



Pump & Motor Division

PGP/PGM 300 Series



ENGINEERING YOUR SUCCESS.



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Commercial PGP/PGM300 Series

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- **Three-piece cast iron construction**
High efficiency and long life in severe operating environments.
- **Low friction bushing**
Provides strength in heavy duty applications.
- **Balanced thrust plates**
Optimize pump efficiency.
- **Largest journal bearings available**
for high pressure and long life.



| Product Features | Description |
|---------------------------------|--|
| Pump type | Heavy-duty, cast iron, external gear |
| Mounting | SAE standard flanges |
| Ports | SAE split flanges and other types of threaded ports, see Specifications |
| Shaft style | SAE splined, keyed, and others, see Specifications |
| Maximum speed | 400 - 3000 rpm, see Specifications |
| Theoretical displacement | See Specifications 0.62 to 2.48 in ³ |
| Drive | Clockwise, counterclockwise, double. Direct drive with flexible coupling is recommended. Pumps subject to radial loads must be specified with an outboard bearing. Axial loading is not allowed. |
| Inlet pressure | 30 psia (15psig) maximum pressure / 5 in. Hg maximum vacuum at operating temperature |
| Outlet pressure | See Specifications |
| Hydraulic fluids | Mineral oil, fire resistant fluids: water-oil emulsions 60/40, MFB; water-glycol, HFC; phosphate-esters, HFD (FPM seals required) |

| Product Features | Description |
|---|---|
| Fluid viscosity | From 7.5 to 1600 cSt (50 to 7500 sus). Recommended 15 to 75 cSt. |
| Fluid temperature | Mineral oil with standard seals: 0°F to 180°F (-20°C to 80°C); Fire resistant fluids HFB, HFC: 0°F to 150°F (-20°C to 65°C) |
| Filtration | ISO 4406 code: <ul style="list-style-type: none"> • 19/16 at 2000 psi/140 bar • 17/14 at 3000 psi/210 bar • 15/12 at 4000 psi/275 bar |
| Direction of rotation (looking at the drive shaft) | CW, CCW, Bi-Rotational |
| Multiple pump assemblies | Up to 6 gear selections of the same model, even with different gear widths |
| Separate or common inlet capability | Common |

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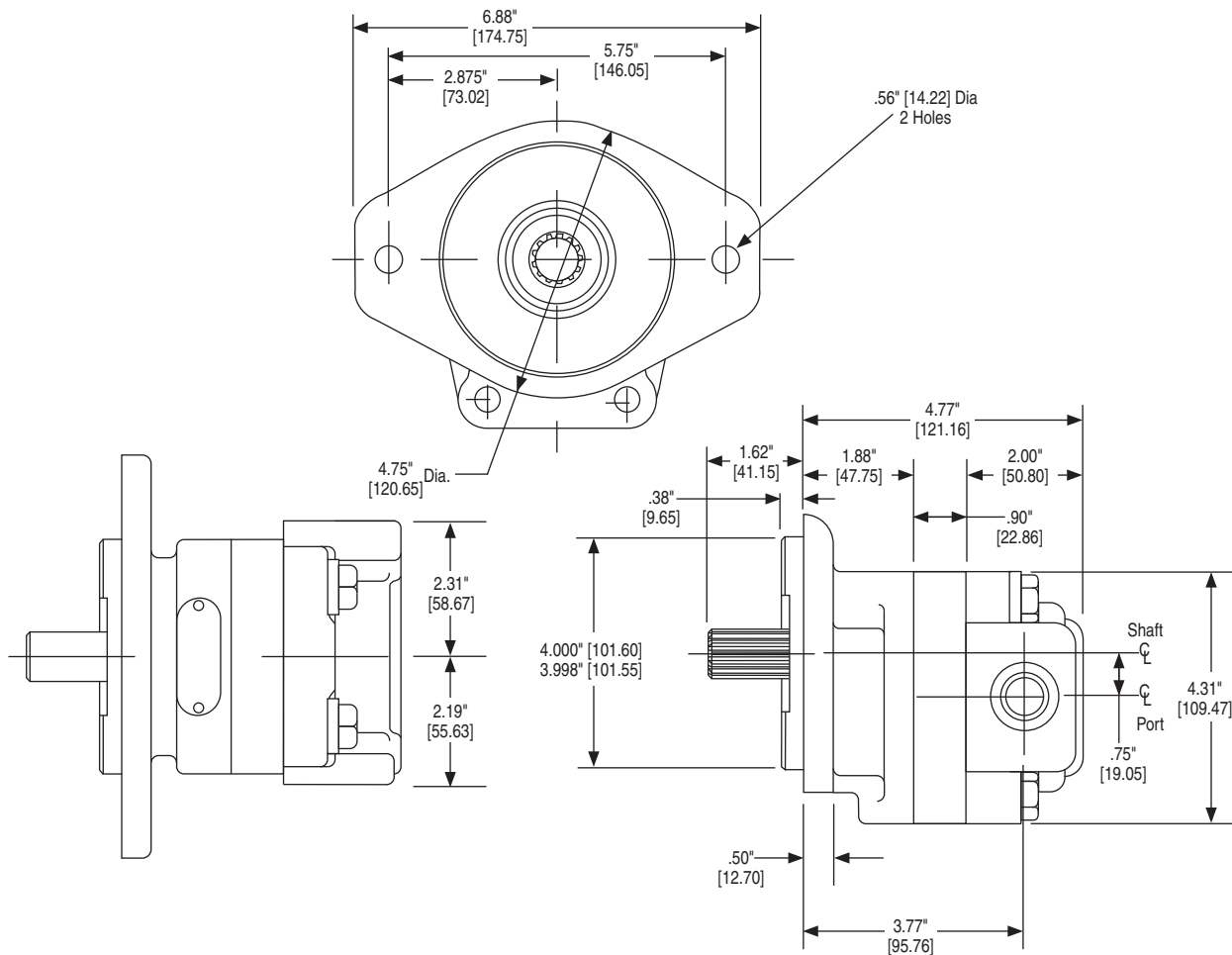
PGP/PGM315 Specifications/Dimensions

PGP/PGM315 Specifications

| PGP315 Frame Size | 05 | 07 | 10 | 12 | 15 | 17 | 20 |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Displacement – cm ³ /rev (in ³ /rev) | 10.2 (0.62) | 15.2 (0.93) | 20.3 (1.24) | 25.4 (1.55) | 30.5 (1.86) | 35.6 (2.17) | 40.6 (2.48) |
| Max continuous pressure – bar (psi) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 228 (3,300) | 200 (2,900) | 172 (2,500) |
| Max Speed – RPM | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 |
| Approximate Weight – Lbs. [kg] | 16.0 [7.2] | 17 [7.7] | 18 [8.2] | 19 [8.6] | 20 [9.1] | 21 [9.5] | 22 [10.0] |

| PGM315 Frame Size | 05 | 07 | 10 | 12 | 15 | 17 | 20 |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Displacement – cm ³ /rev (in ³ /rev) | 10.2 (0.62) | 15.2 (0.93) | 20.3 (1.24) | 25.4 (1.55) | 30.5 (1.86) | 35.6 (2.17) | 40.6 (2.48) |
| Max continuous pressure – bar (psi) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 228 (3,300) | 200 (2,900) | 172 (2,500) |
| Max Speed – RPM | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 |
| Approximate Weight – Lbs. [kg] | 16.0 [7.2] | 17 [7.7] | 18 [8.2] | 19 [8.6] | 20 [9.1] | 21 [9.5] | 22 [10.0] |

PGP/PGM315 Dimensions



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PGP315 Pump Performance Data

| Speed RPM | Output Flow | Gear Widths | | | | | | |
|-----------|-------------|-------------|------|------|--------|--------|--------|------|
| | Input Power | 1/2" | 3/4" | 1" | 1-1/4" | 1-1/2" | 1-3/4" | 2" |
| 900 | GPM | 2.0 | 3.2 | 4.4 | 5.5 | 6.7 | 7.9 | 9.0 |
| | LPM | 8 | 12 | 17 | 21 | 26 | 30 | 34 |
| | HP | 5 | 8 | 11 | 13 | 15 | 15 | 15 |
| | kW | 4 | 6 | 8 | 10 | 11 | 11 | 11 |
| 1200 | GPM | 2.8 | 4.4 | 6.0 | 7.6 | 9.2 | 10.7 | 12.2 |
| | LPM | 11 | 17 | 23 | 29 | 35 | 40 | 46 |
| | HP | 7 | 11 | 14 | 18 | 20 | 21 | 20 |
| | kW | 5 | 8 | 11 | 13 | 15 | 15 | 15 |
| 1500 | GPM | 3.6 | 5.6 | 7.7 | 9.6 | 11.6 | 13.5 | 15.4 |
| | LPM | 14 | 21 | 29 | 36 | 44 | 51 | 58 |
| | HP | 9 | 13 | 18 | 22 | 25 | 26 | 25 |
| | kW | 7 | 10 | 13 | 16 | 19 | 19 | 19 |
| 1800 | GPM | 4.4 | 6.8 | 9.3 | 11.6 | 14.0 | 16.3 | 18.6 |
| | LPM | 17 | 26 | 35 | 44 | 53 | 62 | 70 |
| | HP | 11 | 16 | 21 | 27 | 30 | 31 | 30 |
| | kW | 8 | 12 | 16 | 20 | 22 | 23 | 23 |
| 2100 | GPM | 5.2 | 8.1 | 10.9 | 13.6 | 16.4 | 19.1 | 21.8 |
| | LPM | 20 | 30 | 41 | 51 | 62 | 72 | 83 |
| | HP | 12 | 19 | 25 | 31 | 35 | 36 | 35 |
| | kW | 9 | 14 | 18 | 23 | 26 | 27 | 26 |
| 2400 | GPM | 6.0 | 9.3 | 12.5 | 15.6 | 18.8 | 21.9 | 25.1 |
| | LPM | 23 | 35 | 47 | 59 | 71 | 83 | 95 |
| | HP | 14 | 21 | 28 | 35 | 40 | 41 | 40 |
| | kW | 11 | 16 | 21 | 26 | 30 | 31 | 30 |
| 3000 | GPM | 7.7 | 11.7 | 15.7 | 19.6 | 23.7 | 27.6 | 31.5 |
| | LPM | 29 | 44 | 59 | 74 | 90 | 104 | 119 |
| | HP | 18 | 27 | 35 | 44 | 50 | 51 | 51 |
| | kW | 13 | 20 | 26 | 33 | 37 | 38 | 38 |

Performance data shown are the average results based on a series of laboratory tests of production units and are not necessarily representative of any one unit. Tests were run with the oil reservoir temperature at 120° F and viscosity 150 SUS at 100° F.


NOTE: Pump output flow is at the maximum rated pressure.

PGM315 Motor Performance Data

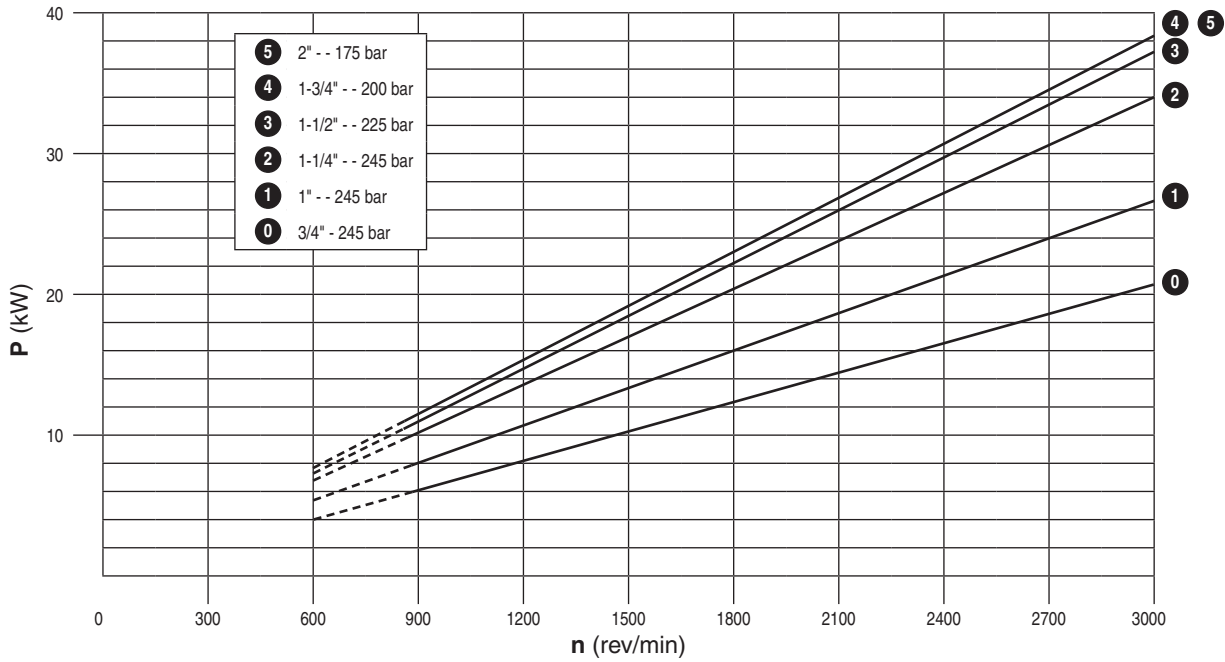
| Speed RPM | Output Torque | Gear Widths | | | | | | | | | |
|-----------|---------------|-------------|------|-----------------|------|-----------------|-------|-----------------|-------|-------------|-------|
| | | 1" 3500 psi | | 1-1/4" 3500 psi | | 1-1/2" 3300 psi | | 1-3/4" 2900 psi | | 2" 2500 psi | |
| | | A | B | A | B | A | B | A | B | A | B |
| 900 | in/lbs | 7.1 | 665 | 8.3 | 830 | 9.6 | 940 | 10.9 | 965 | 12.2 | 950 |
| | Nm | 27 | 75.1 | 32 | 93.8 | 37 | 106.2 | 41 | 109.0 | 46 | 107.3 |
| 1200 | in/lbs | 8.8 | 665 | 10.5 | 830 | 12.2 | 940 | 13.8 | 965 | 15.5 | 950 |
| | Nm | 33 | 75.1 | 40 | 93.8 | 46 | 106.2 | 52 | 109.0 | 59 | 107.3 |
| 1500 | in/lbs | 10.6 | 660 | 12.6 | 825 | 14.7 | 935 | 16.7 | 955 | 18.8 | 945 |
| | Nm | 40 | 74.6 | 48 | 93.2 | 56 | 105.6 | 63 | 107.9 | 71 | 106.8 |
| 1800 | in/lbs | 12.3 | 655 | 14.7 | 820 | 17.2 | 930 | 19.6 | 950 | 22.1 | 940 |
| | Nm | 46 | 74.0 | 56 | 92.6 | 65 | 105.1 | 74 | 107.3 | 84 | 106.2 |
| 2100 | in/lbs | 14.0 | 655 | 16.8 | 820 | 19.7 | 930 | 22.5 | 950 | 25.4 | 940 |
| | Nm | 53 | 74.0 | 64 | 92.6 | 75 | 105.1 | 85 | 107.3 | 96 | 106.2 |
| 2400 | in/lbs | 15.7 | 640 | 18.9 | 800 | 22.2 | 910 | 25.4 | 930 | 28.8 | 920 |
| | Nm | 59 | 72.3 | 72 | 90.4 | 84 | 102.8 | 96 | 105.1 | 109 | 103.9 |
| 3000 | in/lbs | 19.0 | 640 | 23.0 | 800 | 27.2 | 905 | 31.2 | 925 | 35.3 | 915 |
| | Nm | 72 | 72.3 | 87 | 90.4 | 103 | 102.3 | 118 | 104.5 | 134 | 103.4 |

A: Input Flow GPM/LPM; B: Output Torque IN/LBS/Nm

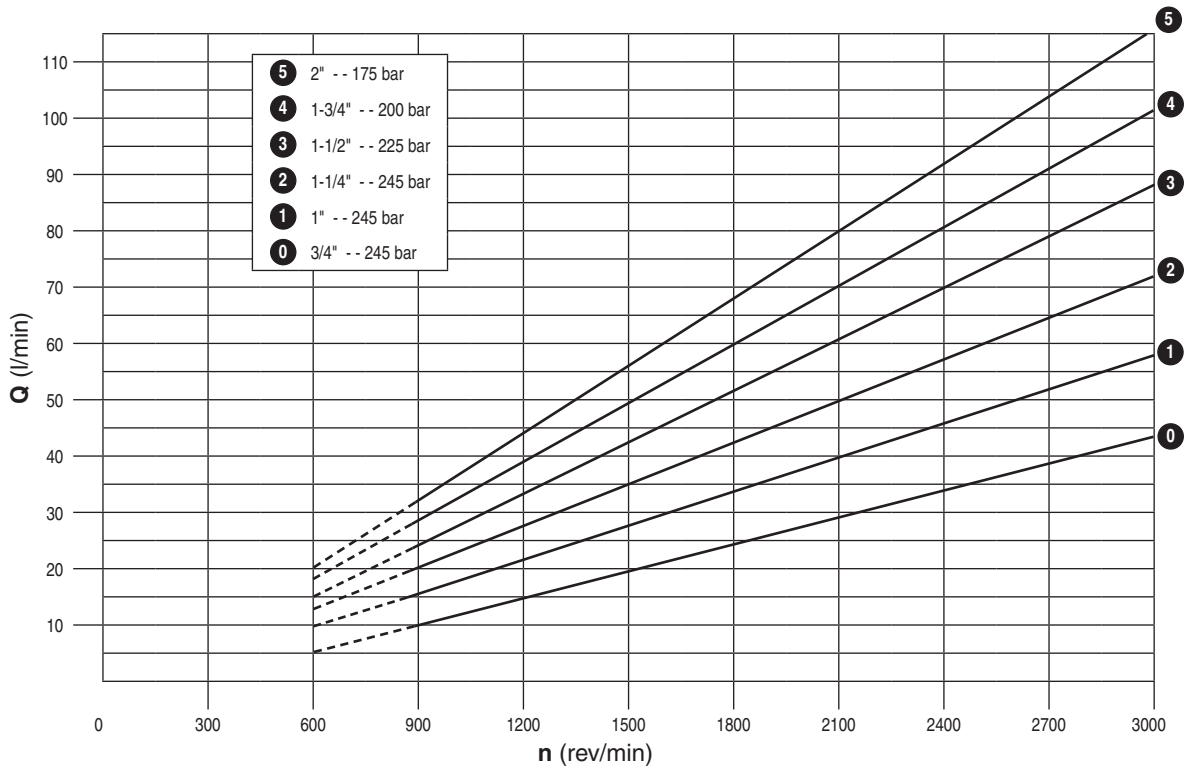
NOTE: In accordance with our policy of continuing product development, we reserve the right to change specifications shown in this catalog without notice.

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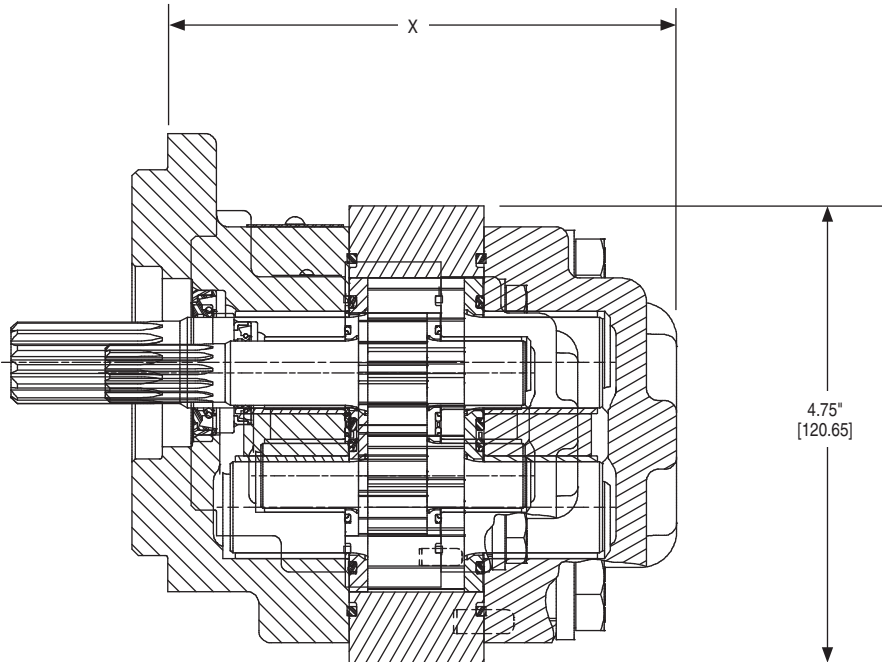
Input



Output

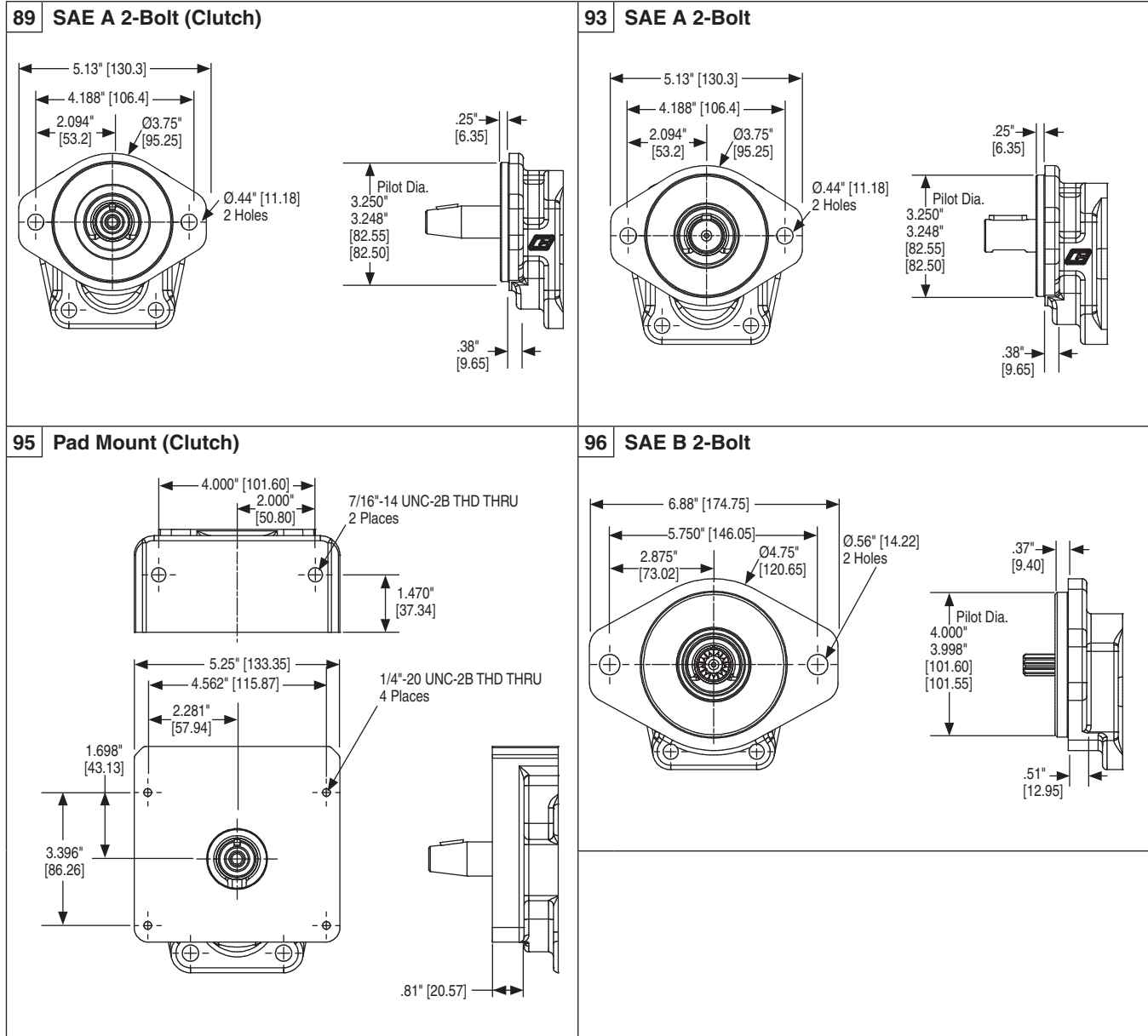


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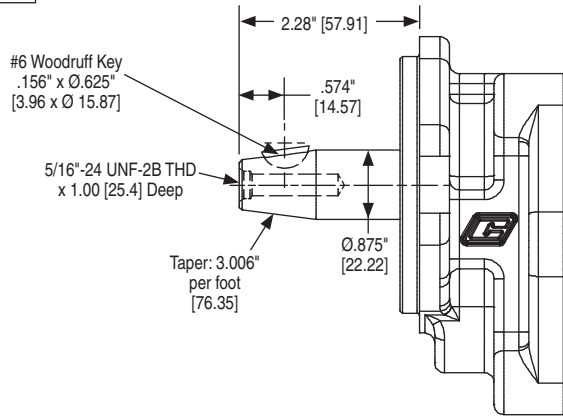
| X DIMENSION | | | | | | | |
|-------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Code | 05 | 07 | 10 | 12 | 15 | 17 | 20 |
| 89 | 4.78" [121.41] | 5.03" [127.76] | 5.28" [134.11] | 5.53" [140.46] | 5.78" [146.81] | 6.03" [153.16] | 6.28" [159.51] |
| 93 | 4.78" [121.41] | 5.03" [127.76] | 5.28" [134.11] | 5.53" [140.46] | 5.78" [146.81] | 6.03" [153.16] | 6.28" [159.51] |
| 95 | 5.52" [140.21] | 5.77" [146.56] | 6.02" [152.91] | 6.27" [159.26] | 6.52" [165.61] | 6.77" [171.96] | 7.02" [178.31] |
| 96 | 4.78" [121.41] | 5.03" [127.76] | 5.28" [134.11] | 5.53" [140.46] | 5.78" [146.81] | 6.03" [153.16] | 6.28" [159.51] |

