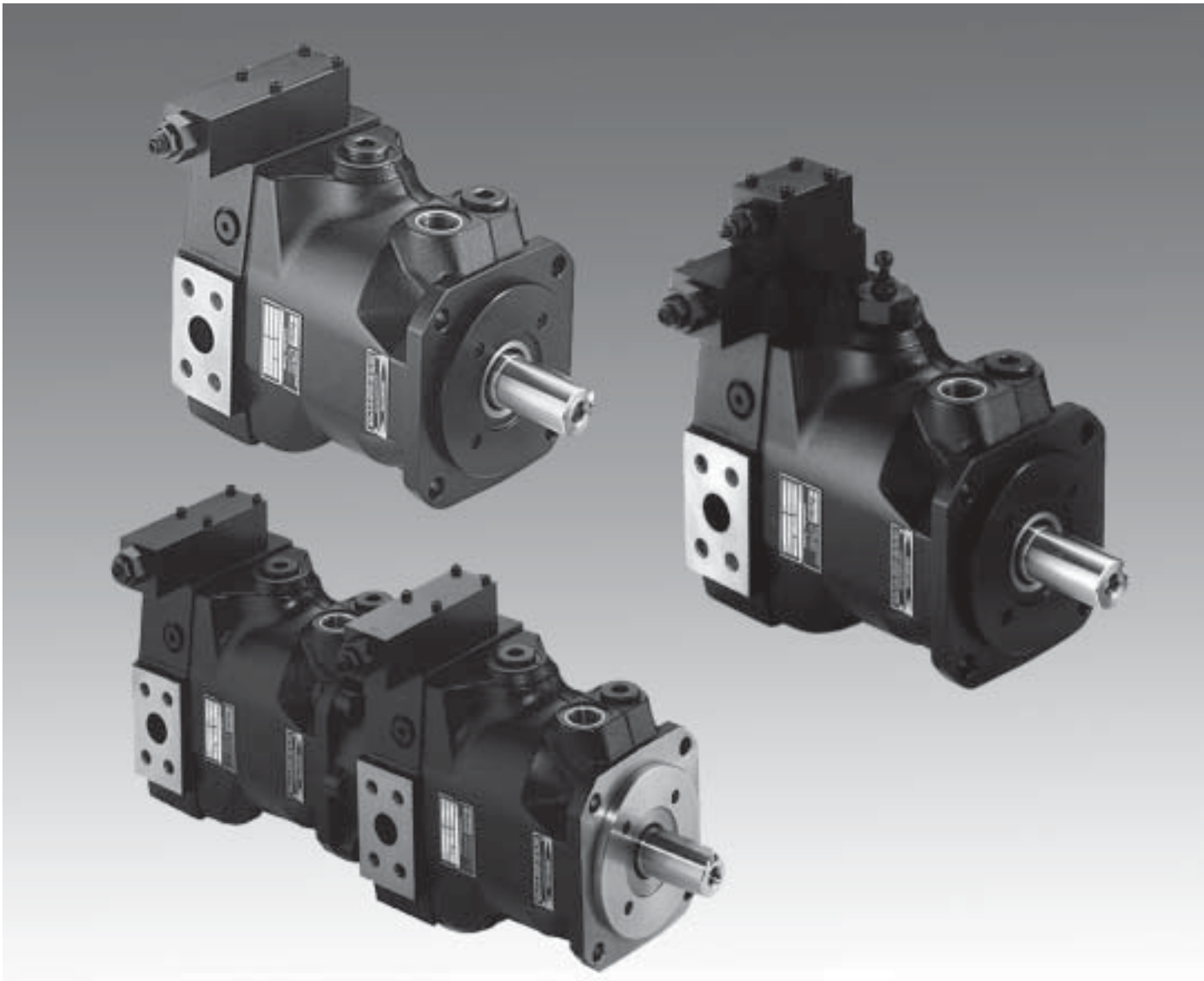
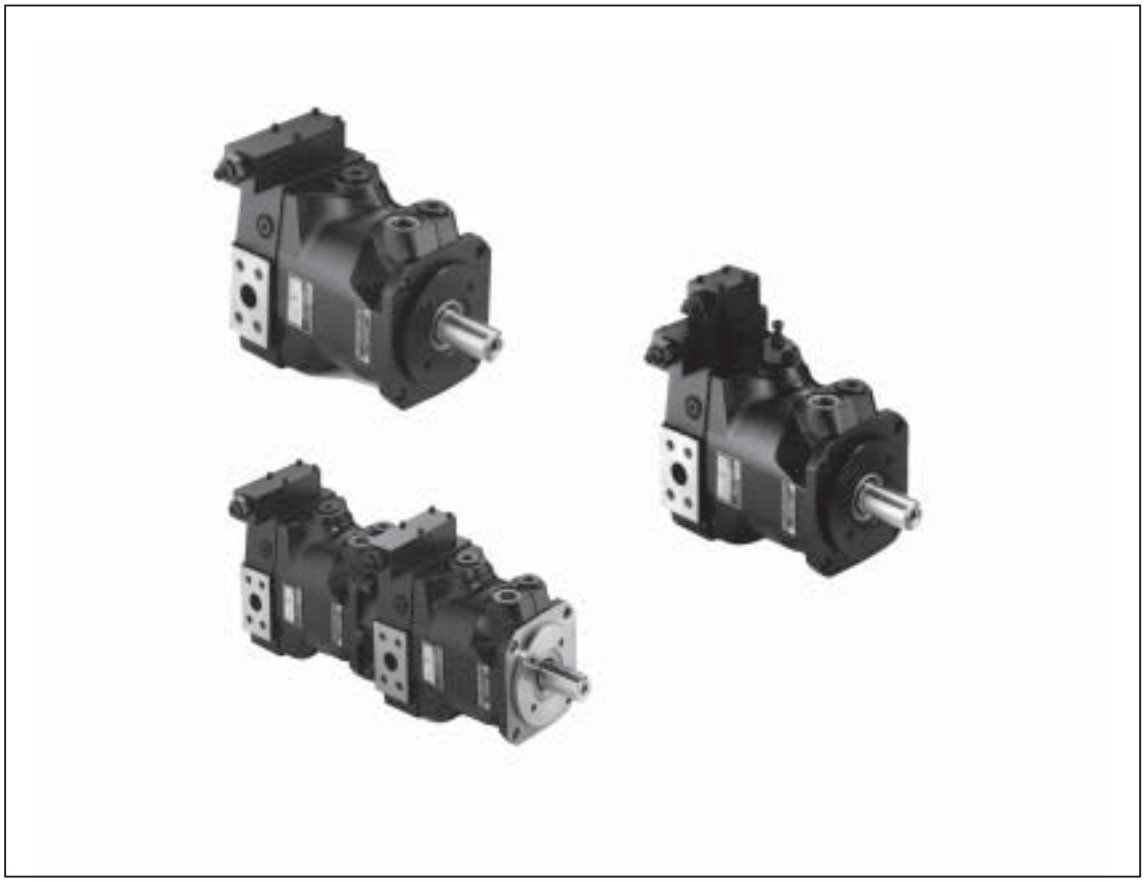
Parker Hydraulics

Series PV Variable Volume Piston Pumps

A

Catalog HY13-2600-600-3/US





Quick Reference Data Chart

Pump Model	Displacement cc/rev (In^3/rev)	Pump Delivery @ (7 bar) 100 PSI in LPM (GPM)		*Approx. Noise Levels dB(A) @ Full Flow and 1500 RPM			Power at 1800 RPM, Max. Displacement & 345 bar (5000 PSI)	Max. Operating Speed (RPM)
		1200 RPM	1800 RPM	70 bar (1000 PSI)	207 bar (3000 PSI)	343 bar (5000 PSI)		
PV016	16 (.98)	19.2 (5.1)	28.8 (7.6)	56	60	68	18.5 kw (24.8 hp)	2750
PV020	20 (1.2)	24.0 (6.3)	36.0 (9.5)	56	60	68	23.4 kw (31.4 hp)	2750
PV023	23 (1.4)	27.6 (7.3)	41.4 (10.9)	56	60	68	25.1 kw (33.6 hp)	2750
PV032	32 (1.9)	38.4 (10.1)	57.6 (15.2)	59	62	69	35.1 kw (47.0 hp)	2400
PV040	40 (2.4)	48.0 (12.7)	72.0 (19.0)	59	62	69	46.5 kw (62.4 hp)	2400
PV046	46 (2.8)	55.2 (14.6)	82.8 (21.9)	59	62	69	50.2 kw (67.3 hp)	2400
PV063	63 (3.8)	75.6 (20.0)	113.4 (30.0)	66	70	74	70.1 kw (94.0 hp)	2400
PV080	80 (4.8)	96.0 (25.4)	144.0 (38.0)	66	70	74	89.2 kw (119.6 hp)	2300
PV092	92 (5.6)	110.4 (29.2)	165.6 (43.8)	66	70	74	136.8 kw (183.5 hp)	2200
PV140	140 (8.5)	168.0 (44.4)	252.1 (66.6)	70	74	76	149.4 kw (200.4 hp)	2400
PV180	180 (10.9)	216.0 (57.1)	324.0 (85.6)	71	75	77	210.0 kw (282.0 hp)	2200
PV270	270 (16.5)	324.0 (85.6)	486.0 (128.4)	77	79	81	298.0 kw (400.0 hp)	1800

* The noise level values are based on anechoic room measurements at a distance of 1 meter in accordance with DIN 45645.

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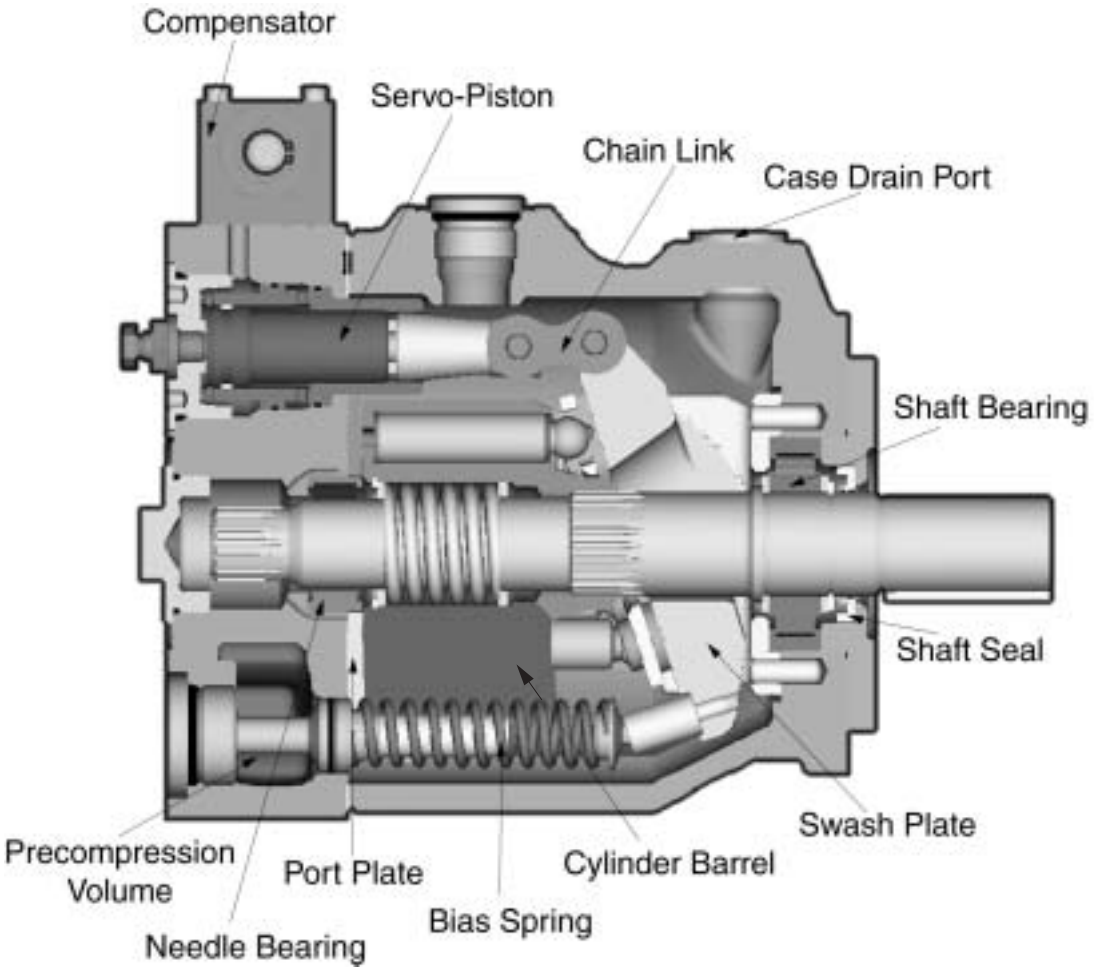
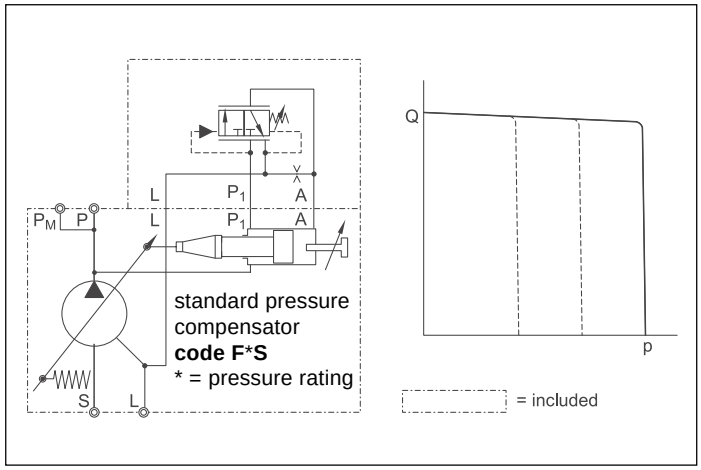
General Description

All control of the pump outlet flow is achieved by the proper positioning of the swash plate. Control is accomplished when the bore area forces of the servo piston acting on one end of the swash plate working against the combined effects of the bias spring, and the rod area forces of the servo piston acting on the other end.

As the shaft in the figure below is rotated by a prime mover, it in turn rotates the cylinder barrel. As the cylinder barrel rotates, it drives the pumping pistons in a circular path with the piston slippers supported hydrostatically against the angled swash plate. In one-half of the revolution, the pumping pistons are forced away from the port plate drawing in fluid, and in the other half of the revolution, the pumping pistons are forced toward the port plate driving out fluid.

The volume of fluid the pump will displace in one revolution of the shaft is dependent upon the area of the pumping piston, the number of pumping pistons and the angle of the swash plate. The swash plate is shown at maximum angle and will produce maximum displacement. As the swash plate is moved toward a vertical position (perpendicular to shaft centerline), the displacement will decrease until it reaches the vertical position and displacement is zero.



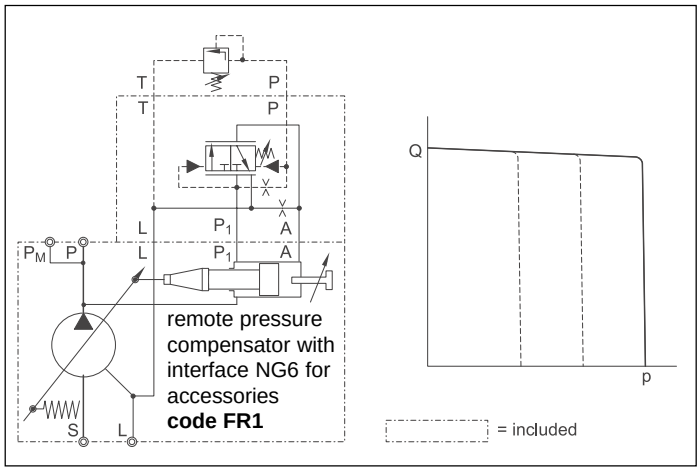


Standard pressure compensator code F*S

The standard pressure compensator adjusts the pump displacement according to the actual need of the system in order to keep the pressure constant.

As long as the system pressure at outlet port P is lower than the set pressure (set as spring preload of the compensator spring) the working port A of the compensator valve is connected to the case drain and the piston area is unloaded. Bias spring and system pressure on the annulus area keep the pump at full displacement.

When the system pressure reaches the set pressure the compensator valve spool connects port P1 to A and builds up a pressure at the servo piston resulting in a downstroking of the pump. The displacement of the pump is controlled in order to match the flow requirement of the system.

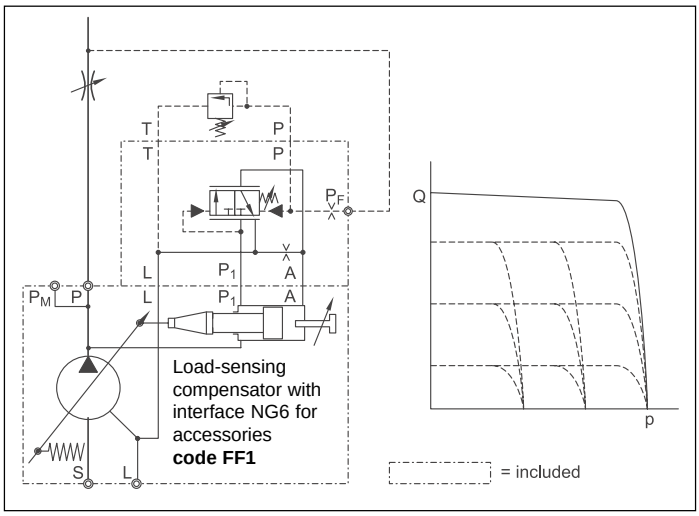


Remote pressure compensator code FR1

Version FR1 of the remote pressure compensator provides on its top side an interface NG6, DIN 24340 (CETOP 03 at RP35H, NFPA D03).

This interface allows a direct mounting of a pilot valve. Besides manual or electrohydraulic operated valves it is also possible to mount complete multiple pressure circuits directly on the compensator body. Parker offers a variety of these compensator accessories ready to install. See page 38 of this catalog.

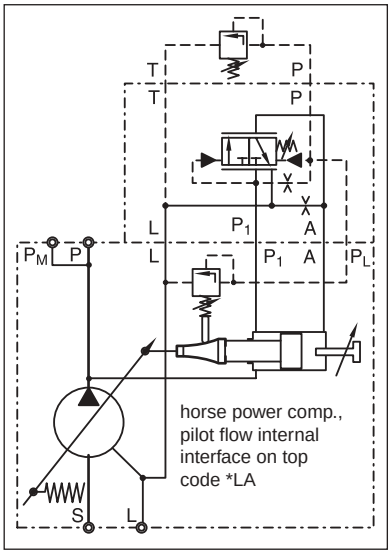
All remote pressure compensators have a factory setting of 15 bar (217 PSI) differential pressure. With this setting, the controlled pressure at the pump outlet is higher than the pressure controlled by the pilot valve.



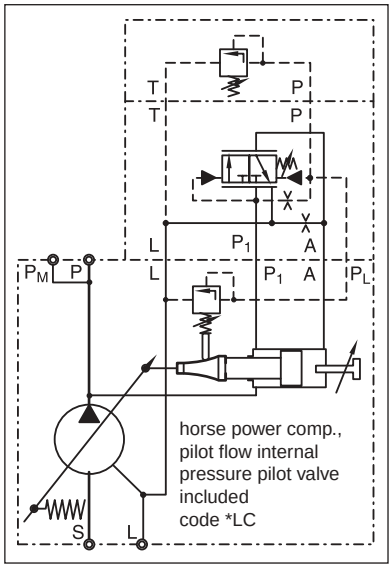
Shown is **load sensing compensator code FF1** with an NG6 interface on top of the control valve. That allows direct mounting of a pilot valve for pressure compensation. This version includes the pilot orifice.

Due to the interaction of flow and pressure compensation this package is not the "ideal" control characteristic. The deviation is caused by the pilot valves characteristic.

A



horse power comp.,
pilot flow internal
interface on top
code *LA



horse power comp.,
pilot flow internal
pressure pilot valve
included
code *LC

Hydraulic-mechanical horsepower compensator

The hydraulic-mechanical horsepower compensator consists of a modified remote pressure compensator (**Code *L***) and a pilot valve. This pilot valve. This pilot valve is integrated into the pump and is adjusted by a cam sleeve. The cam sleeve has a contour that is designed and machined for the individual displacement and the nominal horsepower setting.

At a large displacement the opening pressure (given by the cam sleeve diameter) is lower than at small displacements. This makes the pump compensate along a constant horsepower (torque) curve.

For all nominal powers of standard electric motors Parker offers a dedicated cam sleeve. The exchange of this cam sleeve (e. g.: to change horsepower setting) can easily be done without disassembly of the pump.
On top of that an adjustment of the horsepower setting can be done within certain limits by adjusting the preload of the pilot control cartridge spring . That allows an adjustment of a constant horsepower setting for other than the nominal speeds (1500 RPM) or for other horsepowers.
The ordering code for the horse power option is as follows:
The first digit designates the horsepower setting:

Code B = 5 HP etc. up to
Code 3 = 200 HP

The second digit designates the pilot flow source:

Code L internal pilot pressure, remote pressure function.

The third digit designates the possibility to adjust the overriding pressure compensation:

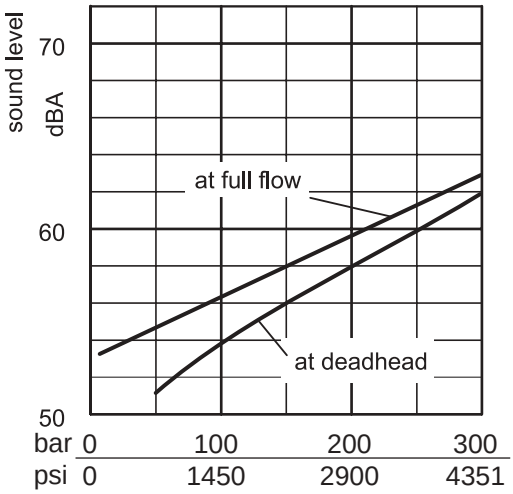
Code A comes with a top side NG6/D03 interface on the control valve to mount any suitable pilot valve or Parker pump accessories.

Code C includes a pilot valve for manual pressure adjustment. Max. setting: 350 bar (5075 PSI).

