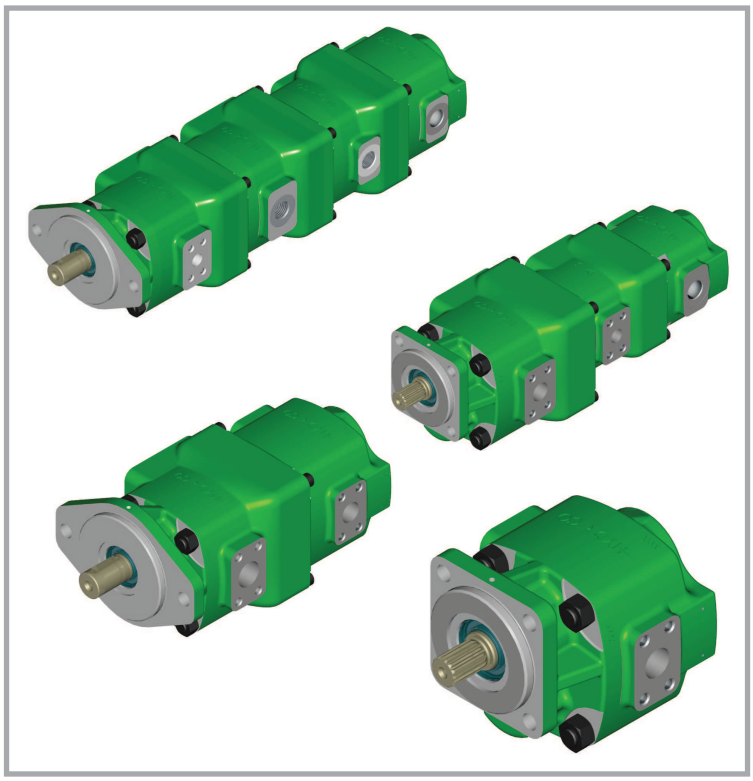
HYDRECO

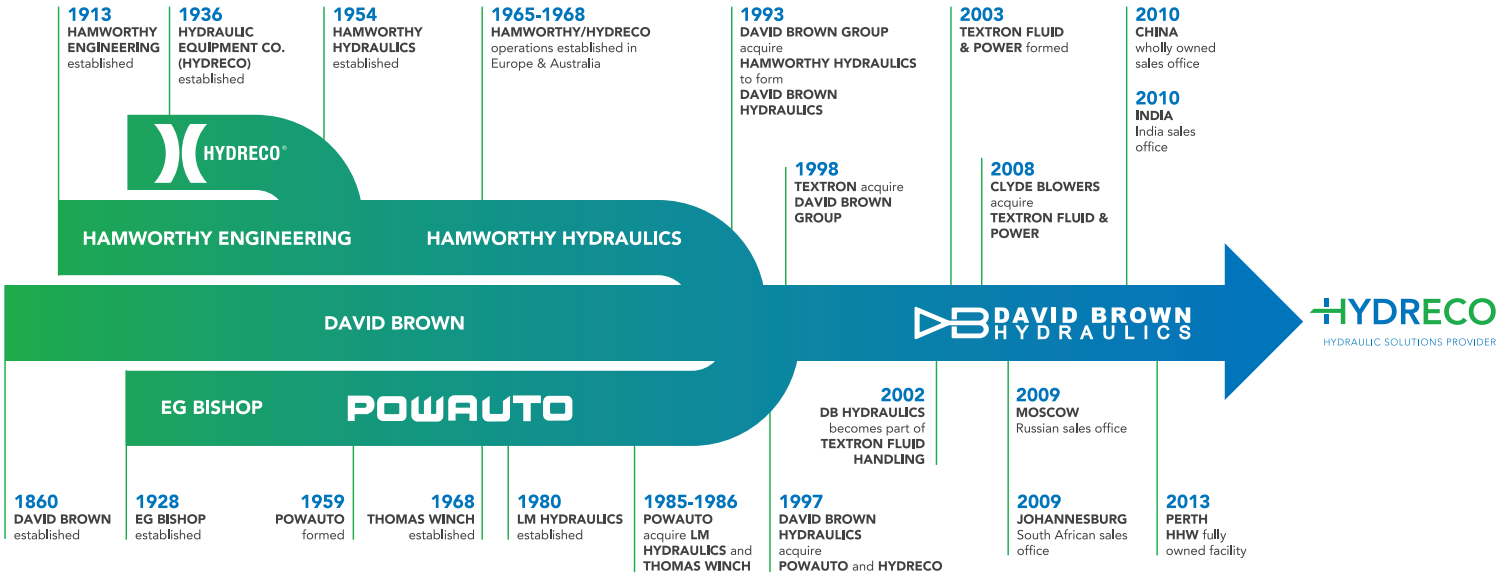
HYDRAULIC SOLUTIONS PROVIDER

# WSP50

## WORLD SERIES GEAR PUMPS



20 to 88 $cm^3$/rev (1.22 to 5.37 $in^3$/rev)
Up to 350 bar (5075 psi) rated pressure




# 100 YEARS OF HYDRAULICS EXPERIENCE

**Hydreco Hydraulics is the designer, manufacturer and distributor of products servicing the transport and mobile hydraulics sector. Hydreco has a combined history of 100 years in developing solutions through a rich heritage of legacy companies. The joining of David Brown Hydraulics, Powauto and Hydreco in 1997 brought together some of the most respected products, people and heritage brands in the business.**

Engineering excellence is at the core of our organization, the product range is geared towards offering the best possible solution for many applications within Construction, Earth moving, Transport, Industrial, Materials handling, and many more. We pride ourselves on supporting customers through leading edge products, designed to provide optimum performance and extensive reliability in continual hard working applications. With innovative technology our products have evolved and developed, leading to a range of some of the highest quality products available in the market place. The business is positioned to respond to your hydraulic needs through a worldwide network of manufacturing and sales facilities.

Hydreco has an extensive range of low noise helical gear, aluminium and cast iron gear pumps and standard spur gear models from its David Brown heritage. Its valve range covers multi-spool sectional and monoblock models with electro hydraulic, hydraulic and lever control. Dual axis, stackable and single axis hydraulic pilot valves, with an extensive range of handle options including ergonomic handles with many switches and button options. The valves are available with spring centred and electric detent options.

Under the name Hydreco Powauto, with heritage back to 1928, we sell our range of Transport hydraulics products. The product range covers power take-off units, pumps, valves, cylinders and accessories for on and off road vehicles. This World Class brand possesses a strong footprint in Asia Pacific building on its excellent reputation.