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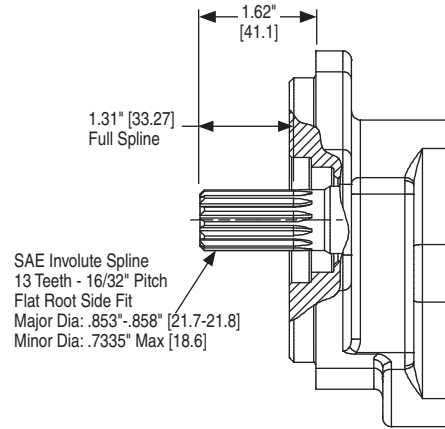


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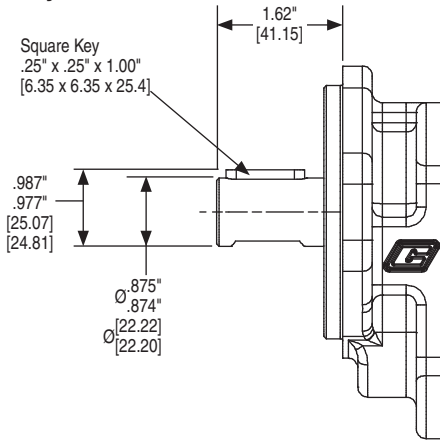
56 Clutch Shaft



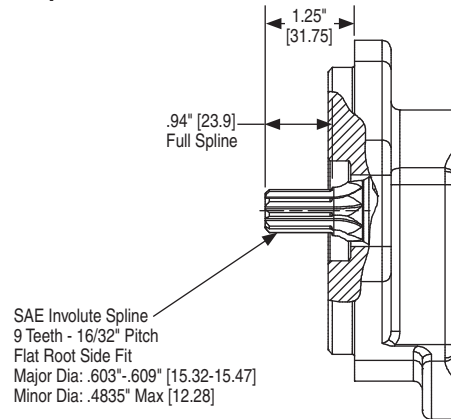
65 SAE B Spline



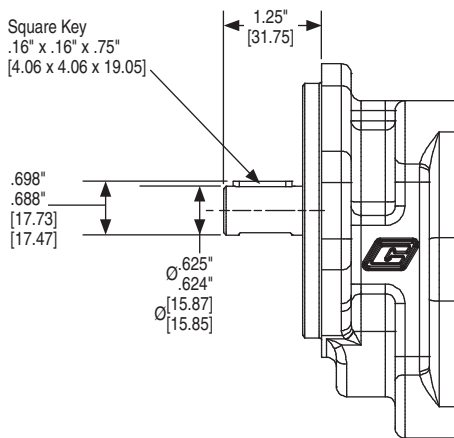
66 SAE B Keyed



96 SAE A Spline



97 SAE A Keyed



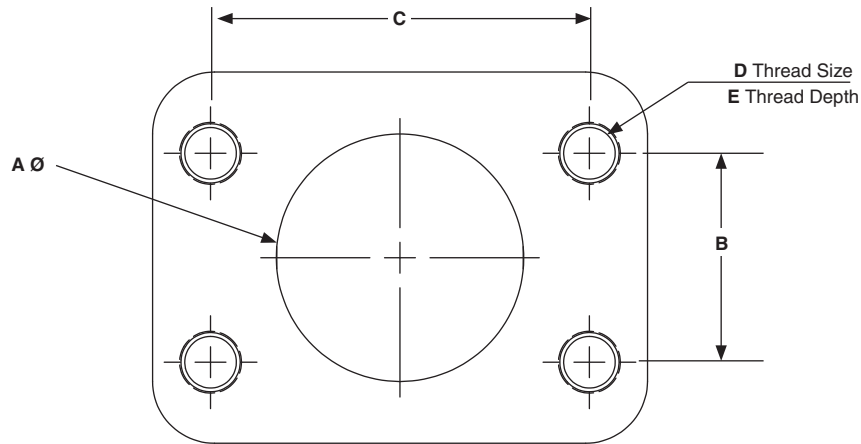
| Shaft Style | Integral: 1 2 pieces: 2 | Maximum Torque | | |
|------------------|----------------------------|----------------|-----|-----|
| | | lb-ft | Nm | |
| SAE A | Splined - 9 Teeth | 1 | 80 | 109 |
| | 5/8" Keyed | 2 | - | - |
| SAE B | Splined - 13 Teeth | 1 | 242 | 328 |
| | 7/8" Keyed | 2 | 167 | 226 |
| SAE BB | Splined - 15 Teeth | 1 | - | - |
| | 1" Keyed | 2 | - | - |
| SAE C | Splined - 14 Teeth | 1 | - | - |
| | 1.25" Keyed | 2 | - | - |
| Connecting Shaft | | | 90 | 122 |

Torque (lb-ft) = $\frac{\text{Pressure (PSI)} \times \text{Displacement (in}^3\text{/rev)}}{75.4}$
 Torque (Nm) = $\frac{\text{Pressure (Bar)} \times \text{Displacement (cc/rev)}}{62.8}$

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SAE Flanged Ports UNC Thread (SSS)

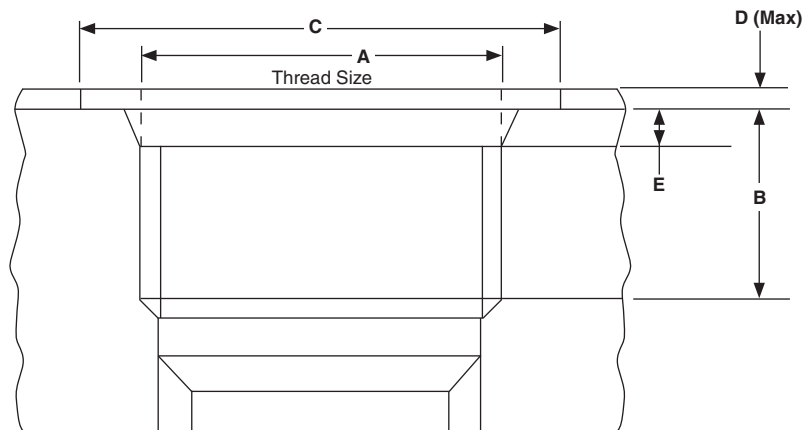
| A | | B | | C | | D | E | |
|------|------|------|------|------|------|----------|------|------|
| inch | mm | inch | mm | inch | mm | UNC | inch | mm |
| 0.50 | 12.7 | 0.69 | 17.5 | 1.50 | 38.1 | 5/16"-18 | 0.94 | 23.9 |
| 0.75 | 19.1 | 0.88 | 22.3 | 1.88 | 47.7 | 3/8"-16 | 0.88 | 22.4 |
| 1.00 | 25.4 | 1.03 | 26.2 | 2.06 | 52.2 | 3/8"-16 | 0.88 | 22.4 |
| 1.25 | 31.8 | 1.19 | 30.2 | 2.31 | 58.7 | 7/16"-14 | 1.12 | 28.4 |
| 1.50 | 38.1 | 1.41 | 35.7 | 2.75 | 69.9 | 1/2"-13 | 1.06 | 26.9 |
| 2.00 | 50.8 | 1.69 | 42.9 | 3.06 | 77.8 | 1/2"-13 | 1.06 | 26.9 |
| 2.50 | 63.5 | 2.00 | 50.8 | 3.50 | 88.9 | 1/2"-13 | 1.19 | 30.2 |



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SAE Straight Thread (ODT)

| ODT | A UNF | B | | C | | D | | E | |
|--------|------------|------|------|------|------|------|-----|------|------|
| | | inch | mm | inch | mm | inch | mm | inch | mm |
| 1/2" | 3/4"-16 | .56 | 14.3 | 1.19 | 30.2 | .09 | 2.4 | .10 | 2.55 |
| 5/8" | 7/8"-14 | .66 | 16.7 | 1.34 | 34.1 | .09 | 2.4 | .10 | 2.55 |
| 3/4" | 1-1/16"-12 | .75 | 19.1 | 1.62 | 41.3 | .09 | 2.4 | .13 | 3.30 |
| 1" | 1-5/16"-12 | .75 | 19.1 | 1.91 | 48.5 | .09 | 2.4 | .13 | 3.30 |
| 1-1/4" | 1-5/8"-12 | .75 | 19.1 | 2.27 | 57.7 | .09 | 2.4 | .13 | 3.35 |
| 1-1/2" | 1-7/8"-12 | .75 | 19.1 | 2.56 | 65.0 | .09 | 2.4 | .13 | 3.35 |
| 2" | 2-1/2"-12 | .75 | 19.1 | 3.48 | 88.4 | .09 | 2.4 | .13 | 3.35 |



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Tandem: Repeat if Necessary

| | | | | | | | | | | | | | | | | | | | | | | |
|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| PG | 1 | 315 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 6 | 6 | 7 | 7 | 10 |
|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|

| Code | 1 – Type |
|------|------------------------------------|
| P | Pump (PE for fluoro-carbon seals) |
| M | Motor (no tandem motors available) |

| Code | 2 – Unit |
|------|---------------------------|
| A | Single Unit |
| B | Tandem Unit (flush studs) |
| L | Unit with Extended Studs |

| Code | 3 – Shaft End Cover |
|------|---|
| 1 | Pump, cw w/o O.B. bearing |
| 2 | Pump, ccw w/o O.B. bearing |
| 9 | Motor, bi-rot w/o O.B. bearing + 1/4" ODT drain |

| Code | 4 – Shaft End Cover |
|------|-----------------------|
| 89 | SAE 2-Bolt for clutch |
| 93 | SAE A 2-Bolt |
| 95 | Pad Mount for clutch |
| 96 | SAE B 2-Bolt |

| Code | 5 – Port End Cover | | |
|---------------------------------|--------------------|----------|------|
| SIDE PORTED | | | |
| CW | CCW | IN | OUT |
| SAE Split Flange (pump) | | | |
| EJ | JE | 1" | 3/4" |
| EK | KE | 1" | 1/2" |
| EL | LE | 3/4" | 3/4" |
| EM | ME | 3/4" | 1/2" |
| OE | EO | 1" | - |
| OF | FO | 3/4" | - |
| OJ | JO | - | 3/4" |
| OL | LO | - | 1/2" |
| SAE Split Flange (motor) | | | |
| DR-Double | | 1" | 1" |
| DS-Double | | 3/4" | 3/4" |
| Unported (pump) | | | |
| BI | | Unported | |

| Code | 5 – Port End Cover (cont.) | | |
|--------------------------------|----------------------------|--------|------|
| SIDE PORTED (cont.) | | | |
| CW | CCW | IN | OUT |
| OD Tube Porting (pump) | | | |
| FB | BF | 1-1/4" | 1" |
| FC | CF | 1-1/4" | 7/8" |
| FG | GF | 1-1/4" | 3/4" |
| FJ | JF | 1-1/4" | 5/8" |
| FL | LF | 1" | 1" |
| FV | VF | 1" | 7/8" |
| FW | WF | 1" | 3/4" |
| FX | XF | 1" | 5/8" |
| FY | YF | 7/8" | 7/8" |
| FZ | ZF | 7/8" | 3/4" |
| BC | CB | 7/8" | 5/8" |
| BG | GB | 7/8" | 1/2" |
| BJ | JB | 3/4" | 3/4" |
| BL | LB | 3/4" | 5/8" |
| BN | NB | 3/4" | 1/2" |
| BV | VB | 1-1/4" | - |
| BW | WB | 1" | - |
| BX | XB | 7/8" | - |
| BY | YB | 3/4" | - |
| BZ | ZB | - | 1" |
| PD | DP | - | 7/8" |
| PE | EP | - | 3/4" |
| PM | MP | - | 5/8" |
| PN | NP | - | 1/2" |
| OD TUBE PORTING (motor) | | | |
| VN-Double | | 1" | 1" |
| VR-Double | | 3/4" | 3/4" |
| VQ-Double | | 1/2" | 1/2" |

| Code | 5 – Port End Cover (cont.) | | |
|-------------------------------------|----------------------------|--------|------|
| REAR PORTED | | | |
| CW | CCW | IN | OUT |
| OD Tube Porting (pump) | | | |
| UC | CU | 1-1/4" | 1" |
| UF | FU | 1-1/4" | 7/8" |
| UN | NU | 1-1/4" | 3/4" |
| UD | DU | 1" | 1" |
| UP | PU | 1" | 7/8" |
| UQ | QU | 1" | 3/4" |
| UR | RU | 1" | 5/8" |
| LN | NL | 7/8" | 7/8" |
| LP | PL | 7/8" | 3/4" |
| LQ | QL | 7/8" | 5/8" |
| LR | RL | 3/4" | 3/4" |
| LS | SL | 3/4" | 5/8" |
| LT | TL | 3/4" | 1/2" |
| OD Tube Porting (motor) | | | |
| RN-Double | | 1" | 1" |
| RQ-Double | | 3/4" | 3/4" |
| RS-Double | | 1/2" | 1/2" |
| BSP Porting (motor) | | | |
| RT-Double | | 1" | 1" |
| RV-Double | | 3/4" | 3/4" |
| RW-Double | | 1/2" | 1/2" |
| National Pipe Thread (motor) | | | |
| RX-Double | | 1" | 1" |
| RY-Double | | 3/4" | 3/4" |
| RZ-Double | | 1/2" | 1/2" |

| Code | 6 – Gear Housing |
|------|------------------|
| AB | Pump |
| EB | Motor |

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Tandem: Repeat if Necessary

| | | | | | | | | | | | | | | | | | | | | | | |
|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| PG | 1 | 315 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 6 | 6 | 7 | 7 | 10 |
|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|

| Code | 7 – Gear Width | | | | |
|------|----------------|------------------------|-----------------------|--------------|-----|
| | Gear Width | in. ³ /rev. | cm ³ /rev. | Max Pressure | |
| | | | | psi | bar |
| 05 | 1/2" | .62 | 10.2 | 3500 | 241 |
| 07 | 3/4" | .93 | 15.2 | 3500 | 241 |
| 10 | 1" | 1.24 | 20.3 | 3500 | 241 |
| 12 | 1-1/4" | 1.55 | 25.4 | 3500 | 241 |
| 15 | 1-1/2" | 1.86 | 30.5 | 3300 | 228 |
| 17 | 1-3/4" | 2.17 | 35.6 | 2900 | 200 |
| 20 | 2" | 2.48 | 40.6 | 2500 | 172 |

| Code | 8 – Drive Shaft |
|------|---|
| 56 | Clutch Pump Tapered, 5/16 - 24 thd. (internal), #6 Woodruff Keyed (single unit only); 1:4 taper |
| 65 | SAE B Splined |
| 66 | SAE B Keyed |
| 96 | SAE A Splined |
| 97 | SAE A Keyed |

For Single or Tandem Units - unless noted

| Code | 9 – Bearing Carriers | | | | |
|--|----------------------|--------|------|------|--|
| DUAL OUTLET - PUMP ONLY | | | | | |
| Outlets: for clockwise porting the top port number comes first; for counter-clockwise porting the bottom port number comes first | | | | | |
| CW | CCW | IN | OUT | | |
| SAE Split Flange | | | | | |
| CA | AC | 1-1/4" | 3/4" | 3/4" | |
| DA | AD | 1-1/4" | 3/4" | 1/2" | |
| EA | AE | 1-1/4" | 1/2" | 1/2" | |
| FA | AF | 1" | 3/4" | 3/4" | |
| GA | AG | 1" | 3/4" | 1/2" | |
| HA | AH | 1" | 1/2" | 1/2" | |
| OD Tube Porting | | | | | |
| JG | GJ | 1-1/2" | 1" | 1" | |
| KG | GK | 1-1/2" | 1" | 7/8" | |
| LG | GL | 1-1/2" | 7/8" | 7/8" | |
| MG | GM | 1-1/2" | 1" | 3/4" | |
| NG | GN | 1-1/2" | 3/4" | 3/4" | |
| PG | GP | 1-1/4" | 1" | 1" | |
| QG | GQ | 1-1/4" | 1" | 7/8" | |
| RG | GR | 1-1/4" | 7/8" | 7/8" | |
| SG | GS | 1-1/4" | 1" | 3/4" | |
| TG | GT | 1-1/4" | 3/4" | 3/4" | |
| UG | GU | 1-1/4" | 3/4" | 5/8" | |
| VG | GV | 1-1/4" | 3/4" | 1/2" | |
| WG | GW | 1-1/4" | 5/8" | 5/8" | |
| XG | GX | 1-1/4" | 1/2" | 1/2" | |
| YG | GY | 1" | 1" | 1" | |
| ZG | GZ | 1" | 1" | 7/8" | |
| RC | CR | 1" | 7/8" | 7/8" | |
| SC | CS | 1" | 1" | 3/4" | |
| TC | CT | 1" | 3/4" | 3/4" | |
| VC | CV | 1" | 3/4" | 5/8" | |
| WC | CW | 1" | 3/4" | 1/2" | |
| XC | CX | 1" | 5/8" | 5/8" | |
| YC | CY | 1" | 1/2" | 1/2" | |

| Code | 9 – Bearing Carriers (cont.) | | | |
|----------------------------------|------------------------------|----------|--------|--|
| SINGLE OUTLET - PUMP ONLY | | | | |
| Outlet for front section | | | | |
| CW | CCW | IN | OUT | |
| SAE Split Flange | | | | |
| CJ | JC | 1-1/4" | 1-1/4" | |
| CL | LC | 1-1/4" | 1" | |
| CM | MC | 1-1/4" | 3/4" | |
| HB | BH | 1-1/4" | 1/2" | |
| HC | CH | 1" | 1" | |
| HF | FH | 1" | 3/4" | |
| HL | LH | 1" | 1/2" | |
| HM | MH | 3/4" | 3/4" | |
| HN | NH | 3/4" | 1/2" | |
| OD Tube Porting | | | | |
| KB | BK | 1-1/2" | 1-1/2" | |
| KC | CK | 1-1/2" | 1-1/4" | |
| KF | FK | 1-1/2" | 1" | |
| KL | LK | 1-1/2" | 7/8" | |
| KM | MK | 1-1/2" | 3/4" | |
| KN | NK | 1-1/4" | 1-1/4" | |
| KO | OK | 1-1/4" | 1" | |
| KP | PK | 1-1/4" | 7/8" | |
| KQ | QK | 1-1/4" | 3/4" | |
| MB | BM | 1-1/4" | 5/8" | |
| ML | LM | 1-1/4" | 1/2" | |
| MN | NM | 1" | 1" | |
| MQ | QM | 1" | 7/8" | |
| MR | RM | 1" | 3/4" | |
| MS | SM | 1" | 5/8" | |
| MT | TM | 1" | 1/2" | |
| MU | UM | 3/4" | 3/4" | |
| MV | VM | 3/4" | 5/8" | |
| MW | WM | 3/4" | 1/2" | |
| Common Inlet Passage | | | | |
| C | D | No Ports | | |

| Code | 10 – Connecting Shaft |
|------|-----------------------|
| 1 | Connecting Shaft |

For connecting tandem units

WARNING: This product can expose you to chemicals including lead or DEHP which are known to the state of California to cause cancer, birth defects, and other reproductive harm. www.p65warnings.ca.gov

- **Three-piece cast iron construction**
High efficiency and long life in severe operating environments.
- **Low friction bushing**
Provides strength in heavy duty applications.
- **Balanced thrust plates**
Optimize pump efficiency.
- **Largest journal bearings available**
for high pressure and long life.



| Product Features | Description |
|----------------------------|--|
| Pump Type | Heavy-duty, cast iron, external gear |
| Mounting | SAE standard flanges, ZF, others |
| Ports | SAE split flanges and other types of threaded ports, see Specifications |
| Shaft Style | SAE splined, keyed, and others, see Specifications |
| Maximum Speed | 400 - 3000 rpm, see Specifications |
| Theor. displacement | See Specifications |
| Drive | Clockwise, counterclockwise, double. Direct drive with flexible coupling is recommended. Pumps subject to radial loads must be specified with an outboard bearing. Axial loading is not allowed. |
| Inlet pressure | 30 psia (15psig) maximum pressure / 5 in. Hg maximum vacuum at operating temperature |
| Outlet pressure | See Specifications |
| Hydraulic fluids | Mineral oil, fire resistant fluids: water-oil emulsions 60/40, MFB; water-glycol, HFC; phosphate-esters, HFD (FPM seals required) |

| Product Features | Description |
|---|---|
| Fluid viscosity | From 7.5 to 1600 cSt (50 to 7500 sus). Recommended 15 to 75 cSt. |
| Fluid temperature | Mineral oil with standard seals: 0°F to 180°F (-20°C to 80°C); Fire resistant fluids HFB, HFC: 0°F to 150°F (-20°C to 65°C) |
| Filtration | ISO 4406 code: <ul style="list-style-type: none"> • 19/16 at 2000 psi/140 bar • 17/14 at 3000 psi/210 bar • 15/12 at 4000 psi/275 bar |
| Direction of rotation (looking at the drive shaft) | CW, CCW, Bi-Rotational |
| Multiple pump assemblies | Up to 6 gear selections of the same model, even with different gear widths |
| Separate or common inlet capability | Common |

