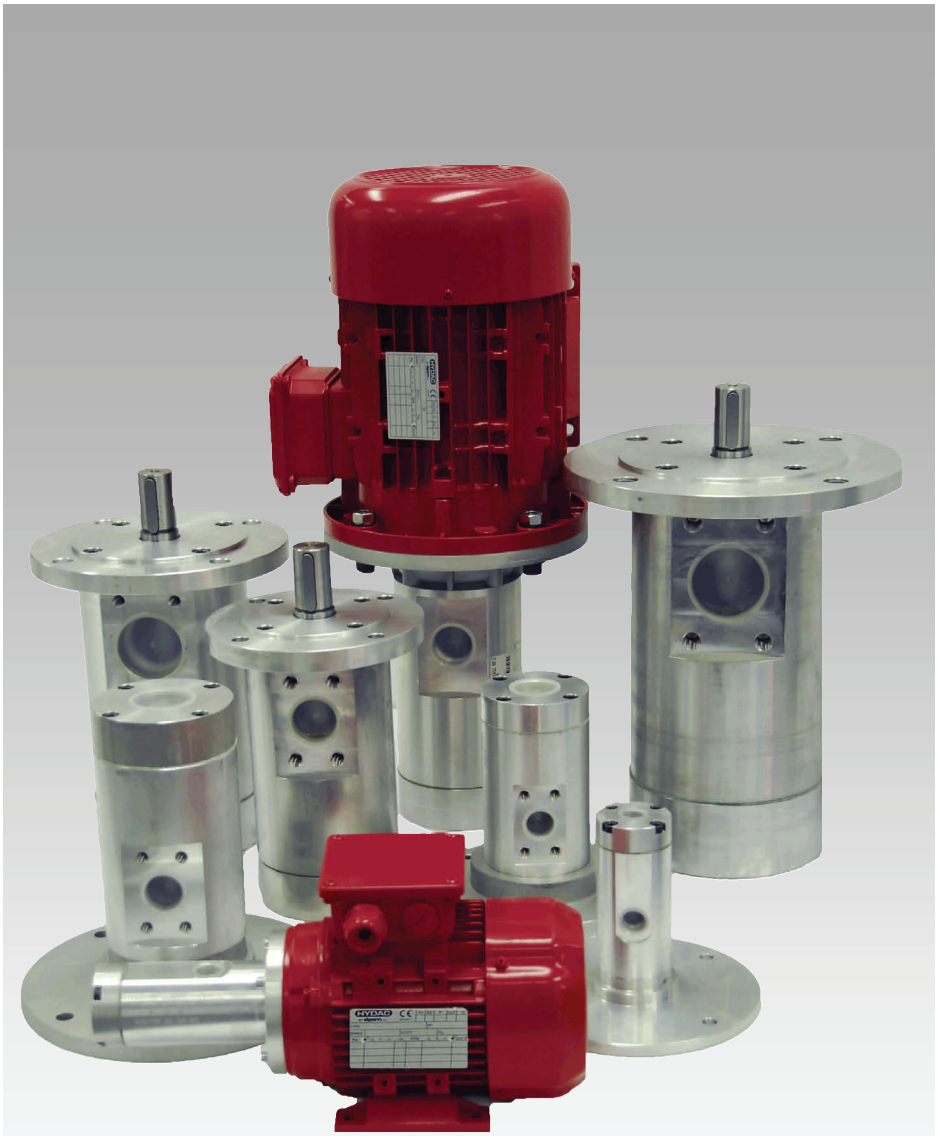
HYDAC INTERNATIONAL

# Hydraulic Screw Pumps

## HSP



## DESCRIPTION

### GENERAL

These pumps are suitable for industrial applications where high reliability and low noise are required.

They produce very low vibration, pulsation and guarantee a long life for your applications.

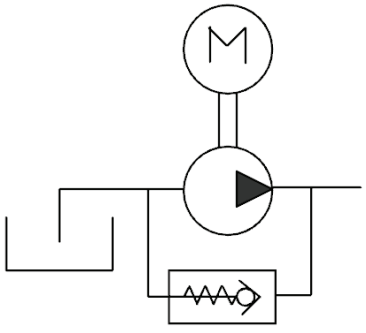
They are optionally coupled with reliable electrical motors and can be used in many kinds of hydraulic applications.

