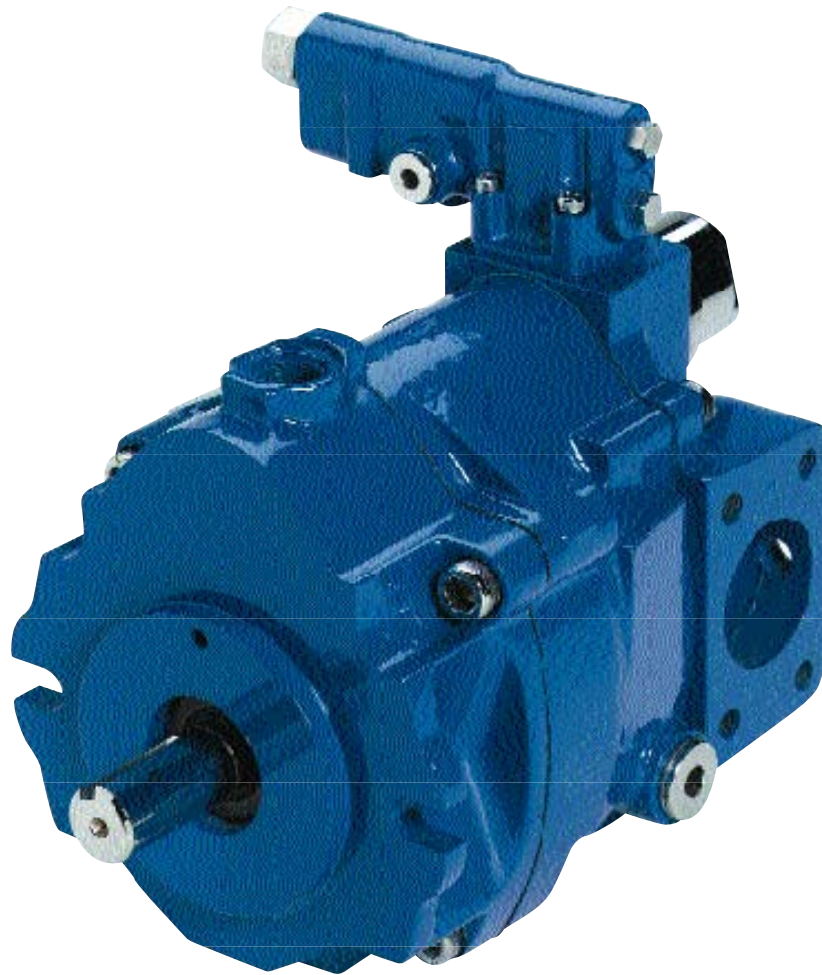


## Vickers® PVM Piston Pumps

18-141cc<sup>3</sup>  
(1.1-8.6in<sup>3</sup>)

M-Series  
Industrial Variable  
Displacement

M-Series  
Mobile Variable  
Displacement



# EATON

*Powering Business Worldwide*

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## M Series Variable Displacement Piston Pumps

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# Principles of Operation

In axial piston pumps, the pistons reciprocate parallel to the axis of rotation of the cylinder block. The simplest type of axial piston pump is the swash plate in-line design.

The cylinder block in this pump is turned by the drive shaft. Pistons fitted to bores in the cylinder block are connected through piston shoes and a shoe plate, so that the shoes bear against an angled swash plate.

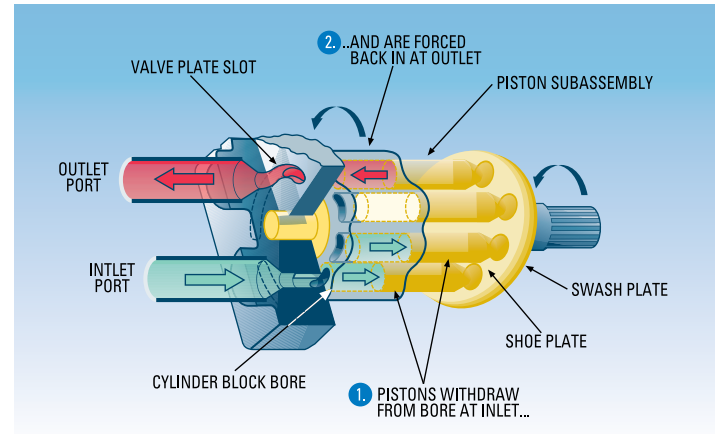
As the block turns, the piston shoes follow the swash plate, causing the pistons to reciprocate. The ports are arranged in the valve plate so that the pistons pass the inlet as they are pulled out and pass the outlet as they are forced back in.

The displacement of axial piston pumps is determined by the size and number of pistons, as well as the stroke length which is determined by the angle of the swash plate.

In variable displacement models of the in-line pump, the swash plate is installed in a movable yoke.

“Pivoting” the yoke on pin-tles changes the swash plate angle to increase or decrease the piston stroke.

## Piston Pump Operation



# Hydraulic System Design Calculations

## Basic Formulas

### Output Flow (Q)

$$\text{lpm} = \frac{\text{cm}^3/\text{r} \times \text{rpm}}{1000} \quad \text{gpm} = \frac{\text{in}^3/\text{r} \times \text{rpm}}{231}$$

### Input Power (P)

$$\text{kW} = \frac{\text{l/min} \times \text{bar}}{600} \quad \text{hp} = \frac{\text{gpm} \times \text{psi}}{1714}$$

### Shaft Torque (M)

$$\text{N-m} = \frac{\text{bar} \times \text{cm}^3/\text{r}}{62.8} \quad \text{lb-in} = \frac{\text{psi} \times \text{in}^3/\text{r}}{6.28}$$

### Shaft Speed (n)

$$\text{rpm} = \frac{1000 \times \text{l/min}}{\text{cm}^3/\text{r}} \quad \text{RPM} = \frac{231 \times \text{gpm}}{\text{in}^3/\text{r}}$$

### Output Power (P)

$$\text{kW} = \frac{\text{N-m} \times \text{RPM}}{9549} \quad \text{hp} = \frac{\text{lb-in} \times \text{rpm}}{63,025}$$

### Volumetric Displacement

$$\text{cm}^3/\text{r} = \frac{\text{lpm} \times 1000}{\text{rpm}} \quad \text{in}^3/\text{r} = \frac{\text{gpm} \times 231}{\text{rpm}}$$

## Basic Formulas

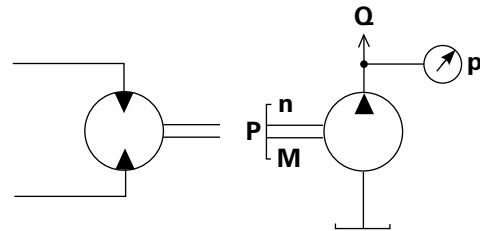
bar = 10 Newtons/cm<sup>2</sup>  
 gpm = gallons per minute  
 hp = horsepower  
 lb-in = pound inch  
 lb-ft = pound feet  
 kW = kilowatt  
 kgf = kilograms force  
 l/min = liters per minute  
 N-m = Newton meters  
 psi = pounds per square inch  
 rpm = revolutions per minute

## Efficiencies

$$\text{Volumetric } N_v = \frac{\text{gpm actual}}{\text{gpm theoretical}}$$

$$\text{Mechanical } N_m = \frac{\text{lb-in actual}}{\text{lb-in theoretical}}$$

$$\text{Total } N_t = N_v \times N_m$$



## Commonly Used Conversions

| To Convert          | Into                | Multiply by     |
|---------------------|---------------------|-----------------|
| bar                 | psi                 | 14.5            |
| cm <sup>3</sup>     | in <sup>3</sup>     | 0.06102         |
| °C                  | °F                  | (°C x 1.8) + 32 |
| gallons (US)        | liters              | 3.785           |
| kg                  | lbs                 | 2.205           |
| kgf/cm <sup>2</sup> | psi                 | 14.2            |
| kW                  | hp                  | 1.341           |
| liters              | US Gallons          | 0.2642          |
| mm                  | inches              | 0.03937         |
| N-m                 | lb-in               | 8.85            |
| N-m                 | lb-ft               | 0.7375          |
| °F                  | °C                  | (°F-32)/1.8     |
| hp                  | kW                  | 0.7457          |
| inch                | mm                  | 2.54            |
| in <sup>3</sup>     | cm <sup>3</sup>     | 16.39           |
| lb-in               | N-m                 | 0.113           |
| lb-ft               | N-m                 | 1.356           |
| lbs                 | kg                  | 0.4535          |
| psi                 | bar                 | 0.06896         |
| psi                 | kgf/cm <sup>2</sup> | .070307         |

Note: Performance charts can be found on subsequent pages.

# Introduction

Eaton Vickers® M Series mobile pumps are open circuit, axial piston designs. A variety of controls provides the ability to match the pumps to each application. Efficiency of the pump controls allows downsizing of system cooling needs, allowing a smaller and less expensive design to be used. Alternatively, cooling capacity could be kept the same and the flow capability of the system increased, thus improving performance and customer satisfaction.

A strong proven rotating group allows the pumps to handle pressures to 280 bar (4000 psi) continuous and 320 bar (4600 psi) intermittent – with less maintenance cost. High-load bearings and a stiff drive shaft help provide a pump life of 5000 hours at rated mobile conditions, reducing operating costs and extending operating life.

M Series pumps feature a saddle-type yoke with steel-backed polymer bearings. The stiff yoke reduces deflection and allows even loading of bearings, improving life. A single control piston reduces loading on the yoke, resulting in reduced pump size which allows installation in tighter locations.

M Series pumps operate at a level of quietness that exceeds the requirements of today's demanding work conditions. The pumps feature a unique three-piece envelope (flange, housing and valve block) specifically created for low fluid-borne and structure-borne noise levels. Another pump feature – a bimetal timing plate – improves pump filling characteristics which, in turn, reduce fluid-borne noise and extend pump life.

Proximity of the pump to the vehicle operator demands a low noise level in the cab. M Series pumps reduce, or in some cases remove, the need for damping barriers between the noise source and the operator. This saves money on the installed cost of the system while improving customer comfort.

An adjustable maximum stop provides a means of tuning flow to your system, while gauge ports allow monitoring of inlet and outlet conditions. These standard features reduce system complexity and cost.

Mounting flanges are offered in SAE and ISO configurations, and ports are offered in SAE, ISO, and BSPP in both tube and flange versions. This provides a wide variety of installation opportunities for global machine design.

Side- or end-ported models are available to facilitate plumbing and help fit the pump to your machine space needs. Multiple drain ports allow many mounting orientations, reducing installed costs.

M Series pumps are capable of operating with many types of hydraulic fluids used in industrial and mobile systems. High-water-content and phosphate ester fluids can be accommodated, in addition to the typical petroleum based and synthetic fluids.

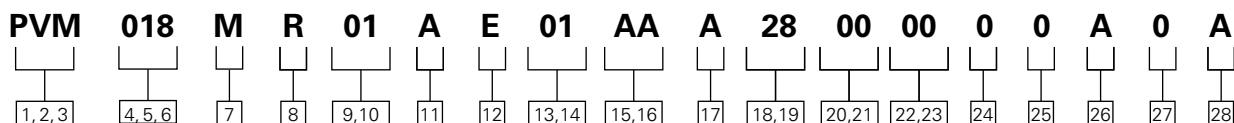
## Typical Applications

- Loader backhoes
- Vibratory cable plows
- Mining machinery
- Dump truck lifts
- Agriculture tractors
- Chemical applicator trucks
- Railroad equipment
- Container handling, all-terrain, and truck cranes
- Vibratory cable plows
- Mining machinery and tunnel boring equipment
- Utility boom, off-road dump, and refuse trucks
- Material handling trucks and rough terrain fork lifts
- Concrete and asphalt pavers
- Feller/bunchers, forwarders, and log loaders
- Crawler dozers
- Articulate haulers
- Mini-excavators

## Features and Benefits

- Long pump life
- Quiet pump operation
- Inlet and outlet gauge ports and adjustable maximum displacement stops – standards
- Astonishingly low 4% pressure ripple
- Low installed and operating costs
- Reduced maintenance
- Flexibility in machine design
- Compact size saves space
- Design promotes leak-free system

# Model Code Selection



## 1, 2, 3 Product Series

**PVM** – M Series Variable Piston Pump

## 4, 5, 6 Displacement

Fourteen displacements available 230 bar and 280 bar continuous ratings

## 7 Valve Plate

**M** – Mobile Equipment Speeds (Higher Speed)

## 8 Input Rotation

**R** – Clockwise (Righthand)  
**L\*** – Counter-clockwise (Lefthand)

## 9, 10 Input Shaft

Standard SAE and ISO splined versions (Other configurations optional)

## 11 Mounting Flange

Thirteen options in SAE and ISO mounts

## 12 Main Port Location

**E\*\*** – End Ported  
**S** – Side Ported

## 13, 14 Main Port Type

SAE & ISO tube ports and 4-bolt flange (Other configurations optional)

## 15, 16 Pump Special Features

**00** – None  
**AA** – Adjustable Maximum Displacement Stop and single shaft (standard)  
**AB** – Double Shaft Seal, Two Way

## 17 Control

**0** – None  
**A** – Pressure Compensator  
**B** – Pressure and Flow Compensator with Bleed Orifice  
**C** – Pressure and Flow Compensator with Plugged Orifice  
**E** – Industrial Control (57cc through 141 cc only)

## 18, 19 Pressure Compensator Setting

**00** – None  
**07** – 70 bar (Adjustable between 40 bar and 130 bar)  
**23** – 230 bar (Adjustable between 130 bar and 320 bar)  
**28** – 280 bar (Adjustable between 130 bar and 320 bar)

## 20, 21 Flow Compensator Setting

**00** – None  
**11** – 11 bar setting  
**20** – 20-20 bar setting  
**24** – 24-24 bar setting

## 22, 23 Torque Limiter Setting

**00** – None (Not available on M Series)

## 24 Compensator Special Features

**0** – None

## 25 Auxiliary Mounting Pad

**0\*\*\*** – None

(Auxiliary mounting available on all frame sizes)

## 26 Paint

**0** – No Paint  
**A** – Standard Blue Paint

## 27 Customer Identification

**0** – None (Contact Eaton for Options)

## 28 Design Code

**A** – A (Initial Release)

\* Not available on 074, 081, 098 and 106 End Port

\*\* Not available on 074, 081, 098 and 106 LH

\*\*\* Through drive not available on the LH

# Model Code Options

## 4,5,6 Maximum geometric displacement

| Displacement Code  | 018  | 020  | 045  | 050  | 057  | 063  | 074  | 081  | 098  | 106   | 131   | 141   |
|--------------------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| cm <sup>3</sup> /r | 18,0 | 21,1 | 45,1 | 50,0 | 57,4 | 63,1 | 73,7 | 81,0 | 98,3 | 106,5 | 131,1 | 141,0 |
| in <sup>3</sup> /r | 1.1  | 1.29 | 2.75 | 3.05 | 3.50 | 3.85 | 4.50 | 4.94 | 6.00 | 6.50  | 8.00  | 8.60  |

## 9,10 Shaft-end type at electric motor end

| Description                            | Shaft Code |            |            |            |            |            |
|----------------------------------------|------------|------------|------------|------------|------------|------------|
|                                        | PVM018/020 | PVM045/050 | PVM057/063 | PVM074/081 | PVM098/106 | PVM131/141 |
| SAE, SAE A, Straight Keyed             | 01         | –          | –          | –          | –          | –          |
| SAE, SAE 19-1, Straight Keyed          | 02         | –          | –          | –          | –          | –          |
| SAE, SAE A, 9T Spline                  | 03         | –          | –          | –          | –          | –          |
| SAE, SAE A, 11T Spline                 | 04         | –          | –          | –          | –          | –          |
| SAE, SAE B, Straight Keyed             | 05         | 05         | –          | –          | –          | –          |
| SAE, SAE B-B, Straight Keyed           | 06         | 06         | 06         | –          | –          | –          |
| SAE, SAE B, 13T Spline                 | 07         | 07         | 07         | –          | –          | –          |
| SAE, SAE B-B, 15T Spline               | 08         | 08         | 08         | –          | –          | –          |
| SAE, SAE C, Straight Keyed             | –          | –          | 09         | 09         | 09         | 09         |
| SAE, SAE C-C, Straight Keyed           | –          | –          | –          | 10         | 10         | 10         |
| SAE, SAE C, 14T Spline                 | –          | –          | 11         | 11         | 11         | 11         |
| SAE, SAE C-C, 17T Spline               | –          | –          | –          | 12         | 12         | 12         |
| SAE, SAE D, Straight Keyed             | –          | –          | –          | –          | –          | 13         |
| SAE, SAE D, 13T Spline                 | –          | –          | –          | –          | –          | 14         |
| ISO E20N, Straight Keyed               | 15         | –          | –          | –          | –          | –          |
| ISO E25N, Straight Keyed, Short Spigot | 16         | –          | –          | –          | –          | –          |
| ISO E25N, Straight Keyed               | 17         | 17         | 17         | –          | –          | –          |
| ISO E32N, Straight Keyed, Short Spigot | –          | –          | 18         | 18         | 18         | 18         |
| ISO E40N, Straight Keyed, Short Spigot | –          | –          | –          | 19         | 19         | 19         |

## 11 Mounting flange specifications

| Code | Description   | PVM018/020 | PVM045/050 | PVM057/063 | PVM074/081 | PVM098/106 | PVM131/141 |
|------|---------------|------------|------------|------------|------------|------------|------------|
| A    | SAE A, 2-bolt | ●          | ○          | ○          | ○          | ○          | ○          |
| B    | ISO 80A2HW    | ●          | ○          | ○          | ○          | ○          | ○          |
| C    | SAE B, 2-bolt | ●          | ●          | ●          | ○          | ○          | ○          |
| D    | ISO 100A2HW   | ●          | ●          | ●          | ○          | ○          | ○          |
| E    | SAE C, 2-bolt | ○          | ○          | ●          | ●          | ●          | ●          |
| F    | ISO 125-A2HW  | ○          | ○          | ●          | ●          | ●          | ●          |
| G    | SAE C, 4-bolt | ○          | ○          | ●          | ●          | ●          | ●          |
| H    | ISO 125B4HW   | ○          | ○          | ●          | ●          | ●          | ●          |
| J    | SAE D, 4-bolt | ○          | ○          | ○          | ○          | ○          | ●          |
| K    | ISO 160B4HW   | ○          | ○          | ○          | ○          | ○          | ●          |

● = Available

○ = Not Available

# Model Code Options

## 13,14 Main Port Options

| Code | Description                                       | Inlet<br>Outlet | PVM018/020 | PVM045/050 | PVM057/063              | PVM074/081 | PVM098/106 | PVM131/141 |
|------|---------------------------------------------------|-----------------|------------|------------|-------------------------|------------|------------|------------|
| 01   | SAE J1926<br>Tube Ports                           | Inlet           | -20        | -24        | -24<br>(End ports only) | -          | -          | -          |
|      |                                                   | Outlet          | -12        | -16        | -16<br>(End ports only) | -          | -          | -          |
| 02   | SAE J518<br>Flange Ports                          | Inlet           | 1.25 inch  | 2.0 inch   | 2.0 inch                | 2.0 inch   | 2.5 inch   | 2.5 inch   |
|      |                                                   | Outlet          | 0.75 inch  | 1.0 inch   | 1.0 inch                | 1.0 inch   | 1.0 inch   | 1.25 inch* |
| 03   | ISO 6149-1<br>Tube Ports                          | Inlet           | M42        | M48        | M48<br>(End ports only) | -          | -          | -          |
|      |                                                   | Outlet          | M27        | M33        | M33<br>(End ports only) | -          | -          | -          |
| 04   | ISO 6162<br>Flange Ports                          | Inlet           | 32mm       | 51mm       | 51mm                    | 51mm       | 64mm       | 64mm       |
|      |                                                   | Outlet          | 19mm       | 25mm       | 25mm                    | 25mm       | 25mm       | 32mm*      |
| 05   | British Standard<br>Parallel Pipe –<br>Tube Ports | Inlet           | G 1-1/4    | G 1-1/2    | -                       | -          | -          | -          |
|      |                                                   | Outlet          | G 3/4      | G 1        | -                       | -          | -          | -          |

\*SAE Code 62, high pressure series, or ISO 400 bar. Other flange ports are SAE Code 61, standard pressure series, or ISO 25-350 bar.

## 25 Thru-Drive Options

| Code | Description                        | PVM018/020 | PVM045/050 | PVM057/063 | PVM074/081* | PVM098/106 | PVM131/141 |
|------|------------------------------------|------------|------------|------------|-------------|------------|------------|
| O    | Single pump,<br>non-thru-drive     | ●          | ●          | ●          | ●           | ●          | ●          |
| A    | SAE A, 2-bolt,<br>9T spline        | ●          | ●          | ●          | ●           | ●          | ●          |
| B    | SAE A, 2-bolt,<br>11T spline       | ●          | ●          | ○          | ●           | ●          | ●          |
| C    | SAE B, 2-1/4-bolt,<br>13T spline   | ○          | ●          | ●          | ●           | ●          | ●          |
| D    | SAE B-B, 2-1/4-bolt,<br>15T spline | ○          | ●          | ●          | ●           | ●          | ●          |
| E    | SAE C, 2-1/4-bolt,<br>14T spline   | ○          | ○          | ●          | ●           | ●          | ●          |
| F    | SAE C-C, 2-1/4-bolt,<br>17T spline | ○          | ○          | ○          | ●           | ●          | ●          |
| G    | ISO 80-A2HW,<br>9T SAE spline      | ●          | ●          | ●          | ●           | ●          | ●          |
| H    | ISO 80-A2HW,<br>11T SAE spline     | ●          | ●          | ○          | ●           | ●          | ●          |
| J    | ISO 100-A2/B4HW,<br>13T SAE spline | ○          | ●          | ●          | ●           | ●          | ●          |
| K    | ISO 100-A2/B4HW,<br>15T SAE spline | ○          | ○          | ●          | ●           | ●          | ●          |
| L    | ISO 125-A2/B4HW,<br>14T SAE spline | ○          | ○          | ●          | ●           | ●          | ●          |
| M    | ISO 125-A2/B4HW,<br>17T SAE spline | ○          | ○          | ○          | ●           | ●          | ●          |

● = Available

○ = Not Available

\* Not available on the 074/081 LH



# Specifications and Performance

## Industrial

**Displacement, Pressure and Flow Ratings** At 50°C (120°F), SAE 10W oil, 1 bar absolute (0 psig) inlet

| Model Series | Maximum Geometric Displacement<br>cm <sup>3</sup> /r (in <sup>3</sup> /r) | Maximum Pressure bar (psi) |               |            | Maximum Flow at 210 bar (3000 psi)<br>l/min (USgpm) |                |                |                |
|--------------|---------------------------------------------------------------------------|----------------------------|---------------|------------|-----------------------------------------------------|----------------|----------------|----------------|
|              |                                                                           | Continuous                 | Intermittent* | Peak**     | @1800<br>r/min                                      | @1500<br>r/min | @1200<br>r/min | @1000<br>r/min |
| PVM018       | 18 (1.1)                                                                  | 280 (4000)                 | 320 (4600)    | 350 (5000) | 31 (8.2)                                            | 26 (7)         | 21 (5.5)       | 17 (4.5)       |
| PVM020       | 21,1 (1.29)                                                               | 230 (3300)                 | 250 (3600)    | 280 (4000) | 35 (9)                                              | 29 (8)         | 23 (6)         | 19 (5)         |
| PVM045       | 45,1 (2.75)                                                               | 280 (4000)                 | 320 (4600)    | 350 (5000) | 76 (20)                                             | 65 (17)        | 49 (13)        | 42 (11)        |
| PVM050       | 50,0 (3.05)                                                               | 230 (3300)                 | 250 (3600)    | 280 (4000) | 87 (23)                                             | 75 (20)        | 62 (16)        | 49 (13)        |
| PVM057       | 57,4 (3.50)                                                               | 280 (4000)                 | 320 (4600)    | 350 (5000) | 102 (27)                                            | 85 (22.4)      | 66 (17.4)      | 54 (14.3)      |
| PVM063       | 63,1 (3.85)                                                               | 230 (3300)                 | 250 (3600)    | 280 (4000) | 111 (29)                                            | 93 (24)        | 74 (19)        | 60 (16)        |
| PVM074       | 73,7 (4.50)                                                               | 280 (4000)                 | 320 (4600)    | 350 (5000) | 127 (33.5)                                          | 106 (28)       | 86 (22.7)      | 70 (18.5)      |
| PVM081       | 81,0 (4.94)                                                               | 230 (3300)                 | 250 (3600)    | 280 (4000) | 139 (37)                                            | 116 (31)       | 93 (25)        | 76 (20)        |
| PVM098       | 98,3 (6.00)                                                               | 280 (4000)                 | 320 (4600)    | 350 (5000) | 170 (45)                                            | 141 (37)       | 112 (29.6)     | 92 (24.3)      |
| PVM106       | 106,5 (6.50)                                                              | 230 (3300)                 | 250 (3600)    | 280 (4000) | 187 (49)                                            | 155 (41)       | 123 (32)       | 102 (27)       |
| PVM131       | 131,1 (8.00)                                                              | 280 (4000)                 | 320 (4600)    | 350 (5000) | 215 (57)                                            | 178 (47)       | 141 (37)       | 118 (31)       |
| PVM141       | 141,0 (8.60)                                                              | 230 (3300)                 | 250 (3600)    | 280 (4000) | 238 (63)                                            | 199 (53)       | 158 (42)       | 131 (35)       |

\*Less than 10% of duty cycle.

\*\*Momentary system pressure spikes only.

**Speed, Input Power and Torque Ratings** At 50°C (120°F), SAE 10W oil, 1 bar absolute (0 psig) inlet

| Model Series | Maximum Operating Speed<br>r/min | Maximum Input Power at 210 bar (3000 psi) kw (hp) |             |             |             | Maximum Torque at 210 bar (3000 psi)<br>Nm (lb-ft) | Approximate Weight<br>kg (lb) |
|--------------|----------------------------------|---------------------------------------------------|-------------|-------------|-------------|----------------------------------------------------|-------------------------------|
|              |                                  | @1800 r/min                                       | @1500 r/min | @1200 r/min | @1000 r/min |                                                    |                               |
| PVM018       | 1800                             | 16 (22)                                           | 13 (18)     | 11 (15)     | 9 (12)      | 84 (62)                                            | 15 (33)                       |
| PVM020       | 1800                             | 14 (18)                                           | 11 (15)     | 9 (12)      | 8 (10)      | 73 (54)                                            | 15 (33)                       |
| PVM045       | 1800                             | 41 (55)                                           | 34 (46)     | 27 (37)     | 23 (31)     | 221 (163)                                          | 24 (52)                       |
| PVM050       | 1800                             | 35 (47)                                           | 30 (40)     | 28 (38)     | 23 (31)     | 190 (140)                                          | 24 (52)                       |
| PVM057       | 1800                             | 52 (70)                                           | 44 (59)     | 36 (49)     | 29 (39)     | 272 (201)                                          | 36 (79)                       |
| PVM063       | 1800                             | 42 (57)                                           | 36 (48)     | 29 (39)     | 24 (32)     | 228 (168)                                          | 36 (79)                       |
| PVM074       | 1800                             | 63 (84)                                           | 52 (70)     | 42 (56)     | 35 (47)     | 334 (246)                                          | 45 (99)                       |
| PVM081       | 1800                             | 56 (75)                                           | 46 (62)     | 35 (47)     | 28 (37)     | 286 (211)                                          | 45 (99)                       |
| PVM098       | 1800                             | 88 (118)                                          | 72 (97)     | 58 (78)     | 48 (64)     | 464 (342)                                          | 55 (121)                      |
| PVM106       | 1800                             | 72 (97)                                           | 60 (80)     | 48 (64)     | 40 (54)     | 383 (282)                                          | 55 (121)                      |
| PVM131       | 1800                             | 113 (152)                                         | 94 (126)    | 75 (101)    | 63 (85)     | 596 (440)                                          | 66 (145)                      |
| PVM141       | 1800                             | 94 (126)                                          | 79 (106)    | 63 (85)     | 53 (71)     | 497 (367)                                          | 66 (145)                      |

### Standard Response Times\*

| Model Series | On Stroke (msec) | Off Stroke (msec) |
|--------------|------------------|-------------------|
| PVM018       | 30               | 25                |
| PVM020       | 39               | 26                |
| PVM045       | 140              | 40                |
| PVM050       | 140              | 40                |
| PVM057       | 65               | 20                |
| PVM063       | 85               | 20                |

### Standard Response Times\*

| Model Series | On Stroke (msec) | Off Stroke (msec) |
|--------------|------------------|-------------------|
| PVM074       | 85               | 30                |
| PVM081       | 85               | 30                |
| PVM098       | 65               | 25                |
| PVM106       | 72               | 29                |
| PVM131       | 135              | 30                |
| PVM141       | 100              | 30                |

\*Values with pressure compensator control.

# Specifications and Performance

## Mobile

**Displacement, Pressure and Flow Ratings** At 93°C (200°F), SAE 10W oil, 1 bar absolute (0 psig) inlet

| Model Series | Geometric Displacement<br>cm <sup>3</sup> /r (in <sup>3</sup> /r) | Maximum Pressure bar (psi) |               |            | Maximum Flow at 280 bar (4000 psi)          |                                           |
|--------------|-------------------------------------------------------------------|----------------------------|---------------|------------|---------------------------------------------|-------------------------------------------|
|              |                                                                   | Continuous                 | Intermittent* | Peak**     | Flange Ports<br>l/min (USgpm) @ 1 bar inlet | Tube Ports<br>l/min (USgpm) @ 1 bar inlet |
| PVM018       | 18,0 (1.10)                                                       | 280 (4000)                 | 320 (4600)    | 350 (5000) | 46 (12) @ 2800 r/min                        | 46 (12) @ 2800 r/min                      |
| PVM020       | 20,1 (1.22)                                                       | 230 (3300)                 | 250 (3600)    | 280 (4000) | 53 (14) @ 2800 r/min                        | 53 (14) @ 2800 r/min                      |
| PVM045       | 45,1 (2.75)                                                       | 280 (4000)                 | 320 (4600)    | 350 (5000) | 115 (30) @ 2600 r/min                       | 106 (28) @ 2400 r/min                     |
| PVM050       | 50,0 (3.05)                                                       | 230 (3300)                 | 250 (3600)    | 280 (4000) | 125 (33) @ 2600 r/min                       | 116 (31) @ 2400 r/min                     |
| PVM057       | 57,4 (3.50)                                                       | 280 (4000)                 | 320 (4600)    | 350 (5000) | 140 (37) @ 2500 r/min                       | 128 (34) @ 2300 r/min                     |
| PVM063       | 63,1 (3.85)                                                       | 230 (3300)                 | 250 (3600)    | 280 (4000) | 150 (40) @ 2500 r/min                       | 140 (37) @ 2400 r/min                     |
| PVM074       | 73,7 (4.50)                                                       | 280 (4000)                 | 320 (4600)    | 350 (5000) | 163 (43) @ 2400 r/min                       | –                                         |
| PVM081       | 81,0 (4.94)                                                       | 230 (3300)                 | 250 (3600)    | 280 (4000) | 181 (48) @ 2400 r/min                       | –                                         |
| PVM098       | 98,3 (6.00)                                                       | 280 (4000)                 | 320 (4600)    | 350 (5000) | 200 (53) @ 2200 r/min                       | –                                         |
| PVM106       | 106,5 (6.50)                                                      | 230 (3300)                 | 250 (3600)    | 280 (4000) | 222 (59) @ 2200 r/min                       | –                                         |
| PVM131       | 131,1 (8.00)                                                      | 280 (4000)                 | 320 (4600)    | 350 (5000) | 233 (62) @ 2000 r/min                       | –                                         |
| PVM141       | 141,0 (8.60)                                                      | 230 (3300)                 | 250 (3600)    | 280 (4000) | 258 (68) @ 2000 r/min                       | –                                         |

\*Less than 10% of duty cycle.

\*\*Less than 0.5 second.

### Standard Response Times\*

| Model Series | On Stroke (msec) | Off Stroke (msec) |
|--------------|------------------|-------------------|
| PVM018       | 50               | 20                |
| PVM020       | 57               | 22                |
| PVM045       | 140              | 40                |
| PVM050       | 140              | 23                |
| PVM057       | 65               | 20                |
| PVM063       | 94               | 20                |

### Standard Response Times\*

| Model Series | On Stroke (msec) | Off Stroke (msec) |
|--------------|------------------|-------------------|
| PVM074       | 95               | 30                |
| PVM081       | 135              | 30                |
| PVM098       | 85               | 24                |
| PVM106       | 90               | 25                |
| PVM131       | 100              | 30                |
| PVM141       | 128              | 28                |

\*Values with pressure compensator control.

# Specifications and Performance

## Mobile

**Speed, Input Power and Torque Ratings** At 93°C (200°F), SAE 10W oil, 1 bar absolute (0 psig) inlet

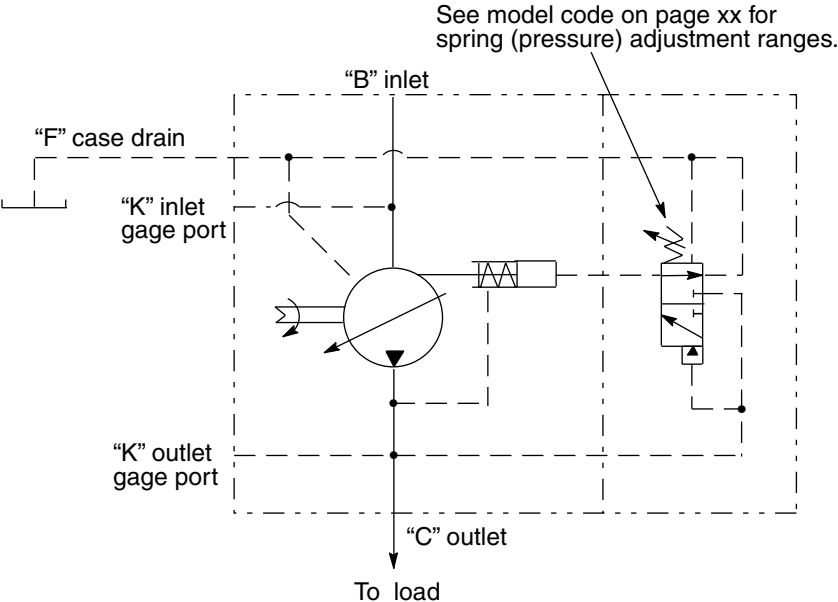
| Model Series | Minimum Operating Speed and Pressure r/min |            |                | Max. Input Power at<br>Max. Speed and 280 bar<br>(4000 psi) kW (hp) | Max. Torque at<br>280 bar (4000 psi)<br>Nm (lb-ft) | Approximate<br>Weight (dry)<br>kg (lbs) |
|--------------|--------------------------------------------|------------|----------------|---------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------|
|              | 1 bar Inlet                                |            | 0,85 bar Inlet |                                                                     |                                                    |                                         |
|              | Flange Ports                               | Tube Ports | Flange Ports   |                                                                     |                                                    |                                         |
| PVM018       | 2800 r/min                                 |            |                | 24 (32)                                                             |                                                    |                                         |
|              |                                            | 2800 r/min |                | 24 (32)                                                             | 82 (60)                                            | 15 (33)                                 |
|              |                                            |            | 2600 r/min     | 22 (30)                                                             |                                                    |                                         |
| PVM020       | 2800 r/min                                 |            |                | 21 (28)                                                             |                                                    |                                         |
|              |                                            | 2800 r/min |                | 21 (28)                                                             | 72 (53)                                            | 15 (33)                                 |
|              |                                            |            | 2600 r/min     | 20 (27)                                                             |                                                    |                                         |
| PVM045       | 2600 r/min                                 |            |                | 56 (75)                                                             |                                                    |                                         |
|              |                                            | 2400 r/min |                | 53 (71)                                                             | 198 (46)                                           | 24 (52)                                 |
|              |                                            |            | 2200 r/min     | 48 (64)                                                             |                                                    |                                         |
| PVM050       | 2600 r/min                                 |            |                | 51 (68)                                                             |                                                    |                                         |
|              |                                            | 2400 r/min |                | 48 (64)                                                             | 204 (150)                                          | 24 (52)                                 |
|              |                                            |            | 2200 r/min     | 44 (59)                                                             |                                                    |                                         |
| PVM057       | 2500 r/min                                 |            |                | 68 (91)                                                             |                                                    |                                         |
|              |                                            | 2300 r/min |                | 62 (83)                                                             | 262 (193)                                          | 36 (79)                                 |
|              |                                            |            | 2100 r/min     | 56 (75)                                                             |                                                    |                                         |
| PVM063       | 2500 r/min                                 |            |                | 59 (79)                                                             |                                                    |                                         |
|              |                                            | 2400 r/min |                | 57 (76)                                                             | 225 (166)                                          | 36 (79)                                 |
|              |                                            |            | 2200 r/min     | 52 (69)                                                             |                                                    |                                         |
| PVM074       | 2400 r/min                                 |            |                | 84 (113)                                                            | 334 (246)                                          | 45 (99)                                 |
|              |                                            |            | 1900 r/min     | 69 (93)                                                             |                                                    |                                         |
| PVM081       | 2400 r/min                                 |            |                | 69 (93)                                                             | 276 (204)                                          | 45 (99)                                 |
|              |                                            |            | 1900 r/min     | 55 (74)                                                             |                                                    |                                         |
| PVM098       | 2200 r/min                                 |            |                | 105 (141)                                                           | 457 (337)                                          | 55 (121)                                |
|              |                                            |            | 1800 r/min     | 86 (115)                                                            |                                                    |                                         |
| PVM106       | 2200 r/min                                 |            |                | 87 (117)                                                            | 377 (278)                                          | 55 (121)                                |
|              |                                            |            | 1800 r/min     | 70 (94)                                                             |                                                    |                                         |
| PVM131       | 2000 r/min                                 |            |                | 122 (164)                                                           | 581 (429)                                          | 66 (145)                                |
|              |                                            |            | 1600 r/min     | 98 (131)                                                            |                                                    |                                         |
| PVM141       | 2000 r/min                                 |            |                | 102 (137)                                                           | 483 (356)                                          | 66 (145)                                |
|              |                                            |            | 1600 r/min     | 81 (109)                                                            |                                                    |                                         |

# Control Options

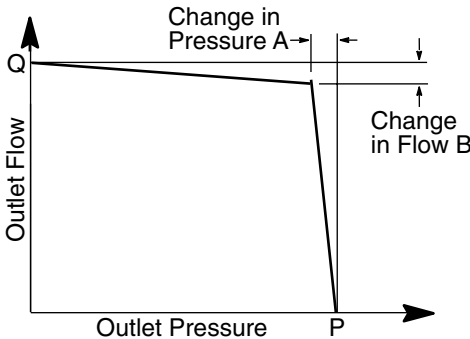
## Pressure Compensator Control – Code A

The pump will provide a continuously modulated flow to meet changing load demands at a pre-adjusted compensator pressure. At pressures below the compensator setting, the pump will operate at maximum displacement. See model code on page 4 for compensator pressure ranges.

**Warning:** The pressure compensator may be adjusted beyond the rated pressure of the pump. When adjusting the pressure limiter, install a 0-350 bar (0-5000 psi) gage in the outlet gage port and limit the pressure setting to the continuous rated pressure for the pump displacement shown on page 7.



## Industrial Pressure Cut-off Characteristics of Code A Pressure Compensator Control at 50°C (120°F), static conditions.

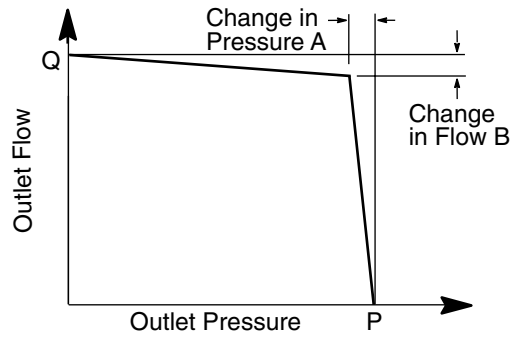


Pressure Cut-off Characteristics of Pressure Compensator Control @ 50°C (120°F), static conditions

| Model Series | Max. Speed<br>r/min | "Q" Outlet Flow<br>l/min (USgpm) | "P" Outlet<br>Pressure<br>bar (psi) | A<br>bar (psi) | B<br>L/min (USgpm) |
|--------------|---------------------|----------------------------------|-------------------------------------|----------------|--------------------|
| PVM018       | 1800                | 32 (8.5)                         | 280 (4000)                          | 2,8 (40)       | 4,5 (1.2)          |
| PVM020       | 1800                | 35 (9.25)                        | 230 (3300)                          | 2,8 (40)       | 4,5 (1.2)          |
| PVM045       | 1800                | 76 (20)                          | 280 (4000)                          | 10 (150)       | 4,5 (1.2)          |
| PVM050       | 1800                | 87 (23)                          | 230 (3300)                          | 10 (150)       | 4,5 (1.2)          |
| PVM057       | 1800                | 102 (27)                         | 280 (4000)                          | 3,5 (51)       | 14 (3.7)           |
| PVM063       | 1800                | 113 (29)                         | 230 (3300)                          | 7,4 (107)      | 7,6 (2.00)         |
| PVM074       | 1800                | 127 (33.5)                       | 280 (4000)                          | 1,5 (22)       | 37 (9.8)           |
| PVM081       | 1800                | 141 (37)                         | 230 (3300)                          | 1,5 (22)       | 37 (9.8)           |
| PVM098       | 1800                | 179 (47)                         | 280 (4000)                          | 1,5 (22)       | 25 (6.6)           |
| PVM106       | 1800                | 195 (51.5)                       | 230 (3300)                          | 1,5 (22)       | 20 (5.3)           |
| PVM131       | 1800                | 229 (60.5)                       | 280 (4000)                          | 3,5 (51)       | 19 (5.0)           |
| PVM141       | 1800                | 238 (63)                         | 230 (3300)                          | 3,5 (51)       | 14 (3.70)          |

# Control Options

**Mobil Pressure Cut-off**  
**Characteristics of Pressure**  
**Compensator Control** at  
 93°C (200°F), static conditions.



**Pressure Cut-off Characteristics of Pressure Compensator Control @ 93°C (200°F), static conditions**

| Model Series | Rated Speed<br>r/min | "Q" Outlet Flow<br>l/min (USgpm) | "P" Outlet<br>Pressure<br>bar (psi) | A<br>bar (psi) | B<br>L/min (USgpm) |
|--------------|----------------------|----------------------------------|-------------------------------------|----------------|--------------------|
| PVM018       | 2800                 | 42 (11)                          | 280 (4000)                          | 2,8 (40)       | 4,5 (1.2)          |
| PVM020       | 2800                 | 52 (14)                          | 230 (3300)                          | 2,8 (41)       | 4,5 (1.2)          |
| PVM045       | 2600                 | 115 (30)                         | 280 (4000)                          | 10 (150)       | 4,5 (1.2)          |
| PVM050       | 2600                 | 125 (33)                         | 230 (3300)                          | 10 (150)       | 4,5 (1.2)          |
| PVM057       | 2500                 | 140 (37)                         | 280 (4000)                          | 3,5 (50)       | 14 (3.7)           |
| PVM063       | 2500                 | 159 (42)                         | 230 (3300)                          | 7,4 (107)      | 11,4 (3.00)        |
| PVM074       | 2400                 | 174 (46)                         | 280 (4000)                          | 1,5 (20)       | 37 (9.8)           |
| PVM081       | 2400                 | 185 (49)                         | 230 (3300)                          | 1,5 (22)       | 37 (9.8)           |
| PVM098       | 2200                 | 217 (57)                         | 280 (4000)                          | 1,5 (20)       | 32 (8.4)           |
| PVM106       | 2200                 | 234 (62)                         | 230 (3300)                          | 1,5 (22)       | 24 (6.33)          |
| PVM131       | 2000                 | 253 (67)                         | 280 (4000)                          | 1,0 (15)       | 23 (6.0)           |
| PVM141       | 2000                 | 258 (68)                         | 230 (3300)                          | 7,0 (100)      | 14 (3.70)          |

# Control Options

## Load Sensing and Pressure Compensator Control – Code B or C

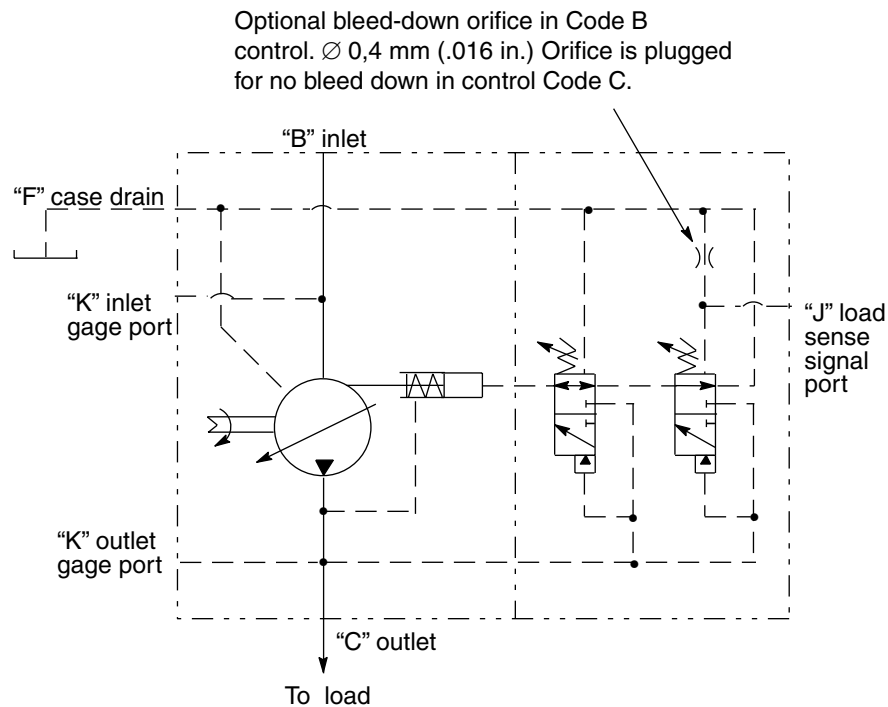
The pump will provide power matching of pump output to system load demand, maximizing efficiency and improving load metering characteristics of any directional control valve installed between the pump and the load.

Load sensing ensures that the pump always provides only the amount of flow needed by the load. At the same time, the pump operating pressure adjusts to the actual load pressure plus a pressure differential required for the control action. When the system is not demanding power, the load sense control will operate in an energy-saving stand-by mode.

Typically, the differential pressure is that between the pressure inlet and service port of a proportionally controlled directional valve, or a load sensing directional control valve. See the model code on page 4 for differential pressure settings for load sensing.

If the load pressure exceeds the system pressure setting, the pressure compensator de-strokes the pump. The load sensing line must be as short as possible and can also be used for remote control or unloading of the pump pressure. For remote control purposes, it is recommended that you contact your Eaton representative for the correct configuration of the control.

**Warning:** The pressure compensator may be adjusted beyond the rated pressure of the pump. When adjusting the pressure limiter, install a 0-350 bar (0-5000 psi) gage in the outlet gage port and limit the pressure setting to the continuous rated pressure for the pump displacement shown on page 7.



# Control Options

## Industrial Control Compensator – Code E & F (Model 057-141 only)

This pump is intended for use when multiple, remote, or electronically controlled compensating settings, with or without load sensing, are desired.

Pressure compensation is obtained when an internal plug is removed, the load-sense signal port is kept plugged, and internal pilot pressure is applied to the spring chamber of the control spool. For pressure compensation with load sensing, the internal plug stays, the load-sense signal port is unplugged, and pilot pressure is externally applied.

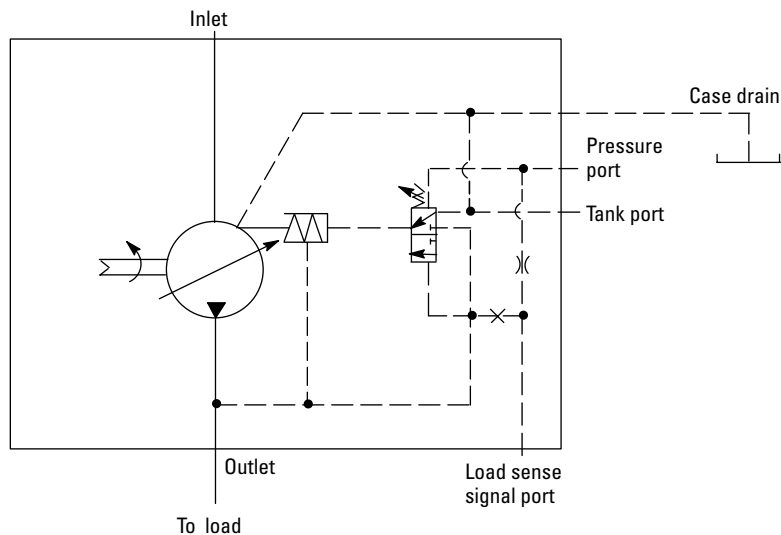
An external relief valve (not supplied) controls spring chamber pressure. The externally adjustable spring determines the differential pressure setting of the control. Outlet pressure is limited to the valve of the spring chamber (pressure port) pressure, plus control differential pressure.

Spring chamber (pilot) pressure is separated from outlet pressure by an internal orifice. Outlet pressure shifts the spool when pressure drop across the orifice reaches the differential pressure setting, and the pump de-strokes.

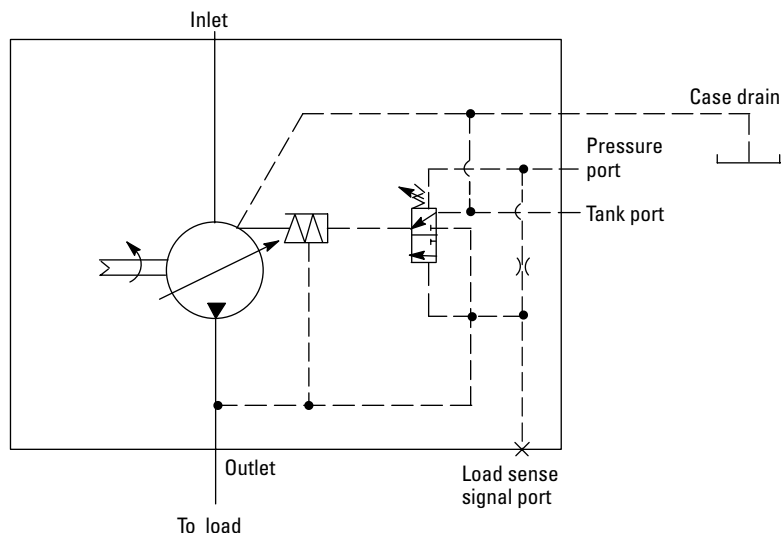
The relief valve can be mounted to an NFPA-D03/ISO 4401-03 pad on the pump control, or remotely located via tapping and blanking plates installed on the pad. See "Ordering Procedure", page 27, for more on valves and plates.

The standard factory-set differential pressure setting of the pump control is 20 bar (290 psi) and is not specified in the pump model number. Any other ordered differential pressure, within the control's adjustable pressure range of 17-35 bar (247-508 psi), will be specified in the model number.

### With Pressure & Flow Compensator (E)



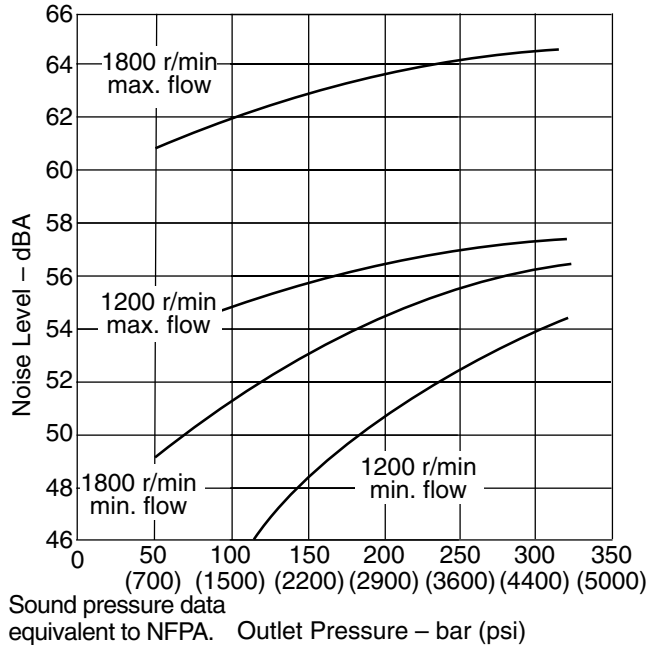
### Pressure Compensating Without Load Sensing (F)



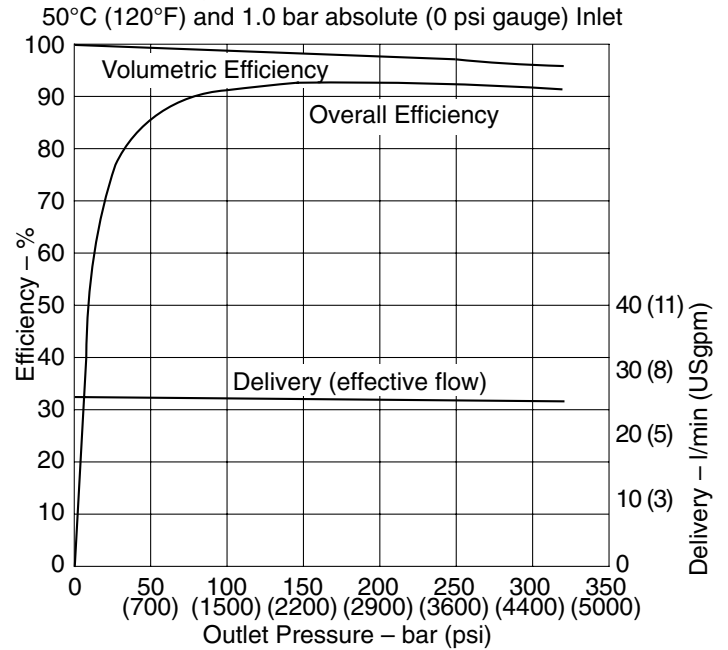
# Performance

## Industrial PVM018

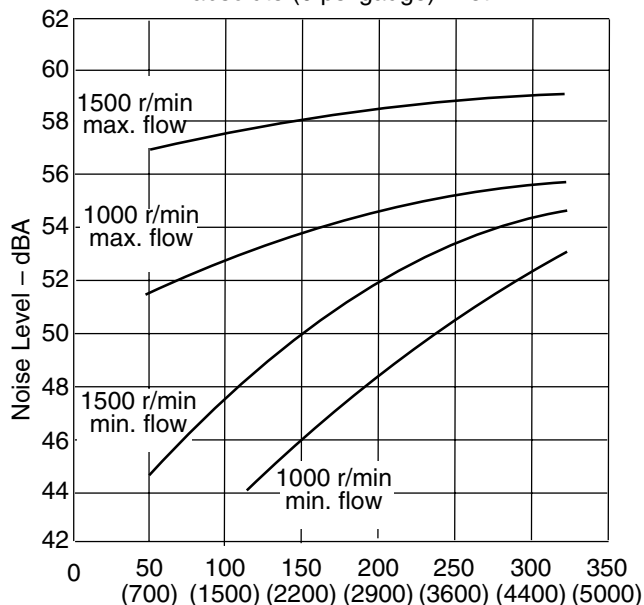
**Typical Noise Levels at 1800 and 1200 r/min with  
Petroleum Oil (10W) at 50°C (120°F) and 1.0 bar  
absolute (0 psi gauge) Inlet**



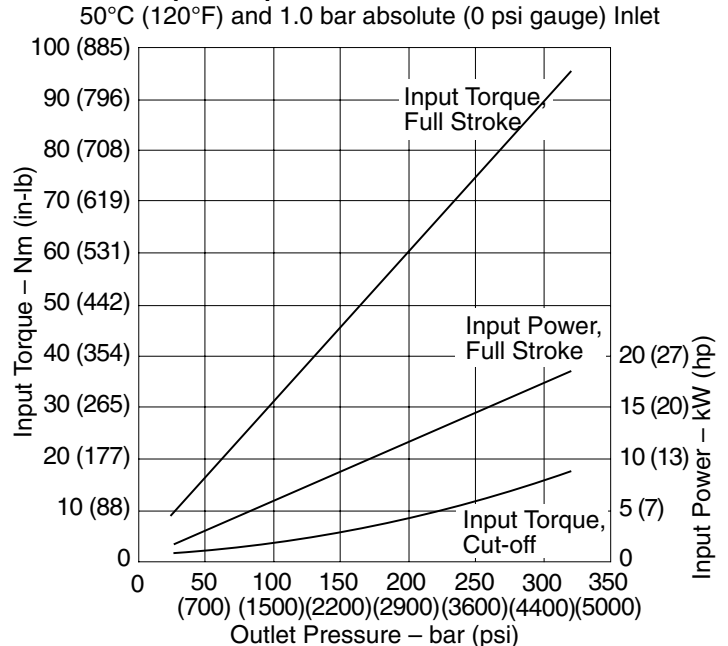
**Delivery and Efficiency at 1800 r/min**



**Typical Noise Levels at 1500 and 1000 r/min with  
Petroleum Oil (10W) at 50°C (120°F) and 1.0 bar  
absolute (0 psi gauge) Inlet**



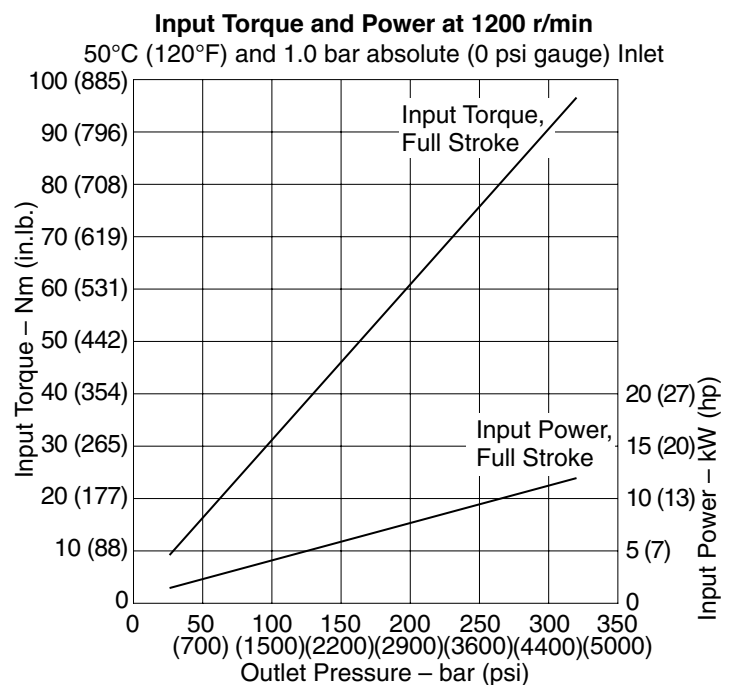
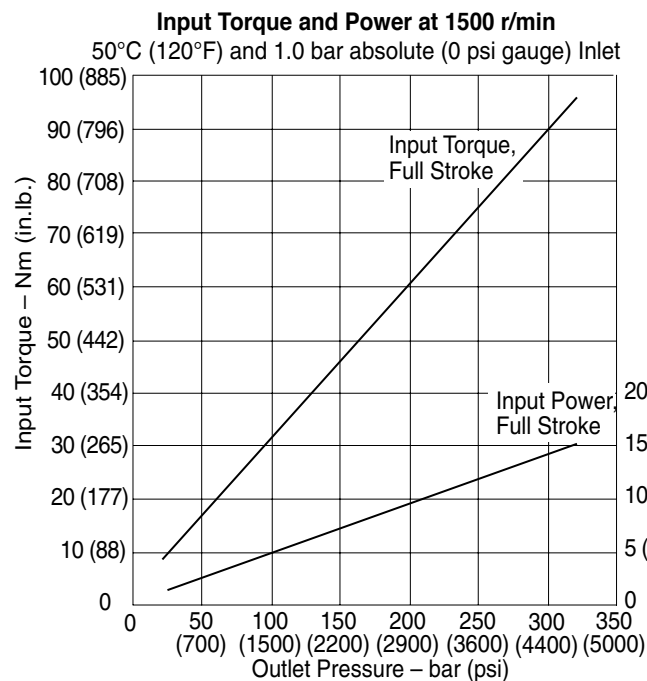
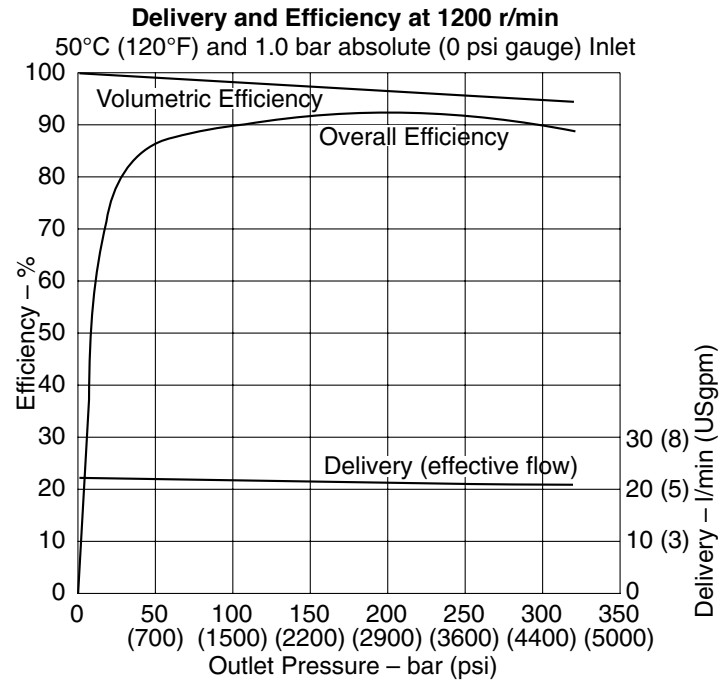
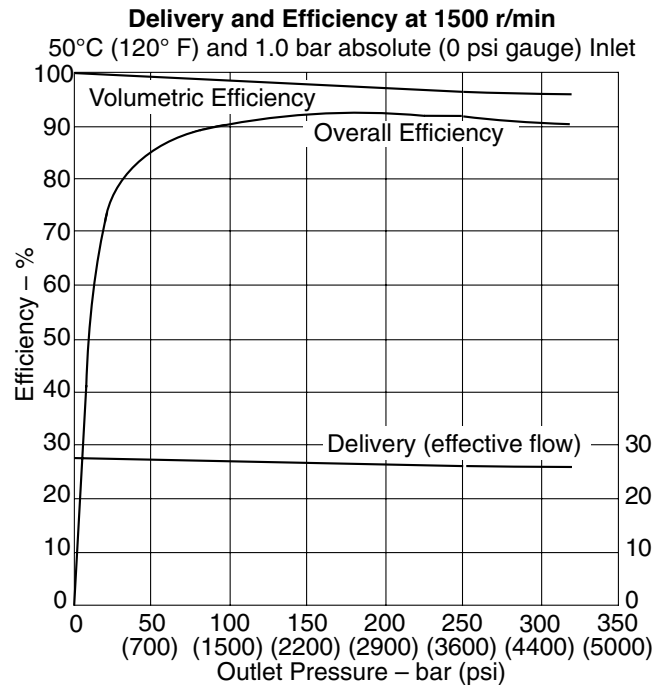
**Input Torque and Power at 1800 r/min**





# Performance

## Industrial PVM018

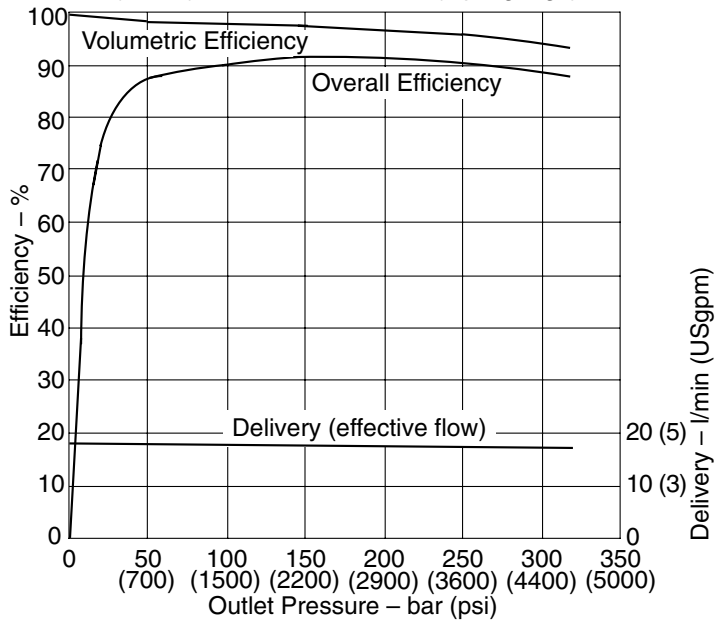


# Performance

## Industrial PVM018

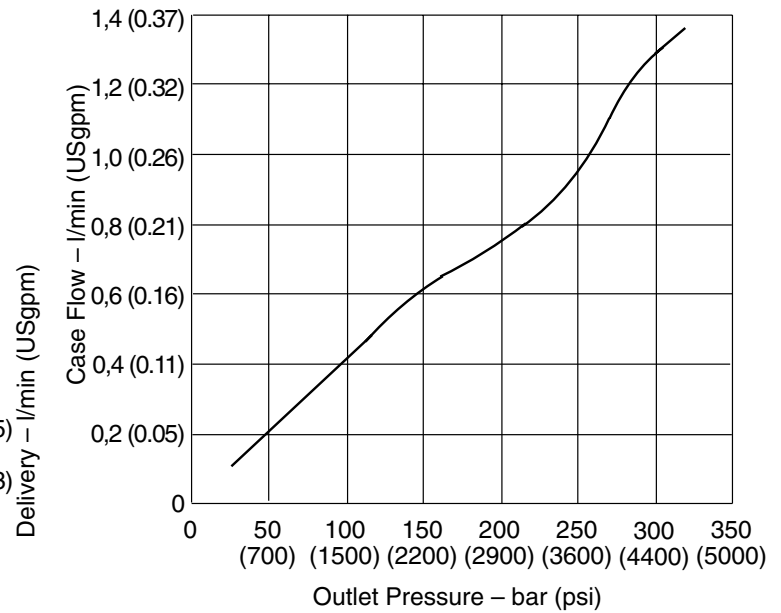
### Delivery and Efficiency at 1000 r/min

50°C (120°F) and 1.0 bar absolute (0 psi gauge) Inlet



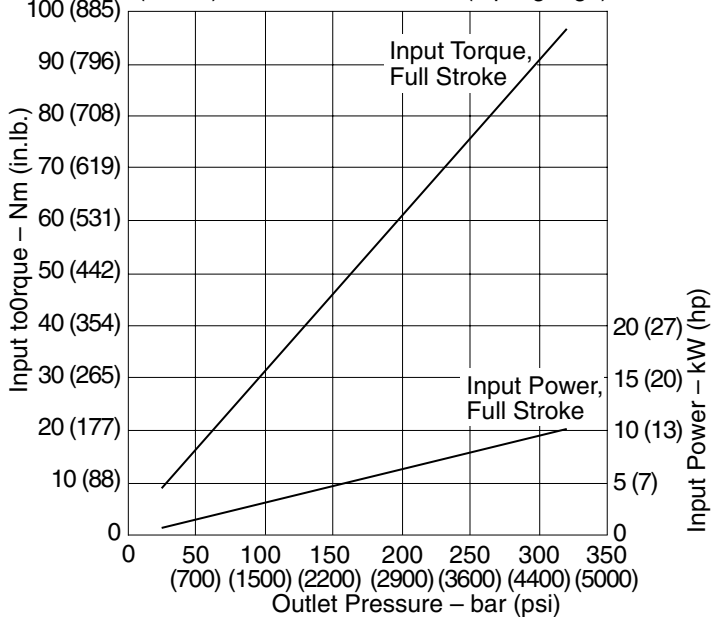
### Case Flow Versus Outlet Pressure at 1800 r/min, Full Flow

50°C (120°F) and 1.0 bar absolute (0 psi gauge) Inlet



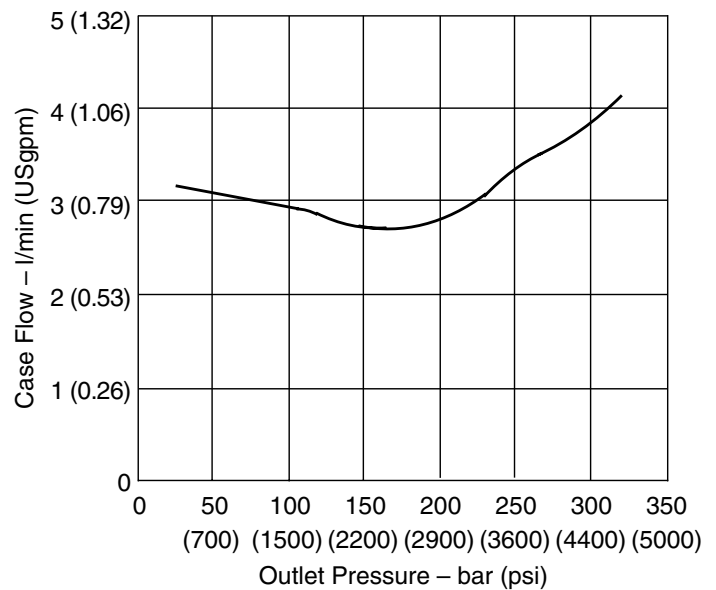
### Input Torque and Power at 1000 r/min