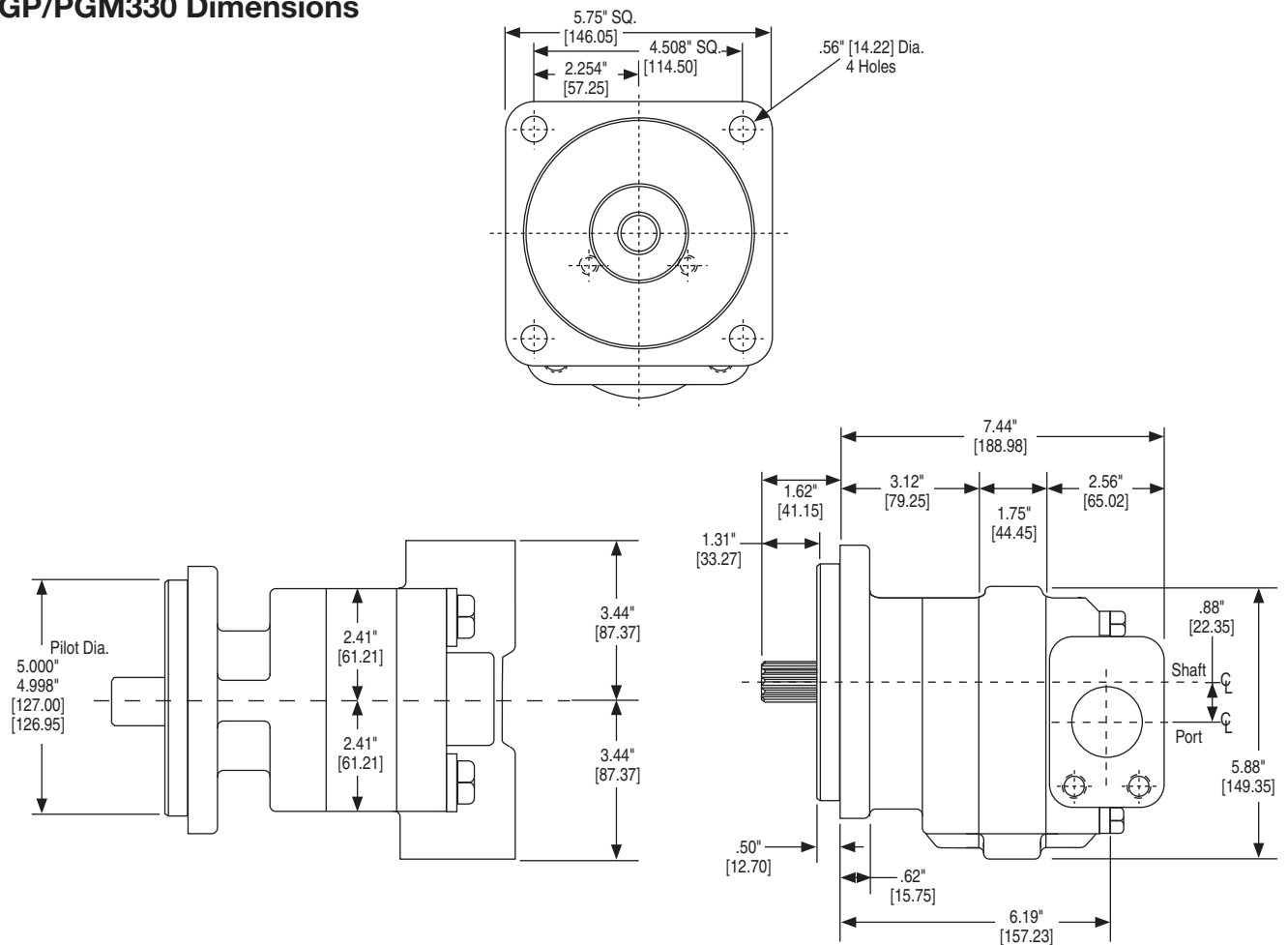
⚠ WARNING: This product can expose you to chemicals including lead or DEHP which are known to the state of California to cause cancer, birth defects, and other reproductive harm. www.p65warnings.ca.gov

PGP/PGM330 Specifications

| PGP330 Frame Size | 05 | 07 | 10 | 12 | 15 | 17 | 20 |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Displacement – cm ³ /rev (in ³ /rev) | 16.1 (0.99) | 24.2 (1.48) | 32.3 (1.97) | 40.4 (2.46) | 48.4 (2.96) | 56.5 (3.45) | 64.6 (3.94) |
| Max continuous pressure – bar (psi) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 224 (3,250) | 207 (3,000) |
| Max Speed – RPM | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 |
| Approximate Weight – Lbs. [kg] | 33.6 [15.2] | 34.8 [15.8] | 36 [16.3] | 37.3 [16.9] | 38.5 [17.5] | 40 [18.1] | 41.3 [18.7] |

| PGM330 Frame Size | 05 | 07 | 10 | 12 | 15 | 17 | 20 |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Displacement – cm ³ /rev (in ³ /rev) | 16.1 (0.99) | 24.2 (1.48) | 32.3 (1.97) | 40.4 (2.46) | 48.4 (2.96) | 56.5 (3.45) | 64.6 (3.94) |
| Max continuous pressure – bar (psi) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 224 (3,250) | 207 (3,000) |
| Max Speed – RPM | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 |
| Approximate Weight – Lbs. [kg] | 33.6 [15.2] | 34.8 [15.8] | 36 [16.3] | 37.3 [16.9] | 38.5 [17.5] | 40.0 [18.1] | 41.3 [18.7] |

PGP/PGM330 Dimensions



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PGP/PGM330 Performance Data

PGP330 Pump Performance Data

| Speed RPM | Output Flow Input Power | Gear Widths | | | | | | |
|-----------|----------------------------|-------------|------|------|--------|--------|--------|------|
| | | 1/2" | 3/4" | 1" | 1-1/4" | 1-1/2" | 1-3/4" | 2" |
| 900 | GPM | 3.2 | 5.1 | 7.0 | 8.8 | 10.6 | 12.4 | 14.3 |
| | LPM | 12 | 19 | 26 | 33 | 40 | 47 | 54 |
| | HP | 9 | 13 | 17 | 21 | 26 | 28 | 29 |
| | kW | 6 | 10 | 13 | 16 | 19 | 21 | 22 |
| 1200 | GPM | 4.5 | 7.0 | 9.5 | 12.0 | 14.5 | 16.9 | 19.4 |
| | LPM | 17 | 26 | 36 | 45 | 55 | 64 | 73 |
| | HP | 11 | 17 | 23 | 28 | 34 | 37 | 39 |
| | kW | 8 | 13 | 17 | 21 | 25 | 28 | 29 |
| 1500 | GPM | 5.8 | 8.9 | 12.1 | 15.2 | 18.3 | 21.4 | 24.5 |
| | LPM | 22 | 34 | 46 | 57 | 69 | 81 | 93 |
| | HP | 14 | 21 | 28 | 35 | 43 | 46 | 49 |
| | kW | 11 | 16 | 21 | 26 | 32 | 34 | 36 |
| 1800 | GPM | 7.1 | 10.8 | 14.7 | 18.4 | 22.1 | 25.9 | 29.6 |
| | LPM | 27 | 41 | 55 | 70 | 84 | 98 | 112 |
| | HP | 17 | 26 | 34 | 43 | 51 | 55 | 58 |
| | kW | 13 | 19 | 25 | 32 | 38 | 41 | 44 |
| 2100 | GPM | 8.4 | 12.7 | 17.2 | 21.6 | 26.0 | 30.3 | 34.7 |
| | LPM | 32 | 48 | 65 | 82 | 98 | 115 | 131 |
| | HP | 20 | 30 | 40 | 50 | 60 | 65 | 68 |
| | kW | 15 | 22 | 30 | 37 | 44 | 48 | 51 |
| 2400 | GPM | 9.6 | 14.7 | 19.8 | 24.8 | 29.8 | 34.8 | 39.8 |
| | LPM | 36 | 55 | 75 | 94 | 113 | 132 | 151 |
| | HP | 23 | 34 | 45 | 57 | 68 | 74 | 78 |
| | kW | 17 | 25 | 34 | 42 | 51 | 55 | 58 |
| 3000 | GPM | 12.2 | 18.5 | 24.9 | 31.2 | 37.5 | 43.8 | 50.1 |
| | LPM | 46 | 70 | 94 | 118 | 142 | 166 | 190 |
| | HP | 28 | 43 | 57 | 71 | 85 | 92 | 97 |
| | kW | 21 | 32 | 42 | 53 | 64 | 69 | 73 |

PGM330 Motor Performance Data

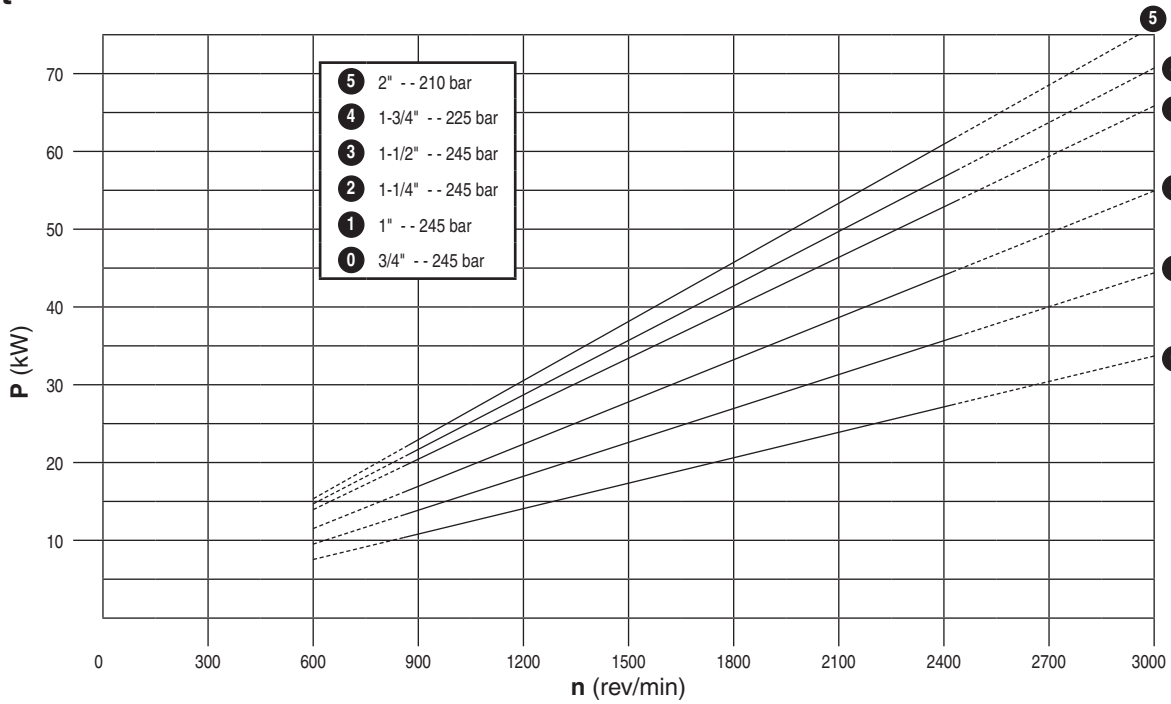
| Speed RPM | Output Torque | Gear Widths | | | | | | | | | |
|-----------|---------------|-------------|-------|-----------------|-------|-----------------|-------|-----------------|-------|-------------|-------|
| | | 1" 3500 psi | | 1-1/4" 3500 psi | | 1-1/2" 3500 psi | | 1-3/4" 3250 psi | | 2" 3000 psi | |
| | | A | B | A | B | A | B | A | B | A | B |
| 900 | in/lbs | 10.1 | 1010 | 12.3 | 1270 | 14.5 | 1530 | 16.7 | 1665 | 19.0 | 1770 |
| | Nm | 38 | 114.1 | 47 | 143.5 | 55 | 172.9 | 63 | 188.1 | 72 | 200.0 |
| 1200 | in/lbs | 12.8 | 1005 | 15.7 | 1265 | 18.6 | 1525 | 21.4 | 1660 | 24.3 | 1760 |
| | Nm | 49 | 113.6 | 59 | 142.9 | 70 | 172.3 | 81 | 187.6 | 92 | 198.9 |
| 1500 | in/lbs | 15.6 | 1000 | 19.1 | 1255 | 22.6 | 1515 | 26.1 | 1650 | 29.6 | 1750 |
| | Nm | 59 | 113.0 | 72 | 141.8 | 85 | 171.2 | 99 | 186.4 | 112 | 197.7 |
| 1800 | in/lbs | 18.4 | 995 | 22.5 | 1250 | 26.6 | 1505 | 30.8 | 1640 | 34.9 | 1740 |
| | Nm | 69 | 112.4 | 85 | 141.2 | 101 | 170.0 | 116 | 185.3 | 132 | 196.6 |
| 2100 | in/lbs | 21.1 | 990 | 25.9 | 1240 | 30.7 | 1495 | 35.4 | 1625 | 40.2 | 1720 |
| | Nm | 80 | 111.9 | 98 | 140.1 | 116 | 168.9 | 134 | 183.6 | 152 | 194.3 |
| 2400 | in/lbs | 23.9 | 985 | 29.3 | 1235 | 34.7 | 1480 | 40.1 | 1605 | 45.5 | 1695 |
| | Nm | 90 | 111.3 | 111 | 139.5 | 131 | 167.2 | 152 | 181.3 | 172 | 191.5 |
| 3000 | in/lbs | 29.2 | 980 | 35.9 | 1230 | 42.6 | 1475 | 49.3 | 1595 | 56.0 | 1685 |
| | Nm | 110 | 110.7 | 136 | 139.0 | 161 | 166.7 | 186 | 180.2 | 212 | 190.4 |

A: Input Flow GPM/LPM; B: Output Torque IN/LBS/Nm

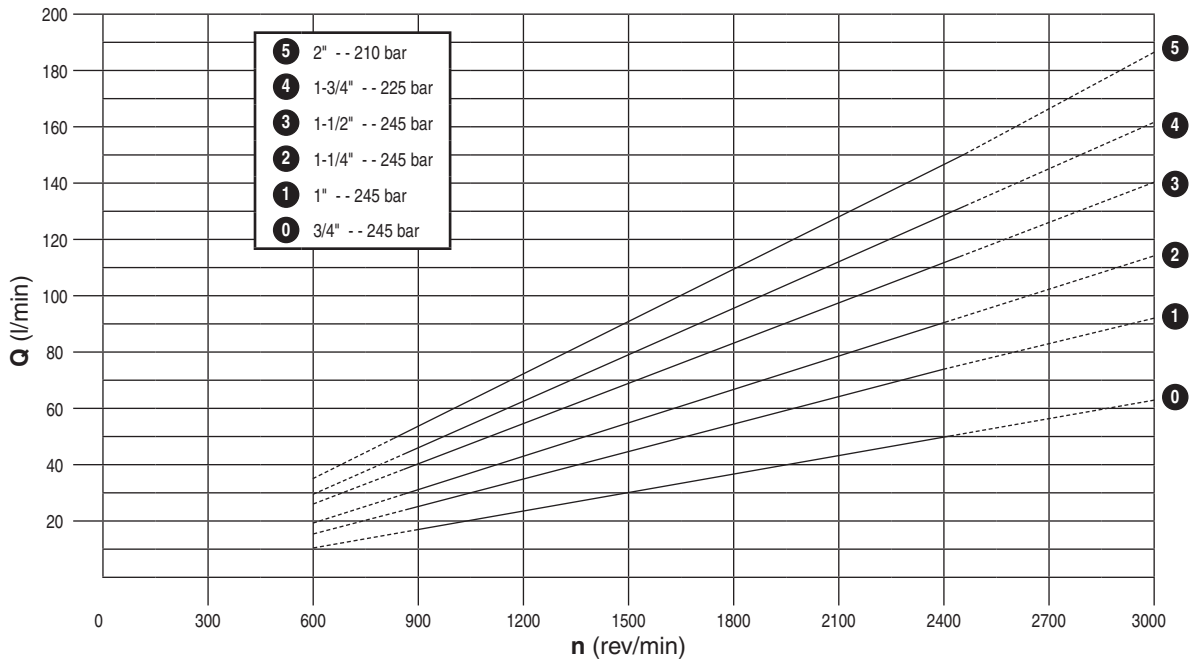
Note: In accordance with our policy of continuing product development, we reserve the right to change specifications shown in this catalog without notice.

WARNING: This product can expose you to chemicals including lead or DEHP which are known to the state of California to cause cancer, birth defects, and other reproductive harm. www.p65warnings.ca.gov

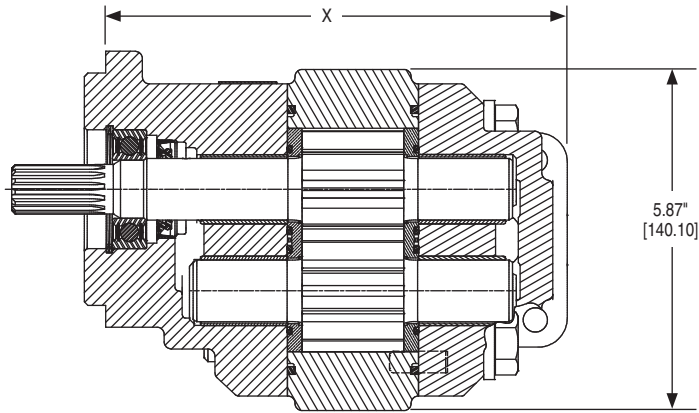
Input



Output

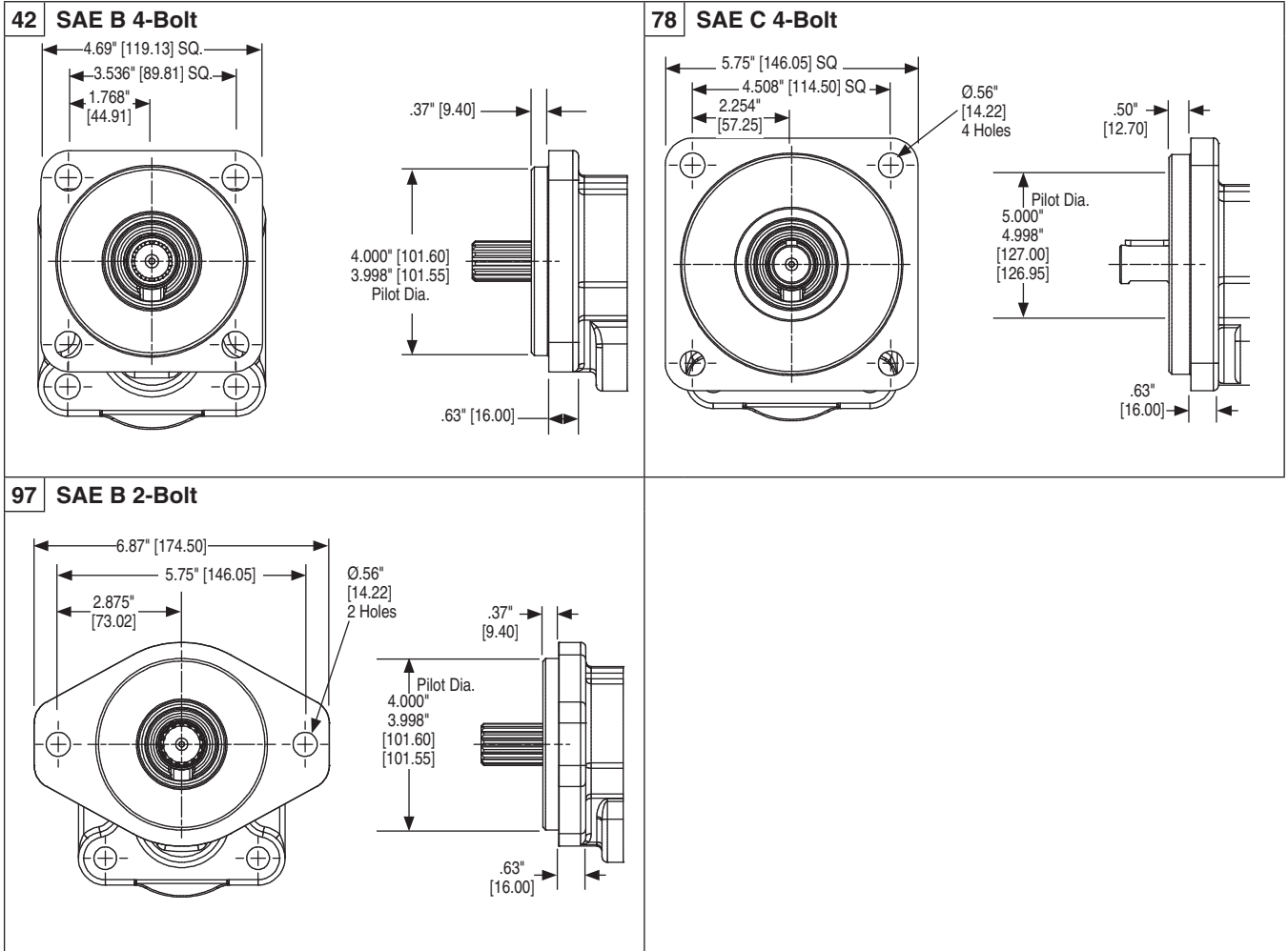


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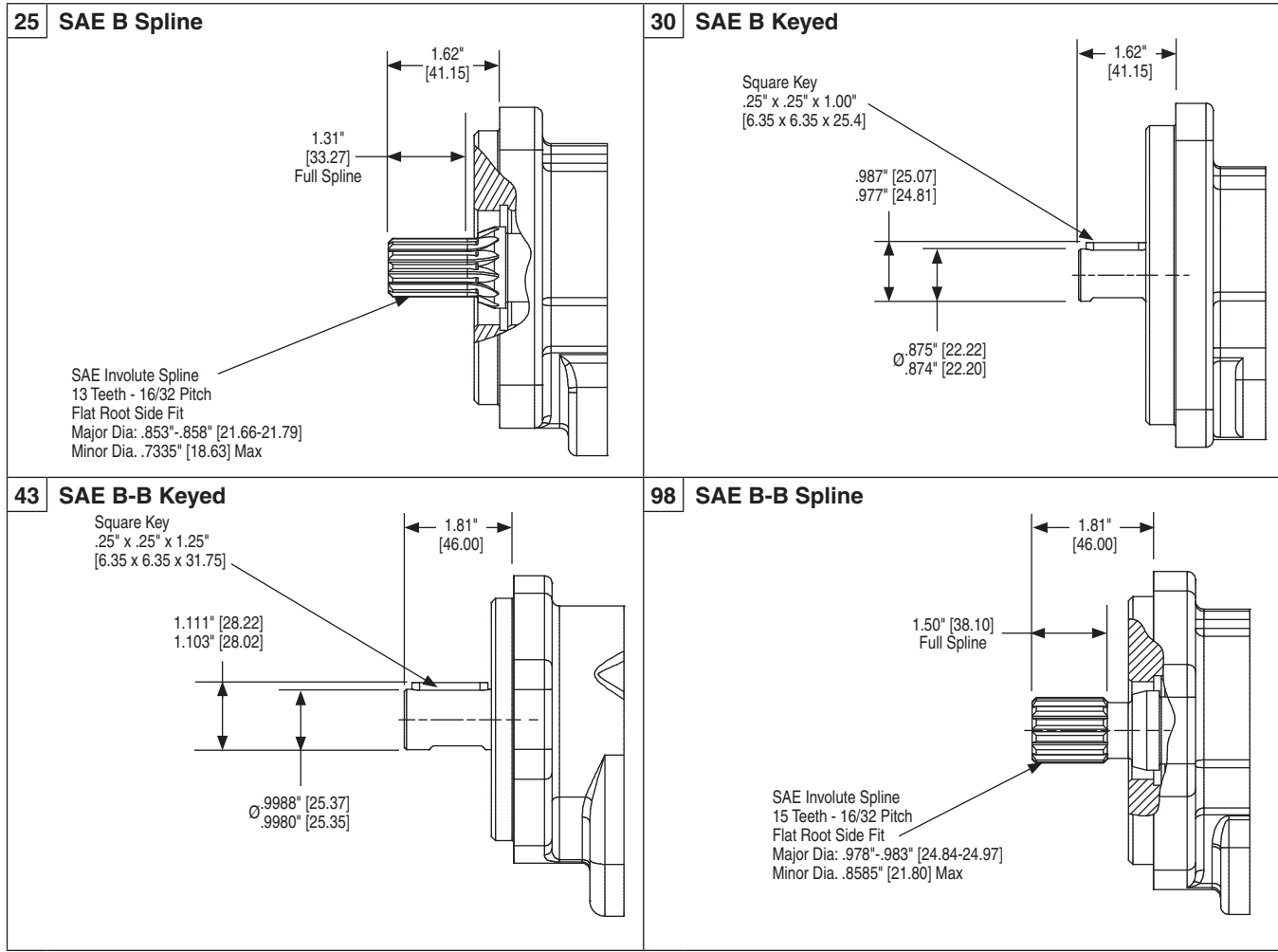


| X DIMENSION | | | | | | | |
|-------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| SEC CODE | 05 | 07 | 10 | 12 | 15 | 17 | 20 |
| 42 | 6.69" [169.93] | 6.94" [176.28] | 7.19" [182.63] | 7.44" [188.98] | 7.69" [195.33] | 7.94" [201.68] | 8.19" [208.02] |
| 78 | 6.69" [169.93] | 6.94" [176.28] | 7.19" [182.63] | 7.44" [188.98] | 7.69" [195.33] | 7.94" [201.68] | 8.19" [208.02] |
| 97 | 6.69" [169.93] | 6.94" [176.28] | 7.19" [182.63] | 7.44" [188.98] | 7.69" [195.33] | 7.94" [201.68] | 8.19" [208.02] |

