

Technical Information

Performance Information

Series PVP 23/33 Pressure Compensated, Variable Volume, Piston Pumps

Features

- High Strength Cast-Iron Housing for Reliability and Quiet Operation
- Optional Inlet/Outlet Locations for Ease of Installation
- Replaceable Bronze Port Plate
- Replaceable Piston Slipper Plate
- Thru-Shaft Capability SAE AA, A and B Pilots Offered
- Low Noise Levels
- Fast Response Times

Controls

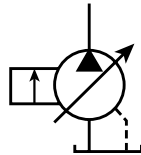
- Pressure Compensation
- Remote Pressure Compensation
- Load Sensing
- Torque (Power) Limiting
- Adjustable Maximum Volume Stop

Schematic Symbol

(Basic Pump)

Specifications

Pressure Ratings



Outlet Port: 248 bar (3600 PSI) Continuous (P1)
310 bar (4500 PSI) Peak (P3)

Inlet Port: 1.72 bar (25 PSI) Maximum
.17 bar (5 In. Hg.) Vacuum Minimum @ 1800 RPM
(See inlet chart for other speeds)

Speed Ratings: 600 to 3000 RPM

Operating Temperature Range:

Housing Material: Cast-Iron

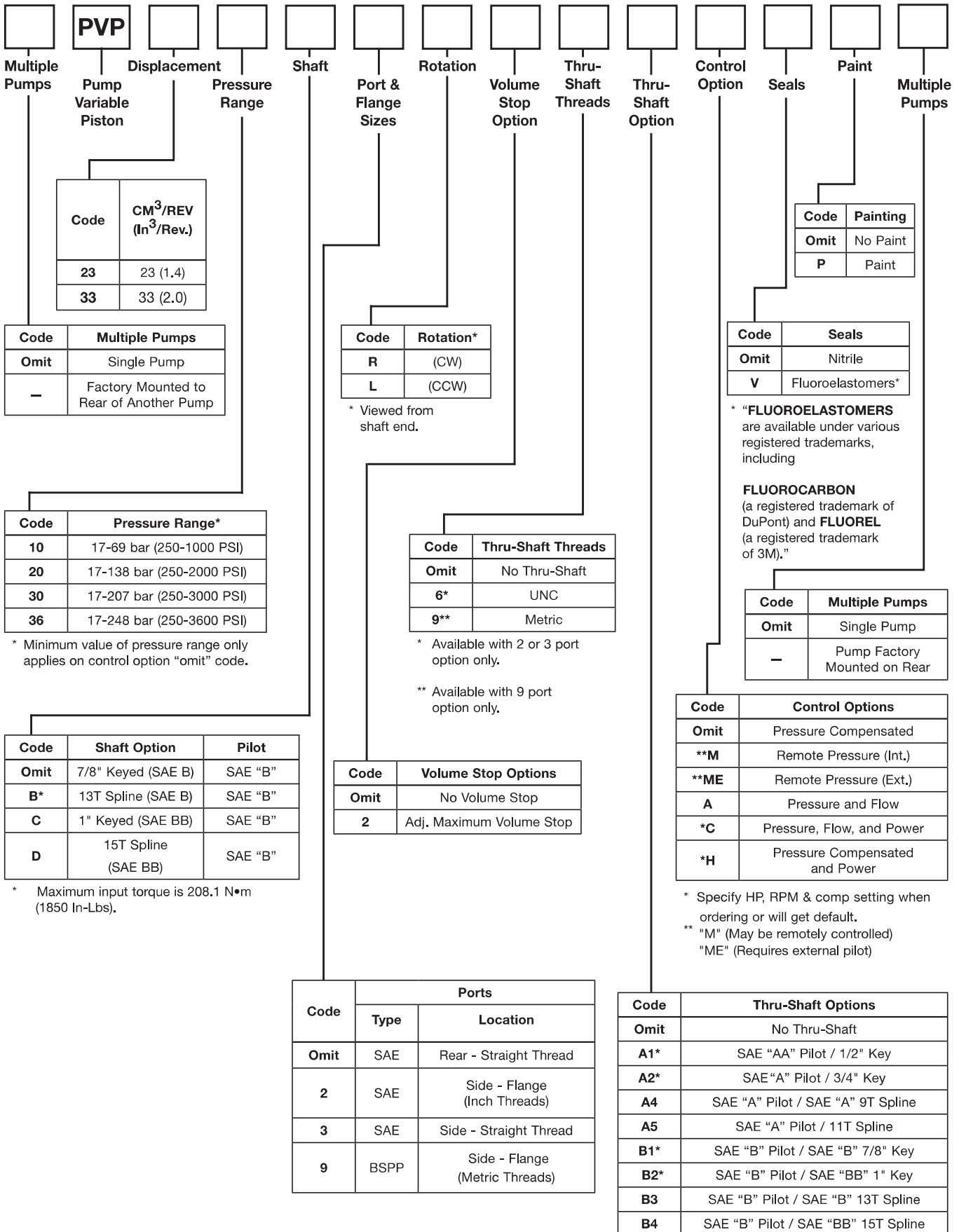
Filtration: Maintain SAE Class 4,
ISO 16/13,
ISO 18/15 Maximum

Mounting: SAE "B"
Flange Mount

Installation Data: See page 42 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 pumps.

Quick Reference Data Chart

Pump Model	Displacement cc/rev (In ³ /rev)	Pump Delivery @ 21 bar (300 PSI) in LPM (GPM)		Input Power At 1800 RPM, Max. Displacement & 248 bar (3600 PSI)
		1200 RPM	1800 RPM	
PVP23	23.0 (1.4)	28.0 (7.4)	42.0 (11.1)	19.7 kw (26.5 hp)
PVP33	33.0 (2.0)	39.4 (10.4)	59.0 (15.6)	27.2 kw (36.5 hp)



Code	CM ³ /REV (In ³ /Rev.)
23	23 (1.4)
33	33 (2.0)

Code	Multiple Pumps
Omit	Single Pump
-	Factory Mounted to Rear of Another Pump

Code	Pressure Range*
10	17-69 bar (250-1000 PSI)
20	17-138 bar (250-2000 PSI)
30	17-207 bar (250-3000 PSI)
36	17-248 bar (250-3600 PSI)

* Minimum value of pressure range only applies on control option "omit" code.

Code	Shaft Option	Pilot
Omit	7/8" Keyed (SAE B)	SAE "B"
B*	13T Spline (SAE B)	SAE "B"
C	1" Keyed (SAE BB)	SAE "B"
D	15T Spline (SAE BB)	SAE "B"

* Maximum input torque is 208.1 N•m (1850 In-Lbs).

Code	Rotation*
R	(CW)
L	(CCW)

* Viewed from shaft end.