The pumps are equipped with an integrated pressure relief valve.

### APPLICATION

**Hydraulic/Lube**

- Cooling
- Fluid transferring
- Lubrication

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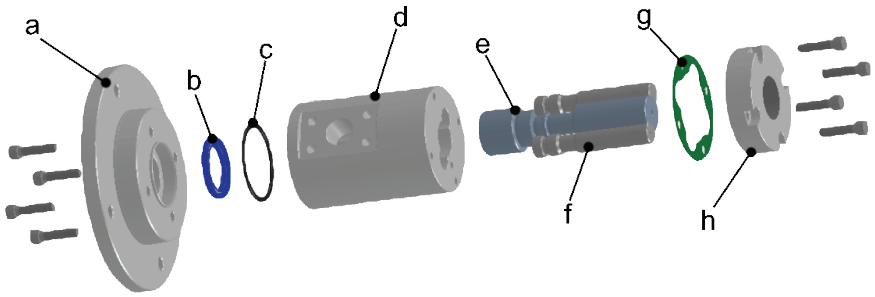
## CONSTRUCTION




(a) Mounting flange
(b) Seal
(c) O-ring seal
(d) Body
(e) Main Screw
(f) Satellite Screw
(g) Gasket
(h) Suction Cover

The HSP are volumetric pumps transferring the pressure axially. Internally there are three moving parts: the main screw is the only driven part and it transmits the movement to the two satellite screws.

## PUMP SPECIFICATIONS
TECHNICAL SPECIFICATIONS

| | |
|---|---|
| Types | **HSP (E)** - External, **HSP (S)** - Submersible |
| Outlet pressure (without bypass) | 40 bar continuous - 50 bar intermittent |
| Inlet pressure | Min. – 0.7/ Max. 3 bar |
| Viscosity | From 4 up to 3,000 mm²/s |
| Ambient temperature | From -20º up to +60ºC |
| Hydraulic temperature | From -20º up to +180ºC |
| Flanges | ISO 3019/2 IEC Standard (for directed coupling with motor) |
| Connections | SAE 3000 / BSP ISO 228 |
| Installation position | Free for HSP “E” / submerged (totally or partially) for HSP “S” |
| Drive loading | No axial or radial loads |
| Shaft rotation | Clockwise viewed at the shaft end |
| Groups | 20 - 25 - 32 - 40 - 45 - 55 - 60 - 70 - 80 - 90 - 110 |
| Flows | From 8 up to 3,200 Lt/min (at 2,850 rpm) |
| Fluids | Mineral oil HLP, HVLP<br>Ecologic fluids HETG,HEPG,HEE<br>Synthetic fluid<br>HFDR phosphate ester<br>Lubrication high viscosity oils (*)<br>Special synthetic fluid: MIL-H, SKYDROL (special on request) |
| Seals | NBR, VITON, FPM, EPDM |
| Noise | From 52 up to 68 dB(A) at 2,850 rpm |
| Pump body (standard) | Extruded aluminium alloy |
| Pump body (optional) | Cast iron, stainless steel |
| Screw | Steel for primary screw, cast iron for secondary screw |
| Filtration | Permissible degree of fluid contamination<br>NAS 1638, class 10 or ISO 4406 – 21/19/16<br>Recommended filtration µm 25 at β 75 |
| Maintenance | No maintenance required |

* *: For high viscosity applications and/or oil-air emulsions, please check with us the suitable pump model.*
*The data shown in the brochure can change without notice. For special applications - please contact HYDAC Pty Ltd.*



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# MODEL CODE

HSP

HSP20 - E - 3 - HL - B5 - SD - V - B10 - AX - BB

**Size**
HSP20 = Group size
HSP20, HSP25, HSP32, HSP40,
HSP45, HSP55, HSP60, HSP70.

**Type**
E = External
S = Submersible

**Displacement**
cc/rev = 3 - 291 (larger displacements available)
Flow is dependant on many factors. i.e. viscosity, pressure etc.

