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.

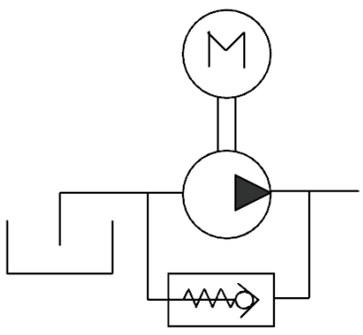
They are optionally coupled with reliable electrical motors and can be used in many kinds of hydraulic applications.

The pumps are equipped with an integrated pressure relief valve.

APPLICATION

Hydraulic/Lube

- Cooling
- Fluid transferring
- Lubrication



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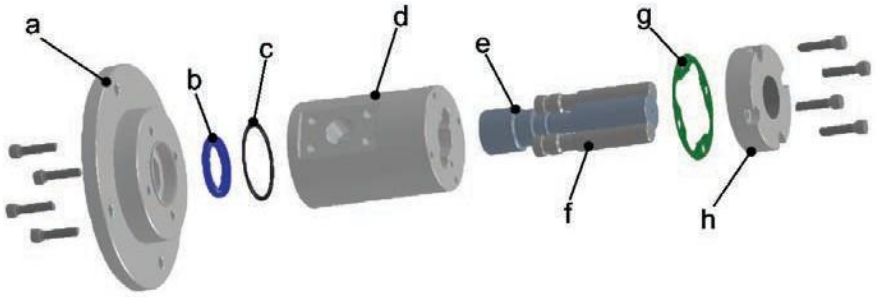
CONSTRUCTION



(a) Mounting flange
(b) Seal
(c) O-ring seal
(d) Body
(e) Main Screw
(f) Secondary 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 mm^2/s (*) / cSt
Ambient temperature	From -20° up to +60°C
Hydraulic oil temperature	From -20° up to +180°C
Flanges	ISO 3019/2 IEC Standard (for direct 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
Flow rate	From 8 up to 3,200 l/min (at 2,850 rpm)
Fluids(**)	Mineral oil H, HL, HM, HLP, HLPD, HVLP Ecologic fluids HETG,HEPG,HEE ,HEES, HEPR Synthetic fluid HFDR phosphate ester Lubrication high viscosity oils (*) 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, carbon steel
Screw	Steel for primary screw, cast iron for secondary screw
Filtration	Permissible degree of fluid contamination NAS 1638, class 10 or ISO 4406 - 21/19/16 Recommended filtration µm 25 at β 75
Maintenance	No maintenance required

** : For high viscosity or high pressure 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.*

*** : For special fluids* HFC , HFA, HFB, HFDR, *please contact HYDAC Pty Ltd.*

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 dependent on many factors. i.e. viscosity, pressure etc.

Model type

HL = Hydraulic/Lube (High Viscosity) > 250 cSt
HLL = Hydraulic/Lube (Low Viscosity) < 250 cSt
HLG = Hydraulic/Lube - Cast Iron > 250 cSt
HLLG = Hydraulic/Lube - Cast Iron < 250 cSt
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 = Keyed shaft & 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
SD38/10 = 38 mm shaft/ 10mm key size
SD55/16 = 55 mm shaft/ 16mm key size

Shaft seal

V = Viton
B = Buna (NBR)
E = EPDM

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"

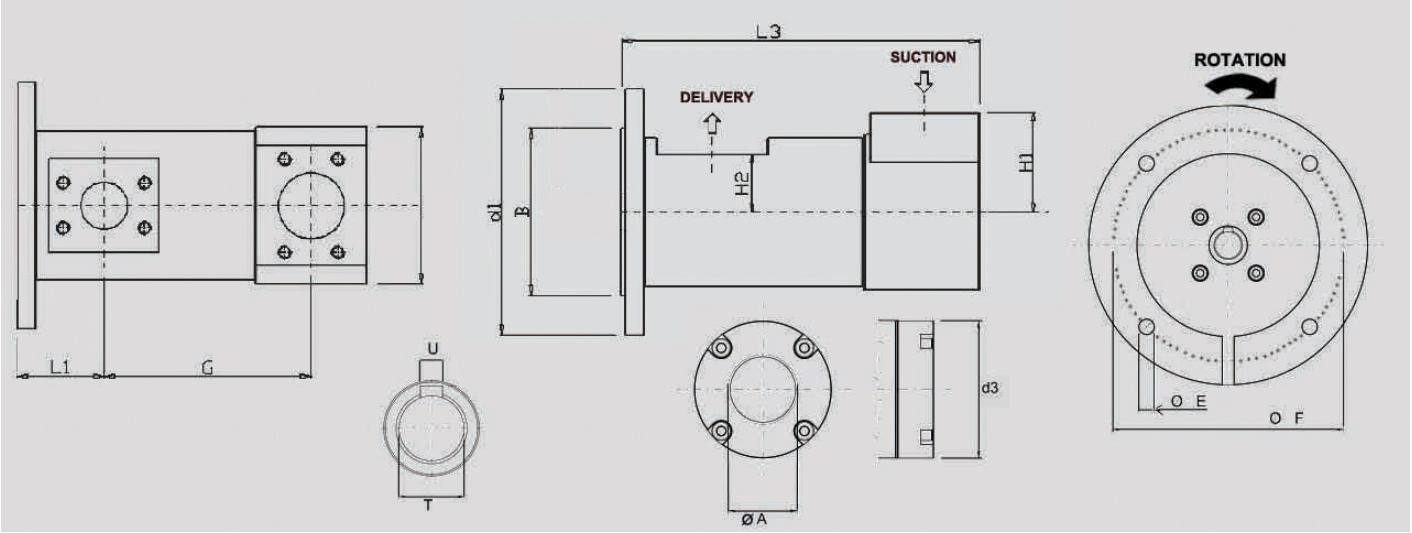
SAE 3000 (Code 61)		
Type	**Port size**	**DN Size**
I	1"	20
J	1 1/4"	32
K	1 1/2"	40
L	2"	50
M	2 1/2"	65
N	3"	80
0	3 1/2"	90
p	4"	100
T	5"	125