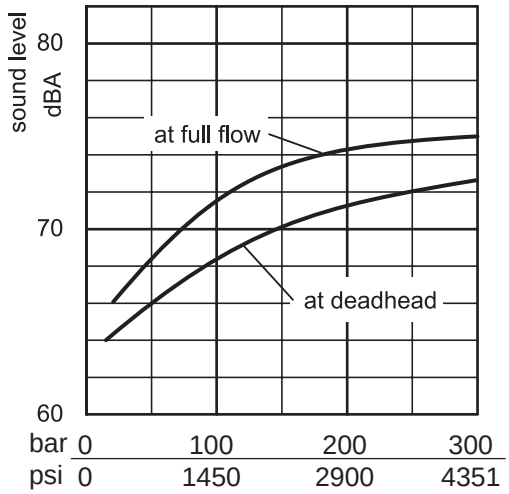
= included

Noise Levels

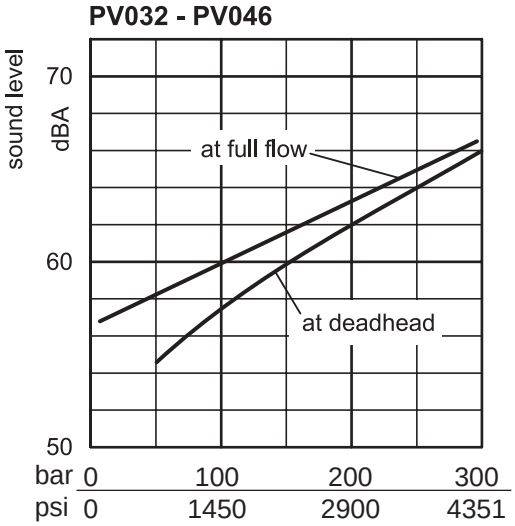
PV016 - PV023



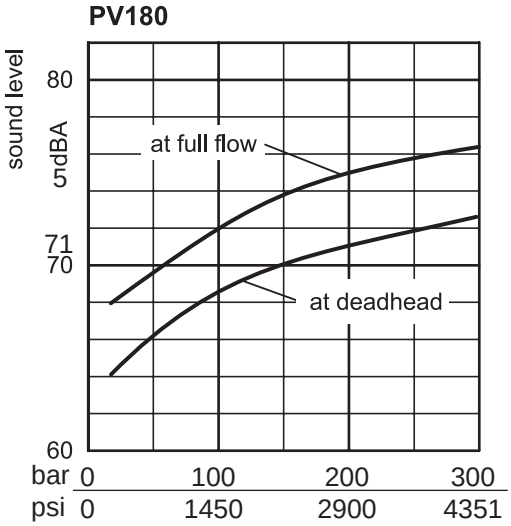
PV140



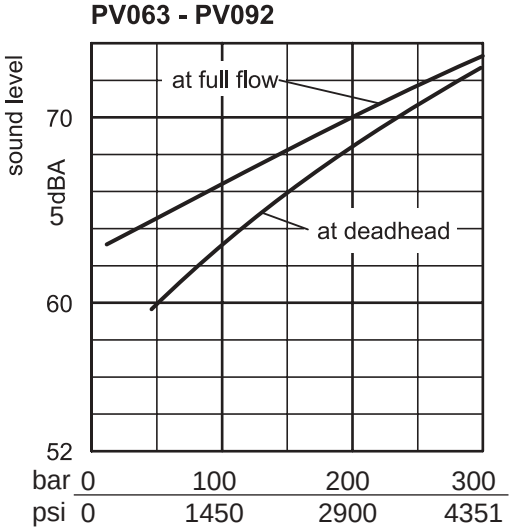
PV032 - PV046



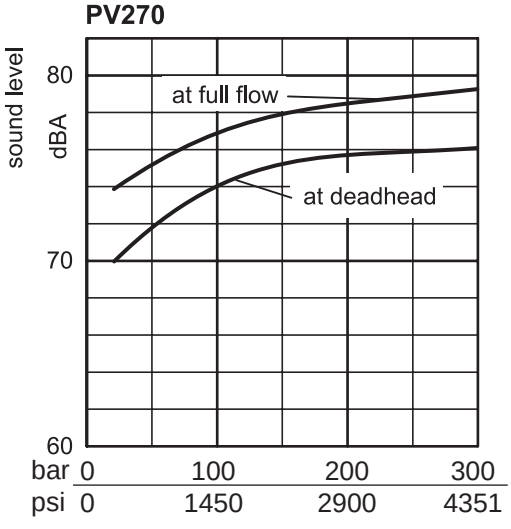
PV180



PV063 - PV092



PV270



Typical sound level for single pumps, measured in unechoic chamber according to DIN 45 635, part 1 and 26. microphone distance 1 m. speed: n = 1500 min-1.

All data measured with mineral oil viscosity 30 mm²/s (cSt) at 50°C.

Noise reduction measures

Operating noise of pumps

The normal operating noise of a pump and consequently the operating noise of the entire hydraulic system is largely determined by **where** and **how** the pump is mounted and how it is connected to the downstream hydraulic system. Also size, style and installation of the hydraulic tubing have a major influence on the overall noise emitted by a hydraulic system.

Last, but not least the connection between pump and driving motor can be the cause of an unacceptably high noise emission.
Even when the mounting space is limited there are suitable means and components to reduce the noise significantly.
The vibration of the pump body, created by high alternating forces in the rotating group and the pulsation of the output flow excite every part of the system connected to the pump mechanically or hydraulically .

Noise reduction measures

Talking about operating noise of a hydraulic pump, primary and secondary pump noise has to be taken into consideration.

Primary pump noise is caused by vibrations of the pump body due to internal alternating forces stressing the body structure.
Flexible elements help to prevent pump body vibration being transmitted to other construction elements, where possible amplification may occur. Such elements can be:

- Bell housing with elastic dampening flange with vulcanized labyrinth (1)
- Floating and flexible coupling (2)
- Damping rails (3) or silent blocks for mounting the electric motor or the foot mounting flange
- Flexible tube connections (compen-sators) or hoses on inlet, outlet and drain port of the pump.
- Exclusive use of gas tight tube fittings for inlet connections to avoid ingression of air causing cavitation and excessive noise.

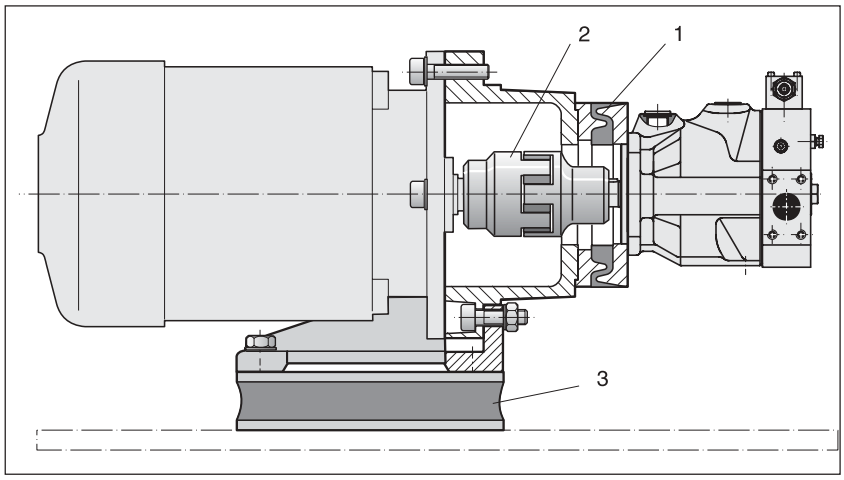


Figure 1: components to avoid vibration transfer from the pump to the drive/installation and their position in the power unit (numbers refer to the text on the left)

Secondary pump noise is caused by vibration induced into all connected hydraulic components by the flow and pressure pulsation of the pump. This secondary noise adds typical 7 - 10 dBA to the noise of a pump measured in the sound chamber according to DIN 45 635. Therefore pipework, its mounting and the mounting of all hydraulic components like pressure filters and control elements has a major influence to the overall system noise level.
Pulsation reduction with precompression volume: the PV is equipped with a new technology for flow ripple reduction. This method reduces the pulsation at the pump outlet by 40 - 60 %. That leads to a significant reduction of the overall system noise without additional cost and without additional components (silencers etc.). The typical reduction reaches 2 - 4 dBA. That means: with a pump of the PV series the secondary noise adds only some 5 - 7 dBA to the pump noise instead of the usually found 7 - 10 dBA.
Figure 2 compares the measured pulsation of a system with 6 pumps of 180 cm≥/rev each.

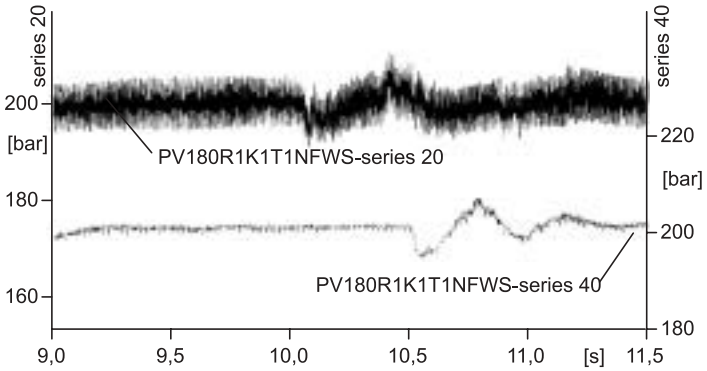


Figure 2: comparison of the pressure pulsation in a system with 6 old PV pumps versus the same system with 6 PVplus pumps. The pulsation reduction effect of the precompression volume is evident.

Other measures

Small diameter tubes do not only cause high flow speeds, turbulences inside the tubes and cavitation in the pump, they also produce noise.
Only correctly sized connections of the largest possible diameter according to the port size of the pump should be used.

Performance Information

Series PV, Pressure Compensated, Variable Volume, Piston Pumps

Features

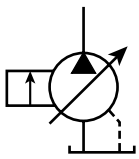
- High Strength Cast-Iron Housing for high reliability and quiet operation
- Modular Controls for field convertability
- Large Control Piston for fast response
- Thru-Shaft Option with 100% thru torque capability
- Multiple Pressure Control with valves mounted directly on pump
- Pre-Compression chamber to minimize over-all system noise

Controls

- Pressure Compensation
- Remote Pressure Compensation
- Load Sensing
- Adjustable Maximum Volume Stop
- Electrohydraulic Pressure
- Dual and Tri-Pressure Control
- Low Pressure Standby
- Horsepower Limiting

Schematic Symbol

(Basic Pump)



Installation Data

See Installation Information on page A156 of this catalog for specific recommendations pertaining to system cleanliness, fluids, start-up, inlet conditions, shaft alignment, drain line restrictions and other important factors relative to the proper installation and use of these products.

Specifications

Pressure Ratings:	5000 PSI (350 bar) Continuous 6000 PSI (420 bar) Peak
Speed Ratings:	600 to 2750 RPM
Inlet Condition:	230 PSI (16 bar) Maximum Inlet Charge 5 In. Hg. Max. Vacuum at 1800 RPM
Case Drain Conditions:	7 PSI (0.5 bar) Maximum
Operating Temp. Range:	-40˚F to 160˚F (-40˚C to 70˚C)
Housing Material:	Cast Iron
Filtration:	Maintain SAE Class 4 (ISO 16/13)
Mounting:	SAE “B” 4-Bolt Flange

Quick Reference Data Chart

Pump Model	Displacement cc/rev (in³/rev)	Pump Delivery @ 7 bar (100 PSI) in LPM (GPM)		*Approx. Noise Levels dB(A) @ Full Flow and 1500 RPM			Input Power At 1800 RPM, Max. Displacement & 343 bar (5000 PSI)	Max. Operating Speed (RPM)
		1200 RPM	1800 RPM	70 bar (1000 PSI)	207 Bar (3000 PSI)	343 bar (5000 PSI)		
PV016	16 (.98)	19.2 (5.1)	28.8 (7.6)	56	60	68	18.5 kw (24.8 hp)	2750
PV020	20 (1.2)	24.0 (6.3)	36.0 (9.5)	56	60	68	23.4 kw (31.4 hp)	2750
PV023	23 (1.4)	27.6 (7.3)	41.4 (10.9)	56	60	68	25.1 kw (33.6 hp)	2750

* The noise level values are based on anechoic room measurements at a distance of 1 meter in accordance with DIN 45645.

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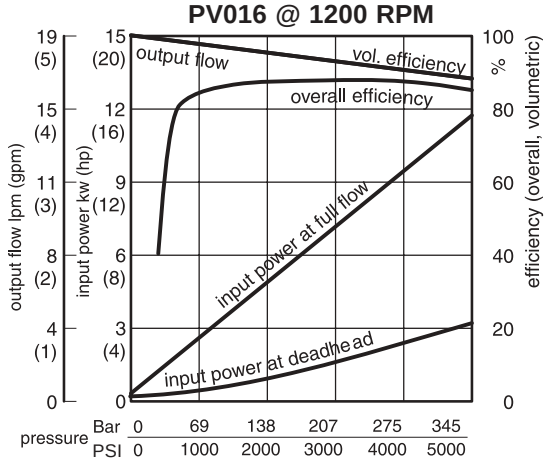
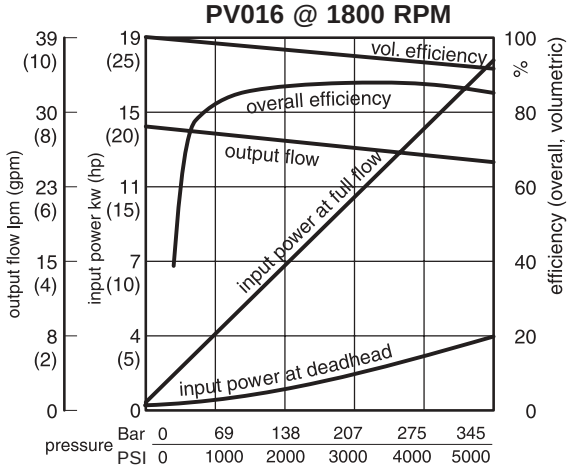
Performance Curves

Fluid: Standard Hydraulic Oil 100 SSU @ 120°F (49°C)

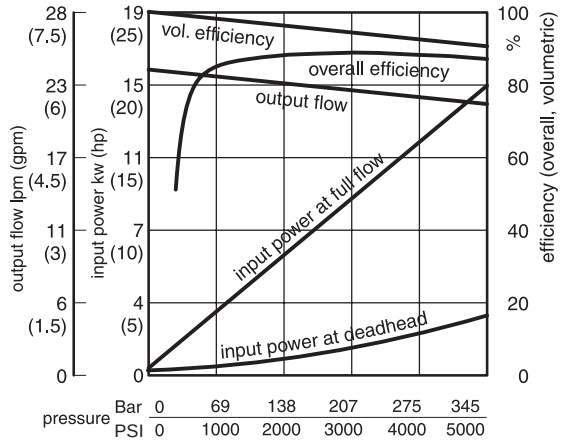
PV016 @ 1200 RPM



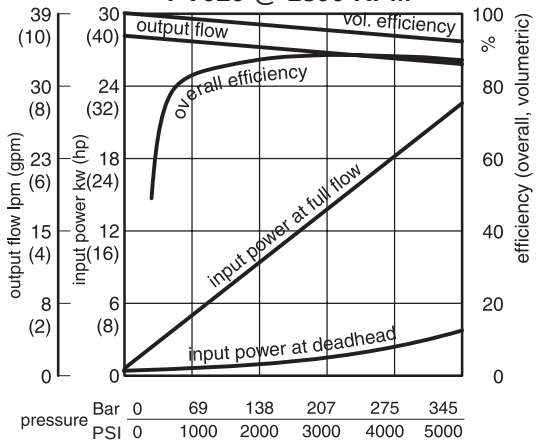
PV016 @ 1800 RPM



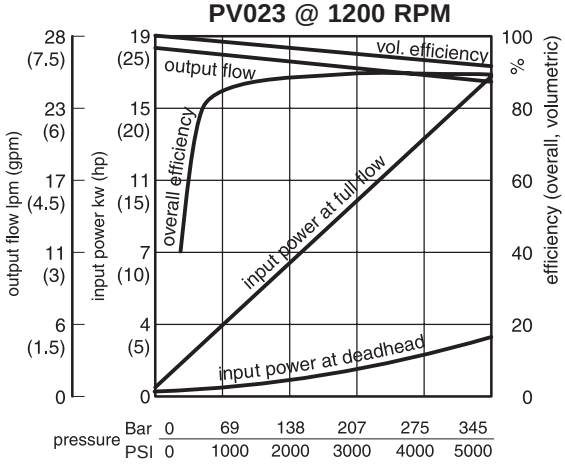
PV020 @ 1200 RPM



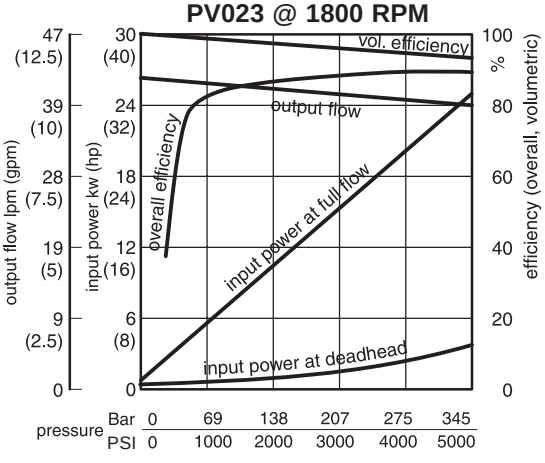
PV020 @ 1800 RPM



PV023 @ 1200 RPM



PV023 @ 1800 RPM



NOTE: The efficiencies and data in the graphs are good only for pumps running at speeds shown and stroked to maximum. To calculate approximate horsepower for the other conditions, use the following formula:

$$HP = \left[\frac{Q \times (PSI)}{1714}\right] + (CHp)$$

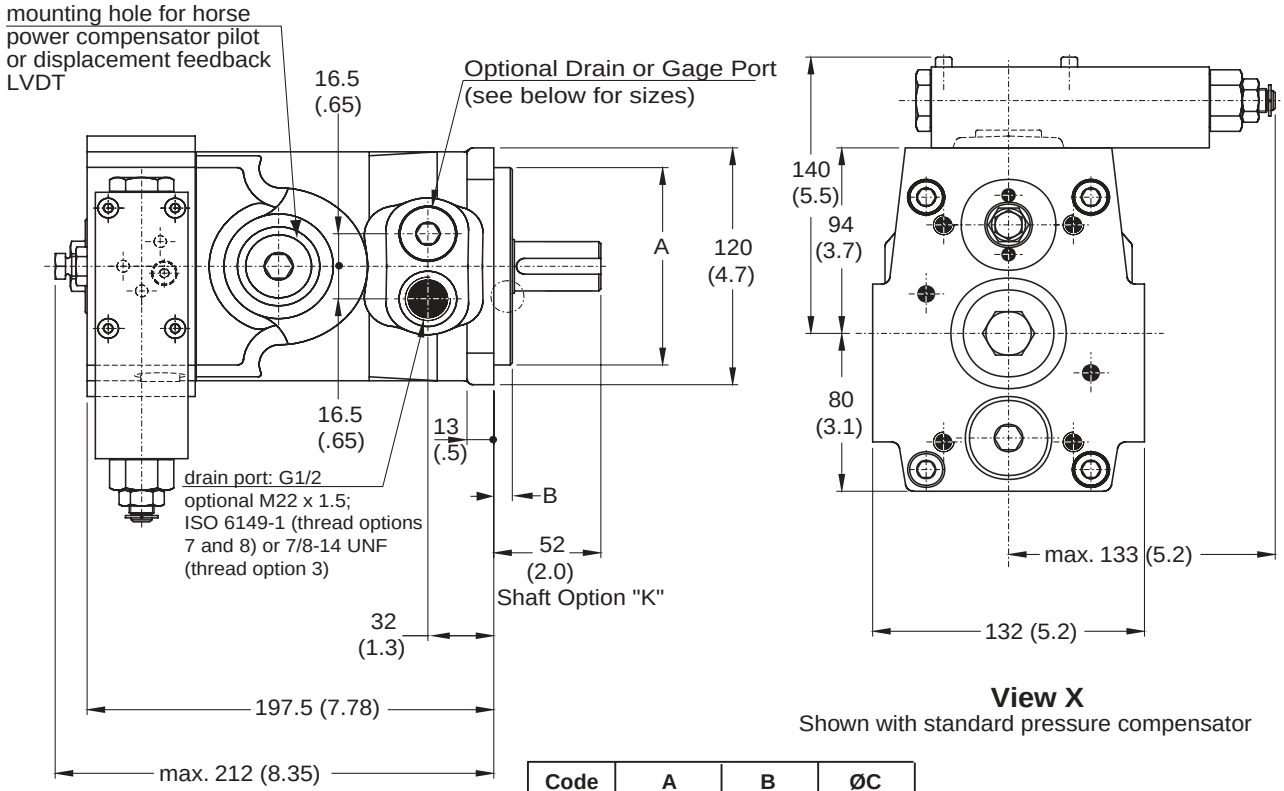
Actual GPM is directly proportional to drive speed and maximum volume setting. Flow loss, however, is a function of pressure only.