Code	Thru-Shaft Threads
Omit	No Thru-Shaft
6*	UNC
9**	Metric

* Available with 2 or 3 port option only.

** Available with 9 port option only.

Code	Volume Stop Options
Omit	No Volume Stop
2	Adj. Maximum Volume Stop

Code	Ports	
	Type	Location
Omit	SAE	Rear - Straight Thread
2	SAE	Side - Flange (Inch Threads)
3	SAE	Side - Straight Thread
9	BSPP	Side - Flange (Metric Threads)

Code	Painting
Omit	No Paint
P	Paint

Code	Seals
Omit	Nitrile
V	Fluoroelastomers*

* "FLUOROELASTOMERS are available under various registered trademarks, including

FLUOROCARBON (a registered trademark of DuPont) and **FLUOREL** (a registered trademark of 3M)."

Code	Multiple Pumps
Omit	Single Pump
-	Pump Factory Mounted on Rear

Code	Control Options
Omit	Pressure Compensated
**M	Remote Pressure (Int.)
**ME	Remote Pressure (Ext.)
A	Pressure and Flow
*C	Pressure, Flow, and Power
*H	Pressure Compensated and Power

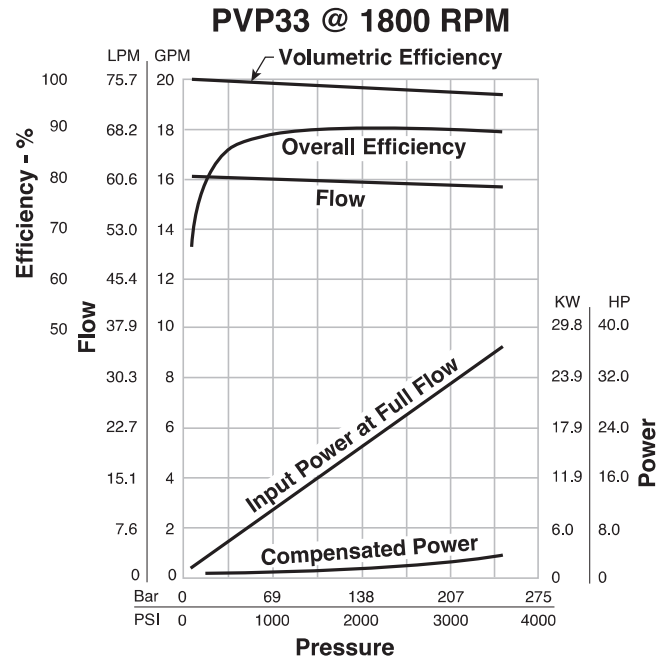
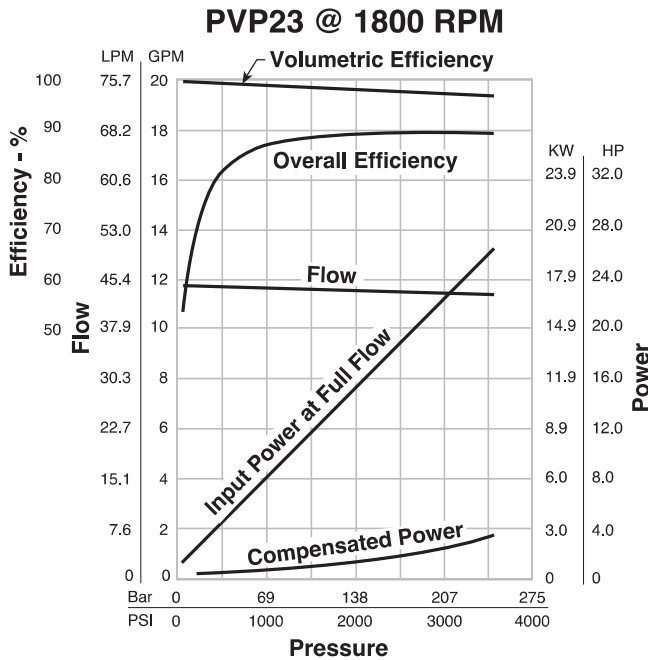
* Specify HP, RPM & comp setting when ordering or will get default.

** "M" (May be remotely controlled)
"ME" (Requires external pilot)

Code	Thru-Shaft Options
Omit	No Thru-Shaft
A1*	SAE "AA" Pilot / 1/2" Key
A2*	SAE "A" Pilot / 3/4" Key
A4	SAE "A" Pilot / SAE "A" 9T Spline
A5	SAE "A" Pilot / 11T Spline
B1*	SAE "B" Pilot / SAE "B" 7/8" Key
B2*	SAE "B" Pilot / SAE "BB" 1" Key
B3	SAE "B" Pilot / SAE "B" 13T Spline
B4	SAE "B" Pilot / SAE "BB" 15T Spline

* Keyed option only available with UNC threads.

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



NOTE: The efficiencies and data in the graph are good only for pumps running at 1800 RPM and stroked to maximum. To calculate approximate horsepower for the other conditions, use the following formula:

WHERE:

Q = Actual Output Flow in GPM

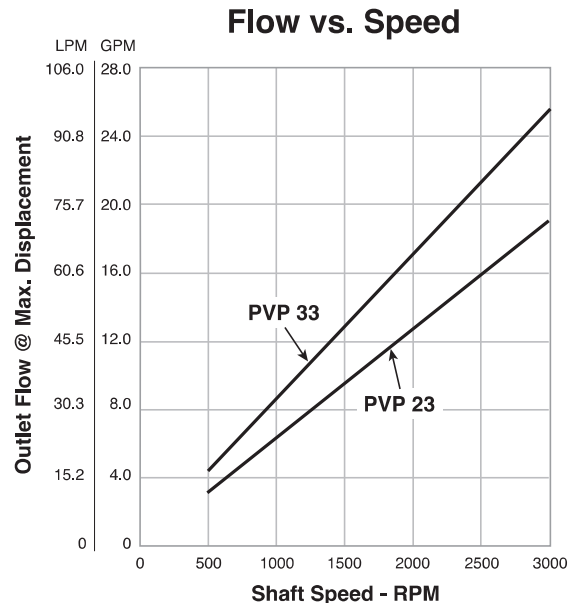
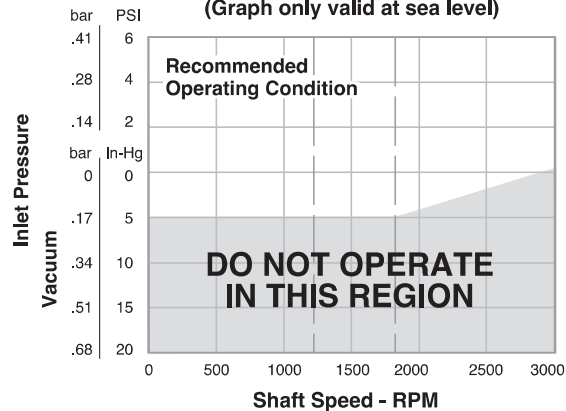
PSI = Pressure At Pump Outlet