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WARNING: This product can expose you to chemicals including lead or DEHP which are known to the state of California to cause cancer, birth defects, and other reproductive harm. www.p65warnings.ca.gov



| Shaft Style | | Integral: 1 2 pieces: 2 | Maximum Torque | |
|-------------|--------------------|----------------------------|----------------|------------|
| | | | lb-ft | Nm |
| SAE A | Splined - 9 Teeth | 1 | - | - |
| | 5/8" Keyed | 1 2 | - - | - - |
| SAE B | Splined - 13 Teeth | 1 2 | 242 159 | 328 215 |
| | 7/8" Keyed | 1 2 | 167 159 | 226 215 |
| SAE BB | Splined - 15 Teeth | 1 2 | 371 159 | 503 215 |
| | 1" Keyed | 1 2 | 250 159 | 339 215 |
| SAE C | Splined - 14 Teeth | 1 2 | - 159 | - 215 |
| | 1.25" Keyed | 1 2 | - 159 | - 215 |
| | Connecting Shaft | | 159 | 215 |

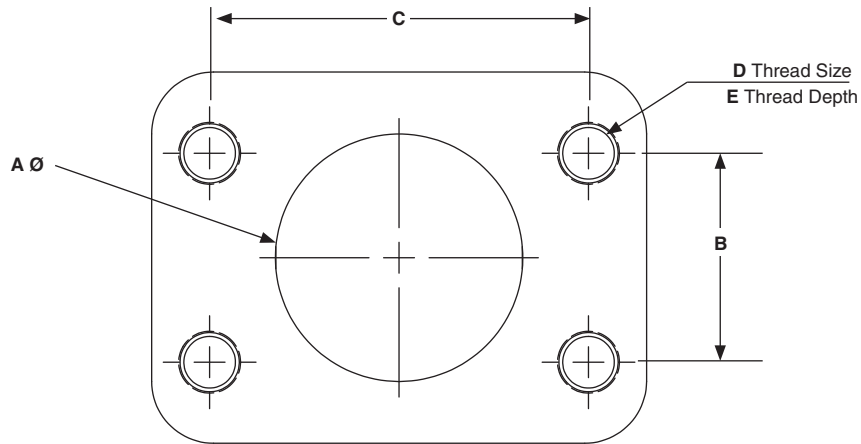
Torque (lb-ft) = $\frac{\text{Pressure (PSI)} \times \text{Displacement (in}^3\text{/rev)}}{75.4}$

Torque (Nm) = $\frac{\text{Pressure (Bar)} \times \text{Displacement (cc/rev)}}{62.8}$

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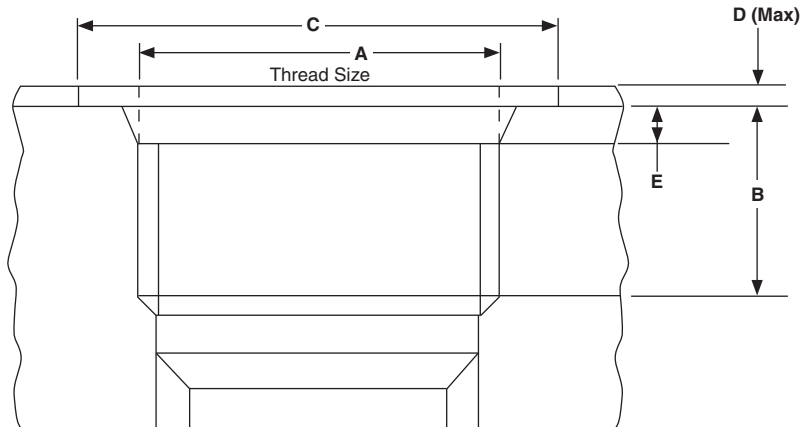
SAE Flanged Ports UNC Thread (SSS)

| A | | B | | C | | D | E | |
|------|------|------|------|------|------|----------|------|------|
| inch | mm | inch | mm | inch | mm | UNC | inch | mm |
| 0.50 | 12.7 | 0.69 | 17.5 | 1.50 | 38.1 | 5/16"-18 | 0.94 | 23.9 |
| 0.75 | 19.1 | 0.88 | 22.3 | 1.88 | 47.7 | 3/8"-16 | 0.88 | 22.4 |
| 1.00 | 25.4 | 1.03 | 26.2 | 2.06 | 52.2 | 3/8"-16 | 0.88 | 22.4 |
| 1.25 | 31.8 | 1.19 | 30.2 | 2.31 | 58.7 | 7/16"-14 | 1.12 | 28.4 |
| 1.50 | 38.1 | 1.41 | 35.7 | 2.75 | 69.9 | 1/2"-13 | 1.06 | 26.9 |
| 2.00 | 50.8 | 1.69 | 42.9 | 3.06 | 77.8 | 1/2"-13 | 1.06 | 26.9 |
| 2.50 | 63.5 | 2.00 | 50.8 | 3.50 | 88.9 | 1/2"-13 | 1.19 | 30.2 |



SAE Straight Thread (ODT)

| ODT | A UNF | B | | C | | D | | E | |
|--------|------------|------|------|------|------|------|-----|------|------|
| | | inch | mm | inch | mm | inch | mm | inch | mm |
| 1/2" | 3/4"-16 | .56 | 14.3 | 1.19 | 30.2 | .09 | 2.4 | .10 | 2.55 |
| 5/8" | 7/8"-14 | .66 | 16.7 | 1.34 | 34.1 | .09 | 2.4 | .10 | 2.55 |
| 3/4" | 1-1/16"-12 | .75 | 19.1 | 1.62 | 41.3 | .09 | 2.4 | .13 | 3.30 |
| 1" | 1-5/16"-12 | .75 | 19.1 | 1.91 | 48.5 | .09 | 2.4 | .13 | 3.30 |
| 1-1/4" | 1-5/8"-12 | .75 | 19.1 | 2.27 | 57.7 | .09 | 2.4 | .13 | 3.35 |
| 1-1/2" | 1-7/8"-12 | .75 | 19.1 | 2.56 | 65.0 | .09 | 2.4 | .13 | 3.35 |
| 2" | 2-1/2"-12 | .75 | 19.1 | 3.48 | 88.4 | .09 | 2.4 | .13 | 3.35 |



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Tandem: Repeat if Necessary

| | | | | | | | | | | | | | | | | | | | | | | |
|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| PG | 1 | 330 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 6 | 6 | 7 | 7 | 10 |
|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|

| Code | 1 – Type |
|------|----------|
| P | Pump |
| M | Motor |

| Code | 2 – Unit |
|------|---|
| A | Single Unit |
| B | Tandem Unit (flush studs) |
| C | Single or Tandem with two-piece shaft (O.B. bearing required) |
| L | Unit with Extended Studs |

| Code | 3 – Shaft End Cover |
|------|--|
| 1 | Pump, cw w/o O.B. bearing |
| 2 | Pump, ccw w/o O.B. bearing |
| 4 | Pump, cw with O.B. bearing |
| 5 | Pump, ccw with O.B. bearing |
| 8 | Motor, bi-rot with O.B. bearing + 1/4" ODT drain |
| 9 | Motor, bi-rot w/o O.B. bearing + 1/4" ODT drain |


| Code | 4 – Shaft End Cover |
|------|---------------------|
| 42 | SAE B 4-Bolt |
| 78 | SAE C 4-Bolt |
| 97 | SAE B 2-Bolt |

| Code | 5 – Port End Cover | | | |
|---------------------------------|--------------------|------------|-----------|------------|
| SIDE PORTED | | | | |
| | CW | CCW | IN | OUT |
| SAE Split Flange (pump) | | | | |
| EJ | JE | 1-1/2" | 1-1/4" | |
| EK | KE | 1-1/2" | 1" | |
| EL | LE | 1-1/4" | 1-1/4" | |
| EM | ME | 1-1/4" | 1" | |
| EN | NE | 1" | 1" | |
| OF | FO | 1-1/2" | - | |
| OG | GO | 1-1/4" | - | |
| OJ | JO | 1" | - | |
| OM | MO | - | 1-1/4" | |
| ON | NO | - | 1" | |
| SAE Split Flange (motor) | | | | |
| CS-Double | | 1-1/4" | 1-1/4" | |
| CT-Double | | 1" | 1" | |
| CV-Double | | 3/4" | 3/4" | |
| OD Tube Porting (pump) | | | | |
| FJ | JF | 1-1/4" | 1" | |
| FL | LF | 1" | 1" | |
| BG | GB | 1-1/4" | - | |
| BJ | JB | 1" | - | |
| BN | NB | - | 1" | |
| OD Tube Porting (motor) | | | | |
| VC-Double | | 1-1/4" | 1-1/4" | |
| VN-Double | | 1" | 1" | |
| VR-Double | | 3/4" | 3/4" | |
| Unported (pump) | | | | |
| BI | | Unported | | |
| Unported (motor) | | | | |
| BA | | Unported | | |

| Code | 6 – Gear Housing |
|------|------------------|
| AB | Pump |
| EB | Motor |

| Code | 7 – Gear Width | | | | |
|------|----------------|------------------------|-----------------------|--------------|-----|
| | Gear Width | in. ³ /rev. | cm ³ /rev. | Max Pressure | |
| | | | | psi | bar |
| 05 | 1/2" | 0.99 | 16.1 | 3500 | 241 |
| 07 | 3/4" | 1.48 | 24.2 | 3500 | 241 |
| 10 | 1" | 1.97 | 32.3 | 3500 | 241 |
| 12 | 1-1/4" | 2.46 | 40.4 | 3500 | 241 |
| 15 | 1-1/2" | 2.96 | 48.4 | 3500 | 241 |
| 17 | 1-3/4" | 3.45 | 56.5 | 3250 | 224 |
| 20 | 2" | 3.94 | 64.6 | 3000 | 207 |

| Code | 8 – Shaft Type |
|------|-------------------------------|
| 7 | SAE C Spline (two-piece only) |
| 11 | SAE C Keyed (two-piece only) |
| 25 | SAE B Spline |
| 30 | SAE B Keyed |
| 43 | SAE BB Keyed |

 **WARNING:** This product can expose you to chemicals including lead or DEHP which are known to the state of California to cause cancer, birth defects, and other reproductive harm. www.p65warnings.ca.gov

Tandem: Repeat if Necessary

| | | | | | | | | | | | | | | | | | | | | | | |
|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| PG | 1 | 330 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 6 | 6 | 7 | 7 | 10 |
|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|


| | | | | | |
|--|-----------------------------|-----------|------------|--------|--|
| 98 | SAE BB Splined | | | | |
| For Single or Tandem Units - unless noted | | | | | |
| Code | 9 – Bearing Carriers | | | | |
| DUAL OUTLET - PUMP ONLY | | | | | |
| Outlets: for clockwise porting the top port number comes first; for counter-clockwise porting the bottom port number comes first | | | | | |
| CW | CCW | IN | OUT | | |
| SAE Split Flange | | | | | |
| AM | MA | 2" | 1-1/4" | 1-1/4" | |
| AN | NA | 2" | 1-1/4" | 1" | |
| AP | PA | 2" | 1" | 1" | |
| AT | TA | 1-1/2" | 1-1/4" | 1-1/4" | |
| AU | UA | 1-1/2" | 1-1/4" | 1" | |
| AV | VA | 1-1/2" | 1" | 1" | |
| AW | WA | 1-1/4" | 1-1/4" | 1-1/4" | |
| AX | XA | 1-1/4" | 1-1/4" | 1" | |
| AY | YA | *1-1/4" | 1" | 1" | |
| AZ | ZA | 1" | 1" | 1" | |
| OD Tube Porting | | | | | |
| GV | VG | 1-1/2" | 1" | 1" | |
| GY | YG | 1-1/4" | 1" | 1" | |
| GZ | ZG | 1" | 1" | 1" | |

* Outlet port for rear section

| | | | | |
|----------------------------------|-------------------------------------|-----------|------------|--|
| Code | 9 – Bearing Carriers (cont.) | | | |
| SINGLE OUTLET - PUMP ONLY | | | | |
| Outlet for front section | | | | |
| CW | CCW | IN | OUT | |
| SAE Split Flange | | | | |
| HB | BH | 2" | 1-1/2" | |
| HC | CH | 2" | 1-1/4" | |
| HF | FH | 2" | 1" | |
| HL | LH | 1-1/2" | 1-1/2" | |
| HM | MH | 1-1/2" | 1-1/4" | |
| HN | NH | 1-1/2" | 1" | |
| HO | OH | 1-1/4" | 1-1/4" | |
| HP | PH | 1-1/4" | 1" | |
| HQ | QH | 1" | 1" | |
| RS | SR | 1-1/4" | 1" | |
| OD Tube Porting | | | | |
| KM | MK | 1-1/2" | 1-1/4" | |
| KN | NK | 1-1/2" | 1" | |
| KO | OK | 1-1/4" | 1-1/4" | |
| KP | PK | 1-1/4" | 1" | |
| KQ | QK | 1" | 1" | |

| | | | | |
|---------------------------------|-------------------------------------|-----------|------------|--|
| Code | 9 – Bearing Carriers (cont.) | | | |
| COMBINED OUTLET | | | | |
| Outlet for front section | | | | |
| CW | CCW | IN | OUT | |
| SAE Split Flange (pump) | | | | |
| UN | NU | 2" | 1-1/2" | |
| UO | OU | 2" | 1-1/4" | |
| UP | PU | 1-1/2" | 1-1/2" | |
| UQ | QU | 1-1/2" | 1-1/4" | |
| UR | RU | 1-1/4" | 1-1/4" | |
| SAE Split Flange (motor) | | | | |
| BB-Double | 1-1/2" | | 1-1/2" | |
| CC-Double | 1-1/4" | | 1-1/4" | |
| EE-Double | 1" | | 1" | |
| FF-Double | 3/4" | | 3/4" | |
| OD Tube Porting (pump) | | | | |
| PQ | QP | 1-1/2" | 1-1/4" | |
| PR | RP | 1-1/4" | 1-1/4" | |
| OD Tube Porting (motor) | | | | |
| NN-Double | 1-1/4" | | 1-1/4" | |
| QQ-Double | 1" | | 1" | |
| RR-Double | 3/4" | | 3/4" | |
| Common Inlet Passage | | | | |
| C | D | No Ports | | |

| | | |
|-----------------------------|------------------------------|--|
| Code | 10 – Connecting Shaft | |
| 1 | Connecting Shaft | |
| For connecting tandem units | | |

 **WARNING:** This product can expose you to chemicals including lead or DEHP which are known to the state of California to cause cancer, birth defects, and other reproductive harm. www.p65warnings.ca.gov

- **Three-piece cast iron construction**
High efficiency and long life in severe operating environments.
- **Low friction bushing**
Provides strength in heavy duty applications.
- **Balanced thrust plates**
Optimize pump efficiency.
- **Largest journal bearings available**
for high pressure and long life.



| Product Features | Description |
|----------------------------|--|
| Pump Type | Heavy-duty, cast iron, external gear |
| Mounting | SAE standard flanges, ZF, others |
| Ports | SAE split flanges and other types of threaded ports, see Specifications |
| Shaft Style | SAE splined, keyed, and others, see Specifications |
| Maximum Speed | 2,400 RPM |
| Theor. displacement | See Specifications |
| Drive | Clockwise, counterclockwise, double. Direct drive with flexible coupling is recommended. Pumps subject to radial loads must be specified with an outboard bearing. Axial loading is not allowed. |
| Inlet pressure | 30 psia (15psig) maximum pressure / 5 in. Hg maximum vacuum at operating temperature |
| Outlet pressure | See Specifications |
| Hydraulic fluids | Mineral oil, fire resistant fluids: water-oil emulsions 60/40, MFB; water-glycol, HFC; phosphate-esters, HFD (FPM seals required) |

| Product Features | Description |
|---|---|
| Fluid viscosity | From 7.5 to 1600 cSt (50 to 7500 sus). Recommended 15 to 75 cSt. |
| Fluid temperature | Mineral oil with standard seals: 0°F to 180°F (-20°C to 80°C); Fire resistant fluids HFB, HFC: 0°F to 150°F (-20°C to 65°C) |
| Filtration | ISO 4406 code: <ul style="list-style-type: none"> • 19/16 at 2000 psi/140 bar • 17/14 at 3000 psi/210 bar • 15/12 at 4000 psi/275 bar |
| Direction of rotation (looking at the drive shaft) | CW, CCW, Bi-Rotational |
| Multiple pump assemblies | Up to 6 gear selections of the same model, even with different gear widths |
| Separate or common inlet capability | Common |

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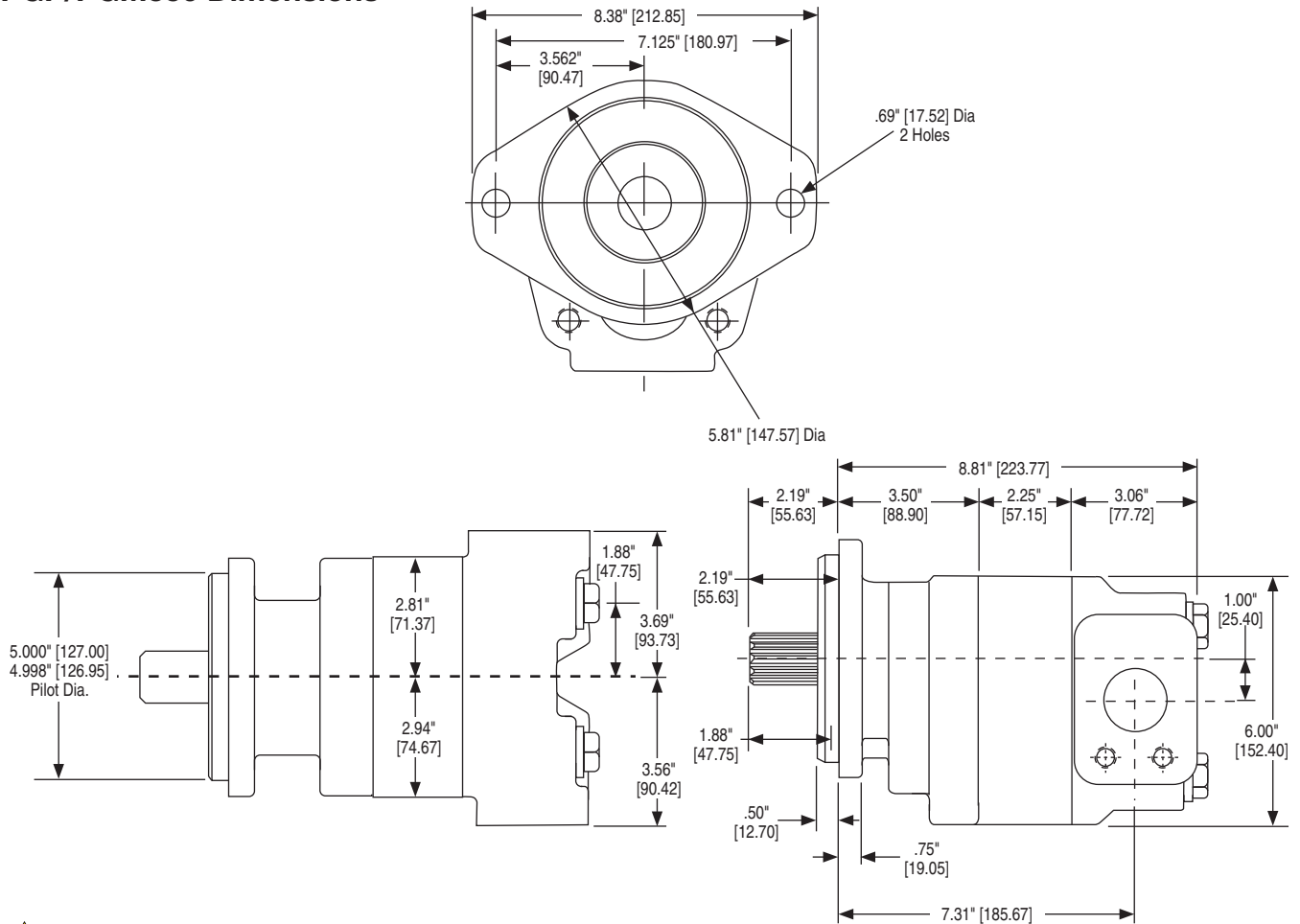
PGP/PGM350 Specifications/Dimensions

Gear Pumps & Motors

| PGP350 Frame Size | 05 | 07 | 10 | 12 | 15 | 17 | 20 | 22 | 25 |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|
| Displacement – cm ³ /rev (in ³ /rev) | 20.9 (1.28) | 31.3 (1.91) | 41.8 (2.55) | 52.2 (3.19) | 62.7 (3.83) | 73.1 (4.46) | 83.6 (5.10) | 94.0 (5.74) | 104.5 (6.38) |
| Max continuous pressure – bar (psi) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 224 (3,250) | 207 (3,000) | 190 (2,750) | 172 (2,500) |
| Max Speed – RPM | 2,400 | 2,400 | 2,400 | 2,400 | 2,400 | 2,400 | 2,400 | 2,400 | 2,400 |
| Approximate Weight – Lbs. [kg] | 48 [21.8] | 49.5 [22.4] | 51 [23.1] | 52.5 [23.8] | 54.0 [24.5] | 55.5 [25.2] | 57.0 [25.9] | 58.5 [26.5] | 60.0 [27.2] |

| PGM350 Frame Size | 05 | 07 | 10 | 12 | 15 | 17 | 20 | 22 | 25 |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|
| Displacement – cm ³ /rev (in ³ /rev) | 20.9 (1.28) | 31.3 (1.91) | 41.8 (2.55) | 52.2 (3.19) | 62.7 (3.83) | 73.1 (4.46) | 83.6 (5.10) | 94.0 (5.74) | 104.5 (6.38) |
| Max continuous pressure – bar (psi) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 224 (3,250) | 207 (3,000) | 190 (2,750) | 172 (2,500) |
| Max Speed – RPM | 2,400 | 2,400 | 2,400 | 2,400 | 2,400 | 2,400 | 2,400 | 2,400 | 2,400 |
| Approximate Weight – Lbs. [kg] | 48 [21.8] | 49.5 [22.4] | 51 [23.1] | 52.5 [23.8] | 54.0 [24.5] | 55.5 [25.2] | 57.0 [25.9] | 58.5 [26.5] | 60.0 [27.2] |