WHERE:

Q = Actual Output Flow in GPM

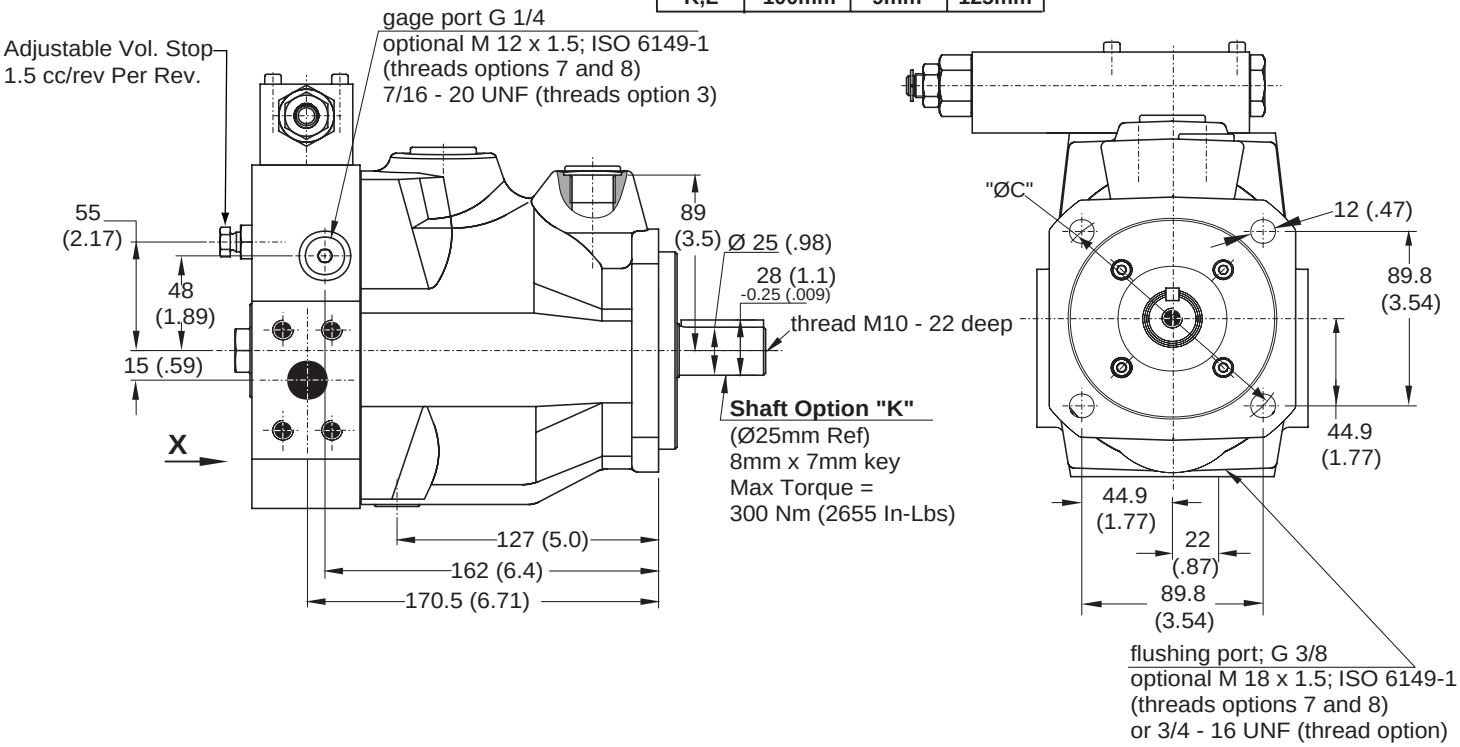
PSI = Pressure At Pump Outlet

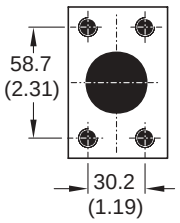
CHp = Input Horsepower @ Full compensation @ 1800 RPM (from graph read at operating pressure)



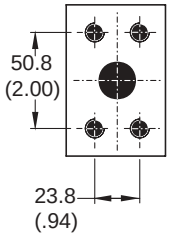
View X
Shown with standard pressure compensator

Code	A	B	ØC
D,E	4.0"	.37"	5.0"
K,L	100mm	9mm	125mm

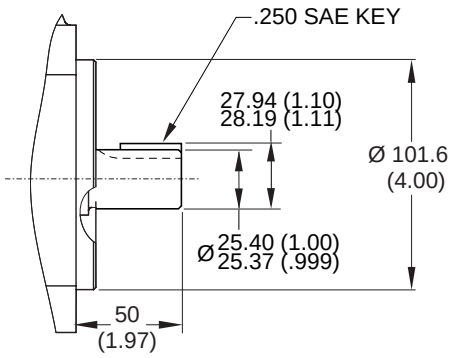




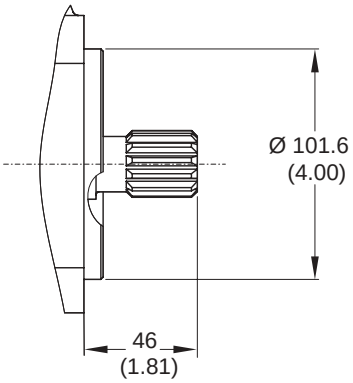
Inlet:
Option 3 & 7
1-1/4" 4 Bolt Flange
7/16-14 UNC-2B Threads
Option 1 & 8
32mm 4 Bolt Flange
M10 Threads
Standard Pressure Series
(Code 61)



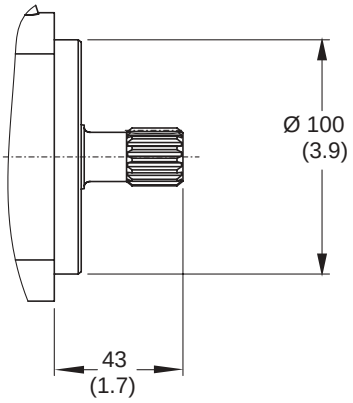
Outlet:
Option 3 & 7
3/4" 4 Bolt Flange
3/8-16 UNC-2B Threads
Option 1 & 8
19mm 4 Bolt Flange
M10 Threads
High Pressure Series (Code 62)



Shaft Option "D"
(SAE "BB")
Max Torque= 300 Nm (2655 In-Lbs)

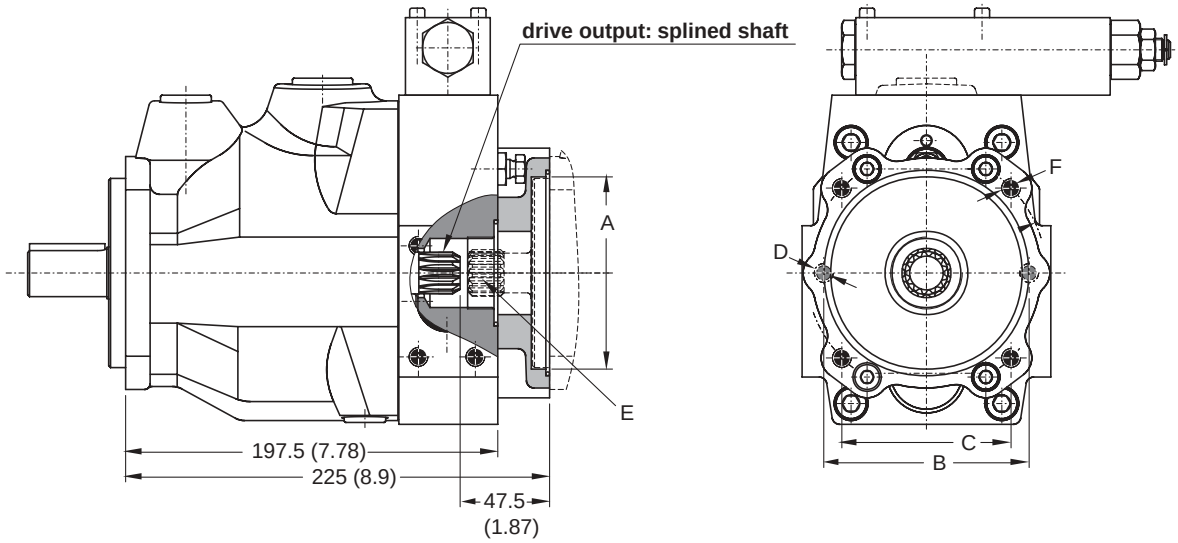


Shaft Option "E"
(SAE "BB")
15 Teeth 16/32 Pitch
30^{O} Involute Spline
Max Torque= 300 Nm (2655 In-Lbs)



Shaft Option "L"
W25mm x 1.5mm x 15mm x 8f
DIN 5480
Max Torque = 405 Nm (3584 In-Lbs)

Thru-Shaft Options



Thru-Shaft Load Limitations

The maxiumum allowable torque of the individual shaft must not be exceeded. For 2-pump combinations there is no problem because the PV series offers 100% thru torque capabilities. For 3-pump combinations or more the limit torque could be reached or exceeded. Therefore it is necessary to calculate the torque factor and compare the sum of each pumps torque factor to the table to make sure it does not exceed the torque limit factor.

Pump	Shaft	Torque Limit Factor
PV016-023	D	17700
	E	17700
	K	17700
	L	20130

Required: Sum of all calculated torque factors must be <torque limit factor.

Torque factor of any pump =
Pressure (bar) x Displacement (cc/rev)

Code	A	B	C	D	E*	F
A7	Ø3.25"	4.188"	-	3/8"-16	SAE "A" 9T 16/32 DP SPLINE	-
B3	Ø4.00"	-	3.536"	-	SAE "B" 13T 16/32 DP SPLINE	1/2"-13
J3	Ø100mm	-	44mm	-	W25 X 1.5 X 8f SPLINE	M10
W3	Ø4.00"	-	3.536"	-	SAE "BB" 15T 16/32 DP SPLINE	1/2"-13
Y7	Ø2.00"	3.250"	-	5/16-18	SAE "AA" 1/2" KEYED	-

*Coupling included with pump when ordered from Greeneville, TN.

Multiple Pumps	Pump Variable Piston	Displace-ment	Rotation	Variations	Shaft & Mounting	Threads Code	Thru-Shaft Option	Seals	Control Options	Paint	Multiple Pumps
	PV										

Code	CM³/REV (In³/rev.)
016	16 (.98)
020	20 (1.2)
023	23 (1.4)

Code	Rotation*
R	CW
L	CCW

* As viewed from shaft end.

Code	Port*	Threads**
1	BSPP	Metric
3	UNF	UNC
7	ISO 6149	UNC
8	ISO 6149	Metric

*Drain, gage, and flusing ports.
**Mounting and connecting threads

Code	Seals
N	Nitrile
V	Fluorocarbon

Code	Painting
Omit	No Paint
P	Paint

Code	Multiple Pumps
Omit	Single Pump
—	Pump Factory Mounted On Rear

Code	Multiple Pumps
Omit	Single
—	Factory mounted to rear of another pump

Code	Pump Variations
1	Standard
9*	Reduced Stroke

* Specify in cc/rev.

Code	Shaft	Pilot
D	1" Keyed (SAE BB)	4 Bolt SAE "B"
E	15T Spline (SAE BB)	4 Bolt SAE "B"
K	25mm Keyed	4 Bolt 100mm
L	W25 x 1.5 x 15 x 8f Spline DIN 5480	4 Bolt 100mm

Code	Thru-Shaft Option
T1	Thru-Shaft Capable, Single Pump w/Cover
Y7	2 Bolt SAE "AA" Pilot 2.00/SAE "AA" 1/2" Keyed
A7	2 Bolt SAE "A" Pilot 3.25/SAE "A" 9T 16/32 DP
B3	4 Bolt SAE "B" Pilot 4.00/SAE "B" 13T 16/32 DP
J3*	4 Bolt 100mm Pilot/W25x1.5x15x8f Spline DIN 5480
W3	4 Bolt SAE "B" Pilot 4.00/SAE "BB" 15T 16/32 DP

*Must be used with port/thread option 1.

Code	Control Options
F ● ●	**Standard Pressure Compensator**
● S	**Adjustment Type**
	Screw With Nut
● W	**Pressure Range**
	70-350 bar (1015-5075 PSI)
H	40-210 bar (580-3050 PSI)
D	10-140 bar (150-2050 PSI)
F ● ●	**Remote/Load Sense Compensator**
● 1	**Control Port**
	NG6/Cetop3 (D1VW) Pattern *
Z	NG6 with Pressure Valve Mnt'd**
● R	**Compensator Control Type**
	Remote Pressure
F	Load Sensing
● L ●	**Horsepower Compensator Control**
● A	**Control Port**
	NG6/Cetop3 (DIVW) Pattern*
C	NG6 with PVAC1PCS*S** Valve Mounted
Z	NG6 with Pressure Valve Mounted**
B	**Input Horsepower at 1800 RPM**
	5.0 (175 in-lb Torque)
C	7.5 (262 in-lb Torque)
D	10.0 (350 in-lb Torque)
E	15.0 (525 in-lb Torque)
G	20.0 (700 in-lb Torque)

* Maximum pressure adjustment not included, but recommended. (See PVAC Section)
** Valve to be mounted at factory must be ordered as a separate line item. Consult factory. See PVAC section for pressure valve options.

Performance Information

Series PV, Pressure Compensated, Variable Volume, Piston Pumps

Features

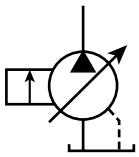
- High Strength Cast-Iron Housing for high reliability and quiet operation
- Modular Controls for field convertability
- Large Control Piston for fast response
- Thru-Shaft Option with 100% thru torque capability
- Multiple Pressure Control with valves mounted directly on pump
- Pre-Compression chamber built in to minimize over-all system noise

Controls

- Pressure Compensation
- Remote Pressure Compensation
- Load Sensing
- Adjustable Maximum Volume Stop
- Electrohydraulic Pressure
- Dual and Tri-Pressure Control
- Low Pressure Standby
- Horsepower Limiting

Schematic Symbol

(Basic Pump)



Installation Data

See Installation Information on page A156 of this catalog for specific recommendations pertaining to a system cleanliness, fluids, start-up, inlet conditions, shaft alignment, drain line restrictions and other important factors relative to the proper installation and use of these products.

Specifications

Pressure Ratings:	5000 PSI (350 bar) Continuous 6000 PSI (420 bar) Peak
Speed Ratings:	600 to 2400 RPM
Inlet Condition:	230 PSI (16 bar) Maximum Inlet Charge 5 In. Hg. Max. Vacuum at 1800 RPM
Case Drain Conditions:	7 PSI (0.5 bar) Maximum
Operating Temp. Range:	-40°F to 160°F (-40°C to 70°C)
Housing Material:	Cast Iron
Filtration:	Maintain SAE Class 4 (ISO 16/13)
Mounting:	SAE “C” 4-Bolt Flange

Quick Reference Data Chart

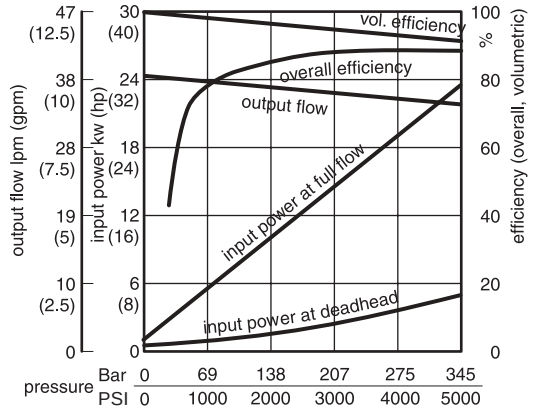
Pump Model	Displacement cc/rev (in³/rev)	Pump Delivery @ 7 bar (100 PSI) in LPM (GPM)		*Approx. Noise Levels dB(A) @ Full Flow and 1500 RPM			Input Power At 1800 RPM, Max. Displacement & 343 bar (5000 PSI)	Max. Operating Speed (RPM)
		1200 RPM	1800 RPM	70 bar (1000 PSI)	207 bar (3000 PSI)	343 bar (5000 PSI)		
PV032	32 (1.9)	38.4 (10.1)	57.6 (15.2)	59	62	69	35.1 kw (47.0 hp)	2400
PV040	40 (2.4)	48.0 (12.7)	72.0 (19.0)	59	62	69	46.5 kw (62.4 hp)	2400
PV046	46 (2.8)	55.2 (14.6)	82.8 (21.9)	59	62	69	50.2 kw (67.3 hp)	2400

* The noise level values are based on anechoic room measurements at a distance of 1 meter in accordance with DIN 45645.

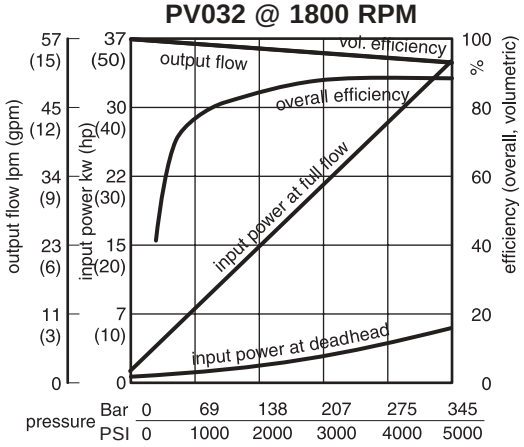
A

Performance Curves Fluid: Standard Hydraulic Oil 100 SSU @ 120°F (49°C)

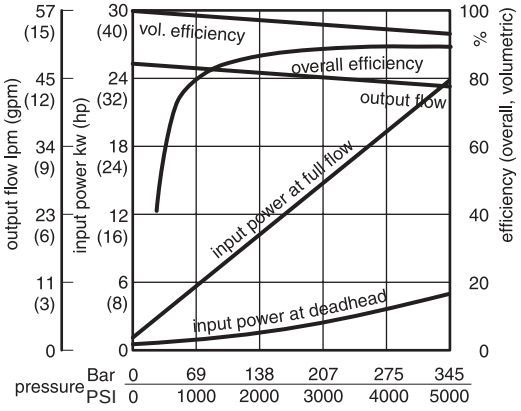
PV032 @ 1200 RPM



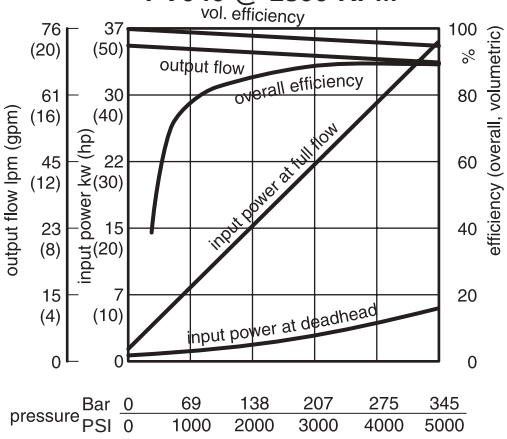
PV032 @ 1800 RPM



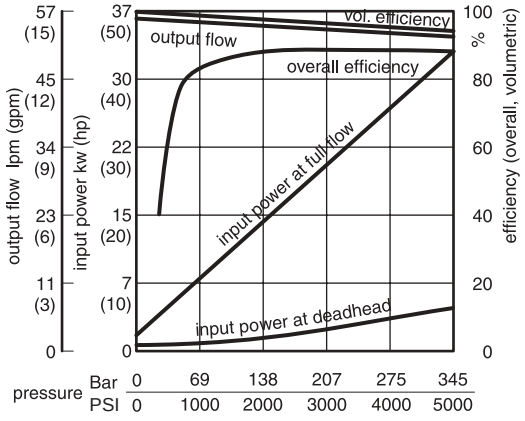
PV040 @ 1200 RPM



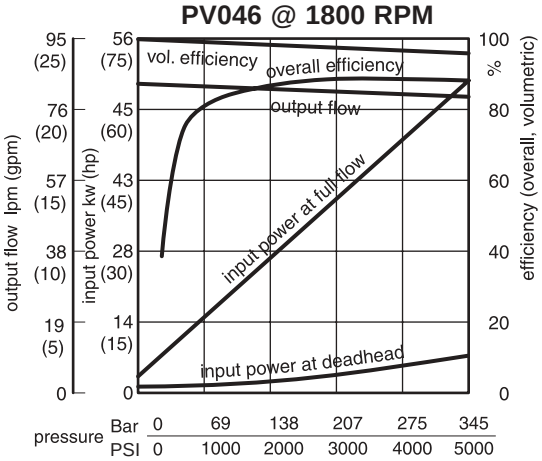
PV040 @ 1800 RPM



PV046 @ 1200 RPM



PV046 @ 1800 RPM



NOTE: The efficiencies and data in the graphs are good only for pumps running at speeds shown and stroked to maximum. To calculate approximate horsepower for the other conditions, use the following formula:

$$HP = \left[\frac{Q \times (PSI)}{1714}\right] + (CHp)$$

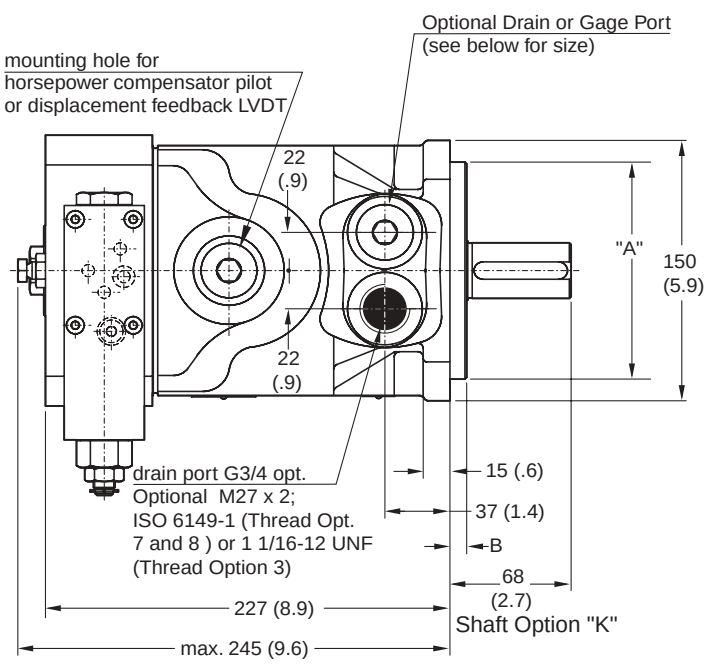
Actual GPM is directly proportional to drive speed and maximum volume setting. Flow loss, however, is a function of pressure only.

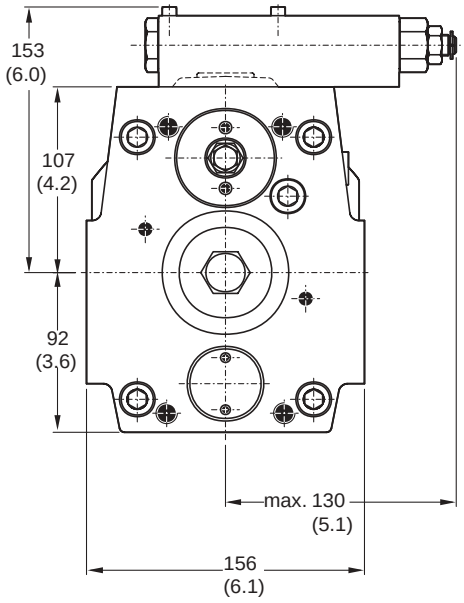
WHERE:

Q = Actual Output Flow in GPM

PSI = Pressure At Pump Outlet

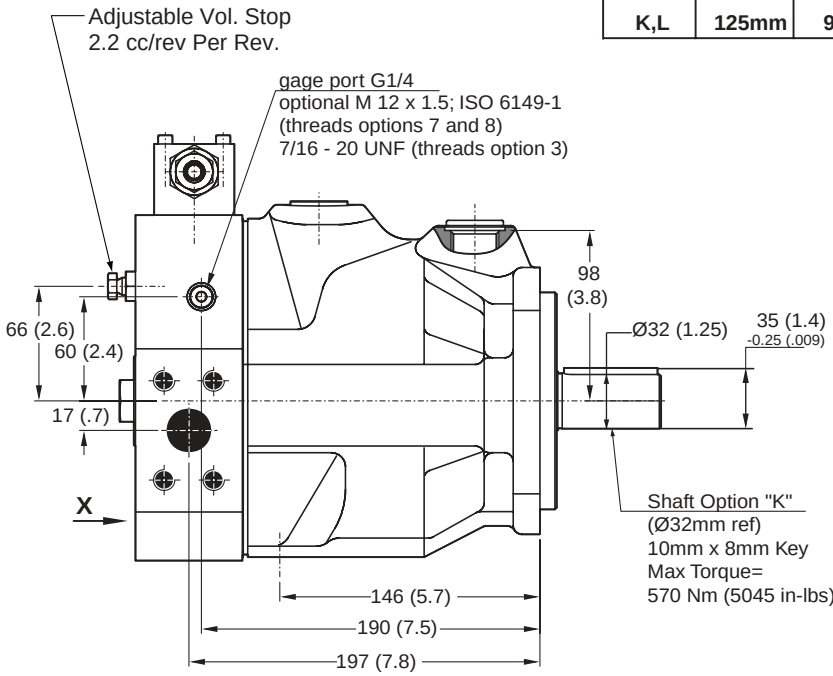
CHp = Input Horsepower @ Full compensation @ 1800 RPM (from graph read at operating pressure)

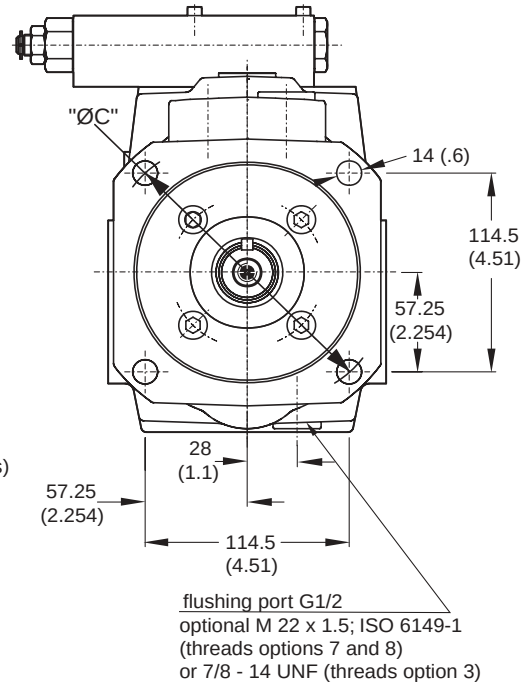


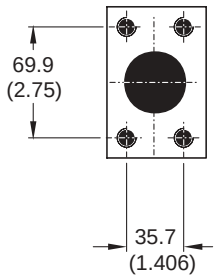


View X
Shown with standard pressure compensator

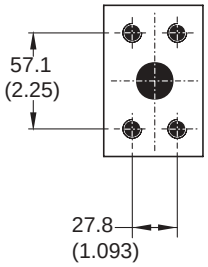
Code	A	B	ØC
D,E	5.0"	.50"	6.37"
K,L	125mm	9mm	160mm



