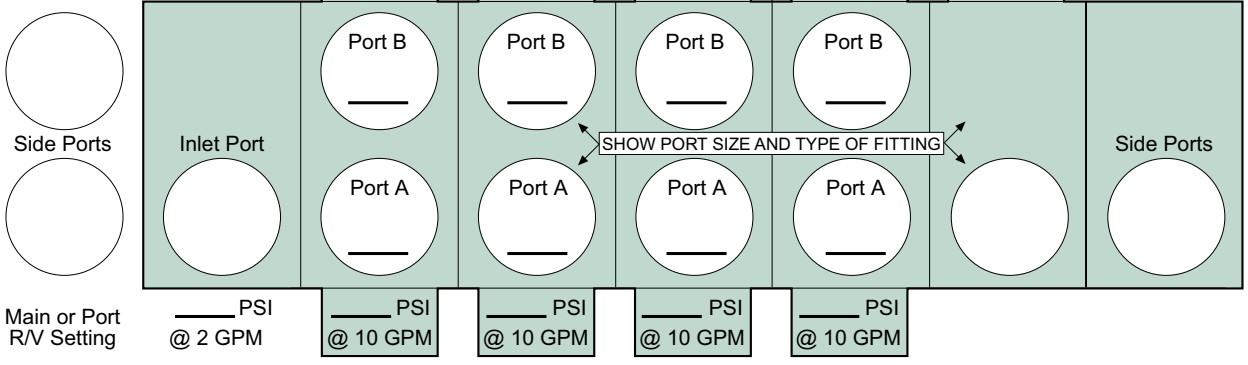
☐ Right-hand Assembly (Right)

SPOOL TYPE...	DAC DAM SAC DAF DAR SAM	DAC DAM SAC DAF DAR SAM	DAC DAM SAC DAF DAR SAM	DAC DAM SAC DAF DAR SAM
SPOOL OPER...	SR DT DES HRM HRNM A	SR DT DES HRM HRNM A	SR DT DES HRM HRNM A	SR DT DES HRM HRNM A
FLOW...	70	70	70	70
PORT A...	RV3 RV6 RVAC AC	RV3 RV6 RVAC AC	RV3 RV6 RVAC AC	RV3 RV6 RVAC AC
PORT B...	RV3 RV6 RVAC AC	RV3 RV6 RVAC AC	RV3 RV6 RVAC AC	RV3 RV6 RVAC AC
HANDLES...	6” 8” 10”	6” 8” 10”	6” 8” 10”	6” 8” 10”

Specify High Pressure & Low Pressure Ports

Clipper or Port R/V Setting: ____ PSI @ 10 GPM | ____ PSI @ 10 GPM | ____ PSI @ 10 GPM | ____ PSI @ 10 GPM

LSRV PSI Setting _____



Main or Port R/V Setting: ____ PSI @ 2 GPM | ____ PSI @ 10 GPM | ____ PSI @ 10 GPM | ____ PSI @ 10 GPM | ____ PSI @ 10 GPM

Section Function _____ _____ _____ _____

Code _____ _____ _____ _____ _____ _____ _____

Parker Hannifin Corporation
Hydraulic Valve Division
Hicksville, Ohio, USA

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Parker Hannifin Corporation
6035 Parkland Blvd.
Cleveland, Ohio 44124-4141
Telephone: (216) 896-3000
Fax: (216) 896-4000
Web site: www.parker.com

Parker Hannifin Corporation

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Parker Hannifin Corporation
Hydraulic Valve Division
373 Meuse Argonne
Hicksville, Ohio 43526 USA
Tel: (419) 542-6611
Fax: (419) 542-8871
http://www.parker.com/hydraulicvalve

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