*The manufacturing engineering office from the 1950's*

*The Tool Room from 1947*

## OPERATING PARAMETERS

World Series pumps use a purpose designed form of spur gear which reduces the amount of fluid borne noise generated by the pump and hence transmitted into the hydraulic system. This results in a reduction in the amount of air borne noise emitted from the machine.

World Series pumps are highly efficient and are designed to provide high performance levels and long life when operated within the parameters shown below. For operation outside these parameters please consult your Hydreco Hydraulics representative.

| | | |
|---|---|---|
| **Max outlet port pressures** | see page 3 | |
| **Inlet port pressures** | see below. | |
| **Speed Range** | All models | 450 - 3500 rev/min |
| **Temperature** | Minimum at start-up | -40°C (-40°F) |
| | Maximum continuous | +80°C (+176°F) |
| | Maximum intermittent | +100°C (+212°F) |
| **Viscosity** | Maximum at start-up | 2000 $mm^2$/sec (9,000 SSU) |
| | Maximum continuous | 250 $mm^2$/sec (1150 SSU) |
| | Minimum continuous | 10 $mm^2$/sec (60 SSU) |
| | Optimum | 15-25 $mm^2$/sec (78-124 SSU) |
| **Fluid Cleanliness** | To ISO4406 solid contaminant | |
| | Start-up period | 21/17 |
| | Maximum in service | 19/15 |
| | Optimum | 16/11 |
| | Maximum water | 0.1% |
| **Fluid Velocity** | Maximum in INLET line | 2.5 m/sec (8 ft/sec) |
| | Recommended in INLET line | 1.5 m/sec (5 ft/sec) |
| **Shaft Loads** | Maximum axial load | 250 N (56 lb) |
| | Maximum radial load | 500 N (112 lb) |
| **Fluids** | All data is quoted for mineral oils HM and HV. | |
| | For fire resistant and environmentally aware fluids please contact your Hydreco Hydraulics representative. | |
| **Rotation** | Clockwise or Anti-clockwise viewed from shaft end (not reversible). | |

## INLET CONDITIONS

It is essential that pumps are installed so that they can always fill with fluid.

World Series pump inlet porting is designed to facilitate full volume fill but the following machine design recommendations should be followed.

- **Never run pumps dry - particular care should be taken to open any shut-off valves.**
- **Use large diameter pipes and fittings and avoid sharp bends and long lengths.**

  Inlet fluid velocity should not exceed 2.5 m/sec (8.0 ft/sec) calculated by:

  $V = \frac{21.22Q}{D^2}$ m/sec where V = velocity (m/sec), Q = flow rate (l/min), D = bore diameter (mm)

  $V = \frac{0.408Q}{D^2}$ ft/sec where V = velocity (ft/sec), Q = flow rate (US gal/min), D = bore diameter (inches)

- **If possible mount the pump below the lowest level of fluid in the tank. If necessary prime the pump on start-up.**
- **Ensure that inlet lines are airtight.**
- **Particular care should be taken where high speeds and/or high fluid viscosities are involved.**

As a general rule pressure at the pump inlet should not be less than 0.8 bar absolute (6" Hg depression) at normal viscosity of 23 $mm^2$/sec (110 SSU) at maximum operating speed.

*Hydreco Hydraulics Engineers will be pleased to advise on any installation*

## SUPER QUIET, HIGH PERFORMANCE HYDRAULIC PUMPS

World Series Pumps incorporates a purpose designed form of spur gear technology to give highest performance with lowest noise levels.

This purpose designed form of spur gear reduces the effects of flow and pressure ripple to significantly reduce generated noise while large diameter shafts and bearings combined with rigidly aligned cast iron housings ensure long life in the most arduous application.

Accuracy of components and pressure compensated side plates ensure that high performance levels are maintained.

## A RANGE OF SINGLE AND MULTIPLE PUMPS

Pump elements are available with displacements from 20 to 88 $cm^3$/rev (1.22 to 5.37 $in^3$/rev) for maximum continuous operating pressures up to 350 bar.

Pumps can be supplied as single, double, triple or quadruple units. There is a limit on the combinations that are available in doubles, triples and quadruples. Please see the data below.

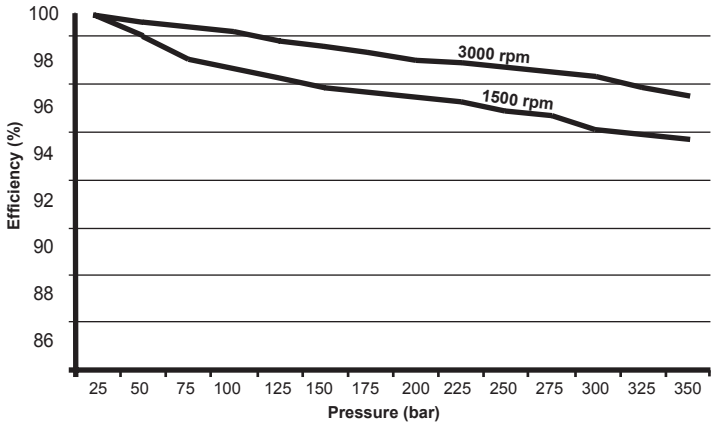
All pump displacements listed in the chart opposite are available for double, triple and quad pumps, but not every combination of pump assembly can be accomodated due to intercoupling strengths, operating sequences, pressure levels, and duty cycles.

Please discuss your specific requirements with your local Hydreco Hydraulics representative.