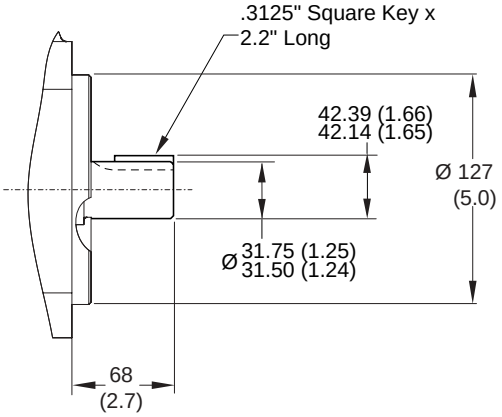




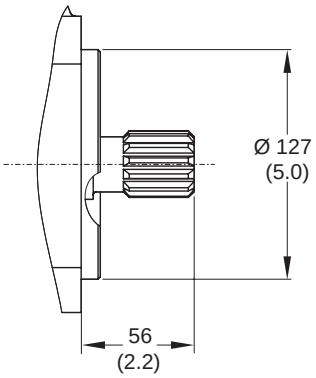
Inlet:
Option 3 & 7
1-1/2" 4 Bolt Flange
1/2-13 UNC-2B Threads
Option 1 & 8
35mm 4 Bolt Flange
M12 Threads
Standard Pressure Series
(Code 61)



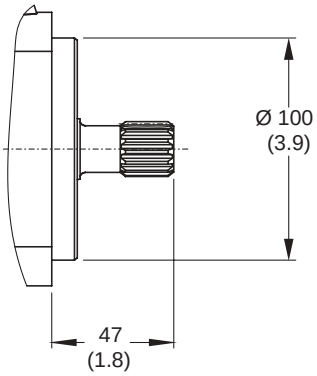
Outlet:
Option 3 & 7
1" 4 Bolt Flange
7/16-14 UNC-2B Threads
Option 1 & 8
25mm 4 Bolt Flange
M12 Threads
High Pressure Series (Code 62)



Shaft Option "D"
(SAE "C")
Max Torque= 550 Nm (4868 In-Lbs)

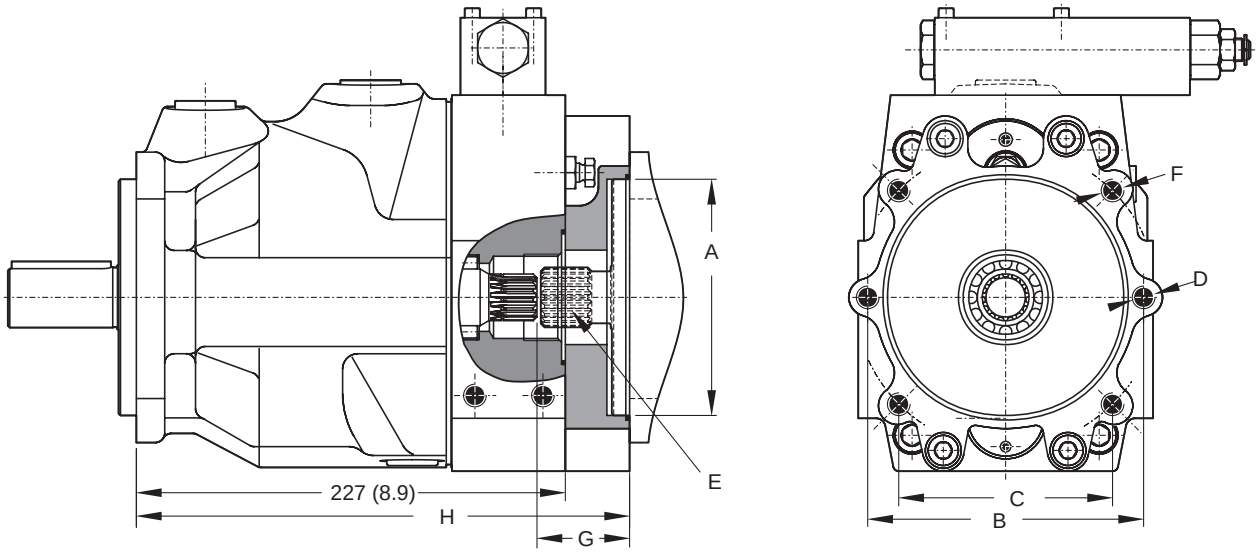


Shaft Option "E"
(SAE "C")
14 Teeth 12/24 Pitch
30^{O} Involute Spline
Max Torque= 610 Nm (5399 In-Lbs)



Shaft Option "L"
W32mm x 1.5mm x 20mm x 8f
DIN 5480
Max Torque = 675 Nm (5974 In-Lbs)

Thru-Shaft Options



Thru-Shaft Load Limitations

The maxiumum allowable torque of the individual shaft must not be exceeded. For 2-pump combinations there is no problem because the PV series offers 100% thru torque capabilities. For 3-pump combinations or more the limit torque could be reached or exceeded. Therefore it is necessary to calculate the torque factor and compare the sum of each pumps torque factor to the table to make sure it does not exceed the torque limit factor.

Pump	Shaft	Torque Limit Factor
PV032-046	D	32680
	E	36380
	K	33810
	L	40250

Required: Sum of all calculated torque factors must be <torque limit factor.

Torque factor of any pump =
Pressure (bar) x Displacement (cc/rev)

Code	A	B	C	D	E*	F	G	H
A7	Ø3.25"	4.188"	-	3/8"-16	SAE "A" 9T 16/32 DP SPLINE	-	1.93"	10.27"
B3	Ø4.00"	-	3.536"	-	SAE "B" 13T 16/32 DP SPLINE	1/2"-13	1.93"	10.27"
B7	Ø4.00"	5.750"	-	1/2"-13	SAE "B" 13T 16/32 DP SPLINE	-	1.93"	10.27"
W3	Ø4.00"	-	3.530"	-	SAE "BB" 15T 16/32 DP SPLINE	1/2"-13	1.93"	10.27"
W7	Ø4.00"	5.750"	-	1/2"-13	SAE "BB" 15T 16/32 DP SPLINE	-	1.93"	10.27"
C3	Ø5.00"	-	4.508"	-	SAE "C" 14T 12/24 DP SPLINE	1/2"-13	2.52"	10.87"
J3	Ø100mm	-	44mm	-	W25 x 1.5 x 15 x 8f SPLINE	M10	1.93"	10.27"
K3	Ø125mm	-	57mm	-	W32 x 1.5 x 20 x 8f SPLINE	M12	1.93"	10.27"

*Coupling included with pump if ordered from Greeneville, TN

Ordering Information

Variable Volume Piston Pumps
Series PV 032/040/046

	PV										
Multiple Pumps	Pump Variable Piston	Displace-ment	Rotation	Variations	Shaft & Mounting	Threads Code	Thru-Shaft Option	Seals	Control Options	Paint	Multiple Pumps

Code	CM³/REV (In³/rev.)
032	32 (1.9)
040	40 (2.4)
046	46 (2.8)

Code	Rotation*
R	CW
L	CCW

* As viewed from shaft end.

Code	Port*	Threads**
1	BSPP	Metric
3	UNF	UNC
7	ISO 6149	UNC
8	ISO 6149	Metric

*Drain, gage, and flusing ports.

**Mounting and connecting threads

Code	Seals
N	Nitrile
V	Fluorocarbon

Code	Painting
Omit	No Paint
P	Paint

Code	Multiple Pumps
Omit	Single Pump
—	Pump Factory Mounted On Rear

Code	Multiple Pumps
Omit	Single
—	Factory mounted to rear of another pump

Code	Pump Variations
1	Standard
9*	Reduced Stroke

* Specify in cc/rev.

Code	Shaft	Pilot
D	1-1/4" Keyed (SAE C)	4 Bolt SAE "C"
E	14T Spline (SAE C)	4 Bolt SAE "C"
K	32mm Keyed	4 Bolt 125mm
L	W32 x 1.5 x 20 x 8f Spline DIN 5480	4 Bolt 125mm

Code	Thru-Shaft Option
T1	Thru-Shaft Capable, Single Pump w/Cover
A7	2 Bolt SAE "A" Pilot Ø3.250/SAE "A" 9T 16/32 DP Spline
B3	4 Bolt SAE "B" Pilot Ø4.00/SAE "B" 13T 16/32 DP Spline
B7	2 Bolt SAE "B" Pilot Ø4.00/SAE "B" 13T 16/32 DP Spline
W3	4 Bolt SAE "B" Pilot Ø4.00/SAE "BB" 15T 16/32 DP Spline
W7	2 Bolt SAE "B" Pilot Ø4.00/SAE "BB" 15T 16/32 DP Spline
C3	4 Bolt SAE "C" Pilot Ø5.00/SAE "C" 14T 12/24 DP Spline
J3*	4 Bolt 100mm Pilot /W25x1.5x15x8f Spline DIN 5480
K3*	4 Bolt 125mm Pilot /W32x1.5x20x8f Spline DIN 5480

*Must be used with port/thread option 1

Code	Control Options
F • •	**Standard Pressure Compensator**
	Adjustment Type
S	Screw With Nut
	Pressure Range
W	70-350 bar (1015-5075 PSI)
H	40-210 bar (580-3050 PSI)
D	10-140 bar (150-2050 PSI)
F • •	**Remote/Load Sense Compensator**
	Control Port
1	NG6/D03 Pattern Only*
Z	NG6/D03 with Pressure Valve Mounted**
	Control Type
R	Remote Compensator
F	Load Sensing Compensator
• L •	**Horsepower Compensator**
	Control Port
A	NG6/Cetop3 (DIVW) Pattern*
C	NG6/D03 with PVAC1PCS*S**ValveMounted
Z	NG6/D03 with Pressure Valve Mounted**
	Horsepower at 1800 RPM
D	10.0 (350 in-lb)
E	15.0 (525 in-lb)
G	20.0 (700 in-lb)
H	25.0 (875 in-lb)
K	30.0 (1050 in-lb)
M	35.0 (1225 in-lb)

* Maximum pressure adjustment for pump not included, but necessary. See PVAC section for pressure valve options.

** Valve to be mounted at factory must be ordered as a separate line item. Consult factory. See PVAC section for pressure valve options.

Performance Information

Series PV, Pressure Compensated, Variable Volume, Piston Pumps

Features

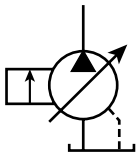
- High Strength Cast-Iron Housing for high reliability and quiet operation
- Modular Controls for field convertability
- Large Control Piston for fast response
- Thru-Shaft Option with 100% thru torque capability
- Multiple Pressure Control with valves mounted directly on pump
- Pre-Compression chamber to minimize over-all system noise

Controls

- Pressure Compensation
- Remote Pressure Compensation
- Load Sensing
- Adjustable Maximum Volume Stop
- Electrohydraulic Pressure Control
- Dual and Tri-Pressure
- Low Pressure Standby
- Horsepower Limiting

Schematic Symbol

(Basic Pump)



Installation Data

See Installation Information on page A156 of this catalog for specific recommendations pertaining to system cleanliness, fluids, start-up, inlet conditions, shaft alignment, drain line restrictions and other important factors relative to the proper installation and use of these products.

Specifications

Pressure Ratings:	5000 PSI (350 bar) Continuous 6000 PSI (420 bar) Peak
Speed Ratings:	600 to 2400 RPM (PV063) 600 to 2300 RPM (PV080) 600 to 2200 RPM (PV092)
Inlet Conditions:	230 PSI (16 bar) Maximum Inlet Charge 5 In. Hg. Max. Vacuum at 1800 RPM
Case Drain Conditions:	7 PSI (0.5 bar) Maximum
Operating Temp. Range:	-40˚F to 160˚F (-40°C to 70˚C)
Housing Material:	Cast Iron
Filtration:	Maintain SAE Class 4 (ISO 16/13)
Mounting:	SAE “D” 4-Bolt Flange

Quick Reference Data Chart

Pump Model	Displacement cc/rev (in³/rev)		Pump Delivery @ 7 bar (100 PSI) in LPM (GPM)				*Approx. Noise Levels dB(A) @ Full Flow and 1500 RPM			Input Power At 1800 RPM, Max. Displacement & 343 bar (5000 PSI)	Max. Operating Speed (RPM)
			1200 RPM		1800 RPM		70 bar (1000 PSI)	207 bar (3000 PSI)	343 bar (5000 PSI)		
PV063	63	(3.8)	75.6	(20.0)	113.4	(30.0)	66	70	74	70.1 kw (94.0 hp)	2400
PV080	80	(4.8)	96.0	(25.4)	144.0	(38.0)	66	70	74	89.2 kw (119.6 hp)	2300
PV092	92	(5.6)	110.4	(29.2)	165.6	(43.8)	66	70	74	136.8 kw (183.5 hp)	2200

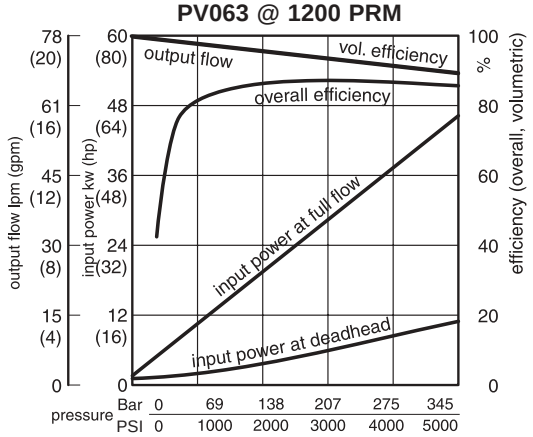
* The noise level values are based on anechoic room measurements at a distance of 1 meter in accordance with DIN 45645.

A

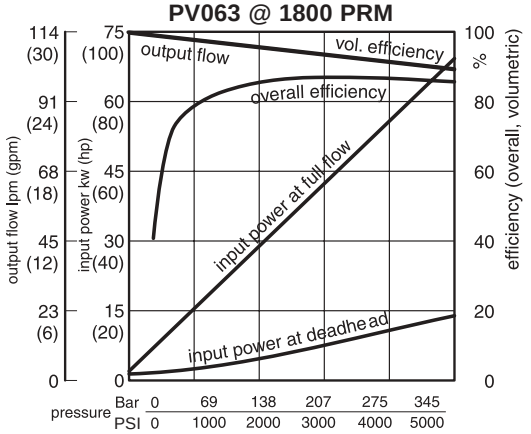
Performance Curves

Fluid: Standard Hydraulic Oil 100 SSU @ 120°F (49°C)

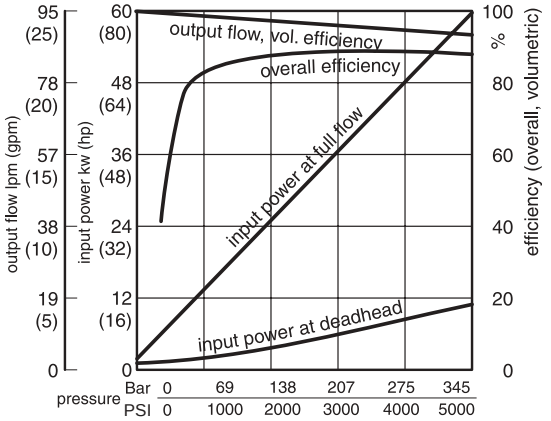
PV063 @ 1200 PRM



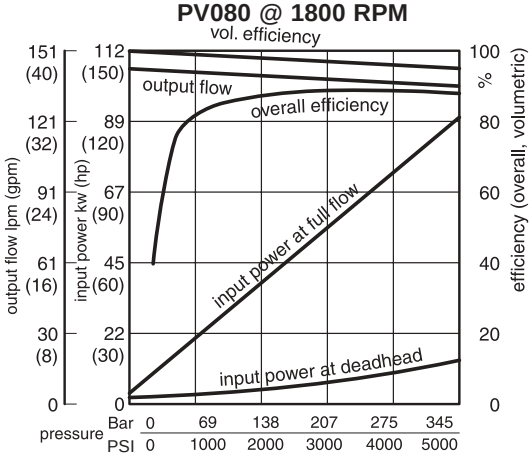
PV063 @ 1800 PRM



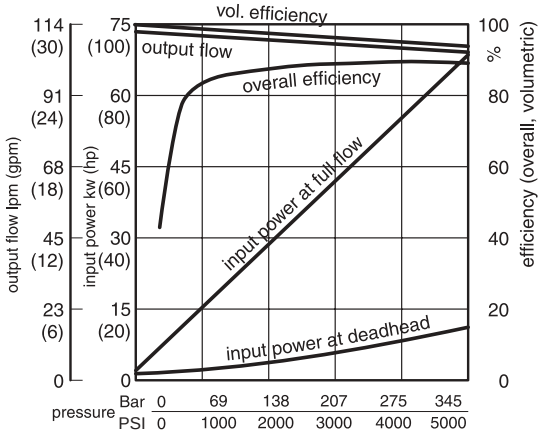
PV080 @ 1200 RPM



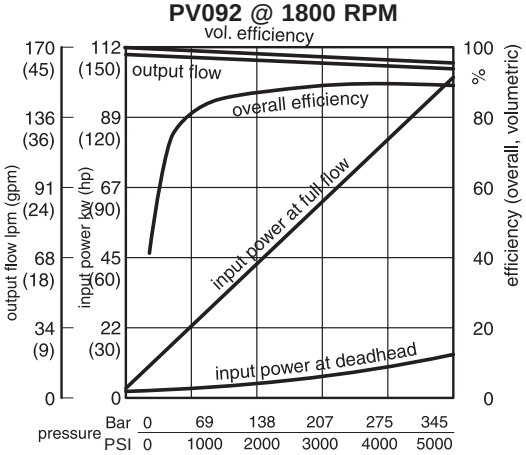
PV080 @ 1800 RPM



PV092 @ 1200 RPM



PV092 @ 1800 RPM



NOTE: The efficiencies and data in the graphs are good only for pumps running at speeds shown and stroked to maximum. To calculate approximate horsepower for the other conditions, use the following formula:

$$HP = \left[\frac{Q \times (PSI)}{1714}\right] + (CHp)$$

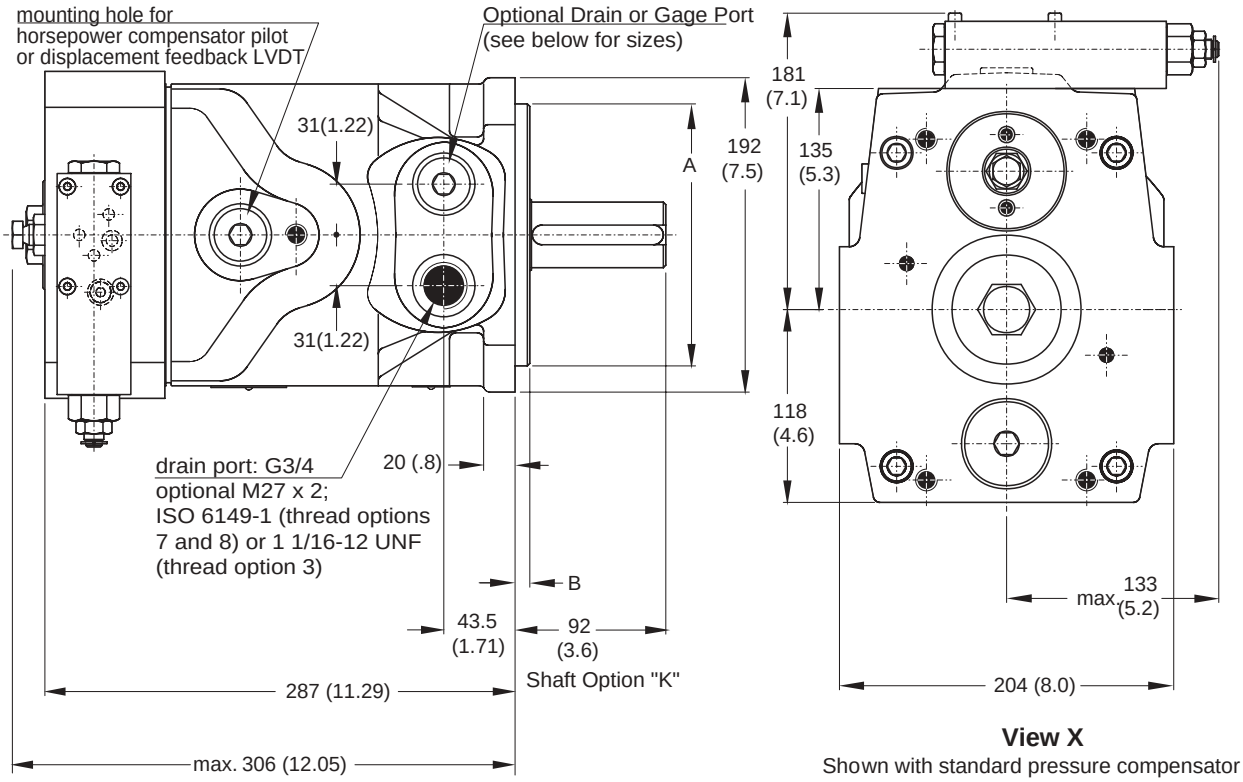
Actual GPM is directly proportional to drive speed and maximum volume setting. Flow loss, however, is a function of pressure only.