50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet



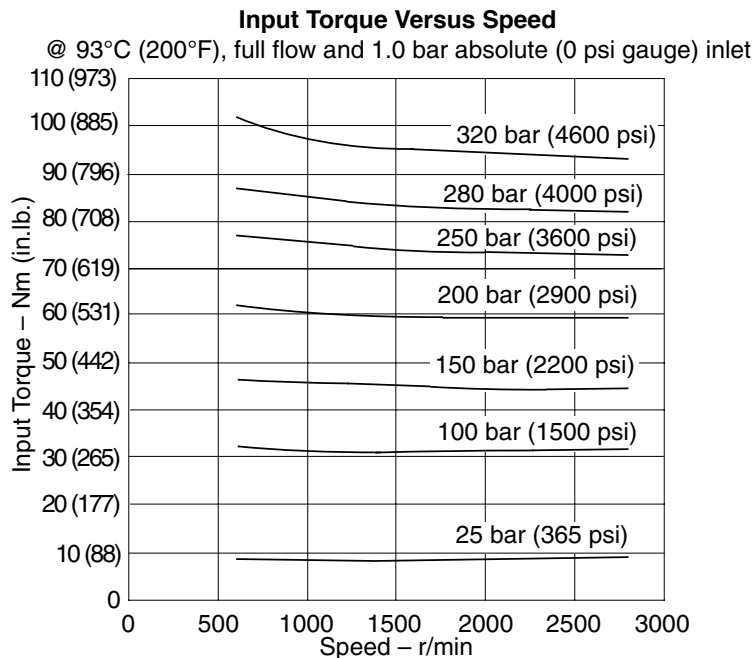
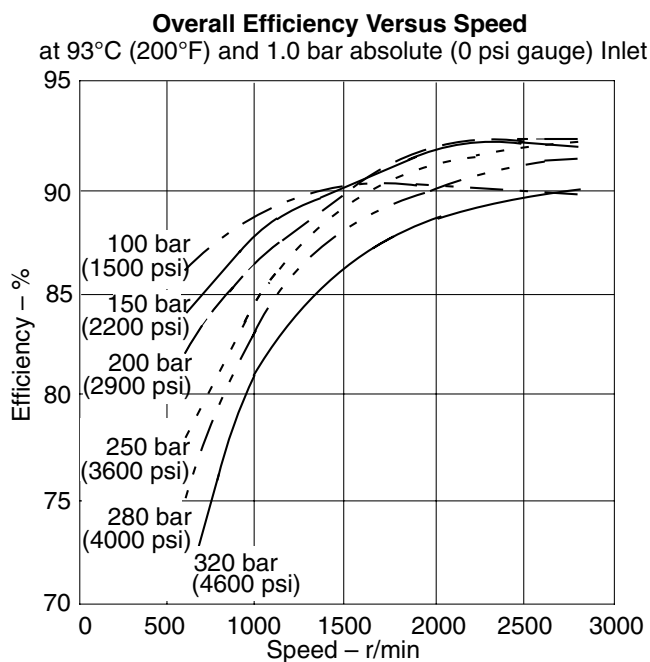
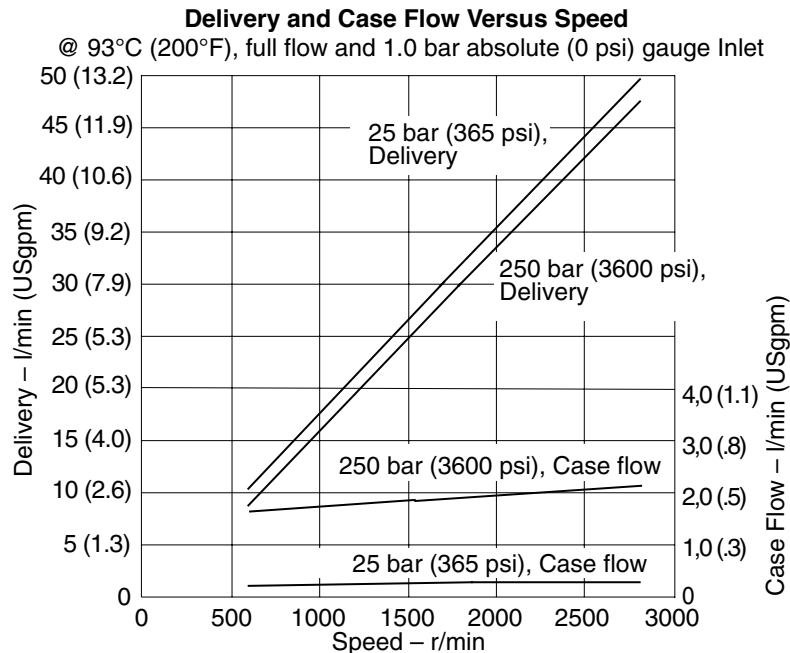
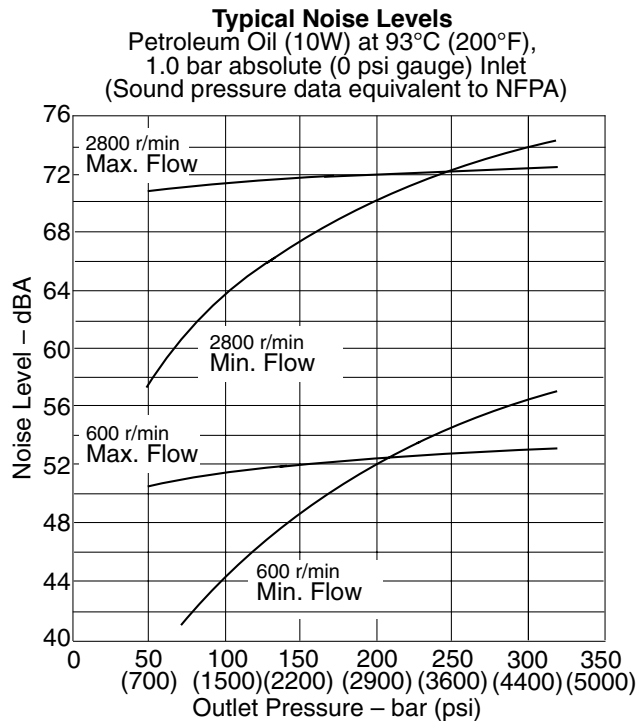
### Case Flow Versus Outlet Pressure at Cutoff, 1800 r/min

50°C (120°F) and 1.0 bar absolute (0 psi gauge) Inlet



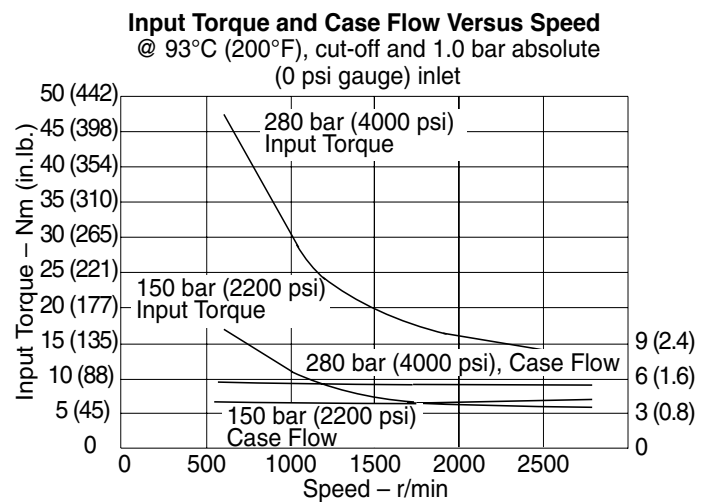
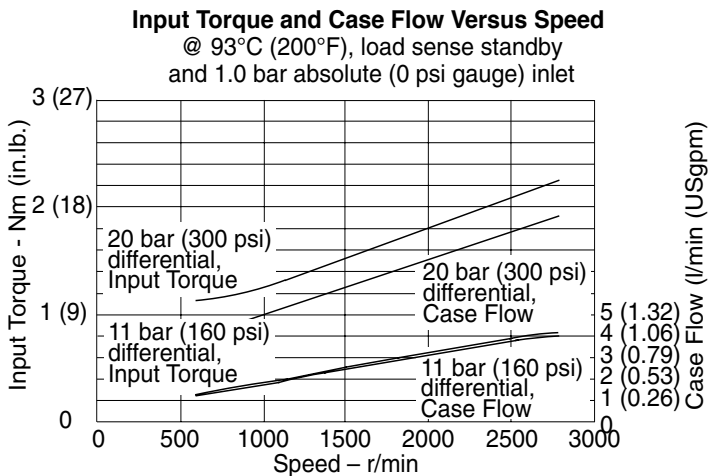
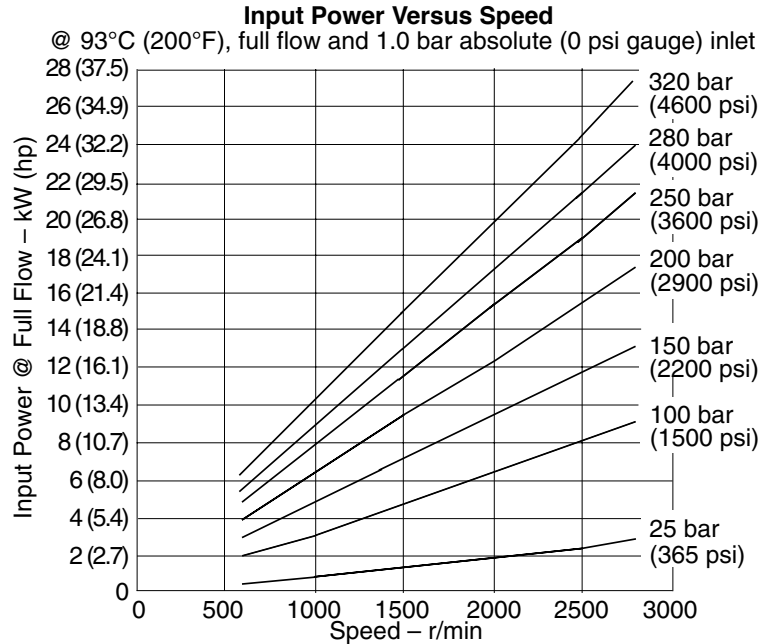
# Performance

## Mobile PVM018



# Performance

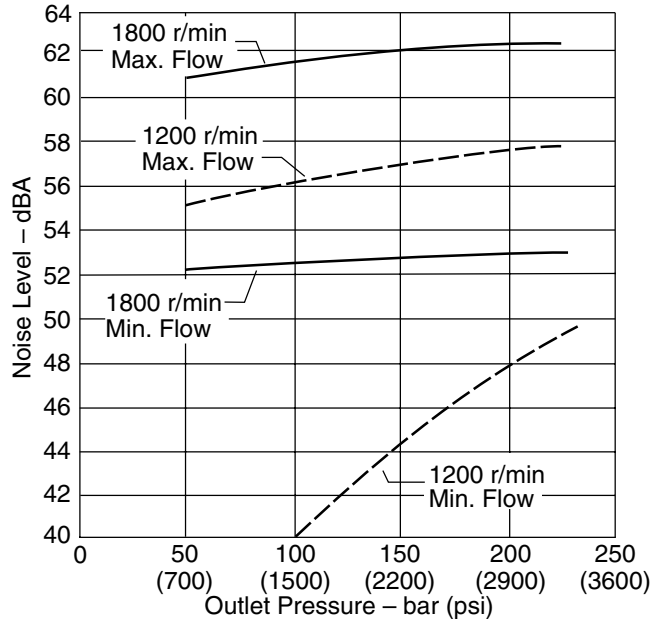
Mobile  
PVM018



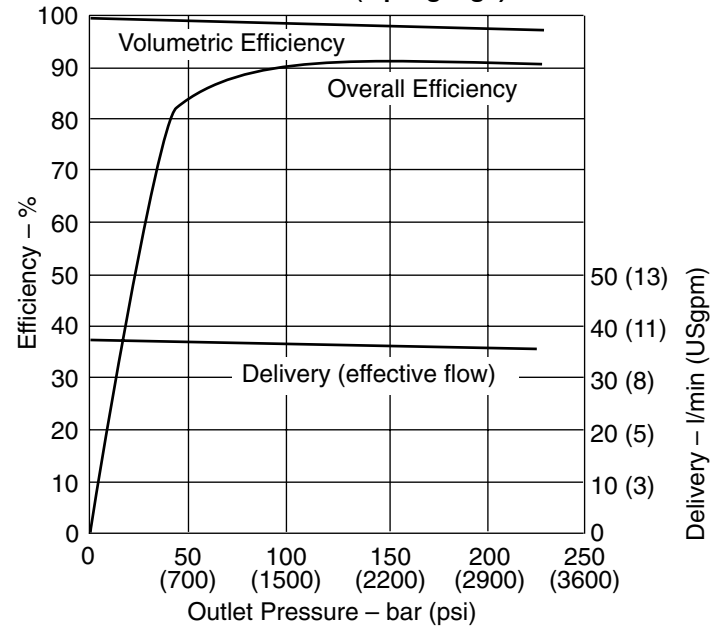
# Performance

## Industrial PVM020

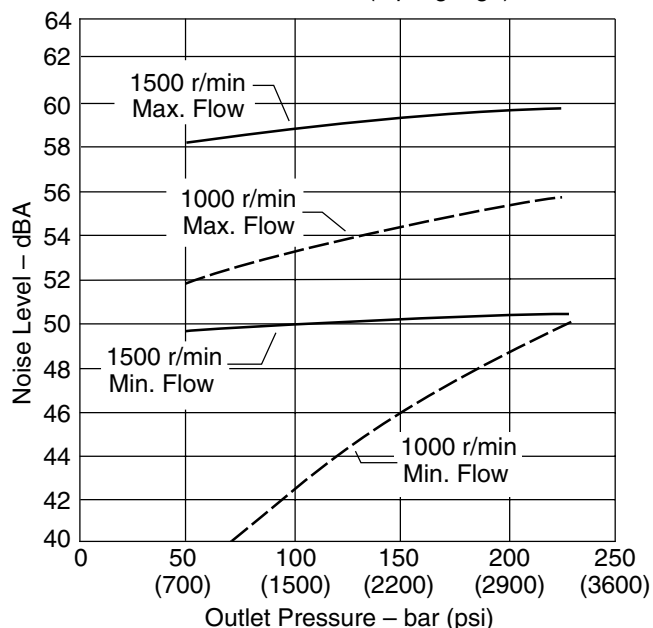
**Typical Noise Levels at 1800 and 1200 r/min**  
with Petroleum Oil (10W) at 50°C (120°F)  
and 1.0 bar absolute (0 psi gauge) Inlet



**Delivery and Efficiency at 1800 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**

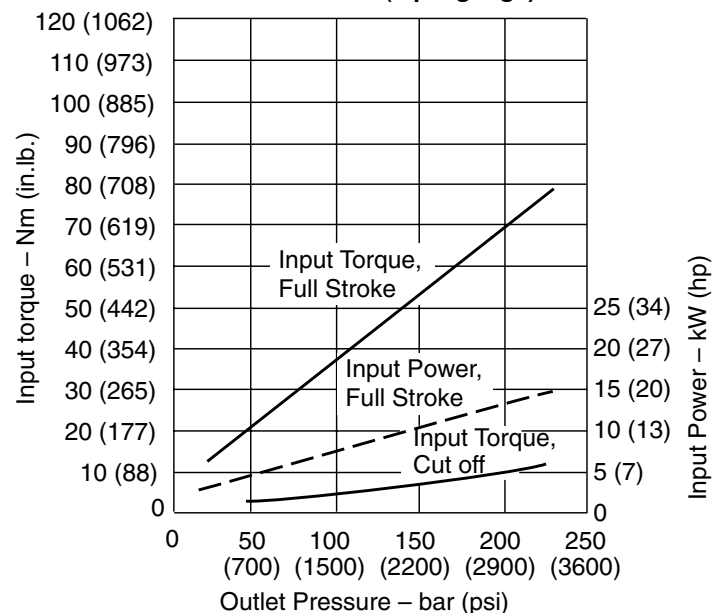


**Typical Noise Levels at 1500 and 1000 r/min**  
with Petroleum Oil (10W) at 50°C (120°F)  
and 1.0 bar absolute (0 psi gauge) Inlet



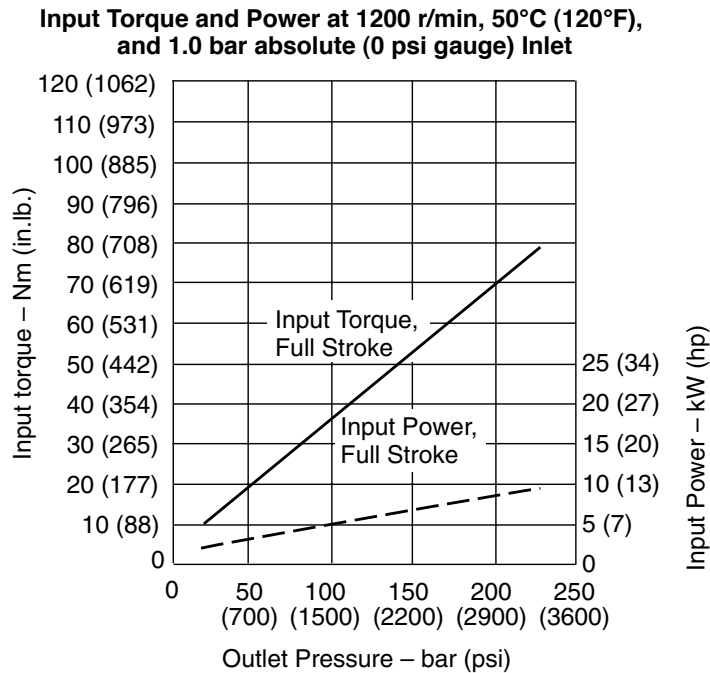
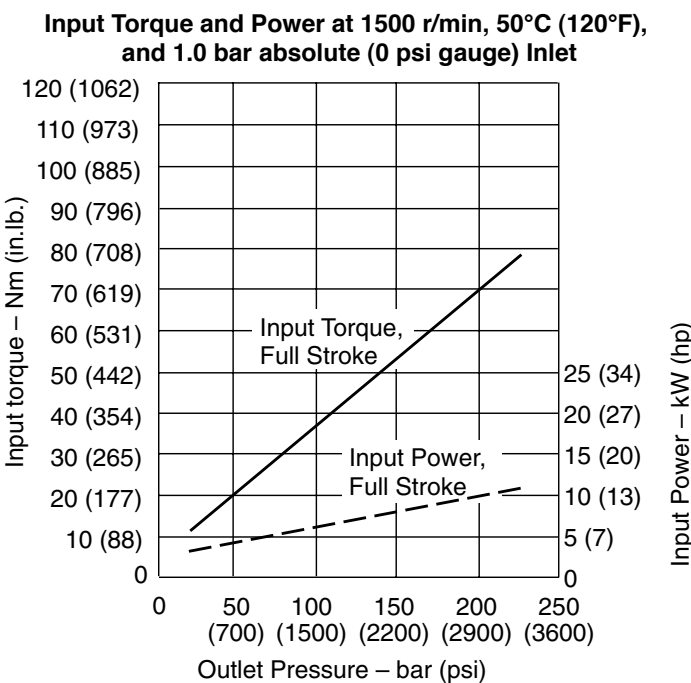
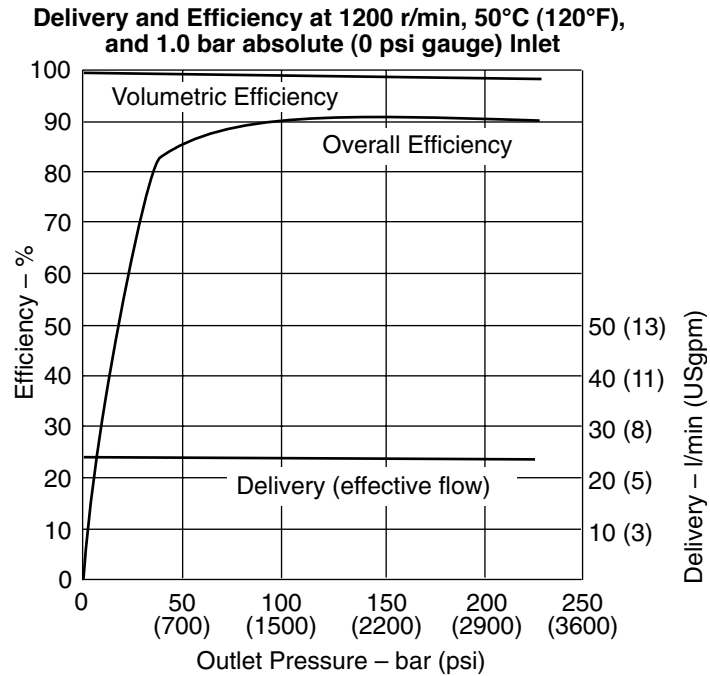
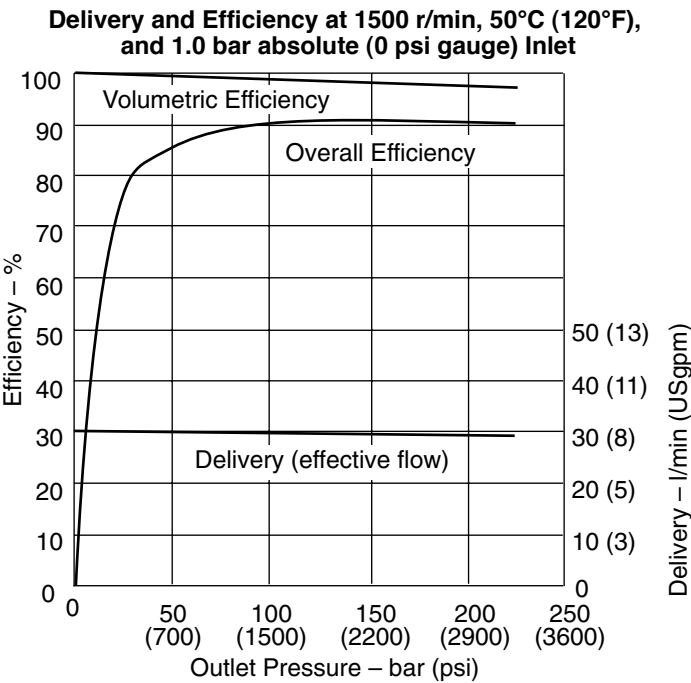
Sound pressure data  
equivalent to NFPA

**Input Torque and Power at 1800 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**



# Performance

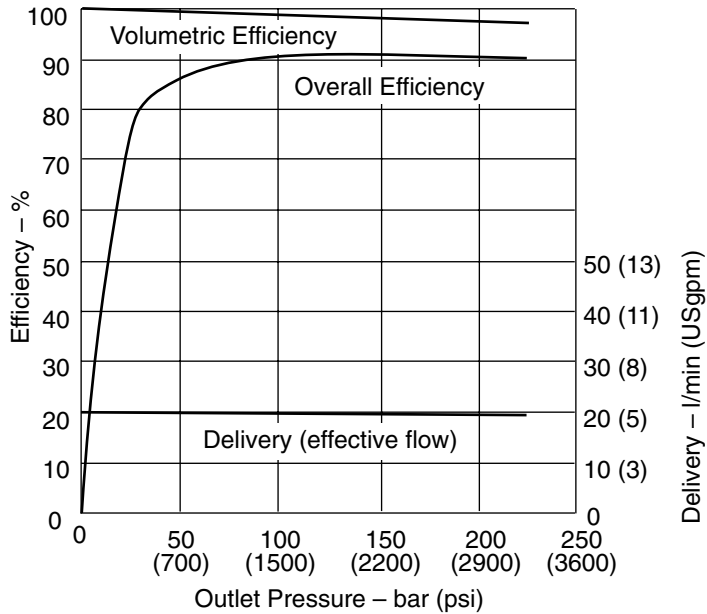
Industrial  
PVM020



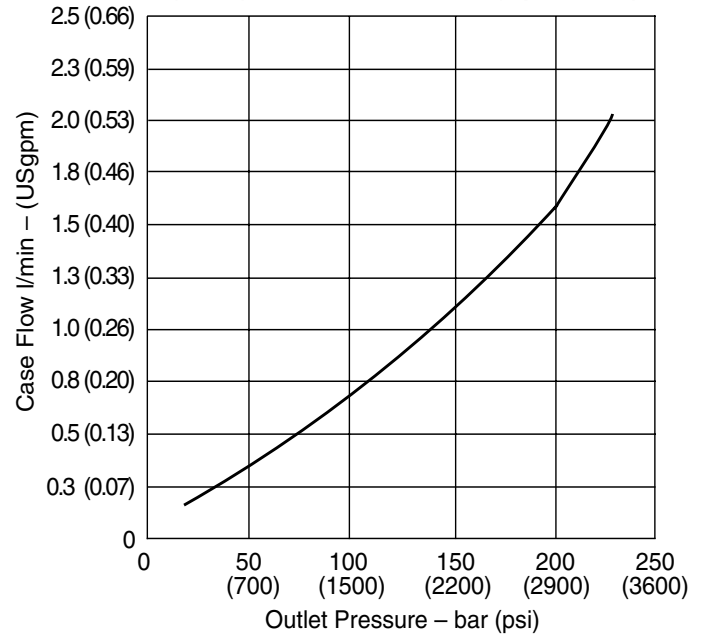
# Performance

## Industrial PVM020

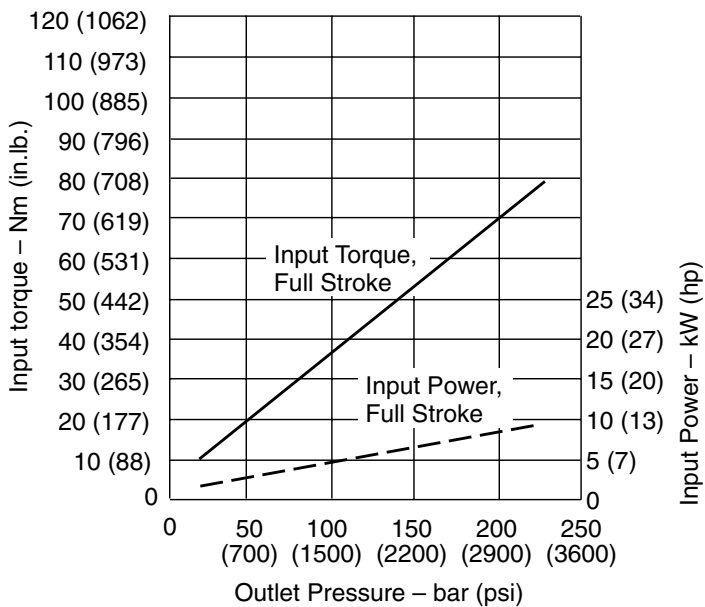
**Delivery and Efficiency at 1000 r/min, 50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**



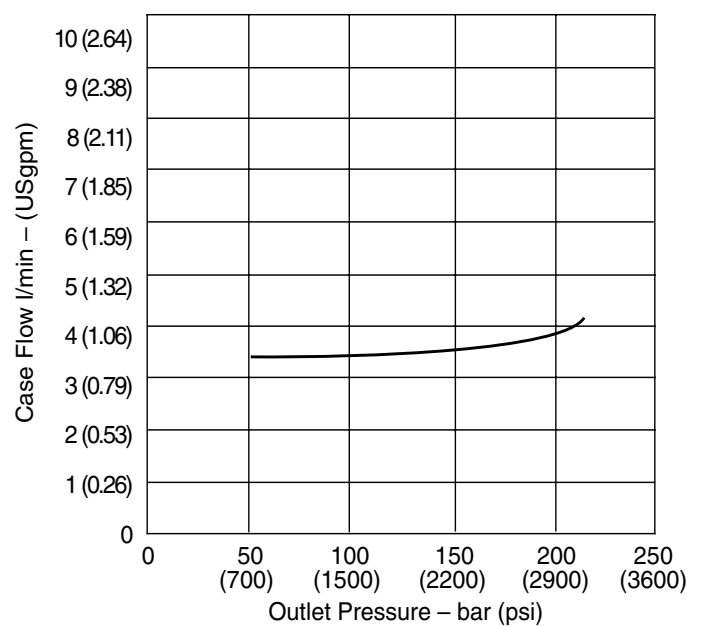
**Case Flow versus Outlet Pressure at 1800 r/min, Full Flow, 50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**



**Input Torque and Power at 1000 r/min, 50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**



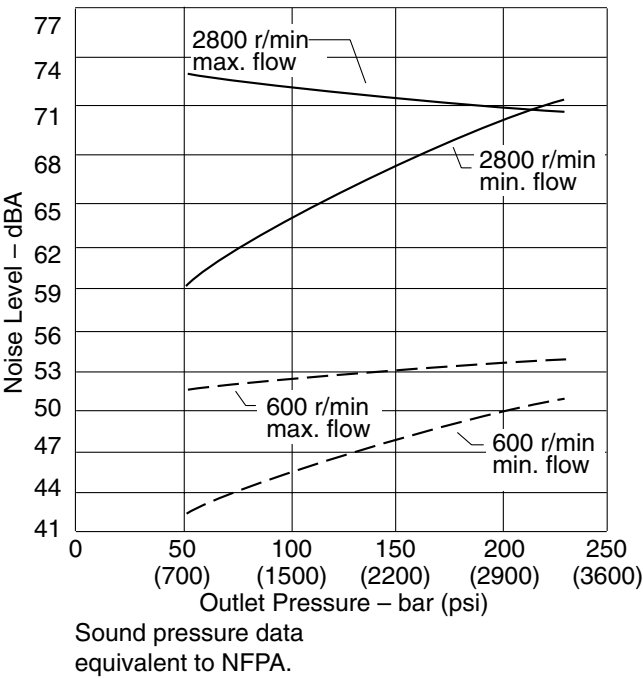
**Case Flow versus Outlet Pressure at Cutoff, 1800 r/min, 50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**



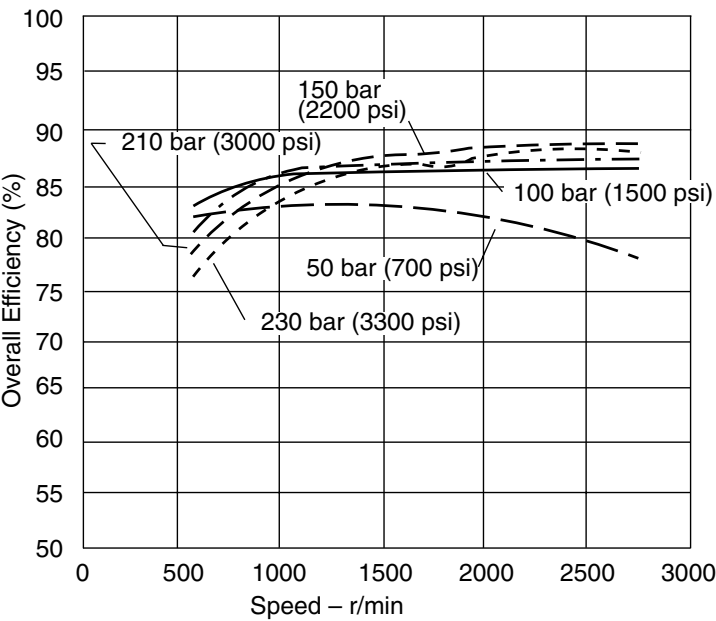
# Performance

Mobile  
PVM020

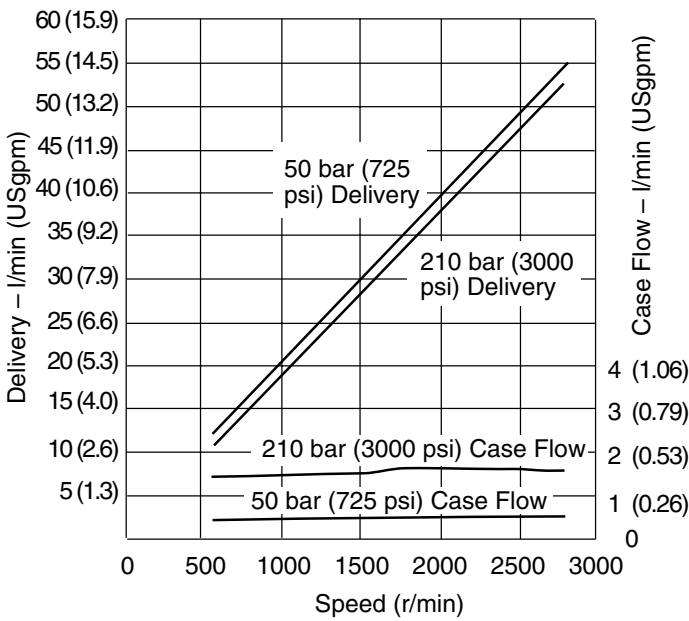
Typical Noise Levels at 2800 & 600 r/min with Petroleum Oil (10W)  
at 93°C (200°F) and 1.0 bar absolute (0 psi gauge) Inlet



Overall Efficiency versus Speed  
at 93°C (200°F) and 1.0 bar absolute (0 psi gauge) inlet



Delivery and Case Flow versus Speed at 93°C (200°F),  
Full Flow 1.0 bar absolute (0 psi gauge) inlet

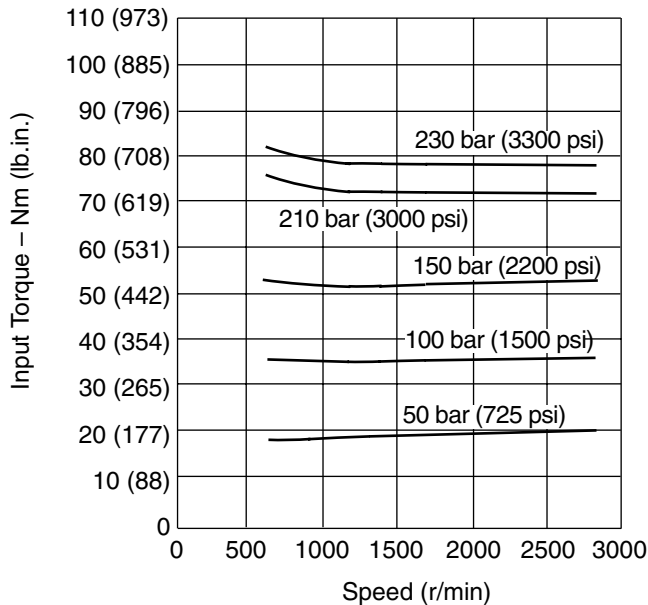




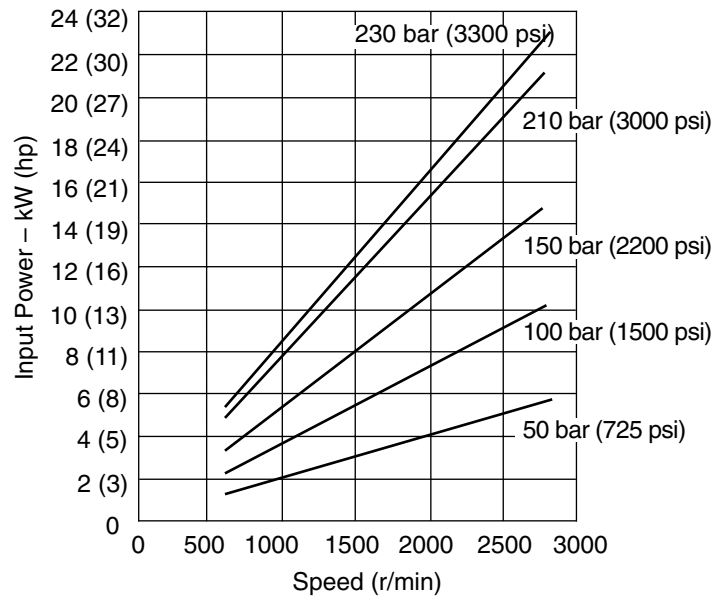
# Performance

## Mobile PVM020

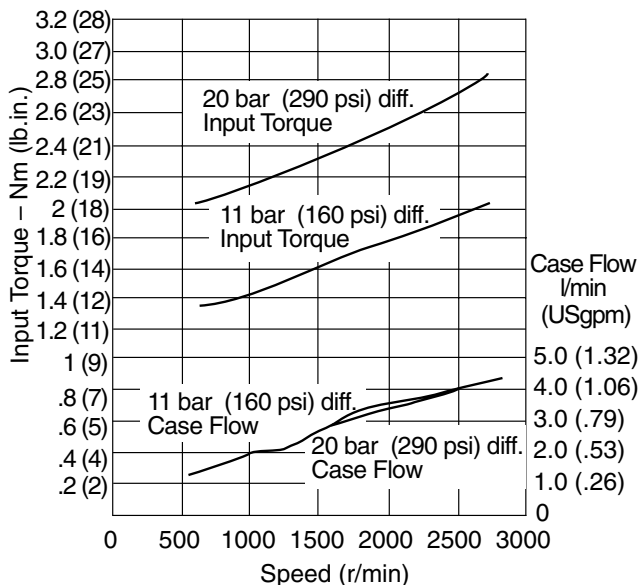
**Input Torque versus Speed at 93°C (200°F),  
Full Flow and 1.0 bar absolute (0 psi gauge) Inlet**



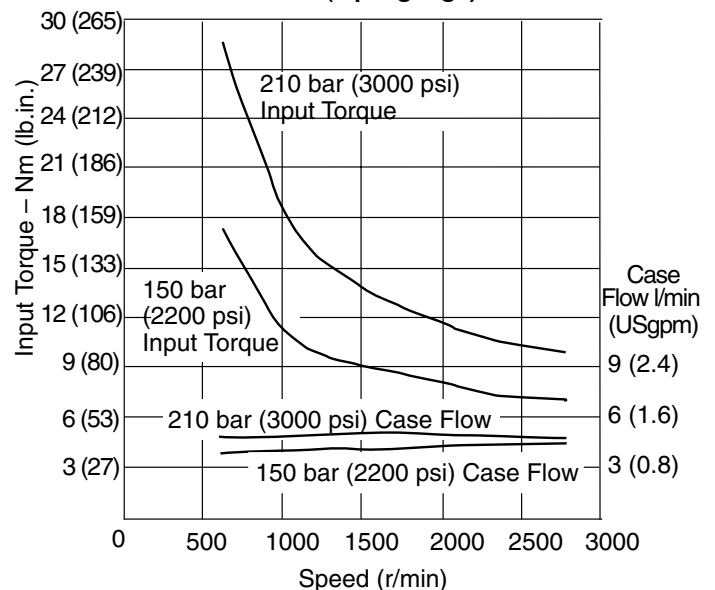
**Input Power versus Speed at 93°C (200°F),  
Full Flow and 1.0 bar absolute (0 psi gauge) Inlet**



**Input Torque and Case Flow versus Speed at  
93°C (200°F), Load Sense Standby and 1.0 bar  
absolute (0 psi gauge) Inlet**



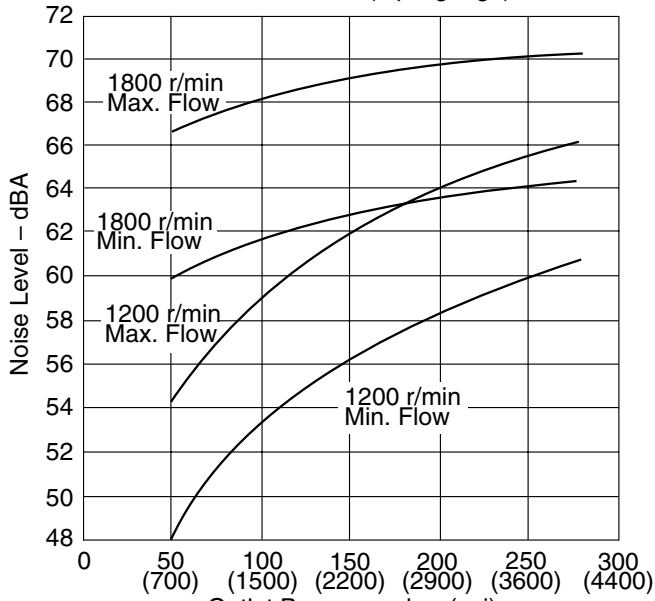
**Input Torque and Case Flow versus Speed at 93°C (200°F), Pressure Limit Cut-off and  
1.0 bar absolute (0 psi gauge) Inlet**



# Performance

## Industrial PVM045

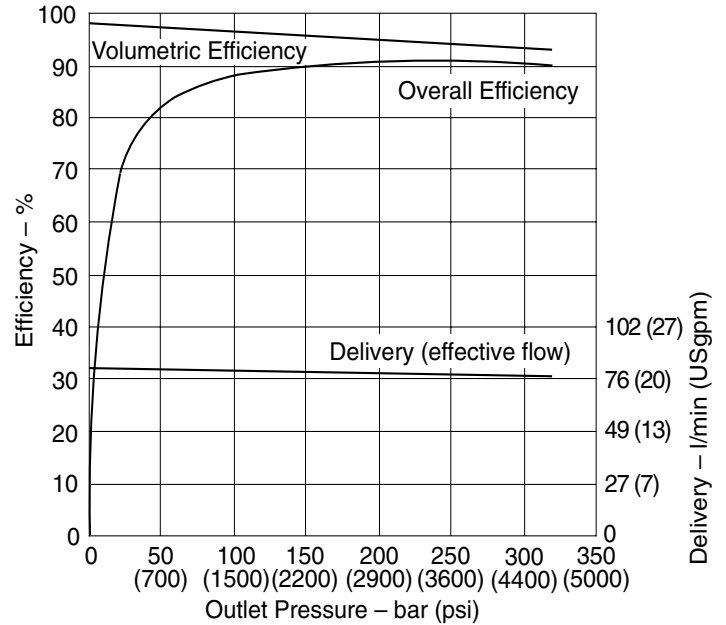
**Typical Noise Levels at 1800 and 1200 r/min**  
with Petroleum Oil (10W) at 50°C (120°F)  
and 1.0 bar absolute (0 psi gauge) Inlet



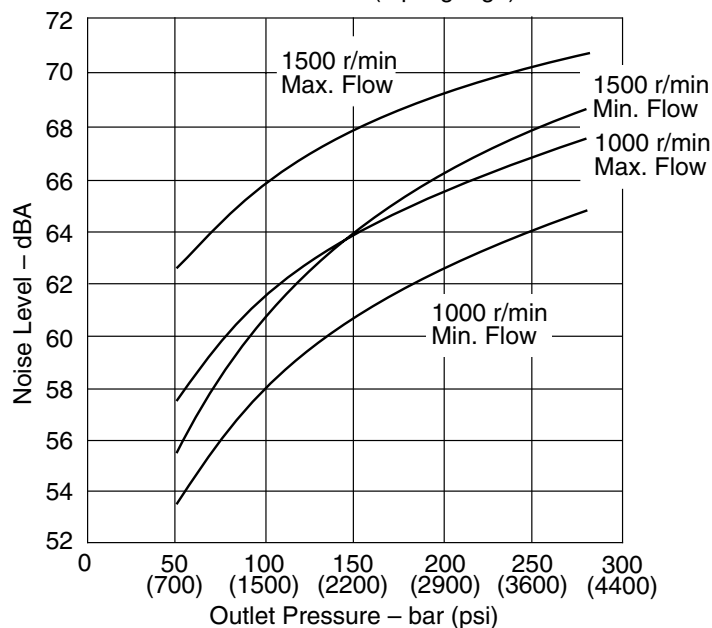
Sound pressure data equivalent to NFPA

**Delivery and Efficiency at 1800 r/min**

50°C (120°F) and 1.0 bar absolute (0 psi gauge) Inlet

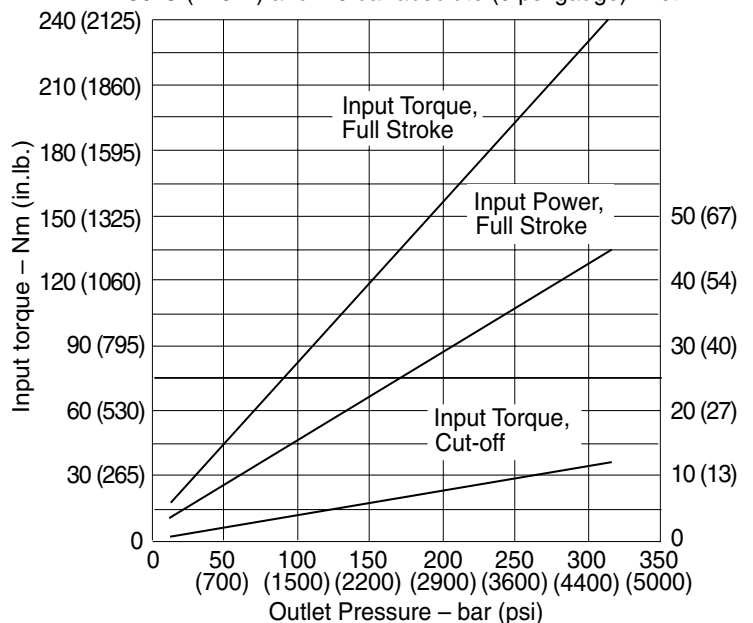


**Typical Noise Levels at 1500 and 1000 r/min**  
with Petroleum Oil (10W) at 50°C (120°F)  
and 1.0 bar absolute (0 psi gauge) Inlet



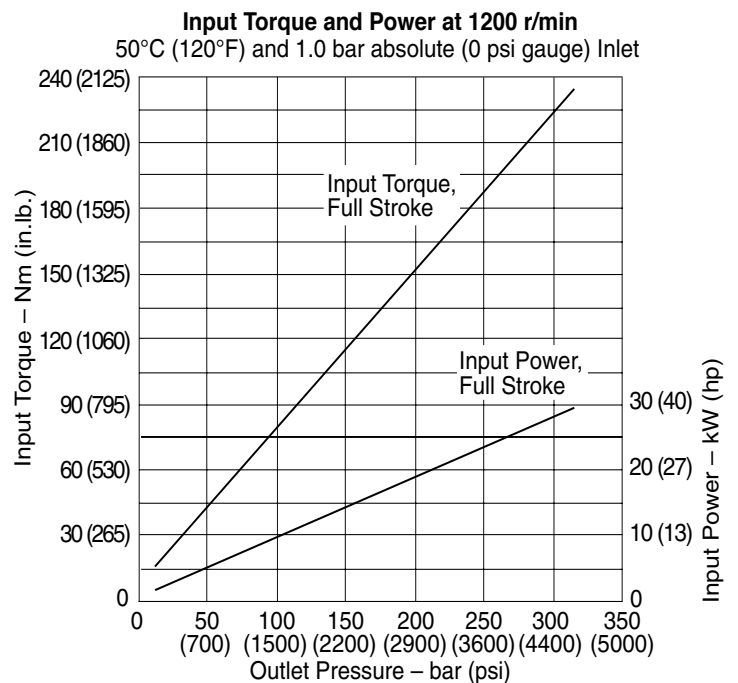
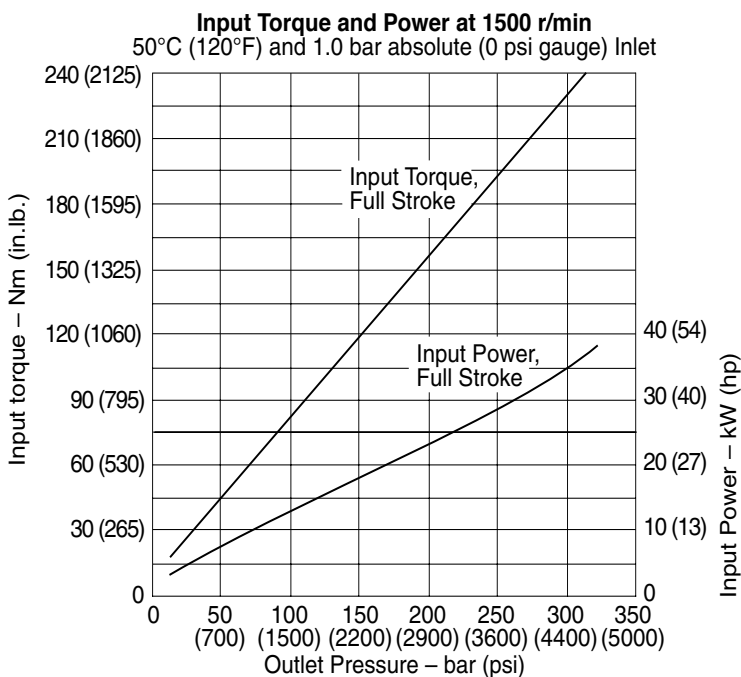
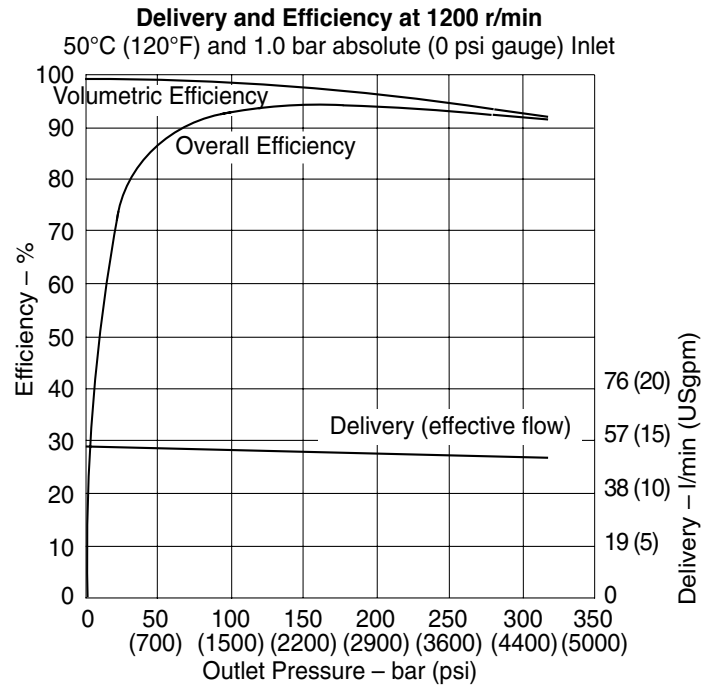
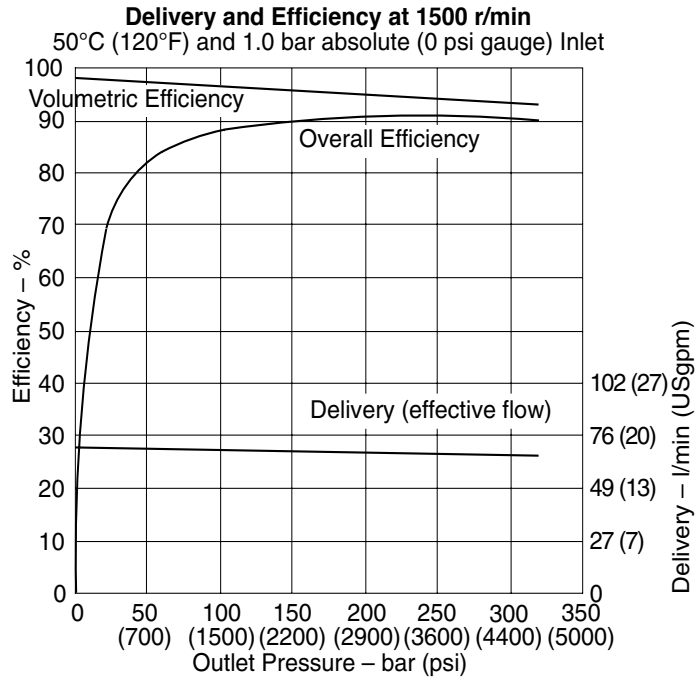
**Input Torque and Power at 1800 r/min**

50°C (120°F) and 1.0 bar absolute (0 psi gauge) Inlet



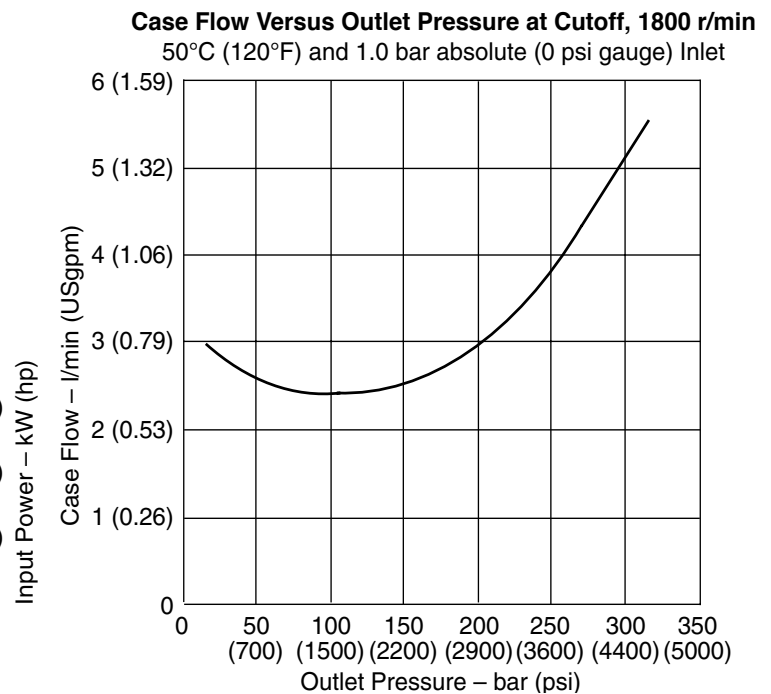
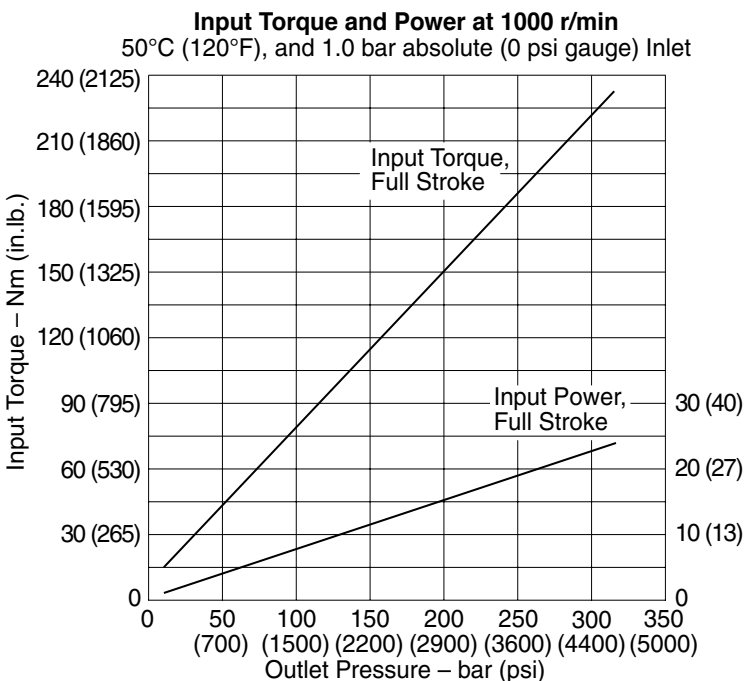
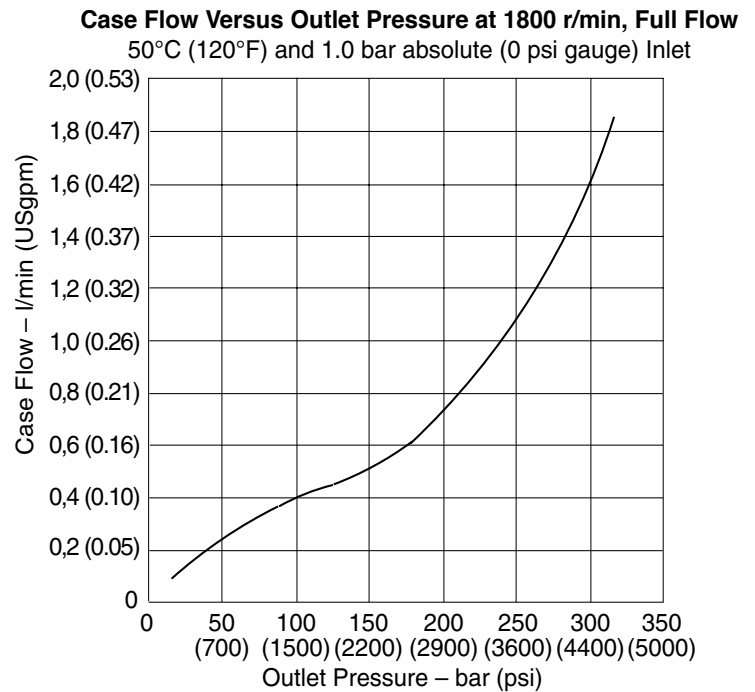
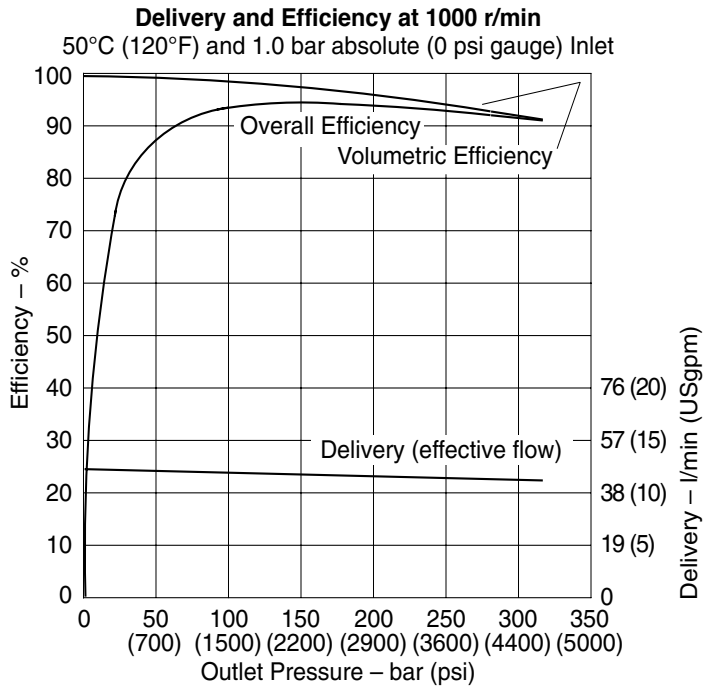
# Performance

## Industrial PVM045



# Performance

## Industrial PVM045

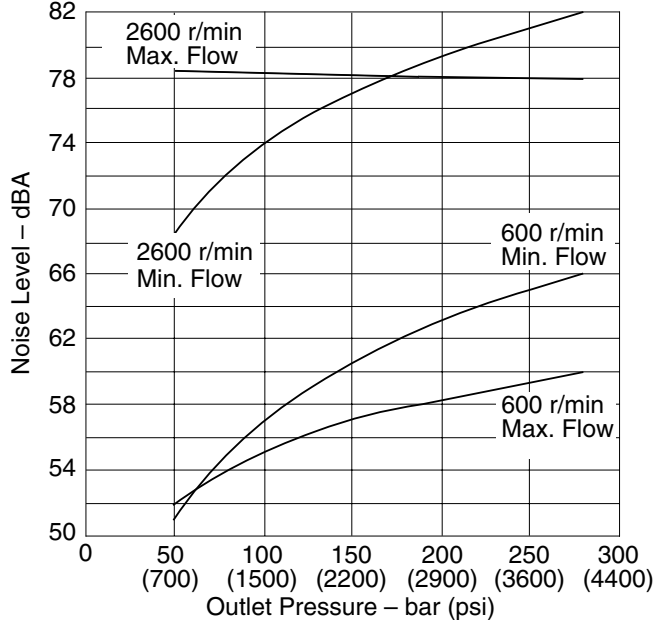


# Performance

## Mobile PVM045

### Typical Noise Levels

Petroleum Oil (10W) at 93°C (200°F),  
1.0 bar absolute (0 psi gauge) Inlet  
(Sound pressure data equivalent to NFPA)



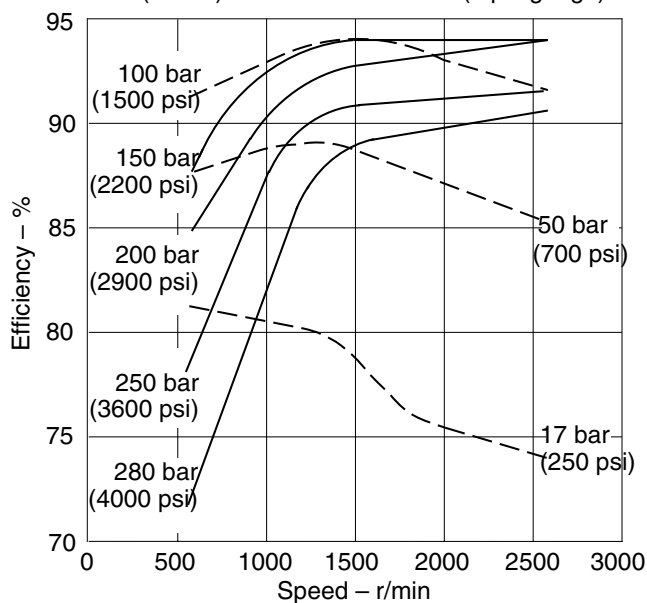
### Delivery and Case Flow Versus Speed

@ 93°C (200°F), full flow and 1.0 bar absolute (0 psi) gauge Inlet



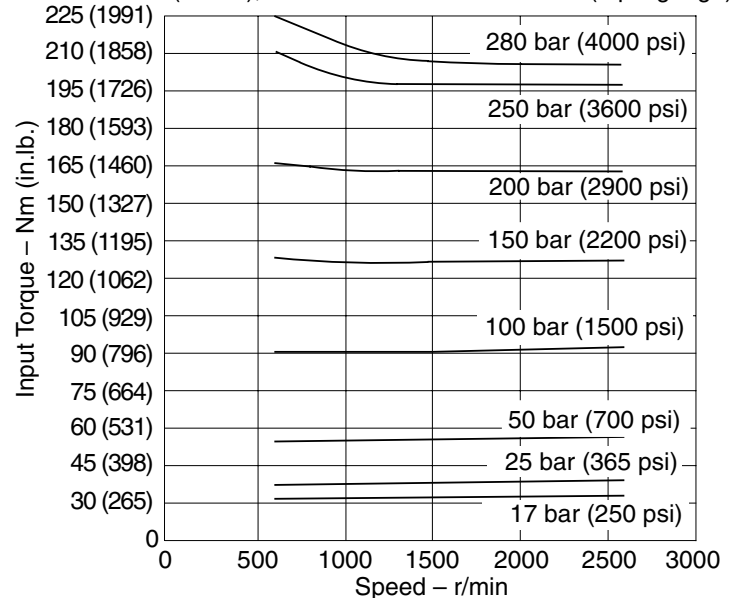
### Overall Efficiency Versus Speed

at 93°C (200°F) and 1.0 bar absolute (0 psi gauge) Inlet



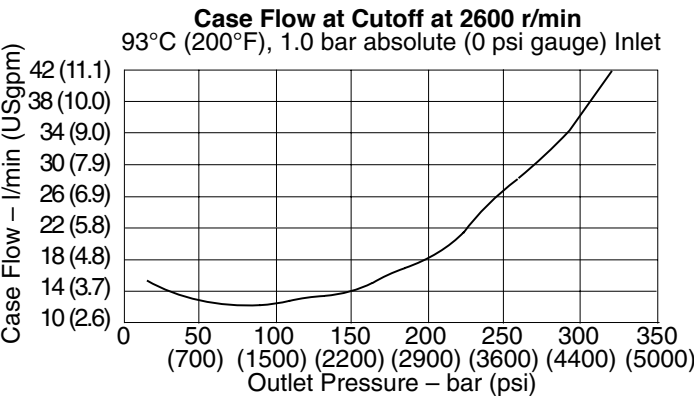
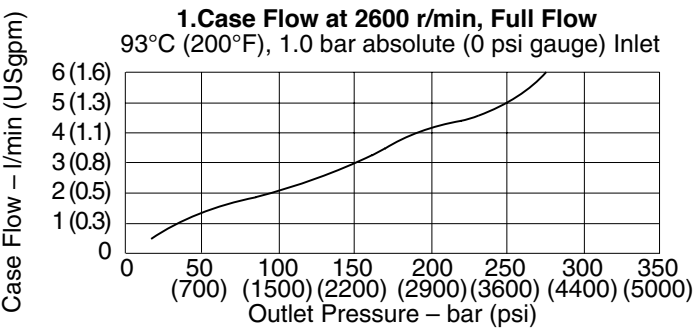
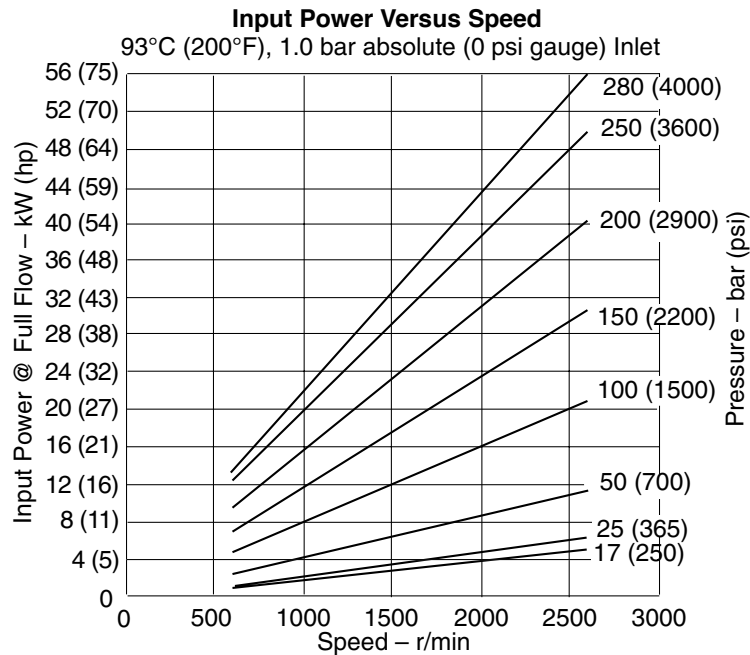
### Input Torque Versus Speed

@ 93°C (200°F), full flow and 1.0 bar absolute (0 psi gauge) inlet



# Performance

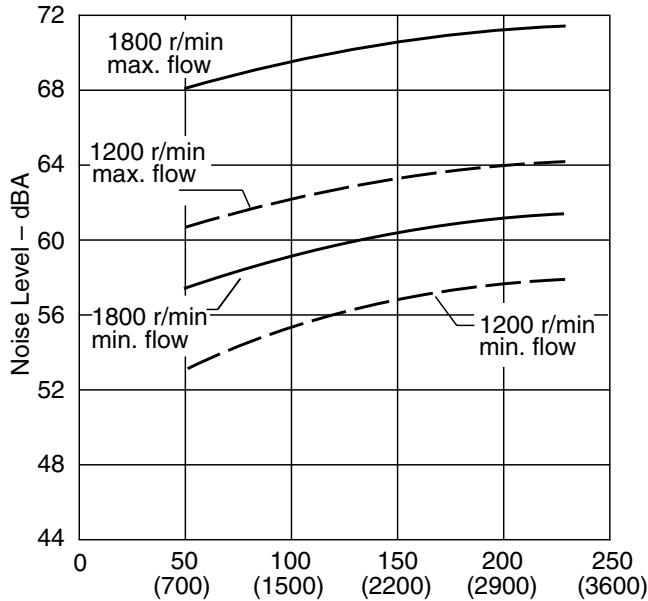
Mobile  
PVM045



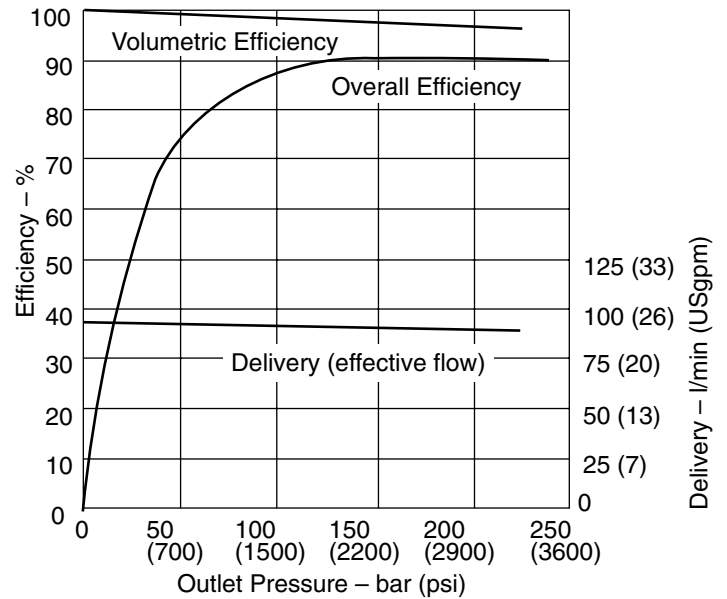
# Performance

## Industrial PVM050

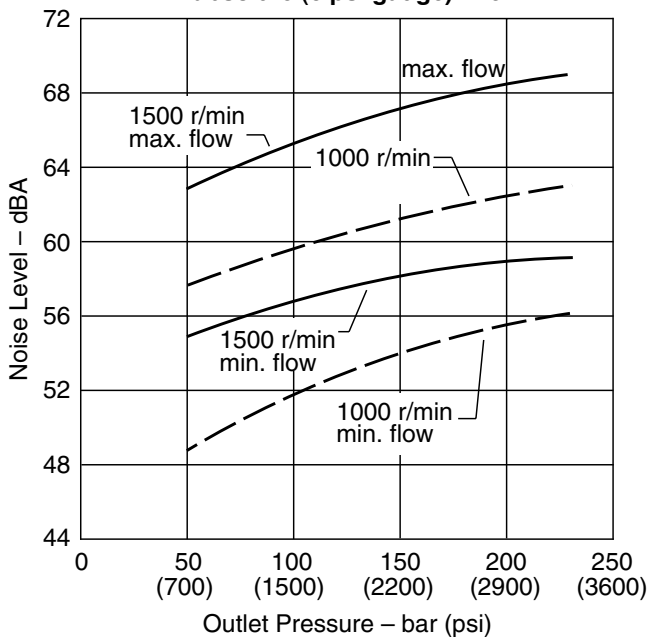
**Typical Noise Levels at 1800 and 1200 r/min with Petroleum Oil (10W) at 50°C (120°F) and 1.0 bar absolute (0 psi gauge) Inlet**



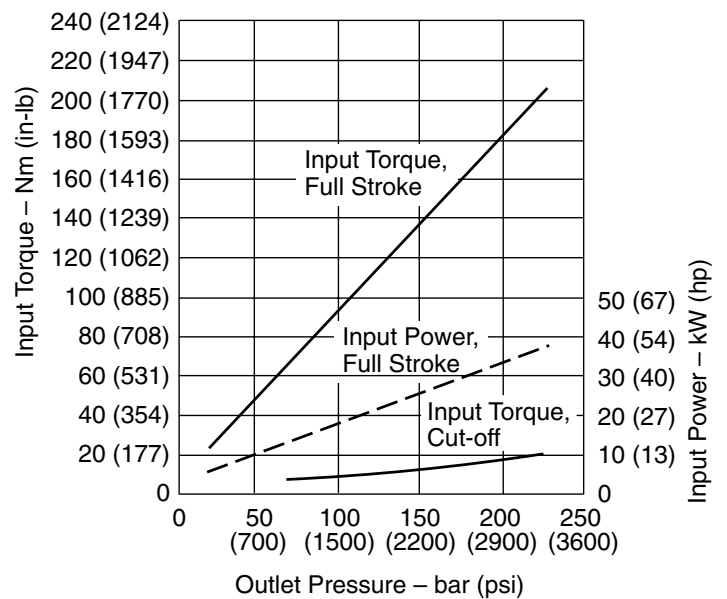
**Delivery and Efficiency at 1800 r/min, 50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**



**Typical Noise Levels at 1500 and 1000 r/min with Petroleum Oil (10W) at 50°C (120°F) and 1.0 bar absolute (0 psi gauge) Inlet**