## DISPLACEMENT RANGE

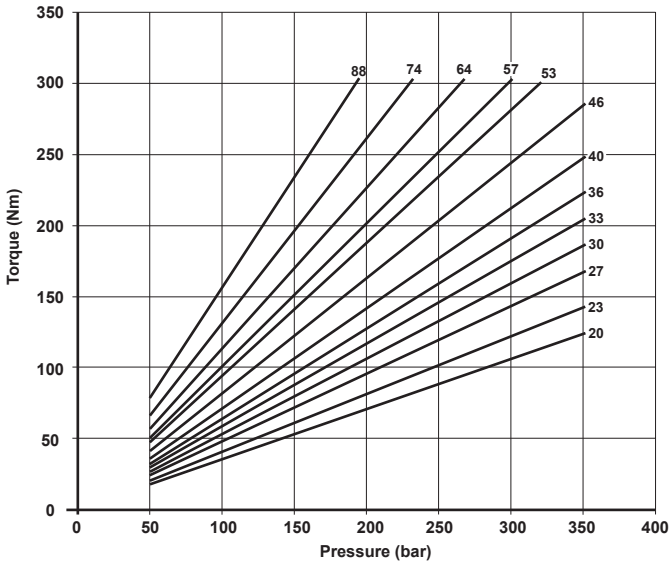
| MODEL | DISPLACEMENT $cm^3$/rev ($in^3$/rev) | RATED PRESSURE bar (psi) |
|---|---|---|
| **5020** | 20.0 (1.22) | 350 (5075) |
| **5023** | 23.0 (1.40) | 350 (5075) |
| **5027** | 27.0 (1.65) | 350 (5075) |
| **5030** | 30.0 (1.83) | 350 (5075) |
| **5033** | 33.0 (2.01) | 350 (5075) |
| **5036** | 36.0 (2.20) | 350 (5075) |
| **5040** | 40.0 (2.44) | 350 (5075) |
| **5046** | 46.0 (2.81) | 350 (5075) |
| **5053** | 53.0 (3.24) | 320 (4640) |
| **5057** | 57.0 (3.47) | 300 (4350) |
| **5064** | 64.0 (3.91) | 275 (3990) |
| **5074** | 74.0 (4.52) | 230 (3335) |
| **5088** | 88.0 (5.37) | 190 (2755) |

## PUMP EFFICIENCIES




NOTE: The are actual efficiencies measured on a 53 cc/rev pump. Efficiencies for pumps at other displacements will vary from this curve

## TORQUE CURVE




NOTE: This is typical torque data with an assumed mechanical efficiency of 90%

# **WORLD SERIES** 50 SERIES PRODUCT SELECTION DATA

**Number of Pumping Sections**

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ |

**Rotation** - viewed on shaft

Anti-clockwise ☐
Clockwise ☐

**Drive Shaft**

SAE 22-4 (B) 7/8" Spline ☐
SAE 25-4 (BB) 1" Spline ☐
SAE 22-1 (B) 7/8" Parallel ☐
SAE 25-1 (BB) 1" Parallel ☐
1.1/8" Parallel ☐
Italian Spline UNI8953 ☐
ISO 7653 (only for ISO7653 Flange) ☐

**Mounting Flanges**

SAE 82-2 (A- 2 bolt) ☐
SAE 101-2 (B - 2 bolt) ☐
SAE 101-2 (B - 2 bolt) with Spigot Seal ☐
SAE 101-4 (B - 4 bolt) ☐
SAE 101-4 (B - 4 bolt) with Spigot Seal ☐
SAE 127-2 (C - 2 bolt) ☐
SAE 127-4 (C - 4 bolt) ☐
3 Bolt Italian ☐
ISO 7653 with Support Bearing ☐
ISO 7653 without Support Bearing ☐

**Displacements**

| Code | DISPLACEMENT cm³/rev | DISPLACEMENT in³/rev | Pump Section 1 | 2 | 3 | 4 | |
|---|---|---|---|---|---|---|---|
| **5027** | 27.0 | 1.65 | ☐ | ☐ | ☐ | ☐ | 50 Series Section |
| **5030** | 30.0 | 1.83 | ☐ | ☐ | ☐ | ☐ | |
| **5033** | 33.0 | 2.01 | ☐ | ☐ | ☐ | ☐ | |
| **5036** | 36.0 | 2.20 | ☐ | ☐ | ☐ | ☐ | |
| **5040** | 40.0 | 2.44 | ☐ | ☐ | ☐ | ☐ | |
| **5046** | 46.0 | 2.81 | ☐ | ☐ | ☐ | ☐ | |
| **5053** | 53.0 | 3.24 | ☐ | ☐ | ☐ | ☐ | |
| **5057** | 57.0 | 3.48 | ☐ | ☐ | ☐ | ☐ | |
| **5064** | 64.0 | 3.91 | ☐ | ☐ | ☐ | ☐ | |
| **5074** | 74.0 | 4.52 | ☐ | ☐ | ☐ | ☐ | |
| **5088** | 88.0 | 5.37 | ☐ | ☐ | ☐ | ☐ | |
| **4012** | 12.0 | 0.73 | ☐ | ☐ | ☐ | ☐ | 40 Series Section |
| **4014** | 14.0 | 0.85 | ☐ | ☐ | ☐ | ☐ | |
| **4016** | 16.0 | 0.98 | ☐ | ☐ | ☐ | ☐ | |
| **4019** | 19.0 | 1.16 | ☐ | ☐ | ☐ | ☐ | |
| **4022** | 22.0 | 1.34 | ☐ | ☐ | ☐ | ☐ | |
| **4025** | 25.0 | 1.53 | ☐ | ☐ | ☐ | ☐ | |
| **4028** | 28.0 | 1.71 | ☐ | ☐ | ☐ | ☐ | |
| **4031** | 31.0 | 1.89 | ☐ | ☐ | ☐ | ☐ | |
| **4034** | 34.0 | 2.07 | ☐ | ☐ | ☐ | ☐ | |
| **4038** | 38.0 | 2.32 | ☐ | ☐ | ☐ | ☐ | |
| **4042** | 42.0 | 2.56 | ☐ | ☐ | ☐ | ☐ | |
| **4046** | 46.0 | 2.81 | ☐ | ☐ | ☐ | ☐ | |
| **4050** | 50.0 | 3.05 | ☐ | ☐ | ☐ | ☐ | |

**Shaft Seals**

Seal and Wiper - (Code A) ☐
2 Seals with Tell Tale - (Code C) ☐
High Pressure - (Code Z) ☐

**Any Other Relevant Information**

**Contact Details** (Company, Name, Address, Tel., E-Mail, etc)

*Note: All Inlet Ports are interconnected within the pump assembly as standard on Multiple Pumps, allowing Common Inlets to be specified*

**Side Inlet Port Type**

| | Pump Section 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| BSPP | ☐ | ☐ | ☐ | ☐ |
| SAE UNF O'Ring | ☐ | ☐ | ☐ | ☐ |
| SAE Split Flange - Metric Bolts | ☐ | ☐ | ☐ | ☐ |
| No Port | ☐ | ☐ | ☐ | ☐ |

**Side Inlet Port Sizes**

| | | Pump Section 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 3/4 | (1-1/16 UNF) | ☐ | ☐ | ☐ | ☐ |
| 1 | (1-5/16 UNF) | ☐ | ☐ | ☐ | ☐ |
| 1-1/4 | (1-5/8 UNF) | ☐ | ☐ | ☐ | ☐ |
| 1-1/2 | | ☐ | ☐ | ☐ | ☐ |
| 2 | | ☐ | ☐ | ☐ | ☐ |
| 2-1/2 | | ☐ | ☐ | ☐ | ☐ |