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

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

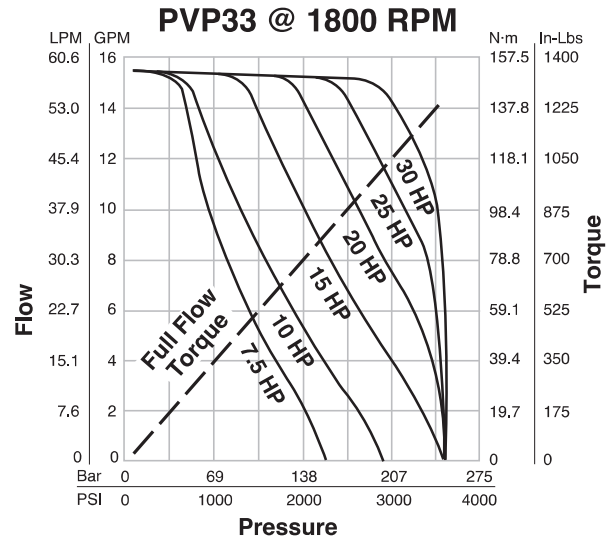
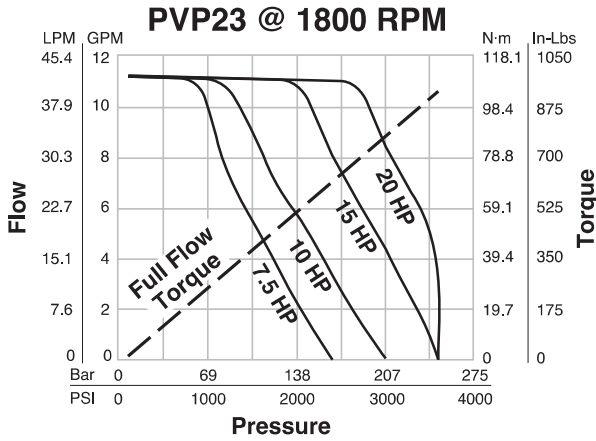
Actual GPM is directly proportional to drive speed and maximum volume setting. Flow loss, however, is a function of pressure only.

PVP 23/33 Inlet Characteristics at Full Displacement
(Graph only valid at sea level)

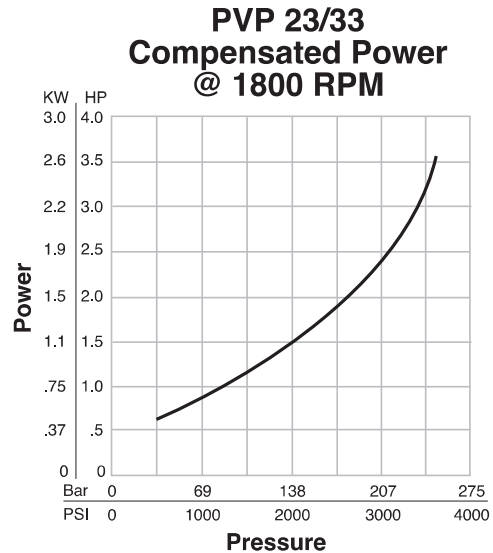
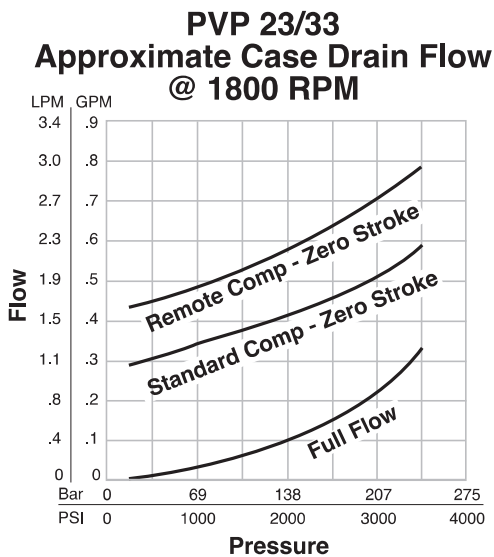
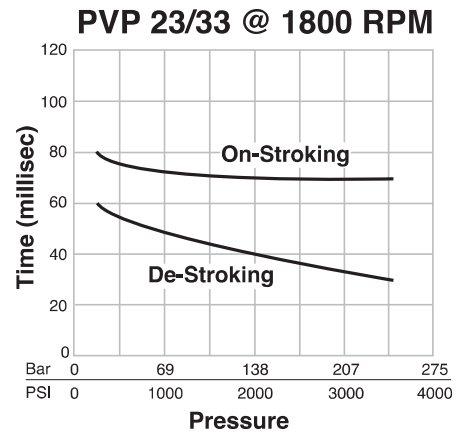
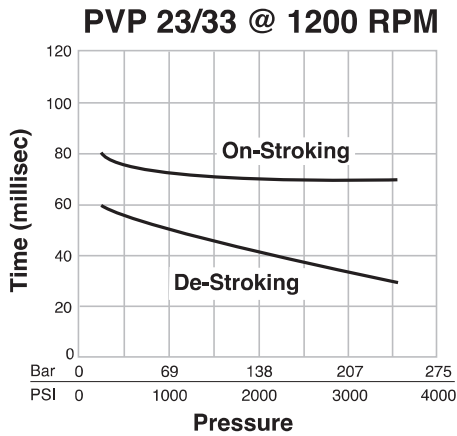


Typical Performance Data - Fluid: Standard Hydraulic Oil 100 SSU @ 49°C (120°F)