**Input Torque and Power at 1800 r/min, 50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**

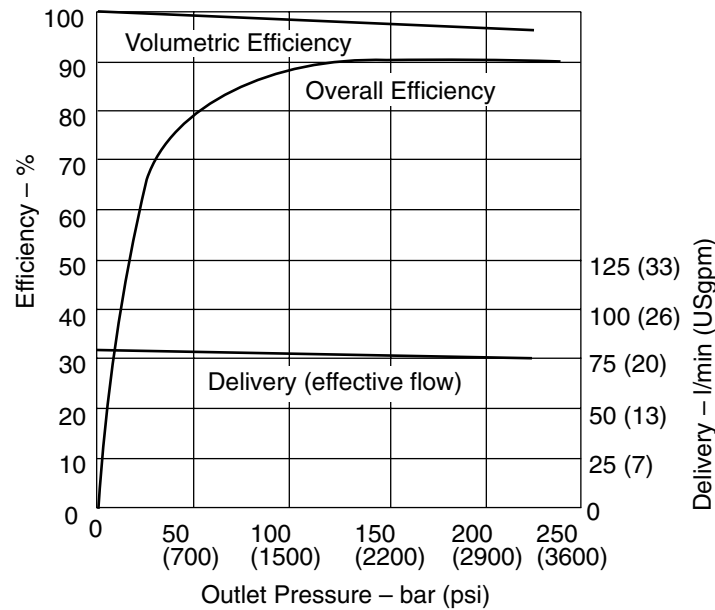


Sound pressure data

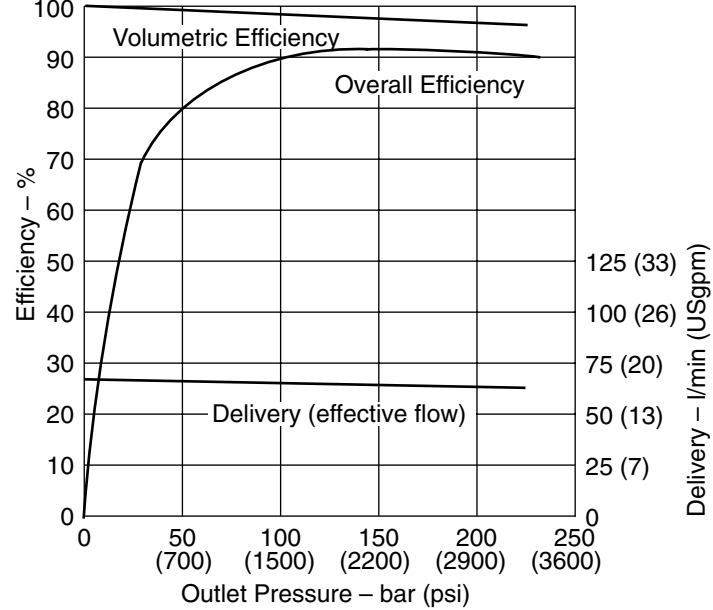
# Performance

## Industrial PVM050

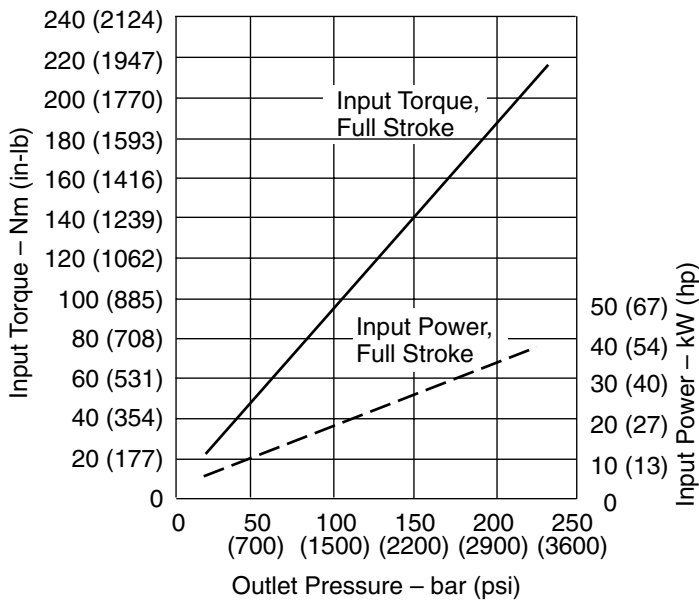
**Delivery and Efficiency at 1500 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**



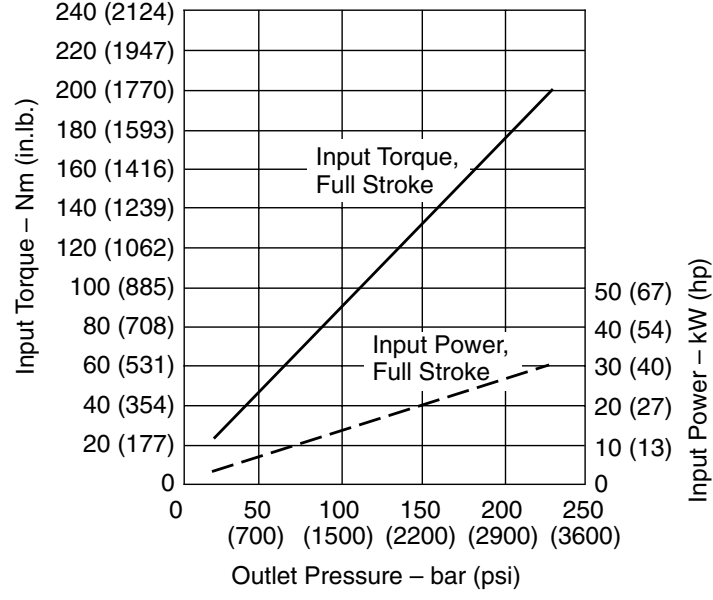
**Delivery and Efficiency at 1200 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**



**Input Torque and Power at 1500 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**



**Input Torque and Power at 1200 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**

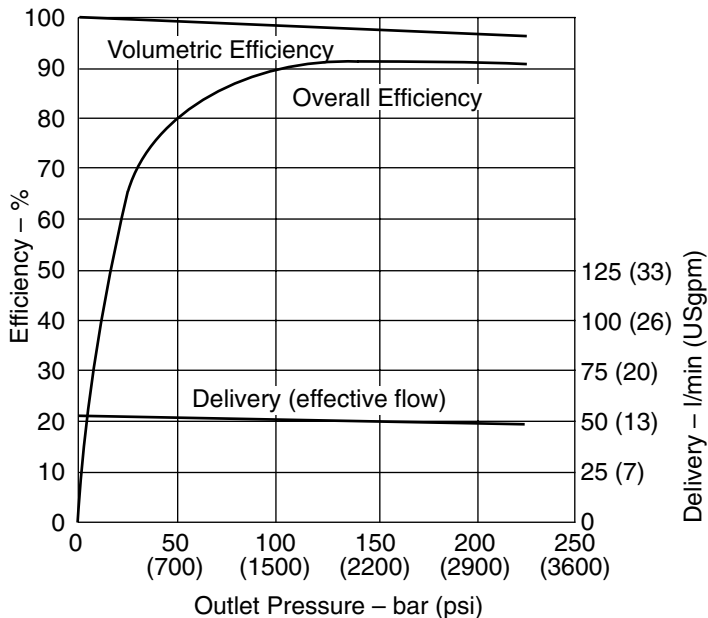




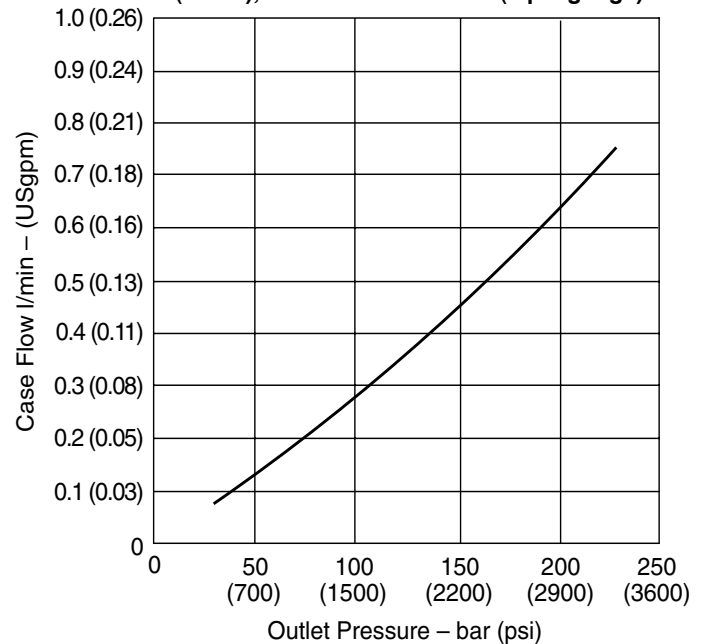
# Performance

## Industrial PVM050

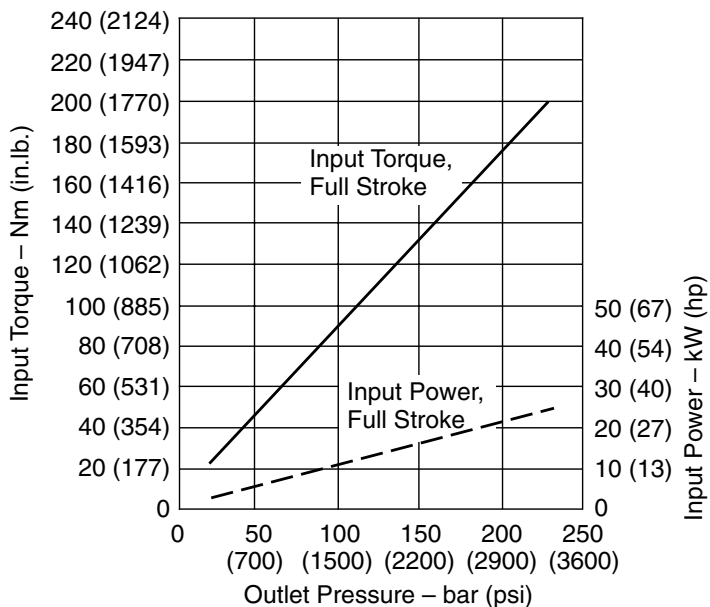
**Delivery and Efficiency at 1000 r/min, 50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**



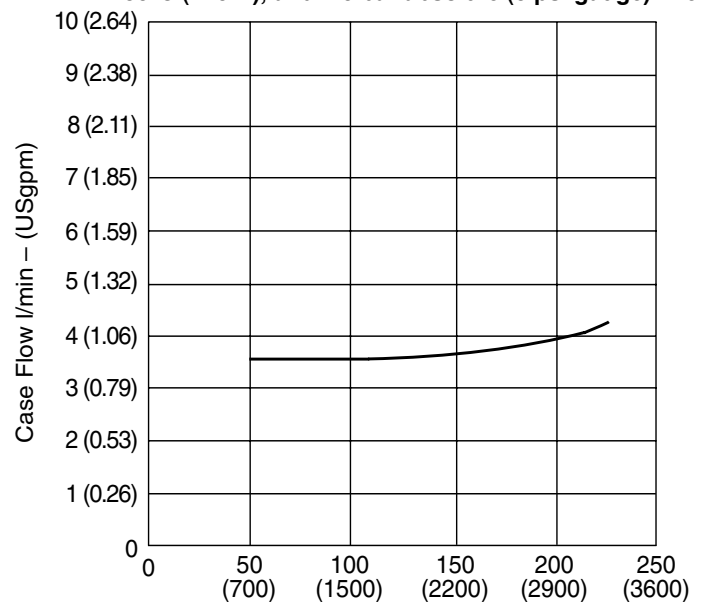
**Case Flow versus Outlet Pressure at 1800 r/min, Full Flow, 50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**



**Input Torque and Power at 1000 r/min, 50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**



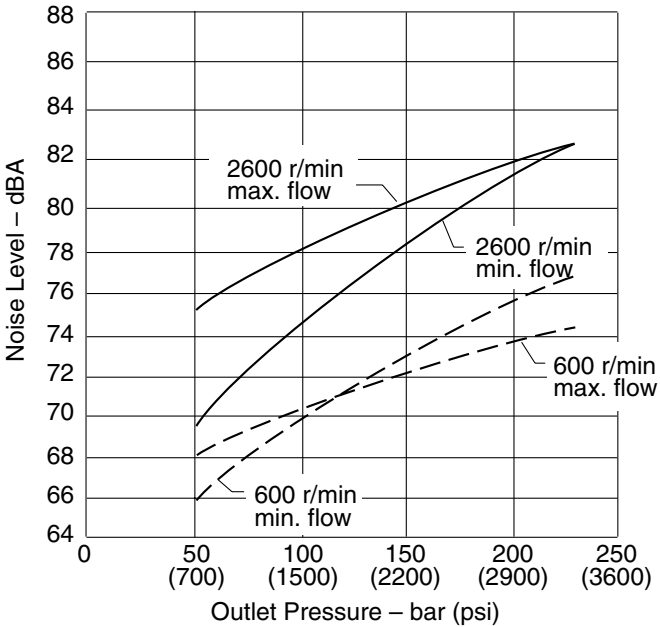
**Case Flow versus Outlet Pressure at Cutoff, 1800 r/min, 50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**



# Performance

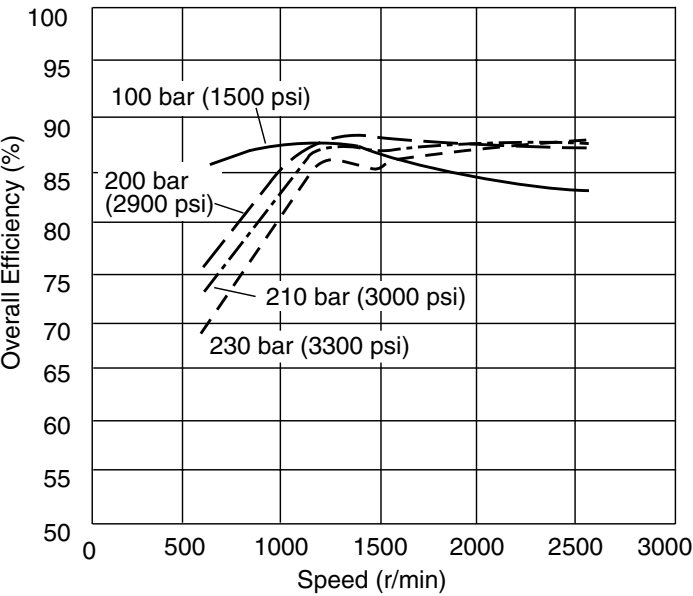
Mobile  
PVM050

Typical Noise Levels at 2600 & 600 r/min  
with Petroleum Oil (10W) at 93°C (200°F) and  
1.0 bar absolute (0 psi gauge) inlet

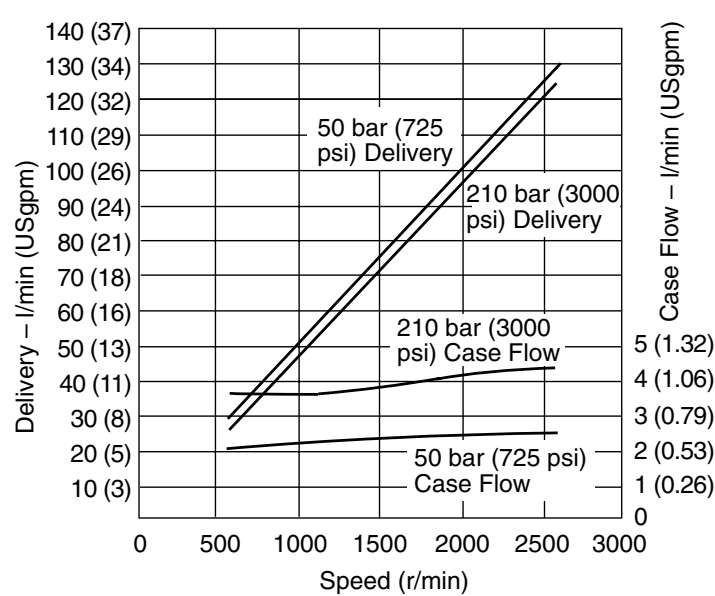


Sound pressure data  
equivalent to NFPA.

Overall Efficiency versus Speed  
at 93°C (200°F) and 1.0 bar absolute (0 psi gauge) inlet



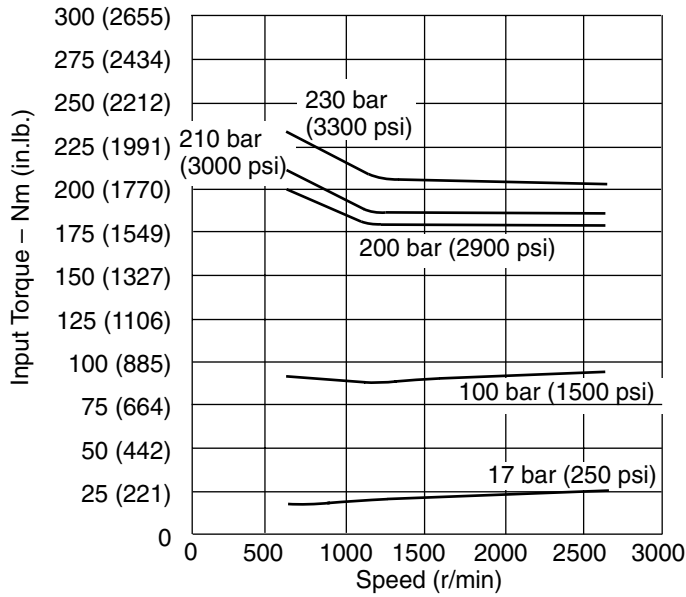
Delivery and Case Flow versus Speed at 93°C (200°F),  
Full Flow and 1.0 bar absolute (0 psi gauge) inlet



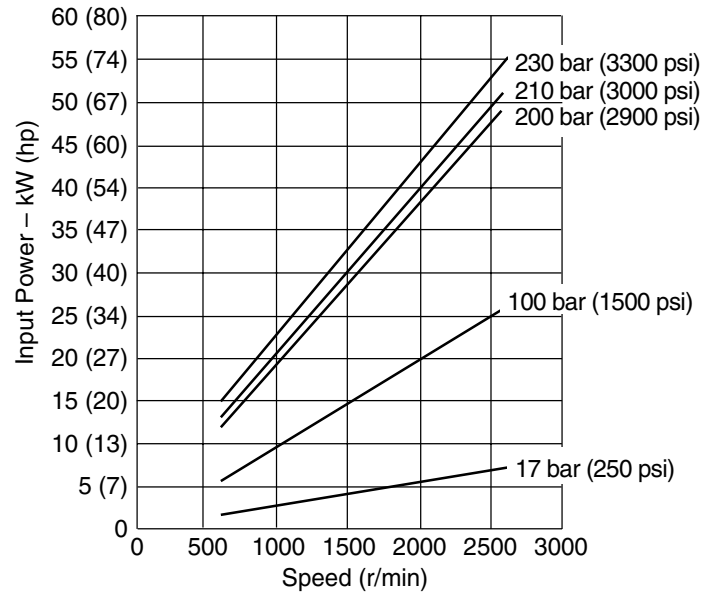
# Performance

## Mobile PVM050

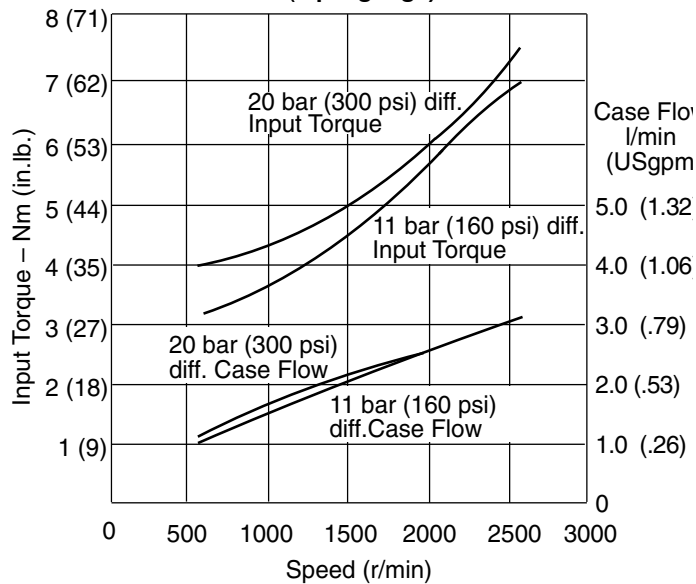
**Input Torque versus Speed at 93°C (200°F),  
Full Flow and 1.0 bar absolute (0 psi gauge) Inlet**



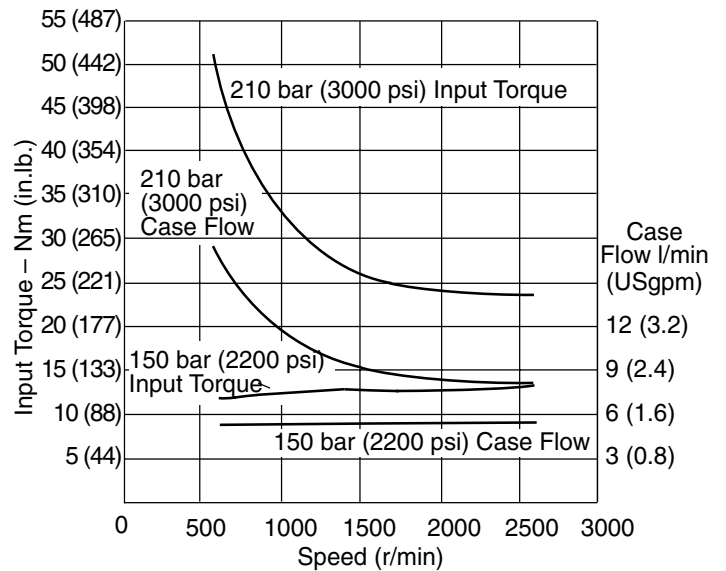
**Input Power versus Speed at 93°C (200°F),  
Full Flow and 1.0 bar absolute (0 psi gauge) Inlet**



**Input Torque and Case Flow versus Speed at  
93°C (200°F), Load Sense Standby and 1.0 bar  
absolute (0 psi gauge) Inlet**



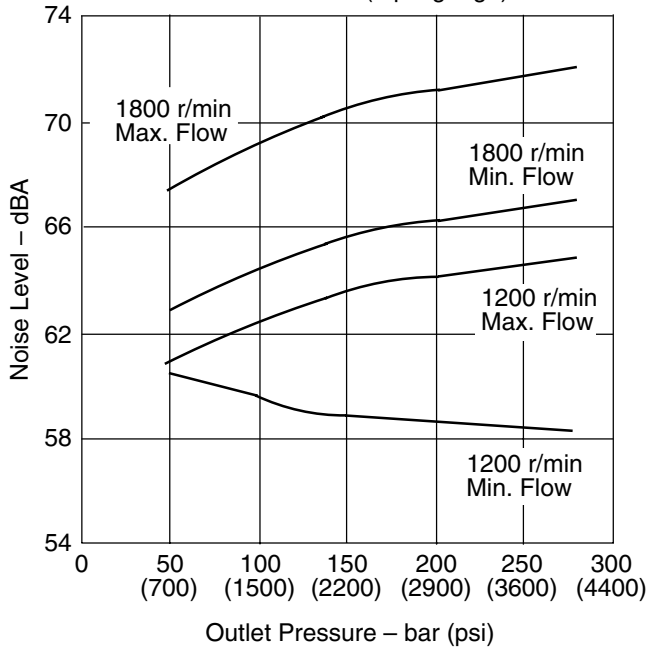
**Input Torque and Case Flow versus Speed at 93°C (200°F), Pressure Limit Cut-off and  
1.0 bar absolute (0 psi gauge) Inlet**



# Performance

## Industrial PVM057

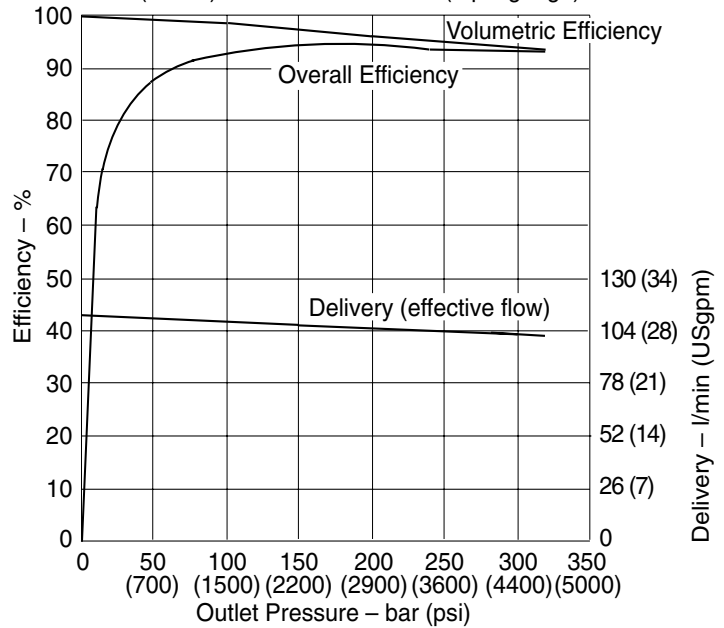
**Typical Noise Levels at 1800 and 1200 r/min**  
with Petroleum Oil (10W) at 50°C (120°F)  
and 1.0 bar absolute (0 psi gauge) Inlet



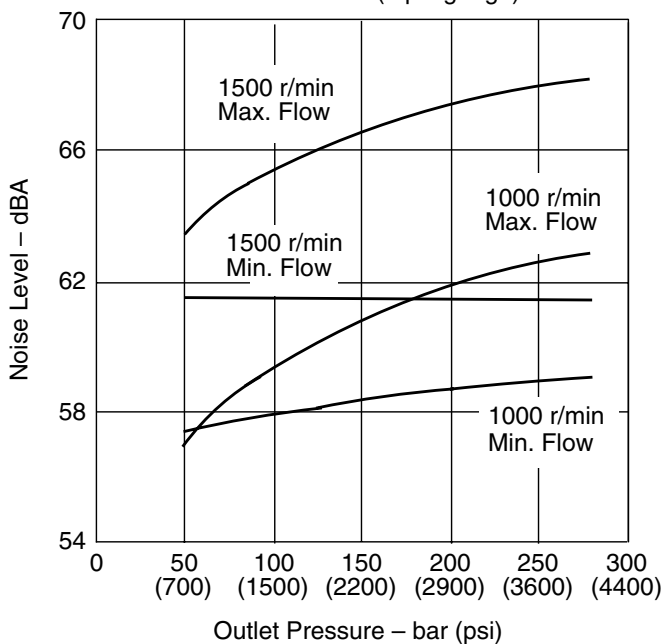
(Sound pressure data  
equivalent to NFPA)

**Delivery and Efficiency at 1800 r/min**

50°C (120°F) and 1.0 bar absolute (0 psi gauge) Inlet

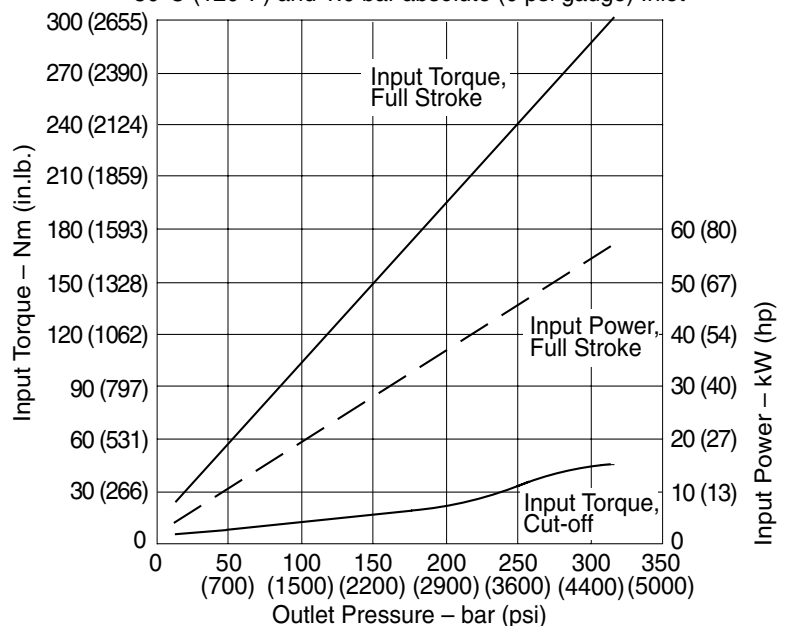


**Typical Noise Levels at 1500 and 1000 r/min**  
with Petroleum Oil (10W) at 50°C (120°F)  
and 1.0 bar absolute (0 psi gauge) Inlet



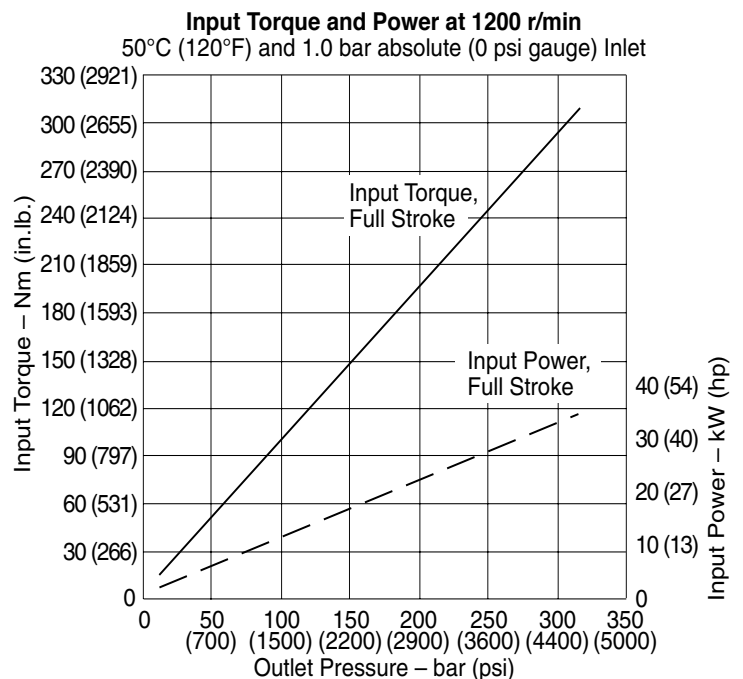
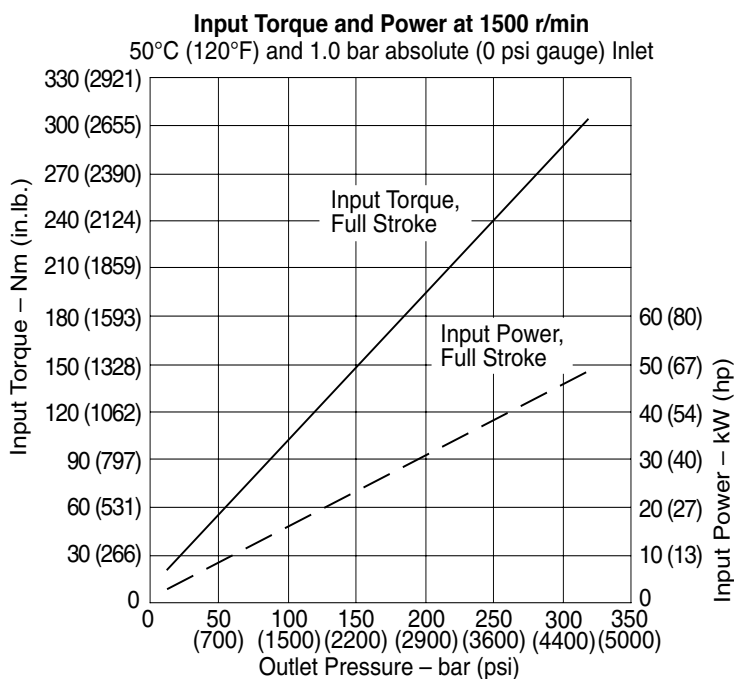
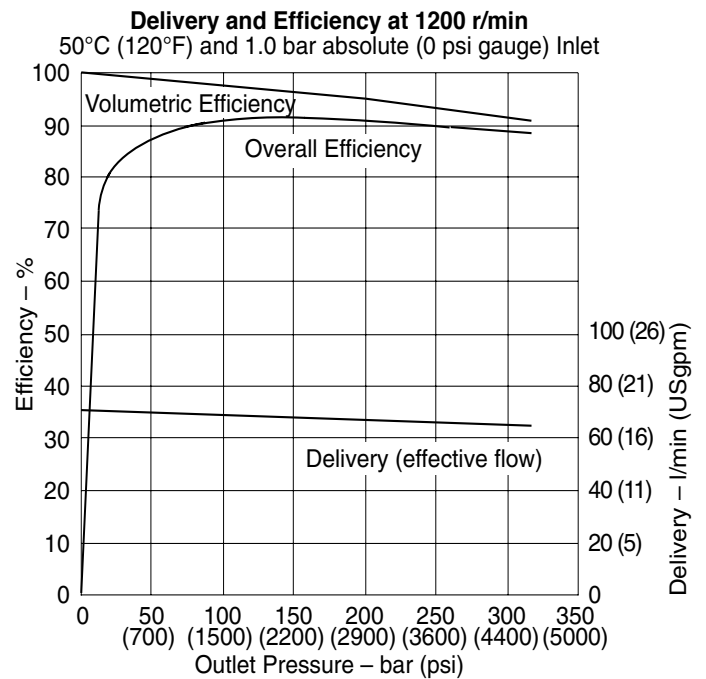
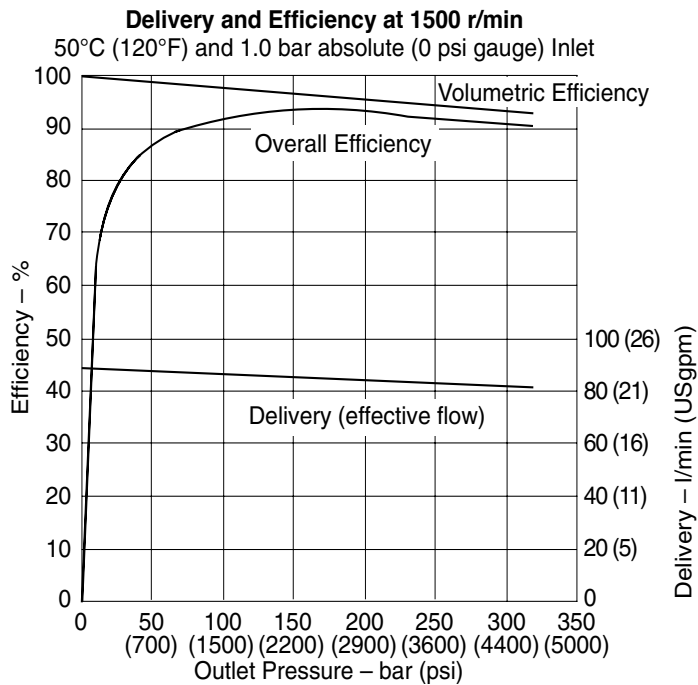
**Input Torque and Power at 1800 r/min**

50°C (120°F) and 1.0 bar absolute (0 psi gauge) Inlet



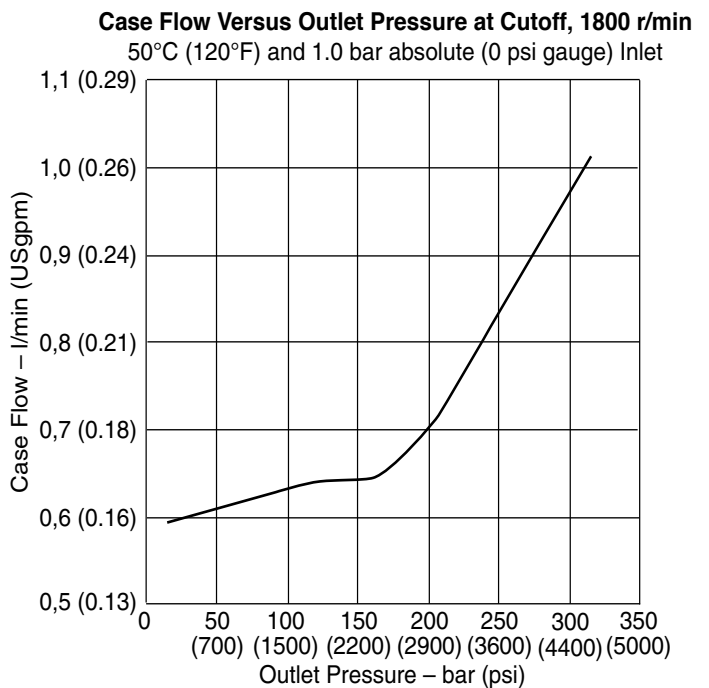
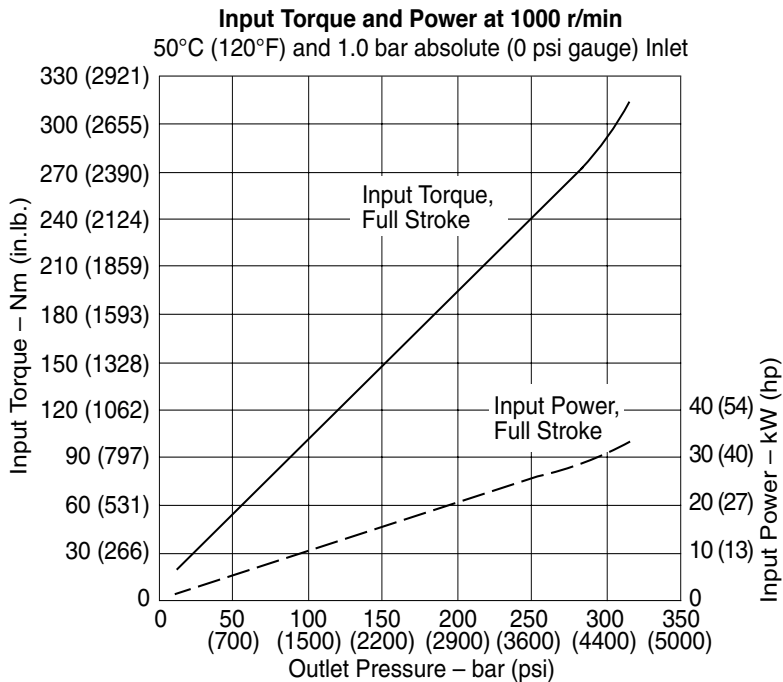
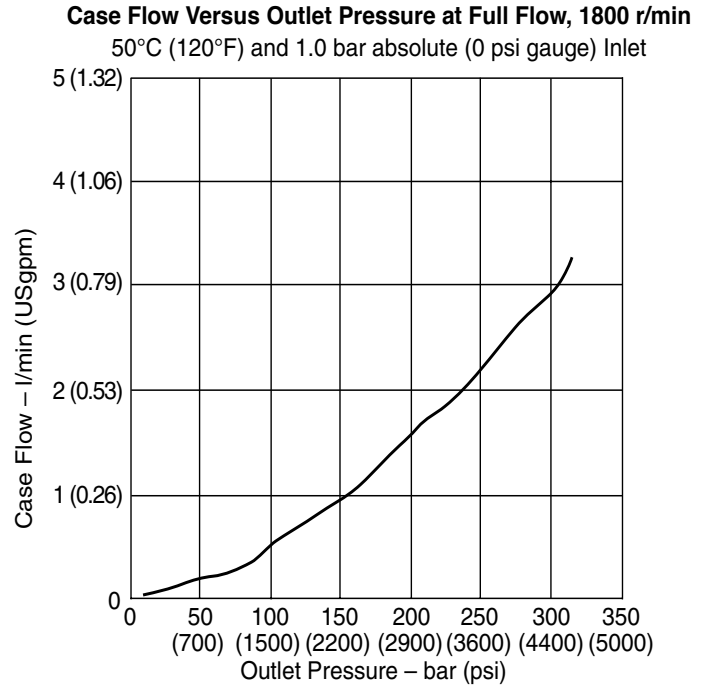
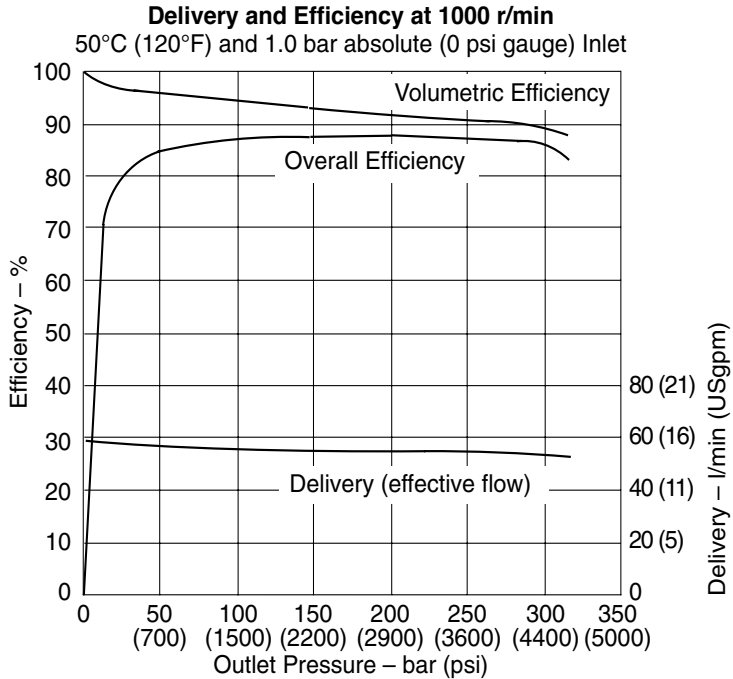
# Performance

## Industrial PVM057



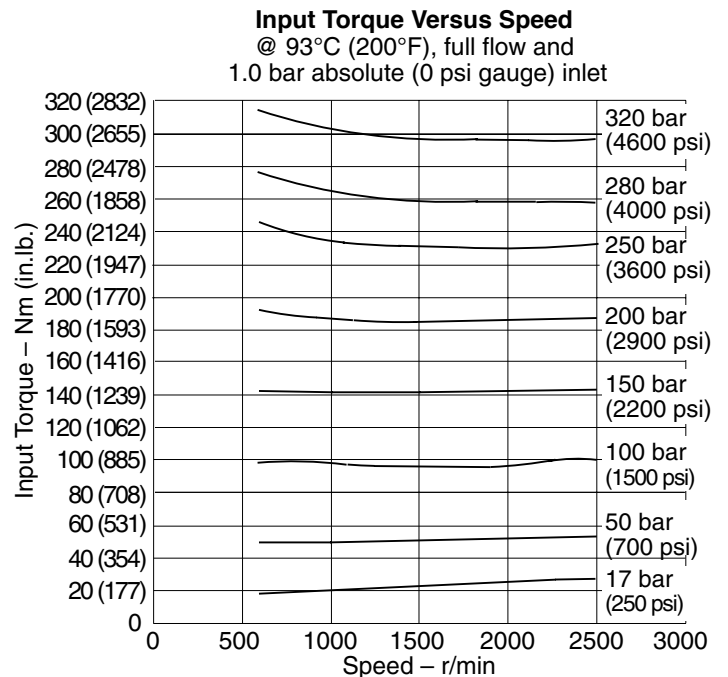
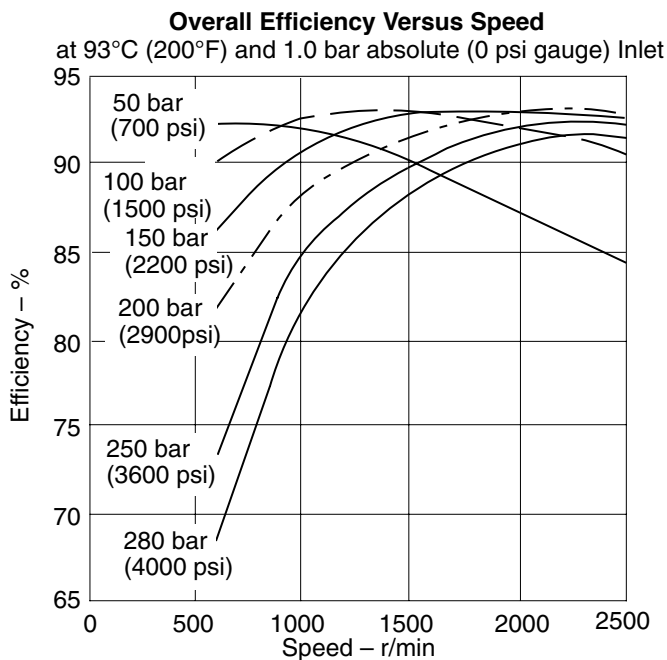
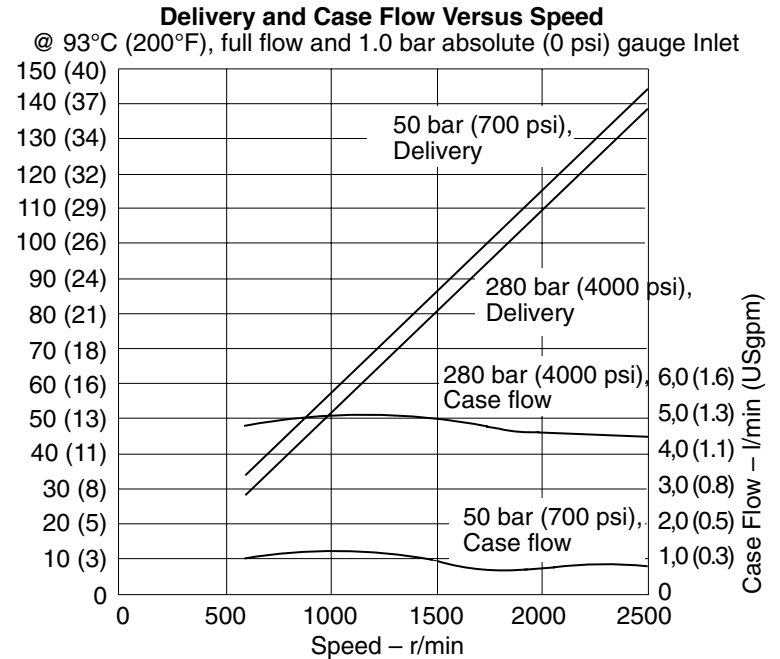
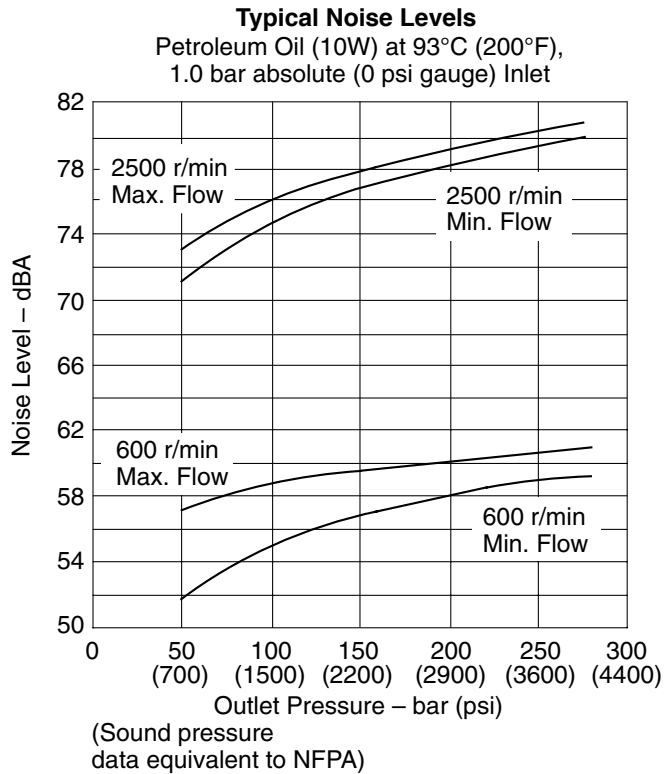
# Performance

## Industrial PVM057



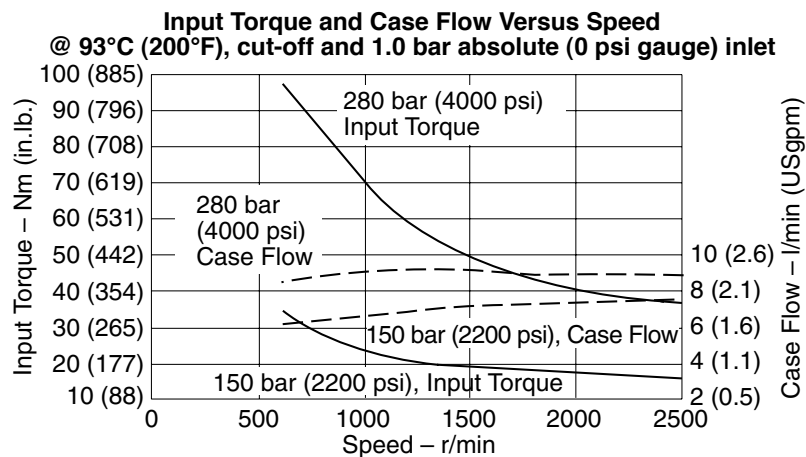
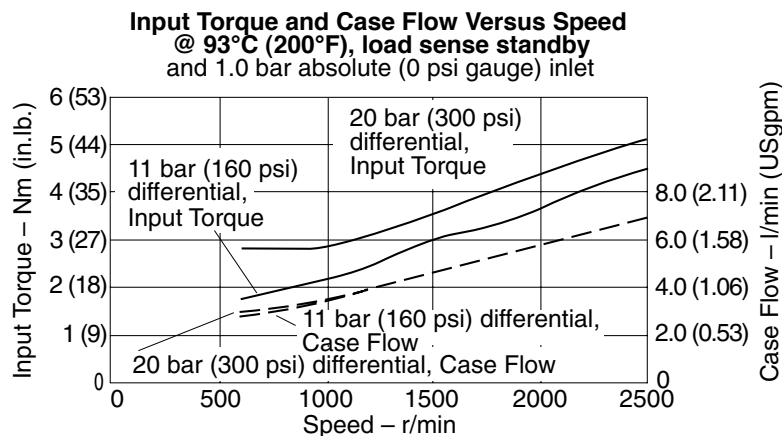
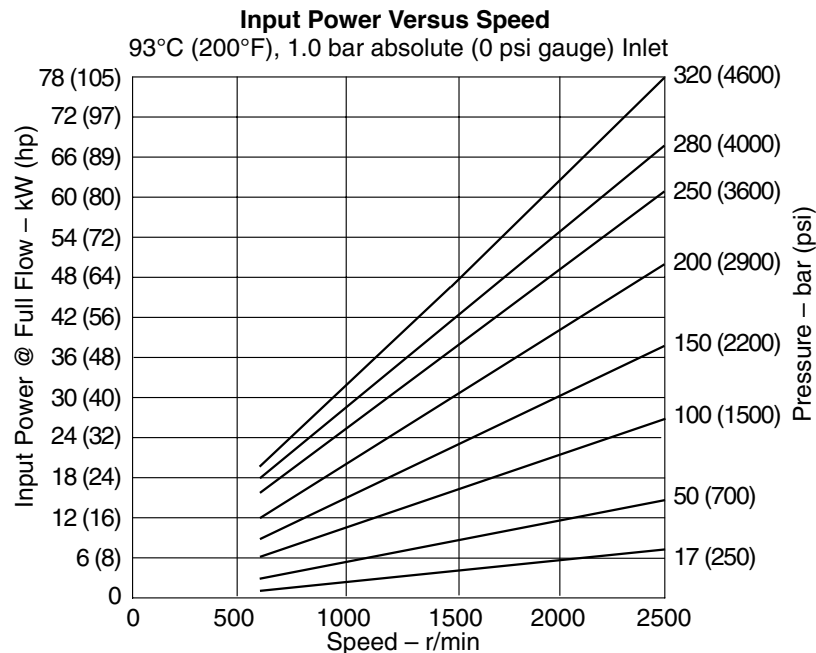
# Performance

## Mobile PVM057



# Performance

Mobile  
PVM057

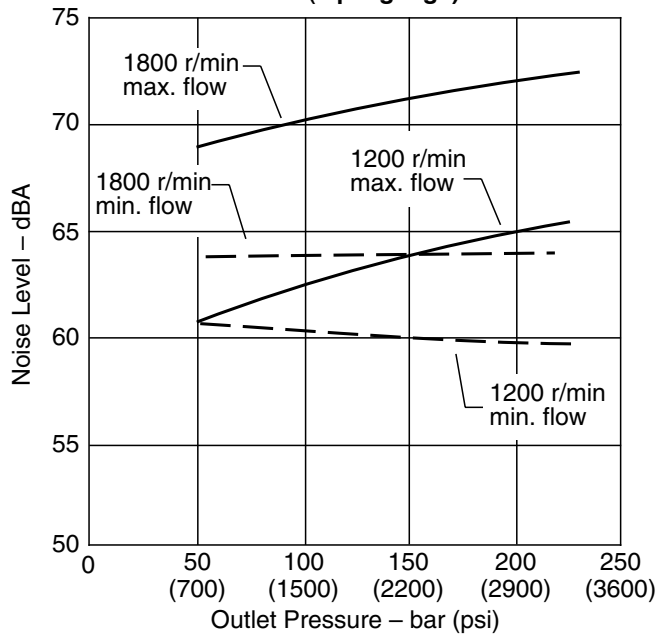




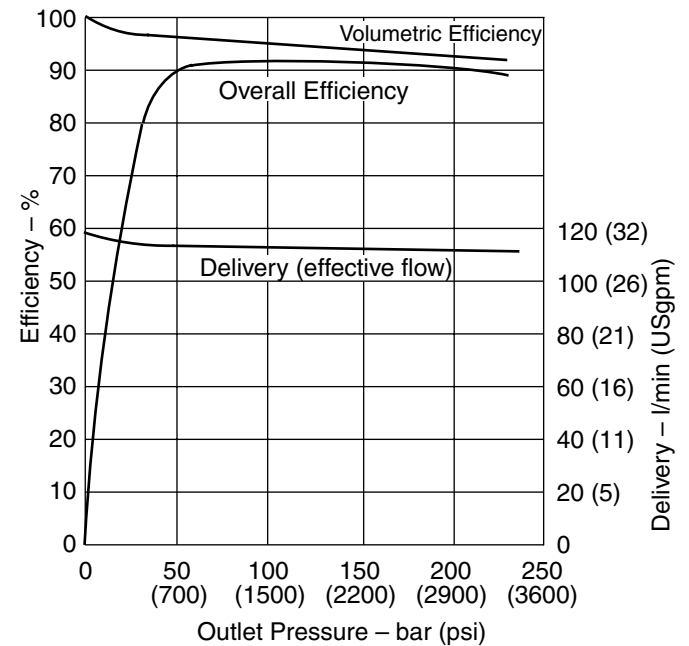
# Performance

## Industrial PVM063

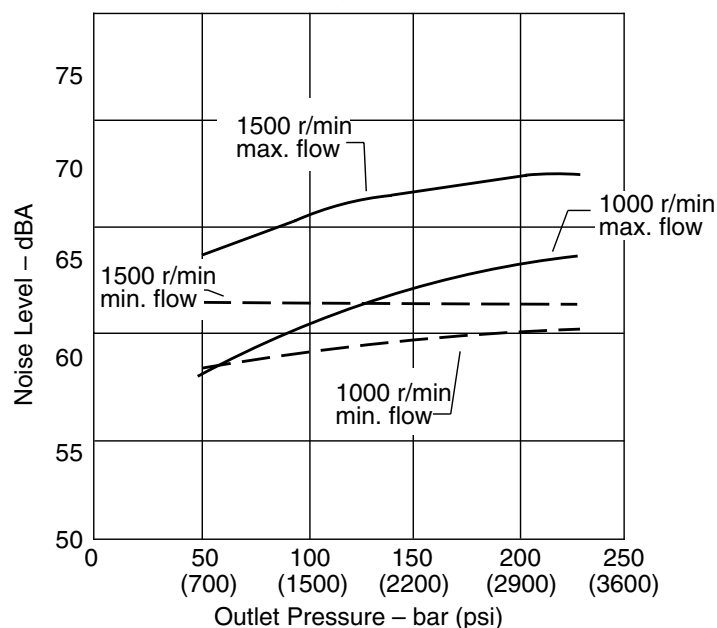
**Typical Noise Levels at 1800 and 1200 r/min. with Petroleum Oil (10W) at 50°C (120°F) and 1.0 bar absolute (0 psi gauge) Inlet**



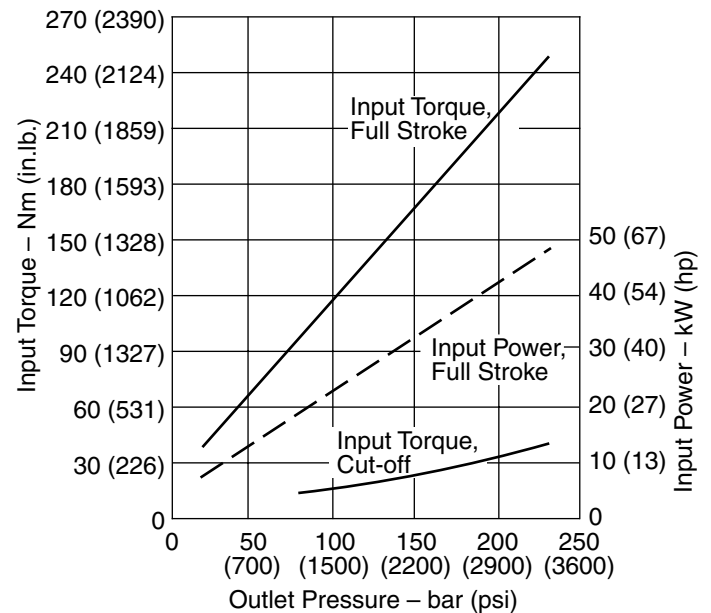
**Delivery and Efficiency at 1800 r/min, 50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**



**Typical Noise Levels at 1500 and 1000 r/min. with Petroleum Oil (10W) at 50°C (120°F) and 1.0 bar absolute (0 psi gauge) Inlet**



**Input Torque and Power at 1800 r/min, 50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**

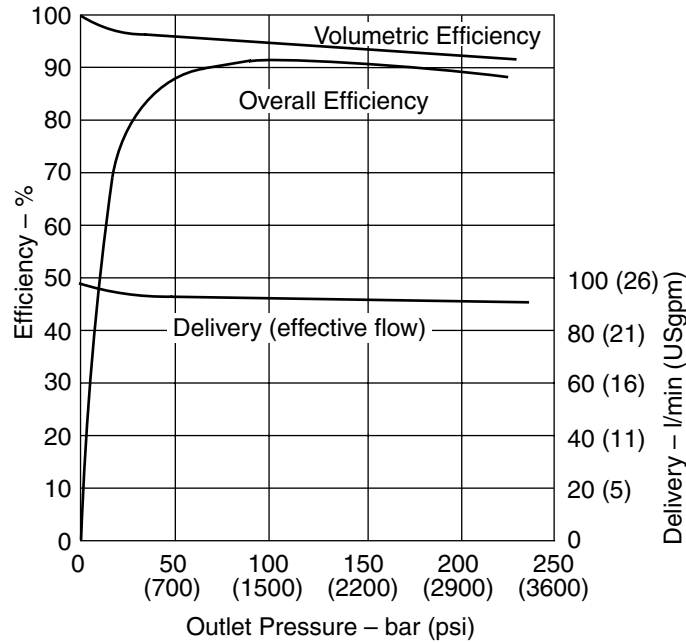


Sound pressure data  
equivalent to NFPA.

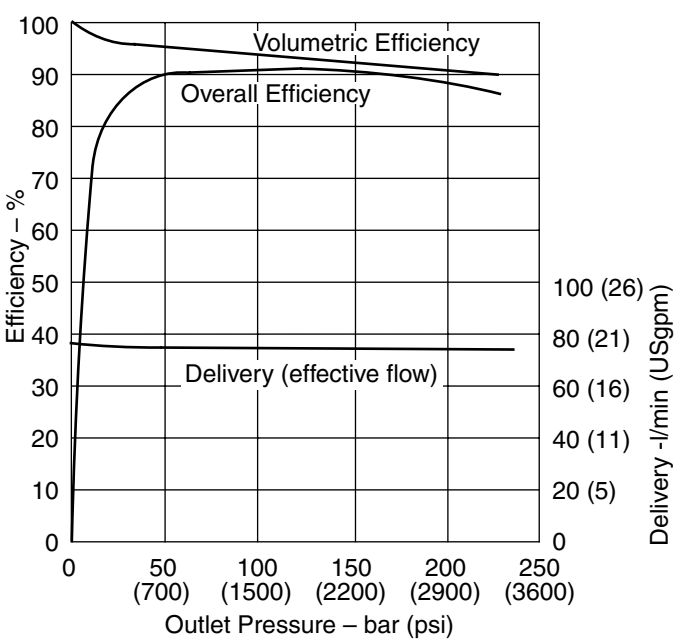
# Performance

Industrial  
PVM063

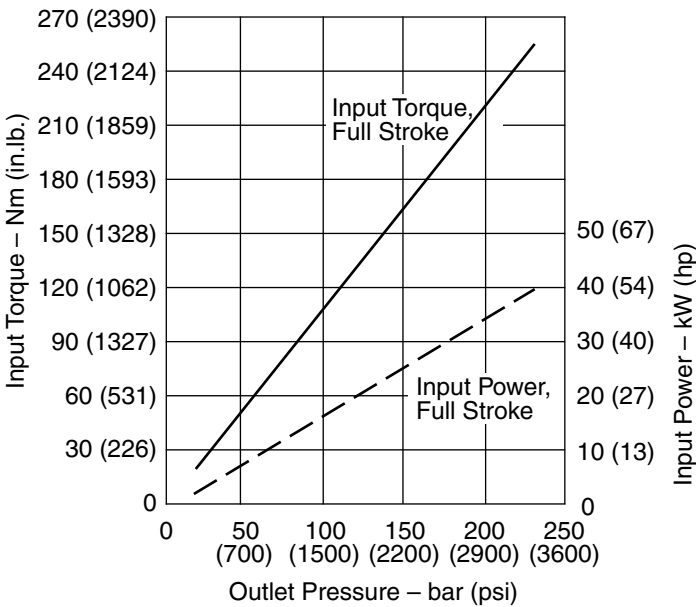
Delivery and Efficiency at 1500 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet



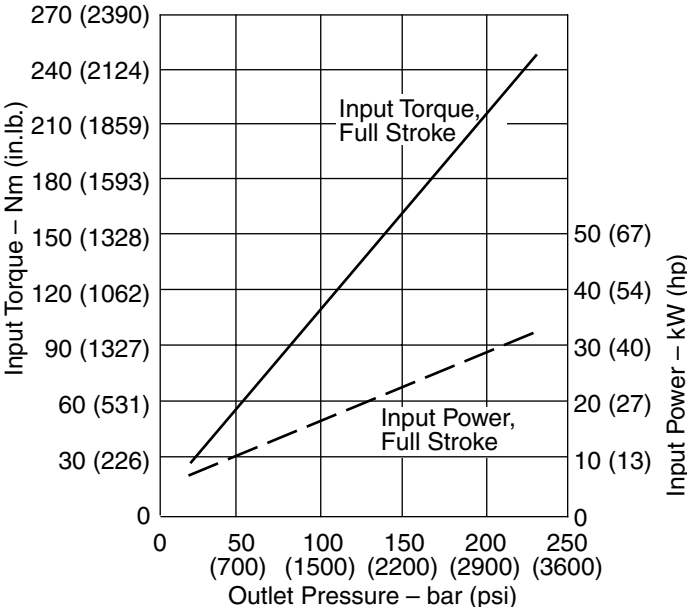
Delivery and Efficiency at 1200 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet



Input Torque and Power at 1500 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet



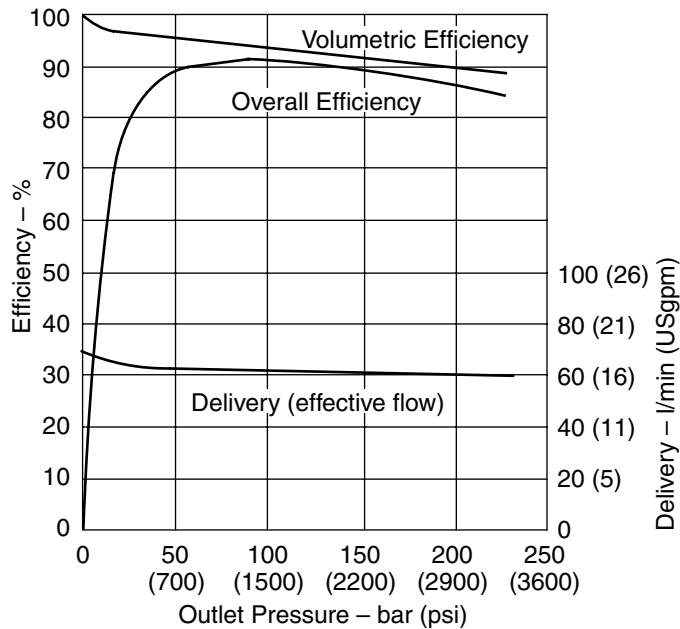
Input Torque and Power at 1200 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet



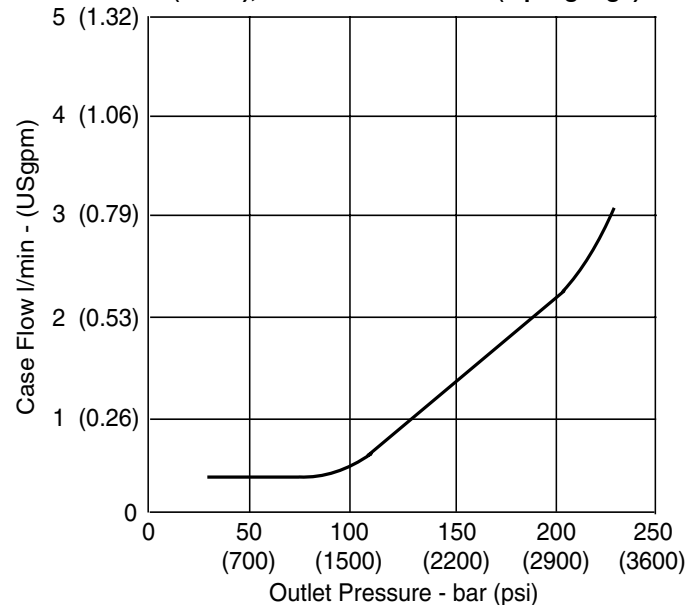
# Performance

## Industrial PVM063

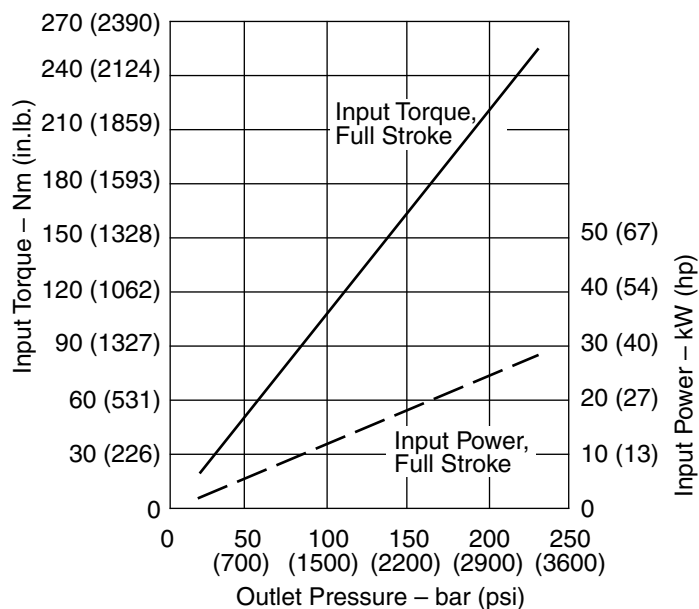
**Delivery and Efficiency at 1000 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**



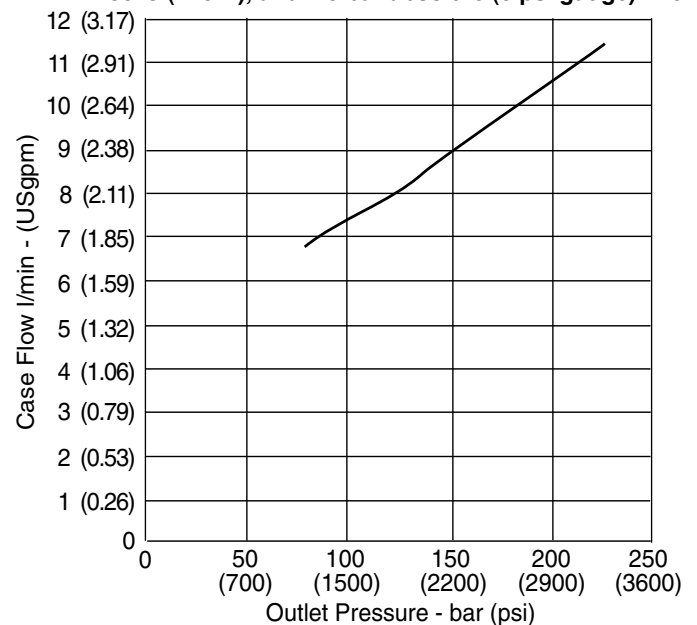
**Case Flow versus Outlet Pressure at 1800 r/min, Full Flow,  
50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**



**Input Torque and Power at 1000 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**



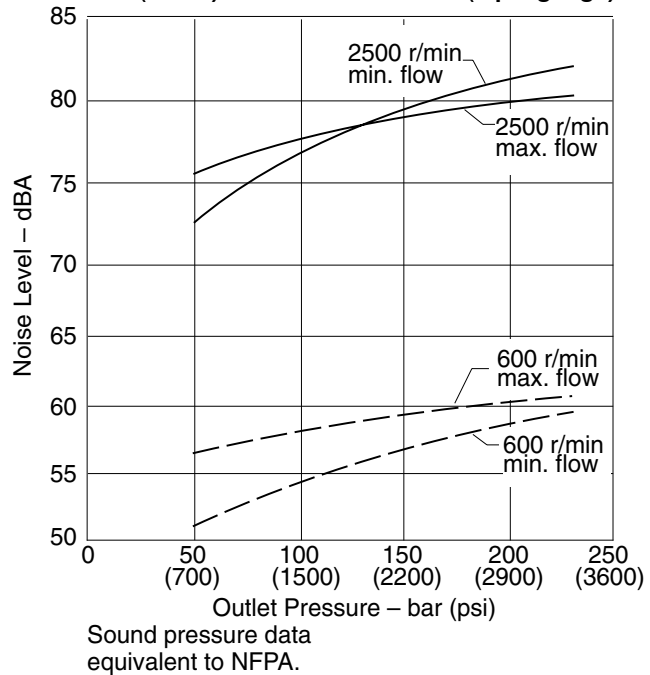
**Case Flow versus Outlet Pressure at Cutoff, 1800 r/min,  
50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**