**Rear Inlet port type**

| | Pump Section 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| BSPP | ☐ | ☐ | ☐ | ☐ |
| SAE UNF O'Ring | ☐ | ☐ | ☐ | ☐ |

*Only available on Single Pumps or the rear section of a Multiple Pump*

**Rear Inlet Port Sizes**

| | | Pump Section 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 3/4 | (1-1/16 UNF) | ☐ | ☐ | ☐ | ☐ |
| 1 | (1-5/16 UNF) | ☐ | ☐ | ☐ | ☐ |
| 1-1/4 | (1-5/8 UNF) | ☐ | ☐ | ☐ | ☐ |

**Side Outlet Port Type**

| | Pump Section 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| BSPP | ☐ | ☐ | ☐ | ☐ |
| SAE UNF O'Ring | ☐ | ☐ | ☐ | ☐ |
| SAE Split Flange - Metric Bolts | ☐ | ☐ | ☐ | ☐ |

**Side Outlet Port Sizes**

| | | Pump Section 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 1/2 | (7/8 UNF) | ☐ | ☐ | ☐ | ☐ |
| 3/4 | (1-1/16 UNF) | ☐ | ☐ | ☐ | ☐ |
| 1 | (1-5/16 UNF) | ☐ | ☐ | ☐ | ☐ |

**Rear Outlet Port Type**

| | Pump Section 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| BSPP Thread | ☐ | ☐ | ☐ | ☐ |
| SAE UNF O'Ring Thread SAE | ☐ | ☐ | ☐ | ☐ |

*Only available on Single Pumps or the rear section of a Multiple Pump*

**Rear Outlet Port Sizes**

| | | Pump Section 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 1/2 | (7/8 UNF) | ☐ | ☐ | ☐ | ☐ |
| 3/4 | (1-1/16 UNF) | ☐ | ☐ | ☐ | ☐ |

**Operating Pressures**

Pump Section 1 ☐
Pump Section 2 ☐
Pump Section 3 ☐
Pump Section 4 ☐

*Before ordering please check that the pump will be operated within quoted parameters and that drive shaft "pD" factors are not exceeded.*

**Operating Speed**

Operating Speed ☐

**Hydraulic Fluid Type**

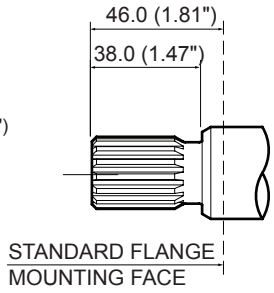
Premium Mineral Oil ☐
Other (please state) ☐

**Application**

## Code Q
### SAE 25-4 (BB) 1" SPLINE

INVOUTE SPLINE
15 TEETH
16/32 DP
FLAT ROOT, SIDE FIT
30 DEG PRESSURE ANGLE
MAJR DIA 24.87/24.97 (0.983"/0.979")

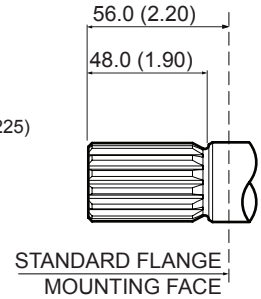
p x D = 22450 (bar x cm³/rev)*
p x D = 19869 (psi x cu.in/rev)*




## Code C
### SAE 32-4 (C) 1 1/4 Spline

INVOUTE SPLINE
14 TEETH
12/24 DP
FLAT ROOT, SIDE FIT
30 DEG PRESSURE ANGLE
MAJOR DIA 31.22/31.12 (1.229/1.225)

p x D = 45565 (bar x cm³/rev)*
p x D = 40325 (psi x cu.in/rev)*

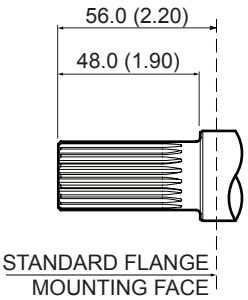



## ISO 7653 Spline

INVOUTE SPLINE
20 TEETH
20/40 DP
FLAT ROOT, SIDE FIT
30 DEG PRESSURE ANGLE
MAJOR DIA 26.67/26.54 (1.050/1.045)

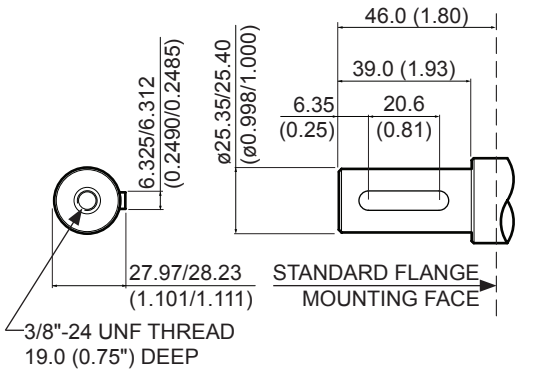
p x D = xxxxx (bar x cm³/rev)*
p x D = xxxxx (psi x cu.in/rev)*