WHERE:

Q = Actual Output Flow in GPM

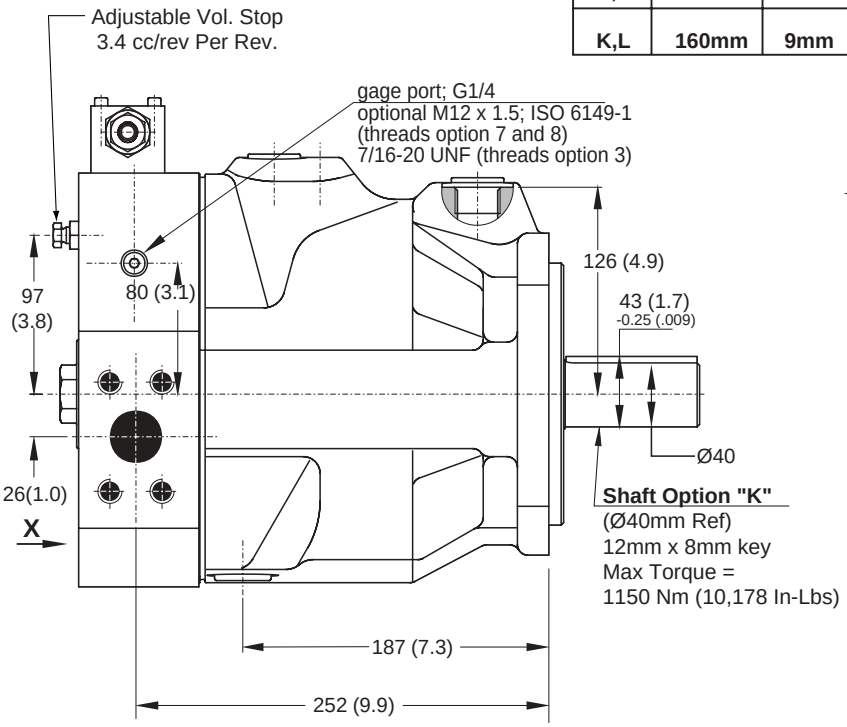
PSI = Pressure At Pump Outlet

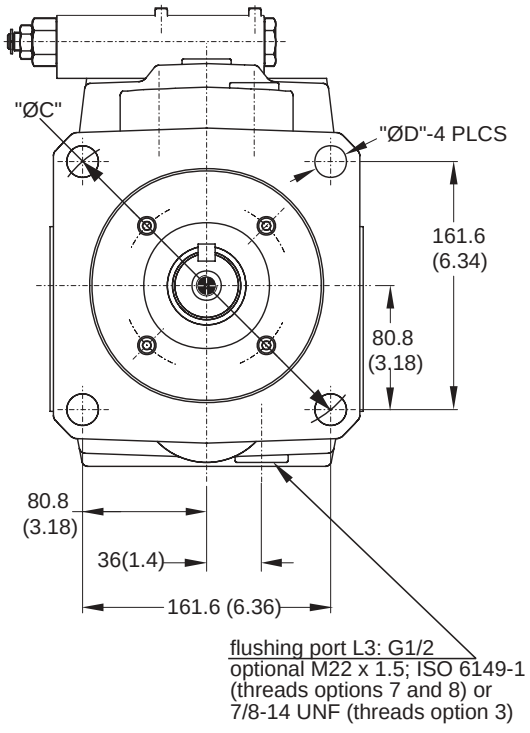
CHp = Input Horsepower @ Full compensation @ 1800 RPM (from graph read at operating pressure)

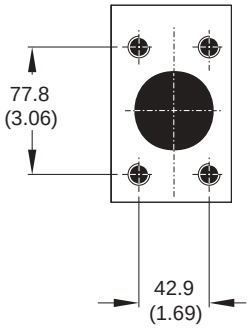


View X
Shown with standard pressure compensator

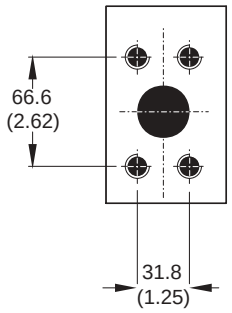
Code	A	B	ØC	ØD
D,E	6.00"	.50"	9.00"	.81"
K,L	160mm	9mm	200mm	18mm



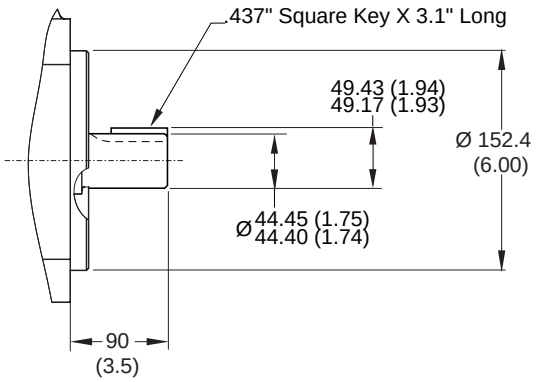




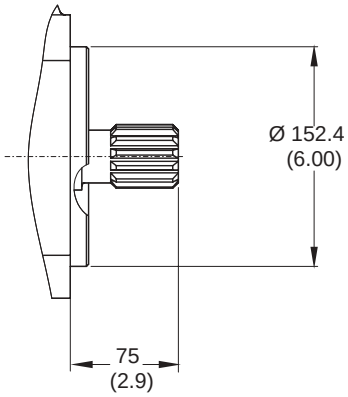
Inlet:
Option 3 & 7
2" 4 Bolt Flange
1/2-13 UNC-2B Threads
Option 1 & 8
50mm 4 Bolt Flange
M12 Threads
Standard Pressure Series
(Code 61)



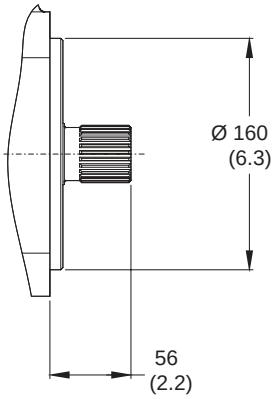
Outlet:
Option 3 & 7
1-1/4" 4 Bolt Flange
1/2-13 UNC-2B Threads
Option 1 & 8
32mm 4 Bolt Flange
M12 Threads
High Pressure Series (Code 62)



Shaft Option "D"
(SAE "D")
Max Torque= 1320 Nm (11,683 In-Lbs)

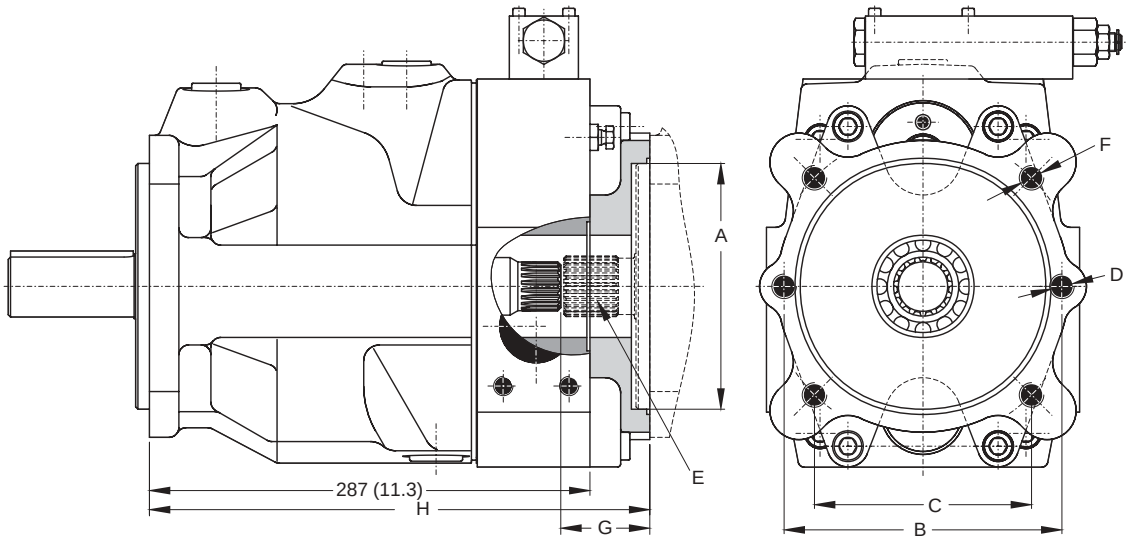


Shaft Option "E"
(SAE "D")
13 Tooth, 18/16 DP
Flat Root, Side Fit
Max Torque = 1218 Nm (15,080 In-Lbs)



Shaft Option "L"
W40mm x 1.5mm x 25mm x 8f
DIN 5480
Max Torque = 1400 Nm (12,391In-Lbs)

Thru-Shaft Options



Thru-Shaft Load Limitations

The maxiumum allowable torque of the individual shaft must not be exceeded. For 2-pump combinations there is no problem because the PV series offers 100% thru torque capabilities. For 3-pump combinations or more the limit torque could be reached or exceeded. Therefore it is necessary to calculate the torque factor and compare the sum of each pumps torque factor to the table to make sure it does not exceed the torque limit factor.

Pump	Shaft	Torque Limit Factor
PV063-092	D	77280
	E	72450
	K	67620
	L	83720

Required: Sum of all calculated torque factors must be <torque limit factor.

Torque factor of any pump =
Pressure (bar) x Displacement (cc/rev)

Code	A	B	C	D	E*	F	G	H
A7	Ø3.25"	4.188"	-	3/8-16	SAE "A" 9T 16/32 DP SPLINE	-	2.28"	12.83"
B3	Ø4.00"	-	3.536"	-	SAE "B" 13T 16/32 DP SPLINE	1/2-13	2.28"	12.83"
B7	Ø4.00"	5.750"	-	1/2-13	SAE "B" 13T 16/32 DP SPLINE	-	2.28"	12.83"
C3	Ø5.00"	-	4.500"	-	SAE "C" 14T 12/24 DP SPLINE	1/2-13	2.28"	12.83"
C7	Ø5.00"	7.125"	-	5/8-11	SAE "C" 14T 12/24 DP SPLINE	-	2.28"	12.83"
D3	Ø6.00"	-	6.364"	-	SAE "D" 13T 8/16 DP SPLINE	5/8-11	3.07"	13.62"
J3	Ø100mm	-	44mm	-	W25 x 1.5 x 15 x 8f SPLINE	M10	2.28"	12.83"
K3	Ø125mm	-	56mm	-	W32 x 1.5 x 20 x 8f SPLINE	M12	2.28"	12.83"
L3	Ø160mm	-	71mm	-	W40 x 1.5 x 25 x 8f SPLINE	M16	2.28"	12.83"
W3	Ø4.00"	-	3.530"	-	SAE "BB" 15T 16/32 DP SPLINE	1/2-13	2.28"	12.83"
W7	Ø4.00"	5.750"	-	1/2-13	SAE "BB" 15T 16/32 DP SPLINE	-	2.28"	12.83"

*Coupling included with pump if ordered from Greeneville, TN

Variable Volume Piston Pumps
Series PV 063/080/092

Ordering Information

	PV											
Multiple Pumps	Pump Variable Piston	Displace-ment	Rotation	Variations	Shaft & Mounting	Threads Code	Thru-Shaft Option	Seals	Control Options	Paint	Multiple Pumps

Code	CM³/REV (In³/rev.)
063	63 (3.8)
080	80 (4.8)
092	92 (5.6)

Code	Rotation*
R	CW
L	CCW

* As viewed from shaft end.

Code	Port*	Threads**
1	BSPP	Metric
3	UNF	UNC
7	ISO 6149	UNC
8	ISO 6149	Metric

*Drain, gage, and flusing ports.
**Mounting and connecting threads

Code	Seals
N	Nitrile
V	Fluorocarbon

Code	Painting
Omit	No Paint
P	Paint

Code	Multiple Pumps
Omit	Single Pump
—	Pump Factory Mounted On Rear

Code	Multiple Pumps
Omit	Single
—	Factory mounted to rear of another pump

Code	Pump Variations
1	Standard
9*	Reduced Stroke

* Specify in cc/rev.

Code	Shaft	Pilot
D	1-3/4" Keyed (SAE D)	4 Bolt SAE "D"
E	17T Spline (SAE CC)	4 Bolt SAE "D"
K	40mm Keyed	4 Bolt 160mm
L	W40 x 1.5 x 25 x 8f Spline DIN 5480	4 Bolt 160mm

Code	Thru-Shaft Option
T1	Thru-Shaft Capable/ Single Pump w/Cover
A7	2 Bolt SAE "A" Pilot Ø3.250/SAE "A" 9T 16/32 DP Spline
B3	4 Bolt SAE "B" Pilot Ø4.00/SAE "B" 13T 16/32 DP Spline
B7	2 Bolt SAE "B" Pilot Ø4.00/SAE "B" 13T 16/32 DP Spline
C3	4 Bolt SAE "C" Pilot Ø5.00/SAE "C" 14T 12/24 DP Spline
C7	2 Bolt SAE "C" Pilot Ø5.00/SAE "C" 14T 12/24 DP Spline
D3	4 Bolt SAE "D" Pilot Ø6.00/SAE "D" 13T 8/16 DP Spline
J3*	4 Bolt 100mm Pilot /W25x1.5x15x8f Spline DIN 5480
K3*	4 Bolt 125mm Pilot /W32x1.5x20x8f Spline DIN 5480
L3*	4 Bolt 160mm Pilot /W40x1.5x25x8f Spline DIN 5480
W3	4 Bolt SAE "B" Pilot 4.00/SAE "BB" 15T 16/32 DP Spline
W7	2 Bolt SAE "B" Pilot 4.00/SAE "BB" 15T 16/32 DP Spline

*Must be used with port/thread option 1

Code	Control Options
F ● ●	**Standard Pressure Compensator**
● S	**Adjustment Type**
	Screw With Nut
● W	**Pressure Range**
	70-350 bar (1015-5075 PSI)
H	40-210 bar (580-3050 PSI)
D	10-140 bar (150-2050 PSI)
F ● ●	**Remote/Load Sense Compensator**
● 1	**Control Port**
	NG6/Cetop3 (D1VW) Pattern *
Z	NG6 with Pressure Valve Mnt'd**
● R	**Compensator Control Type**
	Remote Pressure
F	Load Sensing
● L ●	**Horsepower Compensator Control**
● A	**Control Port**
	NG6 /Cetop3 (DIVW) Pattern*
C	NG6 with PVAC1PCS*S** Valve Mounted
Z	NG6 with Pressure Valve Mounted**
● G	**Input Horsepower at 1800 RPM**
	20.0 (700 in-lb Torque)
H	25.0 (875 in-lb Torque)
K	30.0 (1050 in-lb Torque)
M	35.0 (1225 in-lb Torque)
S	50.0 (1750 in-lb Torque)
T	60.0 (2100 in-lb Torque)
U	75.0 (2625 in-lb Torque)

* Maximum pressure adjustment not included, but recommended. (See PVAC Section)

** Valve to be mounted at factory must be ordered as a separate line item. Consult factory. See PVAC section for pressure valve options.

Performance Information

Series PV 140/180 Pressure Compensated, Variable Volume, Piston Pumps

Features

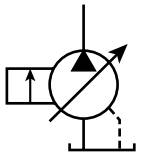
- High Strength Cast-Iron Housing for reliable and quiet operation
- Modular Controls for field convertibility
- Large Control Piston for smooth/fast response
- Multiple Pressure Control with valves mounted directly on pump
- Pre-Compression chamber to minimize over-all system noise

Controls

- Pressure Compensation
- Remote Pressure Compensation
- Load Sensing
- Adjustable Maximum Volume Stop
- Electrohydraulic Pressure
- Dual and Tri-Pressure Control
- Low Pressure Standby
- Horsepower Limiting

Schematic Symbol

(Basic Pump)



Installation Data

See Installation Information on page A156 of this catalog for specific recommendations pertaining to system cleanliness, fluids, start-up, inlet conditions, shaft alignment, drain line restrictions and other important factors relative to the proper installation and use of these products.

Specifications

Pressure Ratings:	5000 PSI (350 bar) Continuous 6000 PSI (420 bar) Peak
Speed Ratings:	750 to 2200 RPM
Inlet Condition:	725 PSI (50 bar) Maximum 3 In-Hg Vacuum at 1500 RPM 0 In-Hg Vacuum at 1800 RPM
Case Drain Conditions:	7 PSI (.5 bar) Maximum
Operating Temp. Range:	-40˚F to 160˚F (-40˚C to 70˚C)
Housing Material:	Cast Iron
Filtration:	Maintain SAE Class 4 (ISO 16/13)
Mounting:	SAE “D” 4-Bolt Flange

Quick Reference Data Chart

Pump Model	Displacement cc/rev (in^3/rev)	Pump Delivery @ 7 bar (100 PSI) in LPM (GPM)		*Approx. Noise Levels dB(A) @ Full Flow and 1500 RPM			Input Power At 1800 RPM, Max. Displacement & 343 bar (5000 PSI)	Max Operating Speed (RPM)
		1200 RPM	1800 RPM	70 bar (1000 PSI)	207 bar (3000 PSI)	343 bar (5000 PSI)		
PV140	140 (8.59)	168 (44.4)	234 (61.8)	70	74	76	149.4 kw (200.4 hp)	2400
PV180	180 (10.98)	216 (57.1)	324 (85.6)	71	75	77	210.3 kw (282.0 hp)	2200

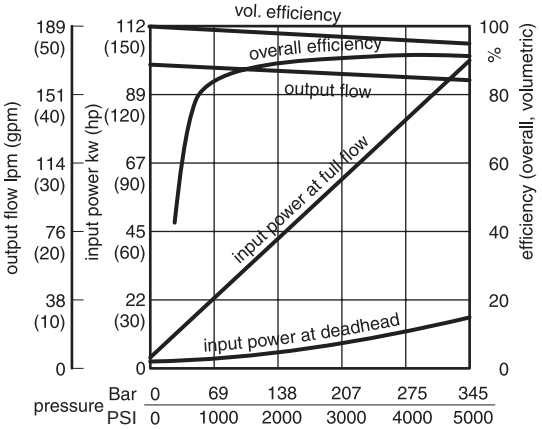
* The noise level values are based on anechoic room measurements at a distance of 1 meter in accordance with DIN 45645.

A

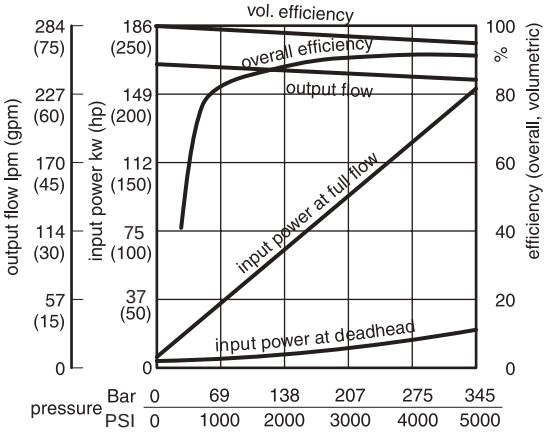
Performance Curves

Fluid: Standard Hydraulic Oil 100 SSU @ 120°F (49°C)

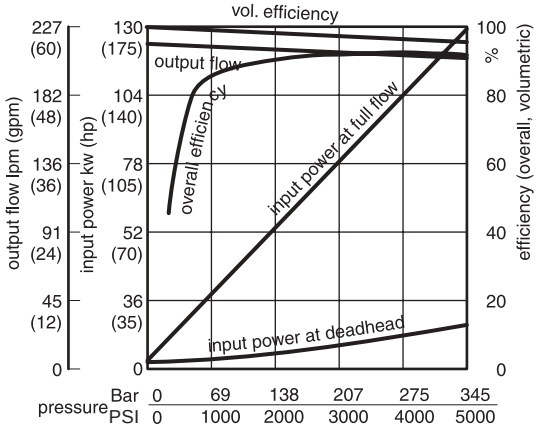
PV140 @ 1200 RPM



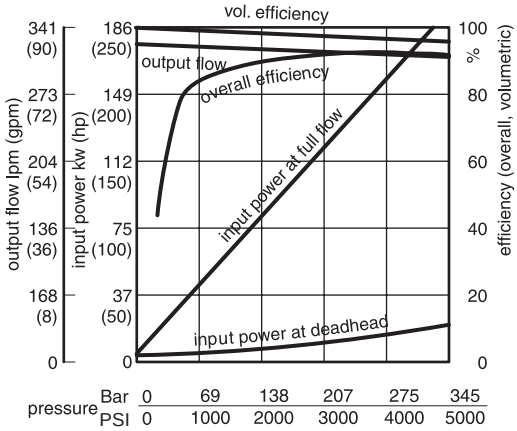
PV140 @ 1800 RPM



PV180 @ 1200 RPM



PV180 @ 1800 RPM



NOTE: The efficiencies and data in the graphs are good only for pumps running at speeds shown and stroked to maximum. To calculate approximate horsepower for the other conditions, use the following formula:

$$HP = \left[\frac{Q \times (PSI)}{1714}\right] + (CHp)$$

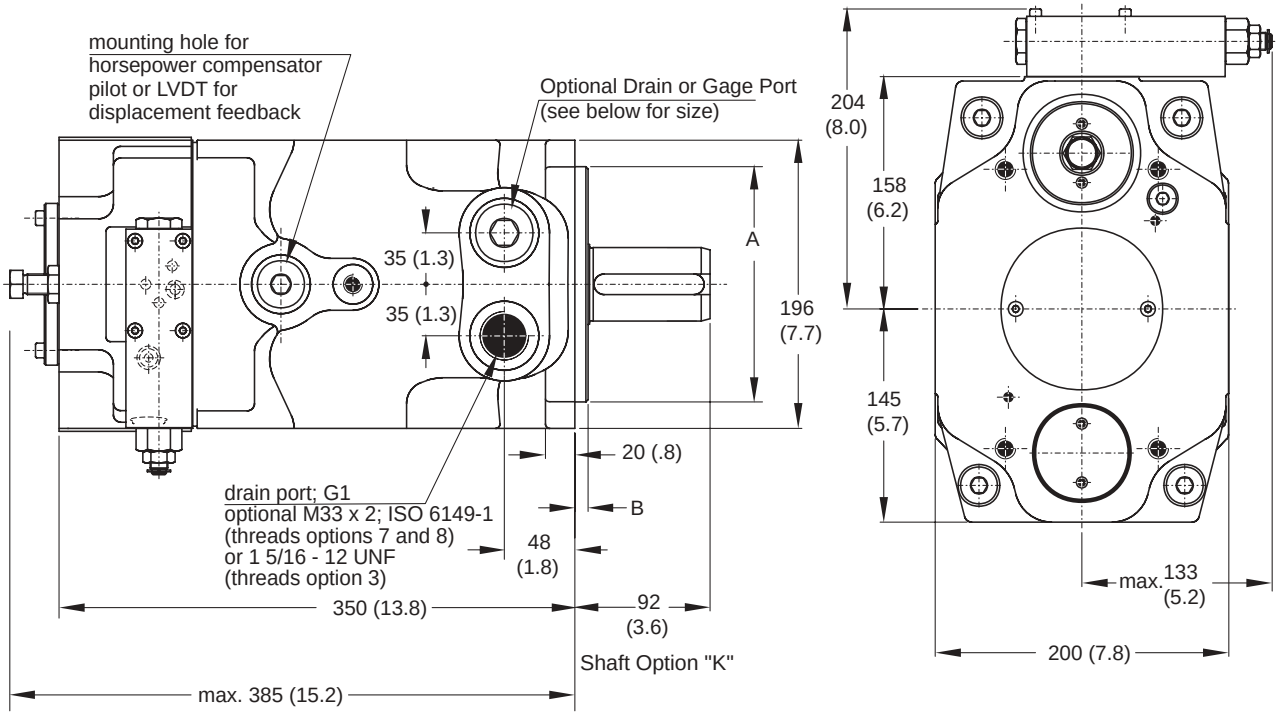
Actual GPM is directly proportional to drive speed and maximum volume setting. Flow loss, however, is a function of pressure only.