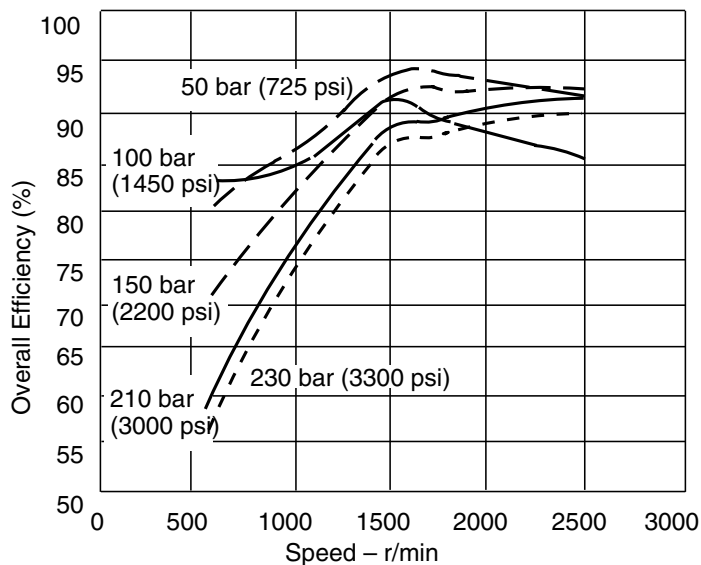
# Performance

## Mobile PVM063

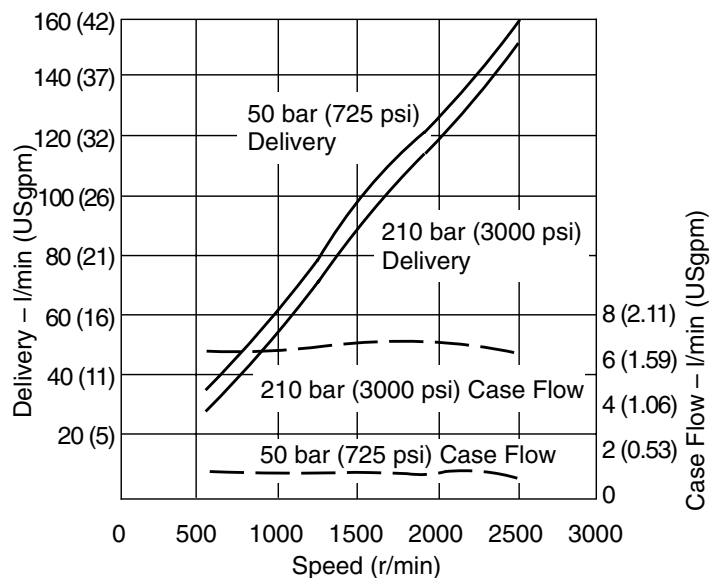
**Typical Noise Levels at 2500 & 600 r/min with Petroleum Oil (10W)  
at 93°C (200°F) and 1.0 bar absolute (0 psi gauge) Inlet**



**Overall Efficiency versus Speed  
at 93°C (200°F) and 1.0 bar absolute (0 psi gauge) inlet**



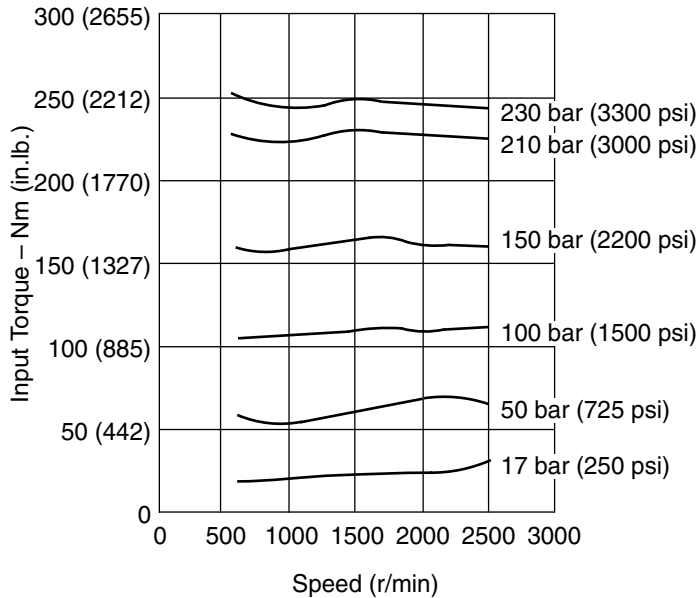
**Delivery and Case Flow versus Speed at 93°C (200°F),  
Full Flow 1.0 bar absolute (0 psi gauge) Inlet**



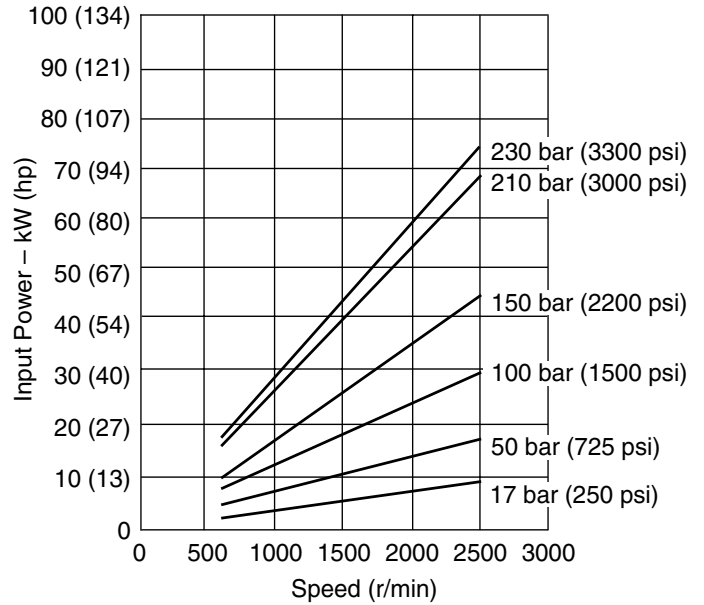
# Performance

## Mobile PVM063

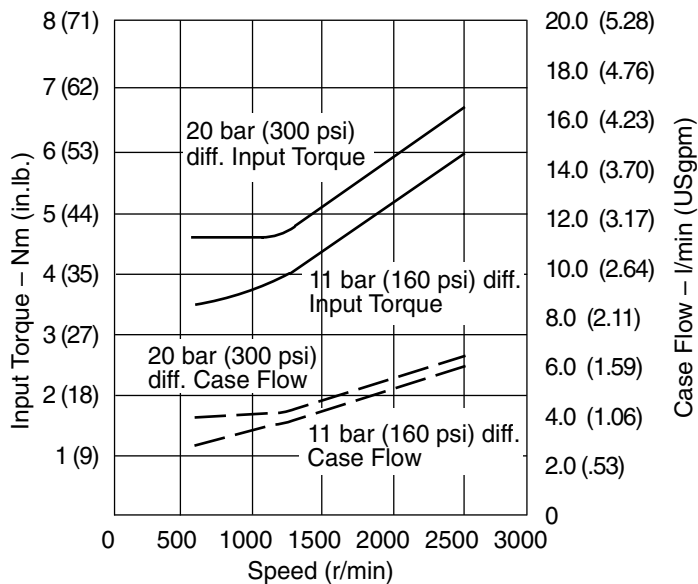
**Input Torque versus Speed at 93°C (200°F),  
Full Flow and 1.0 bar absolute (0 psi gauge) Inlet**



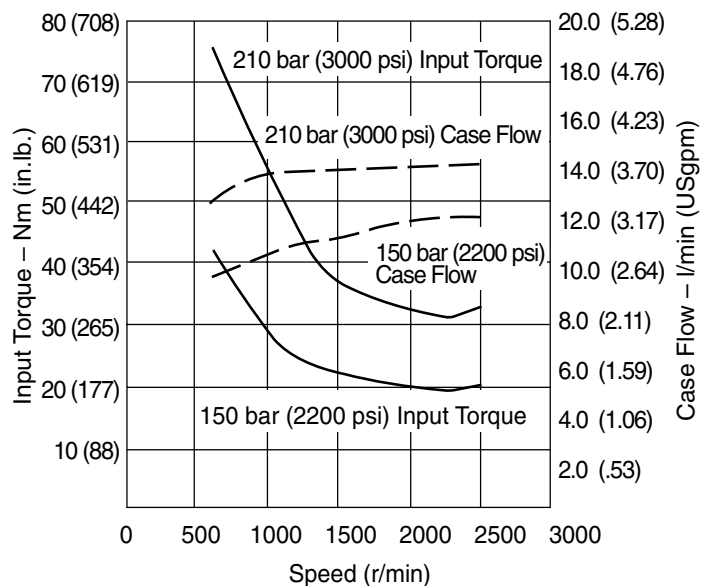
**Input Power versus Speed at 93°C (200°F),  
Full Flow and 1.0 bar absolute (0 psi gauge) Inlet**



**Input Torque and Case Flow versus Speed  
at 93°C (200°F), Load Sense Standby and  
1.0 bar absolute (0 psi gauge) Inlet**



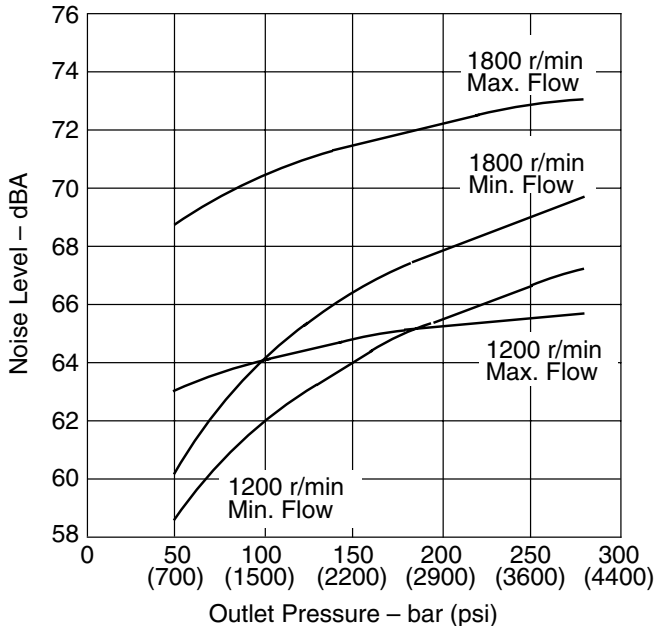
**Input Torque and Case Flow versus Speed  
at 93°C (200°F), Pressure Limit Cut-off and 1.0 bar  
absolute (0 psi gauge) Inlet**



# Performance

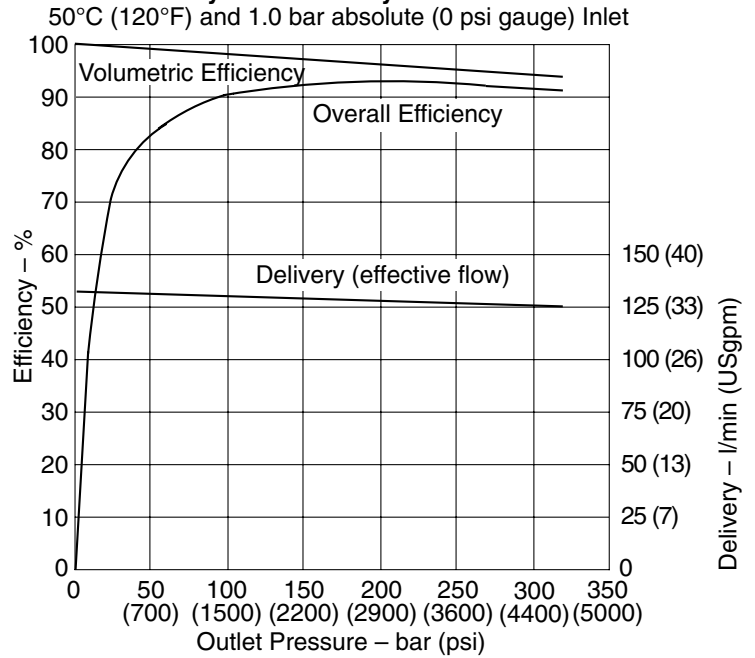
## Industrial PVM074

**Typical Noise Levels at 1800 and 1200 r/min**  
with Petroleum Oil (10W) at 50°C (120°F)  
and 1.0 bar absolute (0 psi gauge) Inlet

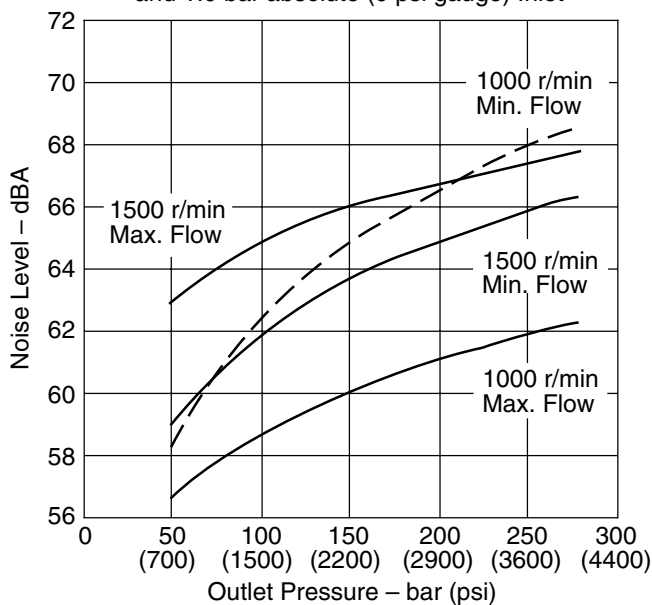


Sound pressure data  
equivalent to NFPA.

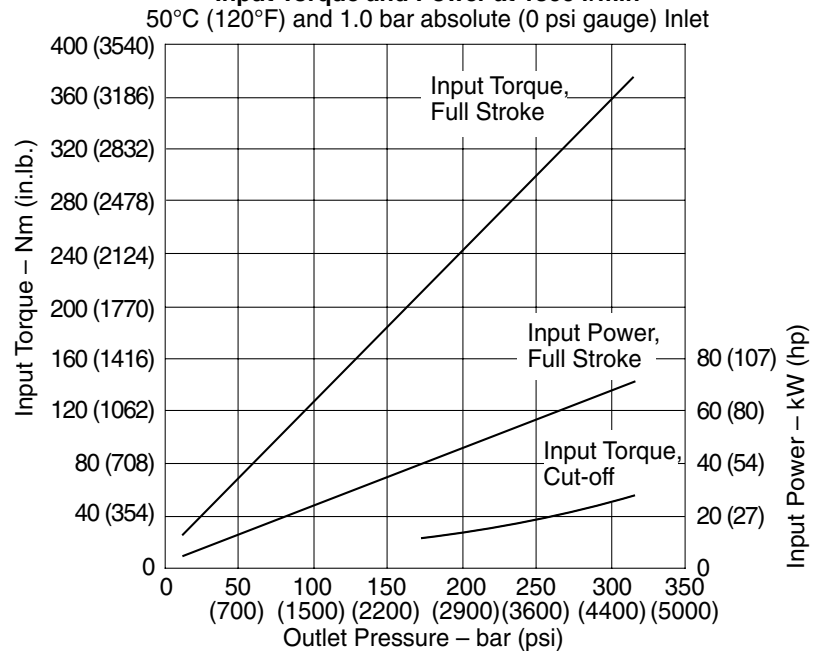
**Delivery and Efficiency at 1800 r/min**



**Typical Noise Levels at 1500 and 1000 r/min**  
with Petroleum Oil (10W) at 50°C (120°F)  
and 1.0 bar absolute (0 psi gauge) Inlet

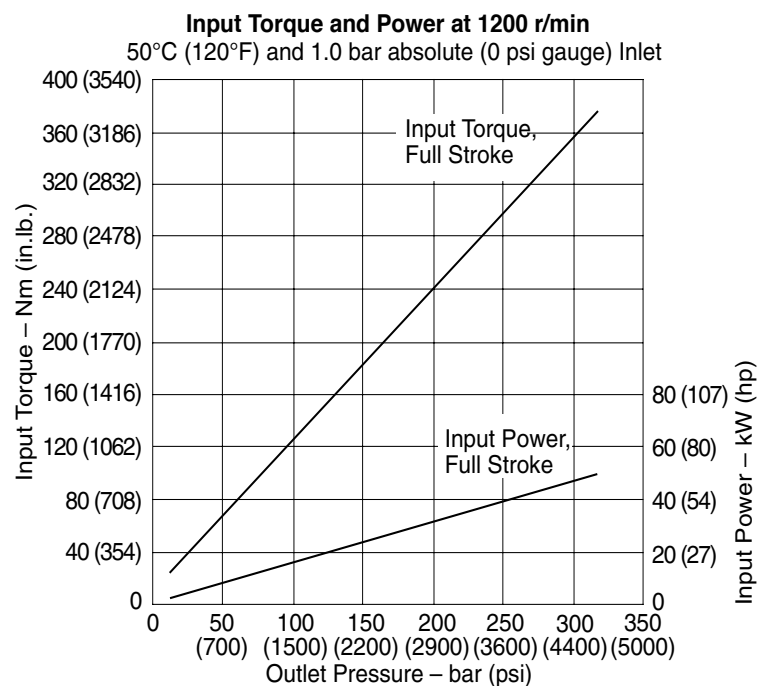
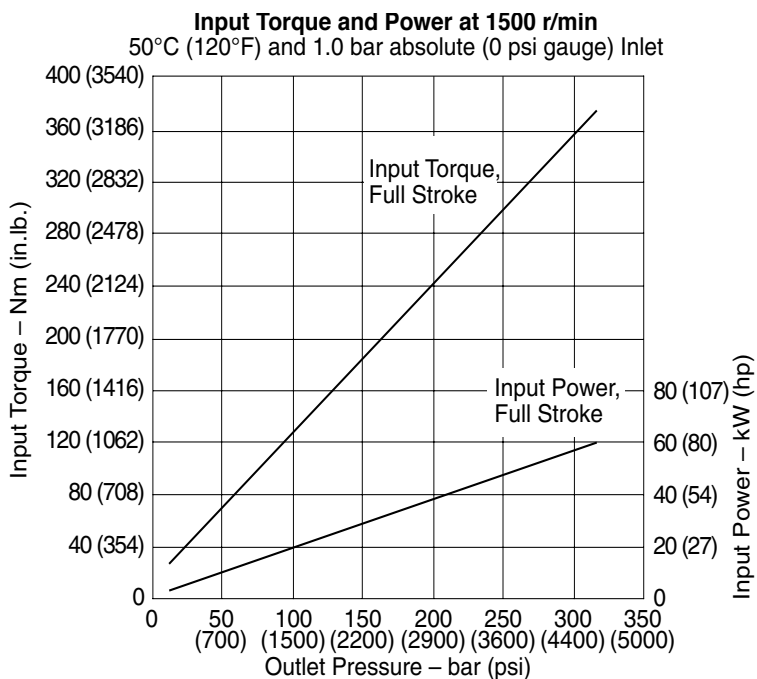
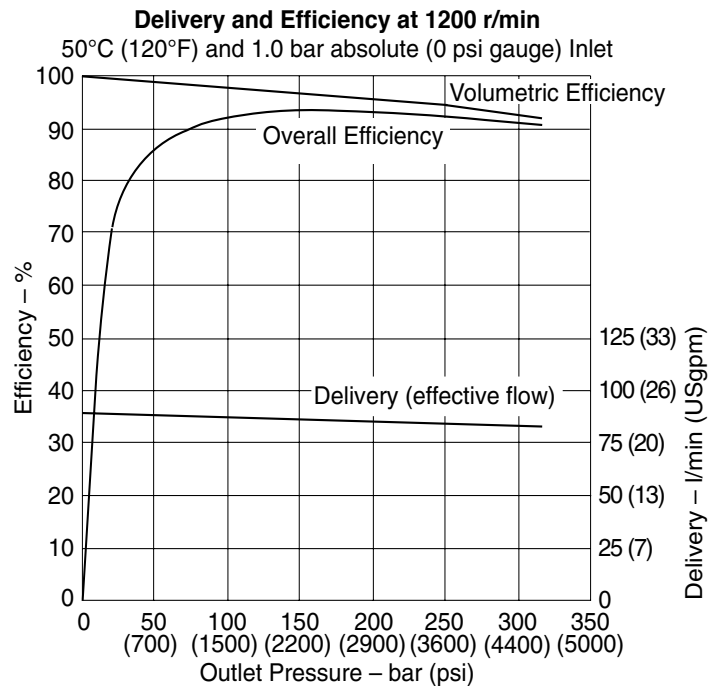
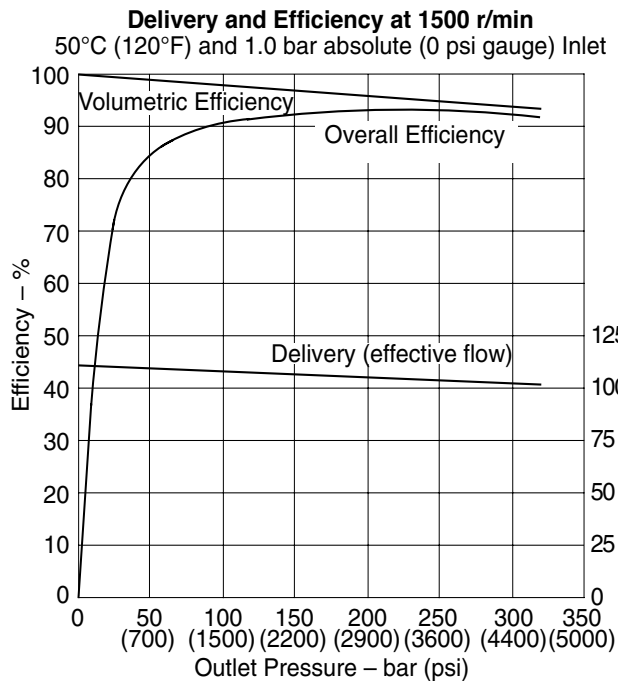


**Input Torque and Power at 1800 r/min**



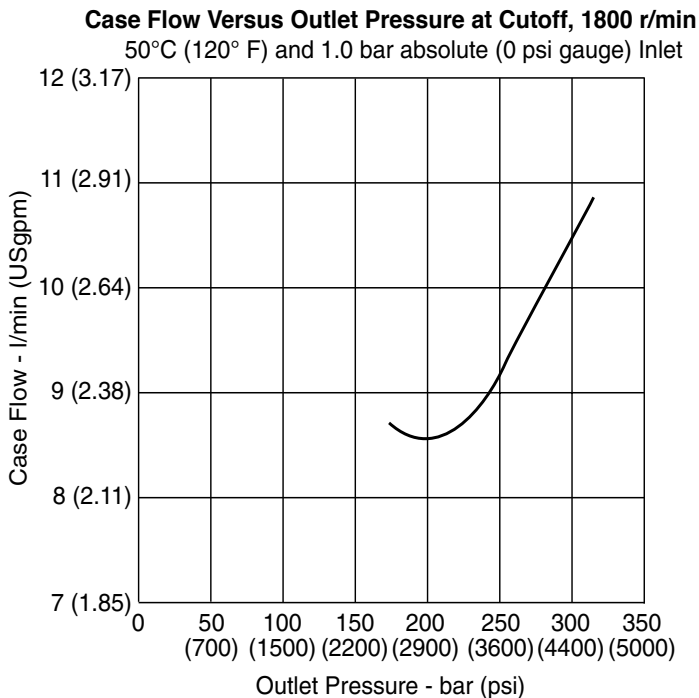
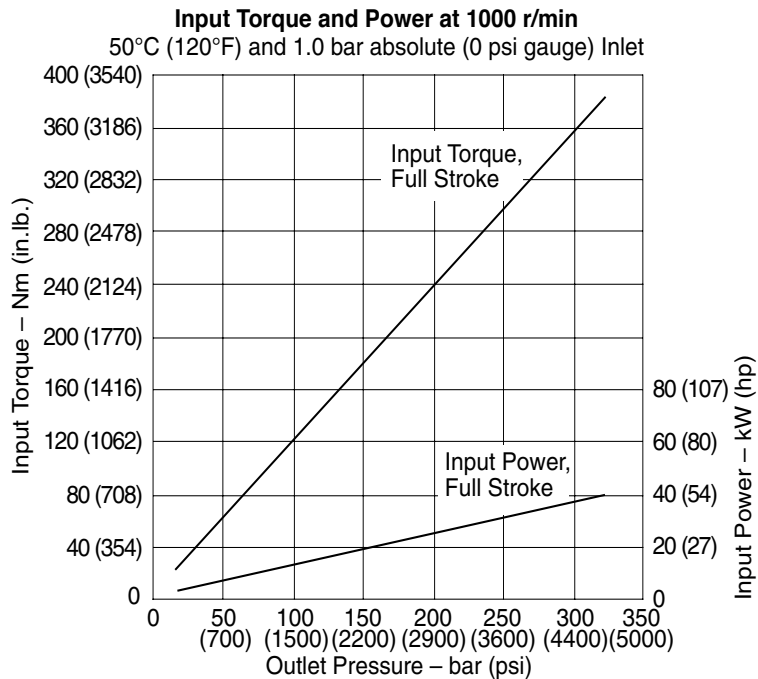
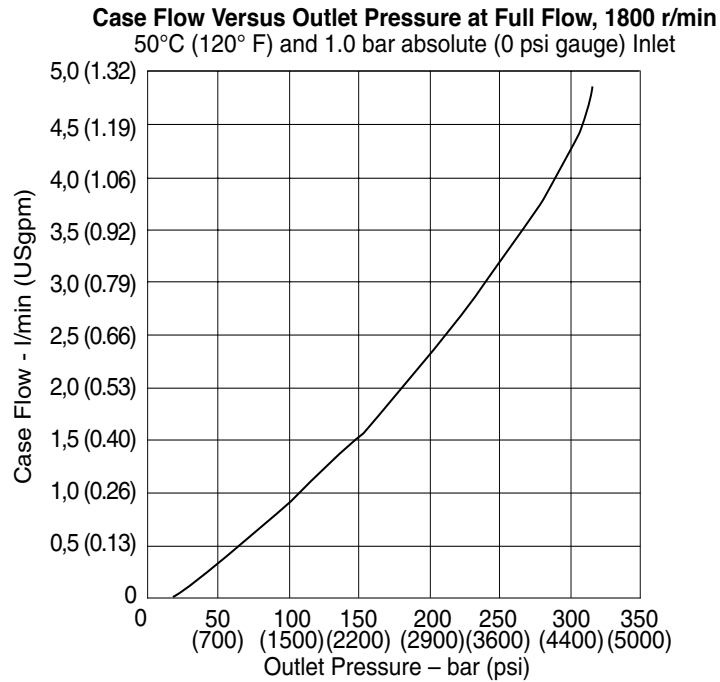
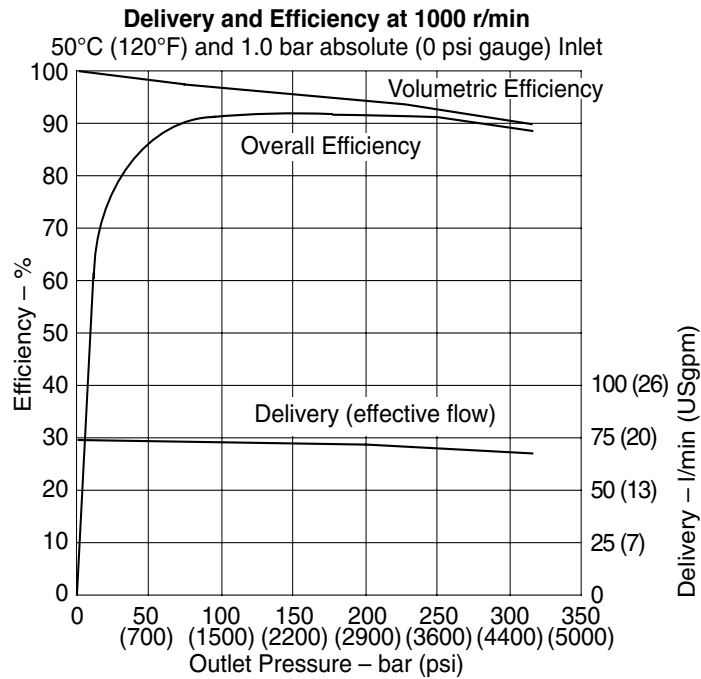
# Performance

## Industrial PVM074



# Performance

Industrial  
PVM074

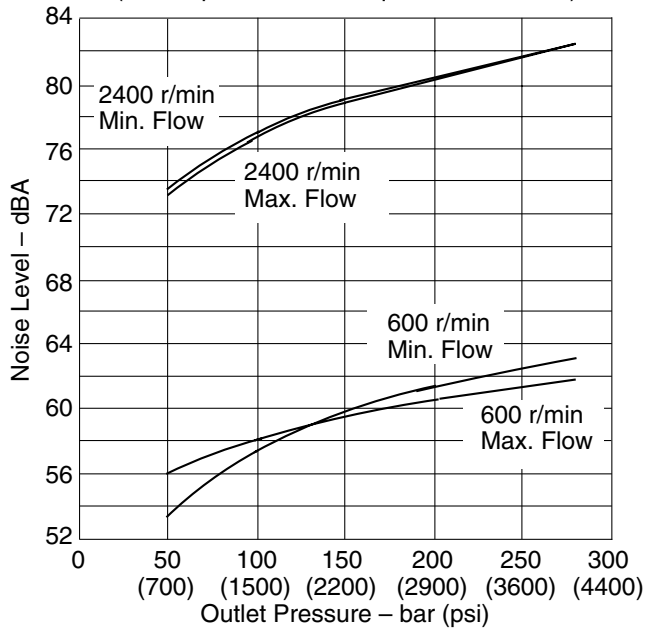




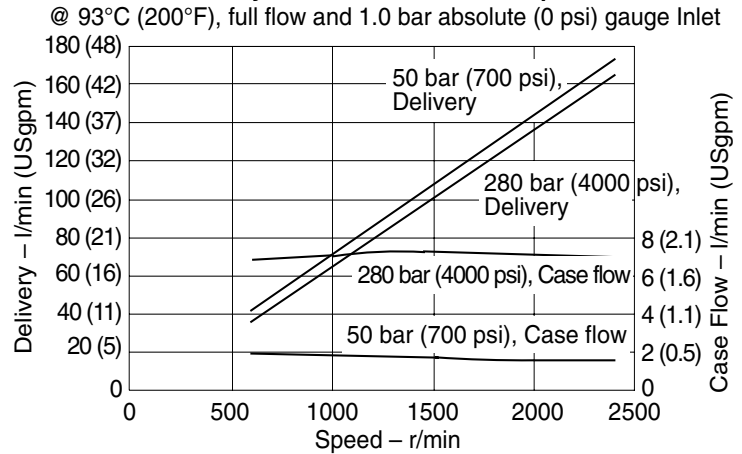
# Performance

## Mobile PVM074

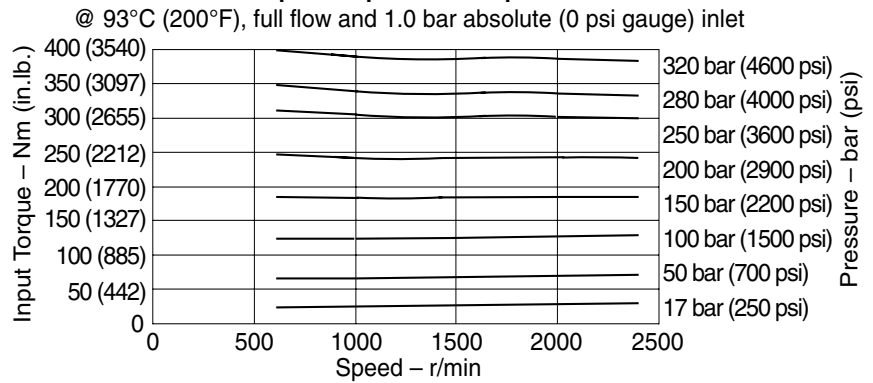
**Typical Noise Levels**  
Petroleum Oil (10W) at 93°C (200°F),  
1.0 bar absolute (0 psi gauge) Inlet  
(Sound pressure data equivalent to NFPA)



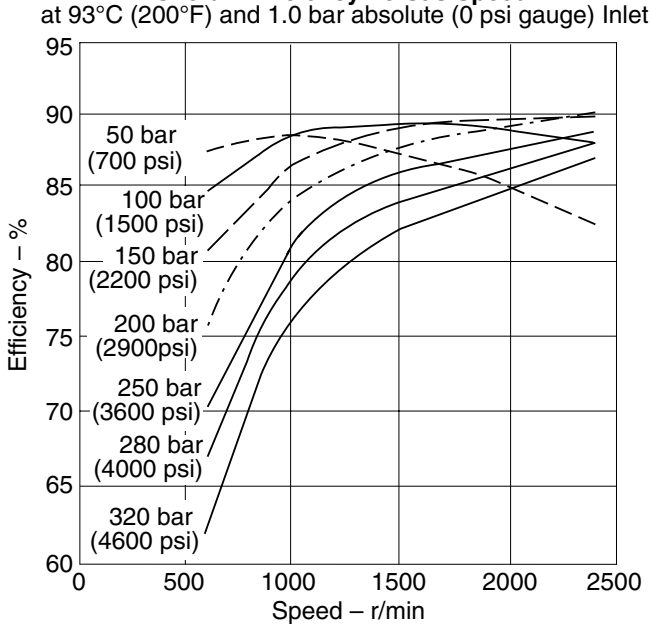
**Delivery and Case Flow Versus Speed**



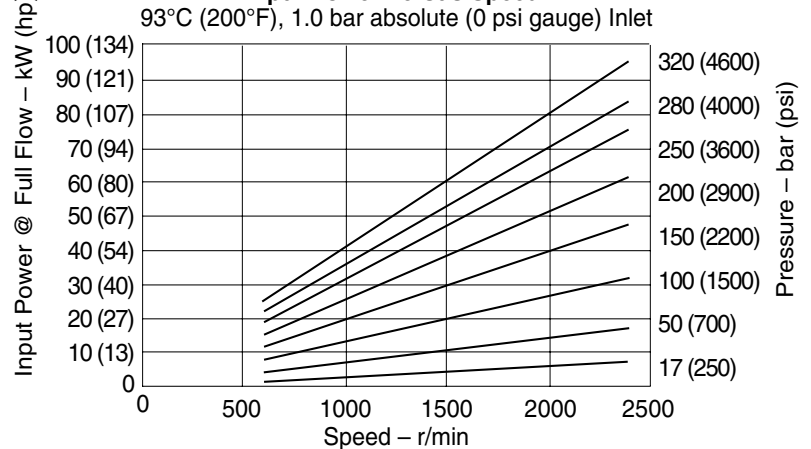
**Input Torque Versus Speed**



**Overall Efficiency Versus Speed**

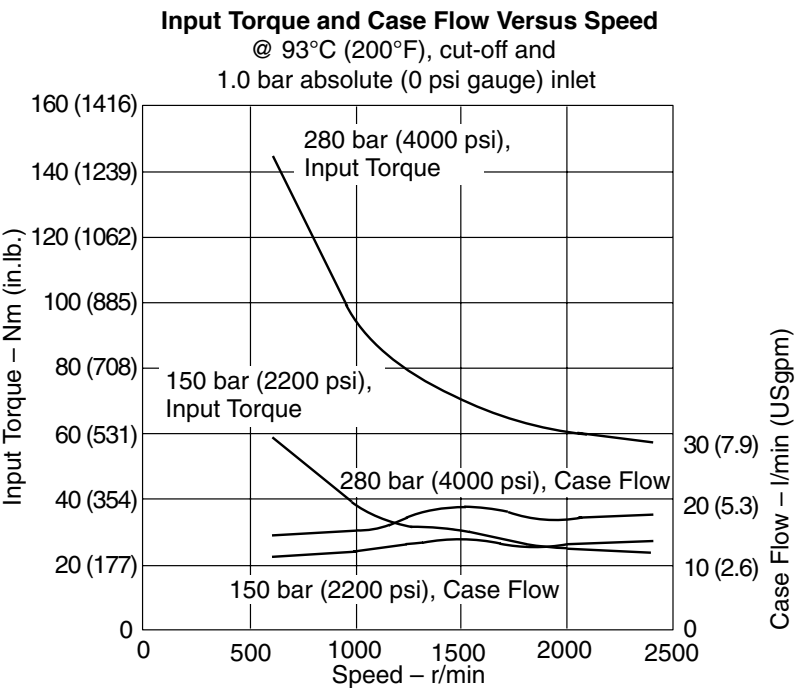
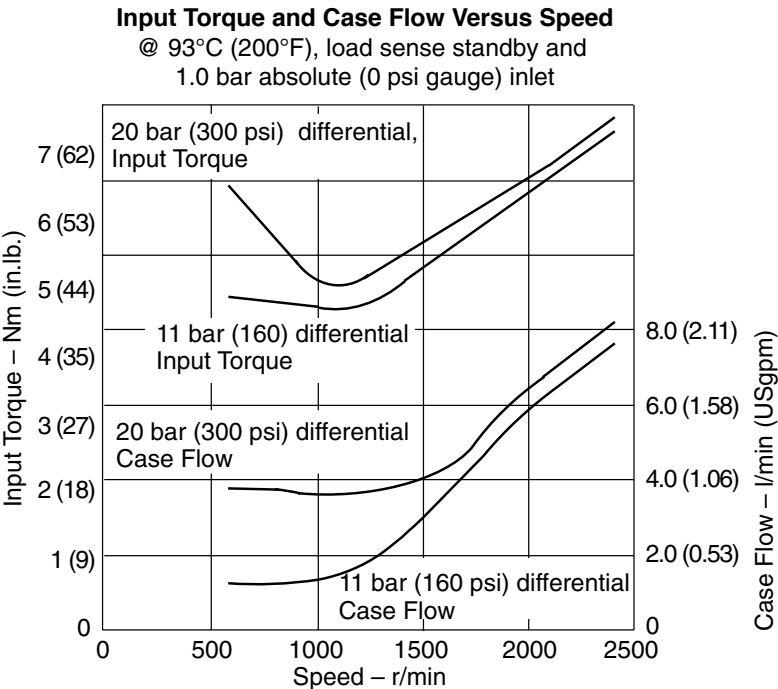


**Input Power Versus Speed**



# Performance

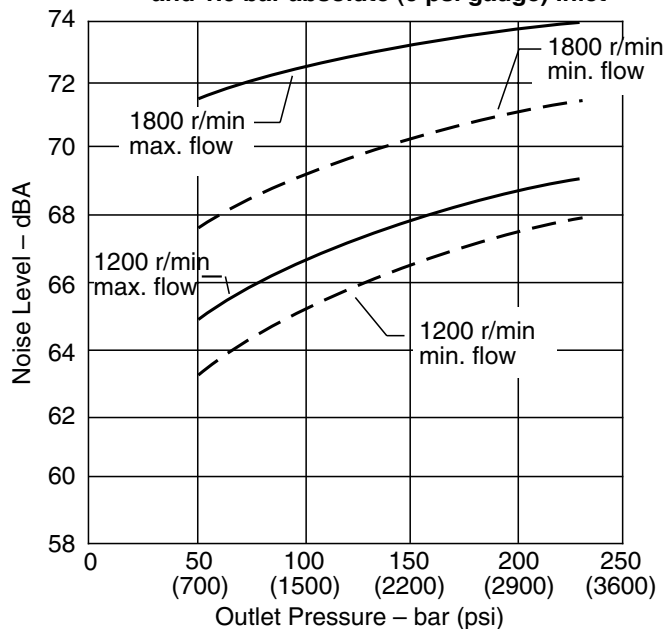
Mobile  
PVM074



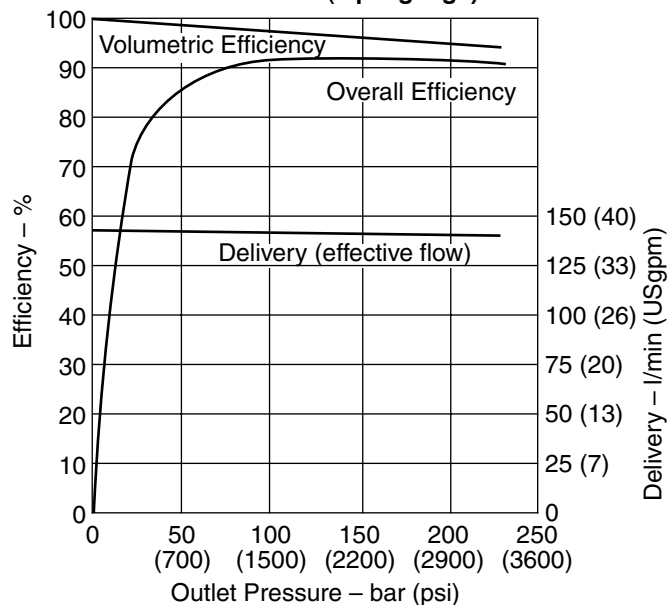
# Performance

## Industrial PVM081

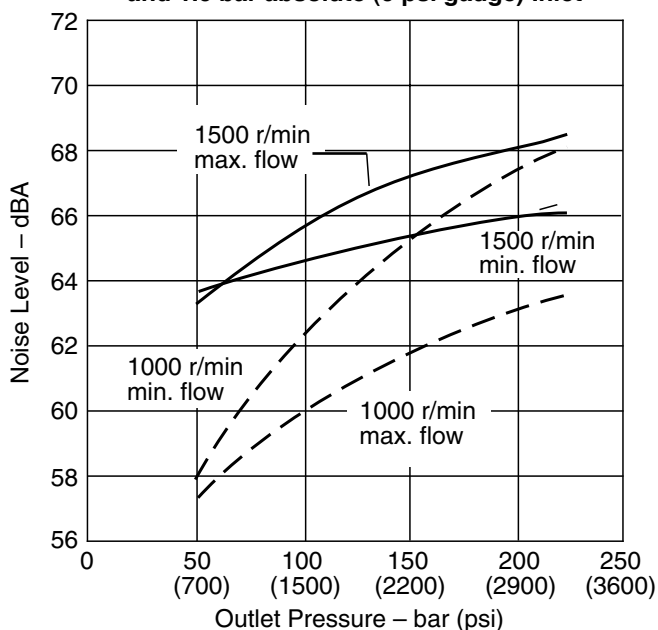
**Typical Noise Levels at 1800 and 1200 r/min. with Petroleum Oil (10W) at 50°C (120°F) and 1.0 bar absolute (0 psi gauge) Inlet**



**Delivery and Efficiency at 1800 r/min, 50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**

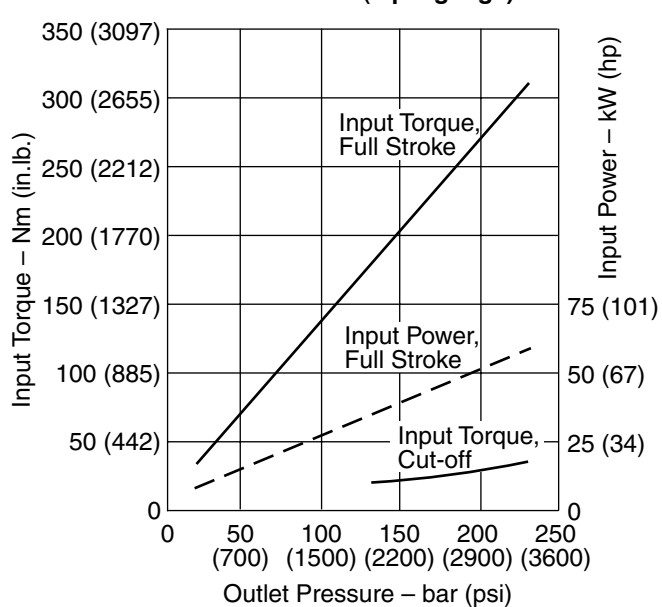


**Typical Noise Levels at 1500 and 1000 r/min. with Petroleum Oil (10W) at 50°C (120°F) and 1.0 bar absolute (0 psi gauge) Inlet**



Sound pressure data  
equivalent to NFPA.

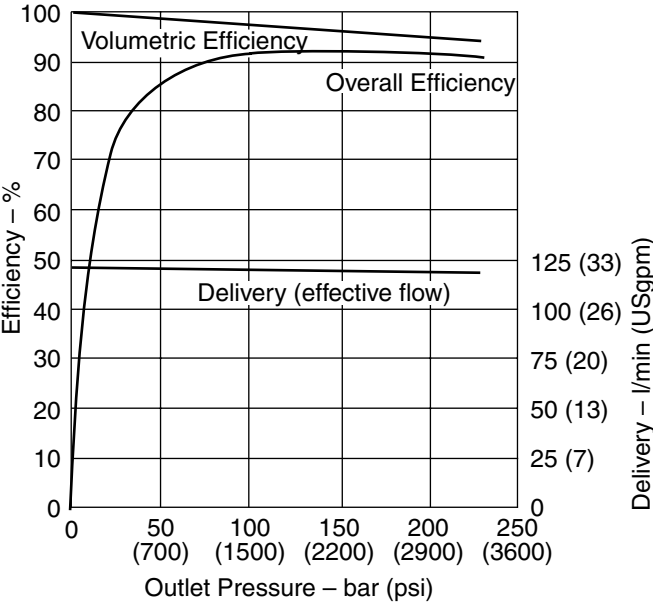
**Input Torque and Power at 1800 r/min, 50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**



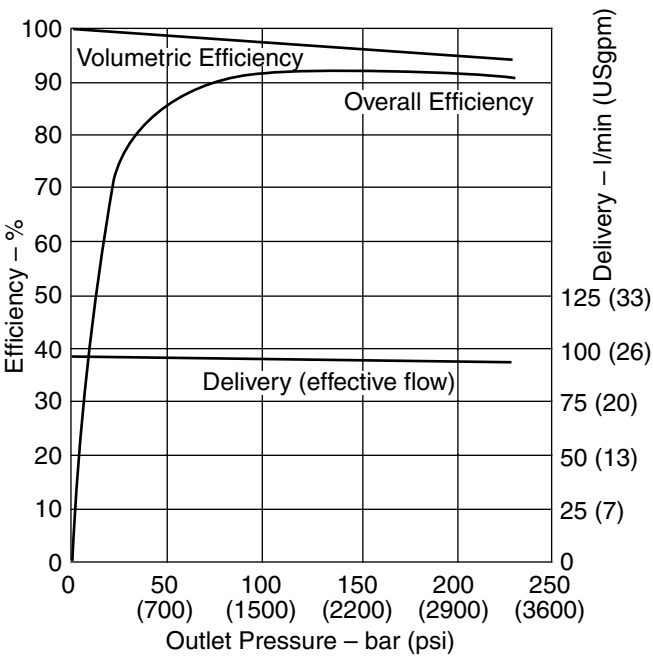
# Performance

Industrial  
PVM081

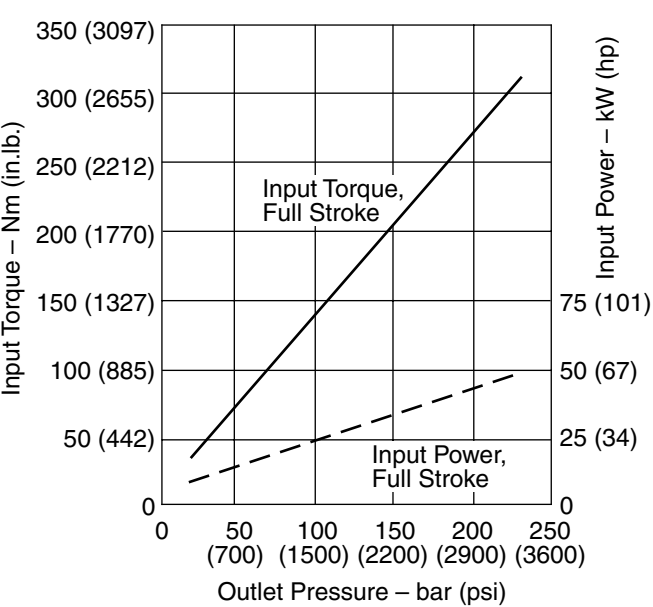
Delivery and Efficiency at 1500 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet



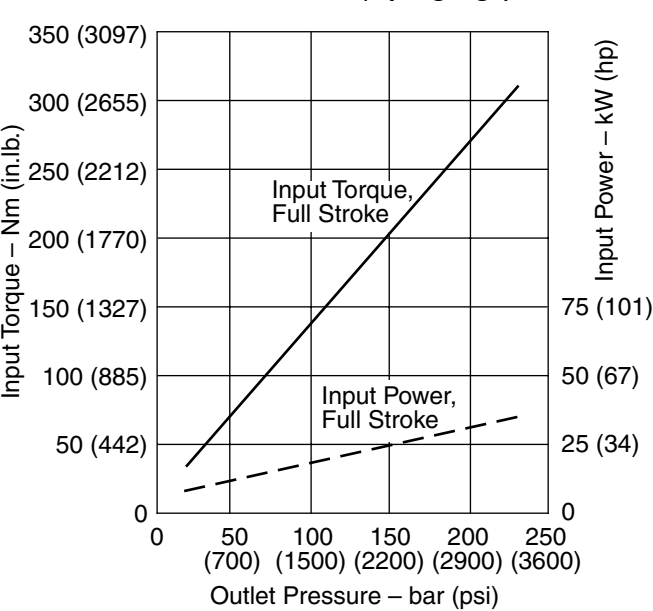
Delivery and Efficiency at 1200 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet



Input Torque and Power at 1500 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet



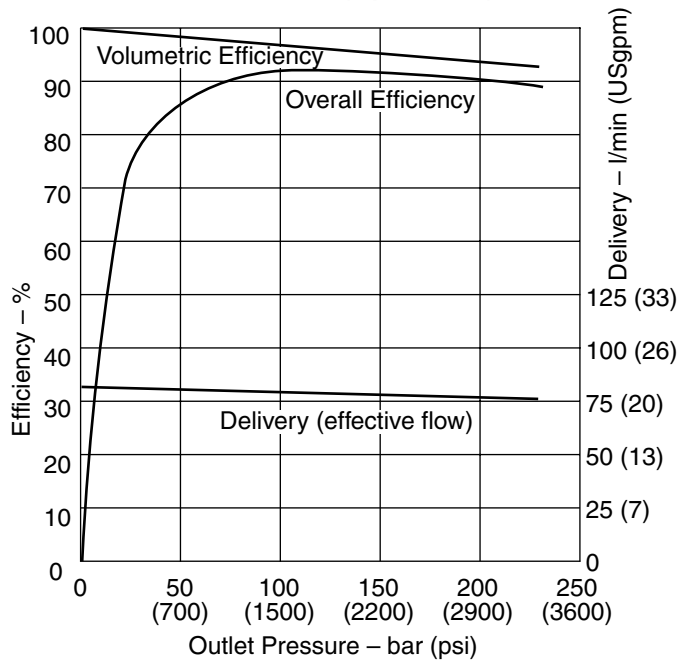
Input Torque and Power at 1200 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet



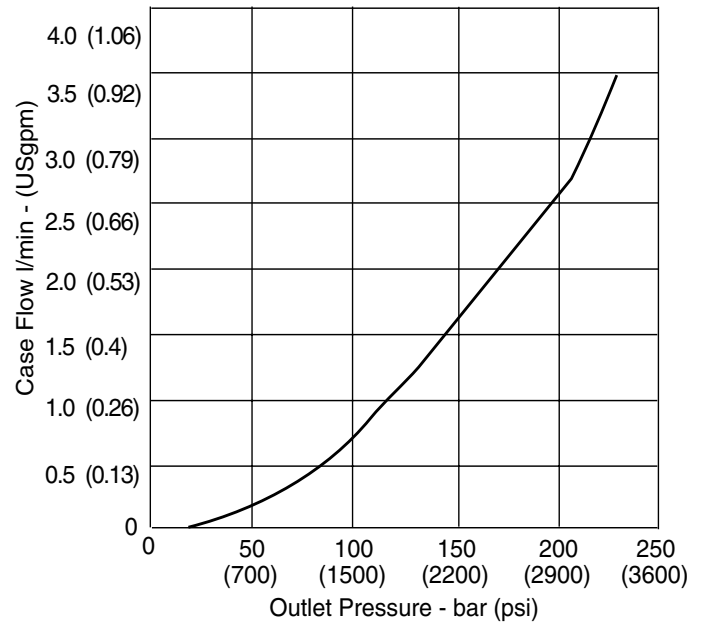
# Performance

## Industrial PVM081

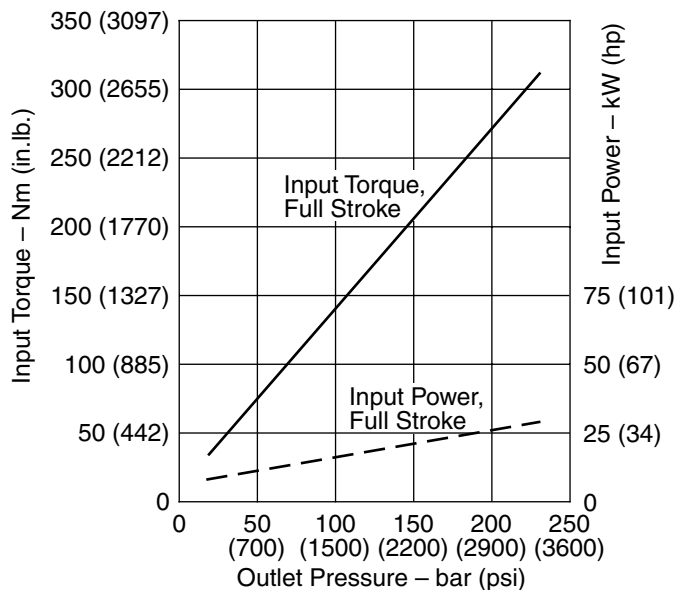
**Delivery and Efficiency at 1000 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**



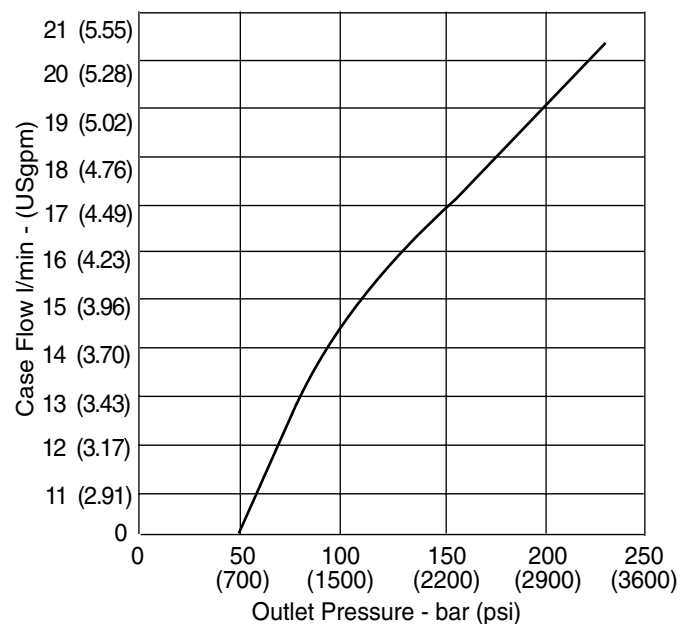
**Case Flow versus Outlet Pressure at 1800 r/min, Full Flow,  
50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**



**Input Torque and Power at 1000 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**



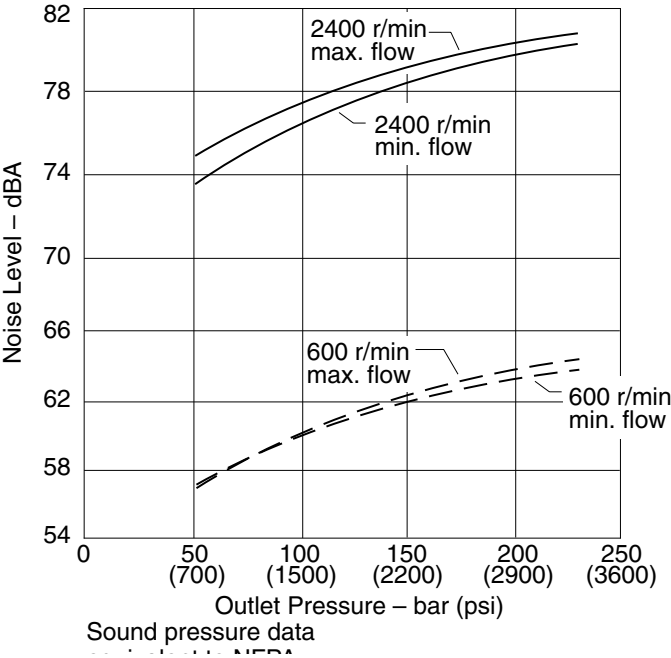
**Case Flow versus Outlet Pressure at Cutoff, 1800 r/min,  
50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**



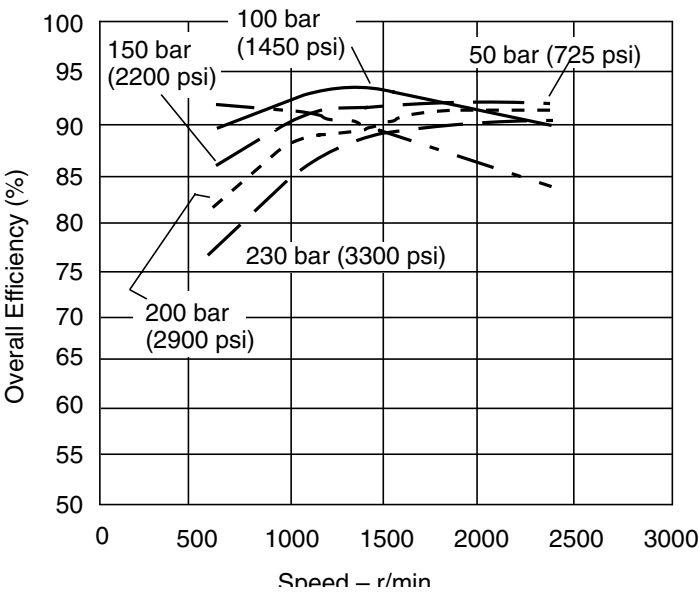
# Performance

Mobile  
PVM081

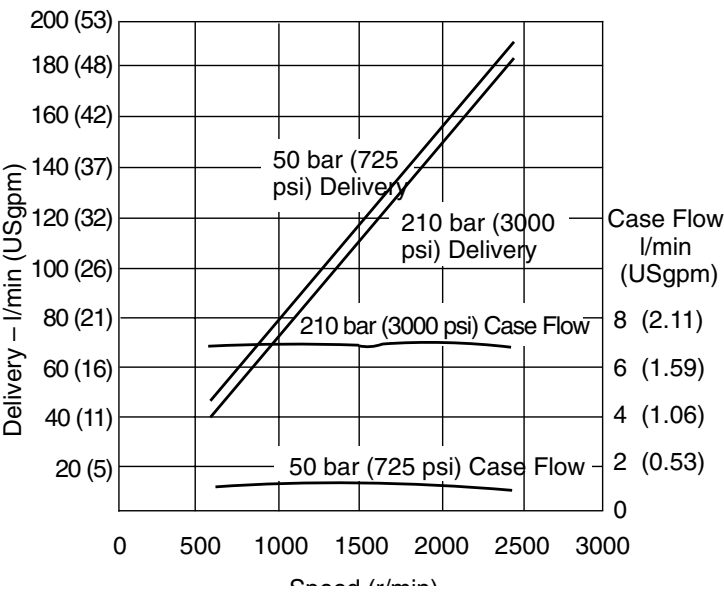
Typical Noise Levels at 2400 & 600 r/min  
with Petroleum Oil (10W) at 93°C (200°F)  
and 1.0 bar absolute (0 psi gauge) Inlet



Overall Efficiency versus Speed  
at 93°C (200°F) and 1.0 bar absolute  
(0 psi gauge) inlet



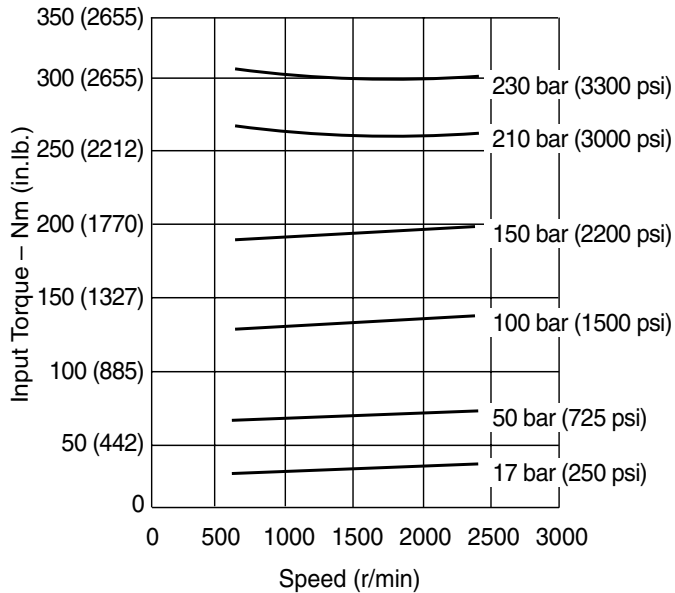
Delivery and Case Flow versus Speed  
at 93°C (200°F), Full Flow 1.0 bar absolute  
(0 psi gauge) Inlet



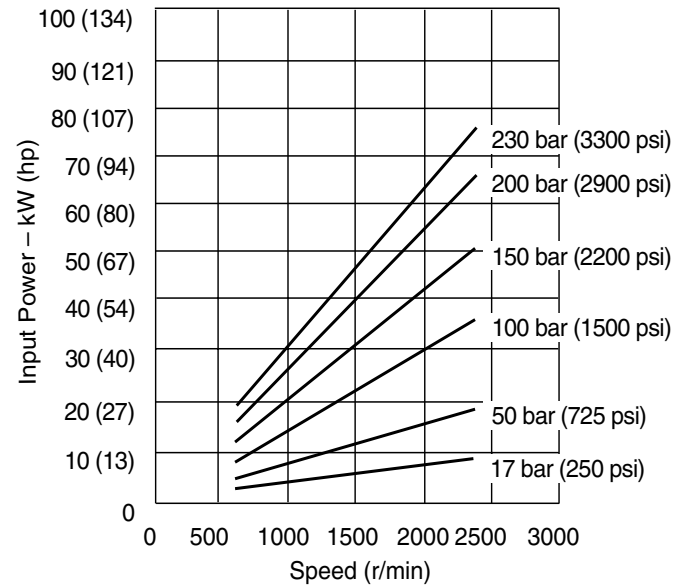
# Performance

## Mobile PVM081

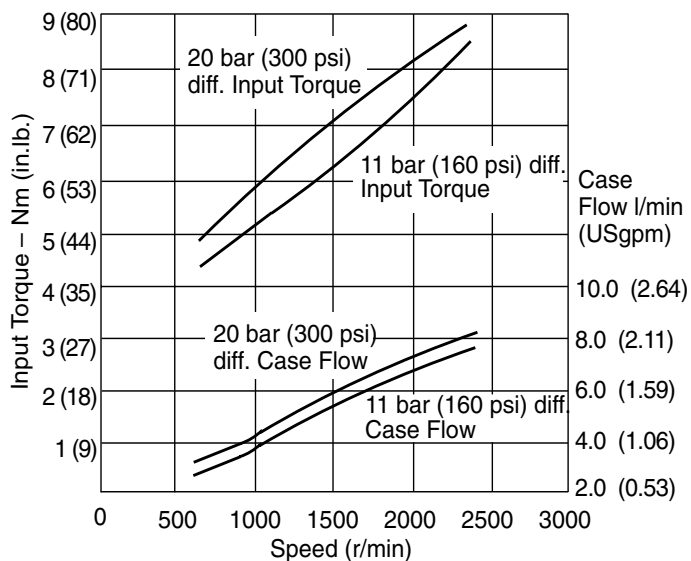
**Input Torque versus Speed at 93°C (200°F),  
Full Flow and 1.0 bar absolute (0 psi gauge) Inlet**



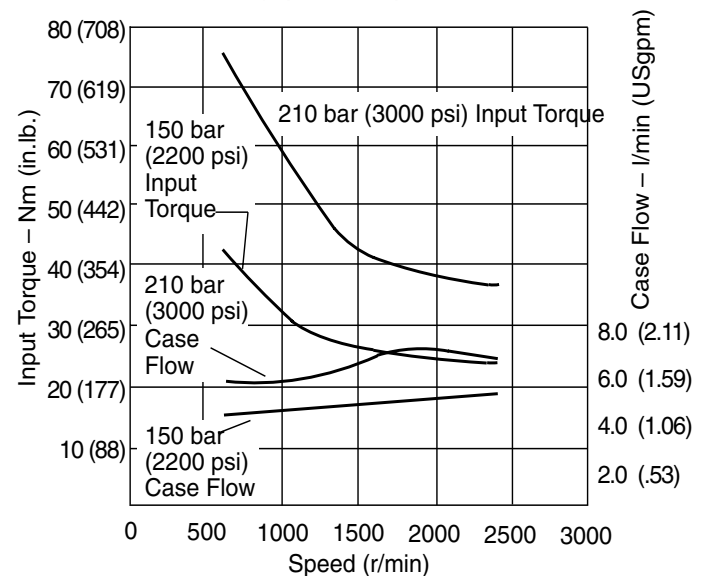
**Input Power versus Speed at 93°C (200°F),  
Full Flow and 1.0 bar absolute (0 psi gauge) Inlet**



**Input Torque and Case Flow versus Speed at 93°C (200°F), Load Sense Standby and 1.0 bar absolute (0 psi gauge) Inlet**



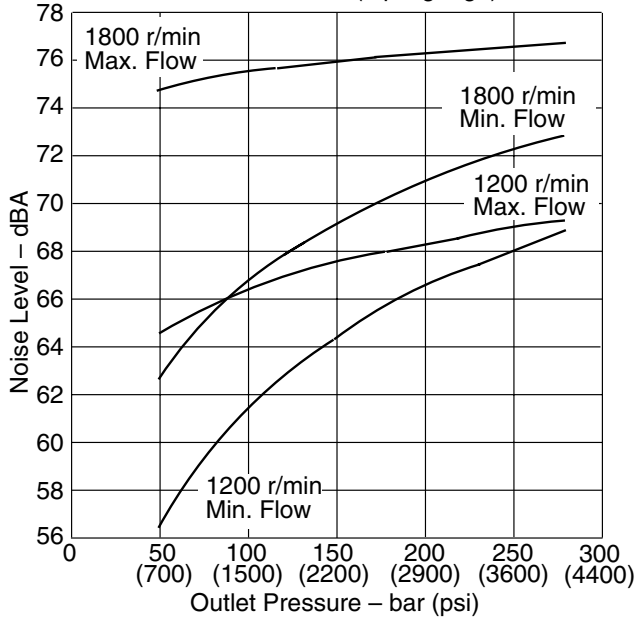
**Input Torque and Case Flow versus Speed at 93°C (200°F), Pressure Limit Cut-off and 1.0 bar absolute (0 psi gauge) Inlet**



# Performance

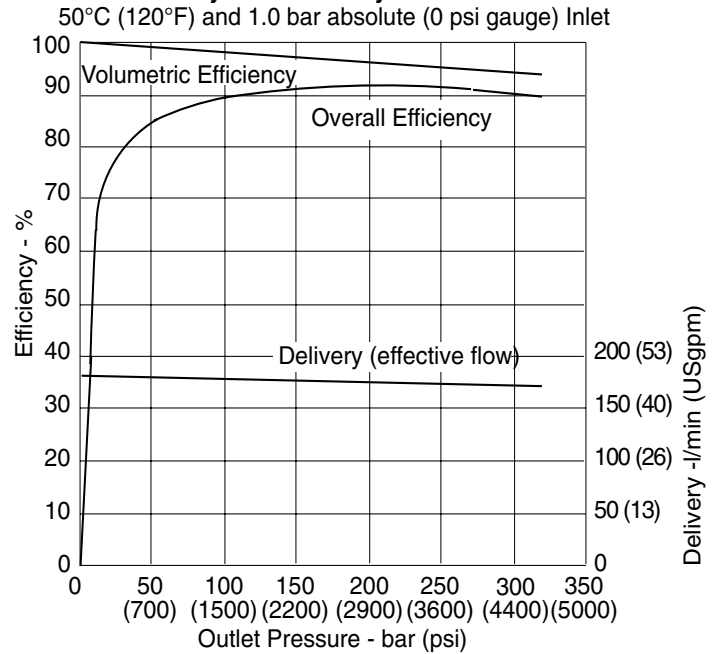
## Industrial PVM098

**Typical Noise Levels at 1800 and 1200 r/min**  
with Petroleum Oil (10W) at 50°C (120°F)  
and 1.0 bar absolute (0 psi gauge) Inlet

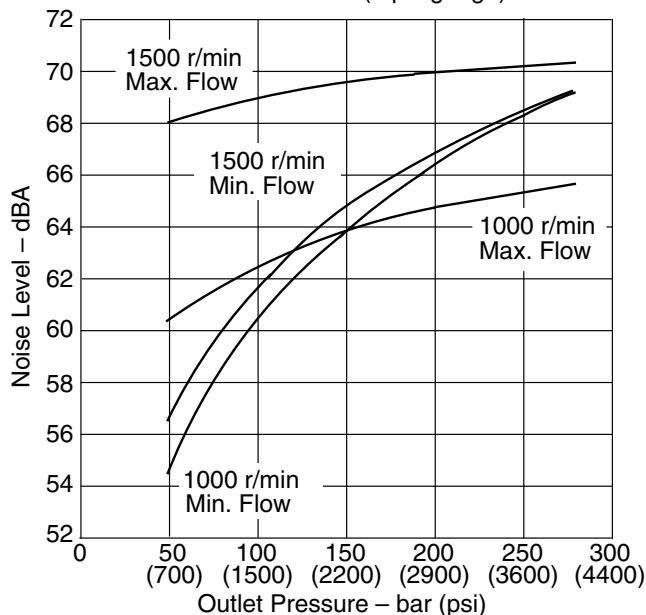


Sound pressure data  
equivalent to NFPA)

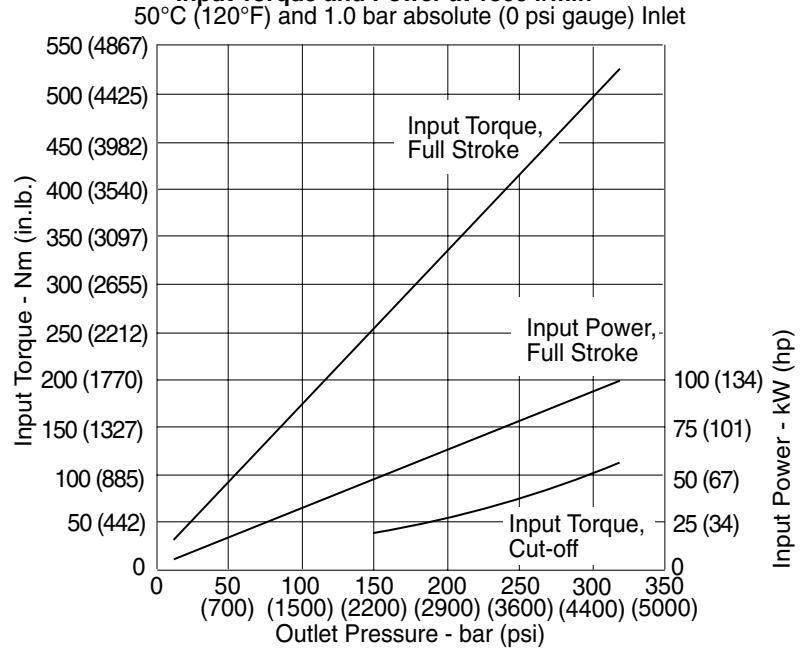
**Delivery and Efficiency at 1800 r/min**