**Note - this shaft is normally used with the Outboard Bearing option Mounting Flange**



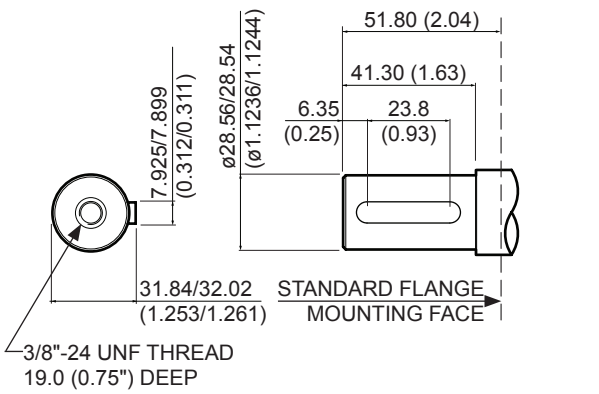

## Code H
### SAE 25-1 (BB) 1" parallel

p x D = 22450 (bar x cm³/rev)*
p x D = 19869 (psi x cu.in/rev)*



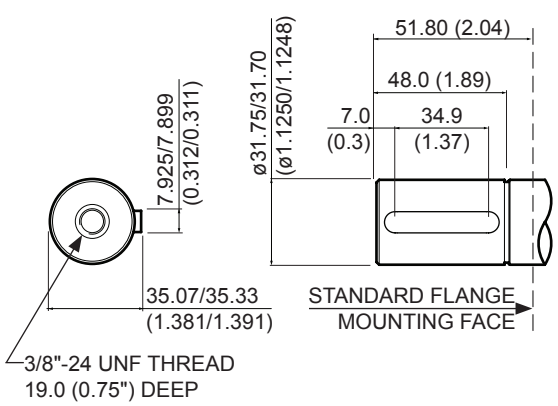

## Code R
### 1 1/8" Parallel

p x D = 31000 (bar x cm³/rev)*
p x D = 27435 (psi x cu.in/rev)*

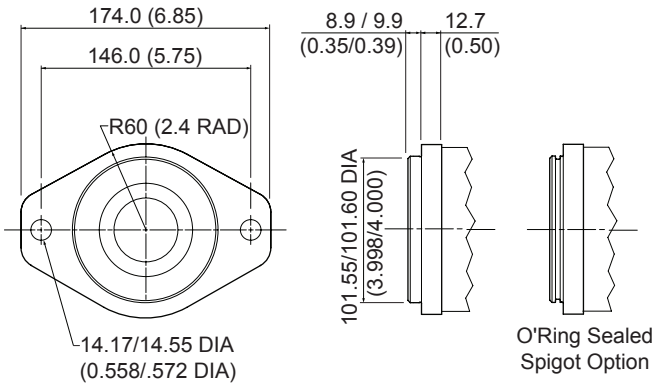



## Code G
### 1 1/4" Parallel

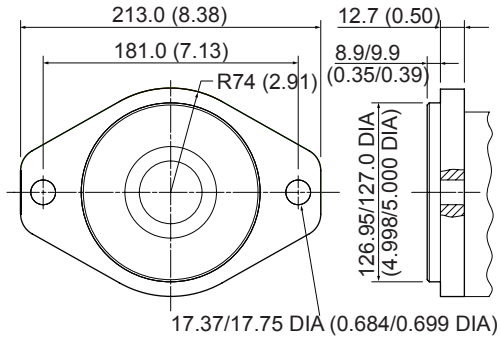
p x D = 45565 (bar x cm³/rev)
p x D = 40325 (psi x cu.in/rev)



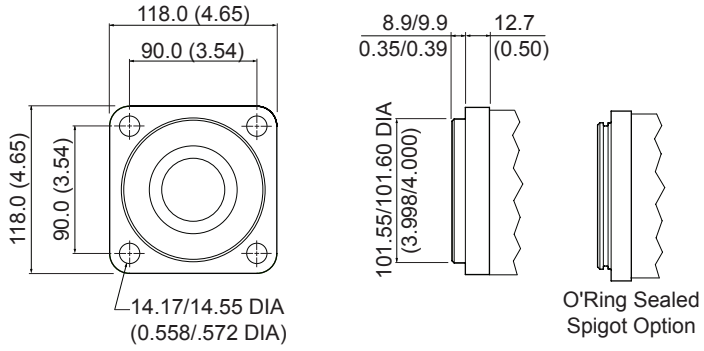
Code 2 SAE 101-2 (B - 2 bolt)



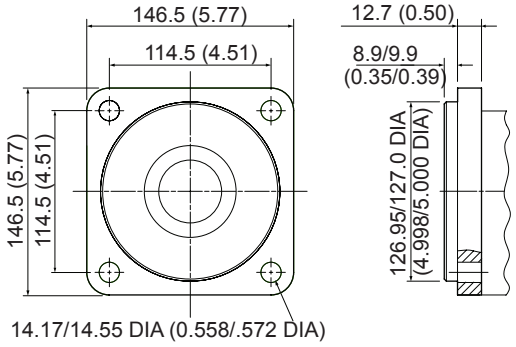

Code 4 SAE 127-2 (C - 2 bolt)



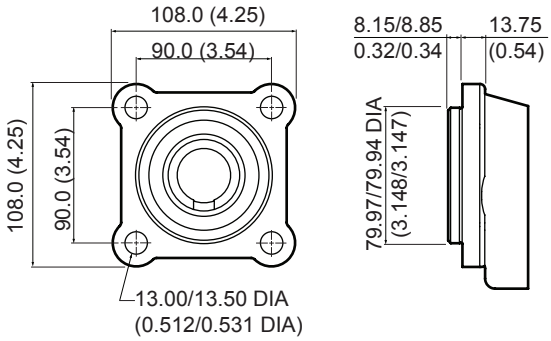

Code 3 SAE 101-4 (B - 4 bolt)




Code 5 SAE 127-4 (C - 4 bolt)

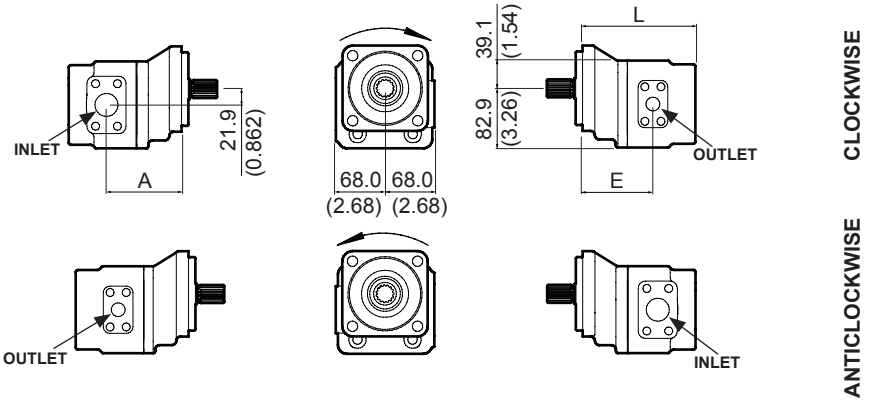



ISO 7653 C Design

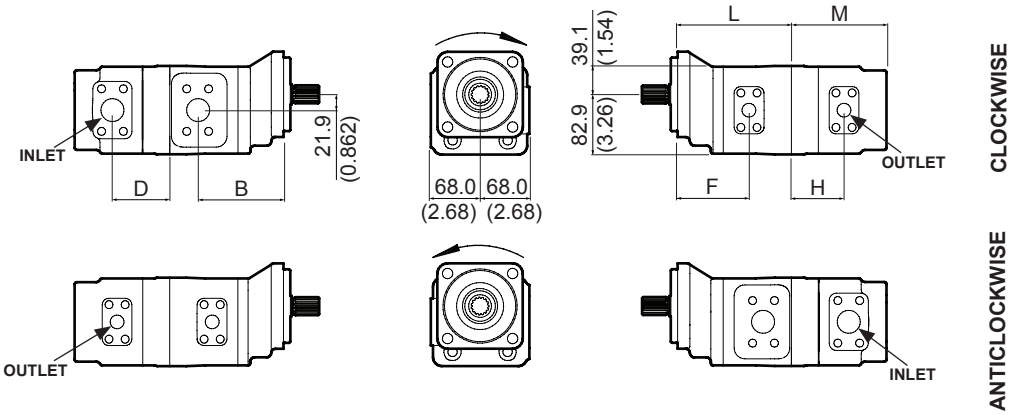



Note:
This Flange is available with or without an External Bearing.
There is no difference with any external dimensions