WHERE:

Q = Actual Output Flow in GPM

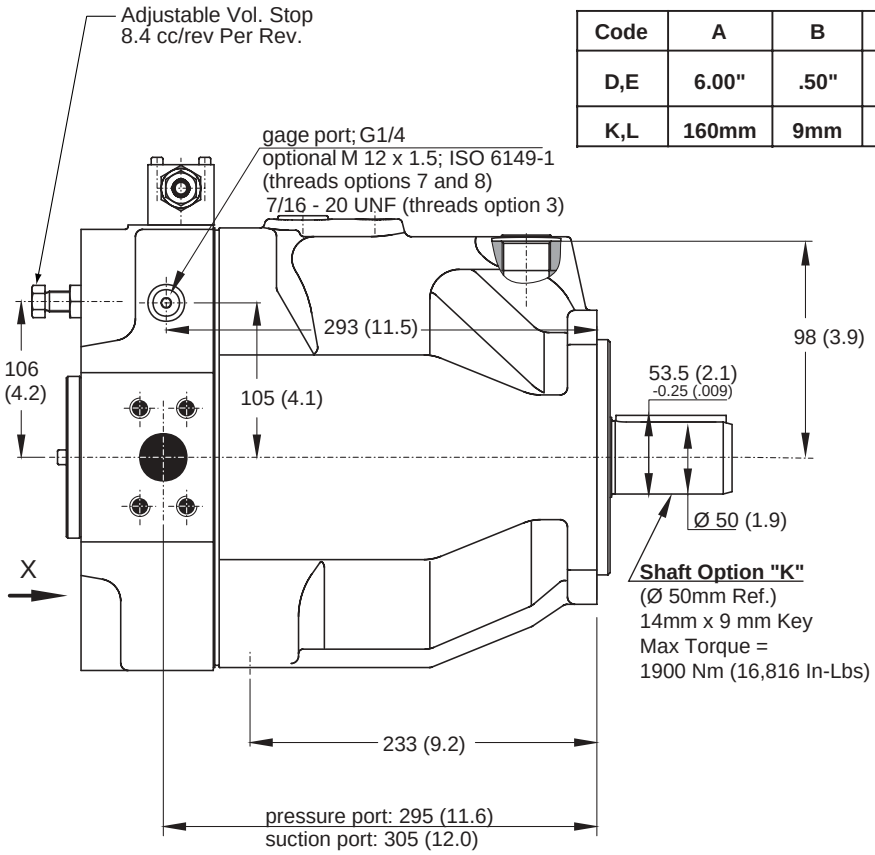
PSI = Pressure At Pump Outlet

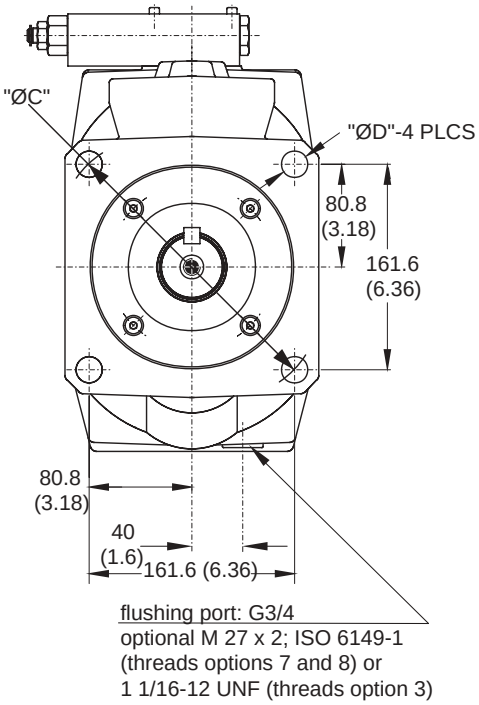
CHp = Input Horsepower @ Full compensation @ 1800 RPM (from graph read at operating pressure)

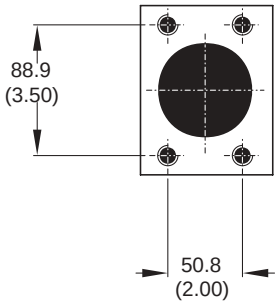


View X
Shown with standard pressure compensator

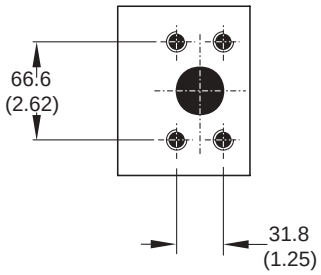
Code	A	B	ØC	ØD
D,E	6.00"	.50"	9.00"	.81"
K,L	160mm	9mm	200mm	18mm



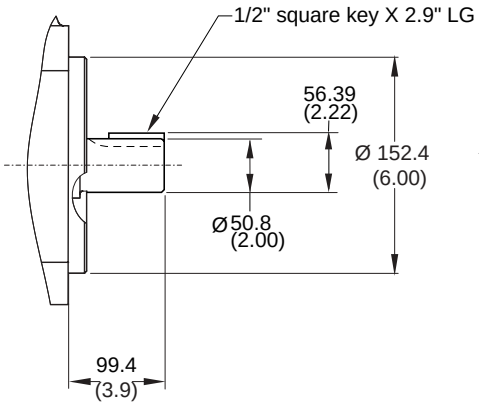




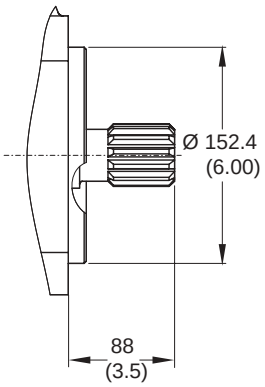
Inlet:
Option 3 & 7
2-1/2" 4 Bolt Flange
1/2-13 UNC-2B Threads
Option 1 & 8
63mm 4 Bolt Flange
M16 Threads
Standard Pressure Series
(Code 61)



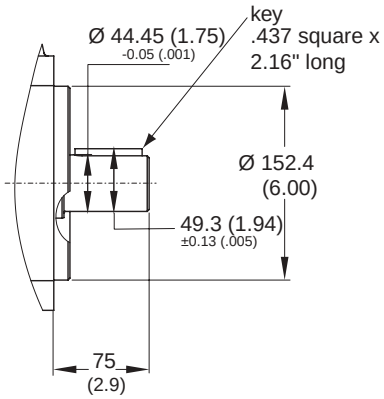
Outlet:
Option 3 & 7
1-1/4" 4 Bolt Flange
1/2-13 UNC-2B Threads
Option 1 & 8
32mm 4 Bolt Flange
M12 Threads
High Pressure Series (Code 62)



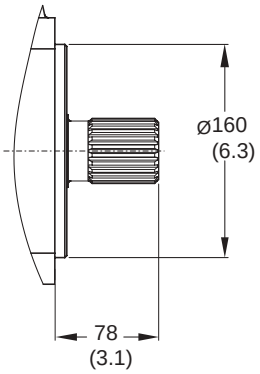
Shaft Option "D"
(SAE "F")
Max Torque= 2000 Nm (17,701 In-Lbs)



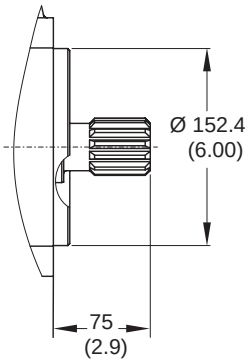
Shaft Option "E"
(SAE "F")
15 Teeth, 8/16 Pitch
30O Involute Spline
Max Torque = 2680 Nm (23,720 In-Lbs)



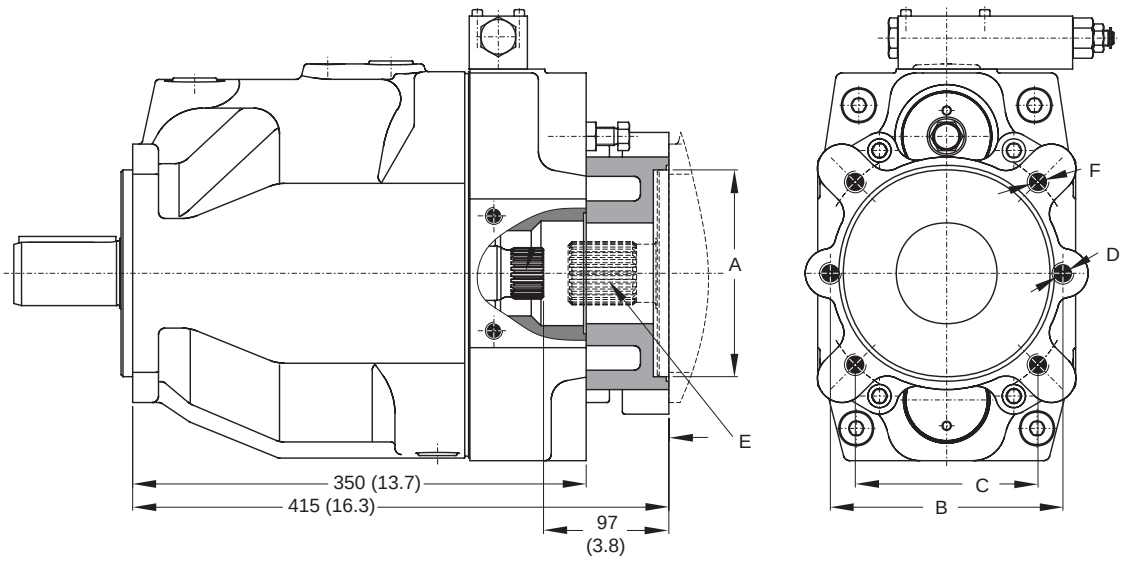
Shaft Option "F"
(SAE "D")
Max Torque= 1320 Nm (11,683 In-Lbs)



Shaft Option "L"
W50mm x 2mm x 24mm x 9g
DIN 5480
Max Torque = 2650 Nm (23,454 In-Lbs)



Shaft Option "G"
(SAE "D")
13 Teeth 8/16 Pitch
30O Involute Spline
Max Torque = 1640 Nm (14,515 In-Lbs)



Thru-Shaft Options

Thru-Shaft Load Limitations

The maxiumum allowable torque of the individual shaft must not be exceeded. For 2-pump combinations there is no problem because the PV series offers 100% thru torque capabilities. For 3-pump combinations or more the limit torque could be reached or exceeded. Therefore it is necessary to calculate the torque factor and compare the sum of each pumps torque factor to the table to make sure it does not exceed the torque limit factor.

Required: Sum of all calculated torque factors must be <torque limit factor.

Torque factor of any pump =
Pressure (bar) x Displacement (cc/rev)

Code	A	B	C	D	E*	F
A7	Ø3.25"	4.188"	-	3/8-16	SAE "A" 9T 16/32 DPSPLINE	-
B3	Ø4.00"	-	3.536"	-	SAE "B" 13T 16/32 DP SPLINE	1/2-13
B7	Ø4.00"	5.750"	-	1/2-13	SAE "B" 13T 16/32 DP SPLINE	-
C3	Ø5.00"	-	4.508"	-	SAE "C" 14T 12/24 DP SPLINE	1/2-13
D3	Ø6.00"	-	6.364"	-	SAE "CC" 13T 8/16 DP SPLINE	5/8-11
D7	Ø6.00"	9.000"	-	5/8-11	SAE "D" 13T 8/16 DP SPLINE	-
J3	Ø100mm	-	44mm	-	W25 x 1.5 x 15 x 8f SPLINE	M10
K3	Ø125mm	-	56mm	-	W32 x 1.5 x 20 x 8f SPLINE	M12
L2	Ø160mm	-	71mm	-	W50 x 2 x 24 x 9g SPLINE	M12
L3	Ø160mm	-	71mm	-	W40 x 1.5 x 25 x 8f SPLINE	M17
W3	Ø4.00"	-	3.536"	-	SAE "BB" 15T 16/32 DP SPLINE	1/2-13
W7	Ø4.00"	5.750"	-	1/2-13	SAE "BB" 15T 16/32 DP SPLINE	-
Z3	Ø6.00"	-	6.364"	-	SAE "F" 15T 8/16 DP SPLINE	5/8-11

*Coupling included when ordered from Greeneville, TN

Pump	Shaft	Torque Limit Factor
PV140-180	D	118400
	E	158760
	F	78750
	G	97650
	K	113400
	L	157500

Multiple Pumps	Pump Variable Piston	Displace-ment	Rotation	Variations	Shaft & Mounting	Threads Code	Thru-Shaft Option	Seals	Control Options	Paint	Multiple Pumps
[ ]	PV	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Code	CM³/REV (In³/rev.)
140	140 (8.5)
180	180 (10.9)

Code	Multiple Pumps
Omit	Single
—	Factory mounted to rear of another pump

Code	Rotation*
R	CW
L	CCW

* As viewed from shaft end.

Code	Pump Variations
1	Standard
9*	Reduced Stroke

* Specify in cc/rev.

Code	Shaft	Pilot
D	2" Keyed (SAE F)	4 Bolt SAE "D"
E	15T Spline (SAE F)	4 Bolt SAE "D"
F	1-3/4" Keyed (SAE D)	4 Bolt SAE "D"
G	13T Spline (SAE D)	4 Bolt SAE "D"
K	50mm Keyed	4 Bolt 160mm
L	W50 x 2 x 24 x 9g Spline DIN 5480	4 Bolt 160mm

Code	Port*	Threads**
1	BSPP	Metric
3	UNF	UNC
7	ISO 6149	UNC
8	ISO 6149	Metric

*Drain, gage, and flusing ports.
**Mounting and connecting threads

Code	Thru-Shaft Option
T1	Thru-Shaft Capable, Single Pump w/Cover
A7	2 Bolt SAE "A" Pilot Ø3.25/SAE "A" 9T 16/32 DP Spline
B3	4 Bolt SAE "B" Pilot Ø4.00/SAE "B" 13T 16/32 DP Spline
B7	2 Bolt SAE "B" Pilot Ø4.00/SAE "B" 13T 16/32 DP Spline
C3	4 Bolt SAE "C" Pilot Ø5.00/SAE "C" 14T 12/24 DP Spline
C7	2 Bolt SAE "C" Pilot Ø5.00/SAE "C" 14T 12/24 DP Spline
D3	4 Bolt SAE "D" Pilot Ø6.00/SAE "D" 13T 8/16 DP Spline
D7	2 Bolt SAE "D" Pilot Ø6.00/SAE "D" 13T 8/16 DP Spline
J3*	4 Bolt 100mm Pilot /W25x1.5x15x8f Spline DIN 5480
K3*	4 Bolt 125mm Pilot /W32x1.5x20x8f Spline DIN 5480
L2*	4 Bolt 160mm Pilot /W50x2x24x9g Spline DIN 5480
L3*	4 Bolt 160mm Pilot /W40x1.5x25x8f Spline DIN 5480
W3	4 Bolt SAE "B" Pilot 4.00/SAE "BB" 15T 16/32 DP Spline
W7	2 Bolt SAE "B" Pilot 4.00/SAE "BB" 15T 16/32 DP Spline
Z3	4 Bolt SAE "D" Pilot 6.00/SAE "F" 15T 8/16 DP Spline
Z7	2 Bolt SAE "D" Pilot 6.00/SAE "F" 15T 8/16 DP Spline

*Must be used with port/thread option 1

Code	Seals
N	Nitrile
V	Fluorocarbon
W	Waterbased Fluids

Code	Painting
Omit	No Paint
P	Paint

Code	Multiple Pumps
Omit	Single Pump
—	Pump Factory Mounted On Rear

Code	Control Options	
F • •	**Standard Pressure Compensator**	
	Adjustment Type	
S	Screw With Nut	
	Pressure Range	
W	70-350 bar (1015-5075 PSI)	
H	40-210 bar (580-3050 PSI)	
D	10-140 bar (150-2050 PSI)	
F • •	**Remote Pressure Compensator**	
	Control Port	
1	NG6/Cetop3 Pattern *	
Z	NG6 with Pressure Valve Mounted**	
	Control Type	
R	Remote Compensator	
F	Load Sensing Compensator	
• L •	**Horsepower Compensator**	
	Control Port	
A	NG6/Cetop (DIVW) Pattern*	
C	NG6 with PVAC1PCS*S** Valve Mounted	
Z	NG6 with Pressure Valve Mounted**	
	HP setting at 1800 RPM	
K	30.0 (1050 in-lb Torque)	PV140
M	35.0 (1225 in-lb Torque)	PV140
S	50.0 (1750 in-lb Torque)	PV140
T	60.0 (2100 in-lb Torque)	PV140
U	75.0 (2625 in-lb Torque)	PV140
W	90.0 (3150 in-lb Torque)	PV140
Y	120.0 (4200 in-lb Torque)	PV180
Z	150.0 (5250 in-lb Torque)	PV180

* Maximum pressure adjustment not included, but recommended. (See PVAC Section)
** Valve to be mounted at factory must be ordered as a separate line item. Consult factory. See PVAC section for pressure valve options.

Performance Information

Series PV270 Pressure Compensated, Variable Volume, Piston Pumps

Features

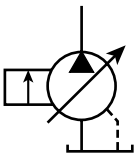
- High Strength Cast-Iron Housing for reliable and quiet operation
- Modular Controls for field convertibility
- Large Control Piston for smooth/fast response
- Multiple Pressure Control with valves mounted directly on pump
- Pre-Compression chamber to minimize over-all system noise.

Controls

- Pressure Compensation
- Remote Pressure Compensation
- Load Sensing
- Adjustable Maximum Volume Control
- Electrohydraulic Pressure Control
- Dual and Tri-Pressure
- Low Pressure Standby
- Horsepower Limiting

Schematic Symbol

(Basic Pump)



Installation Data

See Installation Information on page A156 of this catalog for specific recommendations pertaining to system cleanliness, fluids, start-up, inlet conditions, shaft alignment, drain line restrictions and other important factors relative to the proper installation and use of these products.

Specifications

Pressure Ratings:	5000 PSI (350 bar) Continuous 6000 PSI (420 bar) Peak
Speed Ratings:	750 to 1800 RPM
Inlet Condition:	725 PSI (50 bar) Maximum 3 In-Hg Vacuum at 1500 RPM 0 In-Hg Vacuum at 1800 RPM
Case Drain Conditions:	7 PSI (.5 bar) Maximum
Operating Temp. Range:	-40˚F to 160˚F (-40˚C to 70˚C)
Housing Material:	Cast Iron
Filtration:	Maintain SAE Class 4 (ISO 16/13)
Mounting:	SAE “E” 4-Bolt Flange

Quick Reference Data Chart

Pump Model	Displacement cc/rev (in³/rev)	Pump Delivery @ 7 bar (100 PSI) in LPM (GPM)		*Approx. Noise Levels dB(A) @ Full Flow and 1500 RPM			Input Power At 1800 RPM, Max. Displacement & 343 bar (5000 PSI)	Max Operating Speed (RPM)
		1200 RPM	1800 RPM	70 bar (1000 PSI)	207 bar (3000 PSI)	343 bar (5000 PSI)		
PV270	270 (16.5)	324 (85.6)	486 (128.4)	77	79	81	298 kw (400 hp)	1800

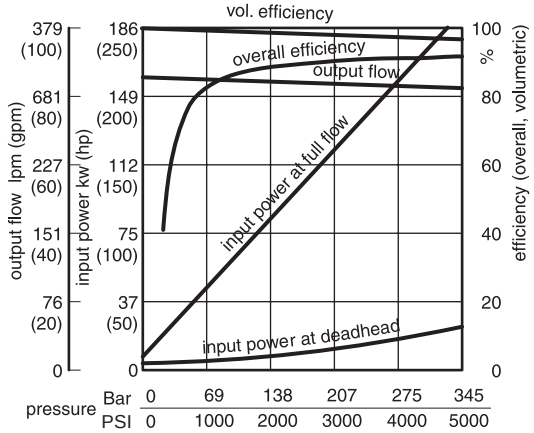
* The noise level values are based on anechoic room measurements at a distance of 1 meter in accordance with DIN 45645.

Performance Curves

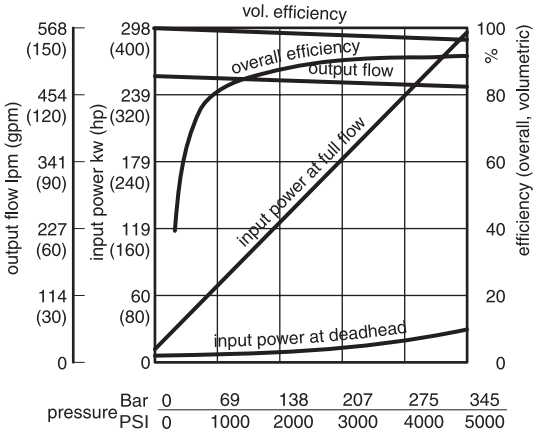
A

Fluid: Standard Hydraulic Oil 100 SSU @ 120°F (49°C)

PV270 @ 1200 RPM



PV270 @ 1800 RPM



NOTE: The efficiencies and data in the graphs are good only for pumps running at speeds shown and stroked to maximum. To calculate approximate horsepower for the other conditions, use the following formula:

$$HP = \left[\frac{Q \times (PSI)}{1714}\right] + (CHp)$$

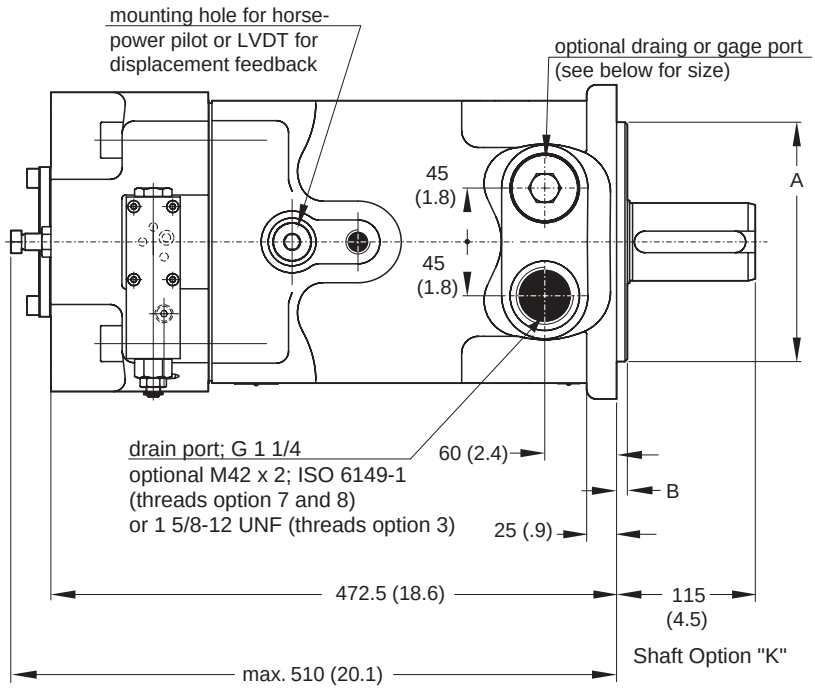
Actual GPM is directly proportional to drive speed and maximum volume setting. Flow loss, however, is a function of pressure only.