PGP/PGM350 Dimensions



WARNING: This product can expose you to chemicals including lead or DEHP which are known to the state of California to cause cancer, birth defects, and other reproductive harm. www.p65warnings.ca.gov

PGP/PGM350 Performance Data

PGP350 Pump Performance Data

| Speed RPM | Output Flow Input Power | Gear Widths | | | | | | | | |
|-----------|----------------------------|-------------|------|------|--------|--------|--------|------|--------|--------|
| | | 1/2" | 3/4" | 1" | 1-1/4" | 1-1/2" | 1-3/4" | 2" | 2-1/4" | 2-1/2" |
| 900 | GPM | 4.0 | 6.4 | 8.8 | 11.2 | 13.7 | 16.1 | 18.6 | 21.0 | 23.4 |
| | LPM | 15 | 24 | 33 | 42 | 52 | 61 | 70 | 79 | 89 |
| | HP | 11 | 17 | 22 | 28 | 33 | 36 | 38 | 39 | 40 |
| | kW | 8 | 12 | 17 | 21 | 25 | 27 | 28 | 29 | 30 |
| 1200 | GPM | 5.6 | 8.8 | 12.1 | 15.4 | 18.7 | 21.9 | 25.2 | 28.4 | 31.7 |
| | LPM | 21 | 33 | 46 | 58 | 71 | 83 | 95 | 108 | 120 |
| | HP | 15 | 22 | 30 | 37 | 44 | 48 | 51 | 52 | 53 |
| | kW | 11 | 17 | 22 | 28 | 33 | 36 | 38 | 39 | 39 |
| 1500 | GPM | 7.3 | 11.3 | 15.5 | 19.5 | 23.6 | 27.7 | 31.8 | 35.9 | 40.0 |
| | LPM | 28 | 43 | 59 | 74 | 89 | 105 | 120 | 136 | 151 |
| | HP | 18 | 28 | 37 | 46 | 55 | 60 | 63 | 65 | 66 |
| | kW | 14 | 21 | 28 | 34 | 41 | 45 | 47 | 49 | 49 |
| 1800 | GPM | 8.9 | 13.8 | 18.8 | 23.6 | 28.6 | 33.5 | 38.4 | 43.3 | 48.3 |
| | LPM | 34 | 52 | 71 | 89 | 108 | 127 | 145 | 164 | 183 |
| | HP | 22 | 33 | 44 | 55 | 67 | 72 | 76 | 78 | 79 |
| | kW | 17 | 25 | 33 | 41 | 50 | 54 | 57 | 58 | 59 |
| 2100 | GPM | 10.6 | 16.3 | 22.1 | 27.8 | 33.6 | 39.3 | 45.1 | 50.8 | 56.6 |
| | LPM | 40 | 62 | 84 | 105 | 127 | 149 | 171 | 192 | 214 |
| | HP | 26 | 39 | 52 | 65 | 78 | 84 | 89 | 91 | 92 |
| | kW | 19 | 29 | 39 | 48 | 58 | 63 | 66 | 68 | 69 |
| 2400 | GPM | 12.2 | 18.8 | 25.4 | 31.9 | 38.5 | 45.1 | 51.7 | 58.2 | 64.8 |
| | LPM | 46 | 71 | 96 | 121 | 146 | 171 | 196 | 220 | 245 |
| | HP | 30 | 44 | 59 | 74 | 89 | 96 | 101 | 105 | 106 |
| | kW | 22 | 33 | 44 | 55 | 66 | 72 | 76 | 78 | 79 |

PGM350 Motor Performance Data

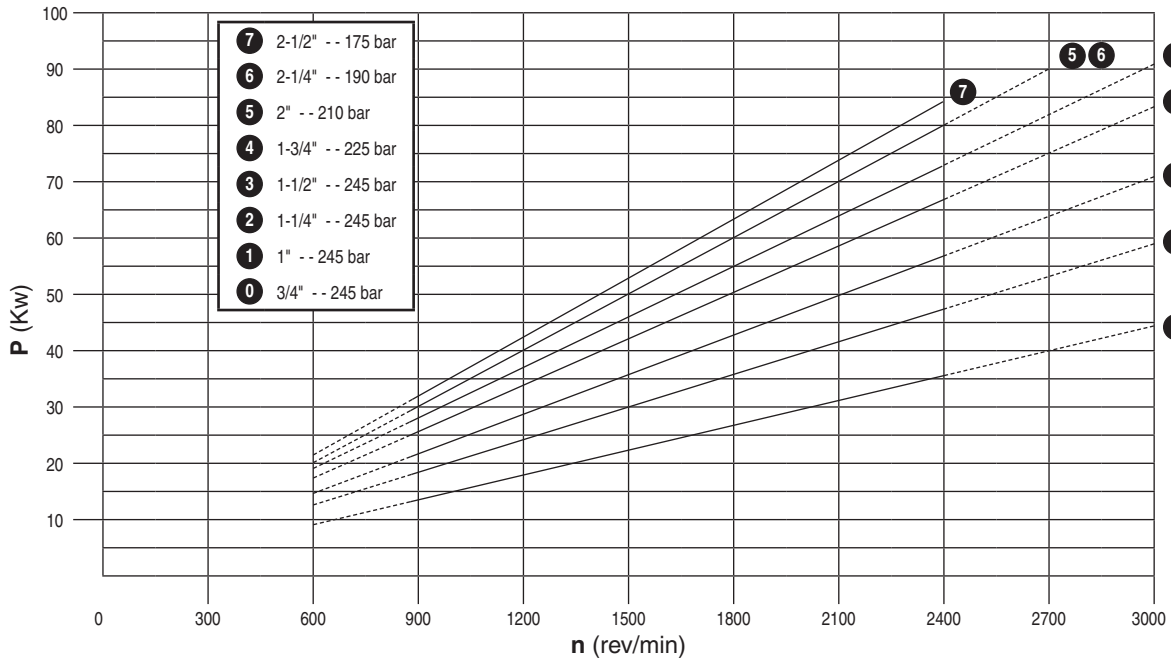
| Speed RPM | Output Torque | Gear Widths | | | | | | | | | | | | | |
|-----------|---------------|-------------|-------|-----------------|-------|-----------------|-------|-----------------|-------|-------------|-------|-----------------|-------|-----------------|-------|
| | | 1" 3500 psi | | 1-1/4" 3500 psi | | 1-1/2" 3500 psi | | 1-3/4" 3250 psi | | 2" 3000 psi | | 2-1/4" 2750 psi | | 2-1/2" 2500 psi | |
| | | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 900 | in/lbs | 13.4 | 1320 | 16.0 | 1670 | 18.6 | 2025 | 21.2 | 2225 | 23.8 | 2350 | 26.4 | 2425 | 28.9 | 2450 |
| | Nm | 51 | 149.1 | 61 | 188.7 | 70 | 228.8 | 80 | 251.4 | 90 | 265.5 | 100 | 274.0 | 110 | 276.8 |
| 1200 | in/lbs | 16.9 | 1315 | 20.4 | 1660 | 23.8 | 2015 | 27.2 | 2215 | 30.6 | 2340 | 34.0 | 2410 | 37.4 | 2435 |
| | Nm | 64 | 148.6 | 77 | 187.6 | 90 | 227.7 | 103 | 250.3 | 116 | 264.4 | 129 | 272.3 | 142 | 275.1 |
| 1500 | in/lbs | 20.5 | 1300 | 24.7 | 1640 | 28.9 | 1990 | 33.2 | 2195 | 37.4 | 2315 | 41.7 | 2385 | 45.9 | 2410 |
| | Nm | 77 | 146.9 | 93 | 185.3 | 110 | 224.8 | 126 | 248.0 | 142 | 261.6 | 158 | 269.5 | 174 | 272.3 |
| 1800 | in/lbs | 24.0 | 1295 | 29.0 | 1635 | 34.1 | 1980 | 39.2 | 2180 | 44.2 | 2300 | 49.3 | 2375 | 54.4 | 2395 |
| | Nm | 91 | 146.3 | 110 | 184.7 | 129 | 223.7 | 148 | 246.3 | 167 | 259.9 | 187 | 268.3 | 206 | 270.6 |
| 2100 | in/lbs | 27.5 | 1285 | 33.4 | 1620 | 39.3 | 1965 | 45.2 | 2165 | 51.1 | 2285 | 57.0 | 2355 | 62.9 | 2380 |
| | Nm | 104 | 145.2 | 126 | 183.0 | 149 | 222.0 | 171 | 244.6 | 193 | 258.2 | 216 | 266.1 | 238 | 268.9 |
| 2400 | in/lbs | 31.0 | 1265 | 37.7 | 1600 | 44.4 | 1940 | 51.2 | 2135 | 57.9 | 2255 | 64.6 | 2325 | 71.3 | 2350 |
| | Nm | 117 | 142.9 | 143 | 180.8 | 168 | 219.2 | 194 | 241.2 | 219 | 254.8 | 245 | 262.7 | 270 | 265.5 |

A: Input Flow GPM/LPM; B: Output Torque IN/LBS/Nm

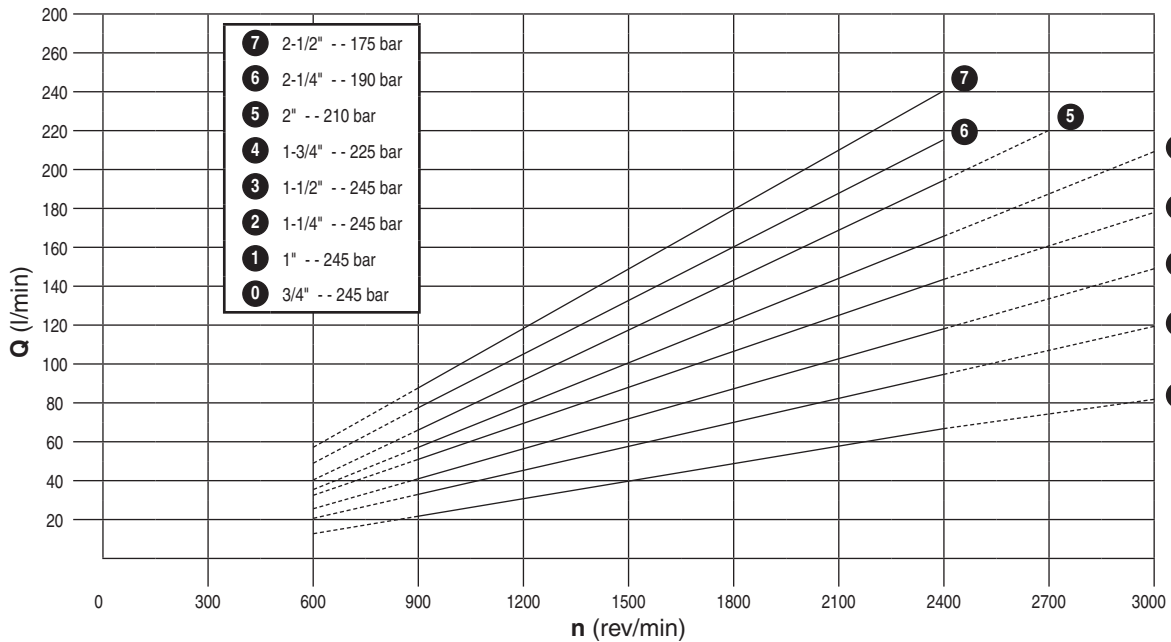
Note: In accordance with our policy of continuing product development, we reserve the right to change specification shown in this catalog without notice.

WARNING: This product can expose you to chemicals including lead or DEHP which are known to the state of California to cause cancer, birth defects, and other reproductive harm. www.p65warnings.ca.gov

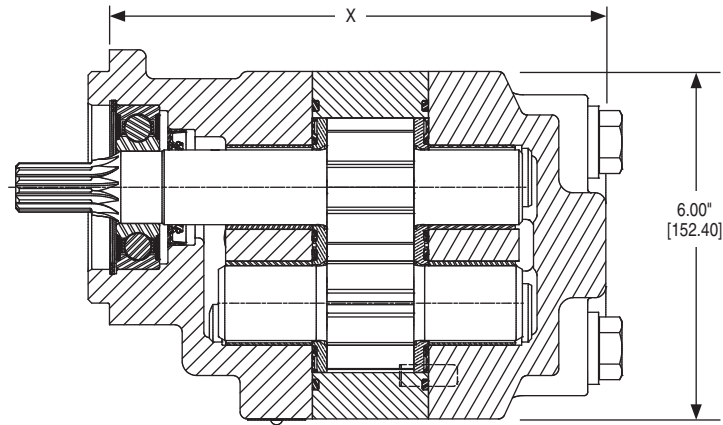
Input



Output

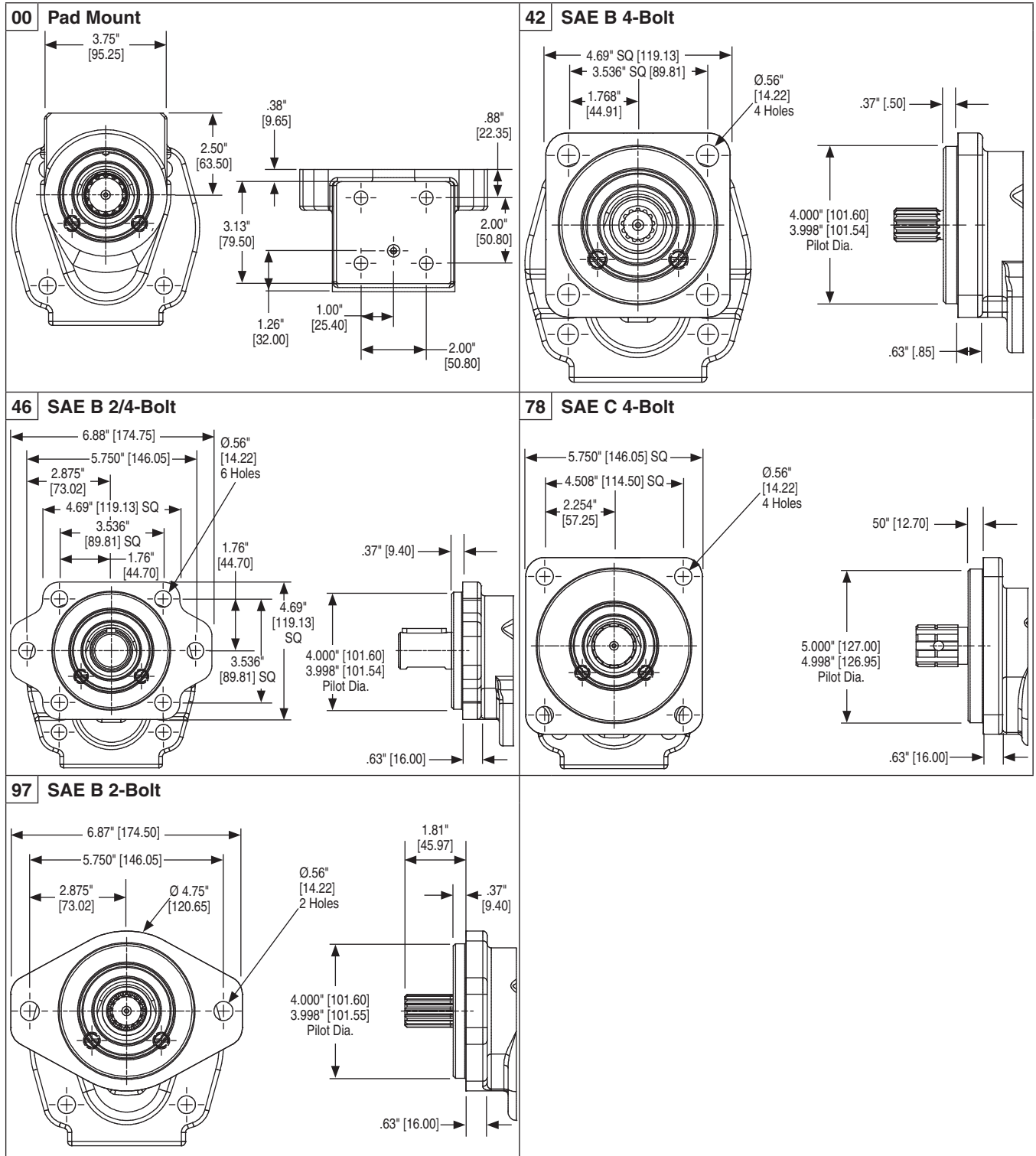


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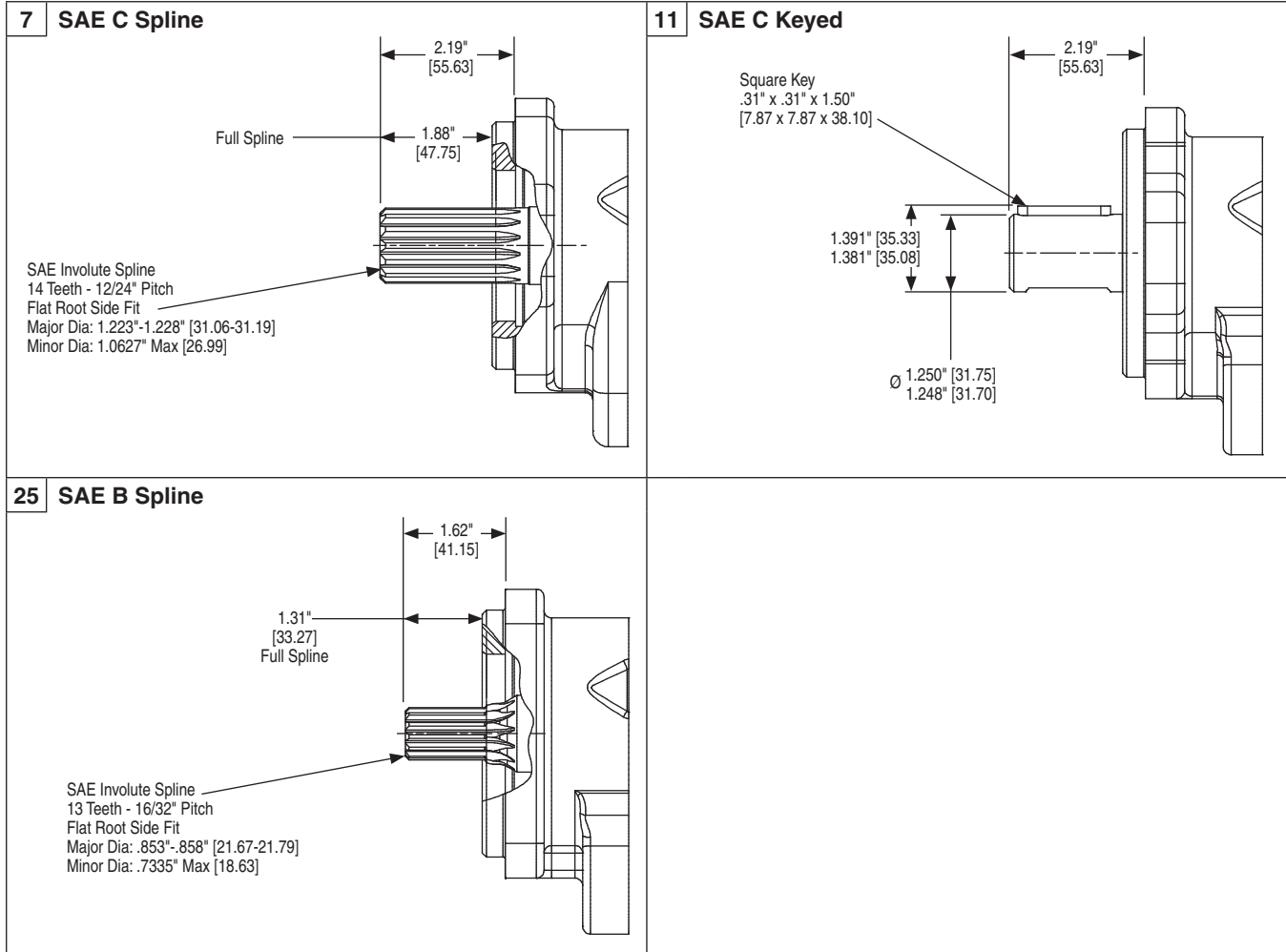


| X DIMENSION | | | | | | | | |
|-------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| SEC CODE | 07 | 10 | 12 | 15 | 17 | 20 | 22 | 25 |
| 00 | 8.06" [204.72] | 8.31" [211.07] | 8.56" [217.42] | 8.81" [223.77] | 9.06" [230.12] | 9.31" [236.47] | 9.56" [242.82] | 9.81" [249.17] |
| 42 | 7.81" [198.37] | 8.06" [204.72] | 8.31" [211.07] | 8.56" [217.42] | 8.81" [223.77] | 9.06" [230.12] | 9.31" [236.47] | 9.56" [242.82] |
| 46 | 7.81" [198.37] | 8.06" [204.72] | 8.31" [211.07] | 8.56" [217.42] | 8.81" [223.77] | 9.06" [230.12] | 9.31" [236.47] | 9.56" [242.82] |
| 78 | 7.81" [198.37] | 8.06" [204.72] | 8.31" [211.07] | 8.56" [217.42] | 8.81" [223.77] | 9.06" [230.12] | 9.31" [236.47] | 9.56" [242.82] |
| 97 | 7.81" [198.37] | 8.06" [204.72] | 8.31" [211.07] | 8.56" [217.42] | 8.81" [223.77] | 9.06" [230.12] | 9.31" [236.47] | 9.56" [242.82] |

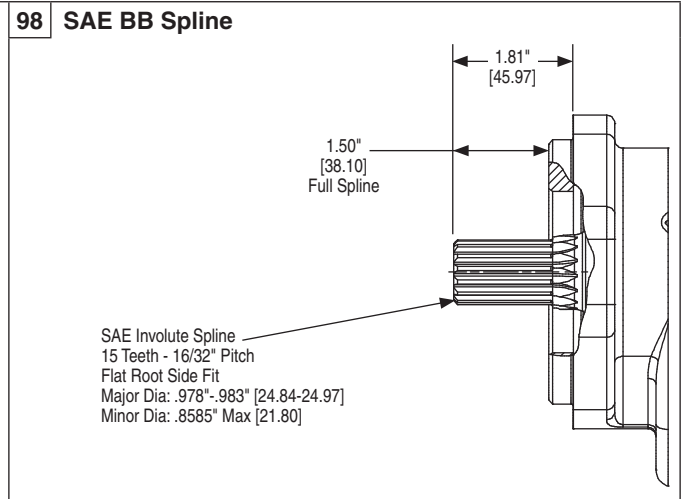
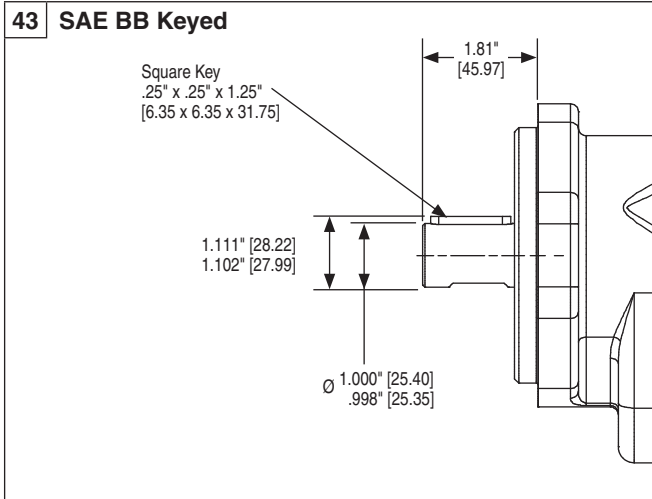
WARNING: This product can expose you to chemicals including lead or DEHP which are known to the state of California to cause cancer, birth defects, and other reproductive harm. www.p65warnings.ca.gov