**Typical Noise Levels at 1500 and 1000 r/min**  
with Petroleum Oil (10W) at 50°C (120°F)  
and 1.0 bar absolute (0 psi gauge) Inlet



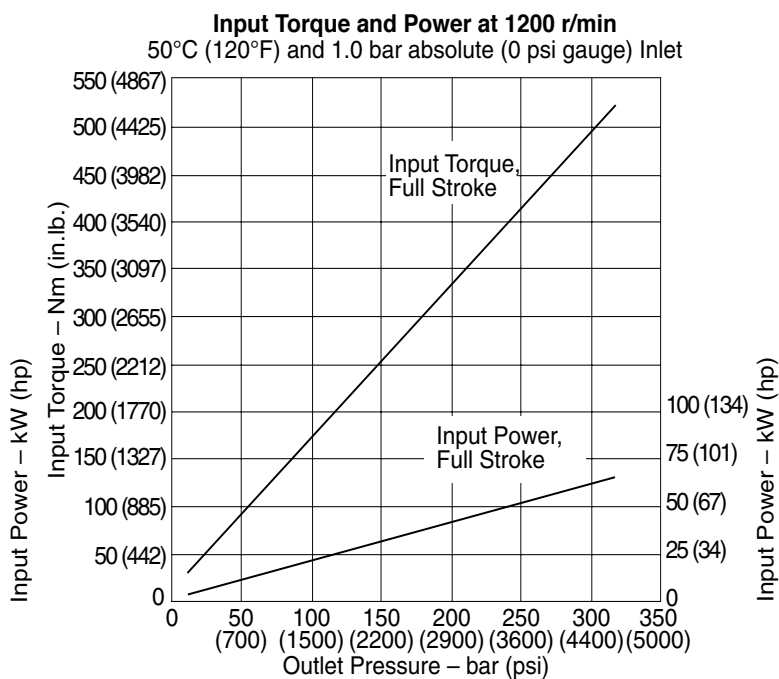
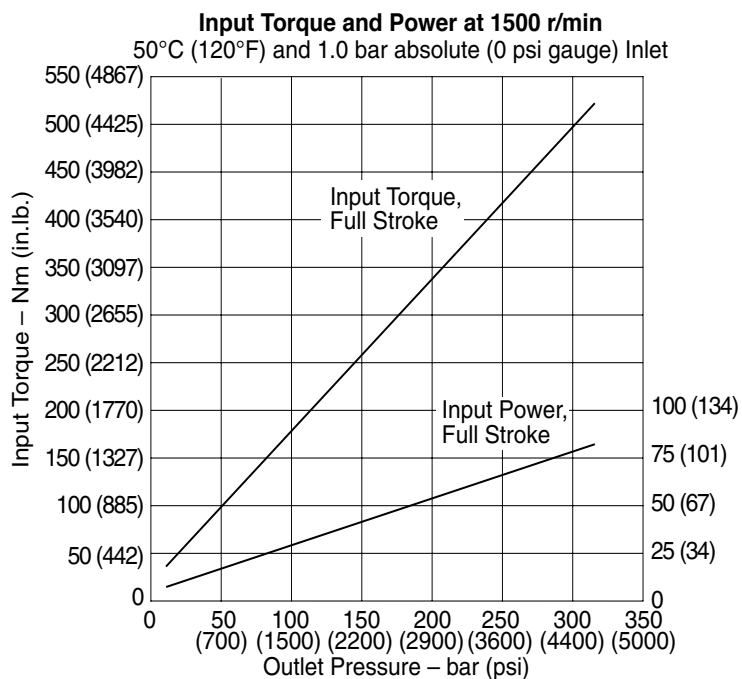
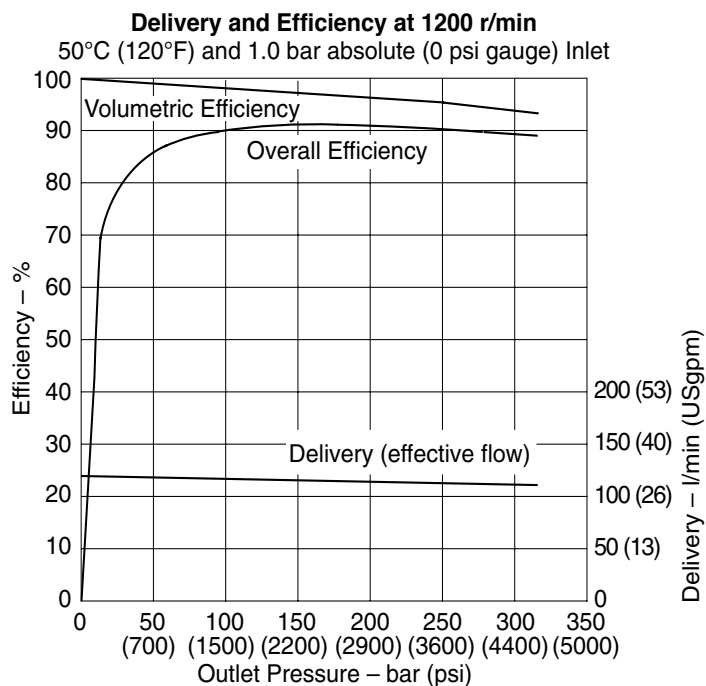
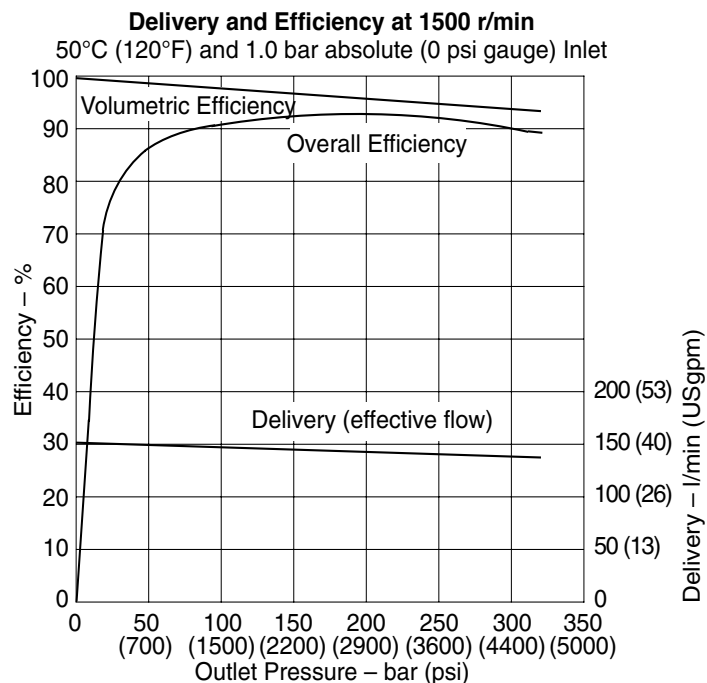
**Input Torque and Power at 1800 r/min**





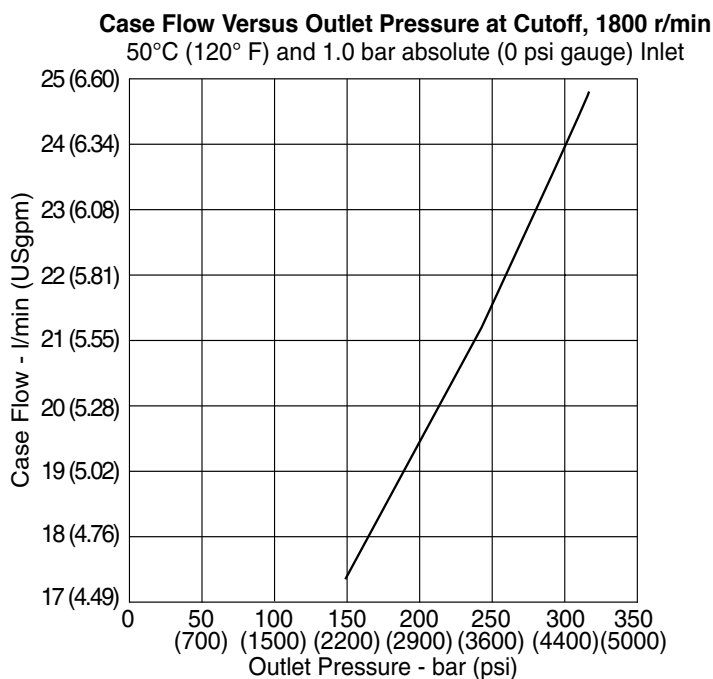
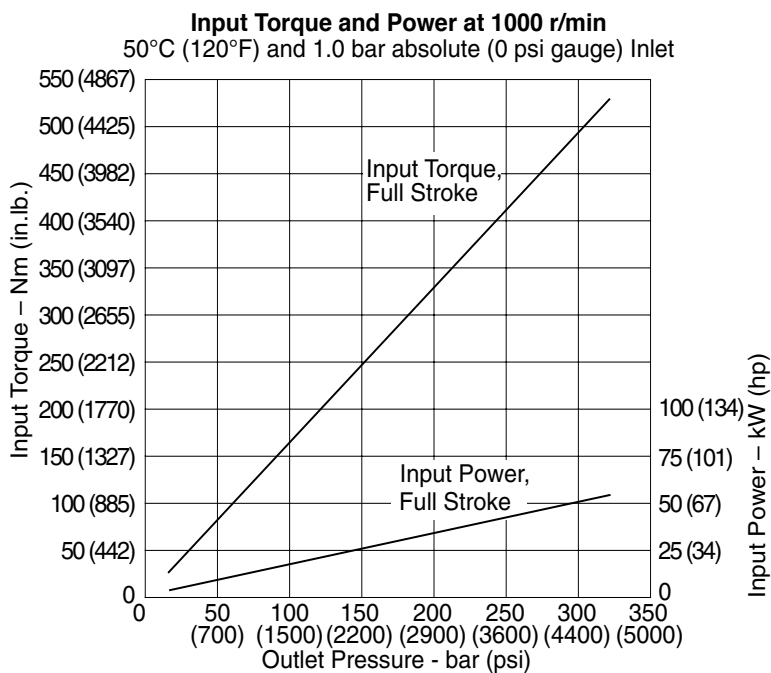
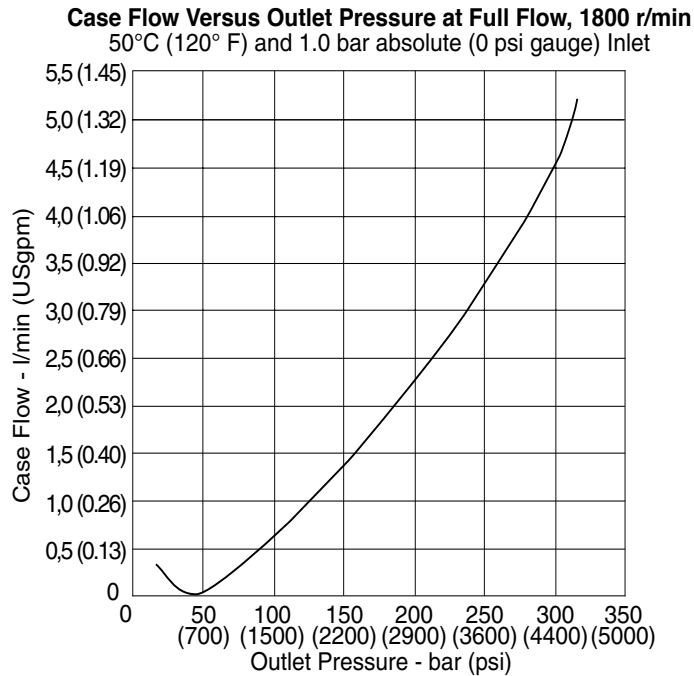
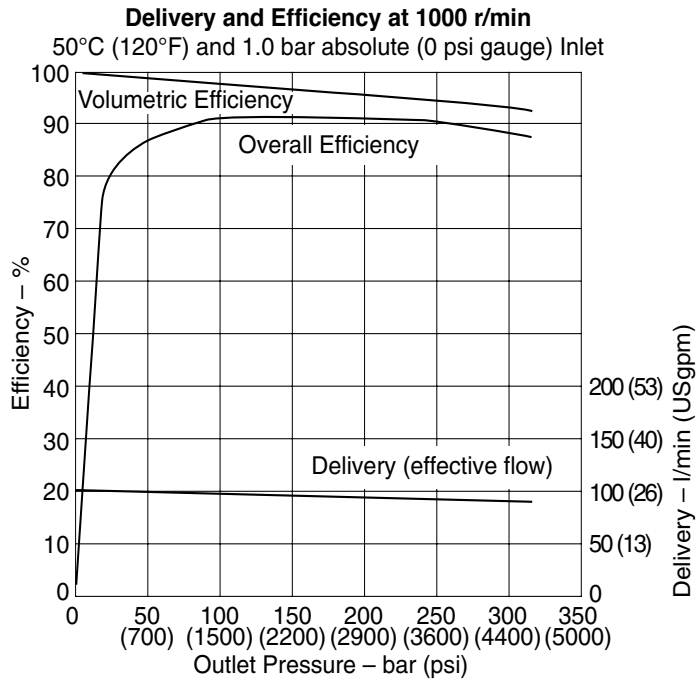
# Performance

## Industrial PVM098



# Performance

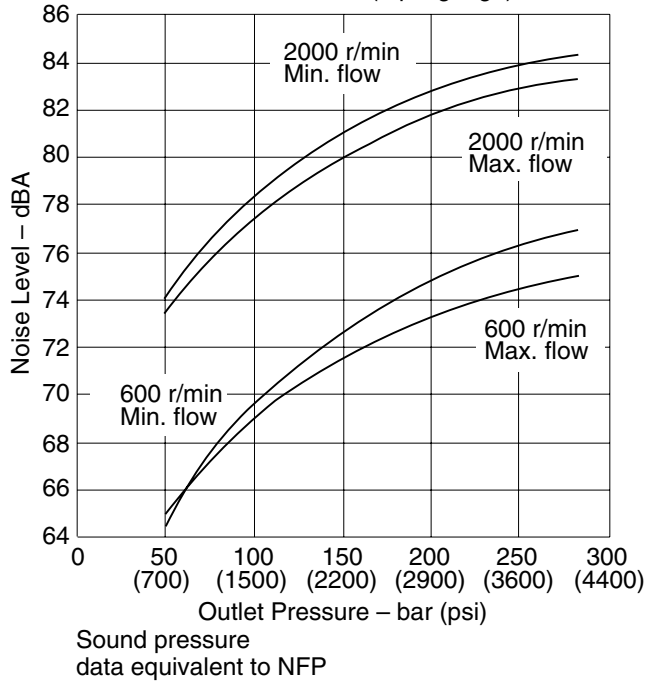
## Industrial PVM098



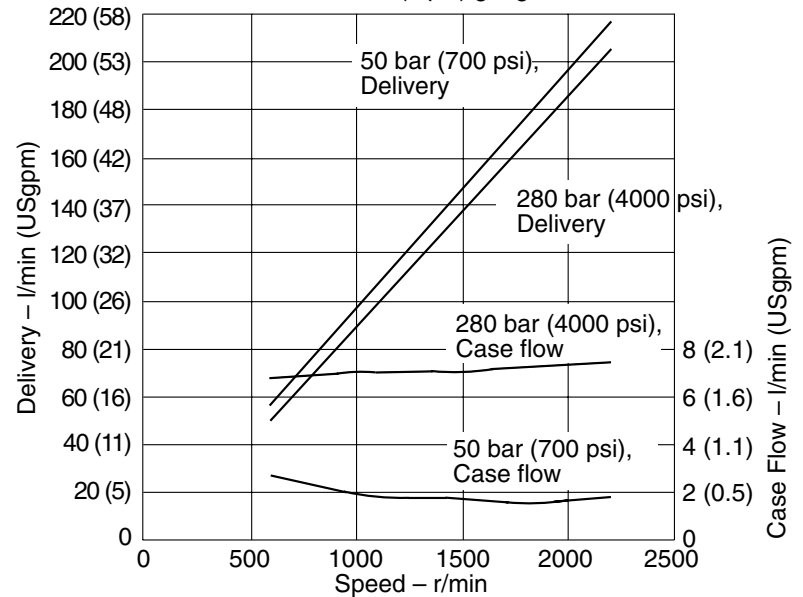
# Performance

## Mobile PVM098

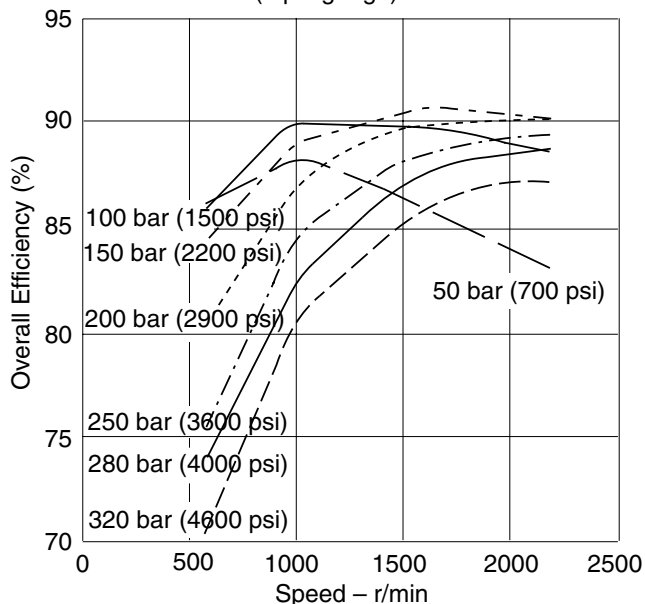
**Typical Noise Levels at 2000 and 600 r/min**  
with petroleum oil (10 W) @ 93°C (200°F)  
and 1.0 bar absolute (0 psi gauge) inlet



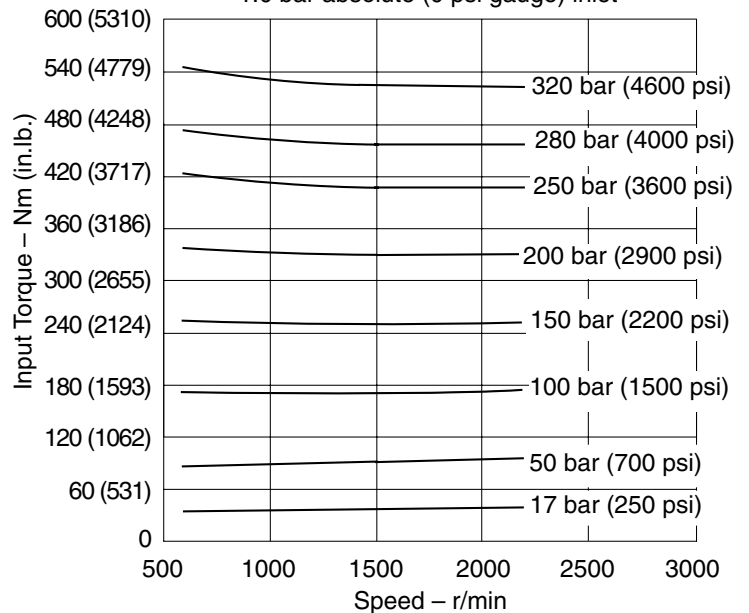
**Delivery and Case Flow Versus Speed**  
@ 93°C (200°F), full flow and  
1.0 bar absolute (0 psi) gauge Inlet



**Overall Efficiency Versus Speed**  
@ 93°C (200°F) and 1.0 bar absolute  
(0 psi gauge) inlet



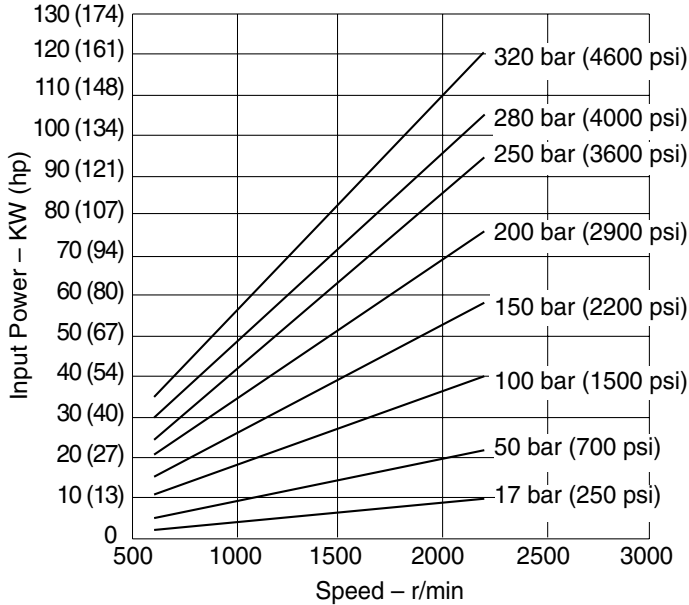
**Input Torque Versus Speed**  
@ 93°C (200°F), full flow and  
1.0 bar absolute (0 psi) gauge inlet



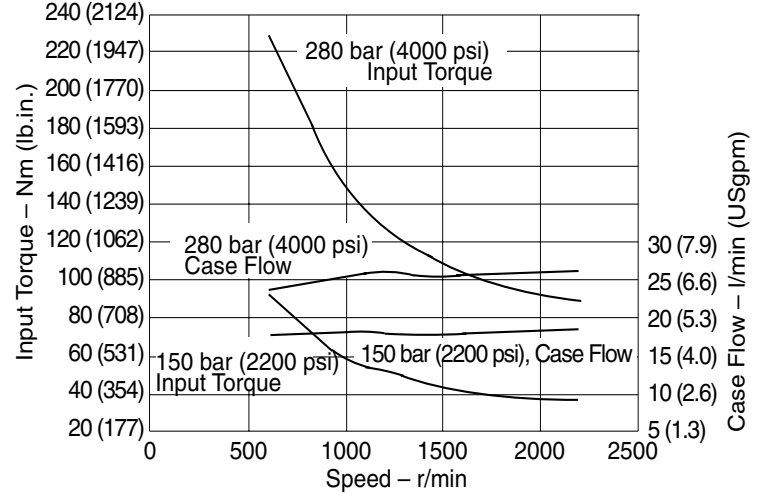
# Performance

## Mobile PVM098

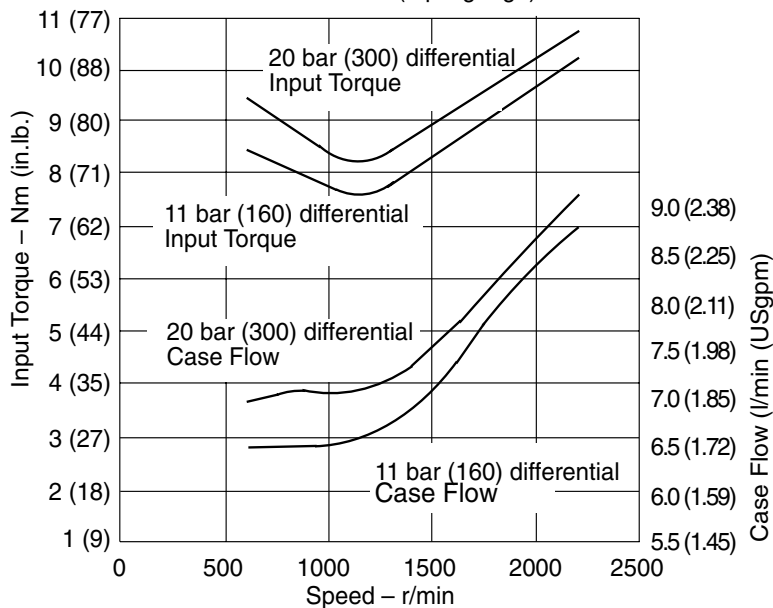
**Input Power Versus Speed**  
@ 93°C (200°F), full flow and  
1.0 bar absolute (0 psi gauge) inlet



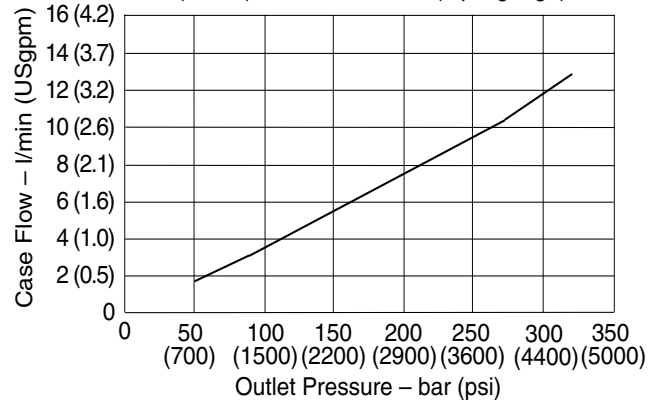
**Input Torque and Case Flow Versus Speed**  
@ 93°C (200°F), cut-off and  
1.0 bar absolute (0 psi gauge) inlet



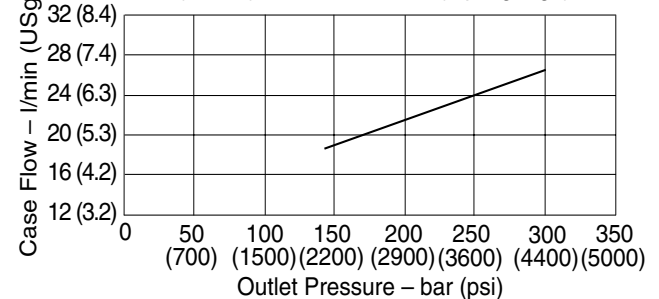
**Input Torque and Case Flow Versus Speed**  
@ 93°C (200°F), load sense standby  
and 1.0 bar absolute (0 psi gauge) inlet



**Case Flow at 2200 r/min, Full Flow**  
93°C (200°F), 1.0 bar absolute (0 psi gauge) Inlet



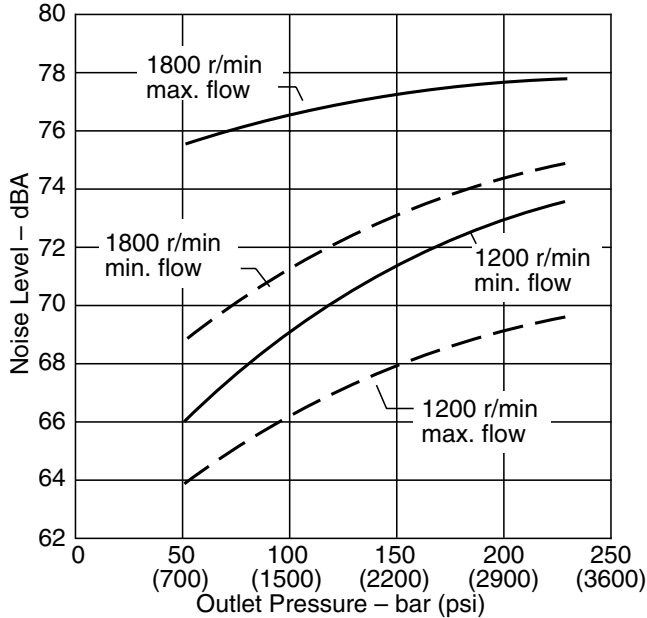
**Case Flow at 2200 r/min, Minimum Flow**  
93°C (200°F), 1.0 bar absolute (0 psi gauge) Inlet



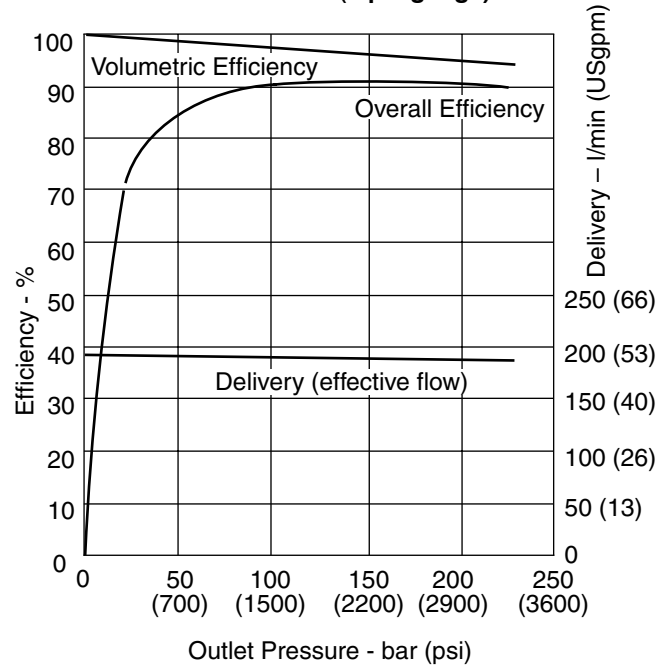
# Performance

## Industrial PVM106

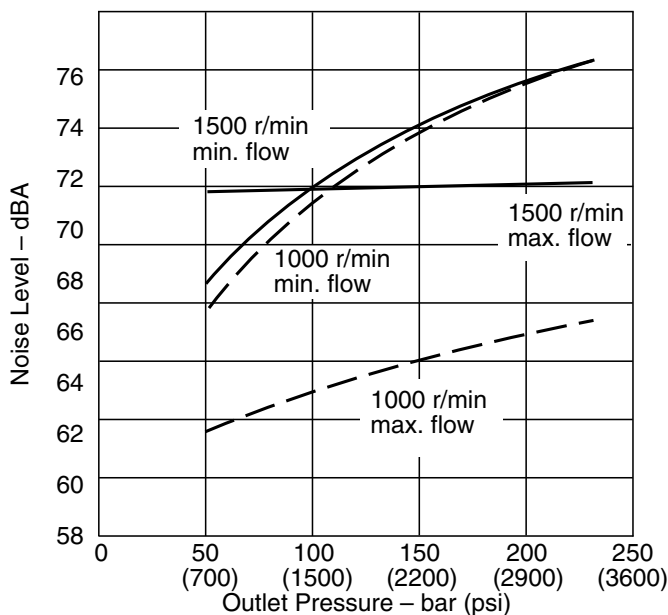
**Typical Noise Levels at 1800 and 1200 r/min.  
with Petroleum Oil (10W) at 50°C (120°F)  
and 1.0 bar absolute (0 psi gauge) Inlet**



**Delivery and Efficiency at 1800 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**

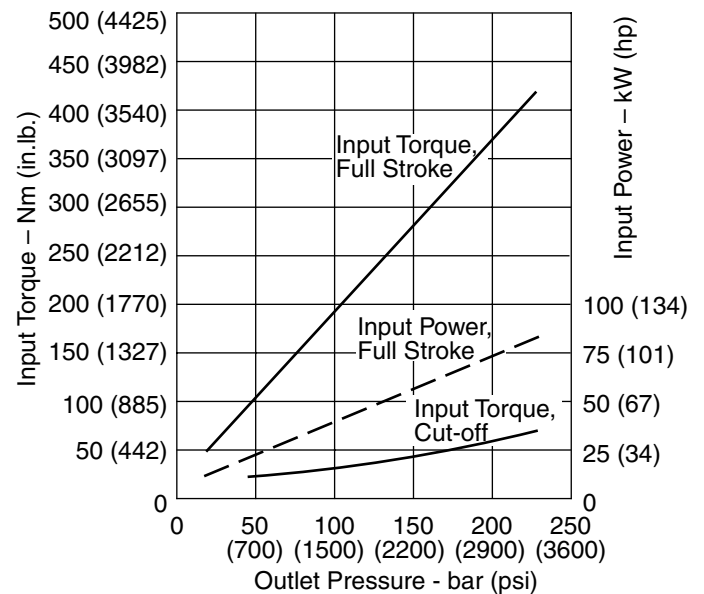


**Typical Noise Levels at 1500 and 1000 r/min.  
with Petroleum Oil (10W) at 50°C (120°F)  
and 1.0 bar absolute (0 psi gauge) Inlet**



Sound pressure data  
equivalent to NFPA.

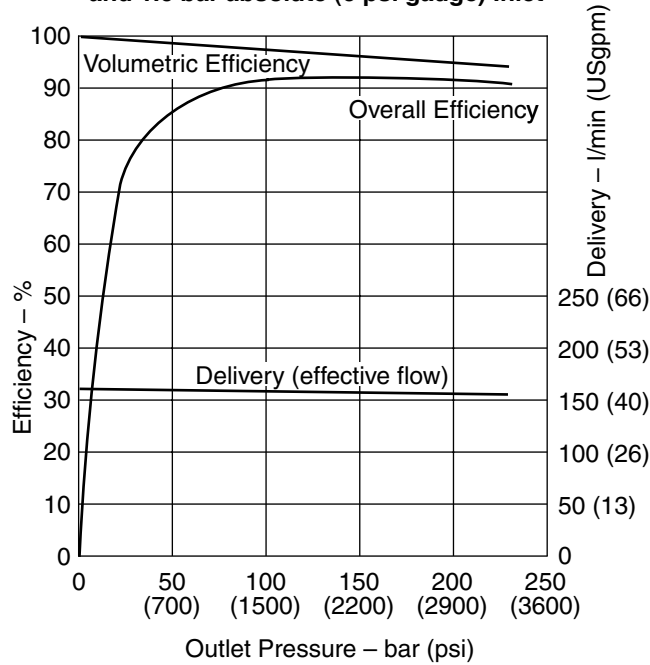
**Input Torque and Power at 1800 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**



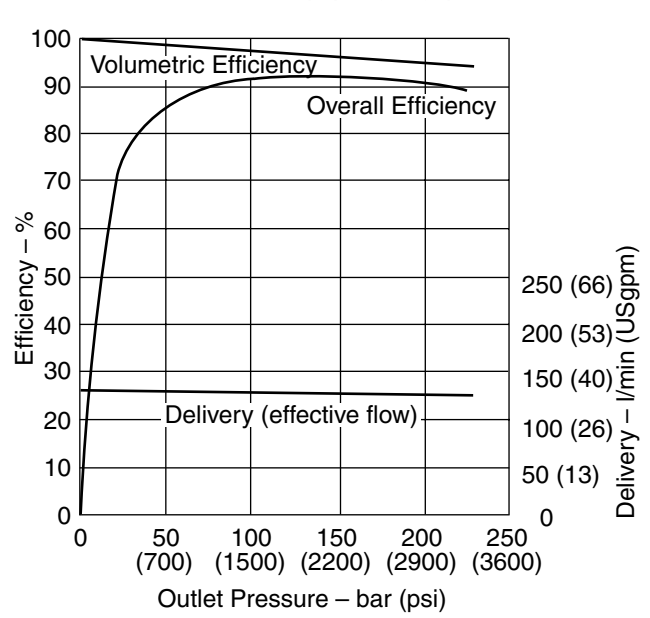
# Performance

Industrial  
PVM106

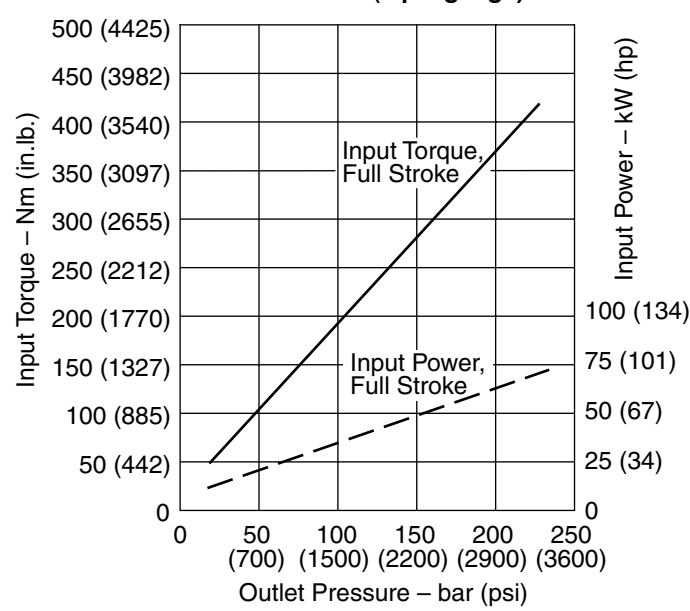
Delivery and Efficiency at 1500 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet



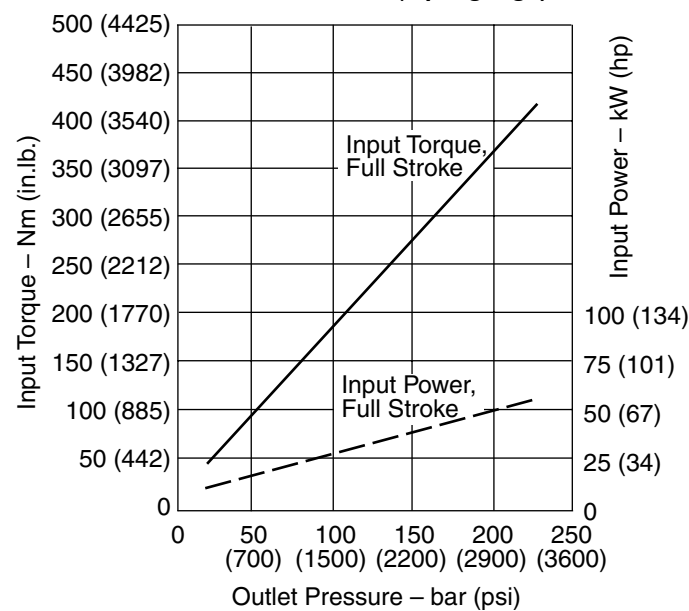
Delivery and Efficiency at 1200 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet



Input Torque and Power at 1500 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet



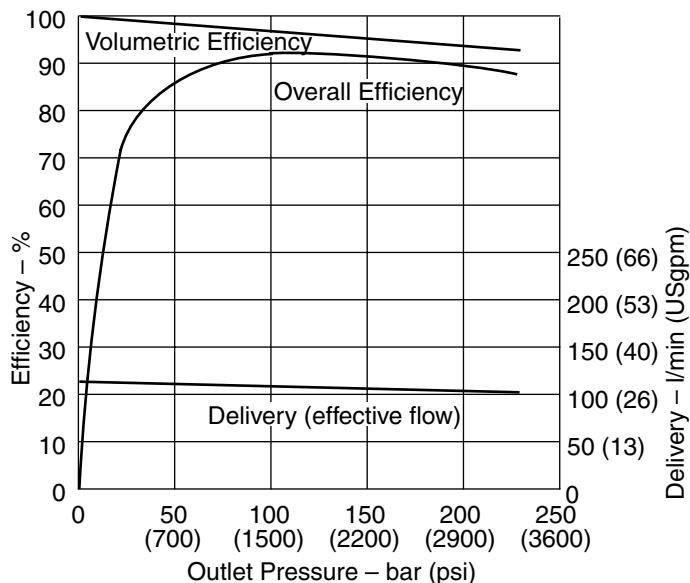
Input Torque and Power at 1200 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet



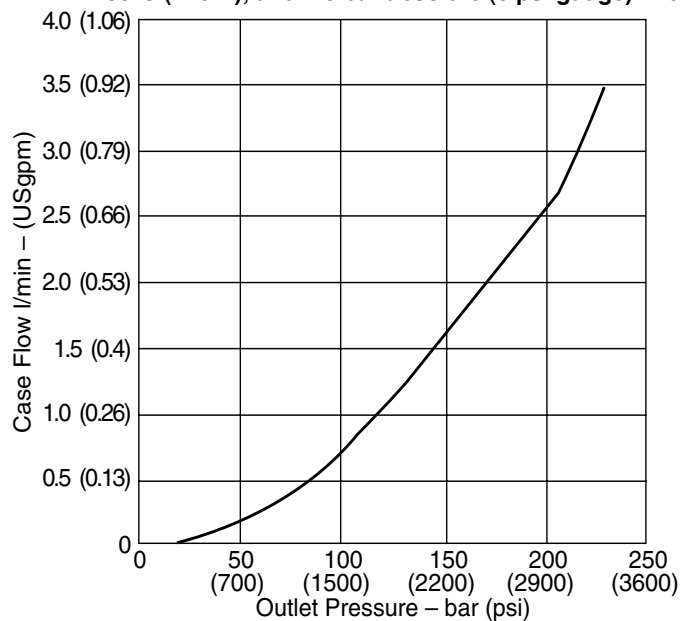
# Performance

## Industrial PVM106

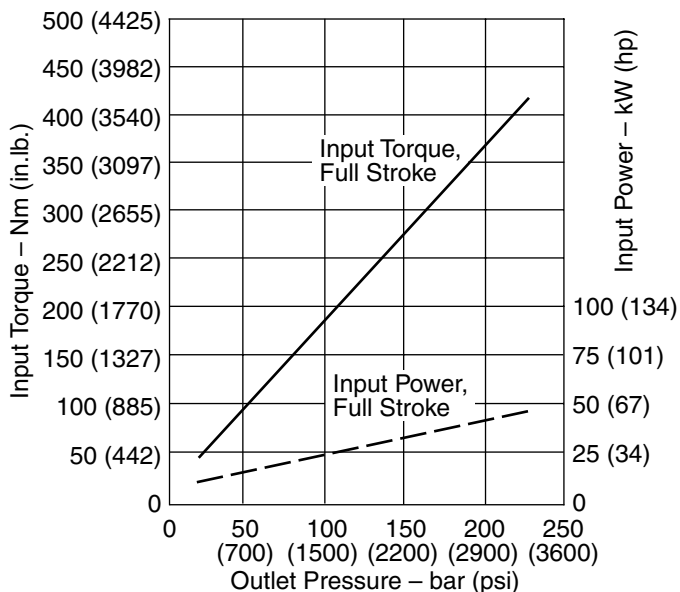
**Delivery and Efficiency at 1000 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**



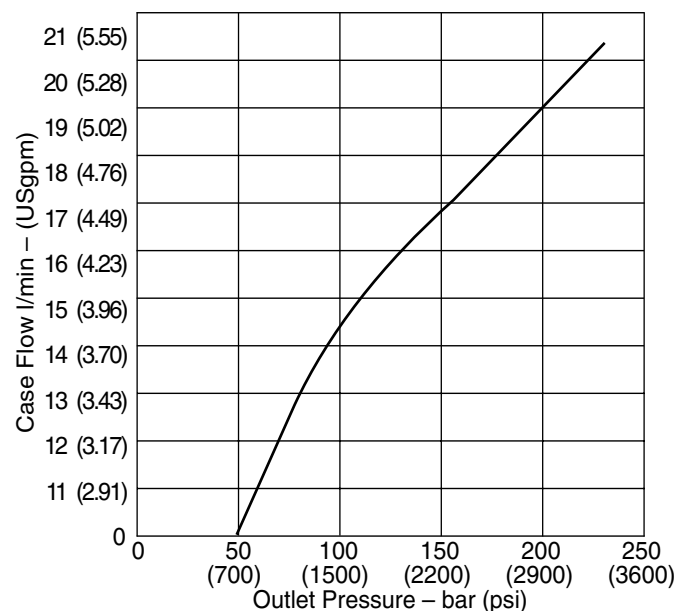
**Case Flow versus Outlet Pressure at 1800 r/min, Full Flow,  
50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**



**Input Torque and Power at 1000 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**



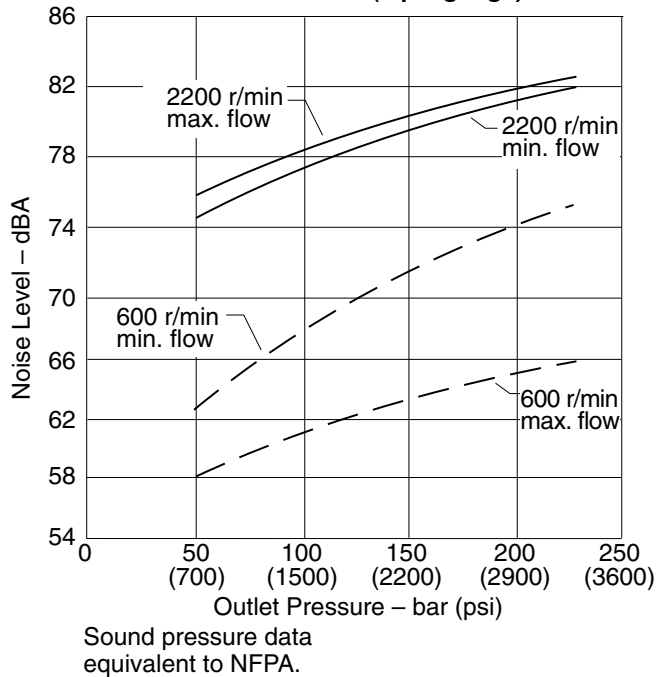
**Case Flow versus Outlet Pressure at Cutoff, 1800 r/min,  
50°C (120°F), and 1.0 bar absolute (0 psi gauge) Inlet**



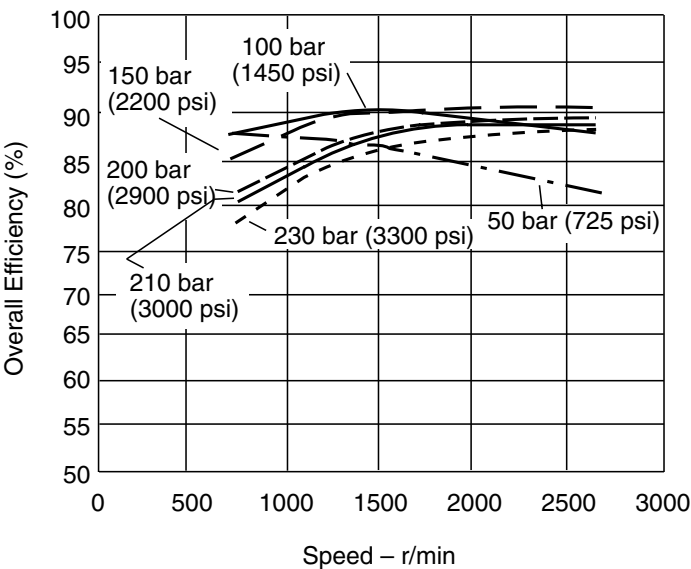
# Performance

Mobile  
PVM106

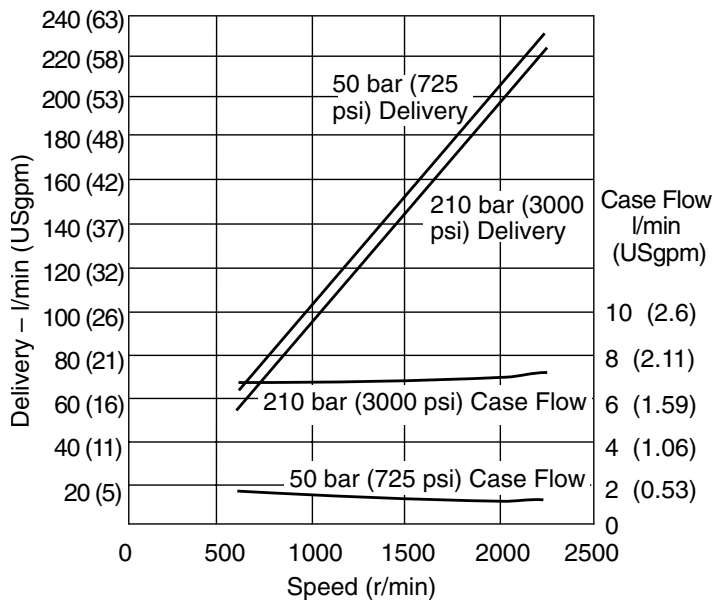
Typical Noise Levels at 2200 & 600 r/min  
with Petroleum Oil (10W) at 93°C (200°F)  
and 1.0 bar absolute (0 psi gauge) Inlet



Overall Efficiency versus Speed at  
93°C (200°F) and 1.0 bar absolute (0 psi gauge) inlet



Delivery and Case Flow versus Speed at 93°C (200°F),  
Full Flow 1.0 bar absolute (0 psi gauge) Inlet

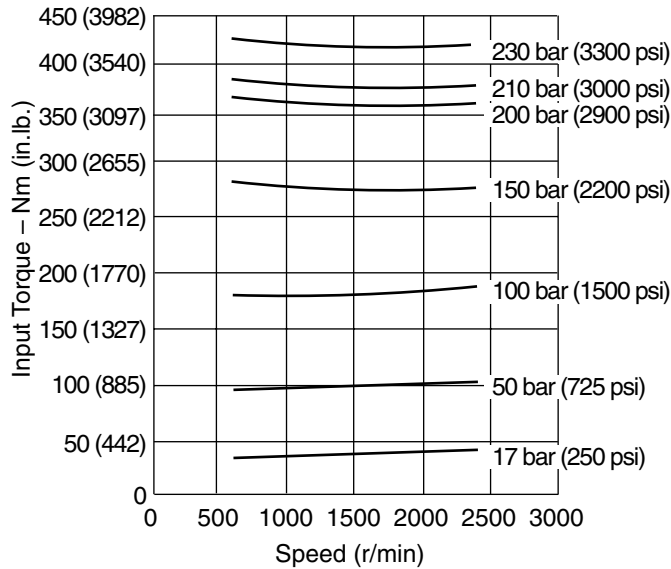




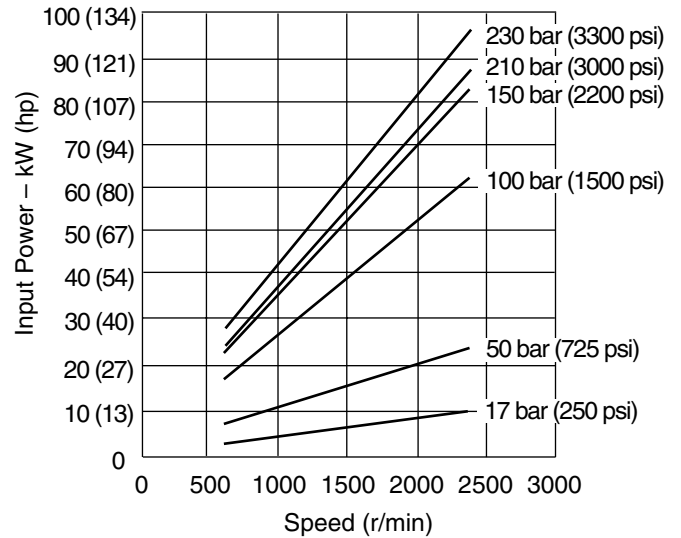
# Performance

## Mobile PVM106

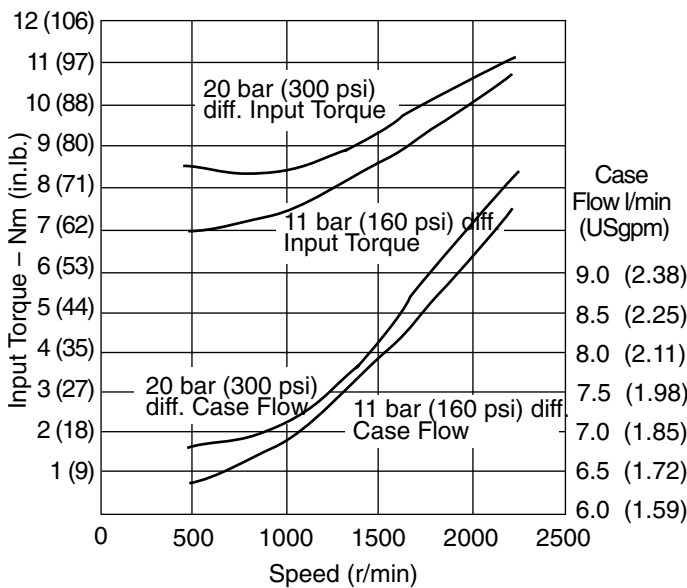
**Input Torque versus Speed at 93°C (200°F),  
Full Flow and 1.0 bar absolute (0 psi gauge) Inlet**



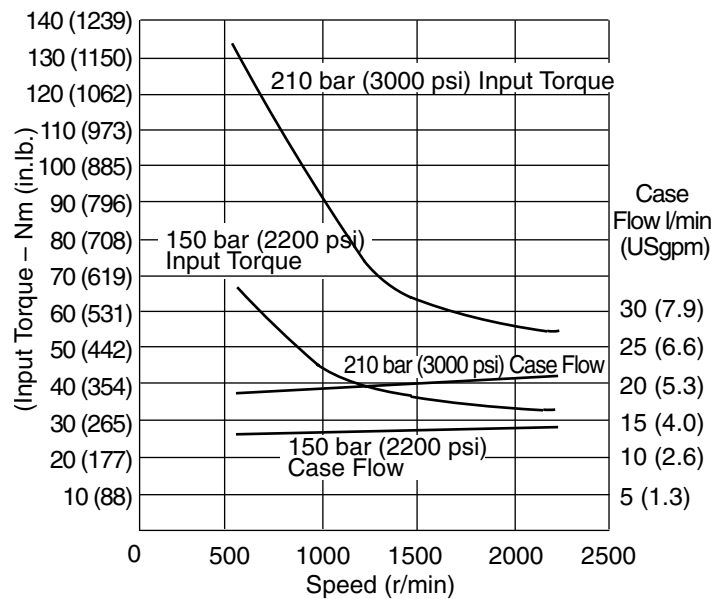
**Input Power versus Speed at 93°C (200°F),  
Full Flow and 1.0 bar absolute (0 psi gauge) Inlet**



**Input Torque and Case Flow versus Speed at 93°C  
(200°F), Load Sense Standby and 1.0 bar absolute  
(0 psi gauge) Inlet**



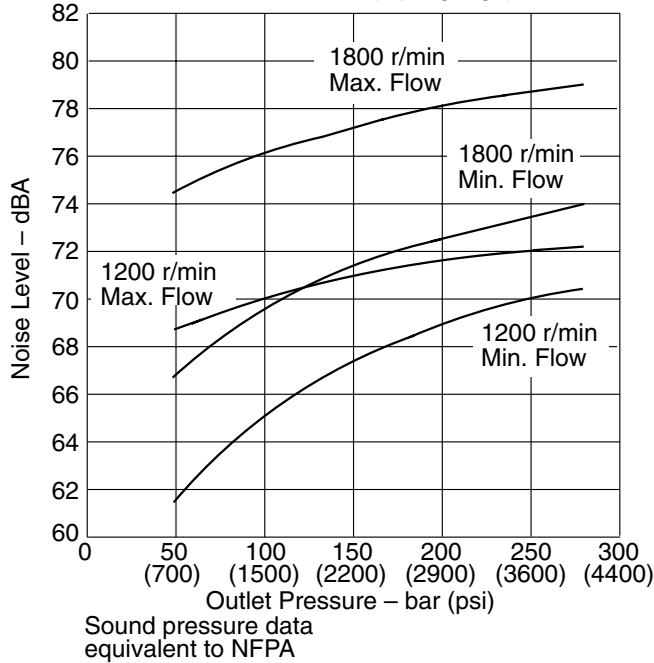
**Input Torque and Case Flow versus Speed at 93°C  
(200°F), Pressure Limit Cut-off and 1.0 bar absolute  
(0 psi gauge) Inlet**



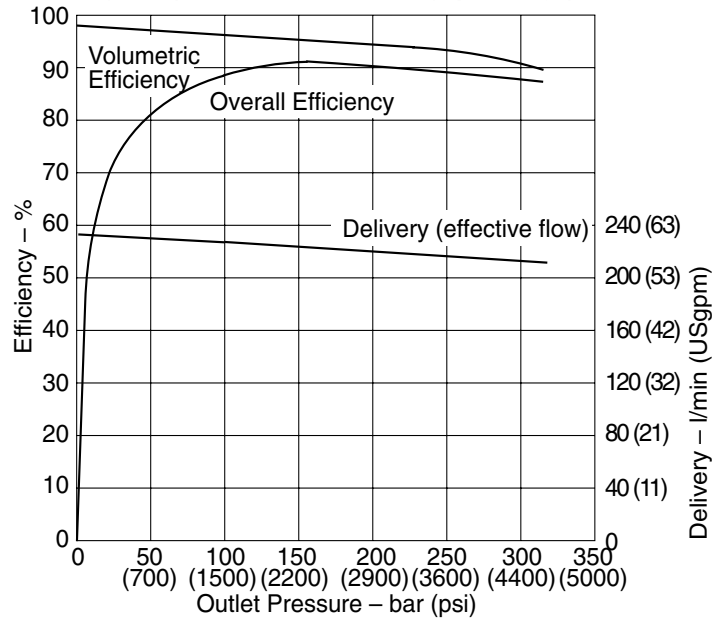
# Performance

## Industrial PVM131

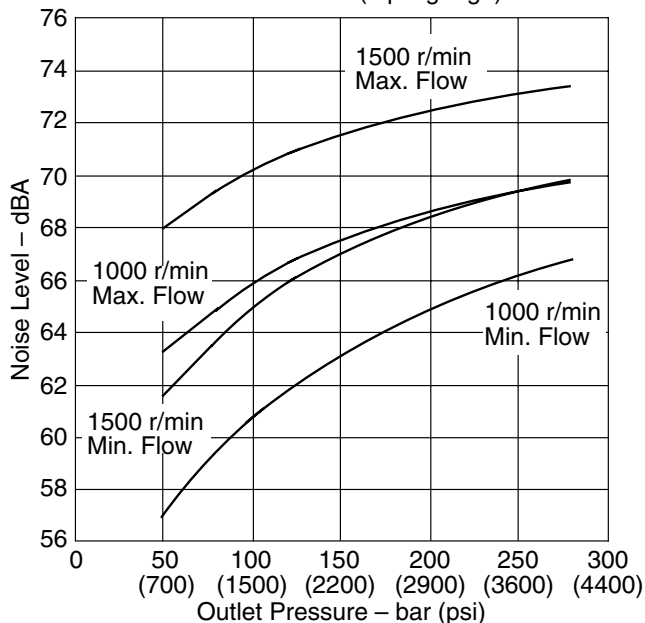
**Typical Noise Levels at 1800 and 1200 r/min**  
with Petroleum Oil (10W) at 50°C (120°F)  
and 1.0 bar absolute (0 psi gauge) Inlet



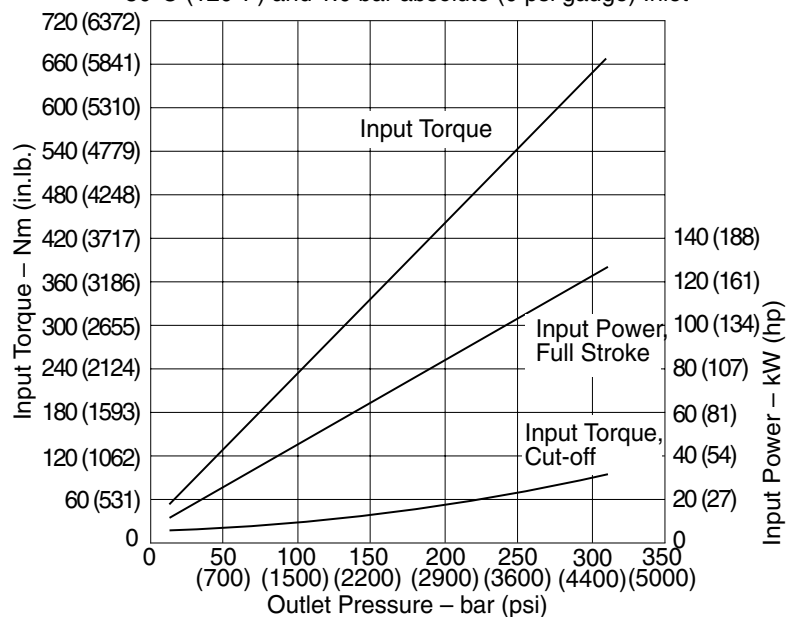
**Delivery and Efficiency at 1800 r/min**  
50°C (120°F) and 1.0 bar absolute (0 psi gauge) Inlet



**Typical Noise Levels at 1500 and 1000 r/min**  
with Petroleum Oil (10W) at 50°C (120°F)  
and 1.0 bar absolute (0 psi gauge) Inlet

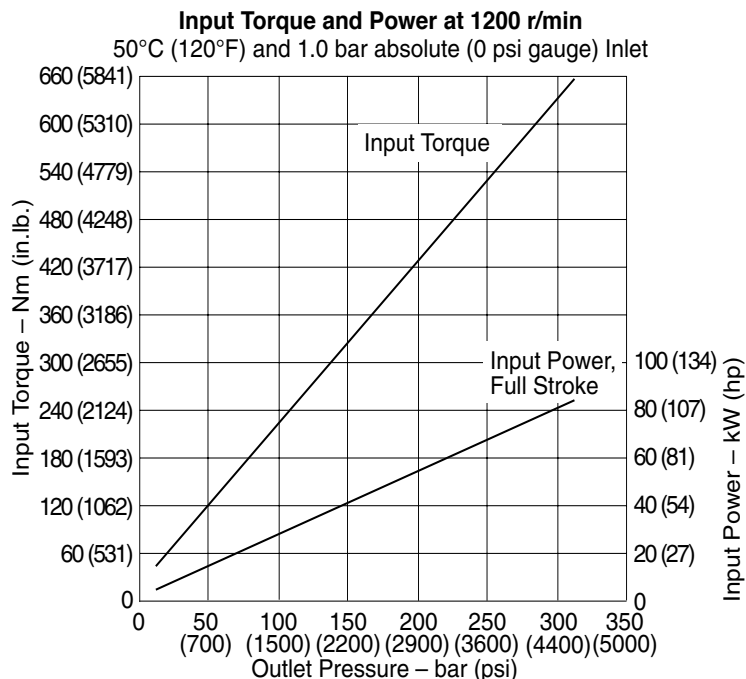
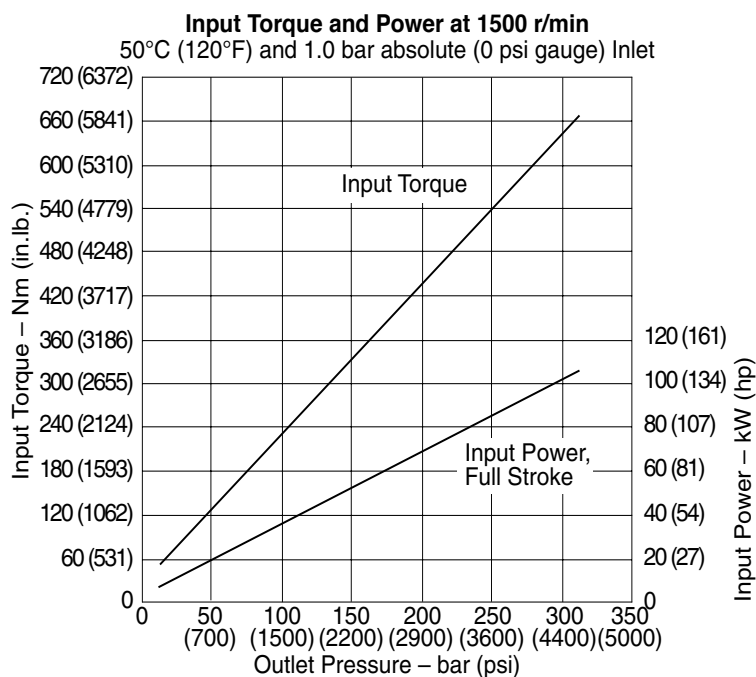
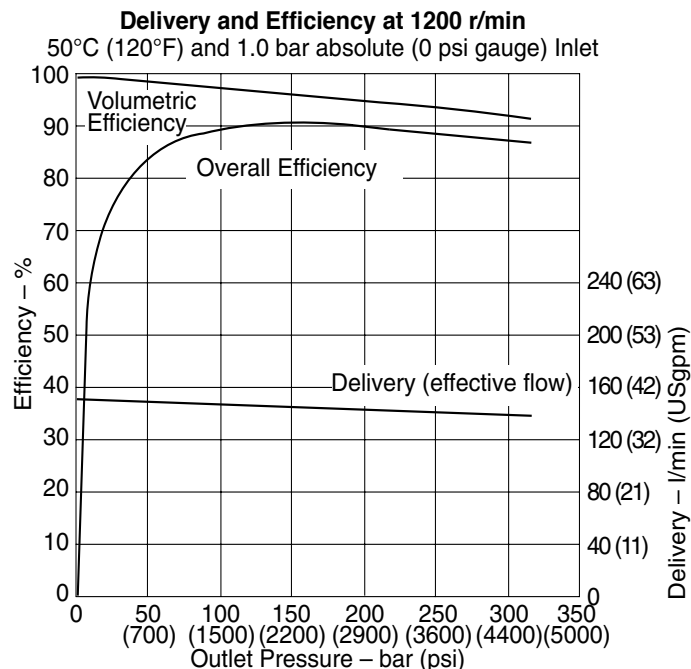
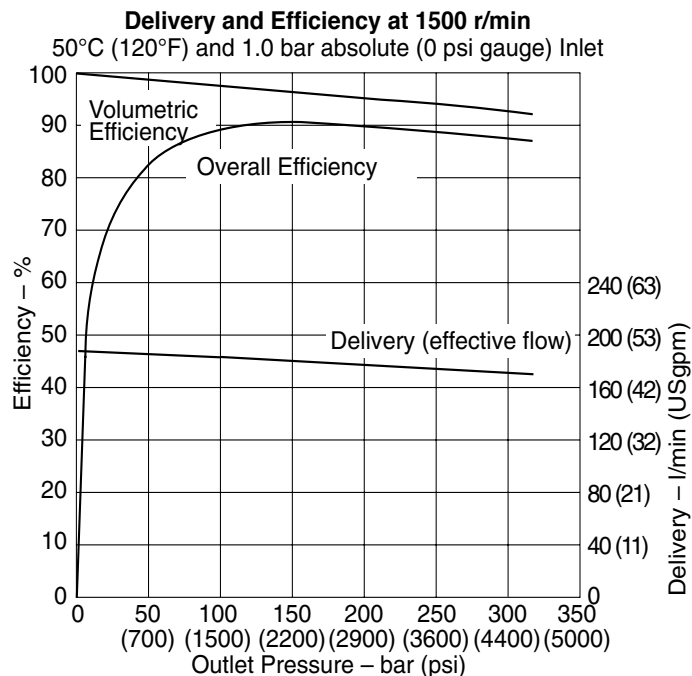


**Input Torque and Power at 1800 r/min**  
50°C (120°F) and 1.0 bar absolute (0 psi gauge) Inlet



# Performance

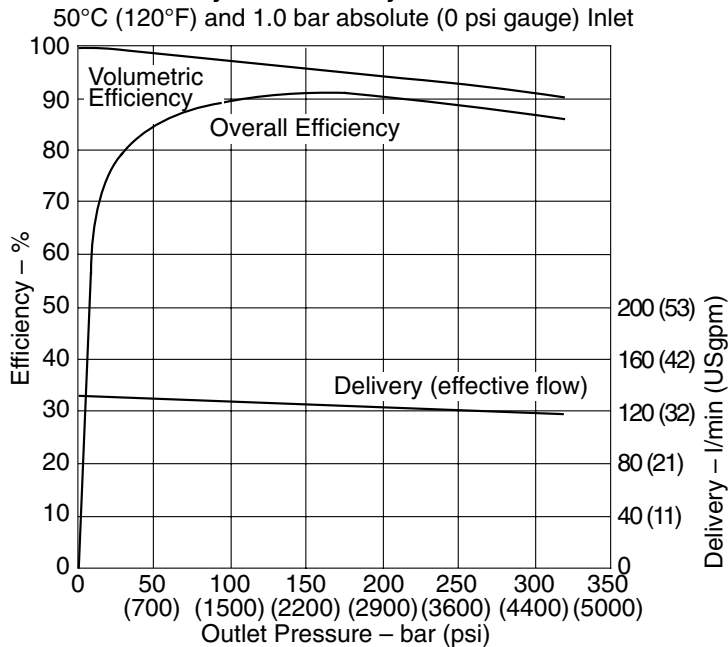
## Industrial PVM131



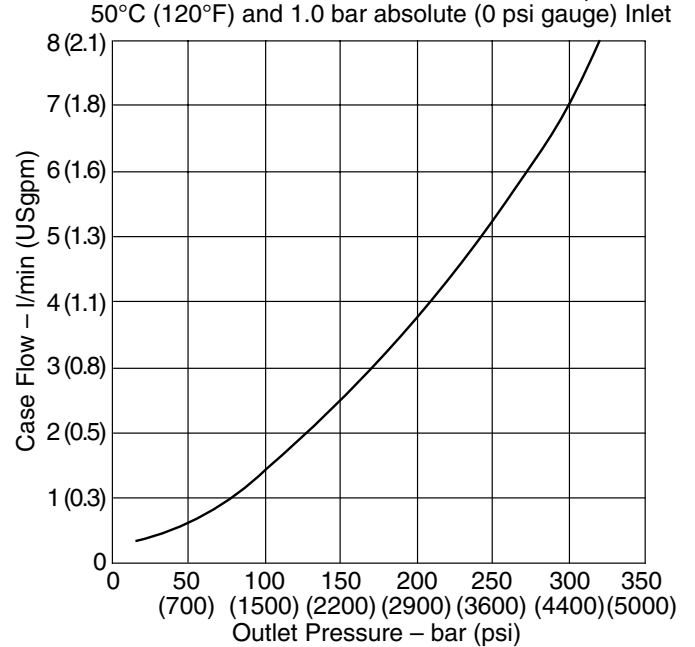
# Performance

## Industrial PVM131

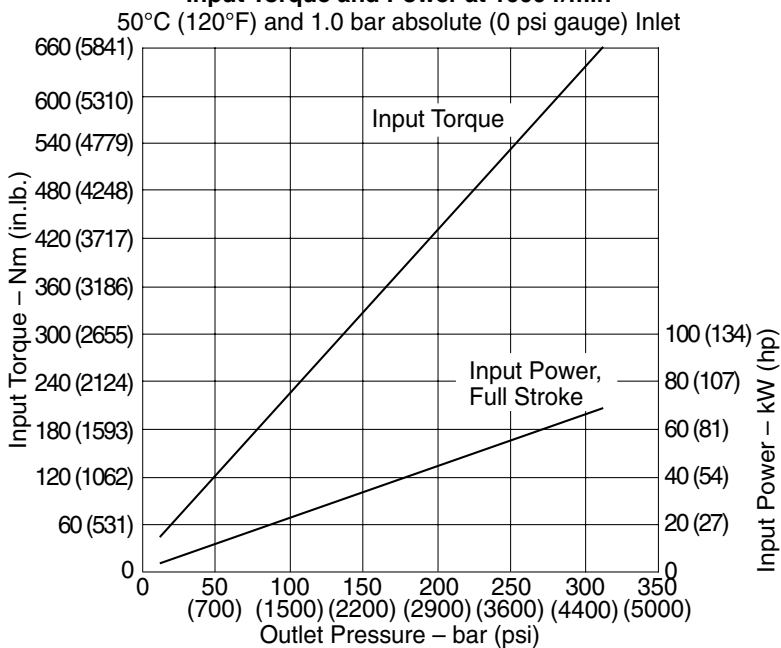
### Delivery and Efficiency at 1000 r/min