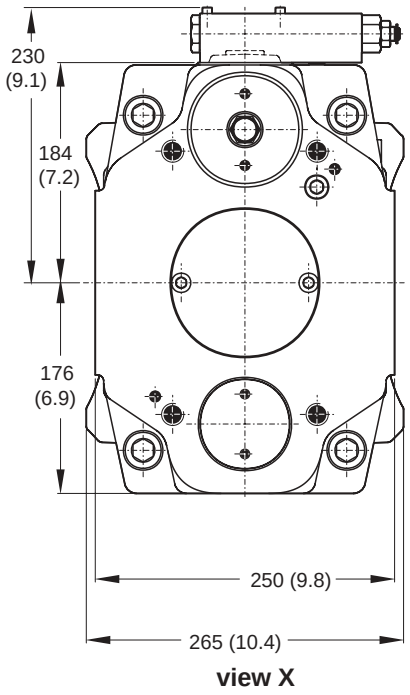
WHERE:

Q = Actual Output Flow in GPM

PSI = Pressure At Pump Outlet

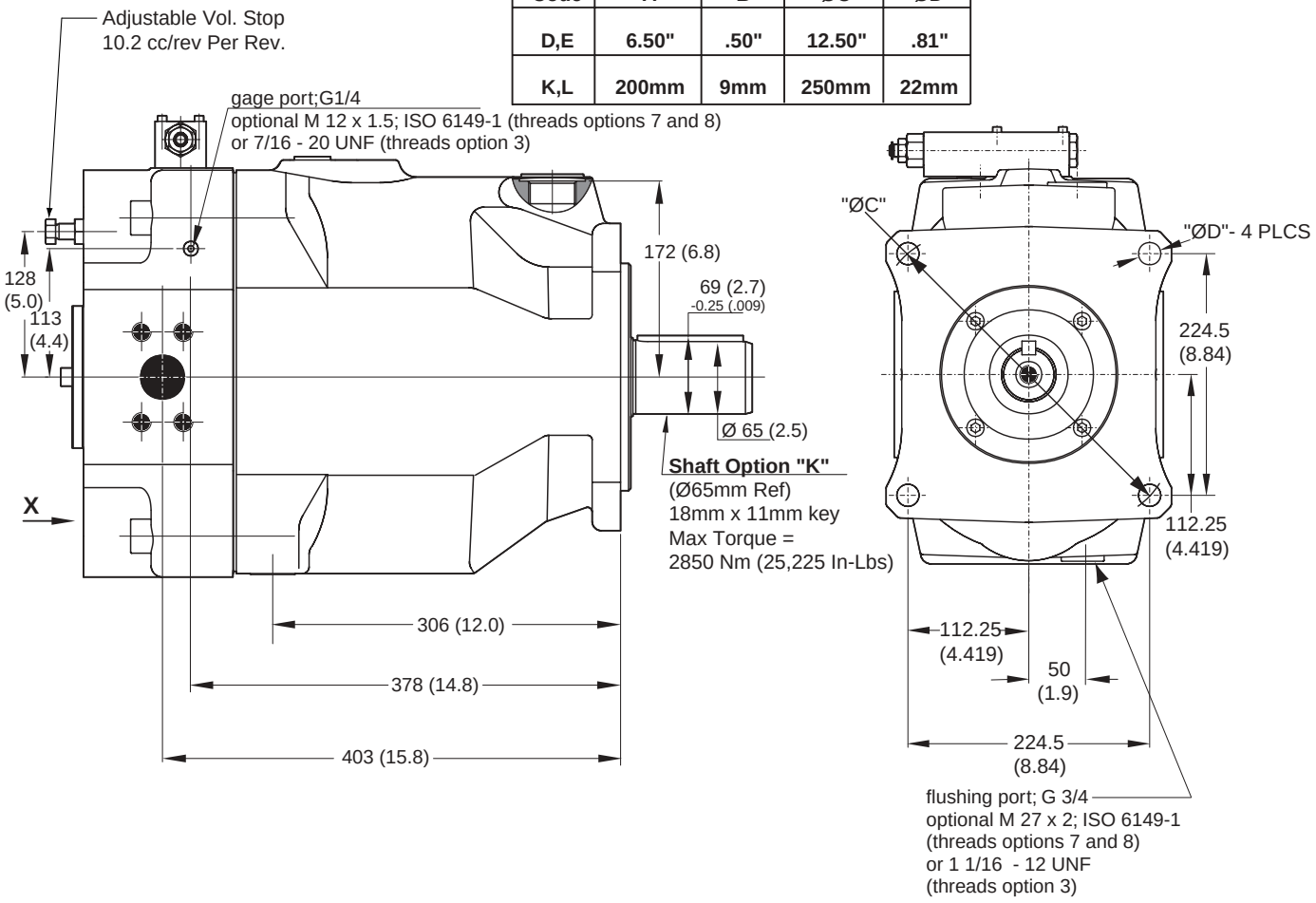
CHp = Input Horsepower @ Full compensation @ 1800 RPM (from graph read at operating pressure)

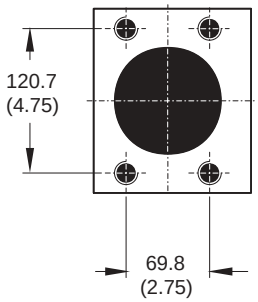




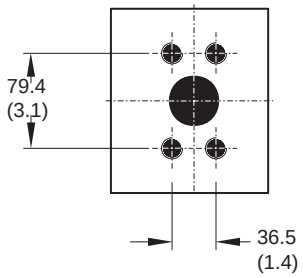
Shown with standard pressure compensator

Code	A	B	ØC	ØD
D,E	6.50"	.50"	12.50"	.81"
K,L	200mm	9mm	250mm	22mm

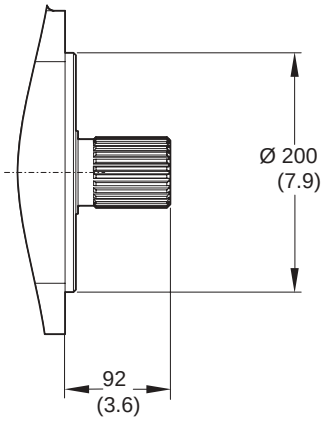




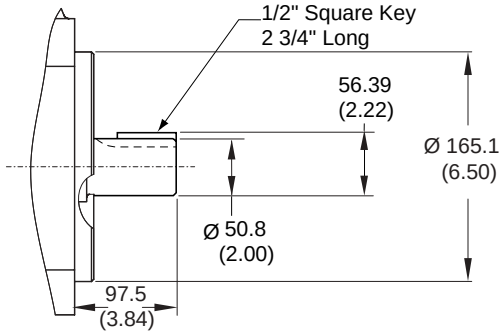
Inlet:
Option 3 & 7
3-1/2" 4 Bolt Flange
5.8-11 UNC-2B Threads
Option 1 & 8
88mm 4 Bolt Flange
M16 Threads
Standard Pressure Series
(Code 61)



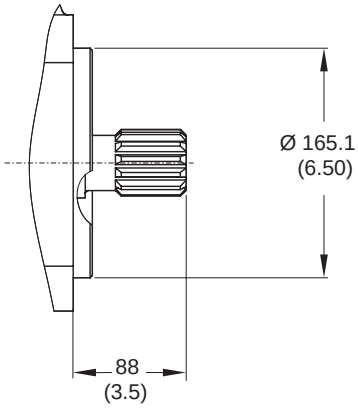
Outlet:
Option 3 & 7
1-1/2" 4 Bolt Flange
5/8-11 UNC-2B Threads
Option 1 & 8
38mm 4 Bolt Flange
M16 Threads
High Pressure Series (Code 62)



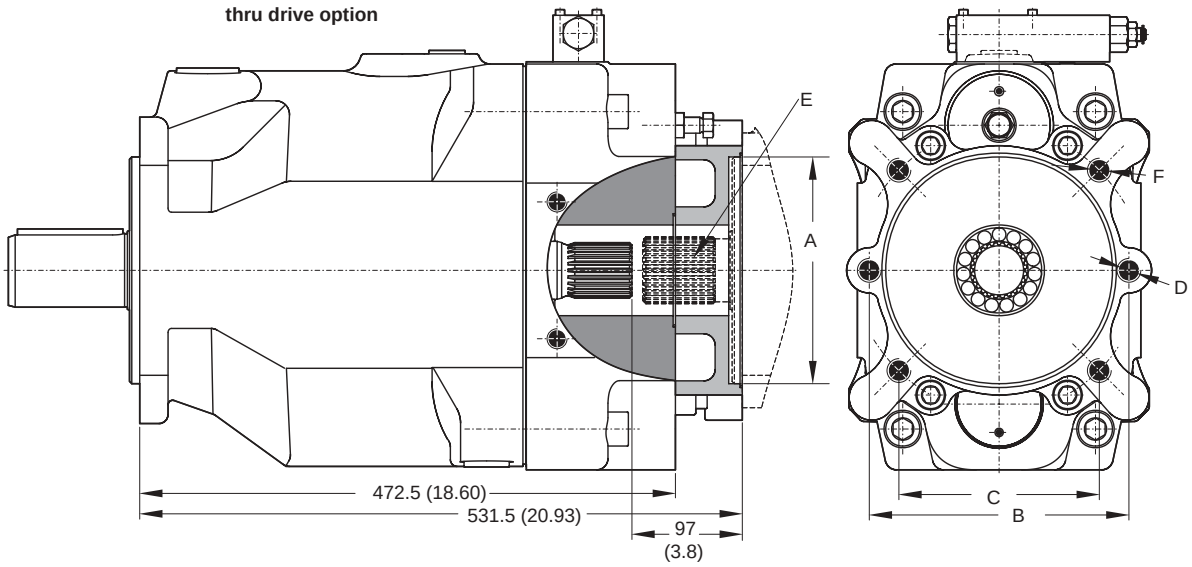
Shaft Option "L"
W60mm x 2mm x 28mm x 9g
DIN 5480
Max Torque = 3980 Nm (35,226 In-Lbs)



Shaft Option "D"
Max Torque= 2000 Nm (17,701 In-Lbs)



Shaft Option "E"
(SAE FF)
15 Teeth 8/16 Pitch
30º Involute Spline
Max Torque= 2680 Nm (23,720 In-Lbs)



Thru-Shaft Load Limitations

The maxiumum allowable torque of the individual shaft must not be exceeded. For 2-pump combinations there is no problem because the PV series offers 100% thru torque capabilities. For 3-pump combinations or more the limit torque could be reached or exceeded. Therefore it is necessary to calculate the torque factor and compare the sum of each pumps torque factor to the table to make sure it does not exceed the torque limit factor.

Required: Sum of all calculated torque factors must be <torque limit factor.

Torque factor of any pump =
Pressure x Displacement (cc/rev) bar

Pump	Shaft	Torque Limit Factor
PV270	D	119,000
	E	159,700
	K	170,100
	L	236,250

Code	A	B	C	D	E*	F
A7	Ø3.25"	4.188"	-	3/8-16	SAE "A" 9T 16/32 DPSPLINE	-
B3	Ø4.00"	-	3.536"	-	SAE "B" 13T 16/32 DP SPLINE	1/2-13
B7	Ø4.00"	5.750"	-	1/2-13	SAE "B" 13T 16/32 DP SPLINE	-
C3	Ø5.00"	-	4.508"	-	SAE "C" 14T 12/24 DP SPLINE	1/2-13
C7	Ø5.00"	7.125"	-	5/8-11	SAE "C" 14T 12/24 DP SPLINE	-
D3	Ø6.00"	-	6.364"	-	SAE "CC" 13T 8/16 DP SPLINE	5/8-11
D7	Ø6.00"	9.000"	-	5/8-11	SAE "D" 13T 8/16 DP SPLINE	-
E3	Ø6.50"	-	8.839"	-	SAE "F" 15T 8/16 DP SPLINE	3/4-10
J3	Ø100mm	-	44mm	-	W25 x 1.5 x 15 x 8f SPLINE	M10
K3	Ø125mm	-	56mm	-	W32 x 1.5 x 20 x 8f SPLINE	M12
L2	Ø160mm	-	71mm	-	W50 x 2 x 24 x 9g SPLINE	M12
L3	Ø160mm	-	71mm	-	W40 x 1.5 x 25 x 8f SPLINE	M17
M3	Ø200mm	-	88mm	-	W60 x 2 x 28 x 9g SPLINE	M20
W3	Ø4.00"	-	3.536"	-	SAE "BB" 15T 16/32 DP SPLINE	1/2-13
W7	Ø4.00"	5.750"	-	1/2-13	SAE "BB" 15T 16/32 DP SPLINE	-
Z3	Ø6.00"	-	6.364"	-	SAE "F" 15T 8/16 DP SPLINE	5/8-11
Z7	Ø6.00"	9.000"	-	5/8-11	SAE "F" 15T 8/16 DP SPLINE	-

*Coupling included when ordered from Greeneville, TN

	PV											
Multiple Pumps	Pump Variable Piston	Displace-ment	Rotation	Variations	Shaft & Mounting	Threads Code	Thru-Shaft Option	Seals	Control Options	Paint	Multiple Pumps

Code	CM³/REV (In³/rev.)
270	270 (16.5)

Code	Multiple Pumps
Omit	Single
—	Factory mounted to rear of another pump

Code	Rotation*
R	CW
L	CCW

* As viewed from shaft end.

Code	Pump Variations
1	Standard
9*	Reduced Stroke

* Specify reduced displacements in cc/rev when ordering

Code	Port*	Threads**
1	BSPP	Metric
3	UNF	UNC
7	ISO 6149	UNC
8	ISO 6149	Metric

*Drain, gage, and flusing ports.
**Mounting and connecting threads

Code	Seals
N	Nitrile
V	Fluorocarbon
W	Waterbased Fluids

Code	Painting
Omit	No Paint
P	Paint

Code	Multiple Pumps
Omit	Single Pump
—	Pump Factory Mounted On Rear

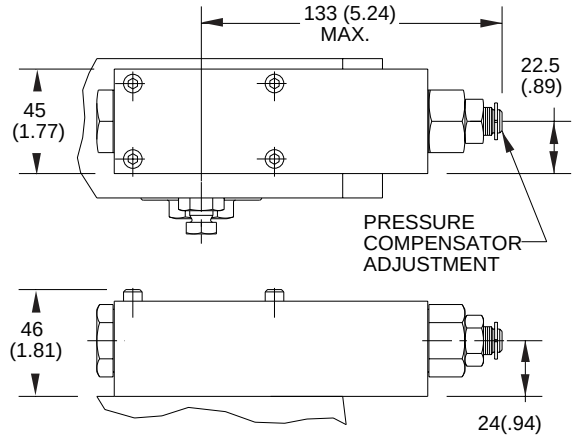
Code	Shaft	Pilot
D	2" SAE Keyed	4 Bolt SAE "E"
E	15T Spline (SAE "F")	4 Bolt SAE "E"
K	65mm Keyed	4 Bolt 200mm
L	W60 x 2 x 28x 9g Spline DIN 5480	4 Bolt 200mm

Code	Thru-Shaft Option
T1	Thru-Shaft Capable/ Single Pump w/Cover
A3	4 Bolt SAE "A" Pilot Ø3.25/SAE "A" 9T 16/32 DP Spline
B3	4 Bolt SAE "B" Pilot Ø4.00/SAE "B" 13T 16/32 DP Spline
B7	2 Bolt SAE "B" Pilot Ø4.00/SAE "B" 13T 16/32 DP Spline
C3	4 Bolt SAE "C" Pilot Ø5.00/SAE "C" 14T 12/24 DP Spline
C7	2 Bolt SAE "C" Pilot Ø5.00/SAE "C" 14T 12/24 DP Spline
D3	4 Bolt SAE "D" Pilot Ø6.00/SAE "D" 13T 8/16 DP Spline
D7	2 Bolt SAE "D" Pilot Ø6.00/SAE "D" 13T 8/16 DP Spline
E3	4 Bolt SAE "E" Pilot Ø6.50/SAE "F" 15T 8/16 DP Spline
J3*	4 Bolt 100mm Pilot /W25x1.5x15x8f Spline DIN 5480
K3*	4 Bolt 125mm Pilot /W32x1.5x20x8f Spline DIN 5480
L2*	4 Bolt 160mm Pilot /W50x2x24x9g Spline DIN 5480
L3*	4 Bolt 160mm Pilot /W40x1.5x25x8f Spline DIN 5480
M3*	4 Bolt 200mm Pilot /W60x2x28x9f Spline DIN 5480
W3	4 Bolt SAE "B" Pilot 4.00/SAE "BB" 15T 16/32 DP Spline
W7	2 Bolt SAE "B" Pilot 4.00/SAE "BB" 15T 16/32 DP Spline
Z3	4 Bolt SAE "D" Pilot 6.00/SAE "F" 15T 8/16 DP Spline
Z7	2 Bolt SAE "D" Pilot 6.00/SAE "F" 15T 8/16 DP Spline

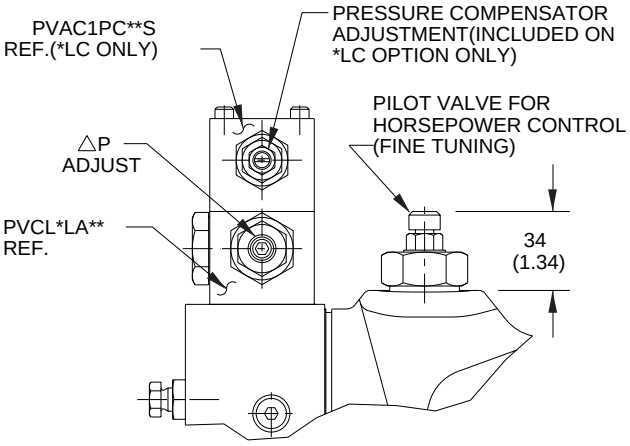
*Must be used with port/thread option 1

Code	Control Options
F • •	**Standard Pressure Compensator**
• S	**Adjustment Type**
	Screw With Nut
• W	**Pressure Range**
	70-350 bar (1000-5075 PSI)
H	40-210 bar (600-3050 PSI)
D	10-140 bar (150-2050 PSI)
F • •	**Remote Pressure Compensator**
• 1	**Control Port**
	NG6/Cetop3 Pattern*
Z	NG6 with Pressure Valve Mounted**
• R	**Control Type**
	Remote Compensator
F	Load Sensing Compensator
• L •	**Horsepower Compensator Control**
• A	**Control Port**
	NG6/Cetop3 (DIVW) Pattern*
C	NG6 with PVAC1PCS*S** Valve Mounted
Z	NG6 with Pressure Valve Mounted**
• T	**HP setting at 1800 RPM**
	60.0 (2100 in-lb Torque)
U	75.0 (2625 in-lb Torque)
W	90.0 (3150 in-lb Torque)
Y	120.0 (4200 in-lb Torque)
Z	150.0 (5250 in-lb Torque)
2	175.0 (6125 in-lb Torque)
3	200.0 (7000 in-lb Torque)

* Maximum pressure adjustment not included, but recommended. (See PVAC Section)
** Valve to be mounted at factory must be ordered as a separate line item. Consult factory. See PVAC section for pressure valve options.

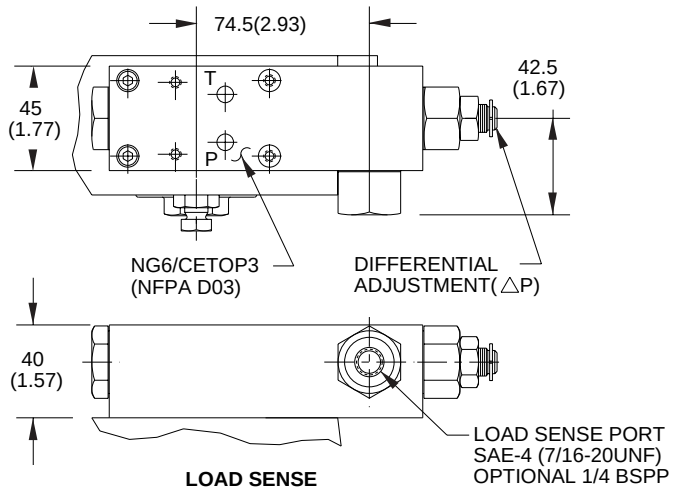


STANDARD PRESSURE COMPENSATOR OPTION FDS, FHS AND FWS

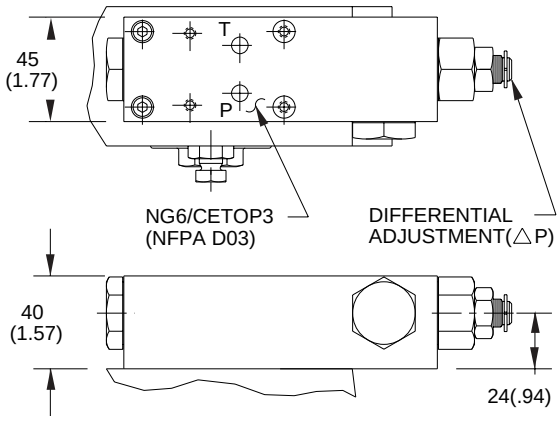


HORSEPOWER COMPENSATOR *LC AND *LZ

NOTE: SEE PAGE 38 FOR COMPENSATOR ACCESSORIES WHEN ORDERING THE *LZ OPTION.



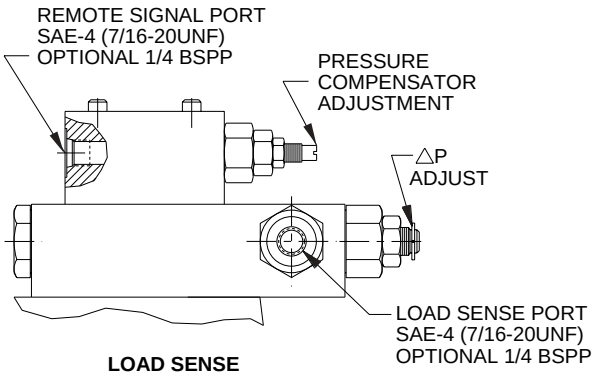
LOAD SENSE COMPENSATOR OPTION FF1 AND FFZ



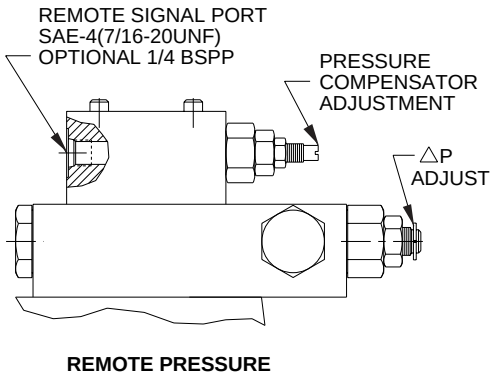
REMOTE PRESSURE COMPENSATOR OPTION FR1 AND FRZ

NOTE: SEE PAGE 38 FOR COMPENSATOR ACCESSORIES WHEN ORDERING THE FFZ OR FRZ OPTION.

CAUTION: FF1& FR1 CONTROL OPTIONS DO NOT HAVE A PUMP MAX.PRESSURE LIMITER (COMPENSATOR) INSTALLED.DO NOT ATTEMPT TO OPERATE PUMP WITHOUT INSTALLING A COMPENSATOR CONTROL.



LOAD SENSE COMPENSATOR OPTION FF1 AND FFZ WITH PVAC1PCS MAX PRESS.RELIEF**



REMOTE PRESSURE COMPENSATOR OPTION FR1 AND FRZ WITH PVAC1PCS MAX PRESS.RELIEF**

Variable Volume Piston Pumps
General PV Series

Control Options

PVAC		C	S		S				*
Variable Piston Pump Accessory	Accessory Valves	Compensator	Porting	Seals	Adjustment Type	Solenoid Voltage	Solenoid Connector		Design Series

Required when Ordering

Code	Compensator
C	Single Comp.