**Viscosity range**
HL = Hydraulic/Lube (High Viscosity) > 250 cSt
HLL = Hydraulic/Lube (Low Viscosity) < 250 cSt
HLG = Hydraulic/Lube - Cast Iron
HHP = Hydraulic high pressure up to 80 bar (contact HYDAC)

**Direct drive / Mounting flange**
B5 = Direct drive pump
B14 = Direct drive pump (Only applicable to HSP20)
ISO = Mounting flange for bell housing units

**Shaft diameter / Key size**
SD14/5 = 14 mm shaft/ 5 mm key size
SD19/6.5 = 19 mm shaft/ 6.5 mm key size
SD24/8.5 = 24 mm shaft/ 8.5 mm key size
SD28/8.5 = 28 mm shaft/ 8.5 mm key size
SD32/10 = 32 mm shaft/ 10 mm key size

**Shaft seal**
V = Viton
B = Buna
E = EPDM
F = FPM

**Internal bypass**
BX = Blocked
B5 = 5 bar
B10 = 10 bar
B15 = 15 bar

**Suction port configuration**
AX = Axial
PD = Perpendicular

**Port type and size**
1st letter = Suction port size (B=1/2" suction port size)
2nd letter = Discharge port size (B=1/2" discharge port size)

| ISO 228 (BSPP) | |
|---|---|
| **Type** | **Port size** |
| B | 1/2" |
| C | 3/4" |
| D | 1" |
| E | 1 1/4" |
| F | 1 1/2" |
| G | 2" |
| H | 2 1/2" |
| Q | 3" |
| R | 3 1/2" |
| S | 4" |

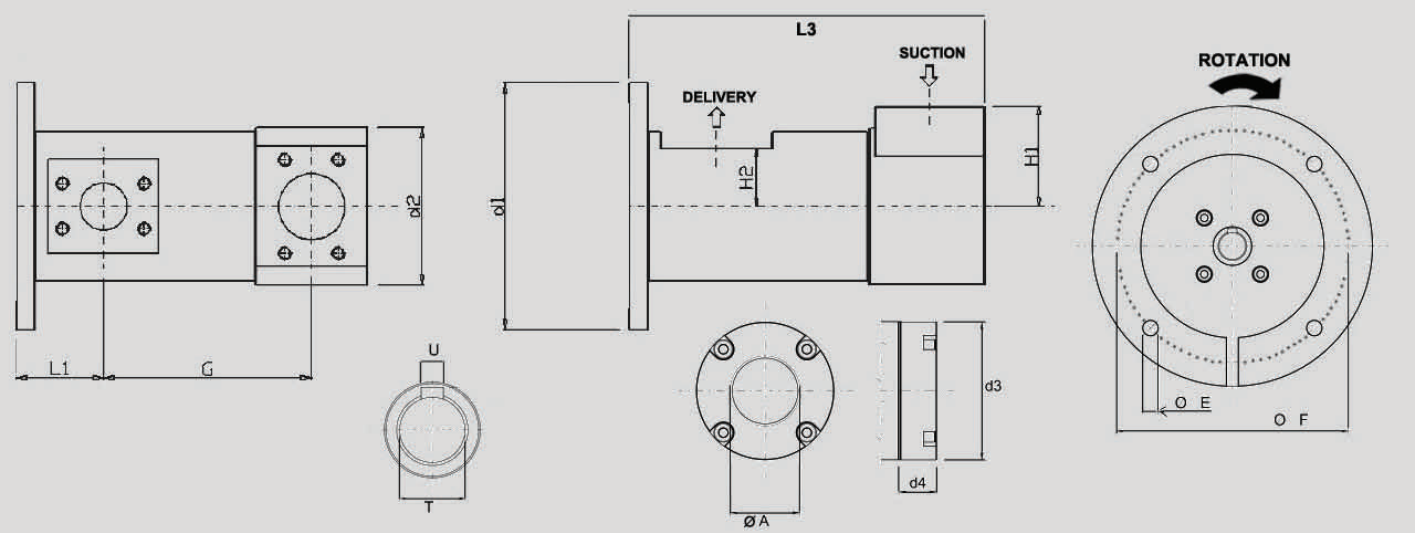
| SAE 3000 (Code 61) | | |
|---|---|---|
| **Type** | **Port size** | **DN Size** |
| I | 1" | 20 |
| J | 1 1/4" | 32 |
| K | 1 1/2" | 40 |
| L | 2" | 50 |
| M | 2 1/2" | 65 |
| N | 3" | 80 |
| O | 3 1/2" | 90 |
| P | 4" | 100 |