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| Shaft Style | | Integral: 1 2 pieces: 2 | Maximum Torque | |
|------------------|--------------------|----------------------------|----------------|-----|
| | | | lb-ft | Nm |
| SAE B | Splined - 13 Teeth | 1 | 242 | 328 |
| | | 2 | 242 | 328 |
| SAE BB | Splined - 15 Teeth | 1 | 371 | 503 |
| | | 2 | 300 | 407 |
| SAE C | Splined - 14 Teeth | 1 | 708 | 960 |
| | | 2 | 300 | 407 |
| | 1.25" Keyed | 1 | 500 | 678 |
| | | 2 | 300 | 407 |
| Connecting Shaft | | | 300 | 407 |

Torque (lb-ft) = $\frac{\text{Pressure (PSI)} \times \text{Displacement (in}^3\text{/rev)}}{75.4}$

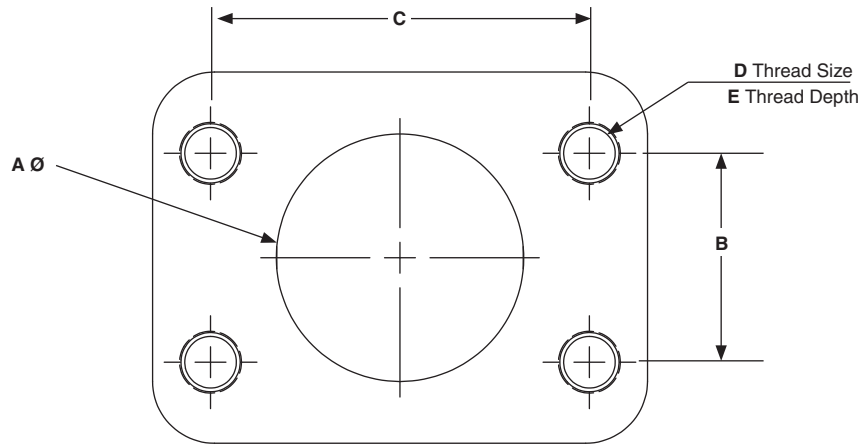
Torque (Nm) = $\frac{\text{Pressure (Bar)} \times \text{Displacement (cc/rev)}}{62.8}$



WARNING: This product can expose you to chemicals including lead or DEHP which are known to the state of California to cause cancer, birth defects, and other reproductive harm. www.p65warnings.ca.gov

SAE Flanged Ports UNC Thread (SSS)

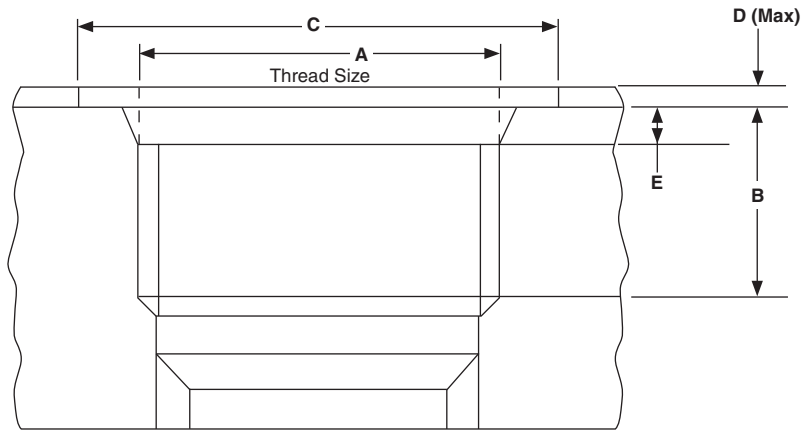
| A | | B | | C | | D | E | |
|------|------|------|------|------|------|----------|------|------|
| inch | mm | inch | mm | inch | mm | UNC | inch | mm |
| 0.50 | 12.7 | 0.69 | 17.5 | 1.50 | 38.1 | 5/16"-18 | 0.94 | 23.9 |
| 0.75 | 19.1 | 0.88 | 22.3 | 1.88 | 47.7 | 3/8"-16 | 0.88 | 22.4 |
| 1.00 | 25.4 | 1.03 | 26.2 | 2.06 | 52.2 | 3/8"-16 | 0.88 | 22.4 |
| 1.25 | 31.8 | 1.19 | 30.2 | 2.31 | 58.7 | 7/16"-14 | 1.12 | 28.4 |
| 1.50 | 38.1 | 1.41 | 35.7 | 2.75 | 69.9 | 1/2"-13 | 1.06 | 26.9 |
| 2.00 | 50.8 | 1.69 | 42.9 | 3.06 | 77.8 | 1/2"-13 | 1.06 | 26.9 |
| 2.50 | 63.5 | 2.00 | 50.8 | 3.50 | 88.9 | 1/2"-13 | 1.19 | 30.2 |



WARNING: This product can expose you to chemicals including lead or DEHP which are known to the state of California to cause cancer, birth defects, and other reproductive harm. www.p65warnings.ca.gov

SAE Straight Thread (ODT)

| ODT | A UNF | B | | C | | D | | E | |
|--------|------------|------|------|------|------|------|-----|------|------|
| | | inch | mm | inch | mm | inch | mm | inch | mm |
| 1/2" | 3/4"-16 | .56 | 14.3 | 1.19 | 30.2 | .09 | 2.4 | .10 | 2.55 |
| 5/8" | 7/8"-14 | .66 | 16.7 | 1.34 | 34.1 | .09 | 2.4 | .10 | 2.55 |
| 3/4" | 1-1/16"-12 | .75 | 19.1 | 1.62 | 41.3 | .09 | 2.4 | .13 | 3.30 |
| 1" | 1-5/16"-12 | .75 | 19.1 | 1.91 | 48.5 | .09 | 2.4 | .13 | 3.30 |
| 1-1/4" | 1-5/8"-12 | .75 | 19.1 | 2.27 | 57.7 | .09 | 2.4 | .13 | 3.35 |
| 1-1/2" | 1-7/8"-12 | .75 | 19.1 | 2.56 | 65.0 | .09 | 2.4 | .13 | 3.35 |
| 2" | 2-1/2"-12 | .75 | 19.1 | 3.48 | 88.4 | .09 | 2.4 | .13 | 3.35 |



WARNING: This product can expose you to chemicals including lead or DEHP which are known to the state of California to cause cancer, birth defects, and other reproductive harm. www.p65warnings.ca.gov

Tandem: Repeat if Necessary

| | | | | | | | | | | | | | | | | | | | | | | |
|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| PG | 1 | 350 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 6 | 6 | 7 | 7 | 10 |
|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|

| Code | 1 – Type |
|------|----------|
| P | Pump |
| M | Motor |

| Code | 2 – Unit |
|------|---|
| A | Single Unit |
| B | Tandem Unit (flush studs) |
| C | Single or Tandem with two-piece shaft (O.B. bearing required) |
| L | Unit with Extended Studs |

| Code | 3 – Shaft End Cover |
|------|---|
| 1 | Pump, cw w/o O.B. bearing |
| 2 | Pump, ccw w/o O.B. bearing |
| 4 | Pump, cw with O.B. bearing |
| 5 | Pump, ccw with O.B. bearing |
| 8 | Motor, bi-rot with O.B. bearing + 1/4" ODT drain |
| 9 | Motor, bi-rot w/o O.B. bearing + 1/4" ODT drain |
| 18 | Motor, bi-rot with O.B. bearing + 1/4" BSPP drain (78 only) |
| 19 | Motor, bi-rot w/o O.B. bearing + 1/4" BSPP drain (42 & 78 only) |

| Code | 4 – Shaft End Cover |
|------|---------------------|
| 00 | Clutch Shaft |
| 42 | SAE B 4-Bolt |
| 46 | SAE B 2/4-Bolt |
| 78 | SAE C 4-Bolt |
| 97 | SAE B 2-Bolt |
| 98 | SAE C 2-Bolt |

| Code | 5 – Port End Cover | | | |
|---------------------------------|--------------------|----------|--------|-----|
| SIDE PORTED | | | | |
| | CW | CCW | IN | OUT |
| SAE Split Flange (pump) | | | | |
| EC | CE | 2" | 1-1/2" | |
| EF | FE | 2" | 1-1/4" | |
| EG | GE | 2" | 1" | |
| EH | HE | 1-1/2" | 1-1/2" | |
| EJ | JE | 1-1/2" | 1-1/4" | |
| EK | KE | 1-1/2" | 1" | |
| EL | LE | 1-1/4" | 1-1/4" | |
| EM | ME | 1-1/4" | 1" | |
| EN | NE | 1" | 1" | |
| OE | EO | 2" | - | |
| OF | FO | 1-1/2" | - | |
| OG | GO | 1-1/4" | - | |
| OJ | JO | 1" | - | |
| OL | LO | - | 1-1/2" | |
| OM | MO | - | 1-1/4" | |
| ON | NO | - | 1" | |
| SAE Split Flange (motor) | | | | |
| CR-Double | | 1-1/2" | 1-1/2" | |
| CS-Double | | 1-1/4" | 1-1/4" | |
| CT-Double | | 1" | 1" | |
| CV-Double | | 3/4" | 3/4" | |
| OD Tube Porting (pump) | | | | |
| FB | BF | 1-1/2" | 1-1/4" | |
| FC | CF | 1-1/2" | 1" | |
| FG | GF | 1-1/4" | 1-1/4" | |
| FJ | JF | 1-1/4" | 1" | |
| FL | LF | 1" | 1" | |
| BC | CB | 1-1/2" | - | |
| BG | GB | 1-1/4" | - | |
| BJ | JB | 1" | - | |
| BL | LB | - | 1-1/4" | |
| BN | NB | - | 1" | |
| OD Tube Porting (motor) | | | | |
| VC-Double | | 1-1/4" | 1-1/4" | |
| VN-Double | | 1" | 1" | |
| VR-Double | | 3/4" | 3/4" | |
| Unported (pump) | | | | |
| BI | IB | Unported | | |
| Unported (motor) | | | | |
| BA | | Unported | | |

| Code | 6 – Gear Housing |
|------|------------------|
| AB | Pump |
| EB | Motor |

| Code | 7 – Gear Width | | | | |
|------|----------------|------------------------|-----------------------|--------------|-----|
| | Gear Width | in. ³ /rev. | cm ³ /rev. | Max Pressure | |
| | | | | psi | bar |
| 05 | 1/2" | 1.28 | 20.9 | 3500 | 241 |
| 07 | 3/4" | 1.91 | 31.3 | 3500 | 241 |
| 10 | 1" | 2.55 | 41.8 | 3500 | 241 |
| 12 | 1-1/4" | 3.19 | 52.2 | 3500 | 241 |
| 15 | 1-1/2" | 3.83 | 62.7 | 3500 | 241 |
| 17 | 1-3/4" | 4.46 | 73.1 | 3250 | 224 |
| 20 | 2" | 5.10 | 83.6 | 3000 | 207 |
| 22 | 2-1/4" | 5.74 | 94.0 | 2750 | 190 |
| 25 | 2-1/2" | 6.38 | 104.5 | 2500 | 172 |

| Code | 8 – Shaft Type |
|------|----------------|
| 7 | SAE C Spline |
| 11 | SAE C Keyed |
| 25 | SAE B Spline |
| 43 | SAE BB Keyed |
| 98 | SAE BB Splined |

For Single or Tandem Units - unless noted

WARNING: This product can expose you to chemicals including lead or DEHP which are known to the state of California to cause cancer, birth defects, and other reproductive harm. www.p65warnings.ca.gov

Tandem: Repeat if Necessary

| | | | | | | | | | | | | | | | | | | | | | | |
|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| PG | 1 | 350 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 6 | 6 | 7 | 7 | 10 |
|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|


| Code | 9 – Bearing Carriers | | | |
|--|----------------------|-----------|------------|--------|
| DUAL OUTLET - PUMP ONLY | | | | |
| Outlets: for clockwise porting the top port number comes first; for counter-clockwise porting the bottom port number comes first | | | | |
| CW | CCW | IN | OUT | |
| SAE Split Flange | | | | |
| AF | FA | 2-1/2" | 1-1/4" | 1-1/4" |
| AG | GA | 2-1/2" | 1-1/4" | 1" |
| AH | HA | 2-1/2" | 1" | 1" |
| AM | MA | 2" | 1-1/4" | 1-1/4" |
| AN | NA | 2" | 1-1/4" | 1" |
| AP | PA | 2" | 1" | 1" |
| AT | TA | 1-1/2" | 1-1/4" | 1-1/4" |
| AU | UA | 1-1/2" | 1-1/4" | 1" |
| AV | VA | 1-1/2" | 1" | 1" |
| AW | WA | 1-1/4" | 1-1/4" | 1-1/4" |
| AX | XA | 1-1/4" | 1-1/4" | 1" |
| AY | YA | 1-1/4" | 1" | 1" |
| AZ | ZA | 1" | 1" | 1" |
| OD Tube Porting | | | | |
| GM | MG | 2" | 1-1/4" | 1-1/4" |
| GN | NG | 2" | 1-1/4" | 1" |
| GP | PG | 2" | 1" | 1" |
| GT | TG | 1-1/2" | 1-1/4" | 1-1/4" |
| GU | UG | 1-1/2" | 1-1/4" | 1" |
| GV | VG | 1-1/2" | 1" | 1" |
| GW | WG | 1-1/4" | 1-1/4" | 1-1/4" |
| GX | XG | 1-1/4" | 1-1/4" | 1" |
| GY | YG | 1-1/4" | 1" | 1" |
| GZ | ZG | 1" | 1" | 1" |

* Outlet port for rear section

| Code | 9 – Bearing Carriers (cont.) | | | |
|----------------------------------|------------------------------|-----------|------------|--|
| SINGLE OUTLET - PUMP ONLY | | | | |
| Outlet for front section | | | | |
| CW | CCW | IN | OUT | |
| SAE Split Flange | | | | |
| HB | BH | 2" | 1-1/2" | |
| HC | CH | 2" | 1-1/4" | |
| HF | FH | 2" | 1" | |
| HL | LH | 1-1/2" | 1-1/2" | |
| HM | MH | 1-1/2" | 1-1/4" | |
| HN | NH | 1-1/2" | 1" | |
| HO | OH | 1-1/4" | 1-1/4" | |
| HP | PH | 1-1/4" | 1" | |
| HQ | QH | * 1" | 1" | |
| RS | SR | 1-1/4" | 1" | |
| OD Tube Porting | | | | |
| KB | BK | 2" | 1-1/2" | |
| KC | CK | 2" | 1-1/4" | |
| KF | FK | 2" | 1" | |
| KL | LK | 1-1/2" | 1-1/2" | |
| KM | MK | 1-1/2" | 1-1/4" | |
| KN | NK | 1-1/2" | 1" | |
| KO | OK | 1-1/4" | 1-1/4" | |
| KP | PK | 1-1/4" | 1" | |
| KQ | QK | 1" | 1" | |
| * Outlet port for rear section | | | | |

| Code | 9 – Bearing Carriers (cont.) | | | |
|---------------------------------|------------------------------|-----------|------------|--|
| COMBINED OUTLET | | | | |
| Outlet for front section | | | | |
| CW | CCW | IN | OUT | |
| SAE Split Flange (pump) | | | | |
| UN | NU | 2" | 1-1/2" | |
| UO | OU | 2" | 1-1/4" | |
| UP | PU | 1-1/2" | 1-1/2" | |
| UQ | QU | 1-1/2" | 1-1/4" | |
| UR | RU | 1-1/4" | 1-1/4" | |
| SAE Split Flange (motor) | | | | |
| AA-Double | | 2" | 2" | |
| BB-Double | | 1-1/2" | 1-1/2" | |
| CC-Double | | 1-1/4" | 1-1/4" | |
| EE-Double | | 1" | 1" | |
| FF-Double | | 3/4" | 3/4" | |
| OD Tube Porting (pump) | | | | |
| PE | EP | 2" | 1-1/2" | |
| PM | MP | 2" | 1-1/4" | |
| PN | NP | 1-1/2" | 1-1/2" | |
| PQ | QP | 1-1/2" | 1-1/4" | |
| PR | RP | 1-1/4" | 1-1/4" | |
| OD Tube Porting (motor) | | | | |
| MM-Double | | 1-1/2" | 1-1/2" | |
| NN-Double | | 1-1/4" | 1-1/4" | |
| QQ-Double | | 1" | 1" | |
| RR-Double | | 3/4" | 3/4" | |
| Common Inlet Passage | | | | |
| C | D | No Ports | | |

| Code | 10 – Connecting Shaft |
|-----------------------------|-----------------------|
| 1 | Connecting Shaft |
| For connecting tandem units | |

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- **Three-piece cast iron construction**
High efficiency and long life in severe operating environments.
- **Low friction bushing**
Provides strength in heavy duty applications.
- **Balanced thrust plates**
Optimize pump efficiency.
- **Largest journal bearings available**
for high pressure and long life.



| Product Features | Description |
|----------------------------|---|
| Pump Type | Heavy Duty, Cast Iron, External Gear |
| Mounting | SAE Standard Flanges |
| Ports | SAE Split Flanges and other types of Threaded Ports, See Specifications |
| Shaft Style | SAE Splined, Keyed, and others, See Specifications |
| Maximum Speed | 2400 RPM |
| Theor. displacement | See Specifications |
| Drive | CW, CCW, Double |
| Inlet pressure | 15psig Max Press / 5inHg Max Vac |
| Outlet pressure | See Specifications |
| Hydraulic fluids | Mineral Oil, Water-Oil Emulsions 60/40HFB, Water-glycol, HFC, Phosphate-esters, HFD |
| Fluid viscosity | 50 to 7500 SUS; Recommended 80 to 350 SUS |
| Port Connection | Flange/Straight Threaded |

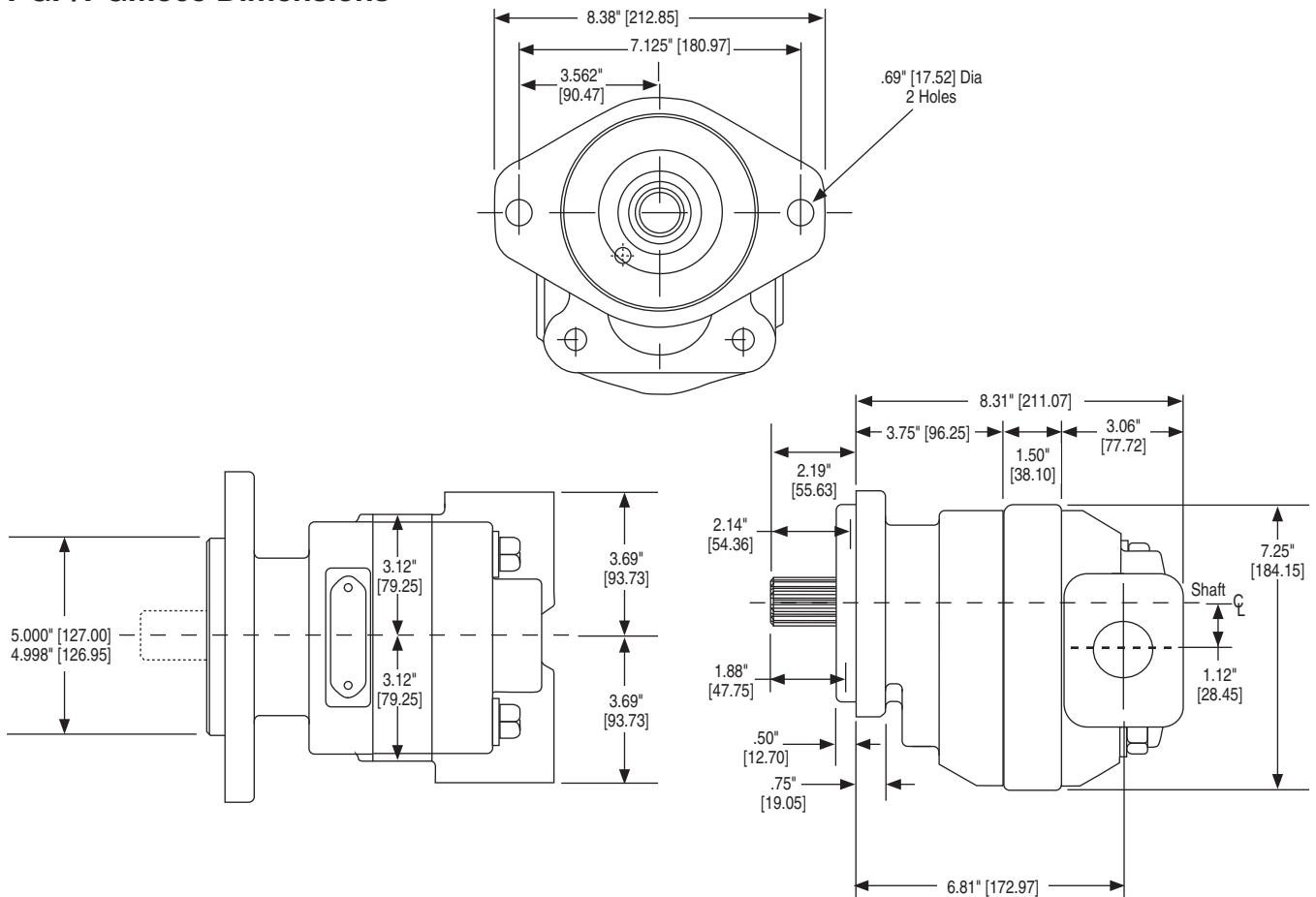
| Product Features | Description |
|---|---|
| Fluid temperature | Mineral oil with standard seals: 0° to 180°F (-20°C to +80°C) Fire resistant fluids HFB, HFC 0° to 150°F (-20°C to +65°C) |
| Filtration | According to ISO 4406 code: • 20/18/15 at 2000 psi/140 bar • 19/17/14 at 3000 psi/210 bar • 17/15/12 at 4000 psi/275 bar |
| Direction of rotation (looking at the drive shaft) | CW, CCW, Bi-Rotational |
| Multiple pump assemblies | Single, Multiple, Piggyback, Thru-Drive |
| Separate or common inlet capability | Common |