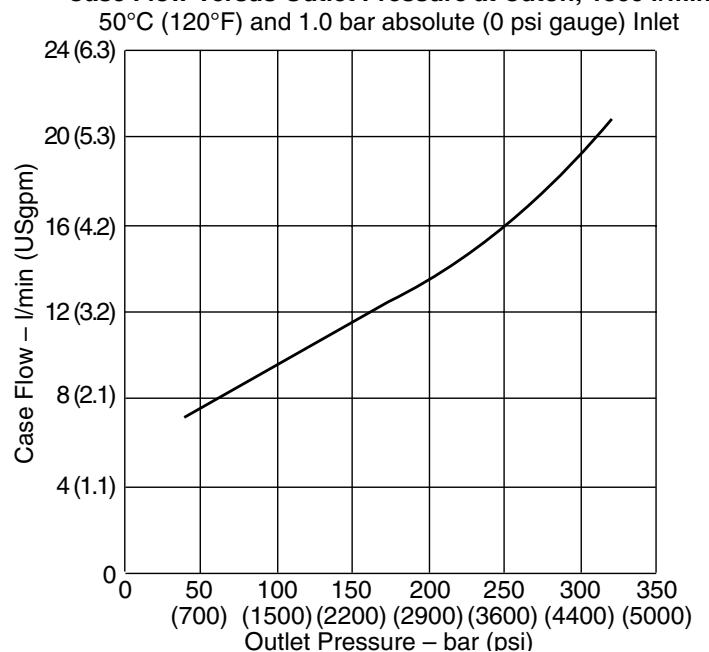
### Case Flow Versus Outlet Pressure at Full Flow, 1800 r/min



### Input Torque and Power at 1000 r/min



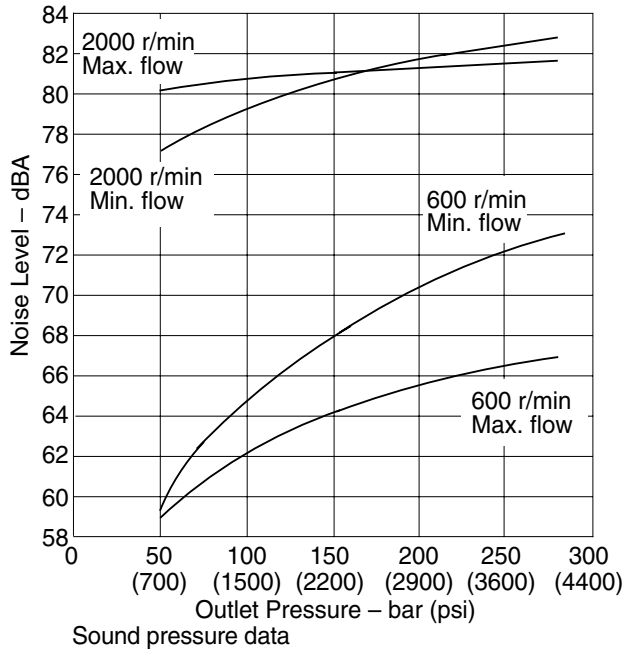
### Case Flow Versus Outlet Pressure at Cutoff, 1800 r/min



# Performance

## Mobile PVM131

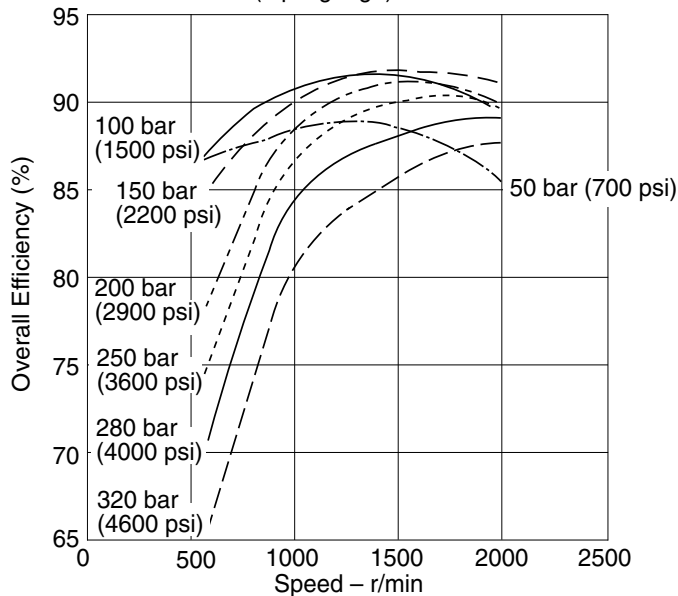
**Typical Noise Levels at 2000 and 600 r/min**  
with petroleum oil (10 W) @ 93°C (200°F)  
and 1.0 bar absolute (0 psi gauge) inlet



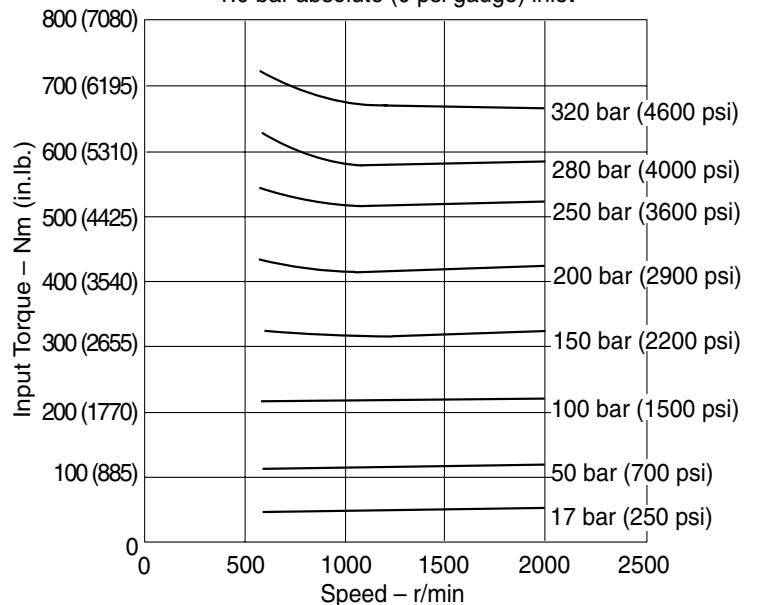
**Delivery and Case Flow Versus Speed**  
@ 93°C (200°F), full flow and  
1.0 bar absolute (0 psi) gauge Inlet



**Overall Efficiency Versus Speed**  
@ 93°C (200°F) and 1.0 bar absolute  
(0 psi gauge) inlet



**Input Torque Versus Speed**  
@ 93°C (200°F), full flow and  
1.0 bar absolute (0 psi gauge) inlet

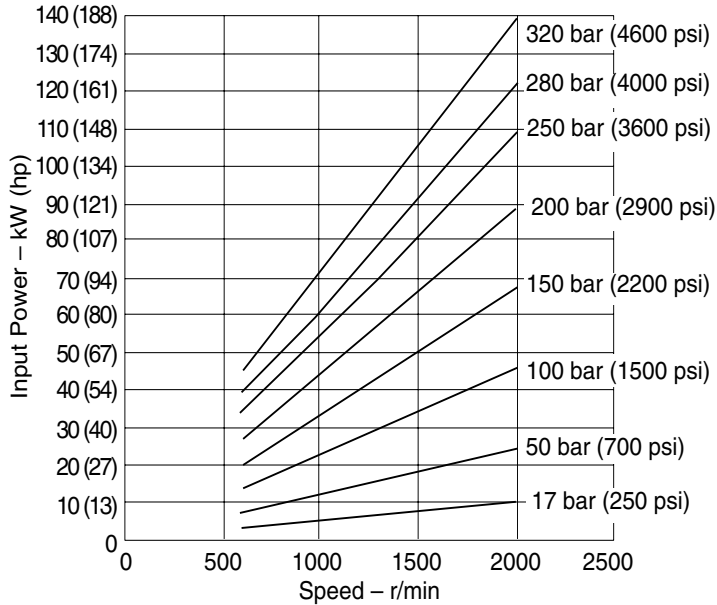


# Performance

## Mobile PVM131

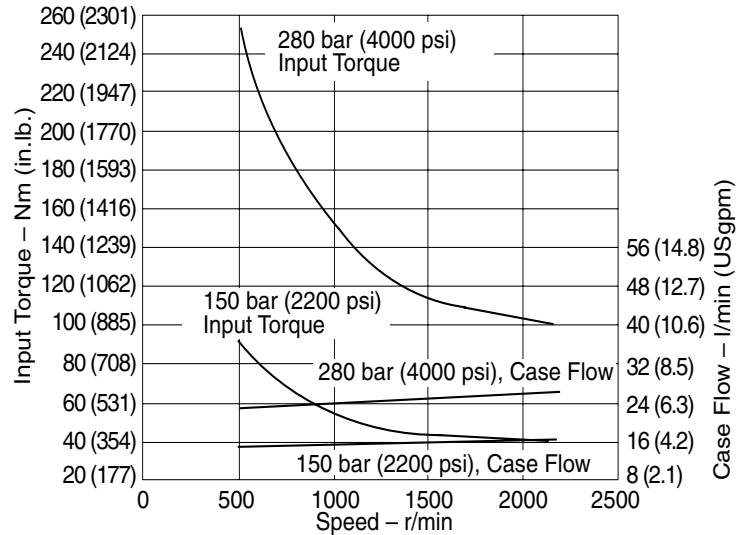
### Input Power Versus Speed

@ 93°C (200°F), full flow and  
1.0 bar absolute (0 psi gauge) inlet



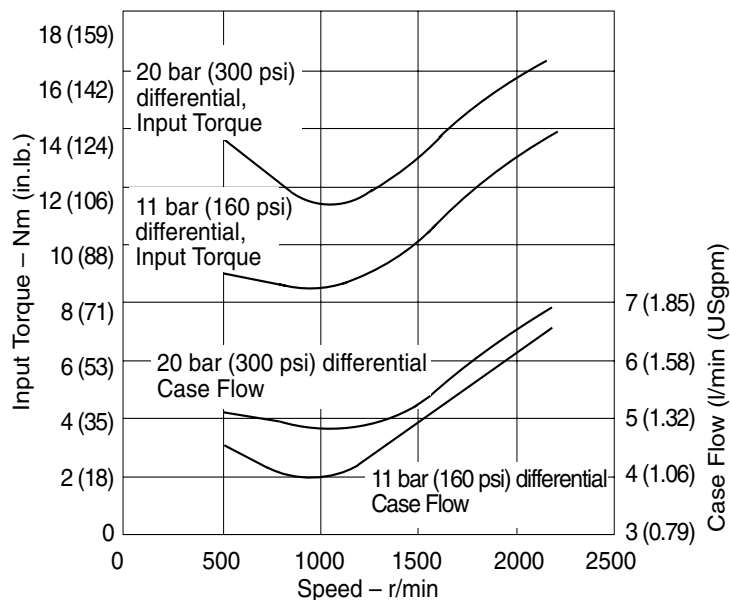
### Input Torque and Case Flow Versus Speed

@ 93°C (200°F), cut-off and  
1.0 bar absolute (0 psi gauge) inlet



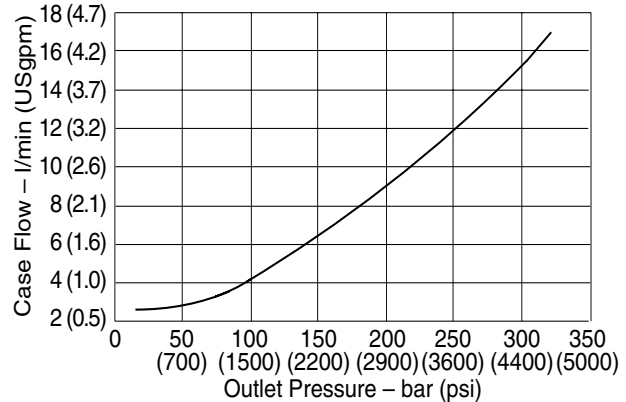
### Input Torque and Case Flow Versus Speed

@ 93°C (200°F), load sense standby  
and 1.0 bar absolute (0 psi gauge) inlet



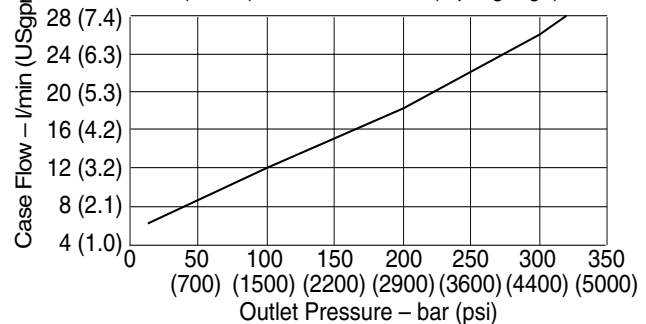
### Case Flow at 2000 r/min, Full Flow

93°C (200°F), 1.0 bar absolute (0 psi gauge) Inlet



### Case Flow at 2000 r/min, Minimum Flow

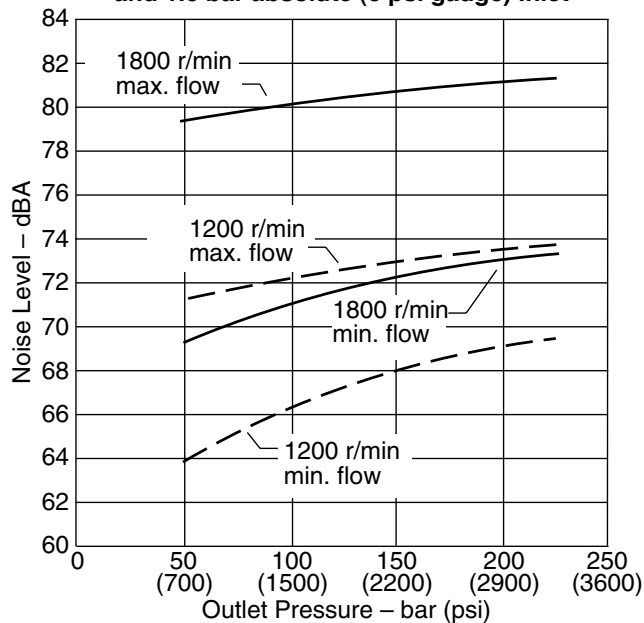
93°C (200°F), 1.0 bar absolute (0 psi gauge) Inlet



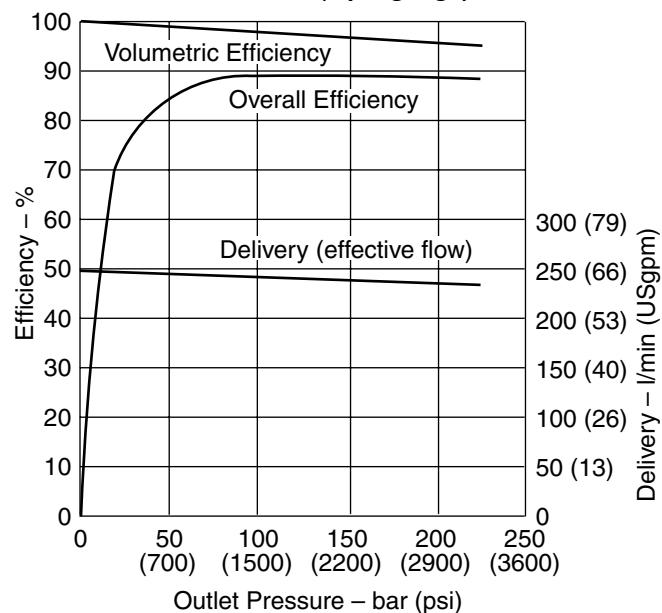
# Performance

## Industrial PVM141

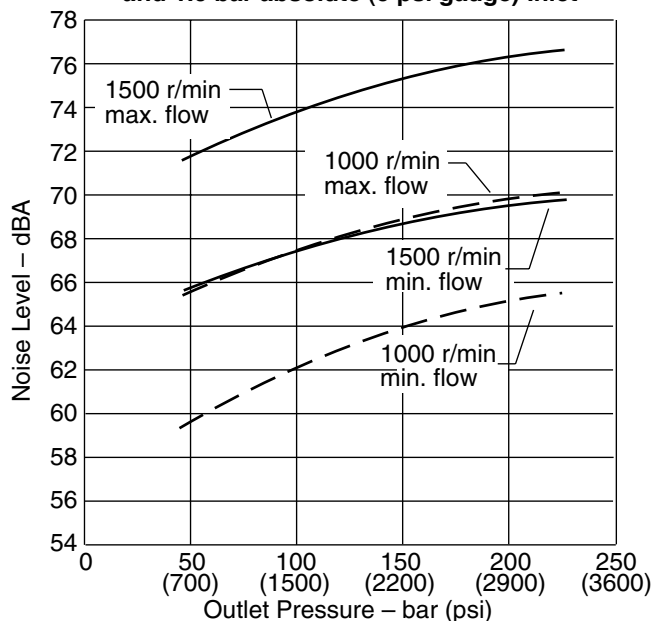
**Typical Noise Levels at 1800 and 1200 r/min  
with Petroleum Oil (10W) at 50°C (120°F)  
and 1.0 bar absolute (0 psi gauge) Inlet**



**Delivery and Efficiency at 1800 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**

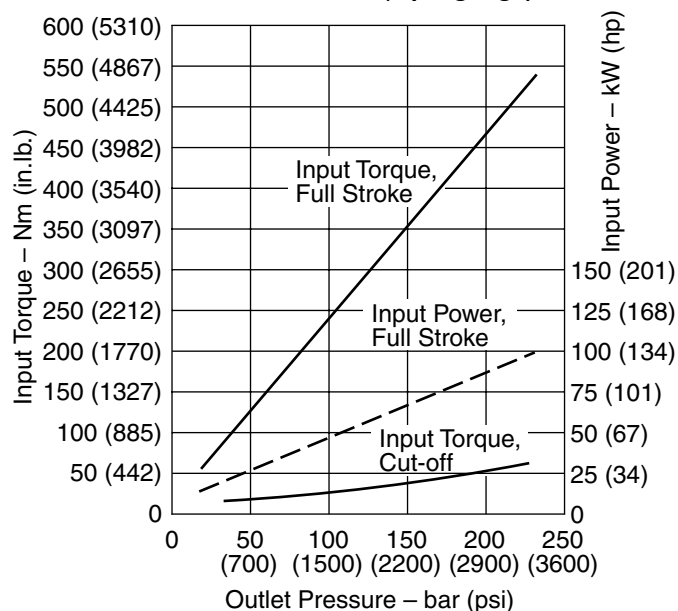


**Typical Noise Levels 1500 and 1000 r/min  
with Petroleum Oil (10W) at 50°C (120°F)  
and 1.0 bar absolute (0 psi gauge) Inlet**



Sound pressure data  
equivalent to NFPA.

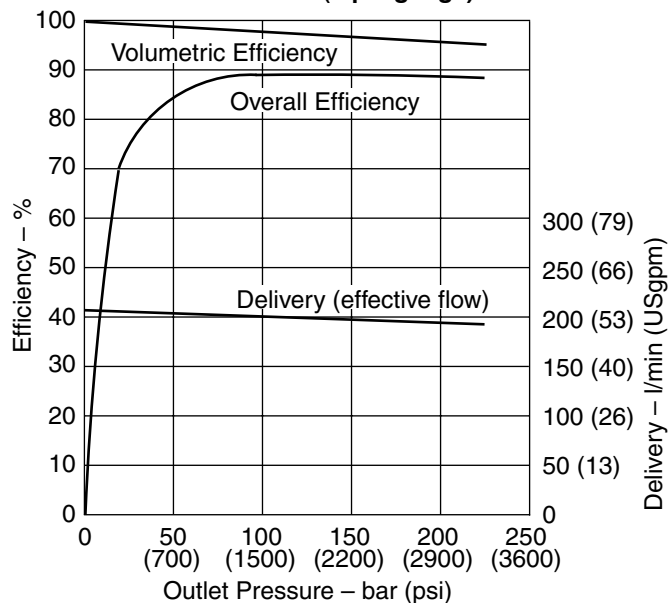
**Input Torque and Power at 1800 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**



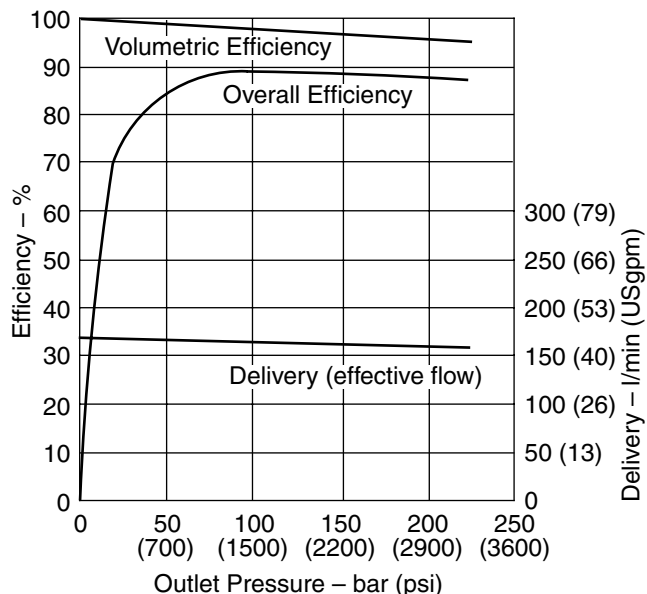
# Performance

## Industrial PVM141

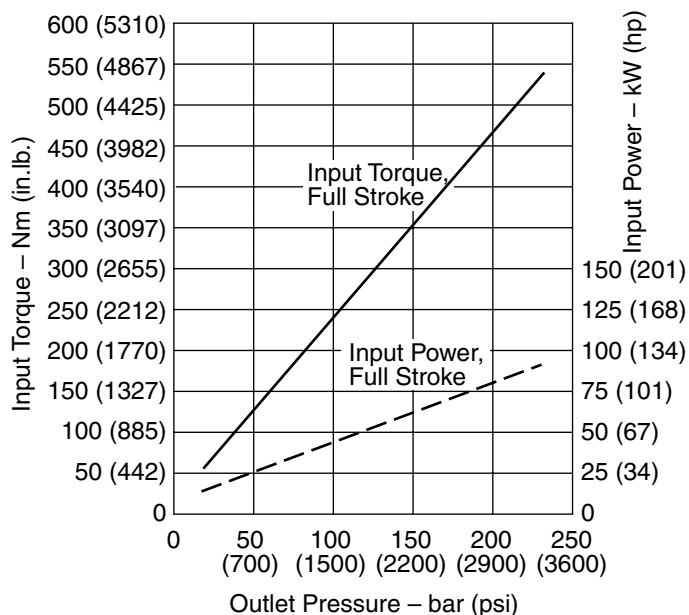
**Delivery and Efficiency at 1500 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**



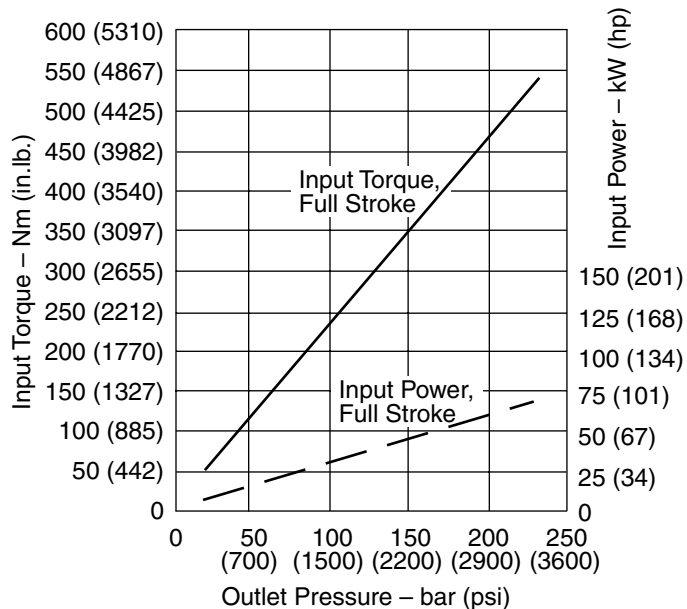
**Delivery and Efficiency at 1200 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**



**Input Torque and Power at 1500 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**



**Input Torque and Power at 1200 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**

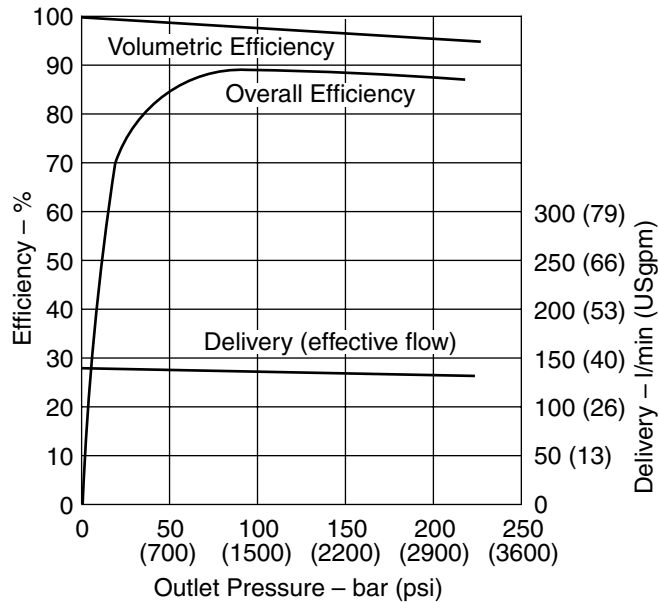




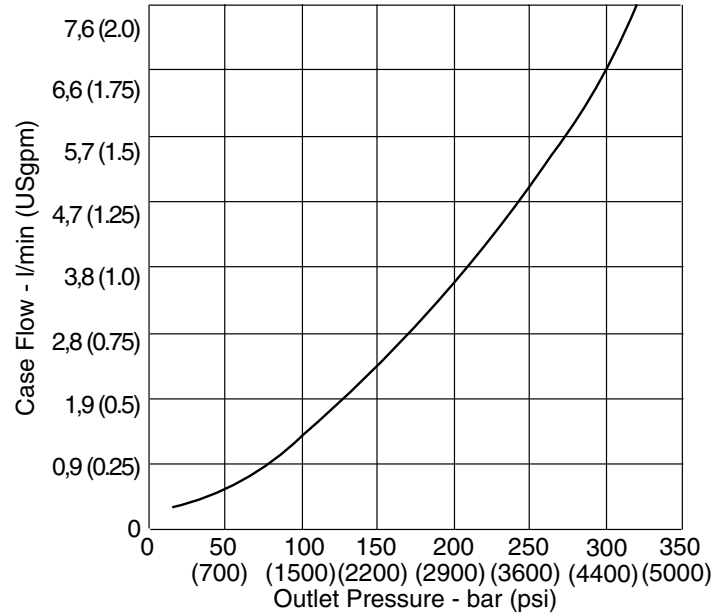
# Performance

## Industrial PVM141

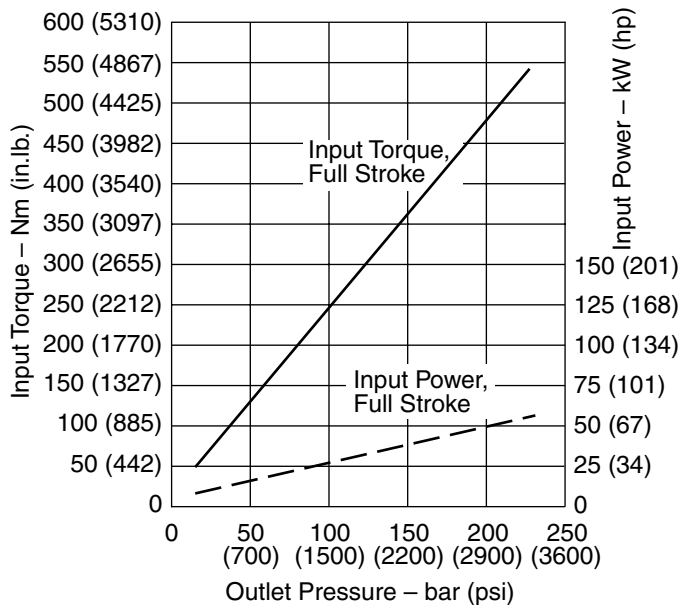
**Delivery and Efficiency at 1000 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**



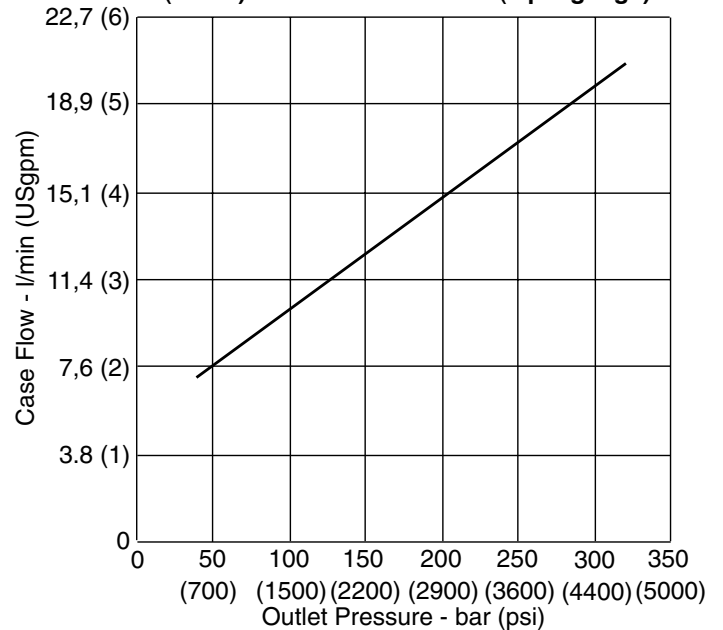
**Case Flow Versus Outlet Pressure at Full Flow, 1800 r/min  
50°C (120°F) and 1.0 bar absolute (0 psi gauge) Inlet**



**Input Torque and Power at 1000 r/min, 50°C (120°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**



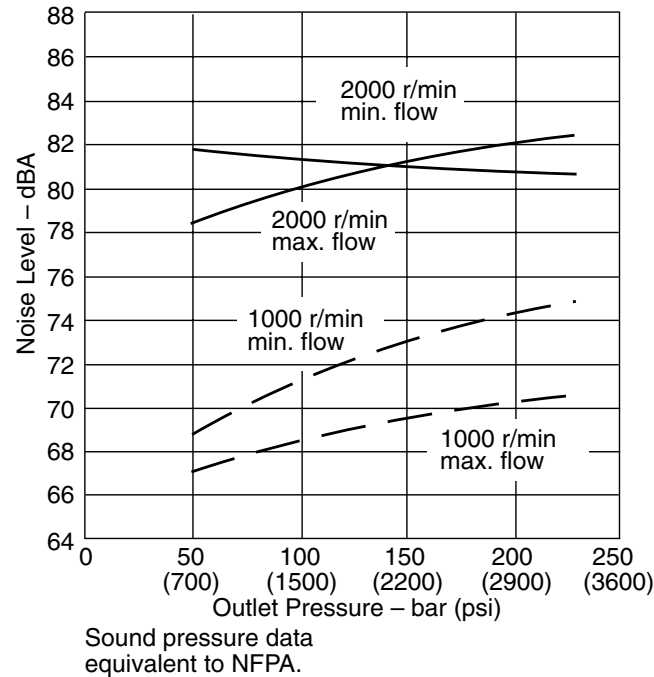
**Case Flow Versus Outlet Pressure at Cutoff, 1800 r/min  
50°C (120°F) and 1.0 bar absolute (0 psi gauge) Inlet**



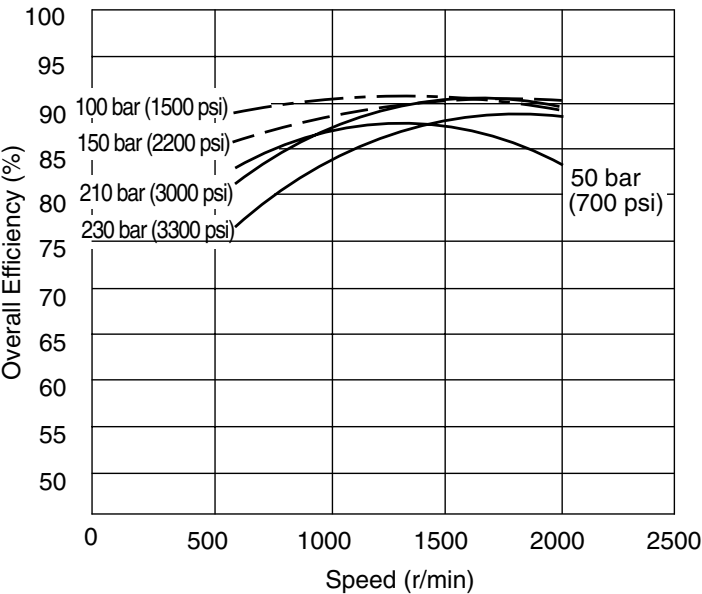
# Performance

Mobile  
PVM141

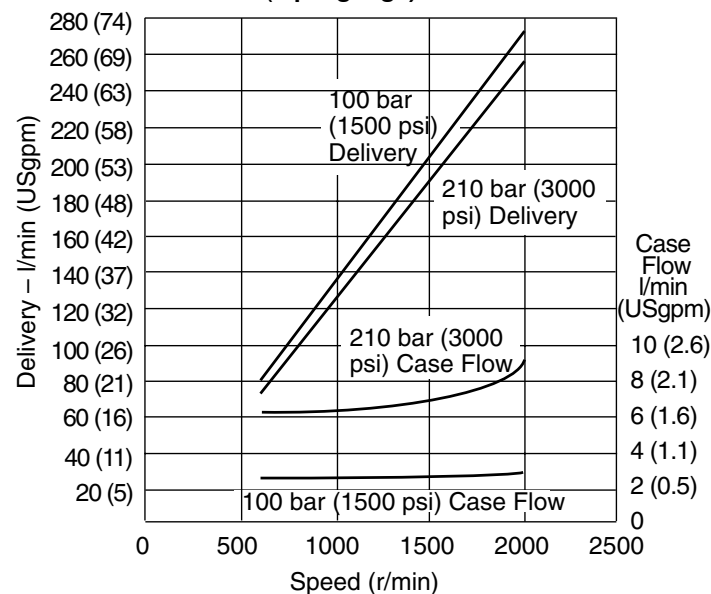
Typical Noise Levels at 2000 and 1000 r/min  
with Petroleum Oil (10W) at 93°C (200°F), and  
1.0 bar absolute (0 psi gauge) Inlet



Overall Efficiency versus Speed at 93°C (200°F),  
and 1.0 bar absolute (0 psi gauge) Inlet



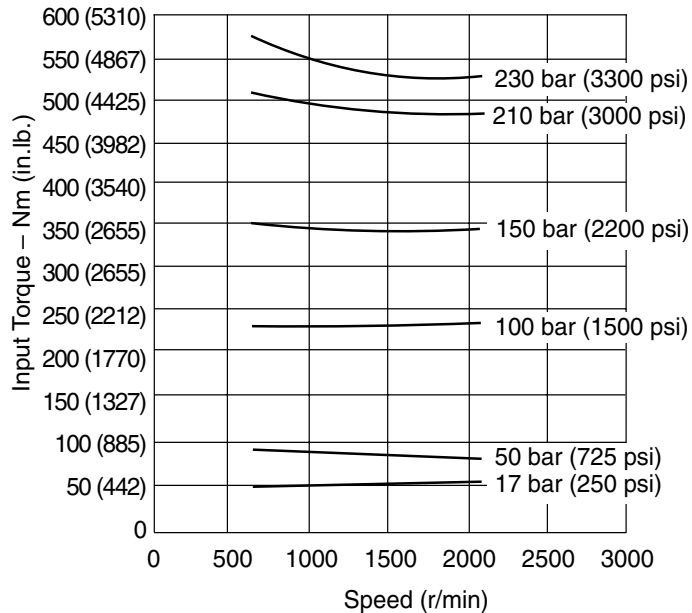
Delivery and Case Flow versus Speed at  
93°C (200°F), Full Flow and 1.0 bar absolute  
(0 psi gauge) Inlet



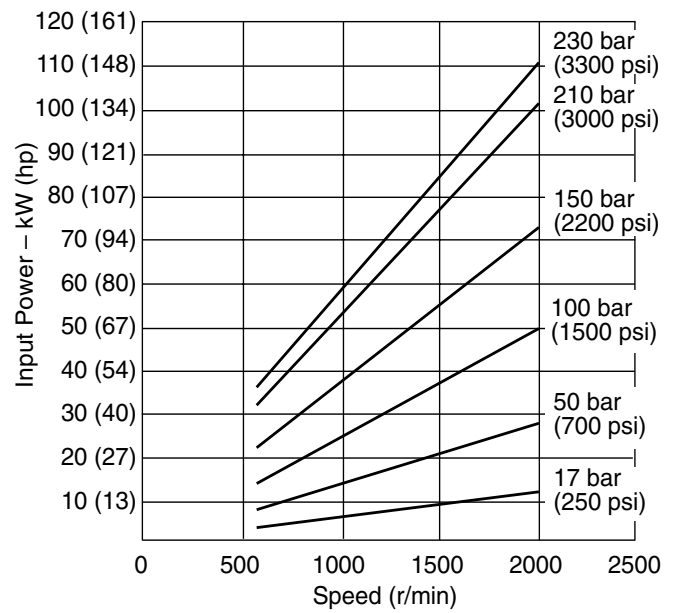
# Performance

## Mobile PVM141

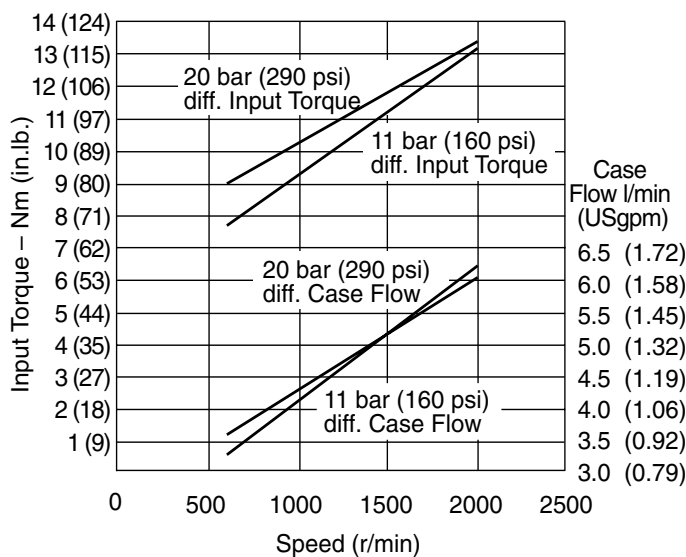
**Input Torque versus Speed at 93°C (200°F),  
Full Flow and 1.0 bar absolute (0 psi gauge) Inlet**



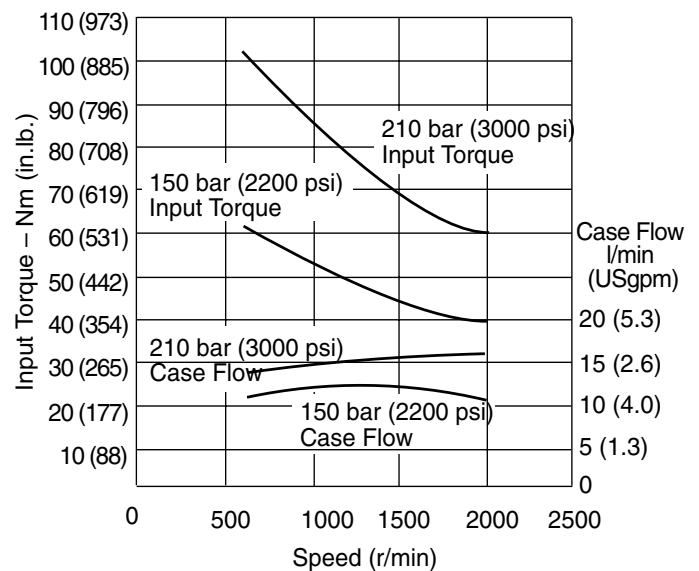
**Input Power versus Speed, 93°C (200°F),  
and 1.0 bar absolute (0 psi gauge) Inlet**



**Input Torque and Case Flow versus Speed at 93°C  
(200°F), Load Sense Standby and 1.0 bar absolute  
(0 psi gauge) Inlet**



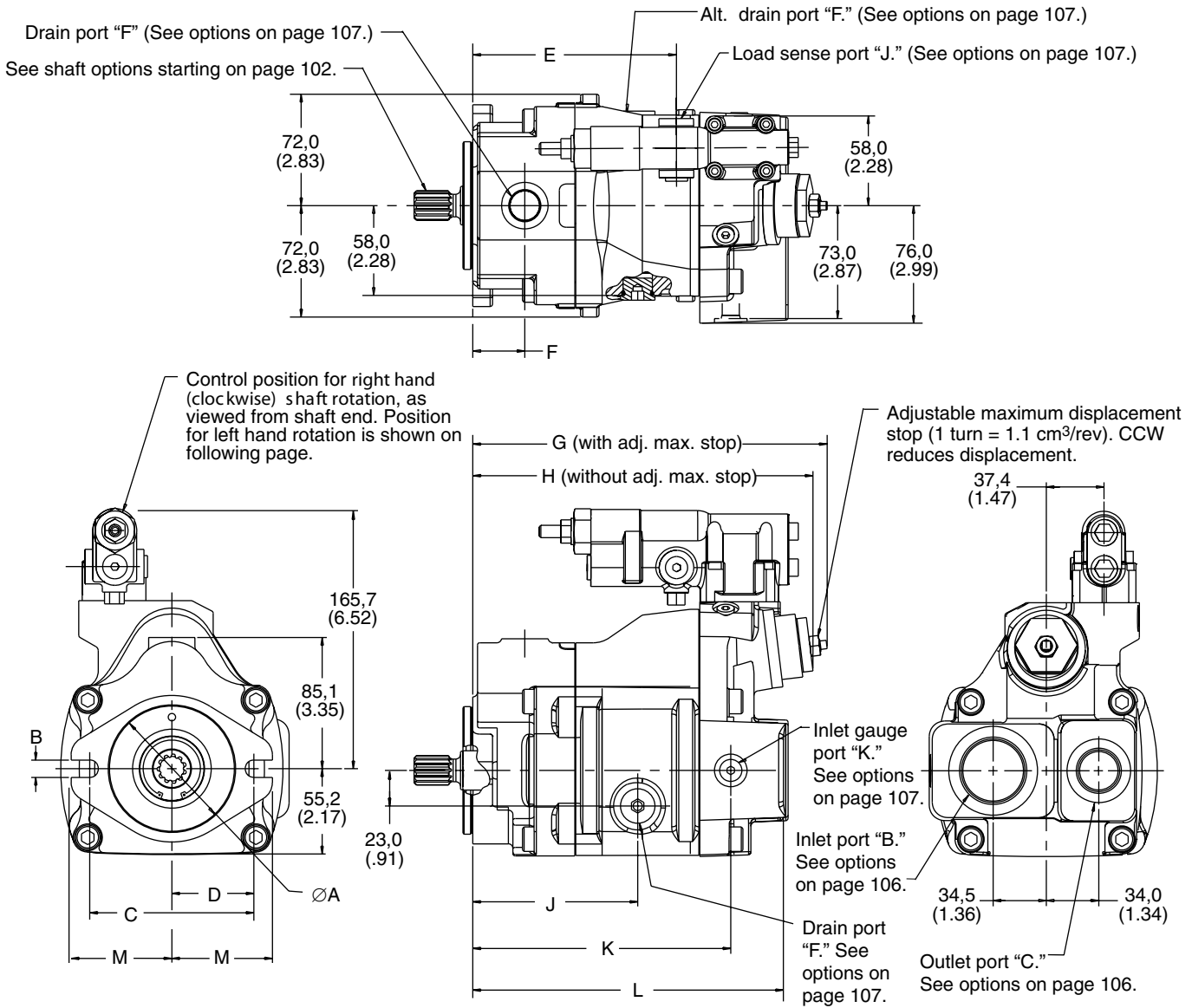
**Input Torque and Case Flow versus Speed  
at 93°C (200°F), Pressure Limit Cut-Off and  
1.0 bar absolute (0 psi gauge) Inlet**



# End-ported Models

## PVM018/020

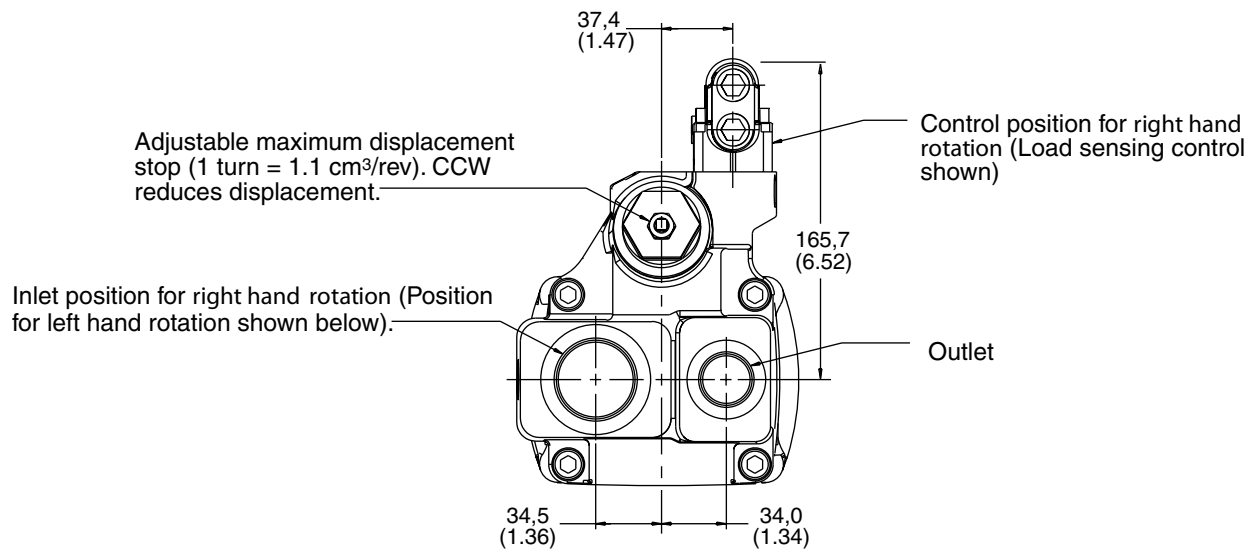
### Dimensions in millimeters (inches)



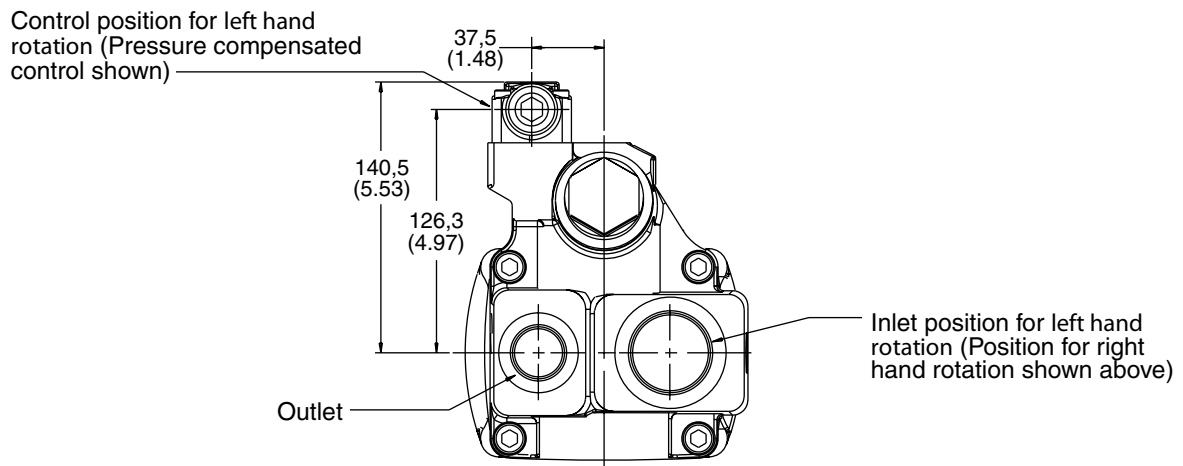
# End-ported Models

## PVM018/020

Dimensions in millimeters (inches)



**Inlet/Outlet Ports and Control  
Positioned for Right Hand Rotation**



**Inlet/Outlet Ports and Control  
Positioned for Left Hand Rotation**

# Side-ported Models

**PVM018/020**

## Dimensions in millimeters (inches)

Load sense port "J"

(See options on page 107)

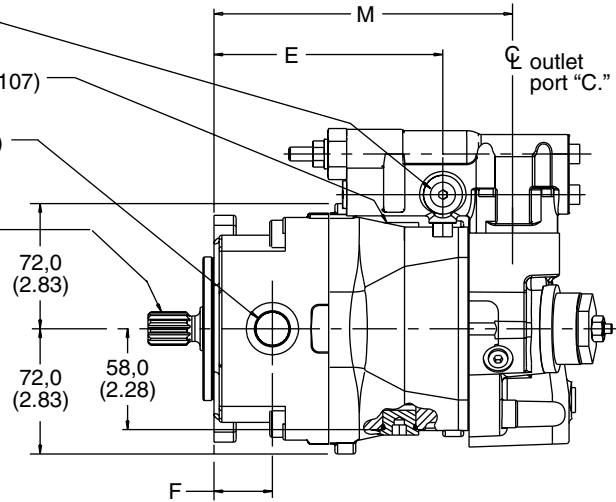
Alt. drain port "F"

(See options on page 107)

Drain port "F"

(See options on page 107)

See shaft options starting  
on page 102.



Outlet port "C."

See options on page 106.

To pilot  
mtg. flg.

Adjustable maximum displacement  
stop (1 turn = 1.1 cm<sup>3</sup>/rev). CCW  
reduces displacement.

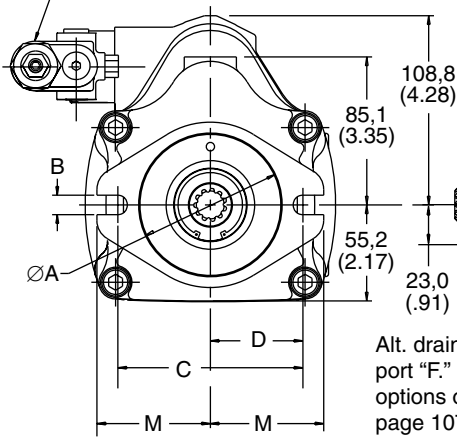
Outlet port "C" (above).

See options on page 106.

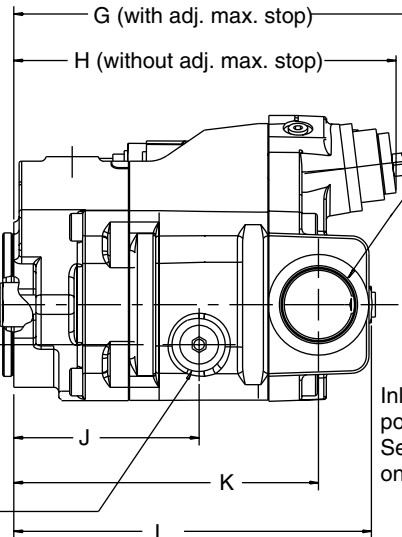
Inlet port "B."

See options on page 106.

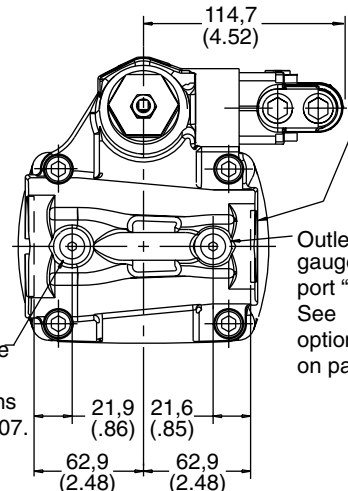
Control position for right hand  
(clockwise) shaft rotation , as viewed  
from shaft end. Position for left hand  
rotation is shown on following page.



Alt. drain  
port "F." See  
options on  
page 107.



Inlet gauge  
port "K." See  
options  
on page 107.

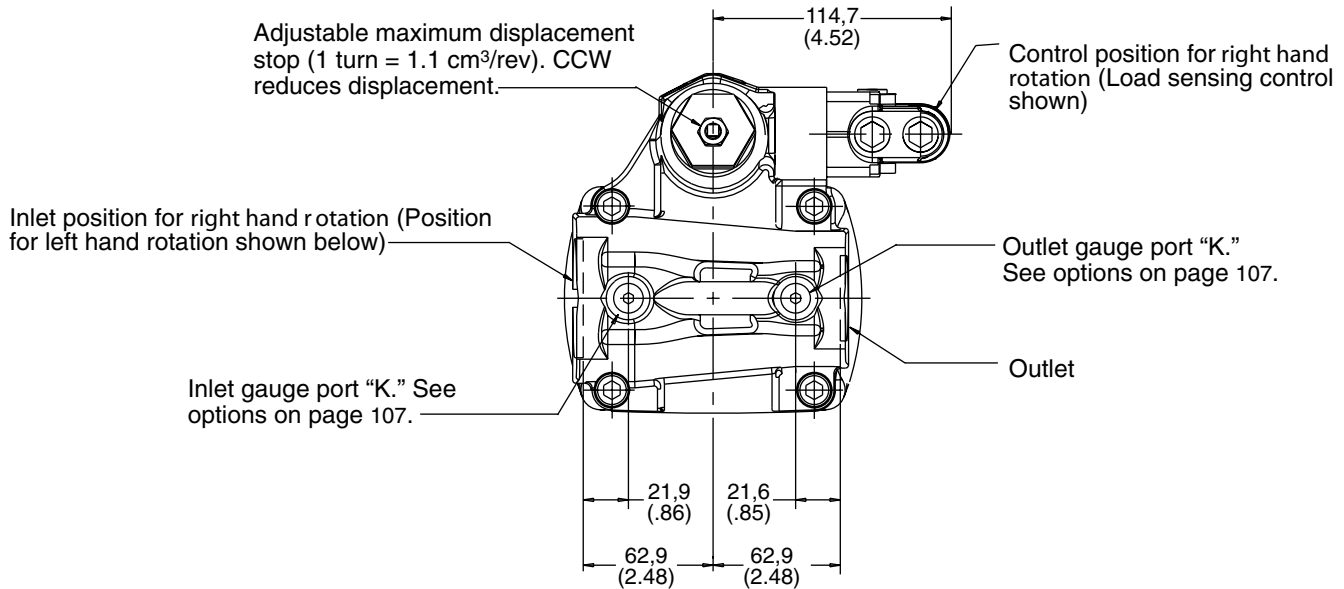


Outlet  
gauge  
port "K." See  
options  
on page 107.

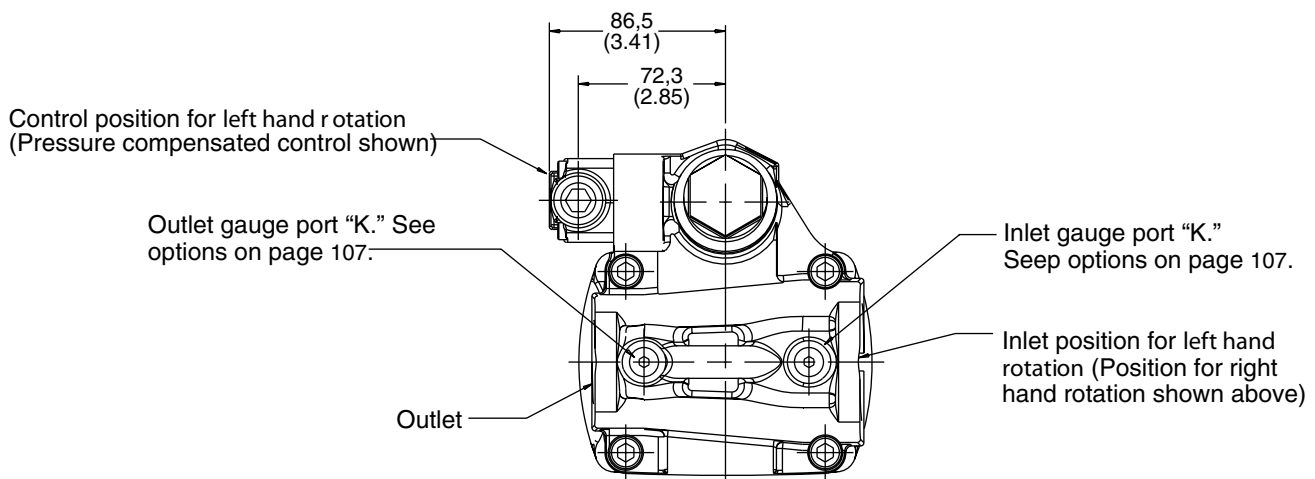
# Side-ported Models

## PVM018/020

### Dimensions in millimeters (inches)



**Inlet/Outlet Ports and Control  
Positioned for Right Hand Rotation**

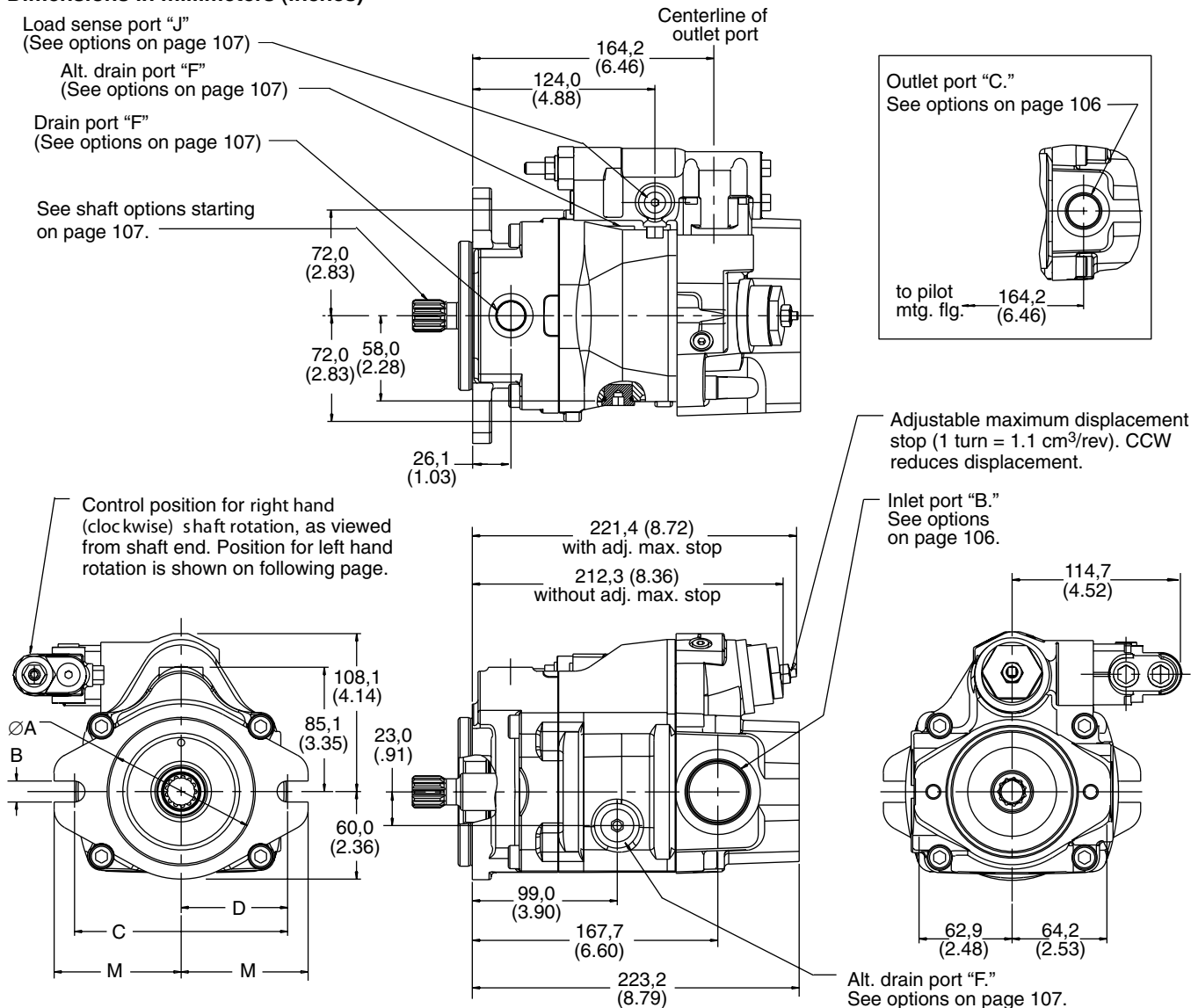


**Inlet/Outlet Ports and Control  
Positioned for Left Hand Rotation**

# Thru-drive Models

**PVM018/020**

## Dimensions in millimeters (inches)





# Thru-drive Models

**PVM018/020**

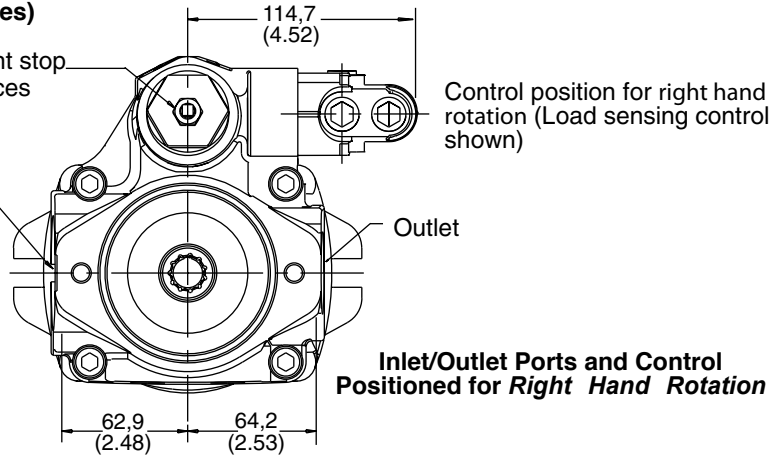
## Model Code Position 25

|   | Description                                                               |
|---|---------------------------------------------------------------------------|
| A | For SAE "A" pad with a 9T, 16/32 DP, 30° pressure angle, involute spline  |
| B | For SAE "A" pad with a 11T, 16/32 DP, 30° pressure angle, involute spline |
| G | For ISO 80 A2HW pad with a 9T SAE spline                                  |
| H | For ISO 80 A2HW pad with a 11T SAE spline                                 |

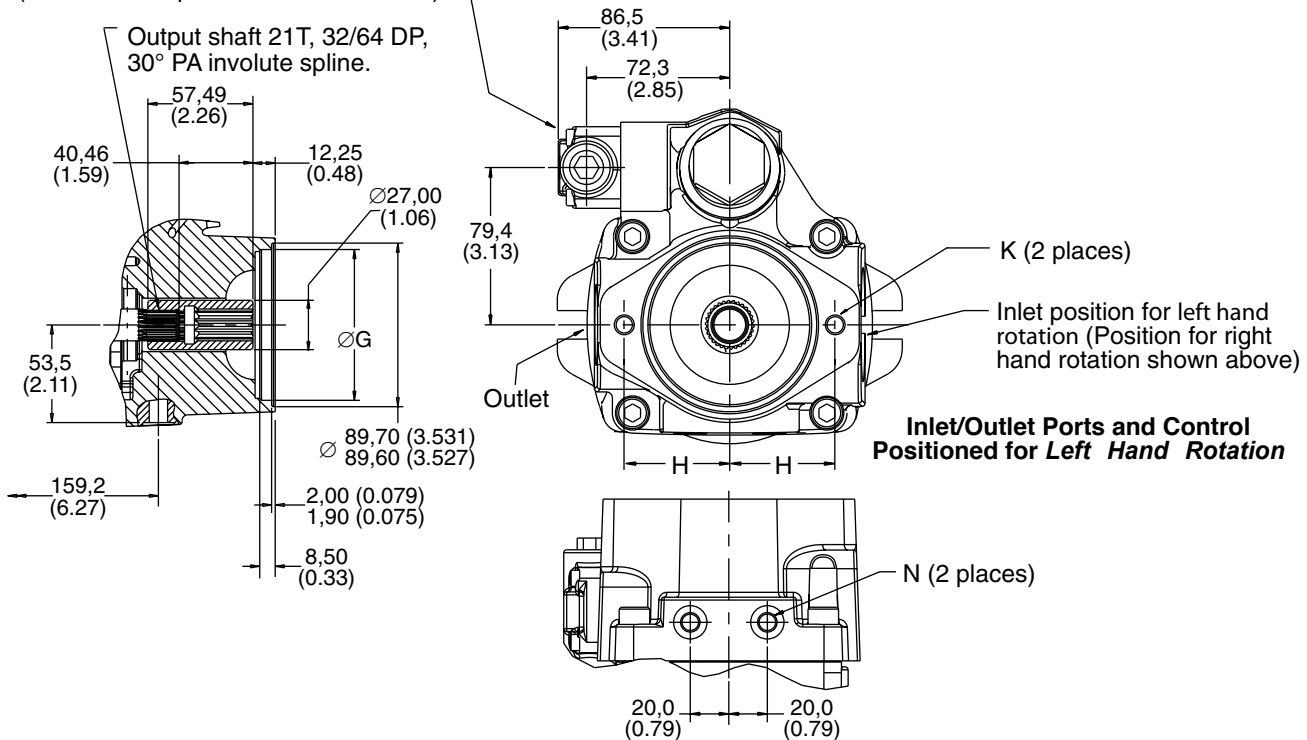
### Dimensions in millimeters (inches)

Adjustable maximum displacement stop  
(1 turn = 1.1 cm<sup>3</sup>/rev). CCW reduces  
displacement.