Based on VG46. *For higher viscosity contact us.*
NPSH - Expressed in BAR (Gauge pressure)

| Net Positive Suction Head | | |
|---|---|---|
| **Group** | **Recom.** | **Min.** |
| HSP20 | 0.2 | 0.1 |
| HSP25 | 0.2 | 0.1 |
| HSP32 | 0.2 | 0.1 |
| HSP40 | 0.2 | 0.1 |
| HSP45 | 0.2 | 0.1 |
| HSP55 | 0.2 | 0.1 |
| HSP60 | 0.2 | 0.1 |
| HSP70 | 0.2 | 0.1 |

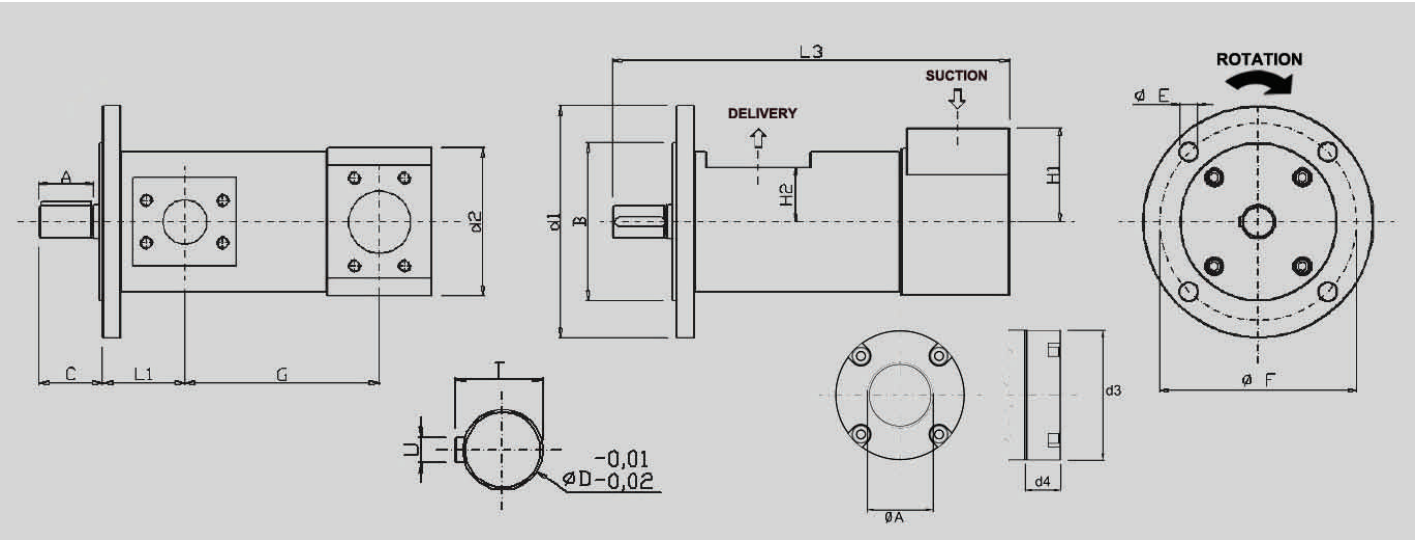
| Displacement | |
|---|---|
| **Group** | **cc/rev** |
| HSP20 | 3,4,5,7 |
| HSP25 | 9 |
| HSP32 | 13,20,27 |
| HSP40 | 36,45,55 |
| HSP45 | 65,76 |
| HSP55 | 91,100,110,138 |
| HSP60 | 160, 182 |
| HSP70 | 291 |