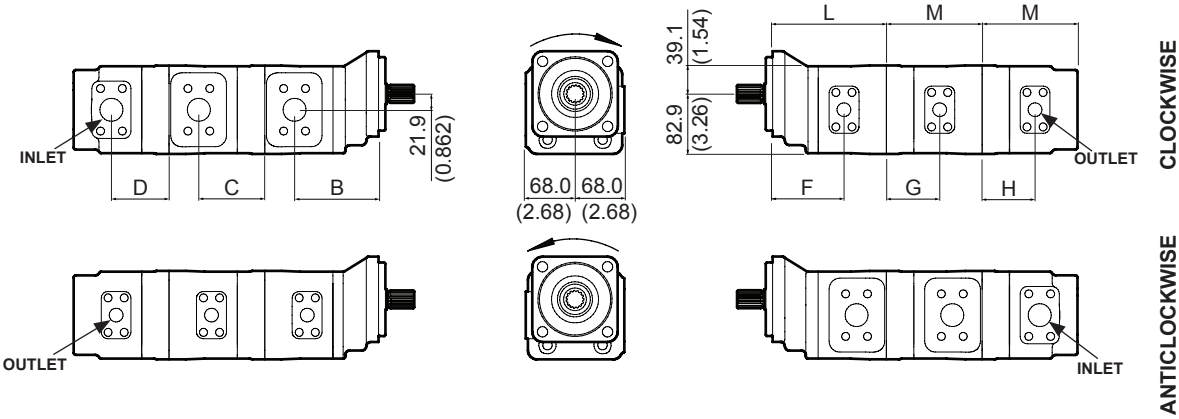
**SINGLE PUMP**



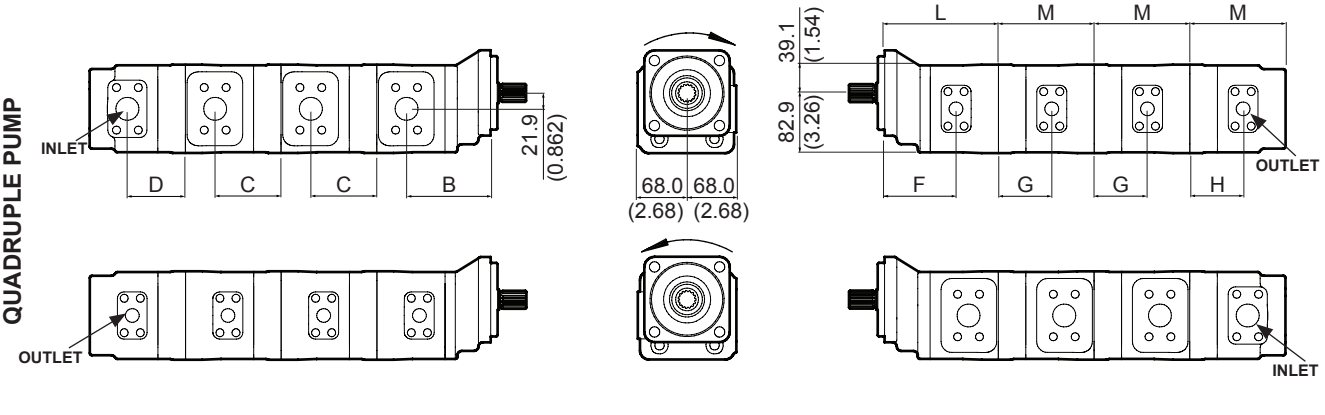

**DOUBLE PUMP**




**TRIPLE PUMP**




**QUADRUPLE PUMP**




**FOR COMPLIMENTARY INSTALLATION DATA SEE PAGE 8 ~ FOR REAR PORT OPTIONS SEE PAGE 9**
**FOR SHAFT OPTIONS SEE PAGE 5 ~ FOR FLANGE OPTIONS SEE PAGE 9**