Inlet position for right hand  
rotation (Position for left hand  
rotation shown below)



Control position for left hand rotation  
(Pressure compensator control shown)



| Model Code Position 25 | ØG                               | H           | K                                   | N                                    |
|------------------------|----------------------------------|-------------|-------------------------------------|--------------------------------------|
| A,B                    | 82,625 (3.253)<br>82,575 (3.251) | 53,2 (2.09) | 375-16 UNC-2B thd.<br>0.75 deep min | 375-16 UNC-2B thd.<br>0.62 deep min. |
| G,H                    | 80,046 (3.151)<br>80,002 (3.150) | 54,5 (2.15) | M10 x 1,50 thd.<br>19,05 deep min   | M10 x 1,50 thd.<br>15,88 deep min.   |

# Flange Designations

## PVM018/020

### "A" Pilot Flange

| Designation                       | ØA              | B                          | C               | D              | E               | F              | G               | H               | J               | K               | L               | M              |
|-----------------------------------|-----------------|----------------------------|-----------------|----------------|-----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|
| SAE J744-82-2<br>Model Code A     | 82,55<br>(3.25) | 11,35/10,97<br>(.447/.432) | 106,4<br>(4.19) | 53,2<br>(2.09) | 131,5<br>(5.18) | 33,6<br>(1.32) | 228,9<br>(9.00) | 219,8<br>(8.65) | 106,5<br>(4.19) | 166,7<br>(6.56) | 200,7<br>(7.90) | 65,2<br>(2.57) |
| ISO 3019/2-80A2HW<br>Model Code B | 80,00<br>(3.15) | 11,27/11,00<br>(.444/.433) | 109,0<br>(4.29) | 54,5<br>(2.15) |                 |                |                 |                 |                 |                 |                 |                |

### "B" Pilot Flange

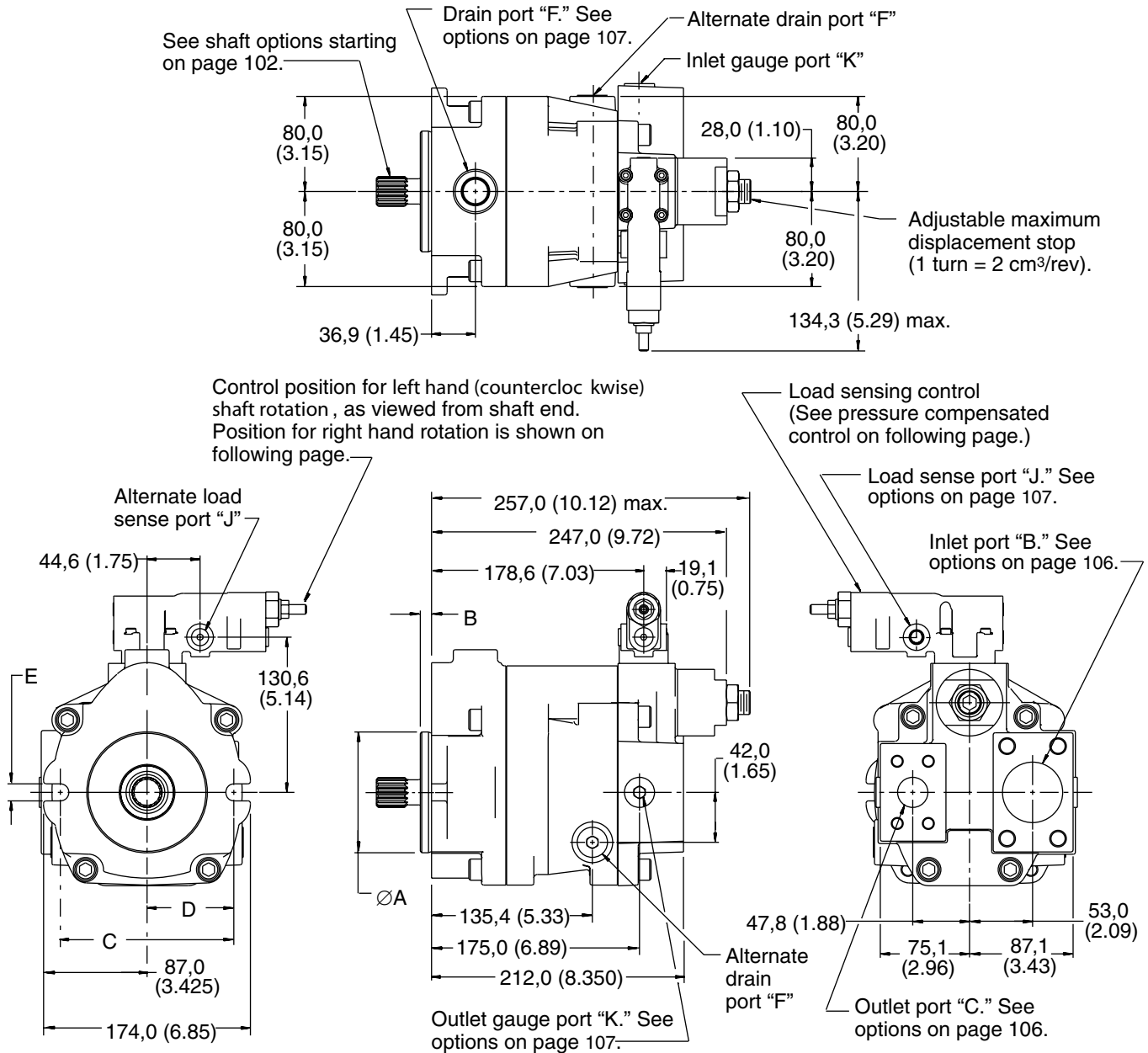
| Designation                        | ØA                | B                          | C                | D               | E               | F              | G               | H               | J              | K               | L               | M              |
|------------------------------------|-------------------|----------------------------|------------------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|
| SAE J744-101-2<br>Model Code C     | 101,60<br>(4.00)  | 14,55/14,17<br>(.572/.557) | 146,0<br>(5.750) | 73,0<br>(2.875) | 124,0<br>(4.88) | 26,1<br>(1.03) | 221,4<br>(8.72) | 212,3<br>(8.36) | 99,0<br>(3.90) | 159,2<br>(6.27) | 193,9<br>(7.63) | 87,0<br>(3.43) |
| ISO 3019/2-100A2HW<br>Model Code D | 100,00<br>(3.937) | 14,27/14,00<br>(.562/.551) | 140,0<br>(5.512) | 70,0<br>(2.756) |                 |                |                 |                 |                |                 |                 |                |

| Pilot Flange Designation         | ØA            | B                       | C            | D           |
|----------------------------------|---------------|-------------------------|--------------|-------------|
| SAE J744-127-2 Model Code C      | 101,60 (4.00) | 14,55/14,17 (.572/.558) | 146,0 (5.75) | 73,0 (2.87) |
| ISO 3019/2-100 A2HW Model Code D | 100,00 (3.94) | 14,27/14,00 (.562/.551) | 140,0 (5.51) | 70,0 (2.76) |

# End-ported Models

## PVM045/050

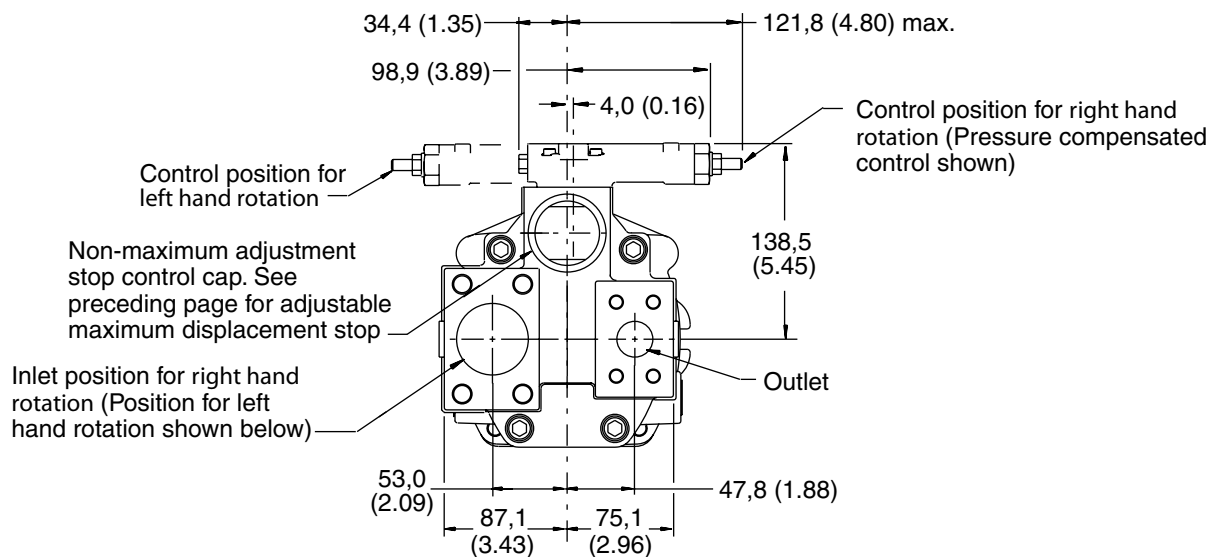
### Dimensions in millimeters (inches)



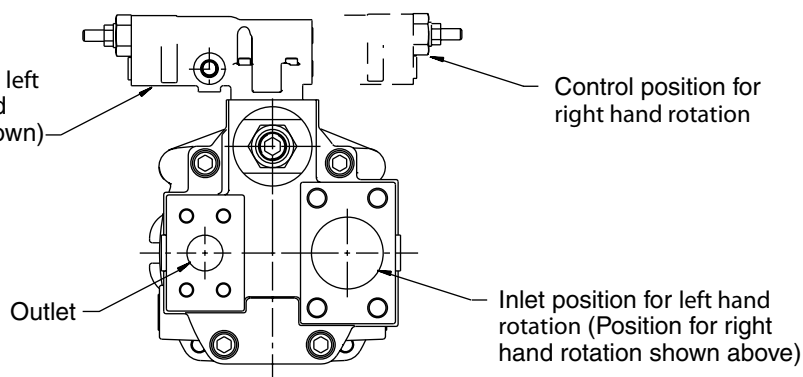
# End-ported Models

## PVM045/050

Dimensions in millimeters (inches)



**Inlet/Outlet Ports and Control Positioned  
for Right Hand Rotation**

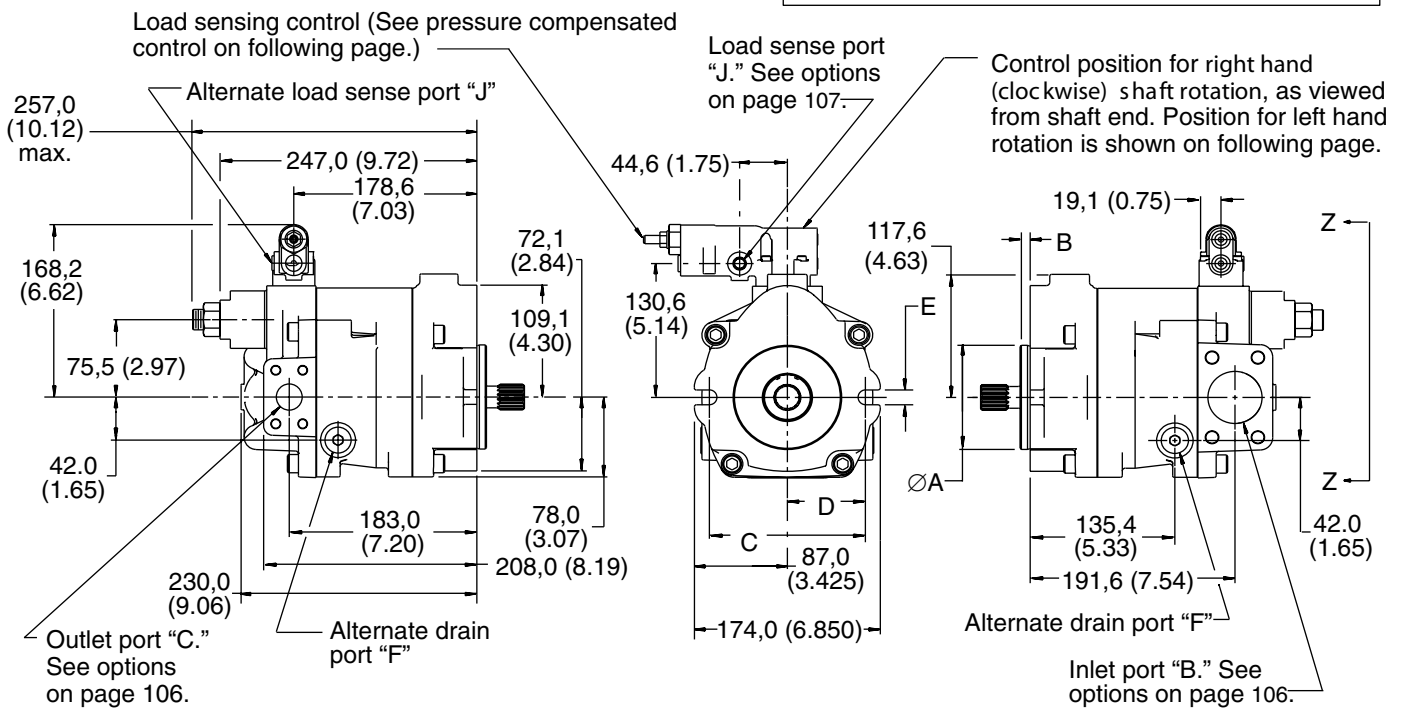
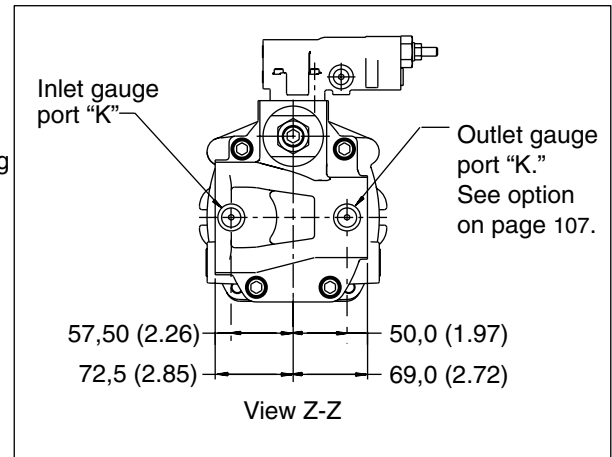
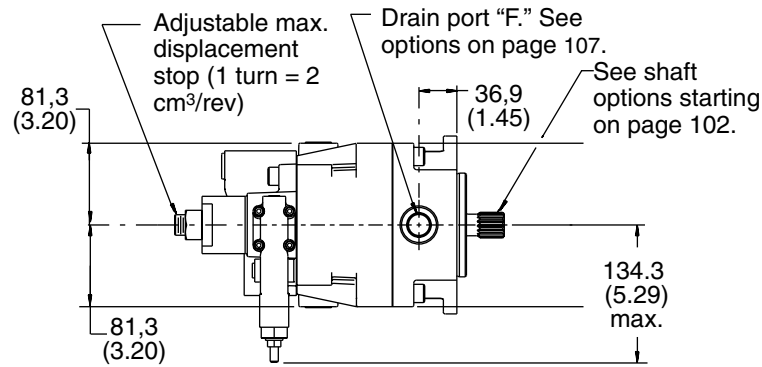


**Inlet/Outlet Ports and Control Positioned  
for Left Hand Rotation**  
Dimensions shown on preceding page.

# Side-ported Models

## PVM045/050

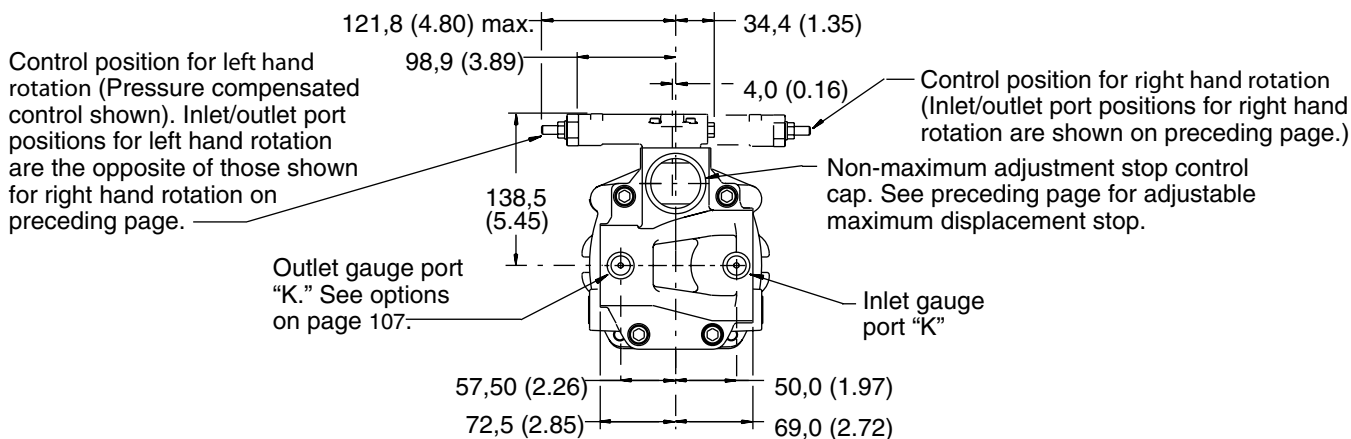
### Dimensions in millimeters (inches)



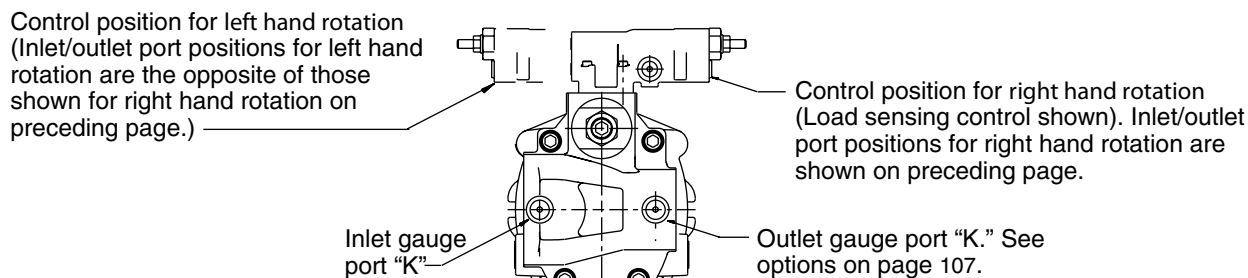
# Side-ported Models

## PVM045/050

### Dimensions in millimeters (inches)



**Inlet/Outlet Ports and Control Positioned  
for Left Hand Rotation**

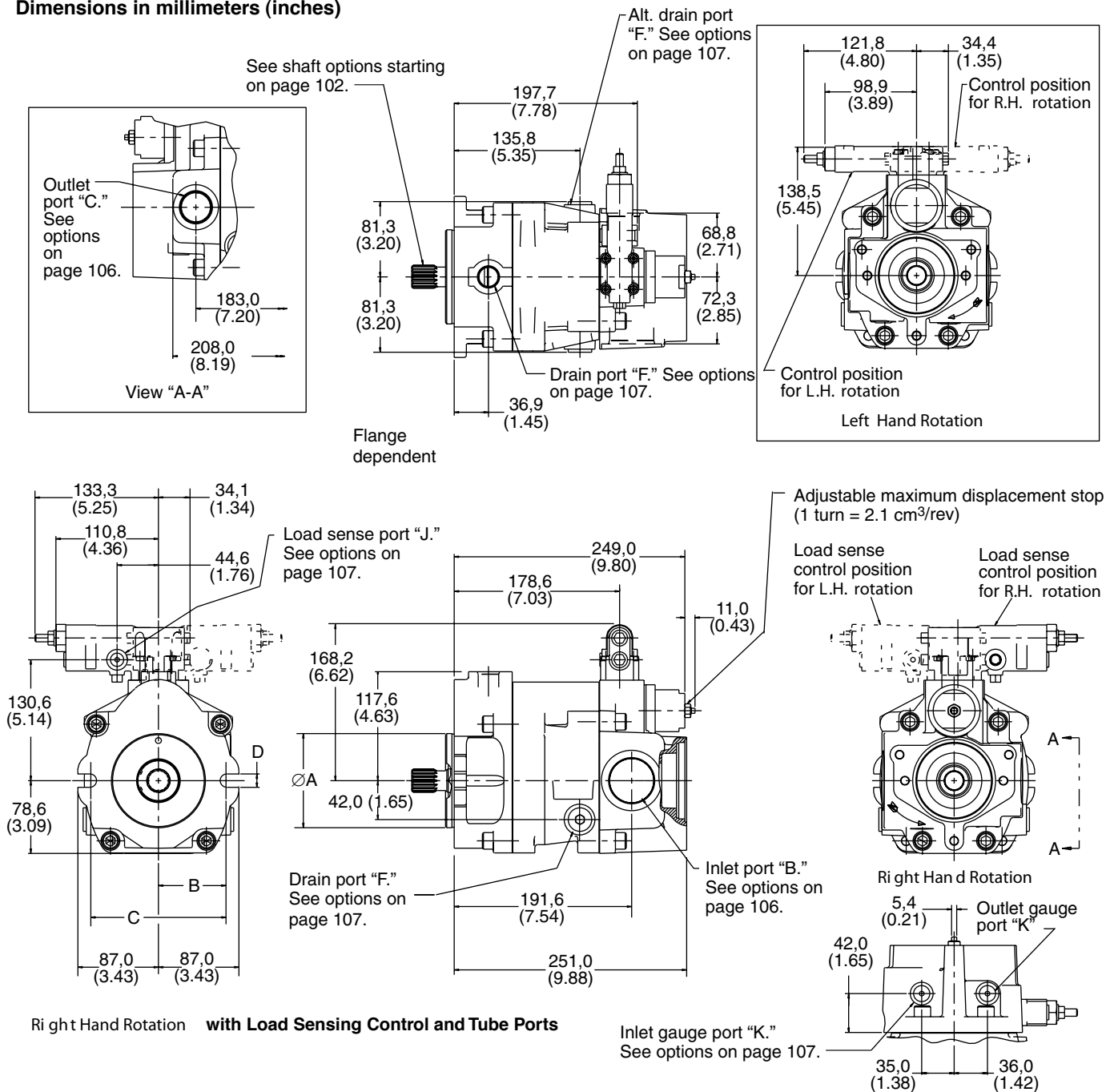


**Inlet/Outlet Ports and Control Positioned  
for Right Hand Rotation**  
Dimensions shown on preceding page.

# Thru-drive Models

**PVM045/050**

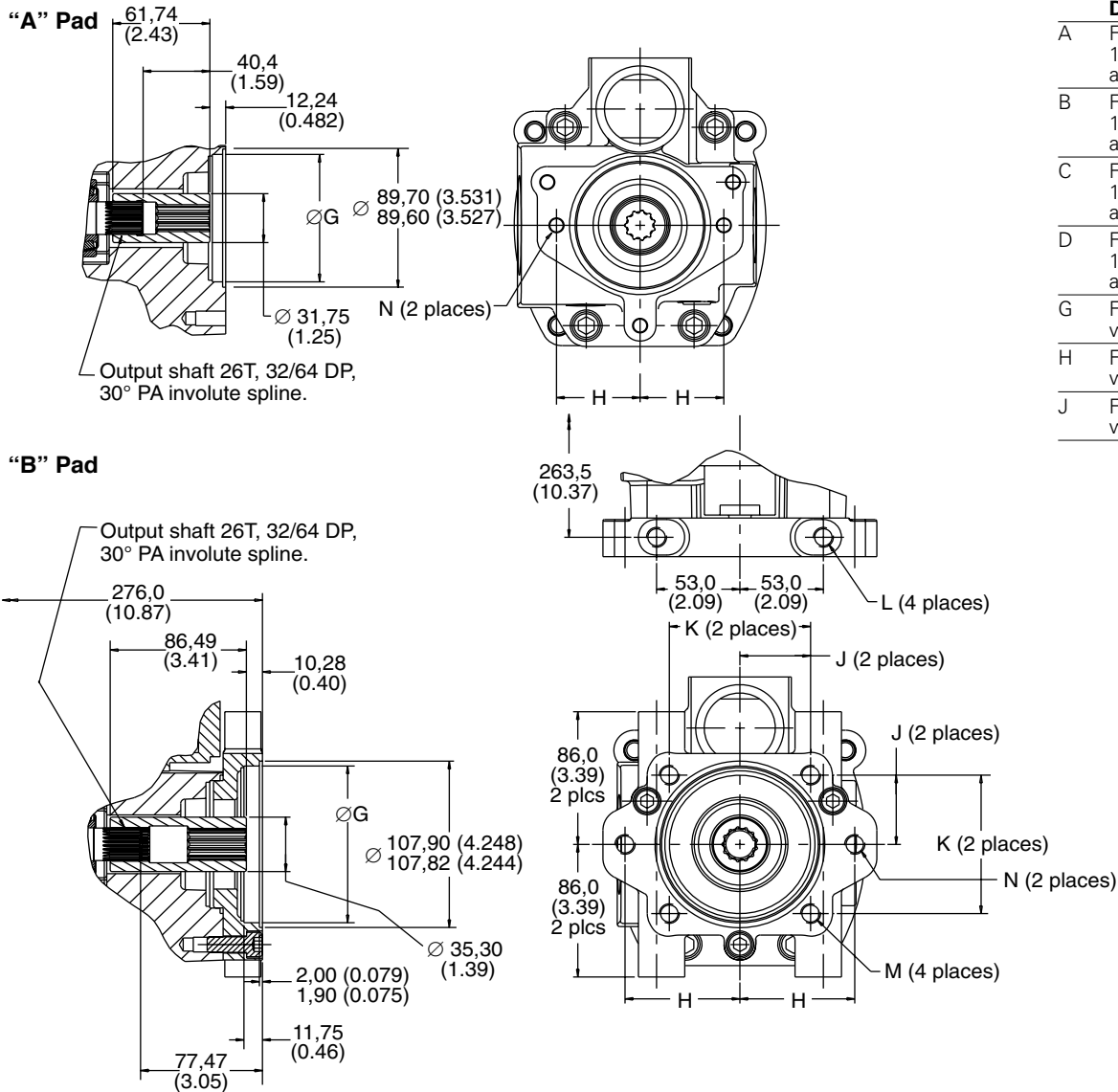
## Dimensions in millimeters (inches)



# Thru-drive Models

## PVM045/050

### Dimensions in millimeters (inches)



### Model Code Position 25

|   | Description                                                               |
|---|---------------------------------------------------------------------------|
| A | For SAE "A" pad with a 9T, 16/32 DP, 30° pressure angle, involute spline  |
| B | For SAE "A" pad with a 11T, 16/32 DP, 30° pressure angle, involute spline |
| C | For SAE "B" pad with a 13T, 16/32 DP, 30° pressure angle, involute spline |
| D | For SAE "B" pad with a 15T, 16/32 DP, 30° pressure angle, involute spline |
| G | For ISO 80-A2HW pad with a 9T SAE spline                                  |
| H | For ISO 80-A2HW pad with a 11T SAE spline                                 |
| J | For ISO 100-A2/B4HW pad with a 13T SAE spline                             |

| Model Code Position 25 | ØG                              | H              | J              | K               | L                                                                       | M                                                   | N                                                   |
|------------------------|---------------------------------|----------------|----------------|-----------------|-------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|
| A,B                    | 82,58 (3.251)<br>82,52 (3.249)  | 53.2<br>(2.09) | —              | —               | —                                                                       | —                                                   | .375-16 UNC-2B<br>thd. 0.60 deep min.               |
| G,H                    | 80,046 (3.15)<br>80,002 (3.149) | 54,5<br>(2.15) | —              | —               | —                                                                       | —                                                   | M10 thd. x 1,50<br>15,0 deep min.                   |
| C,D                    | 101,65 (4.002)<br>101,60 (4.00) | 73,0<br>(2.87) | 44,9<br>(1.77) | 89,8<br>(3.54)  | .500-13 UNC-2B thd.<br>24,9 deep min. M12 x<br>1,50 thd. 24,9 deep min. | .500-13 UNC-2B<br>thd. thru M10 x<br>1,50 thd. thru | .500-13 UNC-2B<br>thd. thru<br>M12 x 1,50 thd. thru |
| J,K                    | 100,0 (3.937)<br>99,946 (3.935) | 70,0<br>(2.76) | 44,2<br>(1.74) | 88,38<br>(3.48) | M12 thd. x 1,50 thd.<br>24,9 deep min.                                  | M10 x 1,50 thd.<br>thru                             | M12 x 1,50 thd.<br>thru                             |



# Flange Designations

## PVM045/050

| Pilot Flange Designation | ØA                             | B                        | C             | D            | E                          |
|--------------------------|--------------------------------|--------------------------|---------------|--------------|----------------------------|
| SAE J744-101-2           | 101,60/101,55<br>(4.000/3.998) | 9,70/9,19<br>(.382/.362) | 146,0 (5.750) | 73,0 (2.875) | 14,55/14,17<br>(.572/.557) |
| ISO 3019/2-100A2HW       | 100,00/99,95<br>(3.937/3.935)  | 9,50/9,00<br>(.374/.354) | 140,0 (5.512) | 70,0 (2.756) | 14,27/14,00<br>(.562/.551) |

| Pilot Flange Designation | ØA                          | B           | C             | D                       |
|--------------------------|-----------------------------|-------------|---------------|-------------------------|
| SAE 2-bolt mount         | 101,60/101,55 (4.000/3.998) | 73,0 (2.87) | 146,0 (5.750) | 14,55/14,17 (.572/.557) |
| ISO 100 2-bolt mount     | 100,00/99,95 (3.937/3.935)  | 70,0 (2.76) | 140,0 (5.512) | 14,27/14,00 (.562/.551) |

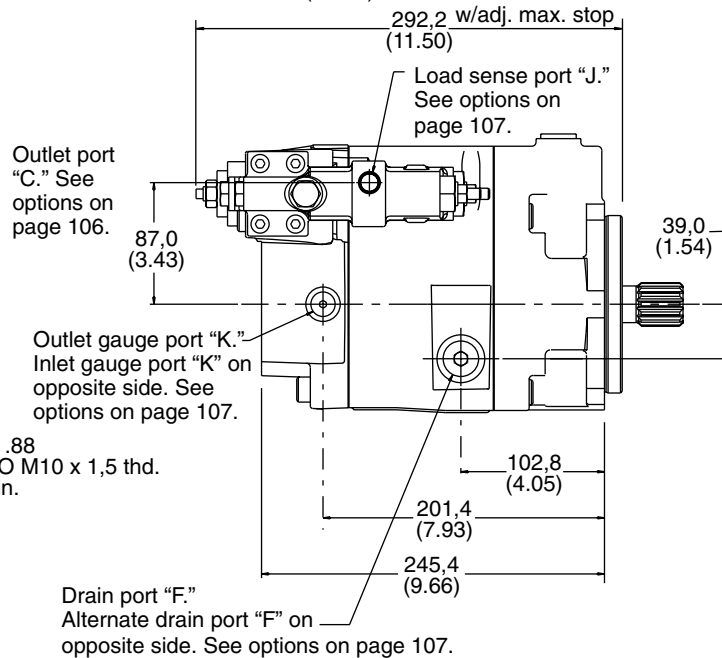
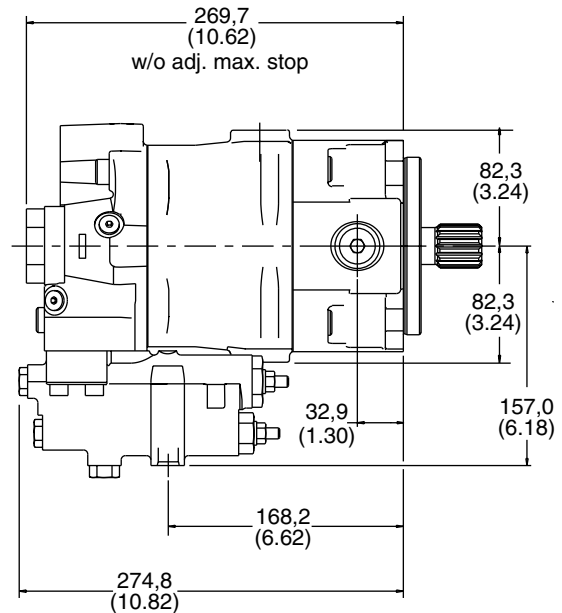
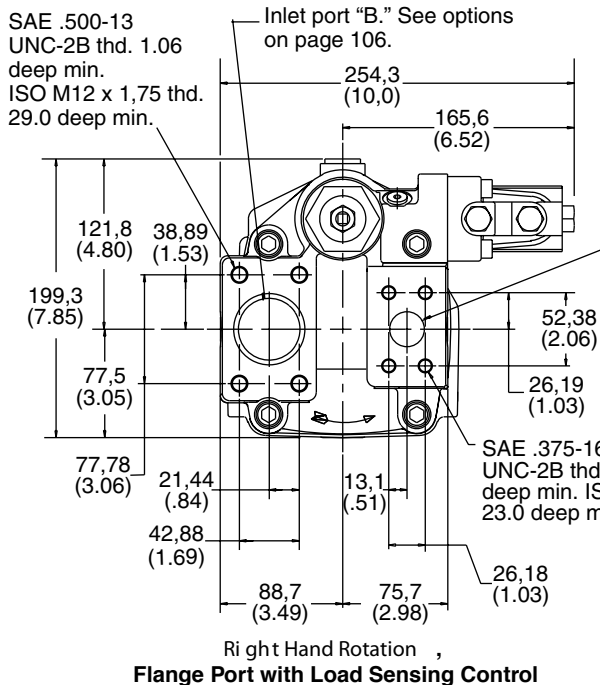
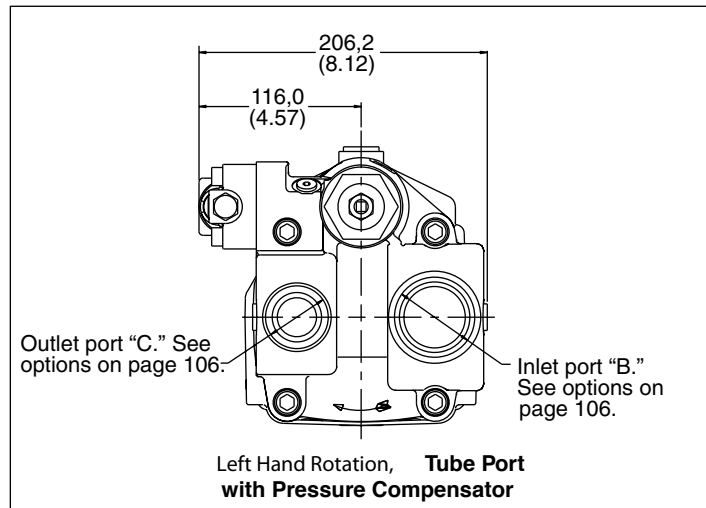
# End-ported Models

## PVM057/063

Dimensions in millimeters (inches)

See mounting flange options on page 101.

See shaft options starting on page 102.



**PVM057/063**

Technical drawing of a pressure compensator. The drawing shows a top-down view of the device with two main dimensions indicated: a total width of 198,1 (7.80) and a distance of 116,0 (4.57) from the left edge to the centerline. The device has four circular ports: two on the left and two on the right. The leftmost port is labeled 'Outlet gauge port "K." See options on page 107.' and the rightmost port is labeled 'Inlet gauge port "K." See options on page 107.' A dashed vertical line indicates the centerline. At the bottom, there is a curved arrow pointing to the right, indicating the direction of flow or rotation.

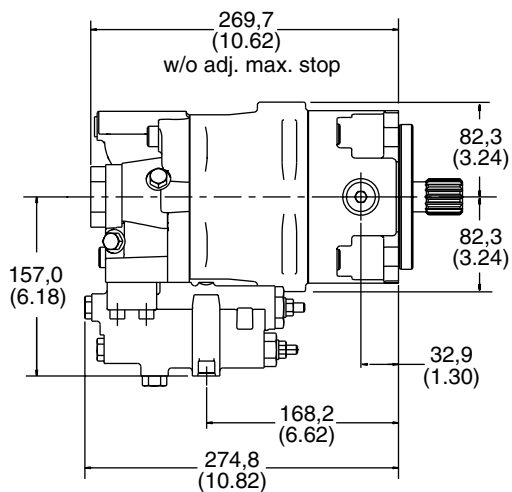
198,1  
(7.80)

116,0  
(4.57)

Outlet gauge port  
"K." See options  
on page 107.

Inlet gauge port "K."  
See options  
on page 107.

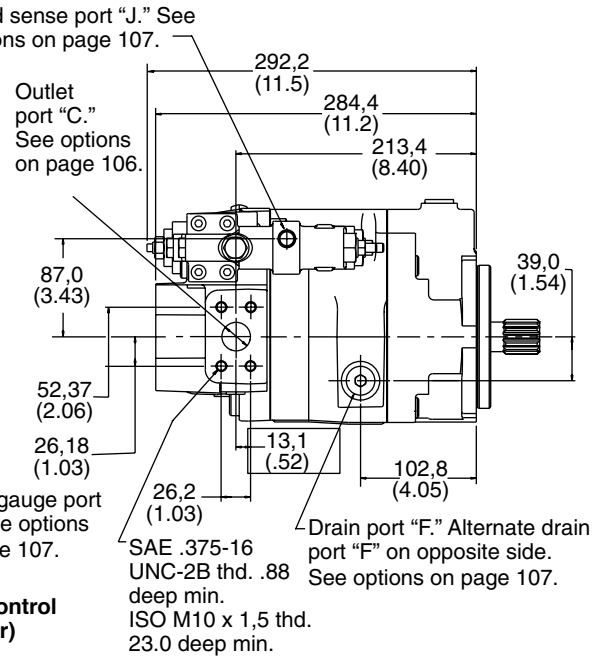
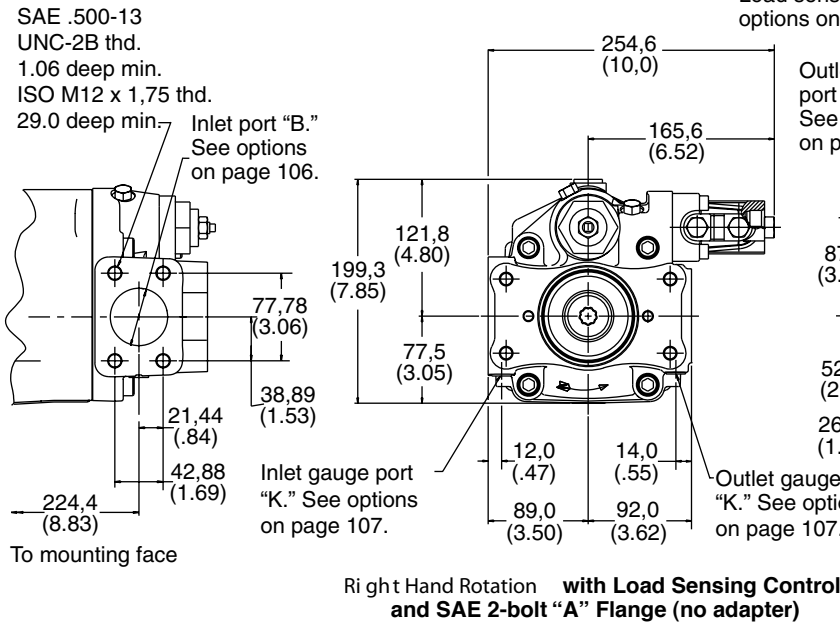
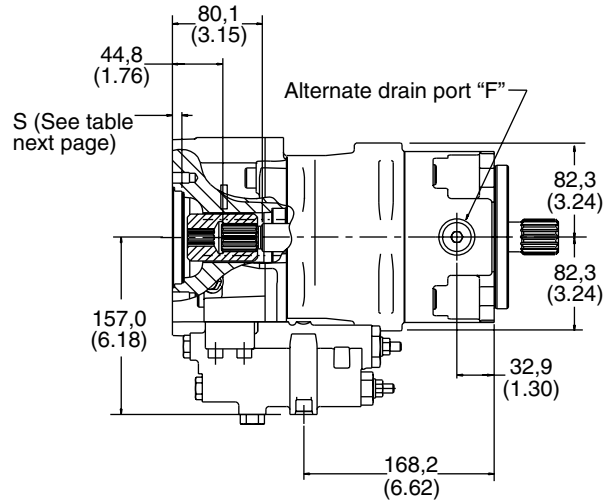
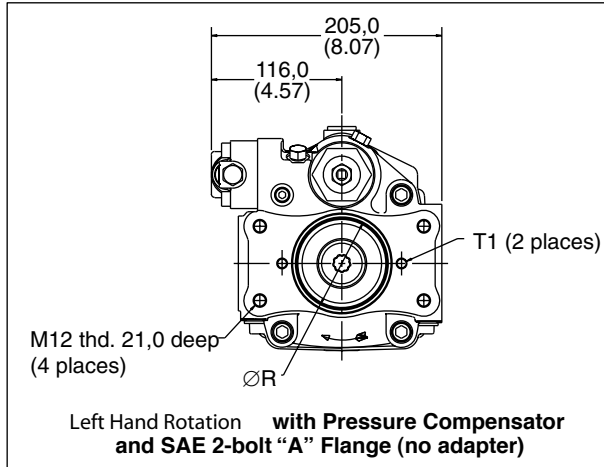
Left Hand Rotation **with**  
**Pressure Compensator**



# Thru-drive Models

## PVM057/063

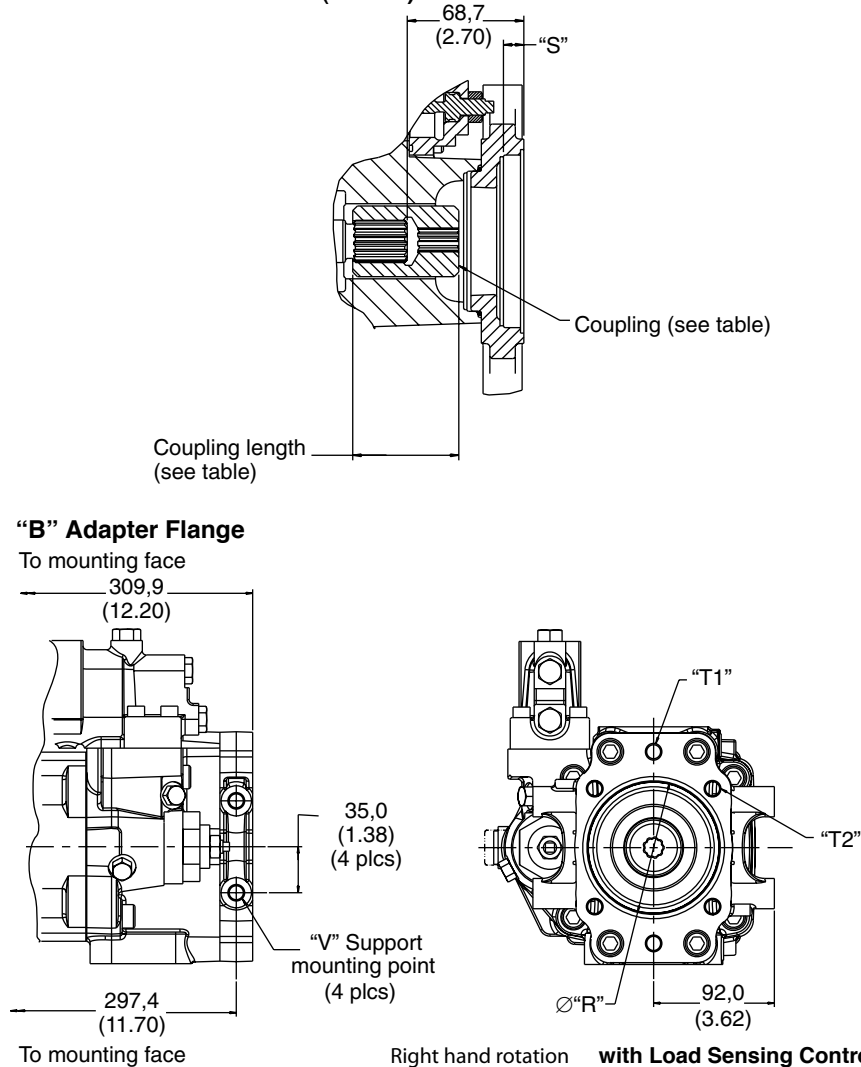
Dimensions in millimeters (inches)  
See pilot flange options on page 101.  
See shaft options starting on page 102.



# Thru-drive Models

## PVM057/063

### Dimensions in millimeters (inches)



Right hand rotation **with Load Sensing Control and  
SAE 2-4-bolt "B" adapter flange**

| Coupling Length |             | Code |
|-----------------|-------------|------|
| SAE "A," 9T     | 62,5 (2.46) | A,G  |
| SAE "B," 13T    | 93,0 (3.66) | C,J  |
| SAE "B-B," 15T  | 93,0 (3.66) | D,K  |
| SAE "C," 14T    | 93,0 (3.66) | E,L  |

### Model Code Position 25 Description

|   |                                                               |
|---|---------------------------------------------------------------|
| A | SAE "A," 9T, 16/32 DP, 30° pressure angle, involute spline    |
| C | SAE "B," 13T, 16/32 DP, 30° pressure angle, involute spline   |
| D | SAE "B-B," 15T, 16/32 DP, 30° pressure angle, involute spline |
| E | SAE "C," 14T, 12/24 DP, 30° pressure angle, involute spline   |
| G | For ISO 80-A2HW pad with a 9T SAE spline                      |
| J | For ISO 100-A2/B4HW pad with a 13T SAE spline                 |
| K | For ISO 100-A2/B4HW pad with a 15T SAE spline                 |
| L | For ISO 125-A2/B4HW pad with a 14T SAE spline                 |

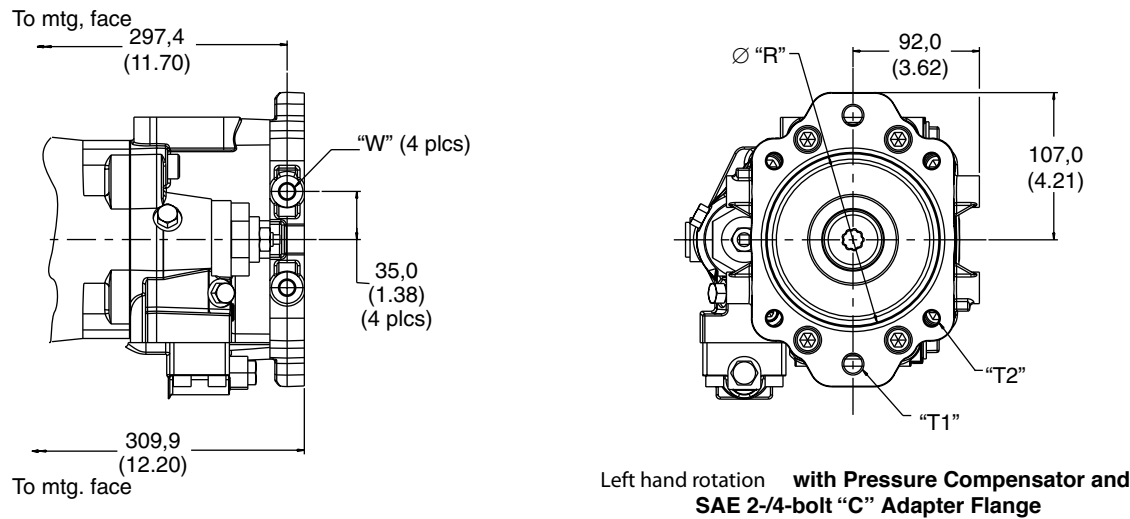
| Model Code Position 25 |      | Pilot Dia.           |                     | Pilot Depth         | 2-bolt             | 4-bolt                       | Support Mounting Points |
|------------------------|------|----------------------|---------------------|---------------------|--------------------|------------------------------|-------------------------|
| Flange                 | Bolt | "R"                  | "S"                 | "T1"                | "T2"               | "V"                          |                         |
| A,B SAE "A" 2-bolt     | SAE  | Ø82,65 (3.25±.001)   | 8,6/8,1 (.32/.34)   | .375-16 UNC-2B thd. | N/A                | N/A                          | N/A                     |
| G,H ISO 80             | ISO  | Ø80,05 (3.15)        | 9,0/8,0 (.35/.31)   | M10 thd.            | N/A                | N/A                          | N/A                     |
| C,D SAE "B" 2-4-bolt   | SAE  | Ø101,65 (4.002±.001) | 12,5/11,5 (.49/.45) | .50-13 UNC-2B thd.  | .50-13 UNC-2B thd. | .50-13 UNC-2B thd. .98" deep |                         |
| J,K ISO 100            | ISO  | Ø100,05 (3.94)       | 12,5/11,5 (.49/.45) | M12 thd.            | M12 thd.           | M12 thd. x 25,0 deep         |                         |

# Thru-drive Models

PVM057/063

## Dimensions in millimeters (inches)

### “C” Adapter Flange



| Model Code Position 25 |      | Pilot Dia.           | Pilot Depth         | 2-bolt              | 4-bolt             | Support Mounting Points      |
|------------------------|------|----------------------|---------------------|---------------------|--------------------|------------------------------|
| Flange                 | Bolt | “R”                  | “S”                 | “T1”                | “T2”               | “V”                          |
| E,F SAE “C” 2-/4-bolt  | SAE  | Ø127,05 (5.002±.001) | 15,5/14,5 (.61/.57) | .625-11 UNC-2B thd. | .50-13 UNC-2B thd. | .50-13 UNC-2B thd. .98” deep |
| L,M ISO 125            | ISO  | Ø125,05 (4.92)       | 15,5/14,5 (.61/.57) | M16 thd.            | M12 thd.           | M12 thd. x 25,0 deep         |

# Side-ported Models

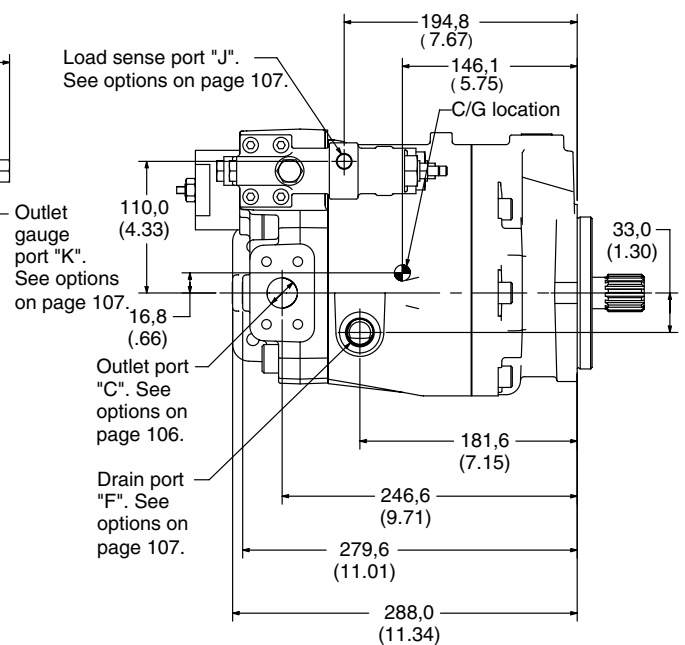
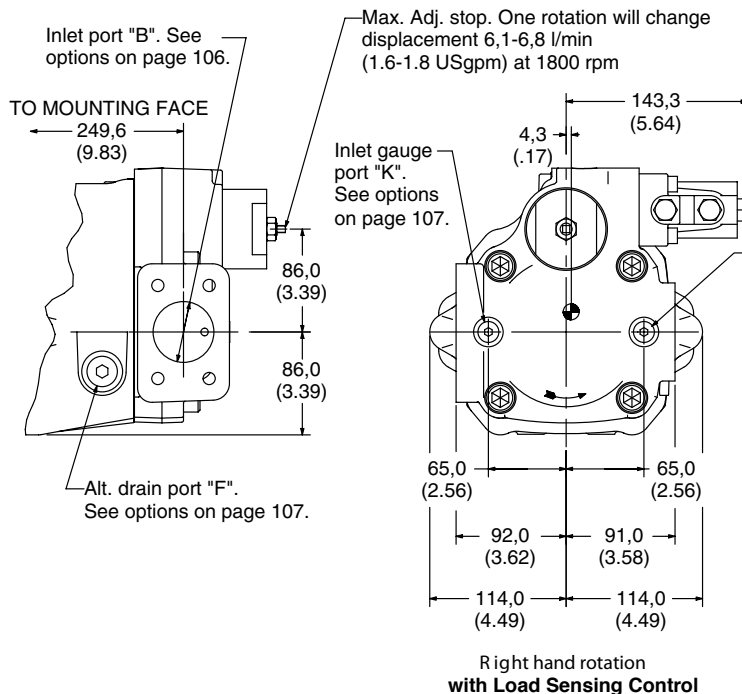
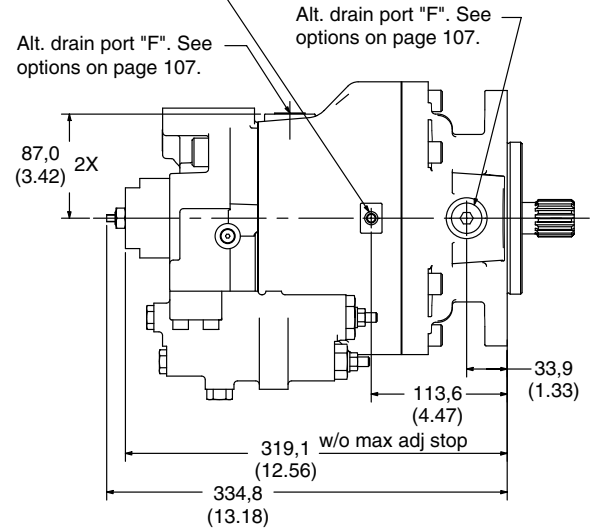
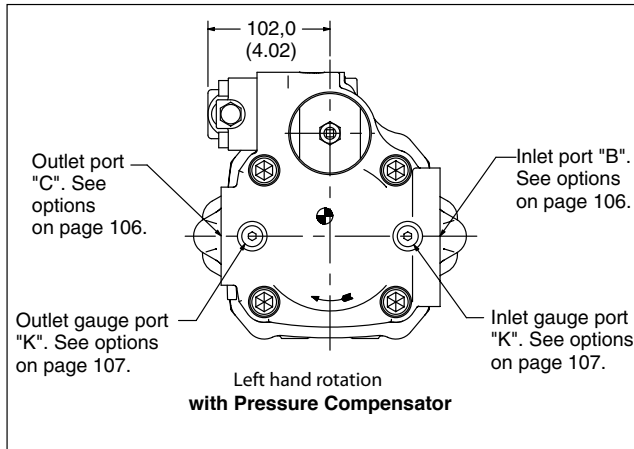
## PVM074/081

### \*Right Hand Only

#### Dimensions in millimeters (inches)

See pilot flange options on page 101.  
See shaft options starting on page 102.

Lifting point .375-16 UNC thd.  
10,0 (.39) deep with SAE drain  
M10 thd. 10,0 (.39) deep with ISO drain



PVM074/108 is not available with left hand rotation in any port configuration.

# Thru-drive Models

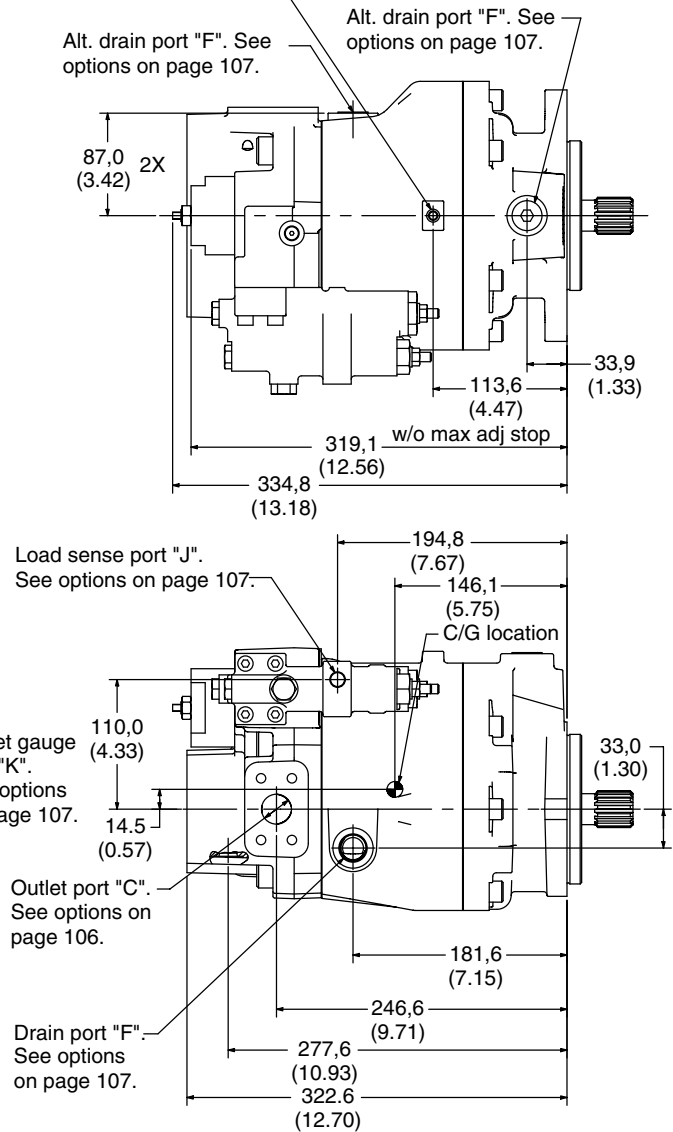
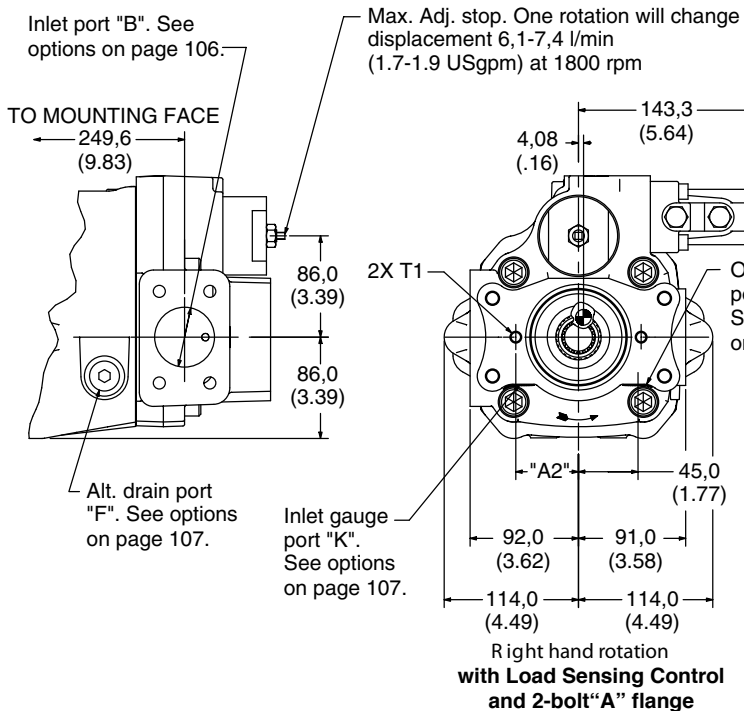
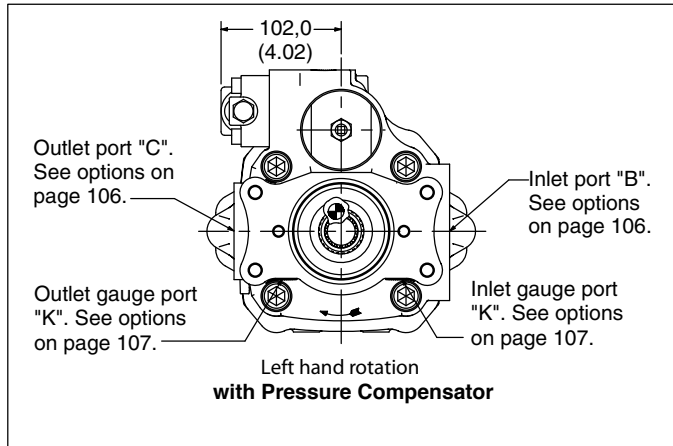
## PVM074/081

**\*Right-hand only**

### Dimensions in millimeters (inches)

See pilot flange options on page 101.  
See shaft options starting on page 102.

Lifting point .375-16 UNC thd.  
10,0 (.39) deep with SAE drain  
M10 thd. 10,0 (.39) deep with ISO drain



PVM074/108 is not available with left hand rotation in any port configuration.

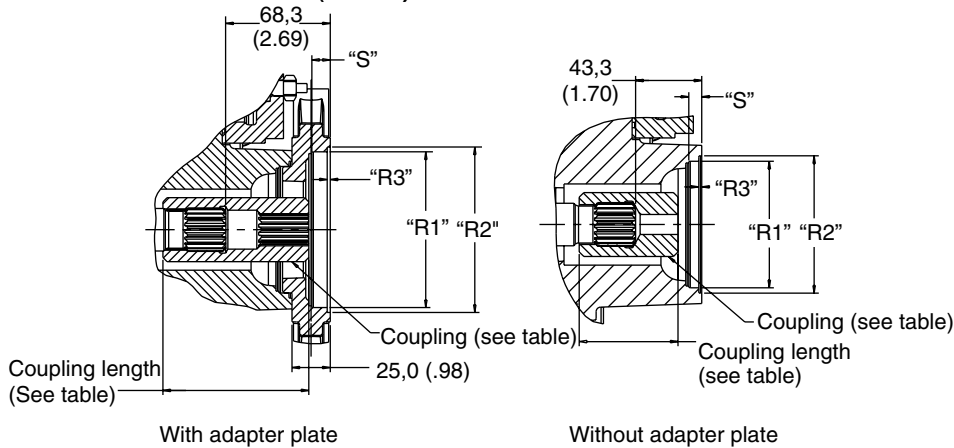


# Thru-drive Models

## PVM074/081

**\*Right-hand only**

### Dimensions in millimeters (inches)



### Coupling Length

#### Code

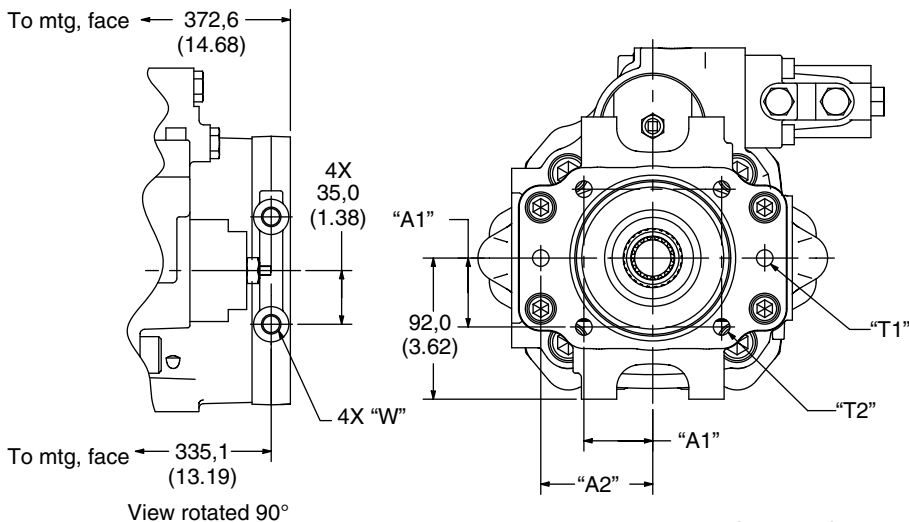
|                |             |     |
|----------------|-------------|-----|
| SAE "A," 9T    | 64,5 (2.54) | A,G |
| SAE "A," 11T   | 65,3 (2.57) | B,H |
| SAE "B," 13T   | 95,3 (3.75) | C,J |
| SAE "B-B," 15T | 95,3 (3.75) | D,K |
| SAE "C," 14T   | 95,3 (3.75) | E,L |
| SAE "C-C," 17T | 91,8 (3.61) | F,M |

### Model code Position 25

#### Description

|   |                                                               |
|---|---------------------------------------------------------------|
| A | SAE "A," 9T, 16/32 DP, 30° pressure angle, involute spline    |
| B | SAE "A," 11T, 16/32 DP, 30° pressure angle, involute spline   |
| C | SAE "B," 13T, 16/32 DP, 30° pressure angle, involute spline   |
| D | SAE "B-B," 15T, 16/32 DP, 30° pressure angle, involute spline |
| E | SAE "C," 14T, 12/24 DP, 30° pressure angle, involute spline   |
| F | SAE "C-C," 17T, 12/24 DP, 30° pressure angle, involute spline |
| G | For ISO 80-A2HW pad with a 9T SAE spline                      |
| H | For ISO 80-A2HW pad with a 11 T SAE spline                    |
| J | For ISO 100-A2/B4HW pad with a 13T SAE spline                 |
| K | For ISO 100-A2/B4HW pad with a 15T SAE spline                 |
| L | For ISO 125-A2/B4HW pad with a 14T SAE spline                 |
| M | For ISO 125-A2/B4HW pad with a 17T SAE spline                 |

### "B" Adapter Flange



Right hand rotation **with Load Sensing Control and ISO or SAE 2-1/4-bolt "B" adapter flange**

| Model | Code    | Position 25 Flange Bolt | Pilot Dia.     | O-ring Dia.    | O-ring Depth          | Pilot Depth         | 2-bolt             | 4-bolt             | Support Mounting Points             | 4-bolt       | 2-bolt      |
|-------|---------|-------------------------|----------------|----------------|-----------------------|---------------------|--------------------|--------------------|-------------------------------------|--------------|-------------|
|       |         |                         | "R1"           | "R2"           | "R3"                  | "S"                 | "T1"               | "T2"               | "W"                                 | "A1"         | "A2"        |
| A,B   | SAE "A" | SAE 2-bolt              | Ø82,6 (3.25)   | Ø89,65 (3.53)  | 2,00 (.08) 1,90 (.07) | 9,0/8,0 (.35/.31)   | 375-16 UNC-2B thd. | N/A                | N/A                                 | N/A          | 53,2        |
| G,H   | ISO 80  | ISO                     | Ø80,05 (3.15)  | Ø89,75 (3.53)  | 2,70 (.11) 2,60 (.10) | 9,0/8,0 (.35/.31)   | M10 thd.           | N/A                | N/A                                 | N/A          | 54,5 (2.15) |
| C,D   | SAE "B" | SAE 2-1/4-bolt          | Ø101,65 (4.00) | Ø108,05 (4.25) | 2,00 (.08) 1,90 (.07) | 12,5/11,5 (.49/.45) | .50-13 UNC-2B thd. | .50-13 UNC-2B thd. | .50-13 UNC-2B thd. .98" deep (1.77) | 44,9 (2.87)  | 73,0        |
| J,K   | ISO 100 | ISO                     | Ø100,05 (3.94) | Ø108,75 (4.28) | 2,70 (.11) 2,60 (.10) | 12,5/11,5 (.49/.45) | M12 thd.           | M10 thd.           | M12 thd. 25,0 deep                  | 44,19 (1.74) | 70,0 (2.76) |

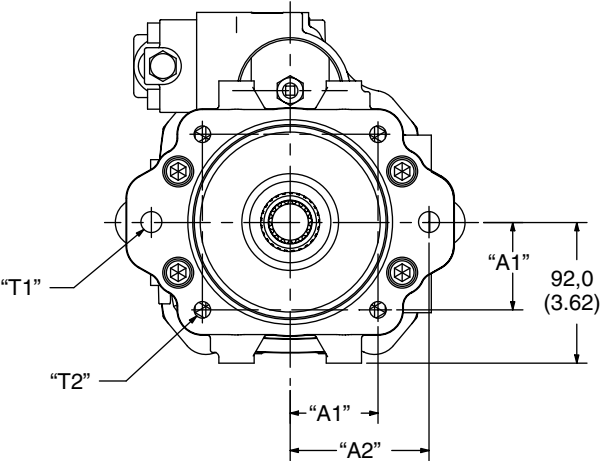
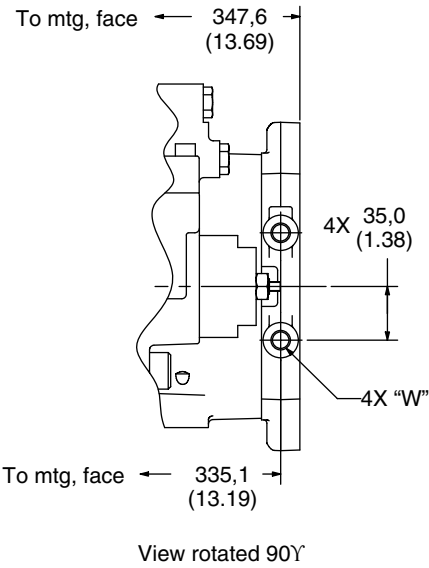
# Thru-drive Models

PVM074/081

\*Right-hand only

Dimensions in millimeters (inches)

“C” Adapter Flange



Left hand rotation    **with Pressure Compensator**  
**and ISO or SAE 2-/4-bolt “C” Adapter Flange**

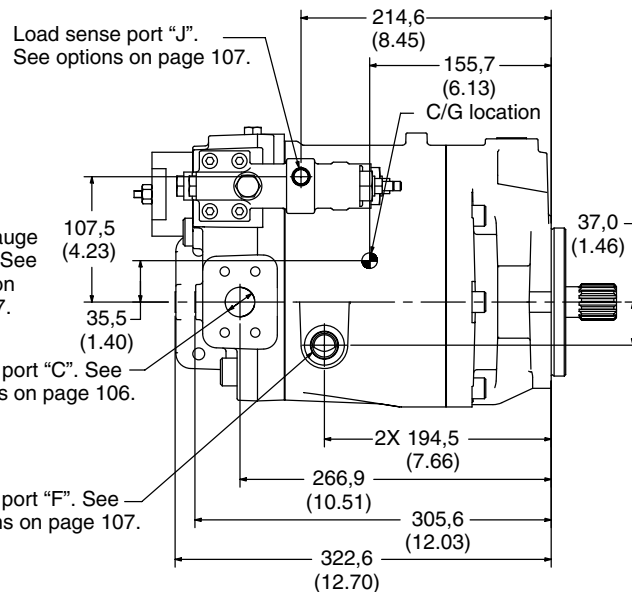
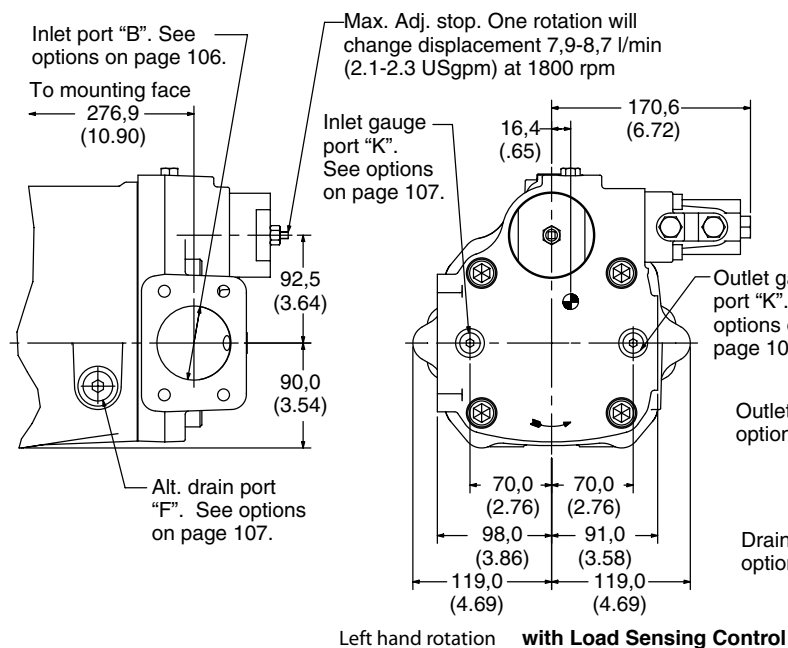
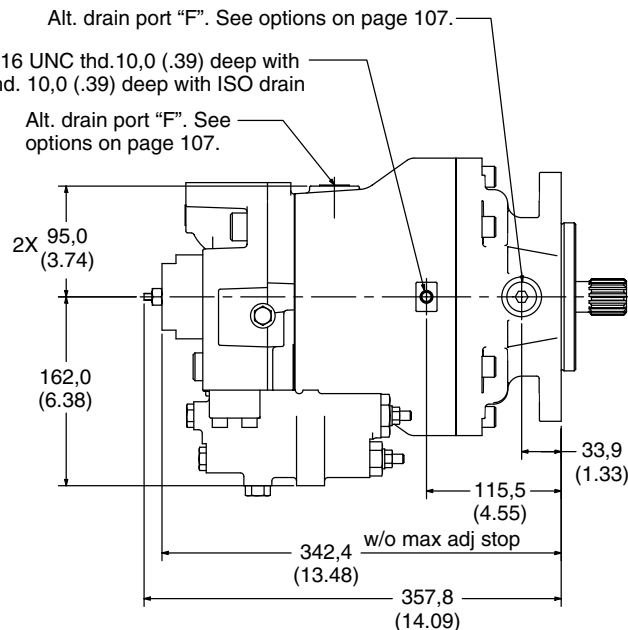
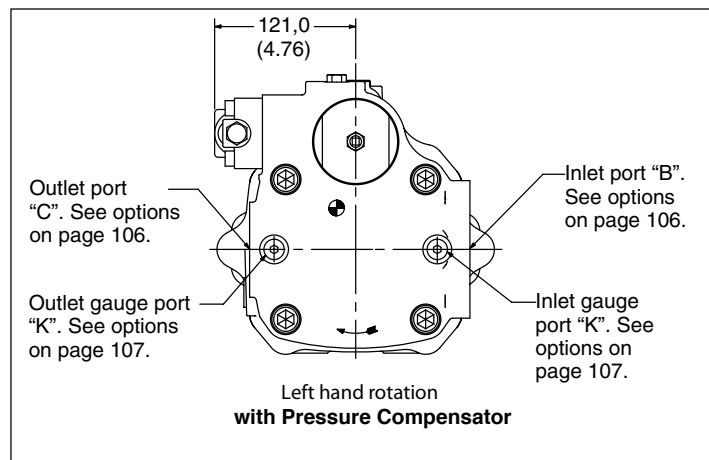
| Model      | Code    | Position 25<br>Flange Bolt | Pilot             | O-ring            | O-ring                   | Pilot                  |                     |                    | Support            |                 |                |
|------------|---------|----------------------------|-------------------|-------------------|--------------------------|------------------------|---------------------|--------------------|--------------------|-----------------|----------------|
|            |         |                            | Dia.              | Dia.              | Depth                    | Depth                  | 2-bolt              | 4-bolt             | Mounting Points    |                 |                |
|            |         |                            | "R1"              | "R2"              | "R3"                     | "S"                    | "T1"                | "T2"               | "W"                | "A1"            | "A2"           |
| E,F<br>L,M | SAE "C" | SAE                        | Ø127,05           | Ø133,45           | 2,00 (.08)               | 15,5/14,5              | .625-11 UNC-2B thd. | .50-13 UNC-2B thd. | .50-13 UNC-2B      | 57,25           | 90,5           |
|            | 2-4bolt |                            |                   |                   |                          |                        |                     |                    | thd. .98" deep     | (2.25)          | (3.56)         |
|            | ISO 125 | ISO                        | Ø125,05<br>(4.92) | Ø133,75<br>(3.26) | 2,70 (.11)<br>2,60 (.10) | 15,5/14,5<br>(.61/.57) | M16 thd.            | M12 thd.           | M12 thd. 25,0 deep | 56,57<br>(2.23) | 90,0<br>(3.54) |

# Side-ported Models

## PVM098/106

### Dimensions in millimeters (inches)

See pilot flange options on page 101.  
See shaft options starting on page 102.