Power Control



Response Times



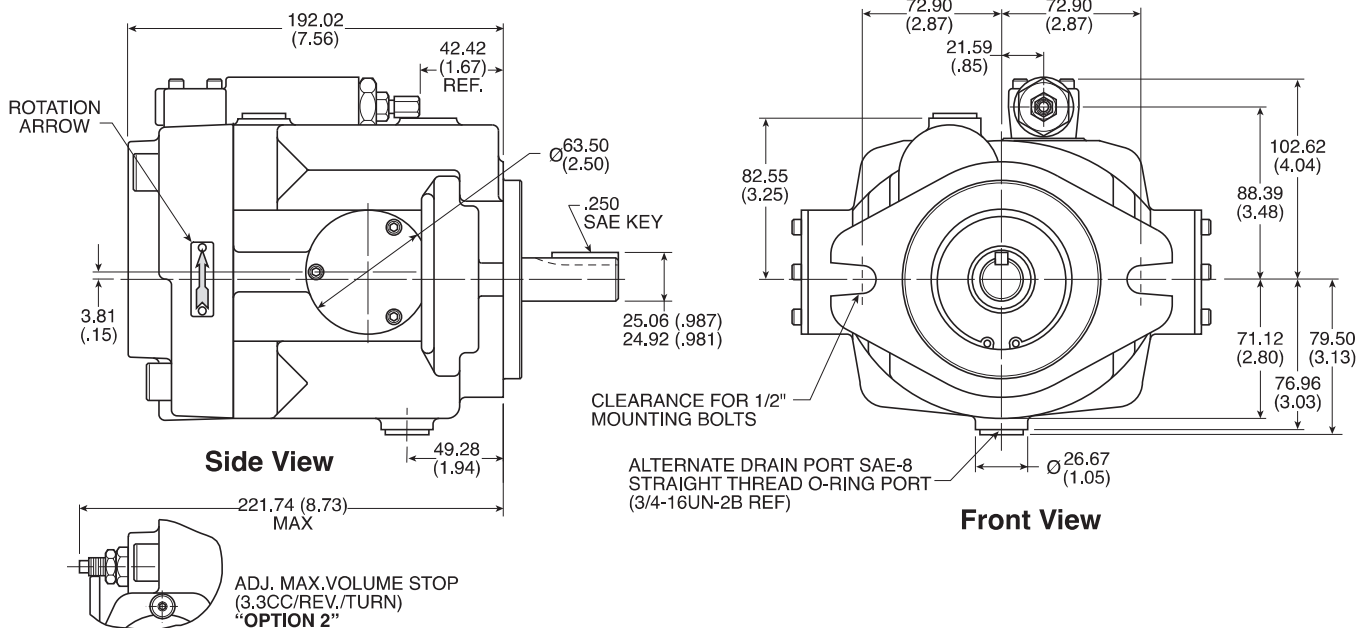
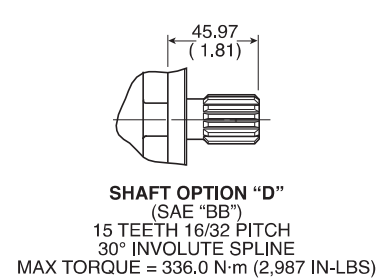
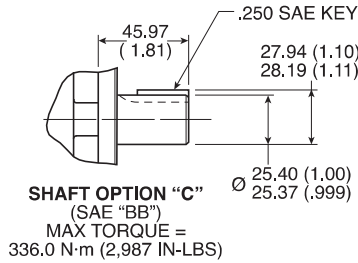
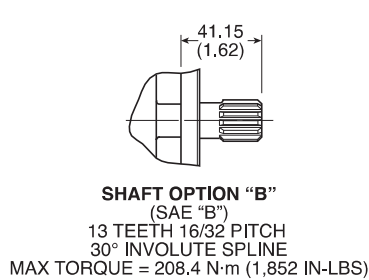
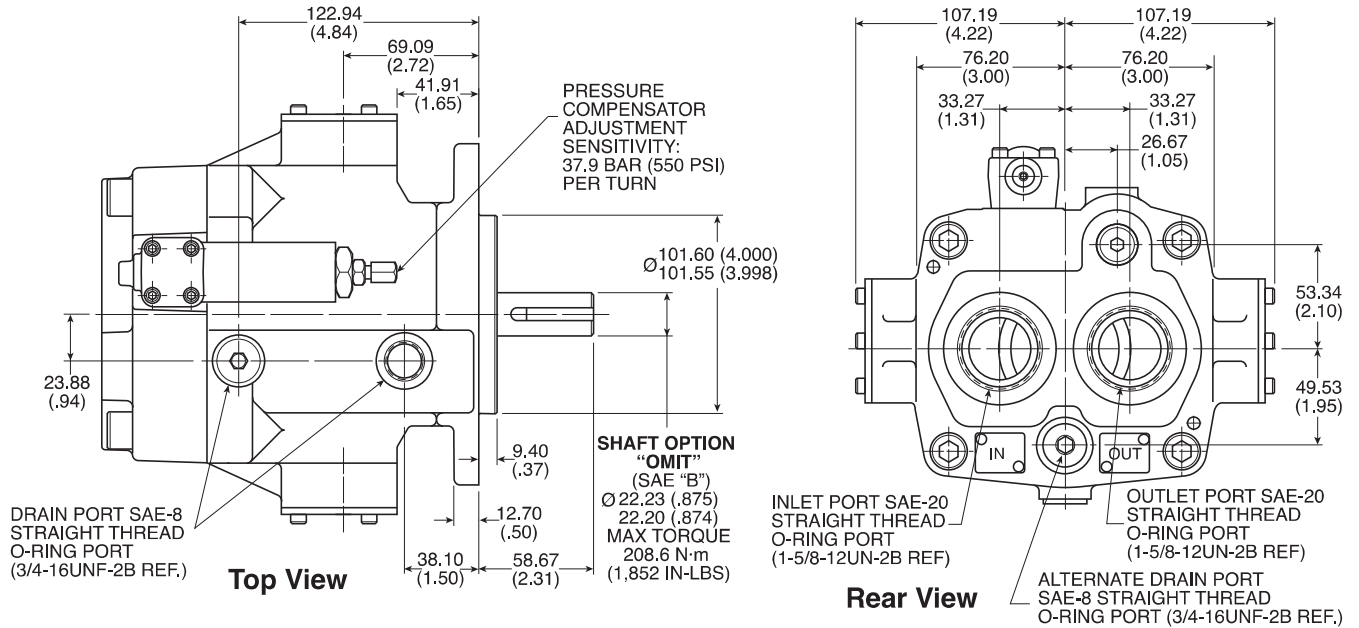
Dimensional Data

Rear Ported Pump Dimensions

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

NOTES:

1. Righthand (CW) rotation pump shown. Lefthand (CCW) pumps have inlet and outlet ports reversed.
2. Pump shown with standard pressure compensator (control option "omit").