## DIMENSIONS
# HOLLOW SHAFT (DIRECT DRIVE)




| | Flange | | | Shaft | | Suction | | Discharge | | Pump | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Type** | *E* | *F* | *d1* | *T* | *U* | *ØA Std* | *ØA Opt* | *ØM* | *H2* | *d2* | *d3* | *d4* | *L3 Std* | *L3 Opt* | *L1* | *G* | *kg* |
| HSP20 - B14 | 6.5 | 85 | 104 | 14.3 | 5 | 1/2" BSPP-Axial | 1/2" BSPP-Radial | 1/2" BSPP | 25 | 59 | 59 | 21 | 140 | 160 | 53 | 78 | 1.5 |
| HSP20 - B5 | 11 | 165 | 200 | 19.3<br>16.2 | 6.5 | 1/2" BSPP-Axial | 1/2" BSPP-Radial | 1/2" BSPP | 25 | 59 | 59 | 21 | 155 | 175 | 53 | 78 | 1.5 |
| HSP25 | 10.5 | 165 | 200 | 19.3 | 6.5 | 3/4" (Axial) | 3/4" BSPP-Radial | 1/2" BSPP | 27.5 | 65 | 65 | 40.5 | 182 | 182 | 64 | 87 | 2.5 |
| HSP32 | 12 | 165 | 200 | 24 | 8.5 | 1 ¼" BSPP | 1 ¼" SAE | 1" SAE | 41 | 95.5 | 94 | 26 | 195 | 242 | 84.7 | 123 | 5 |
| HSP40 | 14 | 215 | 251 | 28 | 8.5 | 1 ½" BSPP | 1 ½" SAE | 1 ¼" SAE | 46.5 | 112 | 108 | 35 | 247 | 304 | 104.5 | 149.5 | 7 |

# STANDARD SHAFT (BELL HOUSING)




| | Flange | | | | Shaft | | | | Suction | | Discharge | | Pump | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Type** | *B* | *E* | *F* | *d1* | *A* | *D* | *T* | *U* | *ØA Std* | *ØA Opt* | *ØM* | *H2* | *C* | *d2* | *d3* | *d4* | *L3 Std* | *L3 Opt* | *L1* | *G* | *kg* |
| HSP45 | 125 | 14 | 160 | 188 | 55 | 32 | 35 | 10 | 2" BSPP | 2" SAE | 1 ½" SAE | 51,5 | 64.5 | 126.5 | 122.5 | 50 | 331 | 375 | 75.4 | 189.7 | 11 |
| HSP55 | 160 | 18 | 200 | 235 | 55 | 32 | 35 | 10 | 2 ½" BSPP | 2 ½" SAE | 2" SAE | 55 | 64.5 | 148.5 | 142.5 | 46 | 338.5 | 402.5 | 83.5 | 203 | 15.5 |
| HSP60 | 160 | 18 | 200 | 235 | 55 | 32 | 35 | 10 | 3" BSPP | 3" SAE | 2 ½" SAE | 63 | 65.5 | 160 | 155 | 49 | 358 | 440 | 83.5 | 228 | 25 |
| HSP70 | 200 | 22 | 250 | 300 | 55 | 32 | 35 | 10 | 3 ½" BSPP | 3 ½" SAE | 3" SAE | 73 | 65.5 | 180 | 180 | 71 | 432 | 507 | 94.5 | 278.5 | 30 |