Code	Threads	Porting
S	English	SAE
M	Metric	Metric

Code	Adjustment Type
S	Screw with jam nut

Code	Solenoid Connector
Omit	Function "1P"
C	Conduit Box
P	Hirschmann w/plug
W	Hirschmann w/o plug

Code	Accessory Valves
1P	Max. Pressure Limit
2P	Two Pressure with DCV
1E	One Pressure and Vent with DCV
2E	2 pressure + low pressure stand-by electrical selection (energize for L.P. stand-by)
2M	2 pressure + low pressure stand-by electrical selection (deenergize for L.P. stand-by)

NOTE: Valves will include bolts for mounting.

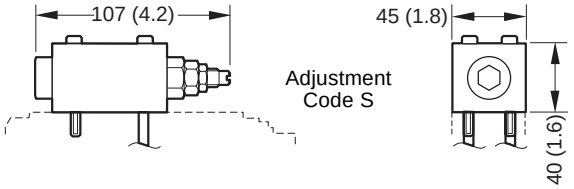
Code	Seals
N	Nitrile
V	Fluoroelastomers*

*"**FLUORELASTOMER** Is available under various registered trademarks, including **VITON** (a registered trademark of DuPont) and **FLUOREL** (a registered trademark of 3M)."

Code	Solenoid Voltage
Omit	Function "1P"
Y	110V/50Hz - 120V/60Hz
T	220V/50Hz - 240V/60Hz
J	24V DC

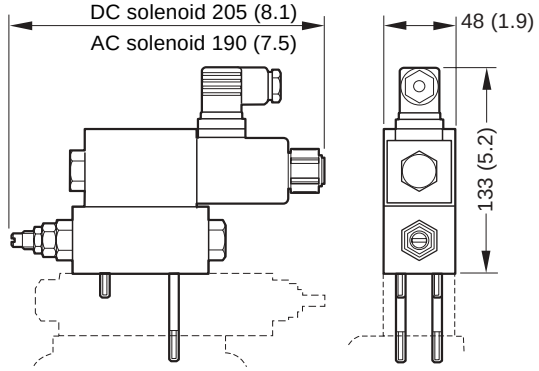
Dimensions

PVAC1P*



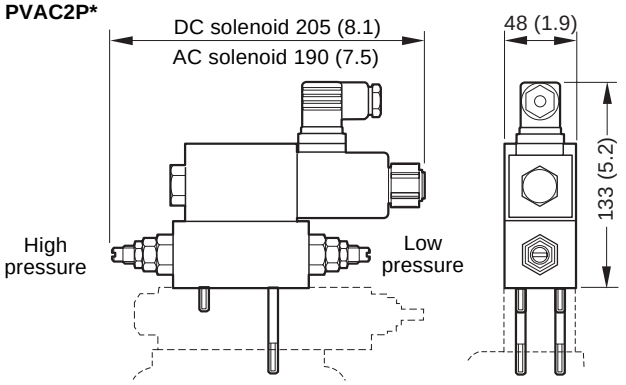
Pressure relief valve
mounted on compensator type R or F

PVAC1E*



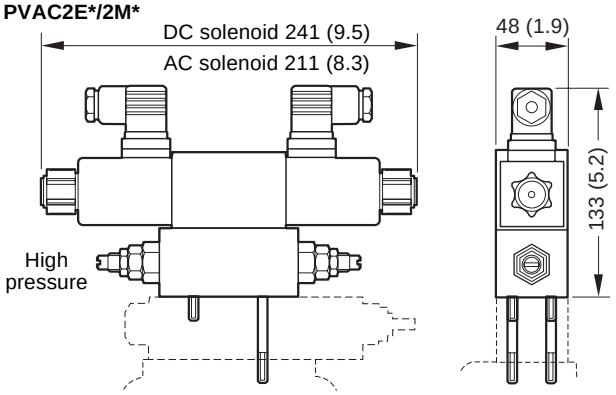
Pressure relief valve, electrical unloading,
mounted on compensator type R or F

PVAC2P*



2-pressure relief valve, electrical selection,
mounted on compensator type R or F

PVAC2E*/2M*



2-pressure relief valve, electrical selection and unloading,
mounted on compensator type R or F

Parker Hannifin Corporation
Hydraulic Pump/Motor Division
Greeneville, Tennessee

Ordering Examples

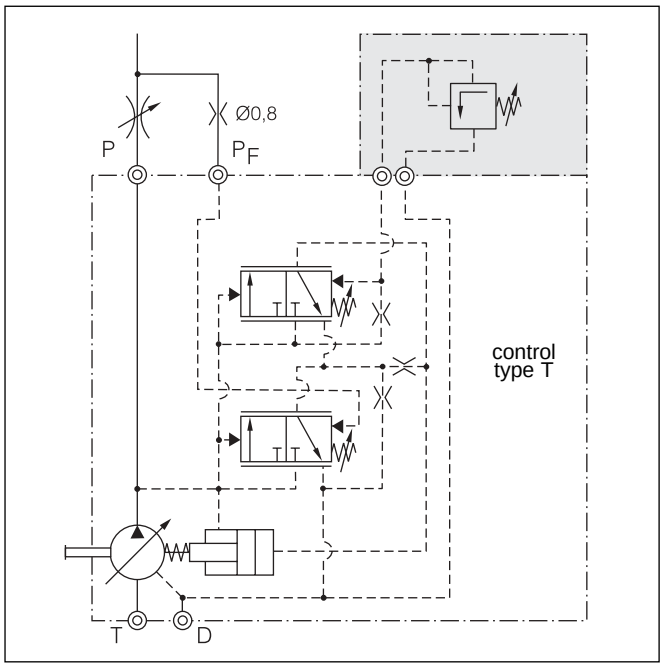
1. PV pump with remote pressure control, relief valve with 2 pressure stages, electrical pressure selection, nitrile seals, 24 VDC solenoid, plug to DIN 46350 accessories **fitted**:
   PV********FRZ
   PVAC2PCMNSJP

2. Same pump accessories **not fitted**:
   PV********FR1
   PVAC2PCMNSJP

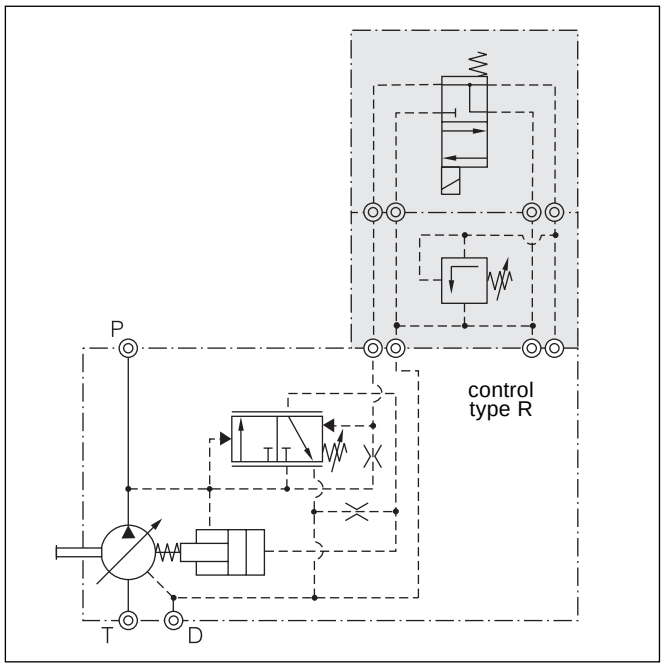
3. Usable for horsepower control.

Symbols

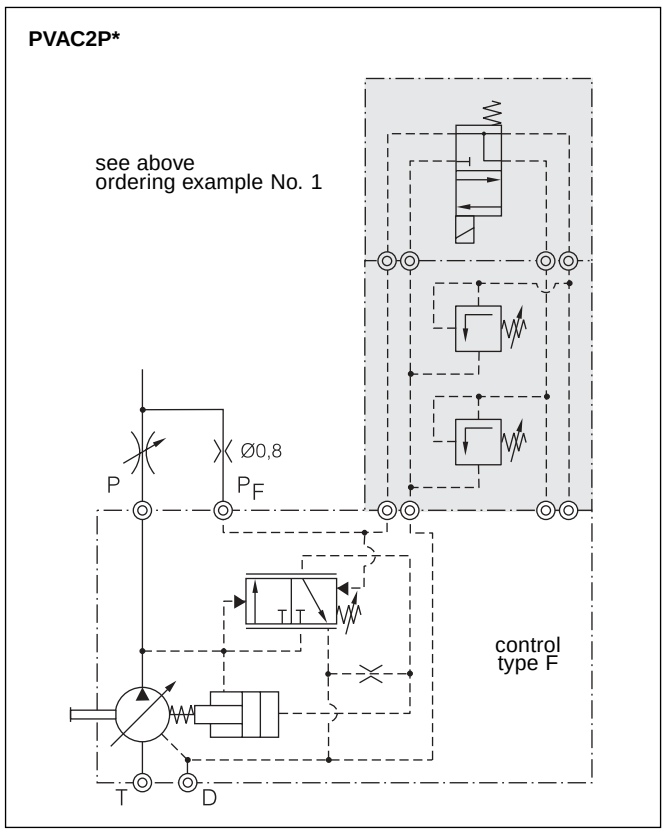
PVAC1P*



PVAC1E*

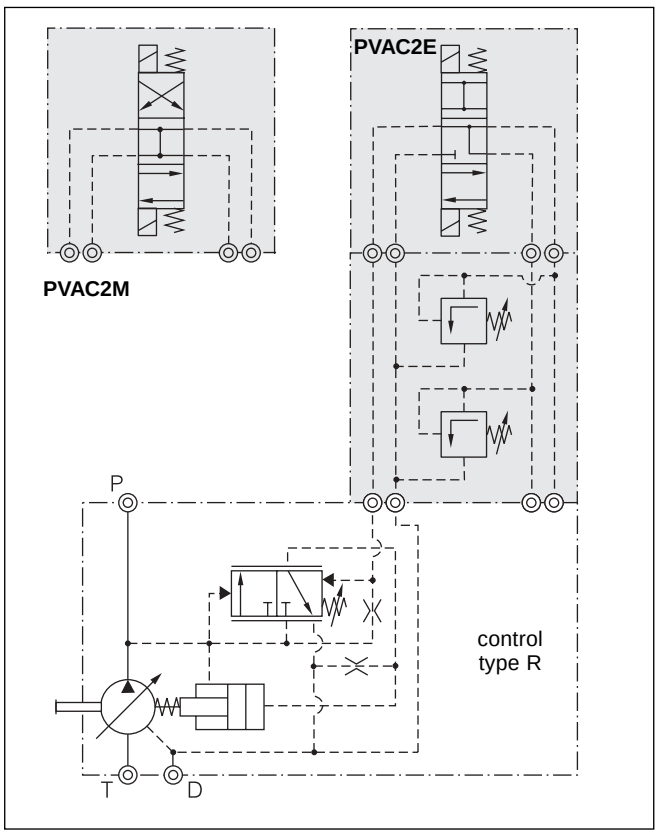


PVAC2P*



PVAC2M

PVAC2E



A

Cross reference ordering codes Parker series PV and Parker series PV plus

Code example PV:
code field no.:

PV	046	R	1	A	1	T	1	N	PWS	XX	YY
1	2	3	4	5	6	7	8	9	10	11	12

PV	Description	Remark	PV*plus*
Field 1	**Pump type**		Field 1
PV	Axial piston pump, open circuit, swashplate type, variable displacement		**PV**

PV	Description	Remark	PVplus
Field 2	**Nominal size, displacement**		Field 2
016	16 cm³/rev displacement		**016**
020	20 cm³/rev displacement		**020**
023	23 cm³/rev displacement		**023**
028	28 cm³/rev displacement	no longer available, in future series PVM up to 250 bar	
032	32 cm³/rev displacement		**032**
040	40 cm³/rev displacement		**040**
046	46 cm³/rev displacement		**046**
063	63 cm³/rev displacement		**063**
080	80 cm³/rev displacement		**080**
092	92 cm³/rev displacement		**092**
130	130 cm³/rev displacement	140 cm³/rev displacement	**140**
180	180 cm³/rev displacement		**180**
250	250 cm³/rev displacement	270 cm³/rev displacement	**270**

PV	Description	Remark	PVplus
Field 3	**Rotation**		Field 3
R	clockwise (looking on shaft)		**R**
L	counter-clockwise (looking on shaft)		**L**

PV	Description	Remark	PVplus
Field 4	**Variation**		Field 4
1	standard		**1**
9	displacement adjusted		**9**

PV	Description	Remark	PVplus
Field 5	**Mounting interface, shaft**		Field 5
A	SAE, 2/4-hole, keyed shaft	4 Bolt SAE Pilot, SAE Keyed Shaft	**D**
B	SAE, 2/4-hole, splined shaft	4 Bolt SAE Pilot, SAE Spline Shaft	**E**
C	SAE, 4-hole, splined shaft, second pump	no longer available	
D	SAE, 4-hole, keyed shaft		**D**
E	SAE, 4-hole, splined shaft		**E**
J	metric, splined shaft, second pump	no longer available	
K	metric, keyed shaft		**K**
L	metric, splined shaft		**L**

PV	Description	Remark	PVplus
Field 6	**Was: displacement adjustment**	**Now: ports, threads**	Field 6
1	with displacement adjustment	metric, BSPP	**1**
		SAE, UNF	**3**
		SAE, ISO 6149	**7**
		metric, ISO 6149	**8**

Code example PV:
code field no.:

PV	046	R	1	D	3	T	1	N	FWS	XX	YY
1	2	3	4	5	6	7	8	9	10	11	12

Cross reference ordering codes Parker series PV and Parker series PV plus

Code example PV:	**PV**	**046**	**R**	**1**	**A**	**1**	**T**	**1**	**N**	**PWS**	**XX**	**YY**
code field no.:	1	2	3	4	5	6	7	8	9	10	11	12

PV		Thru drive and Second Pump Option		PVplus	
Field				Field	
7	**8**	**Description**	**Remark**	**7**	**8**
T	**1**	Thru shaft Capable with Cover		**T**	**1**
A	**4**	2/4 Bolt SAE "A" Pilot 3.25"/SAE "A" 9T Spline Coupler	2 Bolt SAE "A" Pilot 3.25"/SAE "A" 9T Spline Coupler	**A**	**4**
B	**7**	2/4 Bolt SAE "B" Pilot 4.00"/SAE "B" 13T Spline Coupler	4 Bolt SAE "B" Pilot 4.00"/SAE "B" 13T Spline Coupler	**B**	**3**
			2 Bolt SAE "B" Pilot 4.00"/SAE "B" 13T Spline Coupler	**B***	**7**
C	**8**	2/4 Bolt SAE "C" Pilot 5.00"/SAE "C" 14T Spline Coupler	4 Bolt SAE "C" Pilot 5.00"/SAE "C" 14T Spline Coupler	**C****	**3**
			2 Bolt SAE "C" Pilot 5.00"/SAE "C" 14T Spline Coupler	**C*****	**7**
H	**2**	4 Bolt 80mm Pilot/W ? x ? x ? x 8f DIN 5480 Coupler		**H**	**3**
J	**2**	4 Bolt 100mm Pilot/W 25 x 1.5 x 15 x 8f DIN 5480 Coupler		**J**	**3**
K	**2**	4 Bolt 125mm Pilot/W 32 x 1.5 x 20 x 8f DIN 5480 Coupler		**K****	**3**
W	**7**	2/4 Bolt SAE "B" Pilot 4.00"/SAE "BB" 15T Spline Coupler	4 Bolt SAE "B" Pilot 4.00"/SAE "BB" 15T Spline Coupler	**W**	**3**
			2 Bolt SAE "B" Pilot 4.00"/SAE "BB" 15T Spline Coupler	**W**	**7**
Y	**7**	2 Bolt SAE "AA" Pilot 2.00"/SAE "A" 9T Spline		**Y#**	**7**

*Not available with size 1
**Size 2 or larger
***Not available with size 1 and 2
****Only available with 032 and larger
#Only available with size 1

PV	Description	Remark	PVplus
Field 9	**Seal material**		Field 9
N	NBR		**N**
V	FPM		**V**

PV	Description	Remark	PVplus
Field 10	**Compensator options**		Field 10
****S**	standard pressure compensator	only fast response option available	**F*S**
***RC**	remote pressure compensator	only fast response option available	**FRC**
***R1**	remote pressure compensator with D03 interface	only fast response option available	**FR1**
***F1**	load-sensing compensator with D03 interface	only fast response option available	**FF1**
L	horse power compensator	no longer for load sensing	***L***

PV	Description	Remark	PVplus
Field 11	**Design series pump**		Field 11
	not required on order		

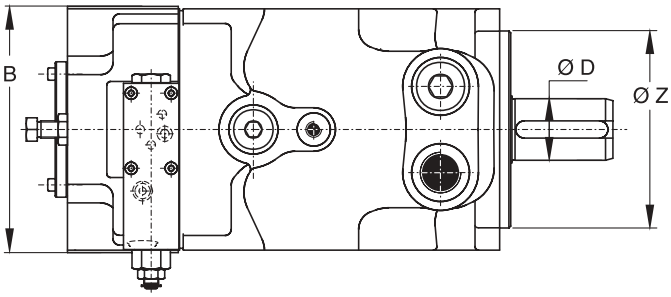
PV	Description	Remark	PVplus
Field 12	**Design series compensator**		Field 12
	not required on order		

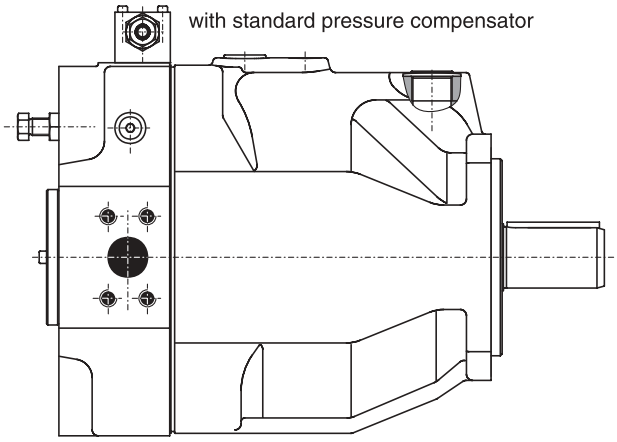
*Consult Factory for assistance in crossing over PV model codes that are not shown.

Code example PV:	**PV**	**046**	**R**	**1**	**D**	**3**	**T**	**1**	**N**	**FWS**	**XX**	**YY**
code field no.:	1	2	3	4	5	6	7	8	9	10	11	12

A

Differences in dimensions
*Dimensional Differences only evident in PV140, 180 & 270.





Dimension	PV130, PV180	PV140, PV180	PV250	PV270
Z, metric (mm)	Ø160	Ø 160	Ø 200	Ø 200
D, metr., key (mm)	Ø 50	Ø 50	Ø 65	Ø 65
D, metr., spline	W50x1.25x38	W50x2x24	W62x1.25x48	W60x2x28
Z, SAE (in)	Ø 152.4	Ø 152.4	Ø 165.1	Ø 165.1
D, SAE, key (in)	Ø 50.8	Ø 50.8	Ø 50.8	Ø 50.8
D, SAE, spline (in)	15T8/16DP	15T8/16DP	15T8/16DP	15T8/16DP
B (mm)	200	200	330	250

Series	Model	Displacement cc/rev (in³/rev)	Mass kg (lbs)
1	PV016	16 (.98)	19 (42)
	PV020	20 (1.2)	
	PV023	23 (1.4)	
2	PV032	32 (1.9)	30 (66)
	PV040	40 (2.4)	
	PV046	46 (2.8)	
3	PV063	63 (3.8)	60 (132)
	PV080	80 (4.8)	
	PV092	92 (5.6)	
4	PV140	140 (8.5)	90 (198)
	PV180	180 (10.9)	
5	PV270	270 (16.5)	172 (379)

Use of Relief Valve

The use of a relief valve, while not mandatory is recommended in the main circuit to supress hydraulic shock loads and adds additional system protection.

Fluid Recommendations

Premium quality hydraulic oil with a viscosity range between 150-250 SSU (30-50 cst.) at 100°F (38°C). Normal operating viscosity range between 80-1000 SSU (17-180 cst.). Maximum start-up viscosity is 4000 SSU (1000cst.).

Note: Consult Parker when exceeding 160°F (71°C) operation. Oil should have maximum anti-wear properties, rust and oxidation treatment.

Filtration

For maximum pump and system component life, the system should be protected from contamination at a level not to exceed 125 particles greater than 10 microns per milliliter of fluid. (SAE Class 4/ISO 16/13.) Due to the nature of variable displacement pumps, variations in pump inlet conditions, fluid acceleration losses, system aeration, and duty cycle we do not recommend suction line filters. We do recommend the use of a properly sized, in-tank, suction strainer. Contact your Parker representative for assistance.

Start-Up

On initial start-up, the pump case must be filled with fluid. Pressure adjustments should be reduced and the circuit should be open to permit priming.

Special Installations

Consult your Parker representative for any application requiring the following:

Pressure above rated, drive speed above maximum, indirect drive, fluid other than petroleum oil, fluid temperature above 160°F (71°C)

Shaft Rotation and Line Up

Pump and motor shaft alignment must be within .010 TIR maximum, using a standard floating coupling. Please follow coupling manufacturer's recommended installation instrucitons to prevent end thrust on pump shaft. Turn pump to assure freedom of rotation. Pump and motor must be on a rigid base.

The coupling should be sized to absorb the peak horsepower developed.

Installation and Mounting

When mounting a PV Series Pump, the "case drain" must be on top of the pump. The "case drain" should be a seperate line unrestricted to the reservoir and extend below the oil level as far from the inlet as possible. The "case drain" line must not exceed 10 PSI (.69 bar) back pressure.

The "case drain" line should be as large in diameter as possible and as short in length as possible. Suggested maximum line length is 10 ft.

Check that the driving motor rotates in the same direction as indicated by the rotation arrow on the pump.

A

Wear protection, wear reduction

Wear protection resp. wear reduction

In hydraulic components there are many gliding contacts partly under high (side) loads. Beside the correct viscosity, which on one hand is responsible for the required supply of lubricating fluid to the gap, on the other hand assures a stable lubricating film, the wear reduction capability of the hydraulic fluid is of major importance.

The describing parameter, the, Schadenskraftstufe" (load carrying capability), is determined in the FZG-normal test A/8, 3/90 according to DIN 51354 part 2 (gear transmission test rig, 12 defined load steps at 90° Cstart temperature and 8,3 m/s circumferance speed).

Depending on the nominal working pressure the following FZG Numbers is recommended!

nominal pressure bar (PSI)		FZG
80 - 125	(1160 - 1812)	$\geq$ 5
125 - 200	(1812 - 2900)	5 - 6
200 - 250	(2900 - 3625)	7 - 9
250 - 320	(3625 - 4641)	$\geq$ 10
> 320	(4641)	$\geq$ 12

Max pressure limit: 1,25 x nominal pressure

Mineral oils are offered according to DIN 51 524 in different fluid types:

- HL-fluids according to DIN 51 524 part 2, normal working load conditions, FZG 6-10.

- HLP-fluids according to DIN 51 524 part 3, higher working load conditions, FZG > 10.

Modern HLP-fluids today usually come with a FZG >12. They are equipped with wear prohibiting additives, which ensure a high safety of operation under severe working conditions.