Dimensional Data

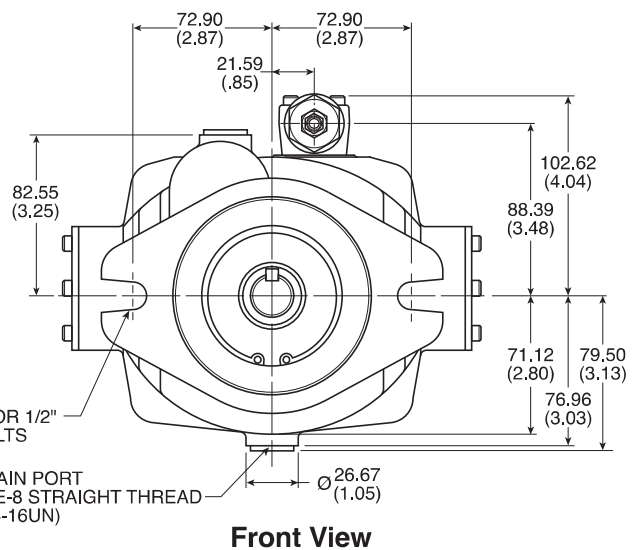
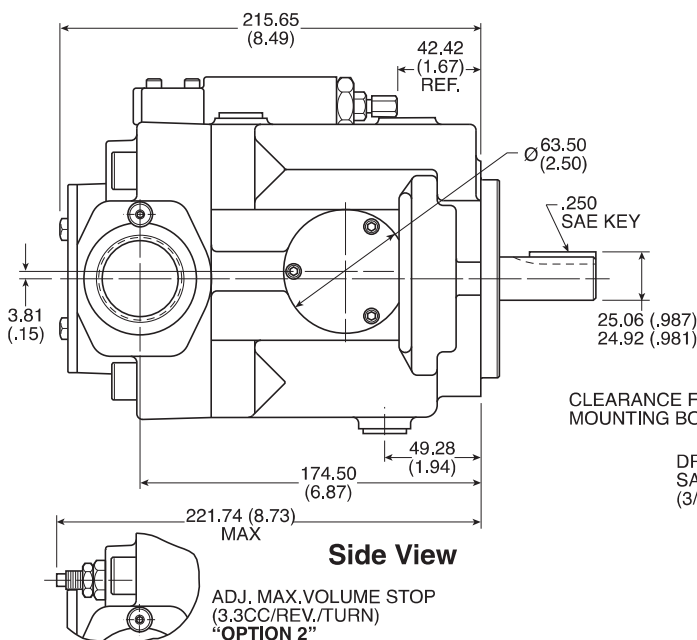
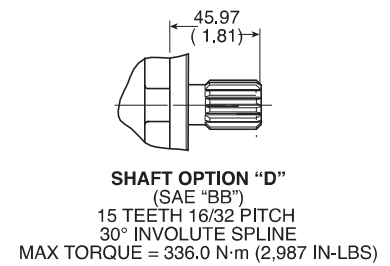
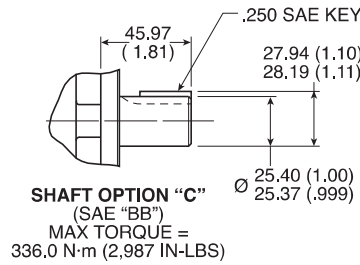
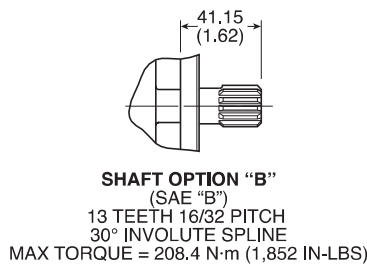
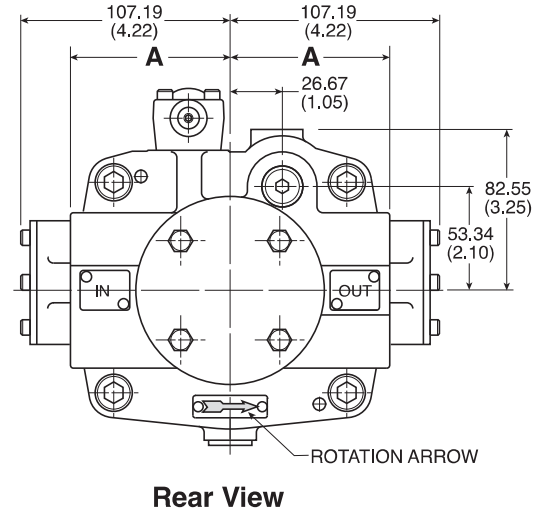
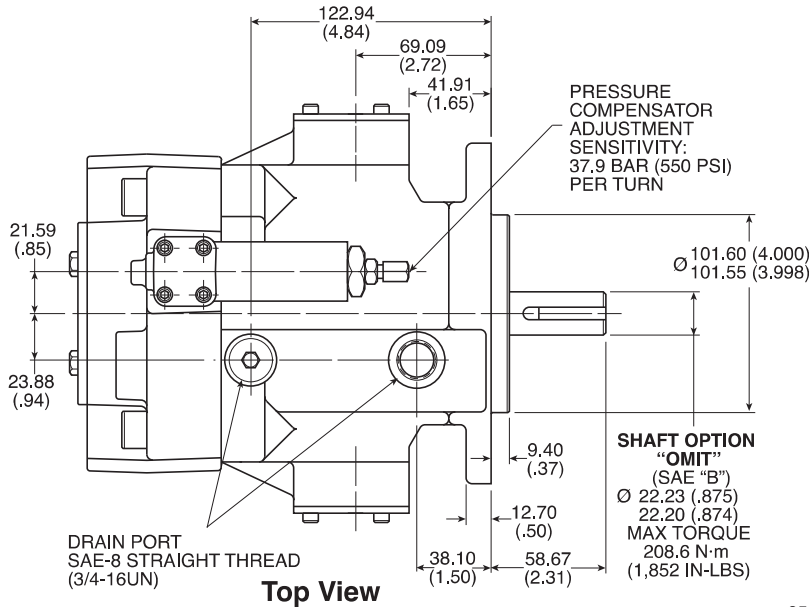
Side Ported – Options 2 & 3 Dimensions

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

NOTES:

1. Righthand (CW) rotation pump shown. Lefthand (CCW) pumps have inlet and outlet ports reversed.
2. Pump shown with standard pressure compensator (control option “omit”).

Port Location		
Option	A	Inlet and Outlet Ports
2	148.84 (3.10)	1-1/4" SAE 4-Bolt Flange 7/16-14 Threads Standard Pressure Series (Code 61)
3	152.40 (3.22)	SAE-20 Straight Thread (1-5/8-12UN-2B)