## MOTOR SELECTION

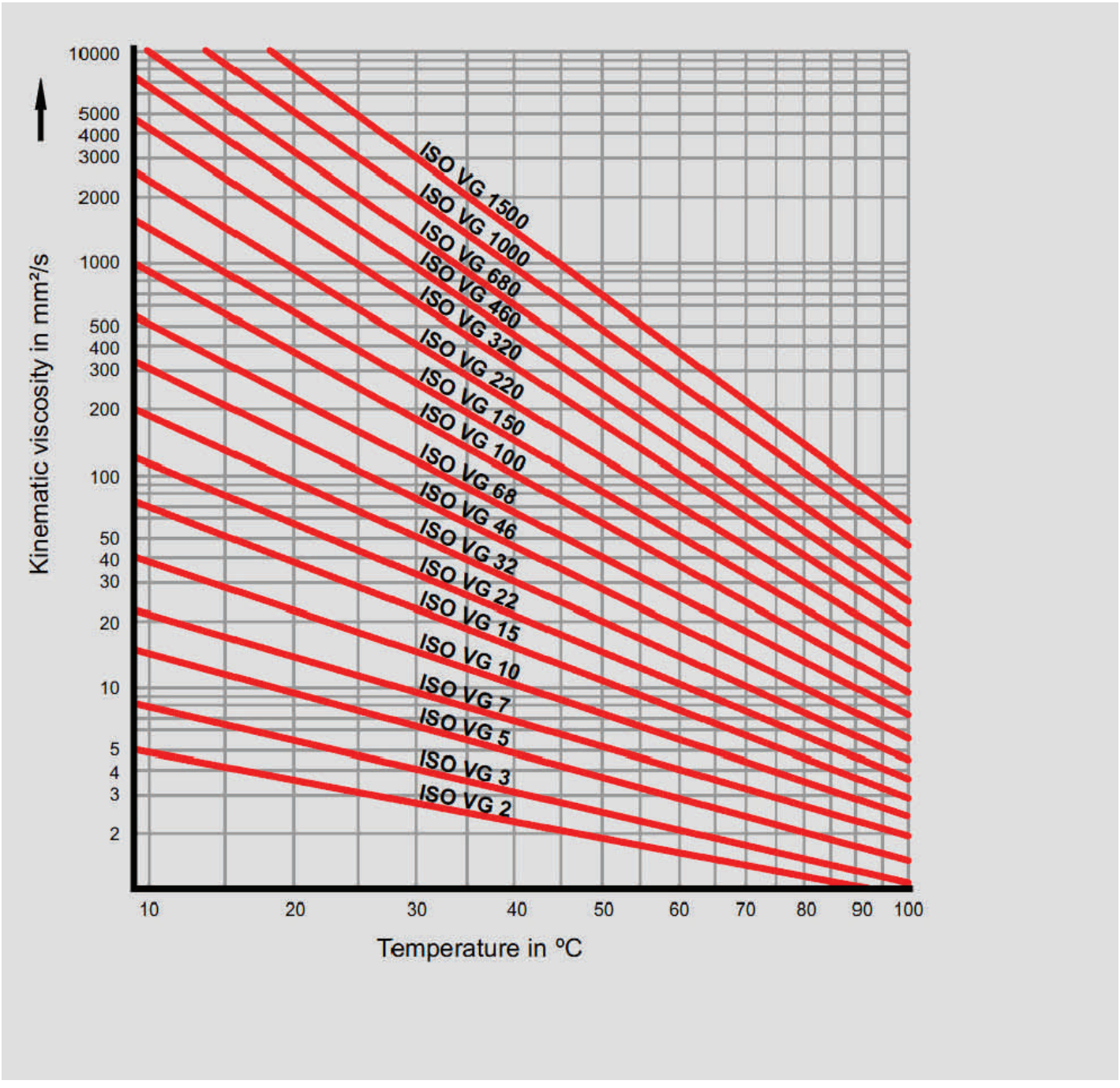
HOLLOW SHAFT (DIRECT DRIVE)

| | Motor | 71 SD14 | 80 SD19 | 90 SD24 | 100 SD28 | 112 SD28 | 132 SD38 |
|---|---|---|---|---|---|---|---|
| **HSP20** | B14 | | | | | | |
| | B5 | | | | | | |
| **HSP25** | B5 | | | | | | |
| **HSP32** | B5 | | | | | | |
| **HSP40** | B5 | | | | | | |
| **HSP45** | B5 | | | | | | |
| **HSP55** | B5 | | | | | | |
| **HSP60** | B5 | | | | | | |
| **HSP70** | B5 | | | | | | |

Stock Items

Available on request

## VISCOSITY / TEMPERATURE GRAPH



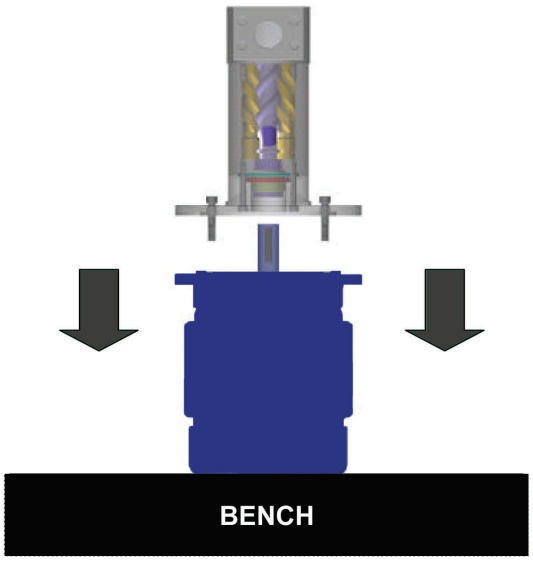
# WARNINGS AND RECOMMENDATIONS

## HOLLOW SHAFT

Remove plastic plugs from outlet and inlet ports.
To facilitate venting, ensure the suction port is always at the top.