## SINGLE AND MULTIPLE 40 SERIES PUMPS

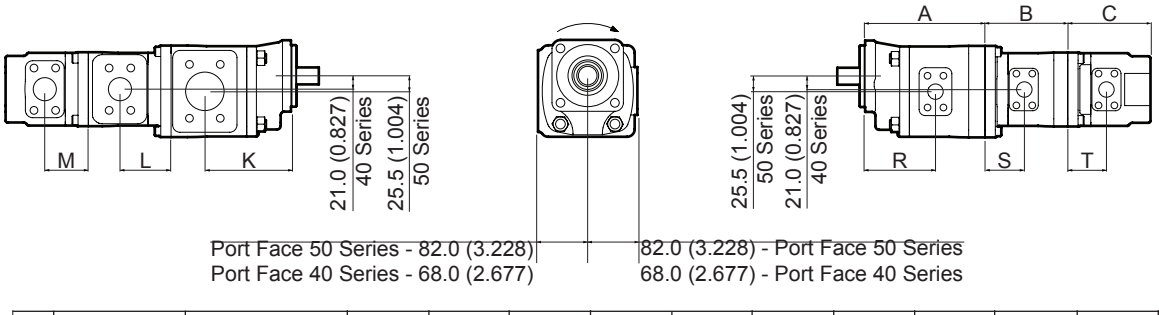
| Dimension Reference | Displacement - cc/rev (in³/rev) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 27 (1.65) | 30 (1.83) | 33 (2.01) | 36 (2.20) | 40 (2.44) | 46 (2.81) | 53 (3.24) | 57 (3.48) | 64 (3.91) | 74 (4.52) | 88 (5.37) |
| A | | | 107.3 (4.225) | 109.7 (4.317) | 112.0 (4.409) | 108.7 (4.280) | 111.8 (4.403) | 116.5 (4.588) | 122.0 (4.803) | 113.7 (4.478) | 119.2 (4.694) | 127.1 (5.002) | 138.0 (5.433) |
| B | | | 118.3 (4.658) | 120.7 (4.750) | 123.0 (4.843) | 121.2 (4.772) | 124.3 (4.895) | 129.0 (5.080) | 134.5 (5.295) | 128.7 (5.069) | 134.2 (5.284) | 142.0 (5.592) | 153.0 (6.024) |
| C | | | 93.3 (3.674) | 95.7 (3.766) | 98.0 (3.858) | 96.2 (3.788) | 99.3 (3.911) | 104.0 (4.096) | 109.5 (4.311) | 103.7 (4.084) | 109.2 (4.300) | 117.0 (4.608) | 128.0 (5.039) |
| D | | | 82.3 (3.241) | 84.7 (3.333) | 87.0 (3.425) | 83.7 (3.295) | 86.8 (3.419) | 91.5 (3.604) | 97.0 (3.819) | 88.7 (3.494) | 94.2 (3.709) | 102.1 (4.018) | 113.0 (4.449) |
| E | | | 101.3 (3.989) | 103.7 (4.081) | 106.0 (4.173) | 101.7 (4.004) | 104.8 (4.127) | 109.5 (4.312) | 115.0 (4.528) | 102.7 (4.045) | 108.2 (4.261) | 116.1 (4.569) | 127.0 (5.000) |
| F | | | 101.3 (3.989) | 103.7 (3.081) | 106.0 (4.173) | 101.7 (4.004) | 104.8 (4.127) | 109.5 (4.312) | 115.0 (4.528) | 102.7 (4.045) | 108.2 (4.261) | 116.1 (4.569) | 127.0 (5.000) |
| G | | | 76.3 (3.004) | 78.7 (3.096) | 81.0 (3.189) | 76.7 (3.020) | 79.8 (3.143) | 84.5 (3.328) | 90.0 (3.543) | 77.7 (3.061) | 83.2 (3.276) | 91.1 (3.585) | 102.0 (4.016) |
| H | | | 76.3 (3.004) | 78.7 (3.096) | 81.0 (3.189) | 76.7 (3.020) | 79.8 (3.143) | 84.5 (3.328) | 90.0 (3.543) | 77.7 (3.061) | 83.2 (3.276) | 91.1 (3.585) | 102.0 (1.016) |
| L | | | 161.0 (6.339) | 163.4 (6.432) | 165.7 (6.524) | 168.1 (6.617) | 171.2 (6.740) | 175.9 (6.925) | 181.4 (7.140) | 184.5 (7.264) | 190.0 (7.479) | 197.8 (7.787) | 208.8 (8.219) |
| M | | | 136.0 (5.355) | 138.4 (5.447) | 140.7 (5.540) | 143.1 (5.632)_ | 146.2 (5.756) | 150.9 (5.940) | 156.4 (6.156) | 159.5 (6.279) | 165.0 (6.795) | 172.8 (6.803) | 183.8 (7.234) |

The data in the table above relates to the WSP 50 Series images on the previous page for single, double, triple and quadruple configurations and assumes standard Mounting Flanges and a standard Interface Adaptor (on multiple pump builds)

## MULTIPLE MIXED 50 AND 40 SERIES PUMPS

The data in this section relates to the WSP 50/40 Series mixed builds for single, double, triple and quadruple configurations and assumes standard Mounting Flanges and a standard Interface Adaptor (on multiple pump builds)

**CLOCKWISE BUILD SHOWN**



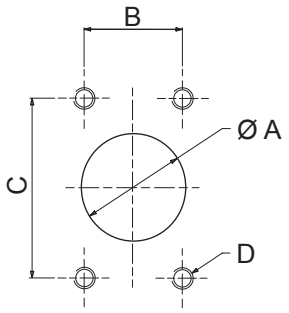

| | Displacement cc/rec (in³/rev) | | 27 (1.65) | 30 (1.83) | 33 (2.01) | 36 (2.20) | 40 (2.44) | 46 (2.81) | 53 (3.24) | 57 (3.48) | 64 (3.91) | 74 (4.52) | 88 (5.37) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 Series Data | K | | 76.0 (2.992) | 76.1 (2.996) | 76.2 (3.000) | 76.0 (2.992) | 76.1 (2.996) | 76.3 (3.004) | 76.5 (3.012) | 76.1 (2.996) | 76.3 (3.004) | 76.6 (3.016) | 77.0 (3.031) |
| | L | | 51.0 (2.008) | 51.1 (2.012) | 51.2 (2.016) | 51.0 (2.008) | 51.1 (2.012) | 51.3 (2.020) | 51.5 (2.028) | 51.1 (2.012) | 51.3 (2.020) | 51.6 (2.031) | 52.0 (2.047) |
| | R | | 76.0 (2.992) | 76.1 (2.996) | 76.2 (3.000) | 76.0 (2.992) | 76.1 (2.996) | 76.2 (3.004) | 76.5 (3.012) | 76.1 (2.996) | 76.3 (3.004) | 76.6 (3.016) | 77.0 (3.031) |
| | S | | 51.0 (2.008) | 51.1 (2.012) | 51.2 (2.016) | 51.0 (2.008) | 51.1 (2.012) | 51.3 (2.020) | 51.5 (2.028) | 51.1 (2.012) | 51.3 (2.020) | 51.6 (2.031) | 52.0 (2.047) |
| | A | | 76.0 (2.992) | 76.1 (2.996) | 76.2 (3.000) | 76.0 (2.992) | 76.1 (2.996) | 76.3 (3.004) | 76.5 (3.012) | 76.1 (2.996) | 76.3 (3.004) | 76.6 (3.016) | 77.0 (3.031) |
| | B | | 51.0 (2.008) | 51.1 (2.012) | 51.2 (2.016) | 51.0 (2.008) | 51.1 (1.012) | 51.3 (2.020) | 51.5 (2.028) | 51.1 (2.012) | 51.3 (2.020) | 51.6 (2.031) | 52.0 (2.047) |