Dimensional Data

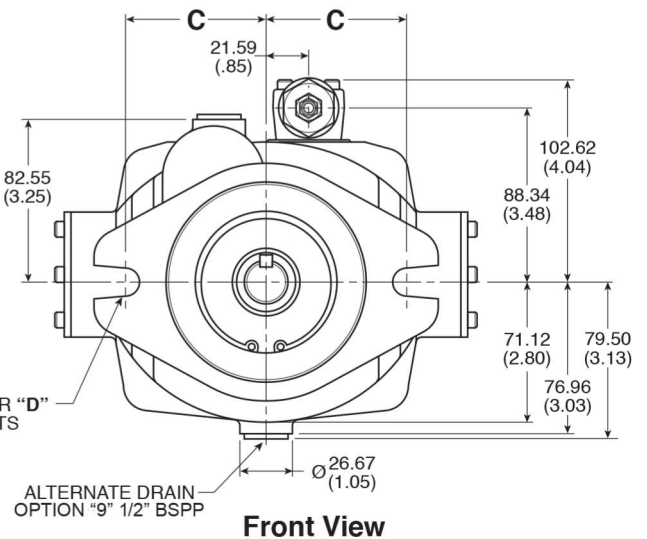
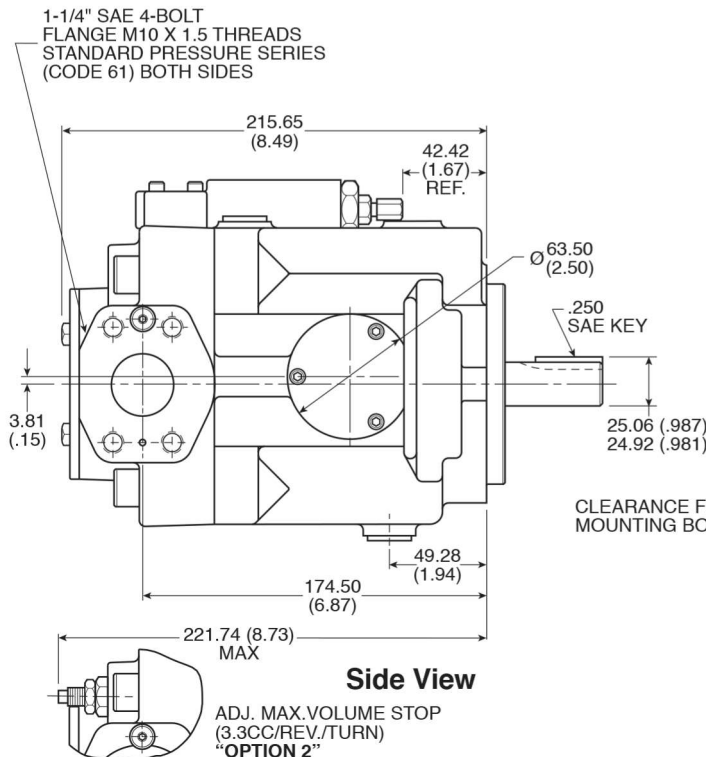
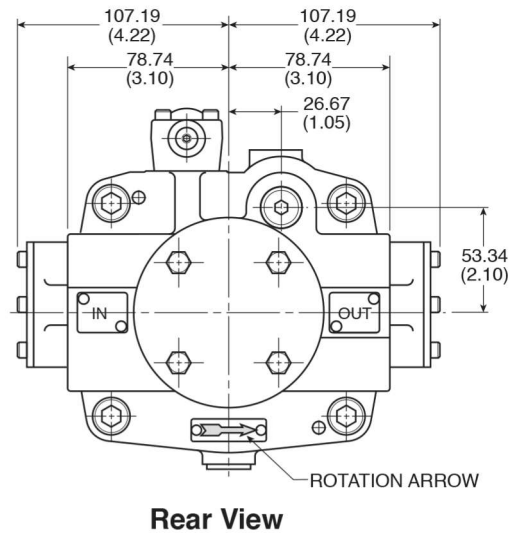
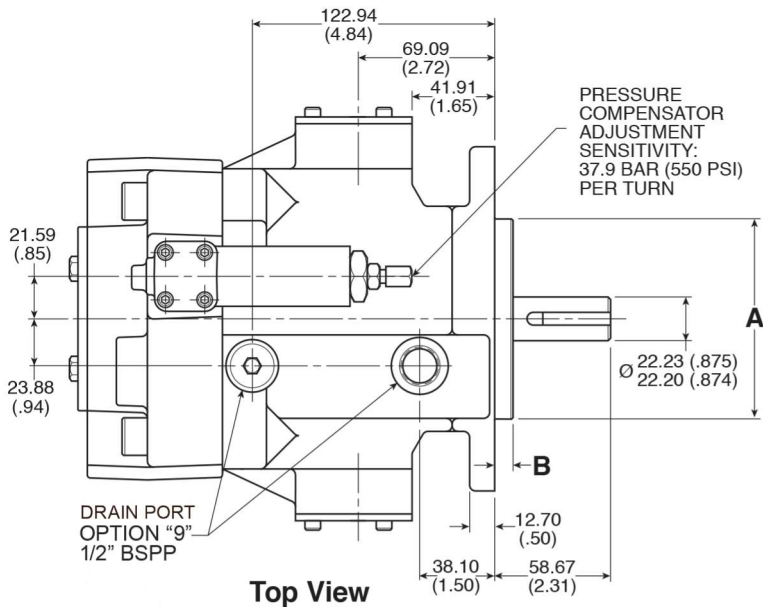
Side Ported – Option 9 Dimensions

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

NOTES:

1. Righthand (CW) rotation pump shown. Lefthand (CCW) rotation pump will have inlet and outlet ports reversed.
2. Pump shown with standard pressure compensator (control option “omit”).

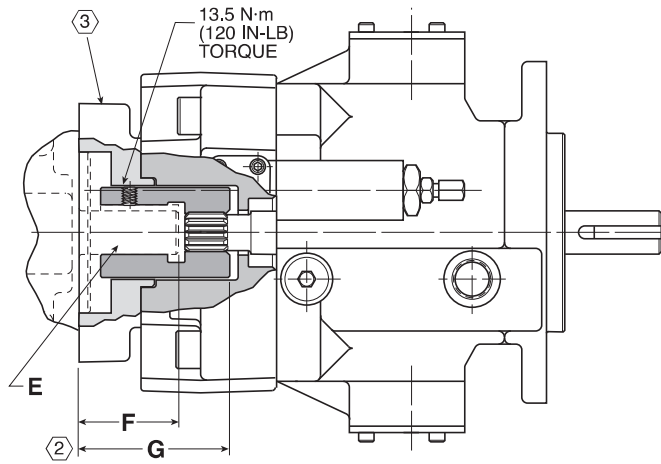
Pilot Dimensions				
Shaft Option	A	B	C	D
Omit B, C, D	101.60/101.55 (4.000/3.998)	9.40 (.37)	72.90 (2.87)	ø 12.70 (.50)