Proceed as follows:

- Check the motor: Verify the perpendicular aspect of the flange to the motor shaft: **0.05mm** max allowed.
- The use of IP55 / 65 motor is suggested.
- Warranty is void if motor is outside the recommended tolerance.
- Put the motor in a **vertical position**, as per diagram.
- The pump has to **enter freely** over the shaft of the electric motor.
- **Do not use excessive force**. If necessary remove and polish the key shaft of the electric motor.
- After you have tightened the four mounting screws, check that the pump-motor group **turns freely by rotating the motor fan**. If it does not turn, the shafts may be misaligned.
- Recheck tolerances.




## COUPLINGS WITH BELL HOUSINGS

Flexible couplings are intended to provide a mechanically flexible connection for two aligned shaft-ends. Flexible couplings are not intended to compensate for major angular or parallel shaft misalignment. The allowable misalignment varies with the type of coupling. Any improvement in alignment beyond coupling manufacturer's minimum specification will extend pump, mechanical seal or packing, coupling, and driver service life by reducing bearing loads and wear.

## BELTS AND SHEAVES

It is not recommended to belt drive HYDAC SCREW PUMPS if they are not specifically designed for this purpose. It is generally not acceptable to belt drive pumps with ratings in excess of 40 bar (580 psi) differential pressure.
**Contact HYDAC PTY LTD if not sure whether a particular pump can be belt driven.**

Belts and sheaves must be properly selected, aligned and tensioned to minimize belt wear, eliminate possibility of belt turnover in sheave grooves, and avoid excessive side load on pump shaft. Adjustable slide rails mounted under driver are recommended for proper belt tensioning.

Check belt tension frequently during first 24 to 48 hours of run-in operation. Follow belt drive manufacturer's recommendations for alignment of sheaves and belt-tension settings.

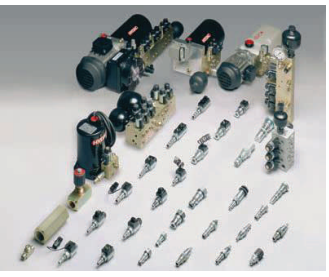
**CAUTION:**

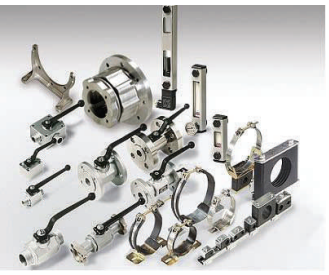
- **Flexible couplings are NOT intended to permit significant shaft misalignment. Proper alignment must be established/maintained to obtain proper operation and maximum life.**
- **Shaft alignment - must be aligned within 0.1mm (0.005 inch) FIM (Full Indicator Movement) for face (angularity) and rim (parallelism) at or near coupling outer diameter while rotating both shafts together one full turn (360°).**
- **Be sure all coupling set-screws and bolts are tight and coupling gap is properly set.**
- **To reduce possible FRETTING corrosions, please use appropriate grease to lubricate the motor shaft.**
- **For hollow shaft pumps, only motors with an entrapped key are permitted. Motor shafts with a floating key may allow the key to dislodge and damage pump shaft. Key must be secured with roll pin to motor shaft in most cases.**