| | Displacement cc/rec (in³/rev) | 12 (0.73) | 14 (0.73) | 16 (0.98) | 19 (1.16) | 22 (1.34) | 25 (1.53) | 28 (1.71) | 31 (1.89) | 34 (2.07) | 38 (2.32) | 42 (2.56) | 46 (2.81) | 50 (3.05) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 Series Data | L | 34.3 (1.35) | 36.5 (1.437) | 38.7 (1.524) | 42.0 (1.654) | 39.9 (1.571) | 43.1 (1.697) | 46.4 (1.827) | 49.7 (1.957) | 53.0 (2.075) | 46.4 (1.827) | 50.7 (1.996) | 55.1 (2.169) | 59.5 (2.343) |
| | M | 26.3 (1.035) | 28.5 (1.122) | 30.7 (1.209) | 34.0 (1.339) | 28.9 (1.138) | 32.1 (1.264) | 35.4 (1.394) | 38.7 (1.524) | 42.0 (1.654) | 33.9 (1.335) | 38.2 (1.504) | 42.6 (1.677) | 47.0 (1.850) |
| | S | 19.3 (0.760) | 21.5 (0.846) | 23.7 (0.933) | 27.0 (1.063) | 22.4 (0.882) | 25.6 (1.008) | 28.9 (1.138) | 32.2 (1.268) | 35.5 (1.398) | 25.9 (1.020) | 30.2 (1.189) | 34.6 (1.362) | 39.0 (1.535) |
| | T | 19.3 (0.760) | 21.5 (0.846) | 23.7 (0.933) | 27.0 (1.063) | 22.4 (0.882) | 25.6 (1.008) | 28.9 (1.138) | 32.2 (1.268) | 35.5 (1.398) | 25.9 (1.020) | 30.2 (1.189) | 34.6 (1.362) | 39.0 (1.535) |
| | B | 70.0 (2.756) | 72.2 (2.843) | 74.4 (2.929) | 77.7 (3.059) | 81.0 (3.189) | 84.3 (3.319) | 87.6 (3.449) | 90.8 (3.575) | 94.1 (3.705) | 98.5 (3.878) | 102.9 (4.051) | 107.3 (4.224) | 111.7 (4.398) |
| | C | 70.0 (2.756) | 74.2 (2.843) | 74.4 (2.929) | 77.7 (3.059) | 81.0 (3.189) | 84.3 (3.319) | 87.6 (3.449) | 90.8 (3.575) | 94.1 (3.705) | 98.5 (3.878) | 102.9 (4.051) | 107.3 (4.224) | 111.7 (4.398) |

For any non standard pump build that is not covered in these configurations please contact your local DBH representative for advice.

# WORLD SERIES INSTALLATION DATA - SAE Port Data

**SAE FLANGE PORT DETAILS**
SAE Code 61 - Standard Pressure Series




| SAE FLANGE SIZE | A mm (in) | B mm (in) | C mm (in) | D |
|---|---|---|---|---|
| 1/2" | 12.7 (0.50) | 17.48 (0.688) | 38.10 (1.500) | M8 x 1.25 x 16 |
| 3/4" | 19.1 (0.75) | 22.23 (0.875) | 47.63 (1.875) | M10 x 1.5 x 20 |
| 1" | 25.4 (1.00) | 26.19 (1.031) | 52.37 (2.062) | M10 x 1.5 x 20 |
| 1-1/4" | 31.8 (1.25) | 30.18 (1.188) | 58.72 (2.312) | M10 x 1.5 x 20 |
| 1-1/2" | 38.1 (1.50) | 35.71 (1.406) | 69.85 (2.750) | M12 x 1.75 x 24 |
| 2" | 50.8 (2.00) | 42.88 (1.688) | 77.77 (3.062) | M12 x 1.75 x 24 |

# WORLD SERIES MULTIPLE PUMPS - pD Factors

Multiple pump combinations, of either the same or a mix of frame sizes, may be limited by the torque capacity of the drive shaft and couplings. The torque factirs listed in the table below must not be exceeded. The examples assumes all pump sections are loaded simultaneously, but in any application this may not be the case, so it is important to understand the operating parameters on any machine.

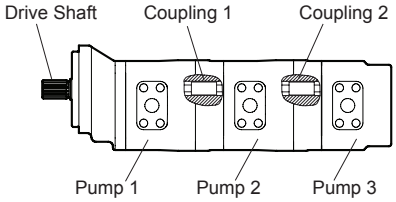
| CODE | SHAFT TYPE | T = pD Maximum | |
|---|---|---|---|
| | | bar x cm³/rev | psi x in³/rev |
| Q | SAE 25-4 (BB) 1" Spline | 22450 | 19869 |
| C | SAE 32-4 (C) 1 1/4" Spline | 45565 | 40325 |
| BD | ISO 7653 Spline | 45566 | 40326 |
| H | SAE 25-1 (BB) 1" Parallel | 22450 | 19869 |
| R | 1 1/8" Parallel | 34452 | 30490 |
| G | SAE 32-1 (C) 1 1/4" Parallel | 45565 | 40325 |
| | Coupling 50 - 50 | 21250 | 18806 |
| | Coupling 50 - 40 | 12500 | 11063 |

$T_{shaft} = p_1 D_1 + p_2 D_2 + p_3 D_3$

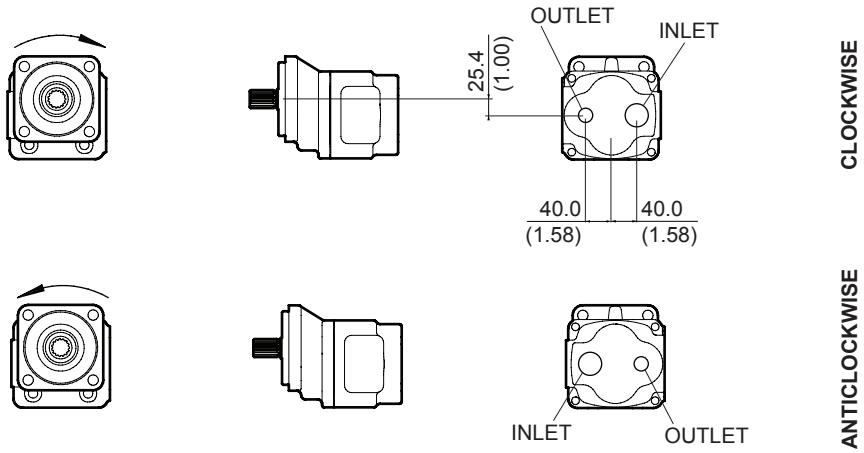
$T_{coupling\ 1} = p_2 D_2 + p_3 D_3$

$T_{coupling\ 2} = p_3 D_3$

(p1, p2, & p3 are maximum simultaneous pressures)




# WORLD SERIES INSTALLATION DATA - Rear Port Option




Rear Ports are available on Single Pumps and on the Rear Pump Section of Multiple Pump assemblies

Only threaded ports are available.

The provision of rear ports may be limited on higher speed, larger displacement applications where risk of inlet cavitation may be an risk.

Maximum Inlet Port size - 1-1/4" BSP or 1-5/8" UNF
Maximum Outlet Port Size - 1" BSP or 1-1/16" UNF

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