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| PGP365 Frame Size | 07 | 10 | 12 | 15 | 17 | 20 | 22 | 25 |
|---|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|
| Displacement – cm ³ /rev (in ³ /rev) | 44.3 (2.70) | 59.0 (3.60) | 73.8 (4.50) | 88.5 (5.40) | 103.3 (6.30) | 118.0 (7.20) | 132.8 (8.10) | 147.5 (9.00) |
| Max continuous pressure – bar (psi) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 224 (3,250) | 207 (3,000) |
| Max Speed – RPM | 2,400 | 2,400 | 2,400 | 2,400 | 2,400 | 2,400 | 2,400 | 2,400 |
| Approximate Weight – Lbs. [kg] | 53.5 [24.3] | 56 [25.4] | 58.5 [26.5] | 61.0 [27.7] | 63.5 [28.8] | 66.0 [30] | 68.5 [31.1] | 71.0 [32.2] |

| PGM365 Frame Size | 07 | 10 | 12 | 15 | 17 | 20 | 22 | 25 |
|---|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|
| Displacement – cm ³ /rev (in ³ /rev) | 44.3 (2.70) | 59.0 (3.60) | 73.8 (4.50) | 88.5 (5.40) | 103.3 (6.30) | 118.0 (7.20) | 132.8 (8.10) | 147.5 (9.00) |
| Max continuous pressure – bar (psi) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 241 (3,500) | 224 (3,250) | 207 (3,000) |
| Max Speed – RPM | 2,400 | 2,400 | 2,400 | 2,400 | 2,400 | 2,400 | 2,400 | 2,400 |
| Approximate Weight – Lbs. [kg] | 53.5 [24.3] | 56 [25.4] | 58.5 [26.5] | 61.0 [27.7] | 63.5 [28.8] | 66.0 [30] | 68.5 [31.1] | 71.0 [32.2] |

PGP/PGM365 Dimensions



WARNING: This product can expose you to chemicals including lead or DEHP which are known to the state of California to cause cancer, birth defects, and other reproductive harm. www.p65warnings.ca.gov

PGP/PGM365 Performance Data

PGP365 Pump Performance Data

| Speed RPM | Output Flow Input Power | Gear Widths | | | | | | | |
|-----------|----------------------------|-------------|------|--------|--------|--------|------|--------|--------|
| | | 3/4" | 1" | 1-1/4" | 1-1/2" | 1-3/4" | 2" | 2-1/4" | 2-1/2" |
| 900 | GPM | 8.0 | 11.5 | 14.9 | 18.4 | 21.8 | 25.4 | 28.8 | 32.3 |
| | LPM | 30 | 44 | 57 | 70 | 83 | 96 | 109 | 122 |
| | HP | 24 | 31 | 39 | 47 | 55 | 63 | 66 | 67 |
| | kW | 18 | 23 | 29 | 35 | 41 | 47 | 49 | 50 |
| 1200 | GPM | 11.5 | 16.2 | 20.8 | 25.5 | 30.0 | 34.7 | 39.3 | 44.0 |
| | LPM | 44 | 61 | 79 | 96 | 114 | 131 | 149 | 166 |
| | HP | 31 | 42 | 52 | 63 | 73 | 84 | 88 | 90 |
| | kW | 23 | 31 | 39 | 47 | 55 | 63 | 65 | 67 |
| 1500 | GPM | 15.0 | 20.9 | 26.6 | 32.5 | 38.2 | 44.1 | 49.8 | 55.6 |
| | LPM | 57 | 79 | 101 | 123 | 145 | 167 | 188 | 211 |
| | HP | 39 | 52 | 66 | 79 | 92 | 105 | 110 | 112 |
| | kW | 29 | 39 | 49 | 59 | 68 | 78 | 82 | 84 |
| 1800 | GPM | 18.5 | 25.6 | 32.5 | 39.5 | 46.4 | 53.4 | 60.3 | 67.3 |
| | LPM | 70 | 97 | 123 | 149 | 176 | 202 | 228 | 255 |
| | HP | 47 | 63 | 79 | 94 | 110 | 126 | 131 | 135 |
| | kW | 35 | 47 | 59 | 70 | 82 | 94 | 98 | 101 |
| 2100 | GPM | 22.0 | 30.2 | 38.3 | 46.5 | 54.6 | 62.8 | 70.8 | 79.0 |
| | LPM | 83 | 114 | 145 | 176 | 207 | 238 | 268 | 299 |
| | HP | 55 | 73 | 92 | 110 | 128 | 147 | 153 | 157 |
| | kW | 41 | 55 | 68 | 82 | 96 | 110 | 114 | 117 |
| 2400 | GPM | 25.6 | 34.9 | 44.2 | 53.5 | 62.8 | 72.1 | 81.4 | 90.7 |
| | LPM | 97 | 132 | 167 | 203 | 238 | 273 | 308 | 343 |
| | HP | 63 | 84 | 105 | 126 | 147 | 168 | 175 | 180 |
| | kW | 47 | 63 | 78 | 94 | 110 | 125 | 131 | 134 |

PGM365 Motor Performance Data

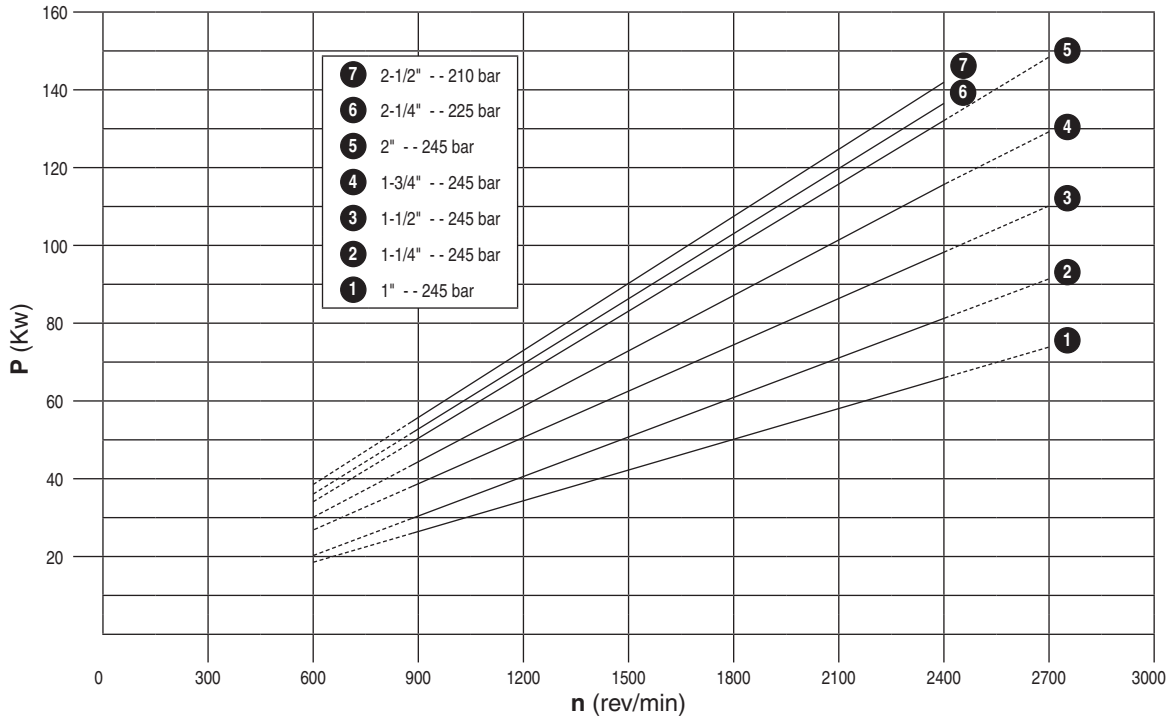
| Speed RPM | Output Torque | Gear Widths | | | | | | | | | | | | | |
|-----------|---------------|-------------|-------|-----------------|-------|-----------------|-------|-----------------|-------|-------------|-------|-----------------|-------|-----------------|-------|
| | | 1" 3500 psi | | 1-1/4" 3500 psi | | 1-1/2" 3500 psi | | 1-3/4" 3500 psi | | 2" 3500 psi | | 2-1/4" 3250 psi | | 2-1/2" 3000 psi | |
| | | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 900 | in/lbs | 18.4 | 1865 | 22.0 | 2355 | 25.6 | 2860 | 29.2 | 3370 | 32.9 | 3850 | 36.5 | 4020 | 40.1 | 4125 |
| | Nm | 70 | 210.7 | 83 | 266.1 | 97 | 323.1 | 111 | 380.8 | 124 | 435.0 | 138 | 454.2 | 152 | 466.1 |
| 1200 | in/lbs | 23.3 | 1845 | 28.1 | 2330 | 32.9 | 2830 | 37.6 | 3335 | 42.4 | 3810 | 47.2 | 3980 | 52.0 | 4080 |
| | Nm | 88 | 208.5 | 106 | 263.3 | 124 | 319.7 | 142 | 376.8 | 160 | 430.5 | 179 | 449.7 | 197 | 461.0 |
| 1500 | in/lbs | 28.2 | 1815 | 34.1 | 2295 | 40.1 | 2780 | 46.0 | 3280 | 52.0 | 3750 | 57.9 | 3915 | 63.8 | 4020 |
| | Nm | 107 | 205.1 | 129 | 259.3 | 152 | 314.1 | 174 | 370.6 | 197 | 423.7 | 219 | 442.3 | 242 | 454.2 |
| 1800 | in/lbs | 33.1 | 1805 | 40.2 | 2280 | 47.3 | 2765 | 54.4 | 3265 | 61.5 | 3730 | 68.6 | 3895 | 75.7 | 3995 |
| | Nm | 125 | 203.9 | 152 | 257.6 | 179 | 312.4 | 206 | 368.9 | 233 | 421.4 | 260 | 440.1 | 287 | 451.4 |
| 2100 | in/lbs | 37.9 | 1755 | 46.2 | 2220 | 54.4 | 2690 | 62.8 | 3160 | 71.1 | 3610 | 79.3 | 3770 | 87.6 | 3865 |
| | Nm | 144 | 198.3 | 175 | 250.8 | 206 | 303.9 | 238 | 357.0 | 269 | 407.9 | 300 | 426.0 | 332 | 436.7 |
| 2400 | in/lbs | 42.8 | 1705 | 52.3 | 2155 | 61.7 | 2615 | 71.2 | 3055 | 80.6 | 3490 | 90.1 | 3645 | 99.5 | 3740 |
| | Nm | 162 | 192.6 | 198 | 243.5 | 234 | 295.5 | 269 | 345.2 | 305 | 394.3 | 341 | 411.8 | 377 | 422.6 |

A: Input Flow GPM/LPM; B: Output Torque IN/LBS/Nm

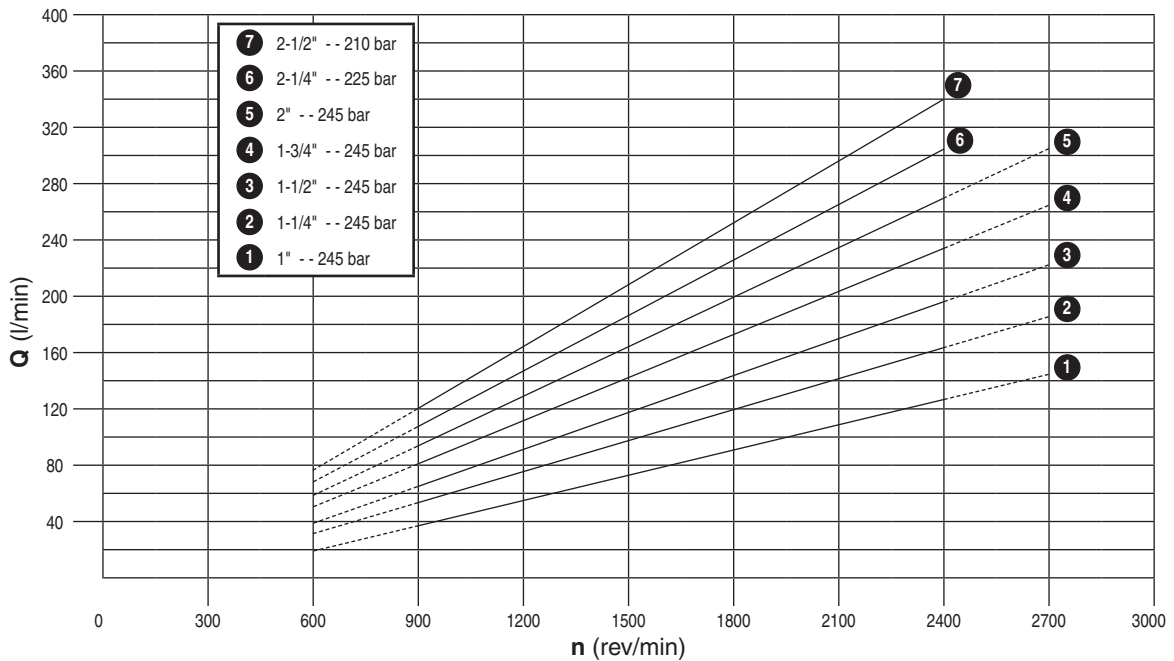
Note: In accordance with our policy of continuing product development, we reserve the right to change specifications shown in this catalog without notice.

WARNING: This product can expose you to chemicals including lead or DEHP which are known to the state of California to cause cancer, birth defects, and other reproductive harm. www.p65warnings.ca.gov

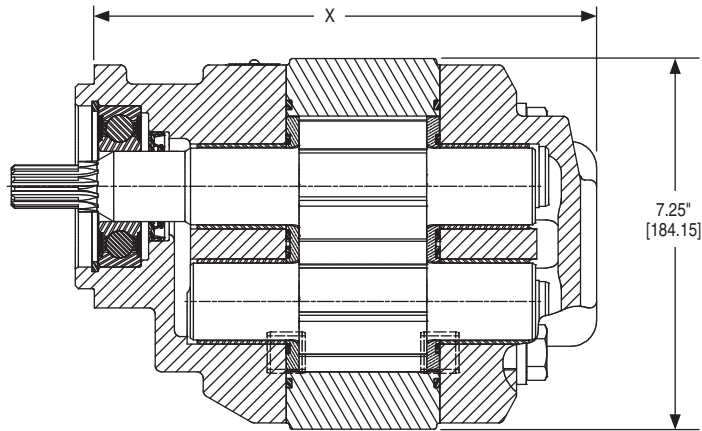
Input



Output

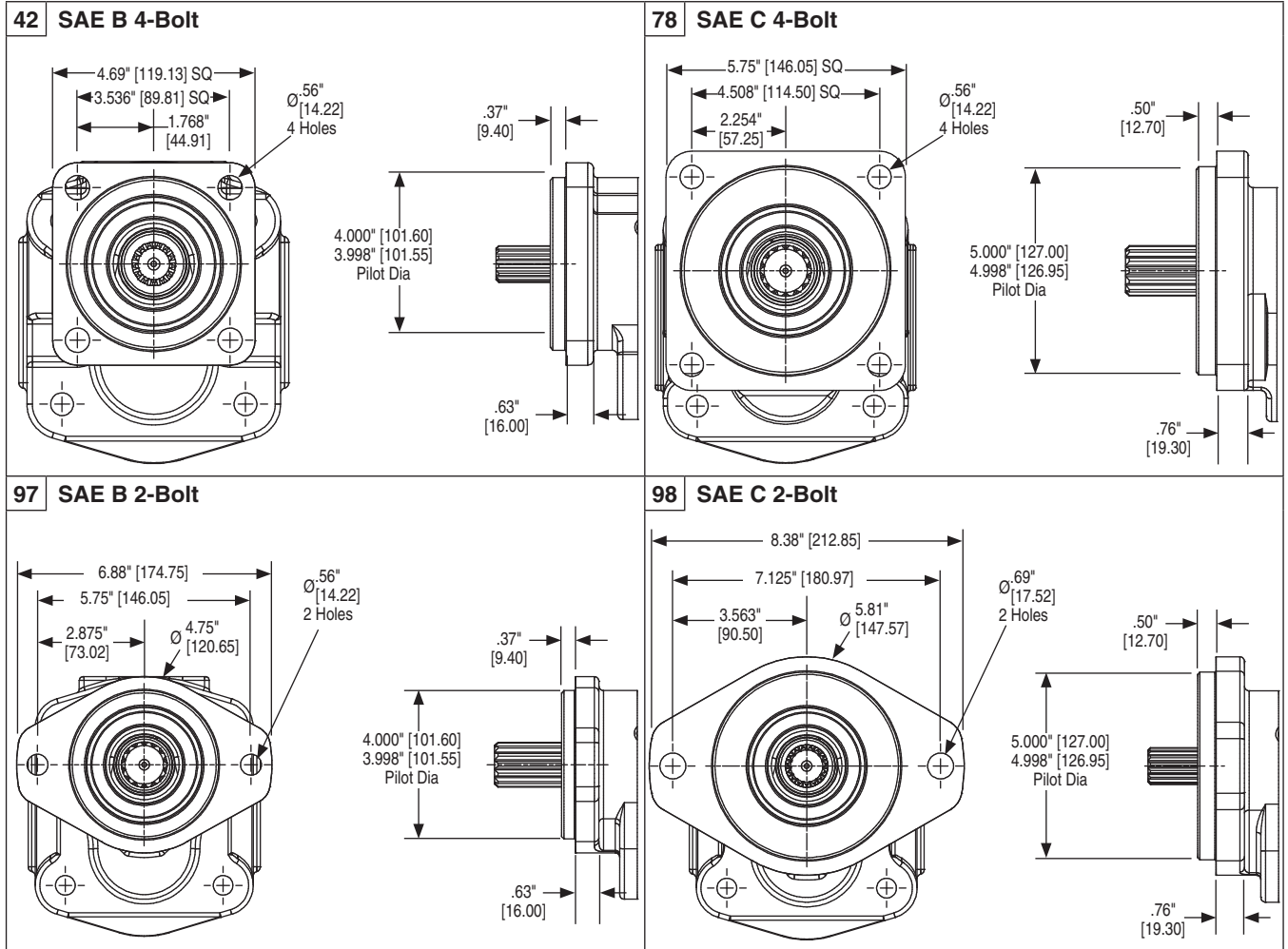


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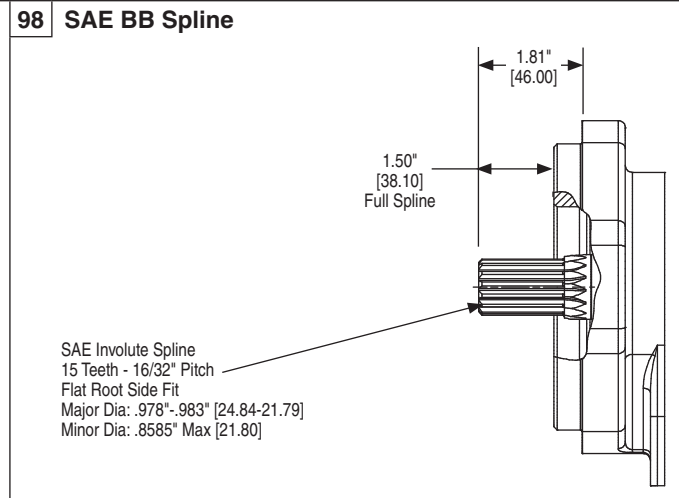
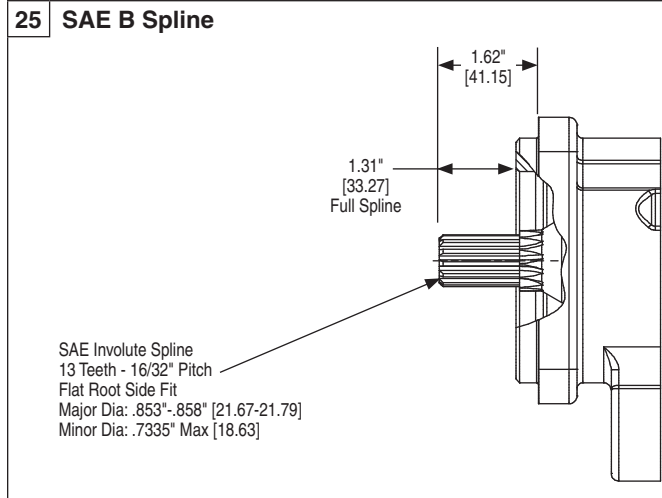
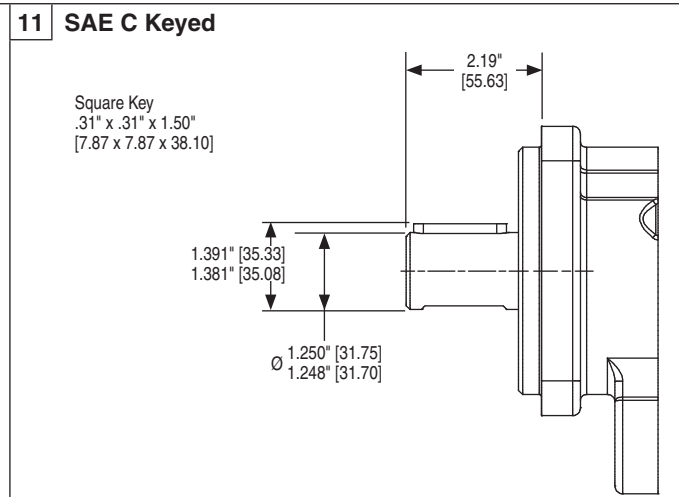
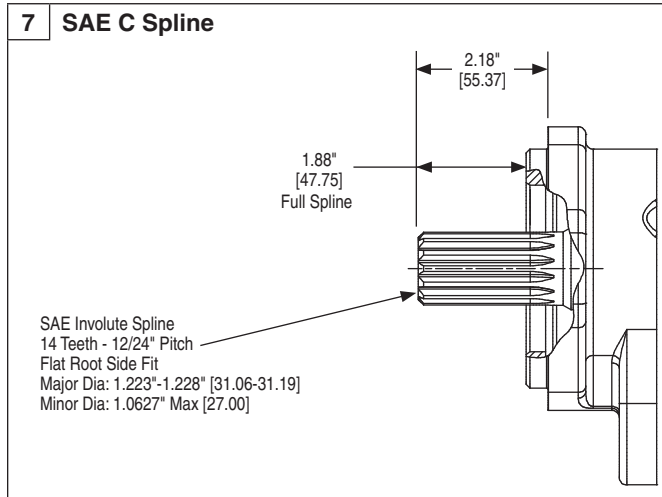


| X DIMENSION | | | | | | | | |
|-------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| SEC CODE | 07 | 10 | 12 | 15 | 17 | 20 | 22 | 25 |
| 42 | 8.06" [204.72] | 8.31" [211.07] | 8.56" [217.42] | 8.81" [223.77] | 9.06" [230.12] | 9.31" [236.47] | 9.56" [242.82] | 9.81" [249.17] |
| 78 | 8.06" [204.72] | 8.31" [211.07] | 8.56" [217.42] | 8.81" [223.77] | 9.06" [230.12] | 9.31" [236.47] | 9.56" [242.82] | 9.81" [249.17] |
| 97 | 8.06" [204.72] | 8.31" [211.07] | 8.56" [217.42] | 8.81" [223.77] | 9.06" [230.12] | 9.31" [236.47] | 9.56" [242.82] | 9.81" [249.17] |
| 98 | 8.06" [204.72] | 8.31" [211.07] | 8.56" [217.42] | 8.81" [223.77] | 9.06" [230.12] | 9.31" [236.47] | 9.56" [242.82] | 9.81" [249.17] |