**NOTES:**

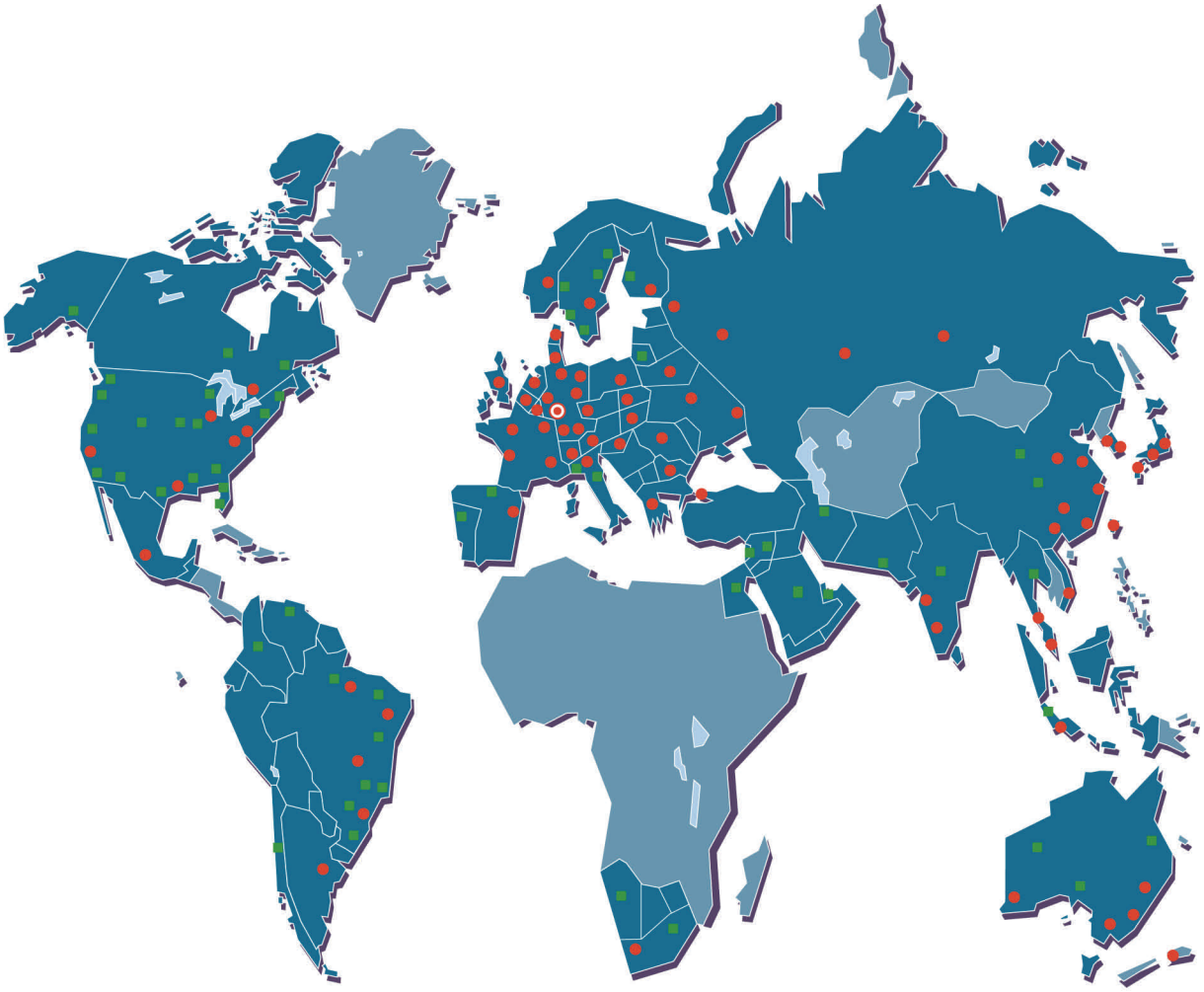
· **FRETTING:** To reduce the corrosion due to fretting, we recommend greasing the motor shaft with dedicated products (e.g.: lubricants based on MoS2, Loctite ® 8008, Molykote ® G-n plus, Turmopast ® MA2).
· **FRETTING:** To reduce the corrosion due to fretting, we recommend checking the electric motor's ground connection and also checking that the shaft residual currents are within the norms.
· **LEACKAGE PREVENTION:** In case of wear of shaft seal to avoid leakage, all pump flanges with hollow shaft have a threaded ¼" GAS thread that can be used for drainage connection to the tank.

## NOTES





# Global Presence.
# Local Competence.
# www.hydac.com.au



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March 2016