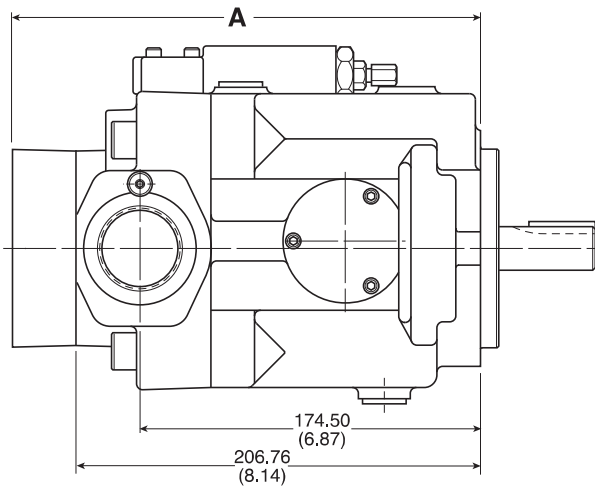
Dimensional Data

Thru-Shaft Pump Dimensions

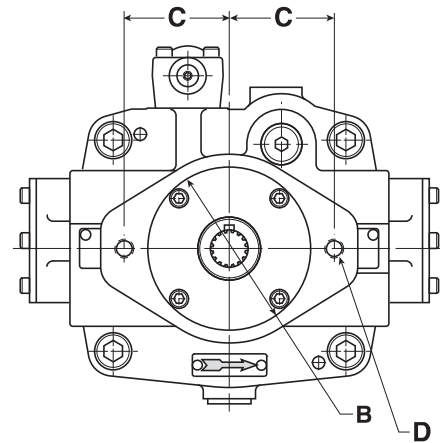
* Inch equivalents for millimeter dimensions are shown in (**).



Top View



Side View



Rear View

NOTES:

1. Righthand (CW) rotation side ported pump shown. Lefthand (CCW) pump will have inlet and outlet ports reversed.
2. Install coupler on shaft of rear pump to dimension shown then lock down coupler using set screws.
3. Options, 6A2, 6A4, 9A4 and 9A5 Design Series 20 have a gasket seal, all other thru-shaft options incorporate an o-ring seal and have an o-ring groove.
4. Maximum torque transmitting capacity 209 N•m (1850 in-lbs).

Thru-Shaft Options							
VARIATION	A	B	C	D	E	F	G
6A1	232.16 (9.14)	50.83/50.85 (2.001/2.002)	41.28 (1.63)	5/16-18UNC-2B	12.70 x 3.18 (.50 x .125) Key	38.10 (1.50)	69.09 (2.72)
6A2	238.51 (9.39)	82.58/82.60 (3.251/3.252)	53.19 (2.09)	3/8-16UNC-2B	19.05 x 4.76 (.75 x .188) Key	44.45 (1.75)	75.44 (2.97)
6A4	238.51 (9.39)	82.58/82.60 (3.251/3.252)	53.19 (2.09)	3/8-16UNC-2B	9 Tooth 16/32 Pitch	31.75 (1.25)	N/A
6A5	238.51 (9.39)	82.58/82.60 (3.251/3.252)	53.19 (2.09)	3/8-16UNC-2B	11 Tooth 16/32 Pitch	31.75 (1.25)	N/A
6B1	252.48 (9.94)	101.63/101.65 (4.001/4.002)	73.03 (2.88)	1/2-13UNC-2B	22.23 x 6.35 (.875 x .25) Key	58.67 (2.31)	89.41 (3.52)
6B2	252.48 (9.94)	101.63/101.65 (4.001/4.002)	73.03 (2.88)	1/2-13UNC-2B	25.40 x 6.35 (1.00 x .25) Key	45.97 (1.81)	89.41 (3.52)
6B3	252.48 (9.94)	101.63/101.65 (4.001/4.002)	73.03 (2.88)	1/2-13UNC-2B	13 Tooth 16/32 Pitch	41.15 (1.62)	N/A
6B4	252.48 (9.94)	101.63/101.65 (4.001/4.002)	73.03 (2.88)	1/2-13UNC-2B	15 Tooth 16/32 Pitch	45.97 (1.81)	N/A
9A4	238.51 (9.39)	82.58/82.60 (3.251/3.252)	53.19 (2.09)	M10 x 1.50	9 Tooth 16/32 Pitch	31.75 (1.25)	N/A
9A5	238.51 (9.39)	82.58/82.60 (3.251/3.252)	53.19 (2.09)	M10 x 1.50	11 Tooth 16/32 Pitch	31.75 (1.25)	N/A
9B3	252.48 (9.94)	101.63/101.65 (4.001/4.00)	73.03 (2.88)	M12 x 1.75	13 Tooth 16/32 Pitch	41.15 (1.62)	N/A
9B4	252.48 (9.94)	101.63/101.65 (4.001/4.00)	73.03 (2.88)	M12 x 1.75	15 Tooth 16/32 Pitch	45.97 (1.81)	N/A

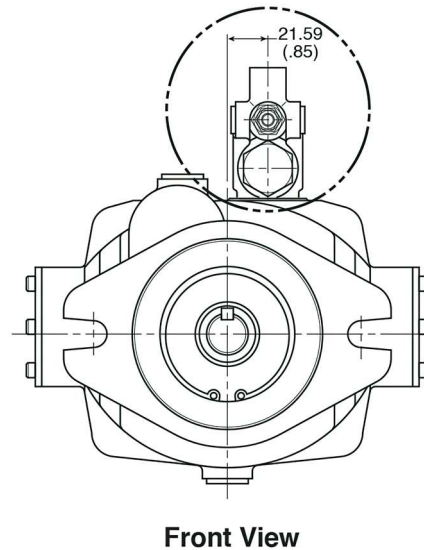
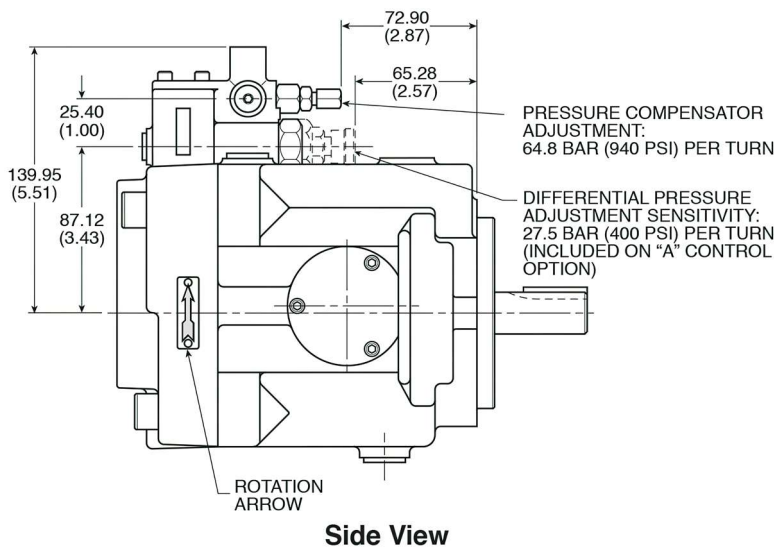
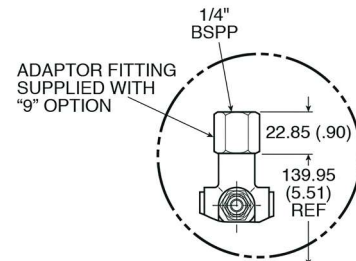
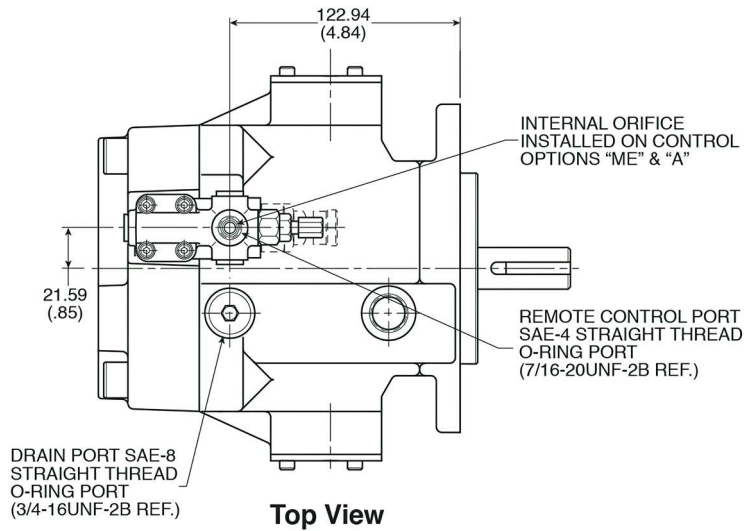
Dimensional Data