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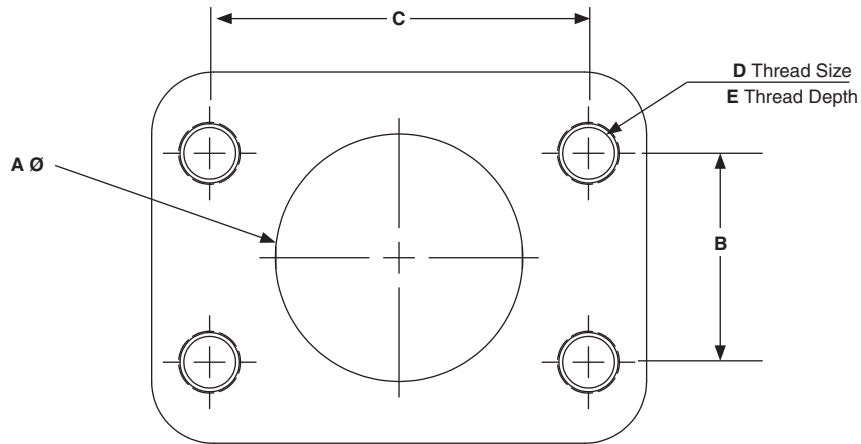
| Shaft Style | | Integral: 1 2 pieces: 2 | Maximum Torque | |
|------------------|--------------------|----------------------------|----------------|-----|
| | | | lb-ft | Nm |
| SAE B | Splined - 13 Teeth | 1 | 242 | 328 |
| | 7/8" Keyed | 2 | 242 | 328 |
| SAE BB | Splined - 15 Teeth | 1 | 167 | 226 |
| | 1" Keyed | 2 | 167 | 226 |
| SAE C | Splined - 14 Teeth | 1 | 371 | 503 |
| | 1.25" Keyed | 2 | 371 | 503 |
| Connecting Shaft | | | 250 | 339 |
| | | | 250 | 339 |
| | | | 708 | 960 |
| | | | 533 | 723 |
| | | | 500 | 678 |
| | | | 500 | 678 |
| | | | 533 | 723 |

Torque (lb-ft) = $\frac{\text{Pressure (PSI)} \times \text{Displacement (in}^3\text{/rev)}}{75.4}$
 Torque (Nm) = $\frac{\text{Pressure (Bar)} \times \text{Displacement (cc/rev)}}{62.8}$

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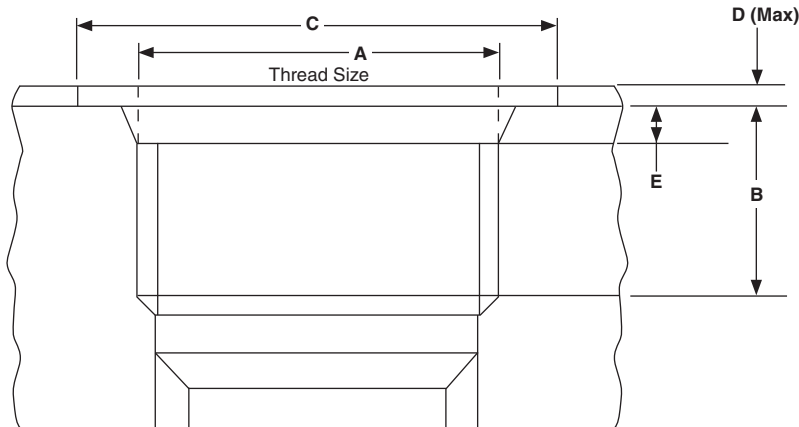
SAE Flanged Ports UNC Thread (SSS)

| A | | B | | C | | D | E | |
|------|------|------|------|------|------|----------|------|------|
| inch | mm | inch | mm | inch | mm | UNC | inch | mm |
| 0.50 | 12.7 | 0.69 | 17.5 | 1.50 | 38.1 | 5/16"-18 | 0.94 | 23.9 |
| 0.75 | 19.1 | 0.88 | 22.3 | 1.88 | 47.7 | 3/8"-16 | 0.88 | 22.4 |
| 1.00 | 25.4 | 1.03 | 26.2 | 2.06 | 52.2 | 3/8"-16 | 0.88 | 22.4 |
| 1.25 | 31.8 | 1.19 | 30.2 | 2.31 | 58.7 | 7/16"-14 | 1.12 | 28.4 |
| 1.50 | 38.1 | 1.41 | 35.7 | 2.75 | 69.9 | 1/2"-13 | 1.06 | 26.9 |
| 2.00 | 50.8 | 1.69 | 42.9 | 3.06 | 77.8 | 1/2"-13 | 1.06 | 26.9 |
| 2.50 | 63.5 | 2.00 | 50.8 | 3.50 | 88.9 | 1/2"-13 | 1.19 | 30.2 |



SAE Straight Thread (ODT)

| ODT | A UNF | B | | C | | D | | E | |
|--------|------------|------|------|------|------|------|-----|------|------|
| | | inch | mm | inch | mm | inch | mm | inch | mm |
| 1/2" | 3/4"-16 | .56 | 14.3 | 1.19 | 30.2 | .09 | 2.4 | .10 | 2.55 |
| 5/8" | 7/8"-14 | .66 | 16.7 | 1.34 | 34.1 | .09 | 2.4 | .10 | 2.55 |
| 3/4" | 1-1/16"-12 | .75 | 19.1 | 1.62 | 41.3 | .09 | 2.4 | .13 | 3.30 |
| 1" | 1-5/16"-12 | .75 | 19.1 | 1.91 | 48.5 | .09 | 2.4 | .13 | 3.30 |
| 1-1/4" | 1-5/8"-12 | .75 | 19.1 | 2.27 | 57.7 | .09 | 2.4 | .13 | 3.35 |
| 1-1/2" | 1-7/8"-12 | .75 | 19.1 | 2.56 | 65.0 | .09 | 2.4 | .13 | 3.35 |
| 2" | 2-1/2"-12 | .75 | 19.1 | 3.48 | 88.4 | .09 | 2.4 | .13 | 3.35 |



WARNING: This product can expose you to chemicals including lead or DEHP which are known to the state of California to cause cancer, birth defects, and other reproductive harm. www.p65warnings.ca.gov

Tandem: Repeat if Necessary

| | | | | | | | | | | | | | | | | | | | | | | |
|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| PG | 1 | 365 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 6 | 6 | 7 | 7 | 10 |
|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|

| Code | 1 – Type |
|------|----------|
| P | Pump |
| M | Motor |

| Code | 2 – Unit |
|------|---|
| A | Single Unit |
| B | Tandem Unit (flush studs) |
| C | Single or Tandem with two-piece shaft (O.B. bearing required) |
| L | Unit with Extended Studs |

| Code | 3 – Shaft End Cover |
|------|--|
| 1 | Pump, cw w/o O.B. bearing |
| 2 | Pump, ccw w/o O.B. bearing |
| 4 | Pump, cw with O.B. bearing |
| 5 | Pump, ccw with O.B. bearing |
| 8 | Motor, bi-rot with O.B. bearing + 1/4" ODT drain |
| 9 | Motor, bi-rot w/o O.B. bearing + 1/4" ODT drain |

| Code | 4 – Shaft End Cover |
|------|---------------------|
| 42 | SAE B 4-Bolt |
| 78 | SAE C 4-Bolt |
| 97 | SAE B 2-Bolt |
| 98 | SAE C 2-Bolt |

| Code | 5 – Port End Cover | | | |
|---------------------------------|--------------------|----------|--------|-----|
| SIDE PORTED | | | | |
| | CW | CCW | IN | OUT |
| SAE Split Flange (pump) | | | | |
| EC | CE | 2" | 1-1/2" | |
| EF | FE | 2" | 1-1/4" | |
| EG | GE | 2" | 1" | |
| EH | HE | 1-1/2" | 1-1/2" | |
| EJ | JE | 1-1/2" | 1-1/4" | |
| EK | KE | 1-1/2" | 1" | |
| EL | LE | 1-1/4" | 1-1/4" | |
| EM | ME | 1-1/4" | 1" | |
| EN | NE | 1" | 1" | |
| OE | EO | 2" | - | |
| OF | FO | 1-1/2" | - | |
| OG | GO | 1-1/4" | - | |
| OJ | JO | 1" | - | |
| OL | LO | - | 1-1/2" | |
| OM | MO | - | 1-1/4" | |
| ON | NO | - | 1" | |
| SAE Split Flange (motor) | | | | |
| CR-Double | | 1-1/2" | 1-1/2" | |
| CS-Double | | 1-1/4" | 1-1/4" | |
| CT-Double | | 1" | 1" | |
| CV-Double | | 3/4" | 3/4" | |
| OD Tube Porting (pump) | | | | |
| FB | BF | 1-1/2" | 1-1/4" | |
| FC | CF | 1-1/2" | 1" | |
| FG | GF | 1-1/4" | 1-1/4" | |
| FJ | JF | 1-1/4" | 1" | |
| FL | LF | 1" | 1" | |
| BC | CB | 1-1/2" | - | |
| BG | GB | 1-1/4" | - | |
| BJ | JB | 1" | - | |
| BL | LB | - | 1-1/4" | |
| BN | NB | - | 1" | |
| OD Tube Porting (motor) | | | | |
| VC-Double | | 1-1/4" | 1-1/4" | |
| VN-Double | | 1" | 1" | |
| VR-Double | | 3/4" | 3/4" | |
| Unported (pump) | | | | |
| BI | IB | Unported | | |
| Unported (motor) | | | | |
| BA | | Unported | | |

| Code | 6 – Gear Housing |
|------|------------------|
| AB | Pump |
| EB | Motor |

| Code | 7 – Gear Width | | | | |
|------|----------------|------------------------|-----------------------|--------------|-----|
| | Gear Width | in. ³ /rev. | cm ³ /rev. | Max Pressure | |
| | | | | psi | bar |
| 07 | 3/4" | 2.70 | 44.3 | 3500 | 241 |
| 10 | 1" | 3.60 | 59.0 | 3500 | 241 |
| 12 | 1-1/4" | 4.50 | 73.8 | 3500 | 241 |
| 15 | 1-1/2" | 5.40 | 88.5 | 3500 | 241 |
| 17 | 1-3/4" | 6.30 | 103.3 | 3500 | 241 |
| 20 | 2" | 7.20 | 118.0 | 3500 | 241 |
| 22 | 2-1/4" | 8.10 | 132.8 | 3250 | 224 |
| 25 | 2-1/2" | 9.00 | 147.5 | 3000 | 207 |

| Code | 8 – Shaft Type |
|------|---------------------------------|
| 7 | SAE C Spline |
| 11 | SAE C Keyed |
| 25 | SAE B Spline |
| 98 | SAE BB Splined (two-piece only) |

For Single or Tandem Units - unless noted

WARNING: This product can expose you to chemicals including lead or DEHP which are known to the state of California to cause cancer, birth defects, and other reproductive harm. www.p65warnings.ca.gov

Tandem: Repeat if Necessary

| | | | | | | | | | | | | | | | | | | | | | | |
|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| PG | 1 | 365 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 6 | 6 | 7 | 7 | 10 |
|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|

| Code | 9 – Bearing Carriers | | | |
|--|----------------------|--------|--------|--------|
| DUAL OUTLET - PUMP ONLY | | | | |
| Outlets: for clockwise porting the top port number comes first; for counter-clockwise porting the bottom port number comes first | | | | |
| CW | CCW | IN | OUT | |
| SAE Split Flange | | | | |
| AC | CA | 2-1/2" | 1-1/2" | 1-1/2" |
| AD | DA | 2-1/2" | 1-1/2" | 1-1/4" |
| AE | EA | 2-1/2" | 1-1/2" | 1" |
| AF | FA | 2-1/2" | 1-1/4" | 1-1/4" |
| AG | GA | 2-1/2" | 1-1/4" | 1" |
| AH | HA | 2-1/2" | 1" | 1" |
| AJ | JA | 2" | 1-1/2" | 1-1/2" |
| AK | KA | 2" | 1-1/2" | 1-1/4" |
| AL | LA | 2" | 1-1/2" | 1" |
| AM | MA | 2" | 1-1/4" | 1-1/4" |
| AN | NA | 2" | 1-1/4" | 1" |
| AP | PA | 2" | 1" | 1" |
| AQ | QA | 1-1/2" | 1-1/2" | 1-1/2" |
| AR | RA | 1-1/2" | 1-1/2" | 1-1/4" |
| AS | SA | 1-1/2" | 1-1/2" | 1" |
| AT | TA | 1-1/2" | 1-1/4" | 1-1/4" |
| AU | UA | 1-1/2" | 1-1/4" | 1" |
| AV | VA | 1-1/2" | 1" | 1" |
| AW | WA | 1-1/4" | 1-1/4" | 1-1/4" |
| AX | XA | 1-1/4" | 1-1/4" | 1" |
| AY | YA | 1-1/4" | 1" | 1" |
| AZ | ZA | 1" | 1" | 1" |
| OD Tube Porting | | | | |
| GJ | JG | 2" | 1-1/2" | 1-1/2" |
| GK | KG | 2" | 1-1/2" | 1-1/4" |
| GL | LG | 2" | 1-1/2" | 1" |
| GM | MG | 2" | 1-1/4" | 1-1/4" |
| GN | NG | 2" | 1-1/4" | 1" |
| GP | PG | 2" | 1" | 1" |
| GQ | QG | 1-1/2" | 1-1/2" | 1-1/2" |
| GR | RG | 1-1/2" | 1-1/2" | 1-1/4" |
| GS | SG | 1-1/2" | 1-1/2" | 1" |
| GT | TG | 1-1/2" | 1-1/4" | 1-1/4" |
| GU | UG | 1-1/2" | 1-1/4" | 1" |
| GV | VG | 1-1/2" | 1" | 1" |
| GW | WG | 1-1/4" | 1-1/4" | 1-1/4" |
| GX | XG | 1-1/4" | 1-1/4" | 1" |
| GY | YG | 1-1/4" | 1" | 1" |
| GZ | ZG | 1" | 1" | 1" |

* Outlet port for rear section

| Code | 9 – Bearing Carriers (cont.) | | | |
|----------------------------------|------------------------------|--------|--------|--|
| SINGLE OUTLET - PUMP ONLY | | | | |
| Outlet for front section | | | | |
| CW | CCW | IN | OUT | |
| SAE Split Flange | | | | |
| CJ | JC | 2-1/2" | 1-1/2" | |
| CL | LC | 2-1/2" | 1-1/4" | |
| CM | MC | 2-1/2" | 1" | |
| HB | BH | 2" | 1-1/2" | |
| HC | CH | 2" | 1-1/4" | |
| HF | FH | 2" | 1" | |
| HL | LH | 1-1/2" | 1-1/2" | |
| HM | MH | 1-1/2" | 1-1/4" | |
| HN | NH | 1-1/2" | 1" | |
| HO | OH | 1-1/4" | 1-1/4" | |
| HP | PH | 1-1/4" | 1" | |
| HQ | QH | 1" | 1" | |
| NR | RN | 2-1/2" | 1-1/2" | |
| RS | SR | 1-1/4" | 1" | |
| OD Tube Porting | | | | |
| KB | BK | 2" | 1-1/2" | |
| KC | CK | 2" | 1-1/4" | |
| KF | FK | 2" | 1" | |
| KL | LK | 1-1/2" | 1-1/2" | |
| KM | MK | 1-1/2" | 1-1/4" | |
| KN | NK | 1-1/2" | 1" | |
| KO | OK | 1-1/4" | 1-1/4" | |
| KP | PK | 1-1/4" | 1" | |
| KQ | QK | 1" | 1" | |

* Outlet port for rear section

| Code | 9 – Bearing Carriers (cont.) | | | |
|---------------------------------|------------------------------|--------|--------|--|
| COMBINED OUTLET | | | | |
| Outlet for front section | | | | |
| CW | CCW | IN | OUT | |
| SAE Split Flange (pump) | | | | |
| UC | CU | 2-1/2" | 1-1/2" | |
| UF | FU | 2-1/2" | 1-1/4" | |
| UN | NU | 2" | 1-1/2" | |
| UO | OU | 2" | 1-1/4" | |
| UP | PU | 1-1/2" | 1-1/2" | |
| UQ | QU | 1-1/2" | 1-1/4" | |
| UR | RU | 1-1/4" | 1-1/4" | |
| SAE Split Flange (motor) | | | | |
| AA-Double | | 2" | 2" | |
| BB-Double | | 1-1/2" | 1-1/2" | |
| CC-Double | | 1-1/4" | 1-1/4" | |
| EE-Double | | 1" | 1" | |
| FF-Double | | 3/4" | 3/4" | |
| OD Tube Porting (pump) | | | | |
| PE | EP | 2" | 1-1/2" | |
| PM | MP | 2" | 1-1/4" | |
| PN | NP | 1-1/2" | 1-1/2" | |
| PQ | QP | 1-1/2" | 1-1/4" | |
| PR | RP | 1-1/4" | 1-1/4" | |
| OD Tube Porting (motor) | | | | |
| MM-Double | | 1-1/2" | 1-1/2" | |
| NN-Double | | 1-1/4" | 1-1/4" | |
| QQ-Double | | 1" | 1" | |
| RR-Double | | 3/4" | 3/4" | |

| Code | 10 – Connecting Shaft |
|-----------------------------|-----------------------|
| 1 | Connecting Shaft |
| For connecting tandem units | |

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Offer of Sale

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 - Goods: means any tangible part, system or component to be supplied by Seller.
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 - Quote: means the offer or proposal made by Seller to Buyer for the supply of Products.
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Offer of Sale (Cont'd)

upon data or specifications provided by Buyer, Buyer is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products. In the event Buyer is not the end-user of the Products, Buyer will ensure such end-user complies with this paragraph.

13. Use of Products. Indemnity by Buyer. Buyer shall comply with all instructions, guides and specifications provided by Seller with the Quote or the Products. **Unauthorized Uses.** If Buyer uses or resells the Products in any way prohibited by Seller's instructions, guides or specifications, or Buyer otherwise fails to comply with Seller's instructions, guides and specifications, Buyer acknowledges that any such use, resale, or non-compliance is at Buyer's sole risk. Further, Buyer shall indemnify, defend, and hold Seller harmless from any losses, claims, liabilities, damages, lawsuits, judgments and costs (including attorney fees and defense costs), whether for personal injury, property damage, intellectual property infringement or any other claim, arising out of or in connection with: (a) improper selection, design, specification, application, or any misuse of Products; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, tools, equipment, plans, drawings, designs, specifications or other information or things furnished by Buyer; (d) damage to the Products from an external cause, repair or attempted repair by anyone other than Seller, failure to follow instructions, guides and specifications provided by Seller, use with goods not provided by Seller, or opening, modifying, deconstructing, tampering with or repackaging the Products; or (e) Buyer's failure to comply with these Terms. Seller shall not indemnify Buyer under any circumstance except as otherwise provided in these Terms.

14. Cancellations and Changes. Buyer may not cancel or modify, including but not limited to movement of delivery dates for the Products, any order for any reason except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage and any additional expense. Seller, at any time, may change features, specifications, designs and availability of Products.

15. Limitation on Assignment. Buyer may not assign its rights or obligations without the prior written consent of Seller.

16. Force Majeure. Seller is not liable for delay or failure to perform any of its obligations by reason of events or circumstances beyond its reasonable control. Such circumstances include without limitation: accidents, labor disputes or stoppages, government acts or orders, acts of nature, pandemics, epidemics, other widespread illness, or public health emergency, delays or failures in delivery from carriers or suppliers, shortages of materials, war (whether declared or not) or the serious threat of same, riots, rebellions, acts of terrorism, fire or any reason whether similar to the foregoing or otherwise. Seller will resume performance as soon as practicable after the event of force majeure has been removed. All delivery dates affected by force majeure shall be tolled for the duration of such force majeure and rescheduled for mutually agreed dates as soon as practicable after the force majeure condition ceases to exist. Force majeure shall not include financial distress, insolvency, bankruptcy, or other similar conditions affecting one of the parties, affiliates and/or sub-contractors.

17. Waiver and Severability. Failure to enforce any provision of these Terms will not invalidate that provision; nor will any such failure prejudice either party's right to enforce that provision in the future. Invalidation of any provision of these Terms shall not invalidate any other provision herein and, the remaining provisions will remain in full force and effect.

18. Termination. Seller may terminate any agreement governed by or arising from these Terms for any reason and at any time by giving Buyer thirty (30) days prior written notice. Seller may immediately terminate, in writing, if Buyer: (a) breaches any provision of these Terms, (b) becomes or is deemed insolvent, (c) appoints or has appointed a trustee, receiver or custodian for all or any part of Buyer's property, (d) files a petition for relief in bankruptcy on its own behalf, or one is filed against Buyer by a third party, (e) makes an assignment for the benefit of creditors; or (f) dissolves its business or liquidates all or a majority of its assets.

19. Ownership of Software. Seller retains ownership of all Software supplied to Buyer hereunder. In no event shall Buyer obtain any greater right in and to the Software than a right in the nature of a license limited to the use thereof and subject to compliance with any other terms provided with the Software.

20. Indemnity for Infringement of Intellectual Property Rights.


Seller is not liable for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights ("Intellectual Property Rights") except as provided in this Section. Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on a third party claim that one or more of the Products sold hereunder infringes the Intellectual Property Rights of a third party in the country of delivery of the Products by Seller to Buyer. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of any such claim, and Seller having sole control over the defense of the claim including all negotiations for settlement or compromise. If one or more Products sold hereunder is subject to such a claim, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Products, replace or modify the Products so as to render them non-infringing, or offer to accept return of the Products and refund the purchase price less a reasonable allowance for depreciation. Seller has no obligation or liability for any claim of infringement: (i) arising from information provided by Buyer; or (ii) directed to any Products provided hereunder for which the designs are specified in whole or part by Buyer; or (iii) resulting from the modification, combination or use in a system of any Products provided hereunder. The foregoing provisions of this Section constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for claims of infringement of Intellectual Property Rights.

21. Governing Law. These Terms and the sale and delivery of all Products are deemed to have taken place in, and shall be governed and construed in accordance with, the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to the sale and delivery of the Products.

22. Entire Agreement. These Terms, along with the terms set forth in the main body of any Quote, forms the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale and purchase. In the event of a conflict between any term set forth in the main body of a Quote and these Terms, the terms set forth in the main body of the Quote shall prevail. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter shall have no effect. These Terms may not be modified unless in writing and signed by an authorized representative of Seller.

23. Compliance with Laws. Buyer agrees to comply with all applicable laws, regulations, and industry and professional standards, including those of the United States of America, and the country or countries in which Buyer may operate, including without limitation the U.S. Foreign Corrupt Practices Act ("FCPA"), the U.S. Anti-Kickback Act ("Anti-Kickback Act"), U.S. and E.U. export control and sanctions laws ("Export Laws"), the U.S. Food Drug and Cosmetic Act ("FDCA"), and the rules and regulations promulgated by the U.S. Food and Drug Administration ("FDA"), each as currently amended. Buyer agrees to indemnify, defend, and hold harmless Seller from the consequences of any violation of such laws, regulations and standards by Buyer, its employees or agents. Buyer acknowledges that it is familiar with all applicable provisions of the FCPA, the Anti-Kickback Act, Export Laws, the FDCA and the FDA and certifies that Buyer will adhere to the requirements thereof and not take any action that would make Seller violate such requirements. Buyer represents and agrees that Buyer will not make any payment or give anything of value, directly or indirectly, to any governmental official, foreign political party or official thereof, candidate for foreign political office, or commercial entity or person, for any improper purpose, including the purpose of influencing such person to purchase Products or otherwise benefit the business of Seller. Buyer further represents and agrees that it will not receive, use, service, transfer or ship any Products from Seller in a manner or for a purpose that violates Export Laws or would cause Seller to be in violation of Export Laws. Buyer agrees to promptly and reliably provide Seller all requested information or documents, including end-user statements and other written assurances, concerning Buyer's ongoing compliance with Export Laws.

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 **WARNING:** This product can expose you to chemicals including lead or DEHP which are known to the state of California to cause cancer, birth defects, and other reproductive harm. www.p65warnings.ca.gov

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