PVM098/106 is not available in left hand rotation with rear ports.

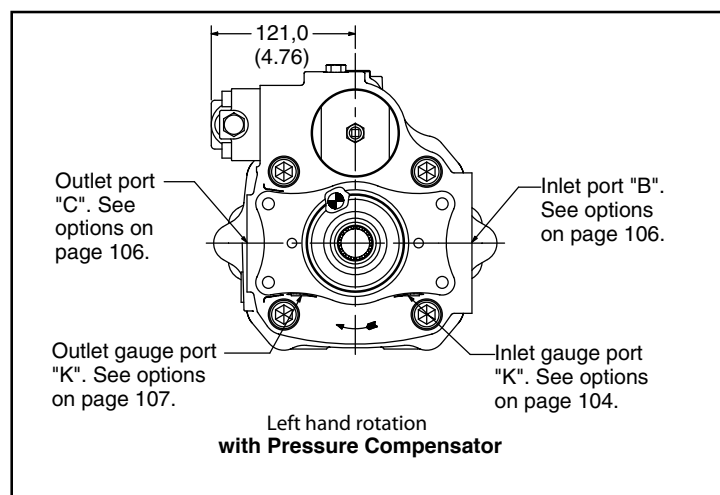
# Thru-drive Models

## PVM098/106

### Dimensions in millimeters (inches)

See pilot flange options on page 101.

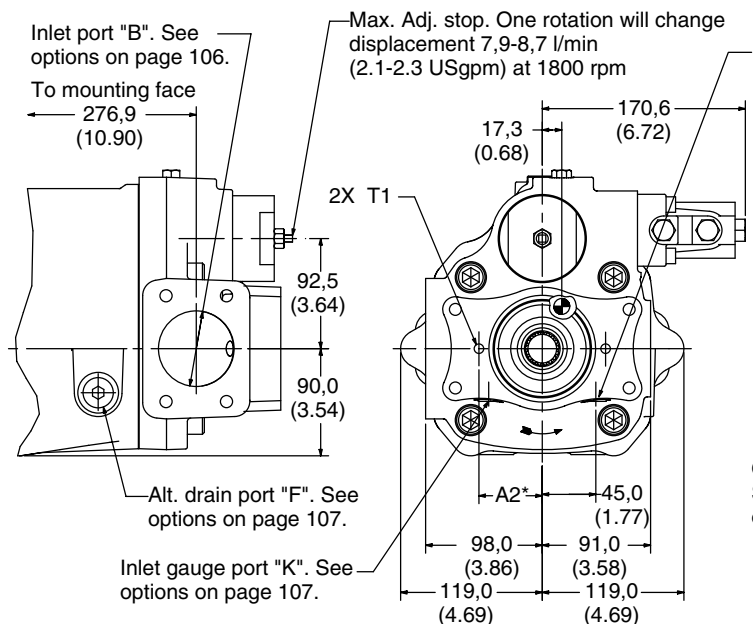
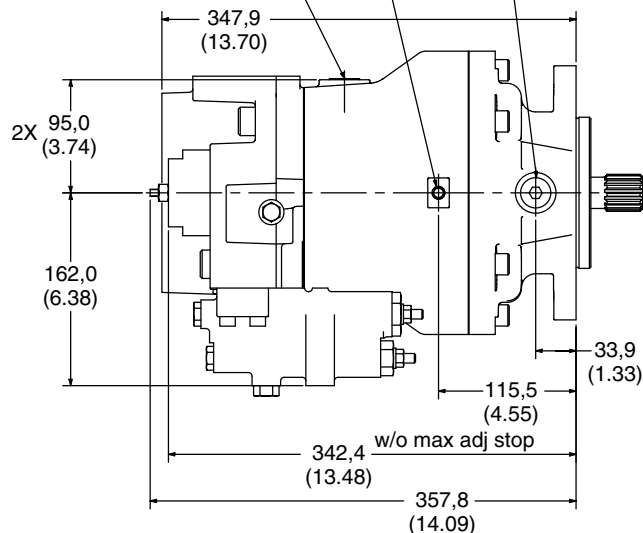
See shaft options starting on page 102.



Alt. drain port "F". See options on page 107.

Lifting point .375-16 UNC thd. 10,0 (.39) deep with SAE drain M10 thd. 10,0 (.39) deep with ISO drain

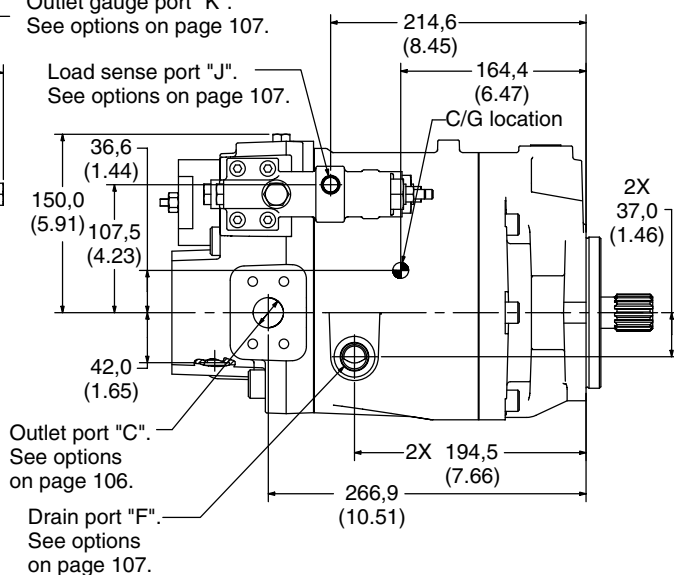
Alt. drain port "F". See options on page 107.



Right hand rotation with 2-bolt "A" flange  
and Load Sensing Control

Outlet gauge port "K". See options on page 107.

Load sense port "J". See options on page 107.

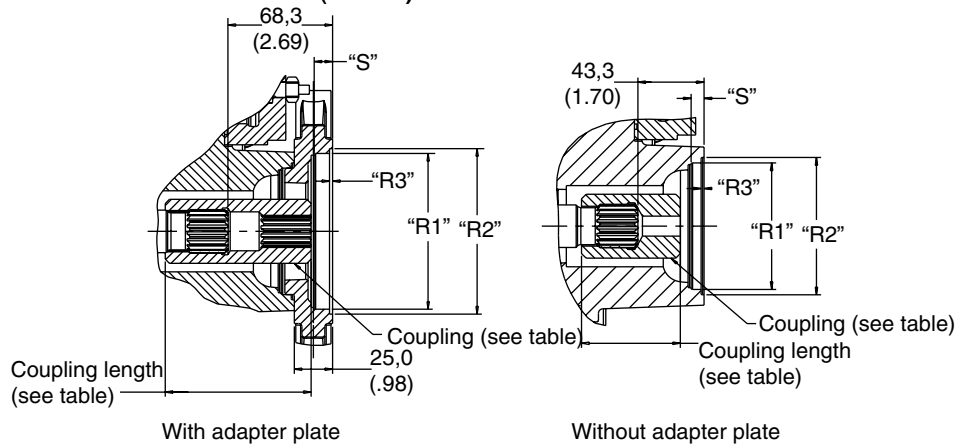


PVM098/106 is not available in left hand rotation with rear ports.

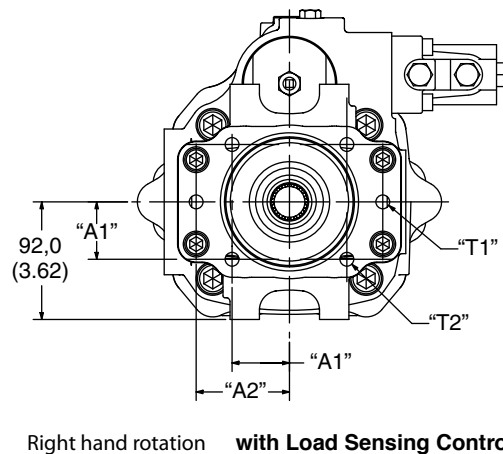
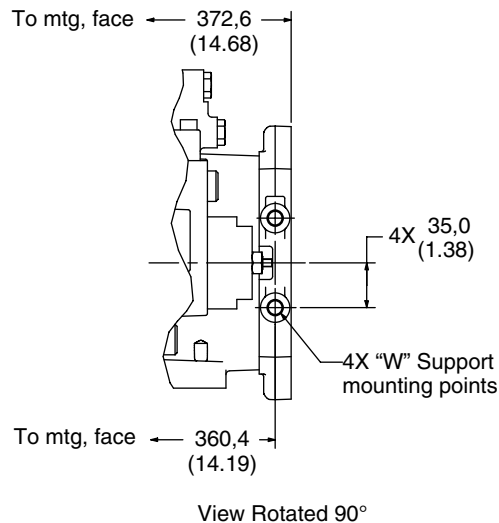
# Thru-drive Models

## PVM098/106

### Dimensions in millimeters (inches)



### "B" Adaptor Flange



### Coupling Length

#### Code

|                |             |     |
|----------------|-------------|-----|
| SAE "A," 9T    | 64,5 (2.54) | A,G |
| SAE "A," 11T   | 65,3 (2.57) | B,H |
| SAE "B," 13T   | 95,3 (3.75) | C,J |
| SAE "B-B," 15T | 95,3 (3.75) | D,K |
| SAE "C," 14T   | 95,3 (3.75) | E,L |
| SAE "C-C," 17T | 91,8 (3.61) | F,M |

### Model code Position 25

#### Description

|   |                                                               |
|---|---------------------------------------------------------------|
| A | SAE "A," 9T, 16/32 DP, 30° pressure angle, involute spline    |
| B | SAE "A," 11T, 16/32 DP, 30° pressure angle, involute spline   |
| C | SAE "B," 13T, 16/32 DP, 30° pressure angle, involute spline   |
| D | SAE "B-B," 15T, 16/32 DP, 30° pressure angle, involute spline |
| E | SAE "C," 14T, 12/24 DP, 30° pressure angle, involute spline   |
| F | SAE "C-C," 17T, 12/24 DP, 30° pressure angle, involute spline |
| G | For ISO 80-A2HW pad with a 9T SAE spline                      |
| H | For ISO 80-A2HW pad with a 11 T SAE spline                    |
| J | For ISO 100-A2/B4HW pad with a 13T SAE spline                 |
| K | For ISO 100-A2/B4HW pad with a 15T SAE spline                 |
| L | For ISO 125-A2/B4HW pad with a 14T SAE spline                 |
| M | For ISO 125-A2/B4HW pad with a 17T SAE spline                 |

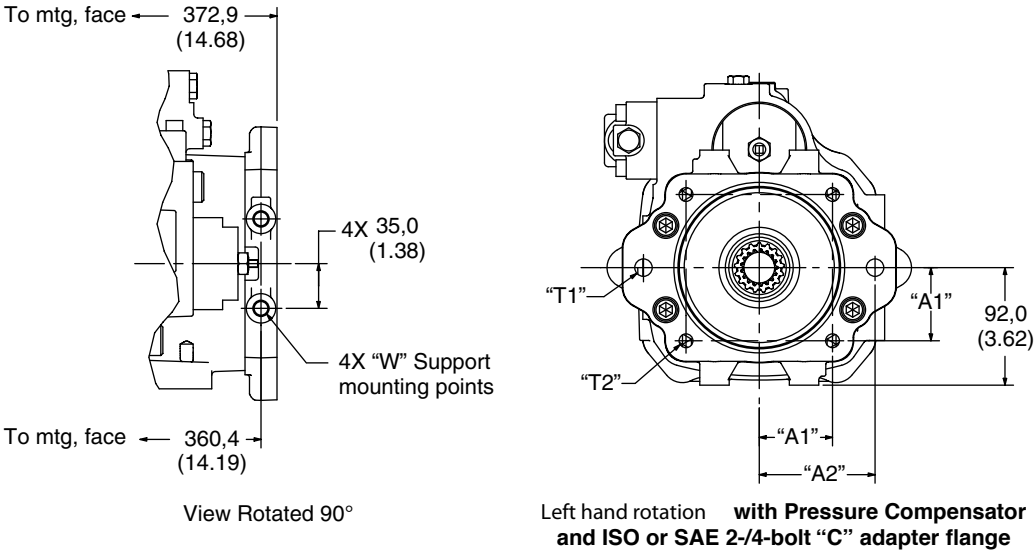
| Model Code | Position 25 Flange Bolt | Pilot Dia.     | O-ring Dia.    | O-ring Depth | Pilot Depth         | 2-bolt                       | 4-bolt             | Support Mounting Points      | 4-bolt       | 2-bolt      |
|------------|-------------------------|----------------|----------------|--------------|---------------------|------------------------------|--------------------|------------------------------|--------------|-------------|
|            |                         | "R1"           | "R2"           | "R3"         | "S"                 | "T1"                         | "T2"               | "W"                          | "A1"         | "A2"        |
| A,B        | SAE "A" SAE             | Ø82,6 (3.25)   | Ø89,65 (3.53)  | 2,00 (.08)   | 9,0/8,0 (.35/.31)   | 375-16 UNC-2B thd. 0.59 deep | N/A                | N/A                          | N/A          | 53,2        |
| G,H        | 2-bolt ISO 80 ISO       | Ø80,05 (3.15)  | Ø89,75 (3.53)  | 2,70 (.11)   | 9,0/8,0 (.35/.31)   | M10 thd. x 18,0 deep         | N/A                | N/A                          | N/A          | 54,5 (2.15) |
| C,D        | SAE "B" SAE             | Ø101,65 (4.00) | Ø108,05 (4.25) | 2,00 (.08)   | 12,5/11,5 (.49/.45) | .50-13 UNC-2B thd.           | .50-13 UNC-2B thd. | .50-13 UNC-2B thd. .98" deep | 44,9 (1.77)  | 73,0 (2.87) |
| J,K        | 2-4-bolt ISO 100 ISO    | Ø100,05 (3.94) | Ø108,75 (4.28) | 2,70 (.11)   | 12,5/11,5 (.49/.45) | M12 thd.                     | M10 thd.           | M12 thd. 25,0 deep           | 44,19 (1.74) | 70,0 (2.76) |

# Thru-drive Models

PVM098/106

## Dimensions in millimeters (inches)

### “C” Adapter Flange



| Model Code | Position 25 | Pilot Dia. | O-ring Dia.    | O-ring Depth   | Pilot Depth           | Support Mounting Points |                     |                    |                              |              |             |
|------------|-------------|------------|----------------|----------------|-----------------------|-------------------------|---------------------|--------------------|------------------------------|--------------|-------------|
|            | Flange Bolt |            |                |                |                       | 2-bolt                  | 4-bolt              |                    |                              |              |             |
|            |             |            | "R1"           | "R2"           | "R3"                  | "S"                     | "T1"                | "T2"               | "W"                          | "A1"         | "A2"        |
| E,F<br>L,M | SAE "C"     | SAE        | Ø127,05        | Ø133,45        | 2,00 (.08)            | 15,5/14,5               | .625-11 UNC-2B thd. | .50-13 UNC-2B thd. | .50-13 UNC-2B thd. .98" deep | 57,25 (2.25) | 90,5 (3.56) |
|            | 2-4-bolt    |            |                |                |                       |                         |                     |                    |                              |              |             |
|            | ISO 125     | ISO        | Ø125,05 (4.92) | Ø133,75 (3.26) | 2,70 (.11) 2,60 (.10) | 15,5/14,5 (.61/.57)     | M16 thd.            | M12 thd.           | M12 thd. 25,0 deep           | 56,57 (2.23) | 90,0 (3.54) |

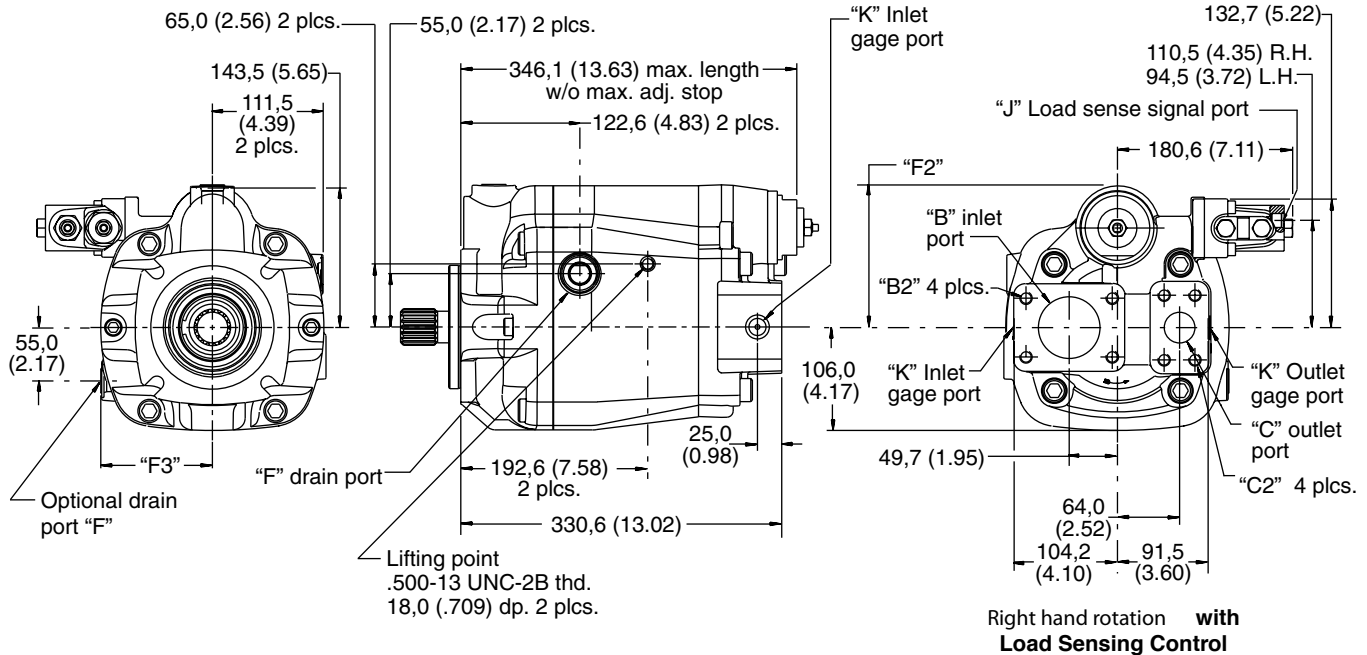
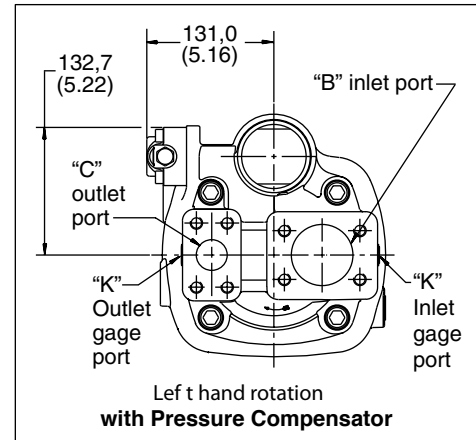
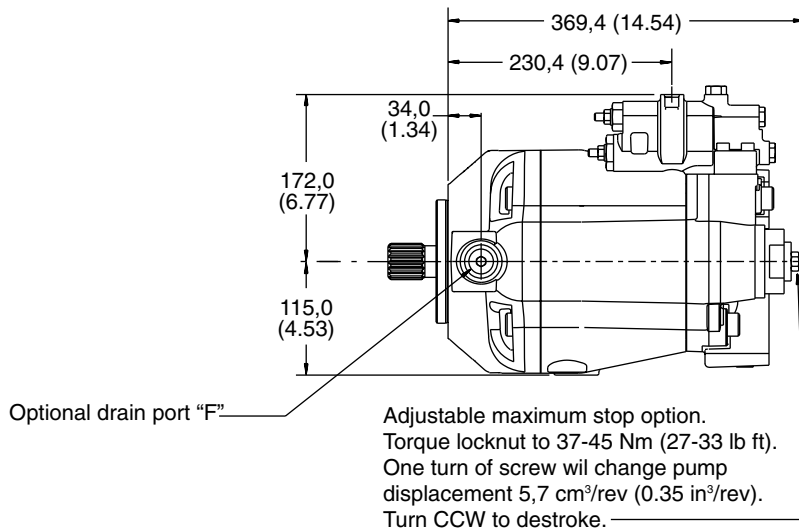
# End-ported Models

## PVM131/141

Dimensions in millimeters (inches)

See pilot flange options on page 101.

See shaft options starting on page 102.

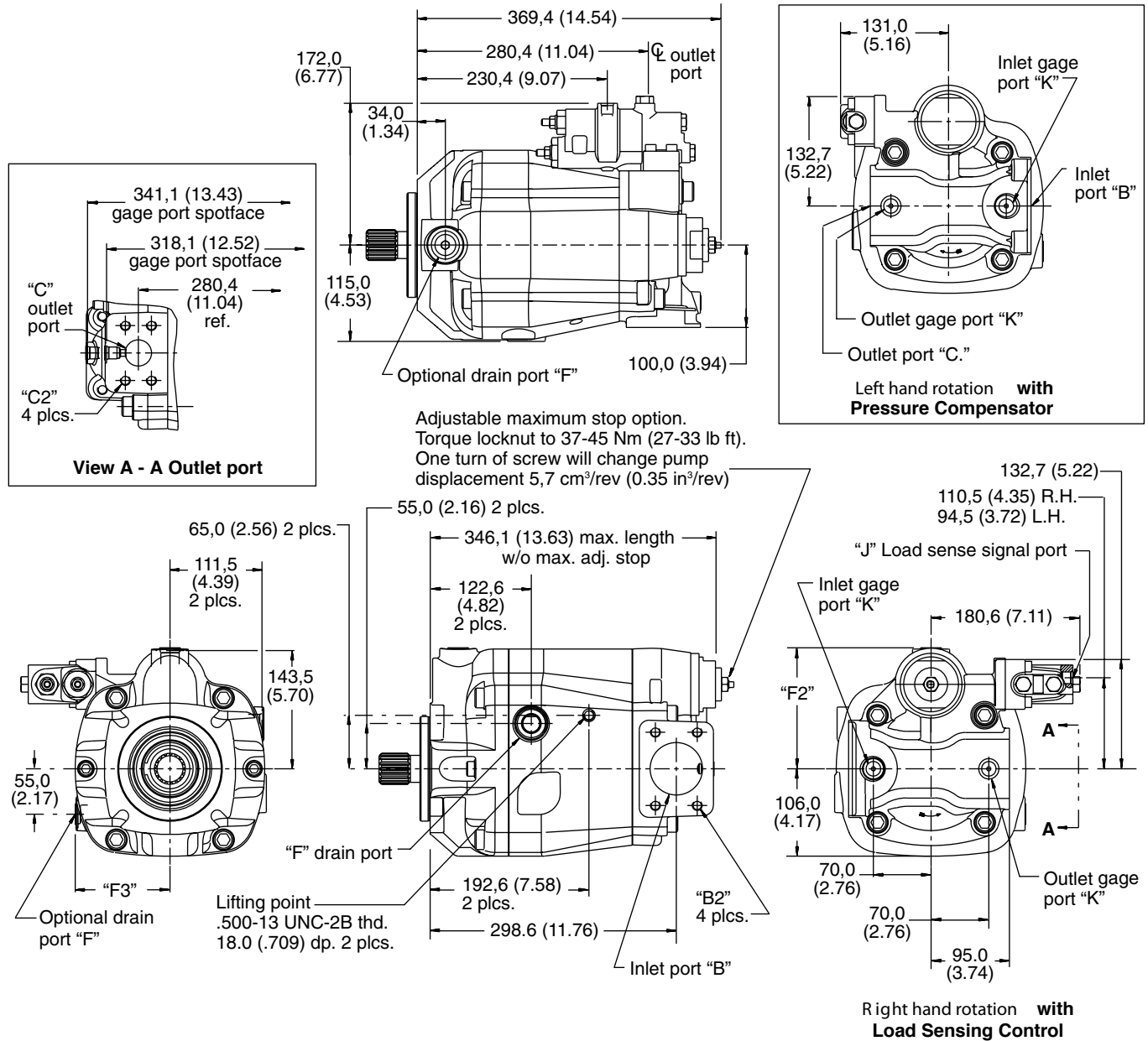


# Side-ported Models

## PVM131/141

### Dimensions in millimeters (inches)

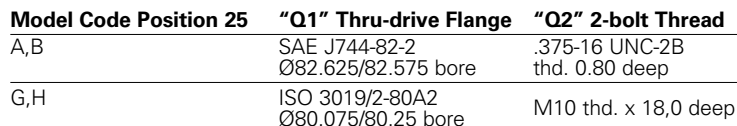
See pilot flange options on page 101.  
See shaft options starting on page 102.





**PVM131/141**

**See pilot flange options on page 101.**  
**See shaft options starting on page 102.**

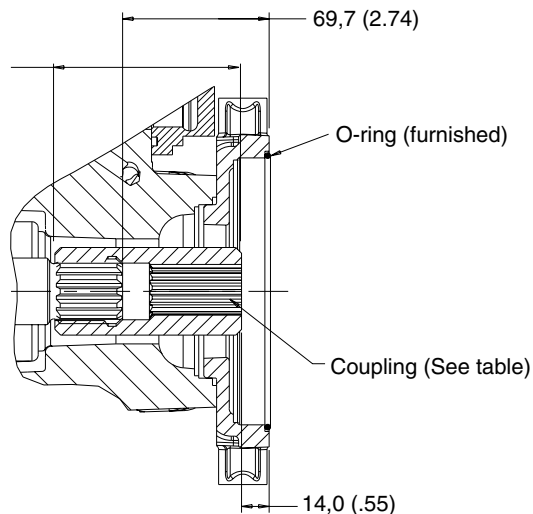


**Right Hand Rotation with Load Sensing Control and SAE 2-bolt "A" Flange (no adapter)**

# Thru-drive Models

## PVM131/141

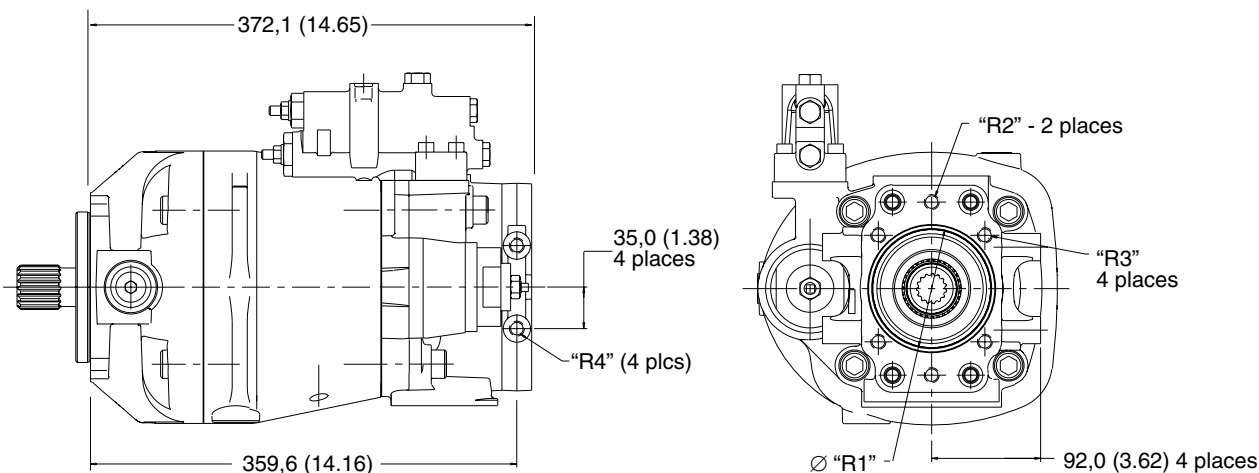
### Dimensions in millimeters (inches)



### Model Code Position 25

|              | Description                                                        |
|--------------|--------------------------------------------------------------------|
| A angle,     | For SAE "A" pad with a 9T, 16/32 DP, 30° pressure involute spline  |
| B angle,     | For SAE "A" pad with a 11T, 16/32 DP, 30° pressure involute spline |
| Output shaft | 14T 12/24 DP external involute spline                              |
| C spline     | SAE "B," 13T, 16/32 DP, 30° pressure angle, involute spline        |
| D            | SAE "B-B," 15T, 16/32 DP, 30° pressure angle, involute spline      |
| E            | SAE "C," 14T, 12/24 DP, 30° pressure angle, involute spline        |
| F            | SAE "C-C," 17T, 12/24 DP, 30° pressure angle, involute spline      |
| G            | For ISO 80-A2HW pad with a 9T SAE spline                           |
| H            | For ISO 80-A2HW pad with a 11T SAE spline                          |
| J            | For ISO 100-A2/B4HW pad with a 13T SAE spline                      |
| K            | For ISO 100-A2/B4HW pad with a 15T SAE spline                      |
| L            | For ISO 125-A2/B4HW pad with a 14T SAE spline                      |
| M            | For ISO 125-A2/B4HW pad with a 17T SAE spline                      |

### "B" Adapter Flange



Right Hand Rotation **with SAE 2-4-Bolt "B" Flange and ISO 100 Adapter Flange**

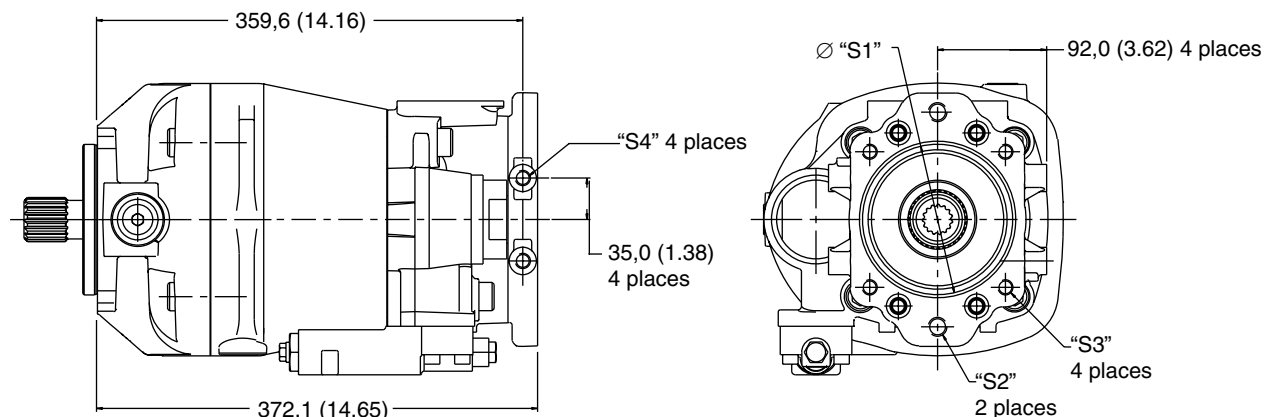
| Model Code Position 25 | "R1" Thru-drive Flange                                          | "R2" 2-bolt Thread          | "R3" 4-bolt Thread          | "R4" Support Mounting Points |
|------------------------|-----------------------------------------------------------------|-----------------------------|-----------------------------|------------------------------|
| C,D                    | SAE J744-101-2 & -4<br>Ø101,675/101.625 bore 12,50/11,50 deep   | .500-13 UNC-2B<br>0.98 deep | .500-13 UNC-2B<br>0.98 deep | .500-13 UNC-2B<br>0.98 deep  |
| J,K                    | ISO 3019/2-100A2 & B2<br>Ø100,075/100.025 bore 12,50/11,50 deep | M12<br>25,0 deep            | M12<br>25,0 deep            | M12<br>25,0 deep             |

# Thru-drive Models

## PVM131/141

### Dimensions in millimeters (inches)

#### “C” Adapter Flange



Left Hand Rotation with SAE 2-1/4-bolt “C”  
and ISO 125 Adapter Flange

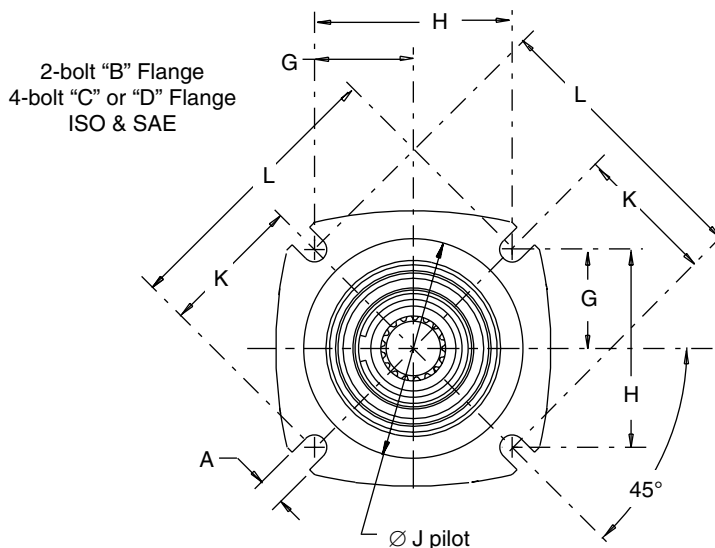
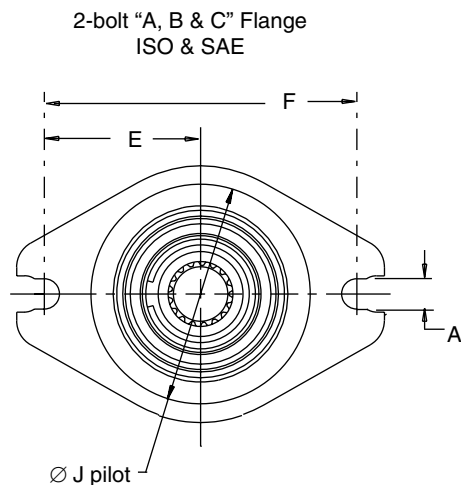
| Model Code  |                                                                 |                             |                             |                              |
|-------------|-----------------------------------------------------------------|-----------------------------|-----------------------------|------------------------------|
| Position 25 | “S1” Thru-drive Flange                                          | “S2” 2-bolt Thread          | “S3” 4-bolt Thread          | “R4” Support Mounting Points |
| E,F         | SAE J744-127-2 & -4<br>Ø127,075/127.025 bore 15,50/14,50 deep   | .625-11 UNC-2B<br>0.98 deep | .500-13 UNC-2B<br>0.98 deep | .500-13 UNC-2B<br>0.98 deep  |
| L,M         | ISO 3019/2-125A2 & B4<br>Ø125,075/125.025 bore 15,50/14,50 deep | M16<br>25,0 deep            | M12<br>25,0 deep            | M12<br>25,0 deep             |

| Port | “B”*                                             | “B2”                                     | “C”*                                              | “C2”                                     | “F2”            | “F3”            |
|------|--------------------------------------------------|------------------------------------------|---------------------------------------------------|------------------------------------------|-----------------|-----------------|
| SAE  | 2.50 inch dia. SAE J518<br>Code 61, low pressure | .500-13 UNC-2B thd.<br>1.19 deep minimum | 1.25 inch dia. SAE J518<br>Code 62, high pressure | .500-13 UNC-2B thd.<br>1.00 deep minimum | 146,8<br>(5.78) | 114,9<br>(4.52) |
| ISO  | 64mm diameter. ISO<br>6162 Type II, 315 bar      | M12 thread<br>31,0 deep minimum          | 32mm diameter.<br>ISO 6162, 400 bar               | M12 thread<br>27,0 deep minimum          | 148,5<br>(5.85) | 116,6<br>(4.59) |

\*4-bolt flange port. See page 101 for load sensing, drain, and gage port threads.

# Mounting Flange Options

## Dimensions in millimeters (inches)



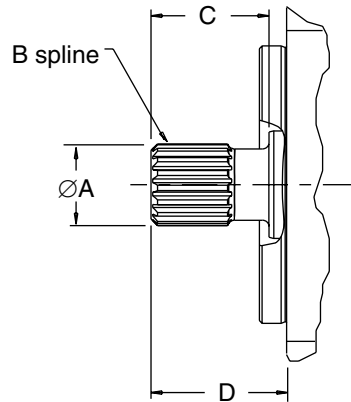
| Series                                                   | 2-bolt or 4-bolt<br>Flange | Code | Flange Description   | A      | E       | F      | G                | H                 | J                                | K                | L                |
|----------------------------------------------------------|----------------------------|------|----------------------|--------|---------|--------|------------------|-------------------|----------------------------------|------------------|------------------|
| PVM018                                                   | 2-bolt                     | A    | SAE J744-82-2        | Ø11,14 | 53,2    | 106,4  | —                | —                 | Ø82,53 +.02<br>-.03              | —                | —                |
| PVM020                                                   | "A"                        |      |                      | (4.38) | (2.09)  | (4.19) | —                | —                 | (Ø3.249) +.000<br>-.001          | —                | —                |
| PVM018                                                   | 2-bolt                     | B    | ISO 3019/2-80A2HW    | Ø11,14 | 54,5    | 109,0  | —                | —                 | Ø79,98 +.02<br>-.03              | —                | —                |
| PVM020                                                   | "A"                        |      |                      | (4.38) | (2.15)  | (4.29) | —                | —                 | (Ø3.15) +.000<br>-.001           | —                | —                |
| PVM018<br>PVM020<br>PVM045<br>PVM050<br>PVM057<br>PVM063 | 2-bolt<br>"B"              | C    | SAE J744-101-2       | 14,36  | 73,0    | 146,0  | —                | —                 | Ø101,58+.02<br>-.03              | —                | —                |
|                                                          |                            |      |                      | (.565) | (2.87)  | (5.75) | —                | —                 | (Ø3.999)                         | ±.001            | —                |
| PVM018<br>PVM020<br>PVM045<br>PVM050<br>PVM057<br>PVM063 | 2-bolt<br>"B" (special)    | D    | ISO 3019/2-100A2HW   | 14,14  | 70,0    | 140,0  | —                | —                 | Ø100,00/99,95<br>(Ø3.937/3.935)  | —                | —                |
|                                                          |                            |      |                      | (.557) | (2.76)  | (5.51) | —                | —                 |                                  | —                | —                |
| PVM057<br>PVM063<br>PVM074<br>PVM081                     | 2-bolt<br>"C"              | E    | SAE J744-127-2 ("C") | 17,4   | 90,5    | 181,0  | —                | —                 | Ø127,00/126,95<br>(Ø5.000/4.998) | —                | —                |
|                                                          |                            | F    | ISO 3019/2-125A2HW   | 18,0   | 90,0    | 180,0  | —                | —                 | Ø125,00/124,95<br>(Ø4.921/4.919) | —                | —                |
|                                                          |                            |      |                      | (.709) | (3.543) | (7.09) | —                | —                 |                                  | —                | —                |
| PVM098<br>PVM106<br>PVM131<br>PVM141                     | 4-bolt<br>"C"              | G    | SAE J744-127-4 ("C") | 14,2   | —       | —      | 57,25<br>(2.254) | 114,50<br>(4.508) | Ø127,00/126,95<br>(Ø5.000/4.998) | —                | —                |
|                                                          |                            | H    | ISO 3019/2-125B4HW   | 14,0   | —       | —      | —                | —                 | Ø125,00/124,95<br>(Ø4.921/4.919) | 80,0<br>(3.150)  | 160,0<br>(6.299) |
|                                                          |                            |      |                      | (.551) | —       | —      | —                | —                 |                                  | —                | —                |
| PVM131<br>PVM141                                         | 4-bolt<br>"D"              | J    | SAE J744-152-4 ("D") | 20,6   | —       | —      | 80,82<br>(3.182) | 161,64<br>(6.364) | Ø152,40/152,35<br>(Ø6.000/5.998) | —                | —                |
|                                                          |                            | K    | ISO 3019/2-160B4HW   | 18,0   | —       | —      | —                | —                 | Ø160,00/159,95<br>(Ø6.299/6.297) | 100,0<br>(3.937) | 200,0<br>(7.874) |
|                                                          |                            |      |                      | (.709) | —       | —      | —                | —                 |                                  | —                | —                |

\*Flanges for PVM020 and PVM050 are shown on pages 73 and 80, respectively.

# Shaft Options

Dimensions in millimeters (inches)

SAE Splined Shaft

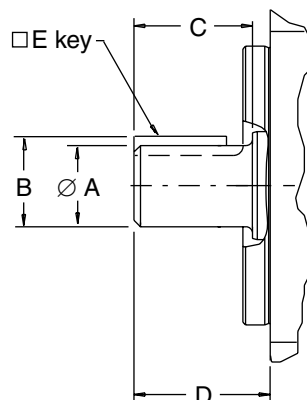


| Model Series             | SAE Spline Shaft Designation     | Shaft Code | A max.        | B            | C           | D           | Max. Input Torque Nm (lb. in.) |
|--------------------------|----------------------------------|------------|---------------|--------------|-------------|-------------|--------------------------------|
| PVM018/020               | SAE J744-16-4<br>SAE "A" (9T)    | 03         | 15,88 (.625)  | 9T 16/32 DP  | 37,0 (1.46) | 32,0 (1.26) | 58 (517)                       |
|                          | SAE J744-19-4<br>SAE "A" (11T)   | 04         | 19,05 (.750)  | 11T 16/32 DP | 30,0 (1.18) | 38,0 (1.50) | 123 (1100)                     |
|                          | SAE J744-22-4<br>SAE "B" (13T)   | 07         | 21,81 (.859)  | 13T 16/32 DP | 33,0 (1.31) | 41,0 (1.61) | 208 (1850)                     |
|                          | SAE J744-25-4<br>SAE "B-B" (15T) | 08         | 24,98 (.983)  | 15T 16/32 DP | 38,0 (1.50) | 46,0 (1.81) | 337 (2987)                     |
| PVM045/050               | SAE J744-22-4<br>SAE "B" (13T)   | 07         | 21,81 (.859)  | 13T 16/32 DP | 33,0 (1.31) | 41,0 (1.61) | 208 (1850)                     |
|                          | SAE J744-25-4<br>SAE "B-B" (15T) | 08         | 24,98 (.983)  | 15T 16/32 DP | 38,0 (1.50) | 46,0 (1.81) | 337 (2987)                     |
| PVM057/063               | SAE J744-22-4<br>SAE "B" (13T)   | 07         | 21,81 (.859)  | 13T 16/32 DP | 33,0 (1.31) | 41,0 (1.61) | 208 (1850)                     |
|                          | SAE J744-25-4<br>SAE "B-B" (15T) | 08         | 24,98 (.983)  | 15T 16/32 DP | 38,0 (1.50) | 46,0 (1.81) | 337 (2987)                     |
|                          | SAE J744-32-4<br>SAE "C" (14T)   | 11         | 31,22 (1.23)  | 14T 12/24 DP | 48,0 (1.89) | 56,0 (2.20) | 640 (5660)                     |
| PVM074/081<br>PVM098/106 | SAE J744-32-4<br>SAE "C" (14T)   | 11         | 31,22 (1.23)  | 14T 12/24 DP | 48,0 (1.89) | 56,0 (2.20) | 640 (5660)                     |
|                          | SAE J744-38-4<br>SAE "C-C" (17T) | 12         | 37,57 (1.479) | 17T 12/24 DP | 54,0 (2.13) | 62,0 (2.44) | 1215 (10,750)                  |
| PVM131/141               | SAE J744-32-4<br>SAE "C" (14T)   | 11         | 31,22 (1.23)  | 14T 12/24 DP | 48,0 (1.89) | 56,0 (2.20) | 640 (5660)                     |
|                          | SAE J744-38-4<br>SAE "C-C" (17T) | 12         | 37,57 (1.479) | 17T 12/24 DP | 54,0 (2.13) | 62,0 (2.44) | 1215 (10,750)                  |
|                          | SAE J744-44-4<br>SAE "D" (13T)   | 14         | 43,71 (1.721) | 13T 8/16 DP  | 67,0 (2.63) | 75,0 (2.95) | 1215 (10,750)                  |

# Shaft Options

Dimensions in millimeters (inches)

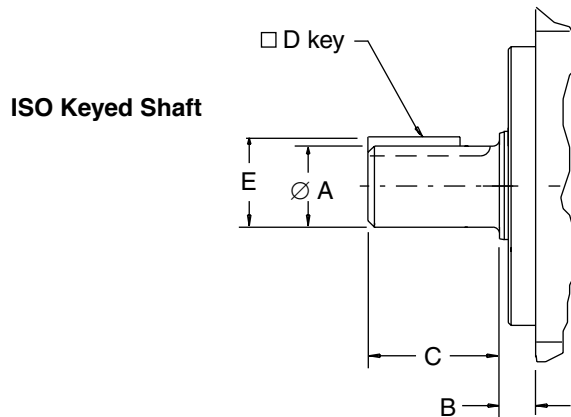
SAE Keyed Shaft



| Model Series             | SAE Keyed Shaft Designation | Shaft Code | A            | B             | C           | D           | E            | Max. Input Torque<br>Nm (lb. in.) |
|--------------------------|-----------------------------|------------|--------------|---------------|-------------|-------------|--------------|-----------------------------------|
| PVM018/020               | SAE J744-16-1<br>SAE "A"    | 01         | 15,88 (.625) | 17,73 (.698)  | 24,0 (.94)  | 32,0 (1.26) | 4,0 (.157)   | 58<br>(517)                       |
|                          | SAE J744-19-1<br>SAE "19-1" | 02         | 19,05 (.750) | 21,23 (.836)  | 24,0 (.94)  | 32,0 (1.26) | 4,81 (.189)  | 104<br>(918)                      |
|                          | SAE J744-22-1<br>SAE "B"    | 05         | 22,22 (.875) | 25,12 (.989)  | 33,0 (1.31) | 41,0 (1.61) | 6,35 (.250)  | 135<br>(1200)                     |
|                          | SAE J744-25-1<br>SAE "B-B"  | 06         | 25,37 (.999) | 28,22 (1.111) | 38,0 (1.50) | 46,0 (1.81) | 6,35 (.250)  | 215<br>(1900)                     |
| PVM045/050               | SAE J744-22-1<br>SAE "B"    | 05         | 22,22 (.875) | 25,12 (.989)  | 33,0 (1.31) | 41,0 (1.61) | 6,35 (.250)  | 135<br>(1200)                     |
|                          | SAE J744-25-1<br>SAE "B-B"  | 06         | 25,37 (.999) | 28,22 (1.111) | 38,0 (1.50) | 46,0 (1.81) | 6,35 (.250)  | 215<br>(1900)                     |
| PVM057/063               | SAE J744-25-1<br>SAE "B-B"  | 06         | 25,37 (.999) | 28,22 (1.111) | 38,0 (1.50) | 46,0 (1.81) | 6,35 (.250)  | 215<br>(1900)                     |
|                          | SAE J744-32-1<br>SAE "C"    | 09         | 31,75 (1.25) | 35,32 (1.390) | 48,0 (1.89) | 56,0 (2.20) | 7,93 (.312)  | 450<br>(3980)                     |
| PVM074/081<br>PVM098/106 | SAE J744-32-1<br>SAE "C"    | 09         | 31,75 (1.25) | 35,32 (1.390) | 48,0 (1.89) | 56,0 (2.20) | 7,93 (.312)  | 450<br>(3980)                     |
|                          | SAE J744-38-1<br>SAE "C-C"  | 10         | 38,10 (1.50) | 42,39 (1.67)  | 54,0 (2.13) | 62,0 (2.44) | 9,52 (.375)  | 765<br>(6770)                     |
| PVM131/141               | SAE J744-32-1<br>SAE "C"    | 09         | 31,75 (1.25) | 35,32 (1.390) | 48,0 (1.89) | 56,0 (2.20) | 7,93 (.312)  | 450<br>(3980)                     |
|                          | SAE J744-38-1<br>SAE "C-C"  | 10         | 38,10 (1.50) | 42,39 (1.67)  | 54,0 (2.13) | 62,0 (2.44) | 9,52 (.375)  | 765<br>(6770)                     |
|                          | SAE J744-44-1<br>SAE "D"    | 13         | 44,45 (1.75) | 49,46 (1.95)  | 67,0 (2.63) | 75,0 (2.95) | 11,11 (.438) | 1200<br>(10,620)                  |

# Shaft Options

Dimensions in millimeters (inches)



| Model Series | ISO Keyed Shaft Designation  | Shaft Code | A           | B           | C         | D         | E            | Max. Input Torque<br>Nm (lb. in.) |
|--------------|------------------------------|------------|-------------|-------------|-----------|-----------|--------------|-----------------------------------|
| PVM018/020   | ISO 3019/2 E20N              | 15         | 19,9 (.786) | 8,5 (.335)  | 36 (1.42) | 6 (.236)  | 22,5 (.886)  | 113 (1000)                        |
|              | ISO 3019/2 E25N Short Spigot | 16         | 25 (.984)   | 8,5 (.335)  | 42 (1.65) | 8 (.315)  | 28,0 (1.102) | 215 (1900)                        |
|              | ISO 3019/2 E25N              | 17         | 25 (.984)   | 10 (.393)   | 42 (1.65) | 8 (.315)  | 28,0 (1.102) | 215 (1900)                        |
| PVM045/050   | ISO 3019/2 E25N              | 17         | 25 (.984)   | 10 (.393)   | 42 (1.65) | 8 (.315)  | 28,0 (1.102) | 215 (1900)                        |
| PVM057/063   | ISO 3019/2 E25N              | 17         | 25 (.984)   | 10 (.393)   | 42 (1.65) | 8 (.315)  | 28,0 (1.102) | 215 (1900)                        |
|              | ISO 3019/2 E32N              | 18         | 32 (1.26)   | 10 (.393)   | 58 (2.28) | 10 (.394) | 35,0 (1.378) | 450 (3980)                        |
| PVM074/081   | ISO 3019/2 E32N              | 18         | 32 (1.26)   | 10,5 (.413) | 58 (2.28) | 10 (.394) | 35,0 (1.378) | 450 (3980)                        |
| PVM098/106   | ISO 3019/2 E40N              | 19         | 40 (1.57)   | 10,5 (.413) | 82 (3.23) | 12 (.472) | 43,0 (1.693) | 870 (7700)                        |
| PVM131/141   | ISO 3019/2 E32N              | 18         | 32 (1.26)   | 10 (.393)   | 58 (2.28) | 10 (.394) | 35,0 (1.378) | 450 (3980)                        |
|              | ISO 3019/2 E40N              | 19         | 40 (1.57)   | 10 (.393)   | 82 (3.23) | 12 (.472) | 43,0 (1.693) | 870 (7700)                        |

ⓂISO 80mm pilot only – B

ⓂISO 80mm pilot only – D

\*Torque of non-thru-drive PVM pump, or combined torque of PVM thru-drive pump and thru-driven pump.

**NOTE:** In those cases where geometric tolerances of mounting are critical, or where specific tolerance ranges are required and not specified, consult Eaton Engineering for specific limits.

# Input Shaft Selection Data

## SAE Splined Shafts

| Model Series | Shaft Designation              | Shaft Code | Max. Input Torque†<br>Nm (lb. in.) | Max. Thru-drive Output Torque‡<br>Nm (lb. in.) |
|--------------|--------------------------------|------------|------------------------------------|------------------------------------------------|
| PVM018/020   | SAE J744-16-4 (SAE "A," 9T)    | 03         | 58 (513)                           | Exceeds maximum input torque                   |
|              | SAE J744-19-4 (SAE "A," 11T)   | 04         | 123 (1100)                         | Exceeds maximum input torque                   |
|              | SAE J744-22-4 (SAE "B," 13T)   | 07         | 208 (1850)                         | 123 (1100)                                     |
|              | SAE J744-25-4 (SAE "B-B," 15T) | 08         | 337 (2987)                         | 123 (1100)                                     |
| PVM045/050   | SAE J744-22-4 (SAE "B," 13T)   | 07         | 208 (1850)                         | 208 (1850)*                                    |
|              | SAE J744-25-4 (SAE "B-B," 15T) | 08         | 337 (2987)                         | 337 (2987)                                     |
| PVM057/063   | SAE J744-22-4 (SAE "B," 13T)   | 07         | 208 (1850)                         | 208 (1850)*                                    |
|              | SAE J744-25-4 (SAE "B-B," 15T) | 08         | 337 (2987)                         | 337 (2987)                                     |
|              | SAE J744-32-4 (SAE "C," 14T)   | 11         | 640 (5660)                         | 337 (2987)                                     |
| PVM074/081   | SAE J744-32-4 (SAE "C," 14T)   | 11         | 640 (5660)                         | 515 (4560)                                     |
| PVM098/106   | SAE J744-38-4 (SAE "C-C," 17T) | 12         | 1215 (10,750)                      | 515 (4560)                                     |
|              | SAE J744-32-4 (SAE "C," 14T)   | 11         | 640 (5660)                         | 640 (5660)                                     |
| PVM131/141   | SAE J744-38-4 (SAE "C-C," 17T) | 12         | 1215 (10,750)                      | 640 (5660)                                     |
|              | SAE J744-44-4 (SAE "D," 13T)   | 14         | 1215 (10,750)                      | 640 (5660)                                     |

## SAE Keyed Shafts

| Model Series | Shaft Designation          | Shaft Code | Max. Input Torque†<br>Nm (lb. in.) | Max. Thru-drive Output Torque‡<br>Nm (lb. in.) |
|--------------|----------------------------|------------|------------------------------------|------------------------------------------------|
| PVM018/020   | SAE J744-16-1 (SAE "A")    | 01         | 58 (513)                           | Exceeds maximum input torque                   |
|              | SAE J744-19-1 (SAE "19-1") | 02         | 104 (920)                          | Exceeds maximum input torque                   |
|              | SAE J744-22-1 (SAE "B")    | 05         | 135 (1200)                         | 123 (1100)                                     |
|              | SAE J744-25-1 (SAE "B-B")  | 06         | 215 (1900)                         | 123 (1100)                                     |
| PVM045/050   | SAE J744-22-1 (SAE "B")    | 05         | 135 (1200)                         | 135 (1200)*                                    |
|              | SAE J744-25-1 (SAE "B-B")  | 06         | 215 (1900)                         | 215 (1900)*                                    |
| PVM057/063   | SAE J744-25-1 (SAE "B-B")  | 06         | 215 (1900)                         | 215 (1900)*                                    |
|              | SAE J744-32-1 (SAE "C")    | 09         | 450 (3980)                         | 337 (2987)                                     |
| PVM074/081   | SAE J744-32-1 (SAE "C")    | 09         | 450 (3980)                         | 450 (3980)*                                    |
| PVM098/106   | SAE J744-38-1 (SAE "C-C")  | 10         | 765 (6770)                         | 515 (4560)                                     |
|              | SAE J744-32-1 (SAE "C")    | 09         | 450 (3980)                         | 450 (3980)*                                    |
| PVM131/141   | SAE J744-38-1 (SAE "C-C")  | 10         | 765 (6770)                         | 640 (5660)                                     |
|              | SAE J744-44-1 (SAE "D")    | 13         | 1200 (10,620)                      | 640 (5660)                                     |

## ISO Keyed Shafts

| Model Series | Shaft Designation              | Shaft Code | Max. Input Torque†<br>Nm (lb. in.) | Max. Thru-drive Output Torque‡<br>Nm (lb. in.) |
|--------------|--------------------------------|------------|------------------------------------|------------------------------------------------|
| PVM018/020   | ISO 3019/2 E20N (B mount only) | 15         | 113 (1000)                         | Exceeds maximum input torque                   |
|              | ISO 3019/2 E25N (B mount only) | 16         | 215 (1900)                         | Exceeds maximum input torque                   |
|              | ISO 3019/2 E25N (D mount only) | 17         | 215 (1900)                         | 123 (1100)                                     |
| PVM045/050   | ISO 3019/2 E25N                | 17         | 215 (1900)                         | 215 (1900)*                                    |
| PVM057/063   | ISO 3019/2 E25N                | 17         | 215 (1900)                         | 215 (1900)*                                    |
|              | ISO 3019/2 E32N                | 18         | 450 (3980)                         | 337 (2987)                                     |
| PVM074/081   | ISO 3019/2 E32N                | 18         | 450 (3980)                         | 450 (3980)*                                    |
| PVM098/106   | ISO 3019/2 E40N                | 19         | 870 (7700)                         | 515 (4560)                                     |
| PVM131/141   | ISO 3019/2 E32N                | 18         | 450 (3980)                         | 450 (3980)*                                    |
|              | ISO 3019/2 E40N                | 19         | 870 (7700)                         | 640 (5660)                                     |

†Maximum total torque of the thru-drive pump and the thru-driven pump(s).

‡Maximum torque that can be applied to the thru-driven pump(s).

\*This value is limited by the maximum input torque.



# Port Options

## Inlet and Outlet Ports

| Model Series | Inlet/Outlet Port Option<br>(per model code, page 5) | Port<br>Code | Inlet Port "B"                                                                         | Outlet Port "C"                                                                        |
|--------------|------------------------------------------------------|--------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| PVM018/020   | Inch Flange                                          | 02           | SAE J518 Code 61, standard pressure.<br>1.25 inch diameter, .4375-14 x 1.12 bolt holes | SAE J518 Code 61, standard pressure.<br>0.75 inches diameter, .375-16 x .88 bolt holes |
|              | Metric Flange                                        | 04           | ISO 6162 Type II, 315 bar.<br>31,75mm diameter, M10 x 28 bolt holes                    | ISO 6162 Type II, 315 bar.<br>19,05mm diameter, M10 x 22 bolt holes                    |
|              | Inch Tube                                            | 01           | SAE J514 O-ring -20, for 1-1/4 inch O.D. tube                                          | SAE J514 O-ring -12, for 3/4 inch O.D. tube                                            |
|              | Metric Tube                                          | 03           | ISO 6149-1, M42 thread                                                                 | ISO 6149-1, M27 thread                                                                 |
|              | British Parallel Pipe                                | 05           | ISO 228-1:1994 (E), G 1-1/4 thread                                                     | ISO 228-1:1994 (E), G 3/4 thread                                                       |
| PVM045/050   | Inch Flange                                          | 02           | SAE J518 Code 61, standard pressure.<br>2.00 inch diameter, .500-13 x 1.06 bolt holes  | SAE J518 Code 61, standard pressure.<br>1.00 inch diameter, .375-16 x .87 bolt holes   |
|              | Metric Flange                                        | 04           | ISO 6162 Type II, 315 bar.<br>51mm diameter, M12 x 27 bolt holes                       | ISO 6162 Type II, 315 bar.<br>25mm diameter, M10 x 22 bolt holes                       |
|              | Inch Tube                                            | 01           | SAE J514 O-ring -24, for 1-1/2 inch O.D. tube                                          | SAE J514 O-ring -16, for 1 inch O.D. tube                                              |
|              | Metric Tube                                          | 03           | ISO 6149-1, M48 thread                                                                 | ISO 6149-1, M33 thread                                                                 |
|              | British Parallel Pipe                                | 05           | ISO 228-1:1994 (E), G 1-1/2 thread                                                     | ISO 228-1:1994 (E), G1 thread                                                          |
| PVM057/063   | Inch Flange                                          | 02           | SAE J518 Code 61, standard pressure.<br>2.00 inch diameter, .500-13 x 1.06 bolt holes  | SAE J518 Code 61, standard pressure.<br>1.00 inch diameter, .375-16 x .88 bolt holes   |
|              | Metric Flange                                        | 04           | ISO 6162 Type II, 350 bar.<br>51mm diameter, M12 x 29 bolt holes                       | ISO 6162 Type, 350 bar.<br>25mm diameter, M10 x 23 bolt holes                          |
|              | Inch Tube<br>(End ported models only)                | 01           | SAE J514 O-ring -24,<br>for 1-1/2 inch O.D. tube                                       | SAE J514 O-ring<br>-16 for 1 inch O.D. tube                                            |
|              | Metric Tube<br>(End ported models only)              | 03           | ISO 6149-1, M48 thread                                                                 | ISO 6149-1, M33 thread                                                                 |
| PVM074/081   | Inch Flange                                          | 02           | SAE J518 Code 61, standard pressure.<br>2.50 inch diameter, .500-13 x 1.19 bolt holes  | SAE J518 Code 61, standard pressure.<br>1.00 inch diameter, .375-16 x .88 bolt holes   |
|              | Metric Flange                                        | 04           | ISO 6162 Type II, 315 bar.<br>51mm diameter, M12 x 20 bolt holes                       | ISO 6162 Type, 400 bar.<br>25mm diameter, M10 x 17 bolt holes                          |
| PVM098/106   | Inch Flange                                          | 02           | SAE J518 Code 61, standard pressure.<br>2.50 inch diameter, .500-13 x 1.19 bolt holes  | SAE J518 Code 61, standard pressure.<br>1.00 inch diameter, .375-16 x .88 bolt holes   |
|              | Metric Flange                                        | 04           | ISO 6162 Type I, 350 bar.<br>64mm diameter, M12 x 31 bolt holes                        | ISO 6162 Type I, 350 bar.<br>25mm diameter, M10 x 23 bolt holes                        |
| PVM131/141   | Inch Flange                                          | 02           | SAE J518 Code 61, standard pressure.<br>2.50 inch diameter, .500-13 x 1.19 bolt holes  | SAE J518 Code 62, high pressure.<br>1.25 inch diameter, .500-13 x 1.00 bolt holes      |
|              | Metric Flange                                        | 04           | ISO 6162 Type II, 315 bar.<br>64mm diameter, M12 x 31 bolt holes                       | ISO 6162 Type, 400 bar.<br>32mm diameter, M12 x 27 bolt holes                          |

# Port Options

## Drain, Load Sensing, and Gauge Ports

| Model Series            | Inlet/Outlet Port Option<br>(per model code, page 5) | Port<br>Code | Drain Port "F"                                             | Load Sensing Port "J"                                       | Gauge Port "K"                                              |
|-------------------------|------------------------------------------------------|--------------|------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|
| PVM018/020              | Inch Flange or Tube                                  | 01, 03       | SAE J514 O-ring, .50" O.D.<br>tube. .750-16 UNF 2B thread  | SAE J514 O-ring, .25" O.D.<br>tube. .4375-20 UNF 2B thread  | SAE J514 O-ring, .25" tube.<br>.4375-20 UNF 2B thread       |
|                         | Metric Flange or Tube                                | 03, 04       | ISO 6149-1 O-ring<br>M18 x 1,5 thread                      | ISO 6149-1 O-ring<br>M12 x 1,5 thread                       | ISO 6149-1 O-ring<br>M12 x 1,5 thread                       |
|                         | British Parallel Pipe                                | 05           | ISO 228-1:1994 (E)<br>G 1/2 thread                         | ISO 228-1:1994 (E)<br>G 1/4 thread                          | ISO 228-1:1994 (E)<br>G 1/4 thread                          |
| PVM045/050              | Inch Flange or Tube                                  | 01, 03       | SAE J514 O-ring, .625" O.D.<br>tube. .875-14 UNF 2B thread | SAE J514 O-ring, .250" O.D.<br>tube. .4375-20 UNF 2B thread | SAE J514 O-ring, .375" O.D. tube.<br>.5625-18 UNF 2B thread |
|                         | Metric Flange or Tube                                | 03, 04       | ISO 6149-1 O-ring<br>M22 x 1,5 thread                      | ISO 6149-1 O-ring<br>M12 x 1,5 thread                       | ISO 6149-1 O-ring<br>M14 x 1,5 thread                       |
|                         | British Parallel Pipe                                | 05           | ISO 228-1:1994 (E)<br>G 1/2 thread                         | ISO 228-1:1994 (E)<br>G 1/4 thread                          | ISO 228-1:1994 (E)<br>G 1/4 thread                          |
| PVM057/063              | Inch Flange or Tube                                  | 01, 02       | SAE J514 O-ring, .625" O.D.<br>tube. .875-14 UNF 2B thread | SAE J514 O-ring, .375" O.D.<br>tube. .5625-18 UNF 2B thread | SAE J514 O-ring, .375" O.D. tube.<br>.5625-18 UNF 2B thread |
|                         | Metric Flange or Tube                                | 03, 04       | ISO 6149-1 O-ring<br>M22 x 1,5 thread                      | ISO 6149-1 O-ring<br>M14 x 1,5 thread                       | ISO 6149-1 O-ring<br>M14 x 1,5 thread                       |
| PVM074/83<br>PVM098/106 | Inch Flange                                          | 02           | SAE J514 O-ring, .625" O.D.<br>tube. .875-14 UNF 2B thread | SAE J514 O-ring, .375" O.D.<br>tube. .562-18 UNF 2B thread  | SAE J514 O-ring, .375" O.D. tube.<br>.5625-18 UNF 2B thread |
|                         | Metric Flange                                        | 04           | ISO 6149-1 O-ring<br>M22 x 1,5 thread                      | ISO 6149-1 O-ring<br>M14 x 1,5 thread                       | ISO 6149-1 O-ring<br>M14 x 1,5 thread                       |
| PVM131/141              | Inch Flange                                          | 02           | SAE J514 O-ring, .625" O.D.<br>tube. .875-14 UNF 2B thread | SAE J514 O-ring, .375" O.D.<br>tube. .562-18 UNF 2B thread  | SAE J514 O-ring, .375" O.D. tube.<br>.5625-18 UNF 2B thread |
|                         | Metric Flange                                        | 04           | ISO 6149-1 O-ring<br>M22 x 1,5 thread                      | ISO 6149-1 O-ring<br>M14 x 1,5 thread                       | ISO 6149-1 O-ring<br>M14 x 1,5 thread                       |

# Operating Requirements

## Inlet Pressure, case pressure, and operating temperature requirements

| Inlet Pressure           |                                |                         | Case Pressure                |                                |                | Operating Temperature |                              |
|--------------------------|--------------------------------|-------------------------|------------------------------|--------------------------------|----------------|-----------------------|------------------------------|
| Rated Absolute bar (psi) | Minimum bar, absolute (in. Hg) | Maximum Gauge bar (psi) | Maximum Continuous bar (psi) | Maximum Intermittent bar (psi) | Peak bar (psi) | Rated °C (°F)         | Maximum Intermittent °C (°F) |
| 1,0 (14.5)               | 0,85 (5)                       | 3,5 (50)                | 0,5 (7)                      | 2 (30)                         | 3,5 (50)       | 82 (180)              | 104 (220)                    |

## Hydraulic Fluids

| Fluid                                                                                                            | Recommended Operating Viscosity Range cSt (SUS) | Maximum Viscosity at Startup cSt (SUS) | Minimum Viscosity @ Max. Intermittent Temperature of 104°C (220°F) cSt (SUS) |
|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------------------------------------|------------------------------------------------------------------------------|
| Use antiwear hydraulic oil, or automotive type crankcase oil (designations SC, SD, SE, or SF) per SAE J183 FEB80 | 16 to 40 (83 to 187)                            | 1000 (4550)                            | 10 (90)                                                                      |

For more information, see Eaton publication 579. For operation on other alternative or environmentally friendly fluids, please contact your Eaton Representative.

## Fluid Cleanliness

The M Series pumps are rated in anti-wear petroleum fluids with a contamination level of 20/18/13 (Eaton) or ISO 18/13. Operation in fluids with levels more contaminated than this is not recommended. Fluids other than petroleum, severe service cycles, or temperature extremes are cause for adjustment of these codes. Please contact your Eaton Representative for specific duty cycle recommendation.

Eaton M Series pumps, as with any variable displacement piston pumps, will operate with apparent satisfaction in fluids up to the rating specified here. Experience has shown, however, that pump and hydraulic system life is not optimized with high fluid contamination levels (high ISO cleanliness codes).

Proper fluid condition is essential for long and satisfactory life of hydraulic components and systems. Hydraulic fluid must have the correct balance of cleanliness, materials, and additives for protection against wear of components, elevated viscosity and inclusion of air.

Essential information on the correct methods for treating hydraulic fluid is included in Eaton publication 561 – “Eaton Guide to Systemic Contamination Control” – Available from your local Eaton distributor. In this publication, filtration and cleanliness levels for extending the life of axial piston pumps and other system components are listed. Included is an excellent discussion of the selection of products needed to control fluid condition.

## Moment of Inertia (single pump rotating group)

| Model  | Moment of Inertia       |                            |
|--------|-------------------------|----------------------------|
|        | N-m (sec <sup>2</sup> ) | lbf-in (sec <sup>2</sup> ) |
| PVM018 | 0.0012                  | 0.0104                     |
| PVM020 | 0.0012                  | 0.0104                     |
| PVM045 | 0.0036                  | 0.0320                     |
| PVM050 | 0.0034                  | 0.0300                     |
| PVM057 | 0.0052                  | 0.0457                     |
| PVM063 | 0.0051                  | 0.0447                     |
| PVM074 | 0.0078                  | 0.0691                     |
| PVM081 | 0.0073                  | 0.0643                     |
| PVM098 | 0.0132                  | 0.1165                     |
| PVM106 | 0.0123                  | 0.1086                     |
| PVM131 | 0.0213                  | 0.1889                     |
| PVM141 | 0.0210                  | 0.1856                     |

# Installation and Start-up

**Warning:** Care should be taken that mechanical and hydraulic resonances are avoided in the application of the pump. Such resonances can seriously compromise the life and/or safe operation of the pump.

## Drive Data

Mounting attitude can be either horizontal or vertical, using the appropriate case drain ports to ensure that the case remains full of fluid at all times. Consult your local Eaton Representative if a different arrangement is required.

In those cases where geometric tolerances of mounting are critical, or where specific tolerance ranges are required and not specified, consult Eaton Engineering for specific limits.

Direction of shaft rotation, viewed from the prime mover end, must be as indicated in the model designation on the pump – either right hand (clockwise) or left hand (counter-clockwise).

Direct coaxial drive through a flexible coupling is recommended. If drives imposing radial shaft loads are considered, please consult your Eaton Representative.

## Start-up Procedure

Make sure the reservoir and circuit are clean and free of dirt/debris prior to filling with hydraulic fluid.

Fill the reservoir with filtered oil and fill to a level sufficient enough to prevent vortexing at the suction connection to pump inlet. It is good practice to clean the system by flushing and filtering, using an external slave pump.

**Caution:** Before the pump is started, fill the case through the uppermost drain port with hydraulic fluid of the type to be used. The case drain line must be connected directly to the reservoir and must terminate below the oil level.

Once the pump is started, it should prime within a few seconds. If the pump does not prime, check to make sure that there are no restrictions between the reservoir and the inlet to the pump, that the pump is being rotated in the proper direction, and that there are no air leaks in the inlet line and connections. Also check to make sure that trapped air can escape at the pump outlet.

After the pump is primed, tighten the loose outlet connections, then operate for five to ten minutes (unloaded) to remove all trapped air from the circuit.

If the reservoir has a sight gage, make sure the fluid is clear – not milky.

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