Remote Compensator Control Pump Dimensions

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

NOTES:

1. Righthand (CW) rotation rear ported pump shown. Lefthand (CCW) pumps will have inlet and outlet ports reversed.
2. When controlling pump compensator pressure with remote relief valve, size relief valve to pass a minimum of 1.89 LPM (.5 GPM).
3. Remote compensator shown on rear ported pump. Also available on side ported or thru-shaft option pumps.

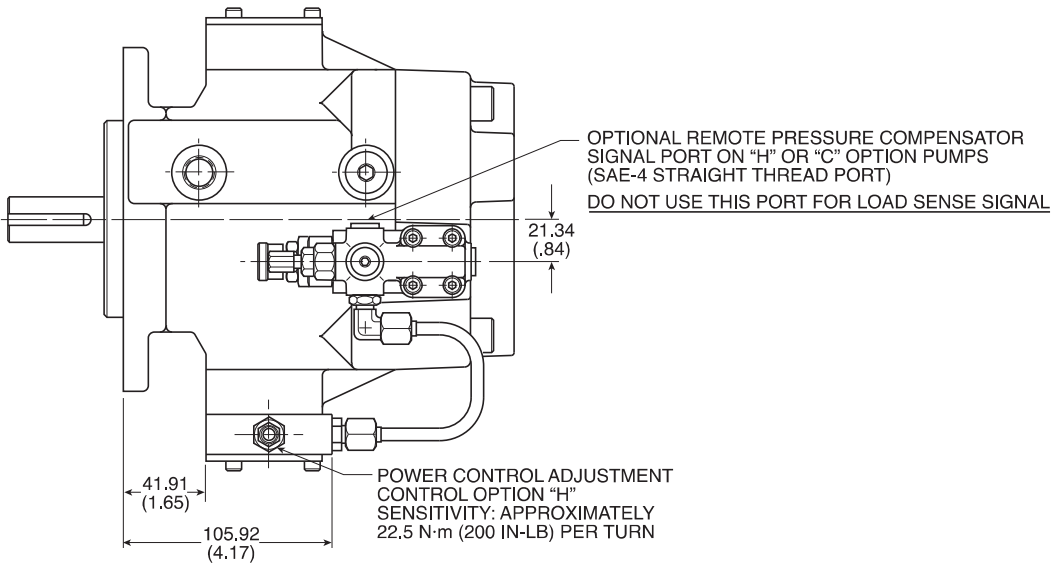


Power (Torque) Control Pump Dimensions

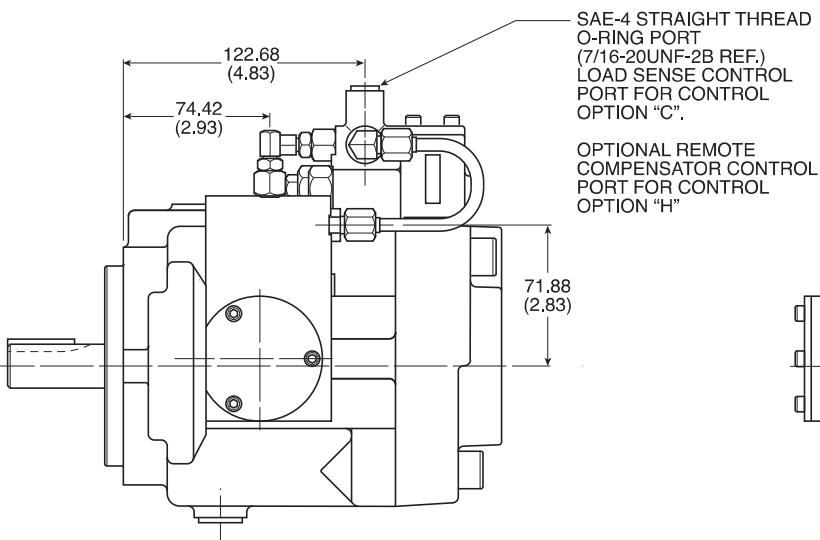
* Inch equivalents for millimeter dimensions are shown in (**).

NOTES:

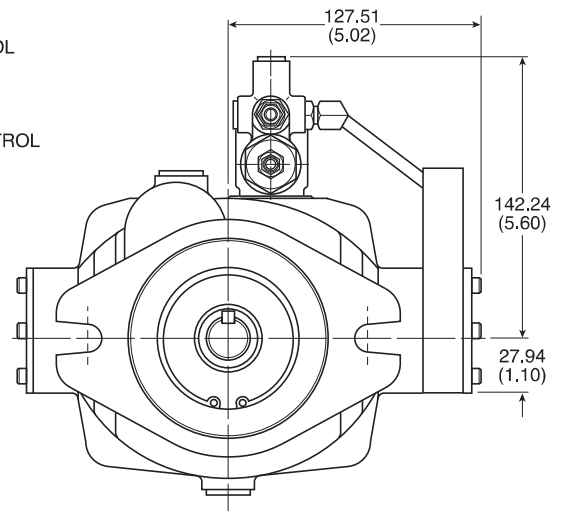
1. Righthand (CW) rotation rear ported pump shown. Lefthand (CCW) pumps will have inlet and outlet ports reversed.
2. Power control shown on rear ported pump. Also available on side ported or thru-shaft option pumps.



Top View



Side View



Front View