Displacement	
Group	**cc/rev**
HSP20	3,4,5,7
HSP25	9
HSP32	13, 20, 22, 27
HSP40	36,45, 55
HSP45	65, 76, 91
HSP55	91, 110, 121, 138
HSP60	160, 182
HSP70	291
HSP80	403, 480
HSP90	547,638, 730, 840

HYDAC

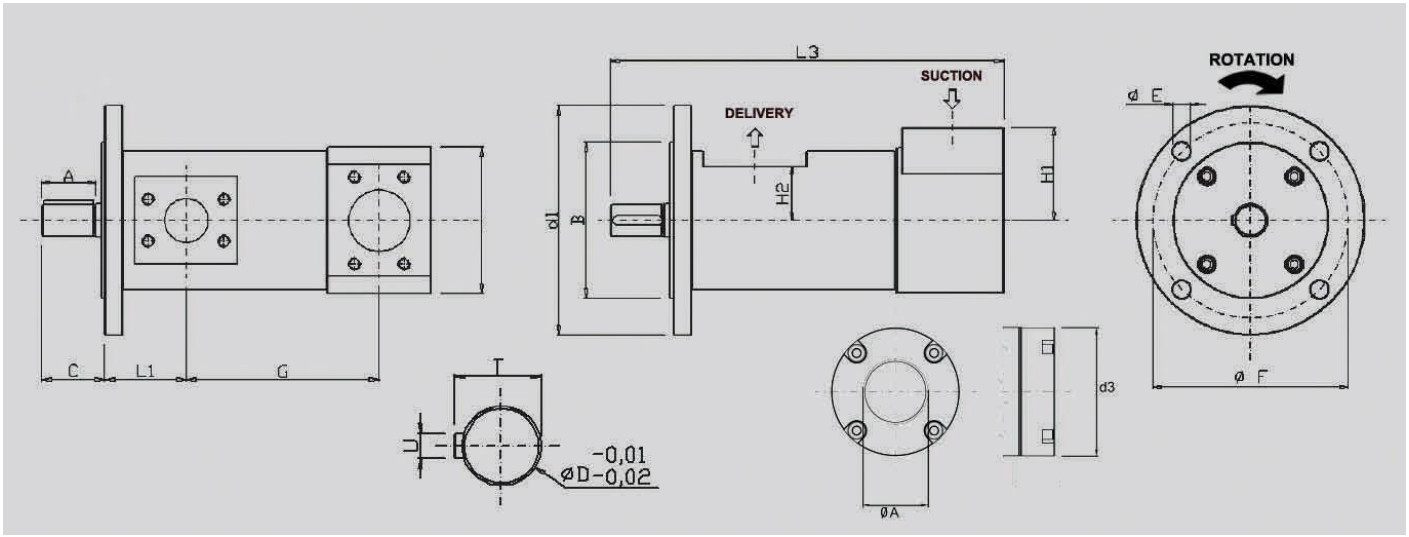
DIMENSIONS

HOLLOW SHAFT (DIRECT DRIVE)



	Flange				Shaft		Suction		Discharge							
Type	B	E	F	d1	T	U	ØA Std	ØA Opt	ØM	H2	d3	L3 Std	L1	G	kg	H1
HSP20	130	11	165	200	19.3	6.5	1/2" BSPP-Axial	1/2" BSPP-Radial	1/2" BSPP	25	59	155	53	78	1.5	26
HSP25	130	10.5	165	200	19.3	6.5	3/4" (Axial)	3/4" BSPP-Radial	1/2" BSPP	27.5	65	182	64	87	2.5	27
HSP32	130	12	165	200	24	8.5	1 ¼" BSPP	1 ¼" SAE	1" SAE	41	94	195	84.7	123	5	55
HSP40	180	14	215	251	28	8.5	1 ½" BSPP	1 ½" SAE	1 ¼" SAE	46.5	108	247	104.5	149.5	7	65
HSP45	230	15	265	300	32	10	2" BSPP-Axial	2" SAE-Radial	1" 1/2 SAE	51.5	122.5	303	120	190.1	7	85

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	d3	L3 Std	L1	G	kg	H1
HSP45	125	14	160	188	55	32	35	10	2" BSPP	2" SAE	1 ½" SAE	51.5	64.5	123	331	75.4	190	11	85
HSP55	160	18	200	235	55	32	35	10	2 ½" BSPP	2 ½" SAE	2" SAE	55	64.5	143	339	83.5	203	15.5	95
HSP60	160	18	200	235	55	32	35	10	3" BSPP	3" SAE	2 ½" SAE	63	65.5	155	358	83.5	228	25	105
HSP70	200	22	250	300	55	32	35	10	3 ½" BSPP	3 ½" SAE	3" SAE	73	65.5	180	432	94.5	279	30	110

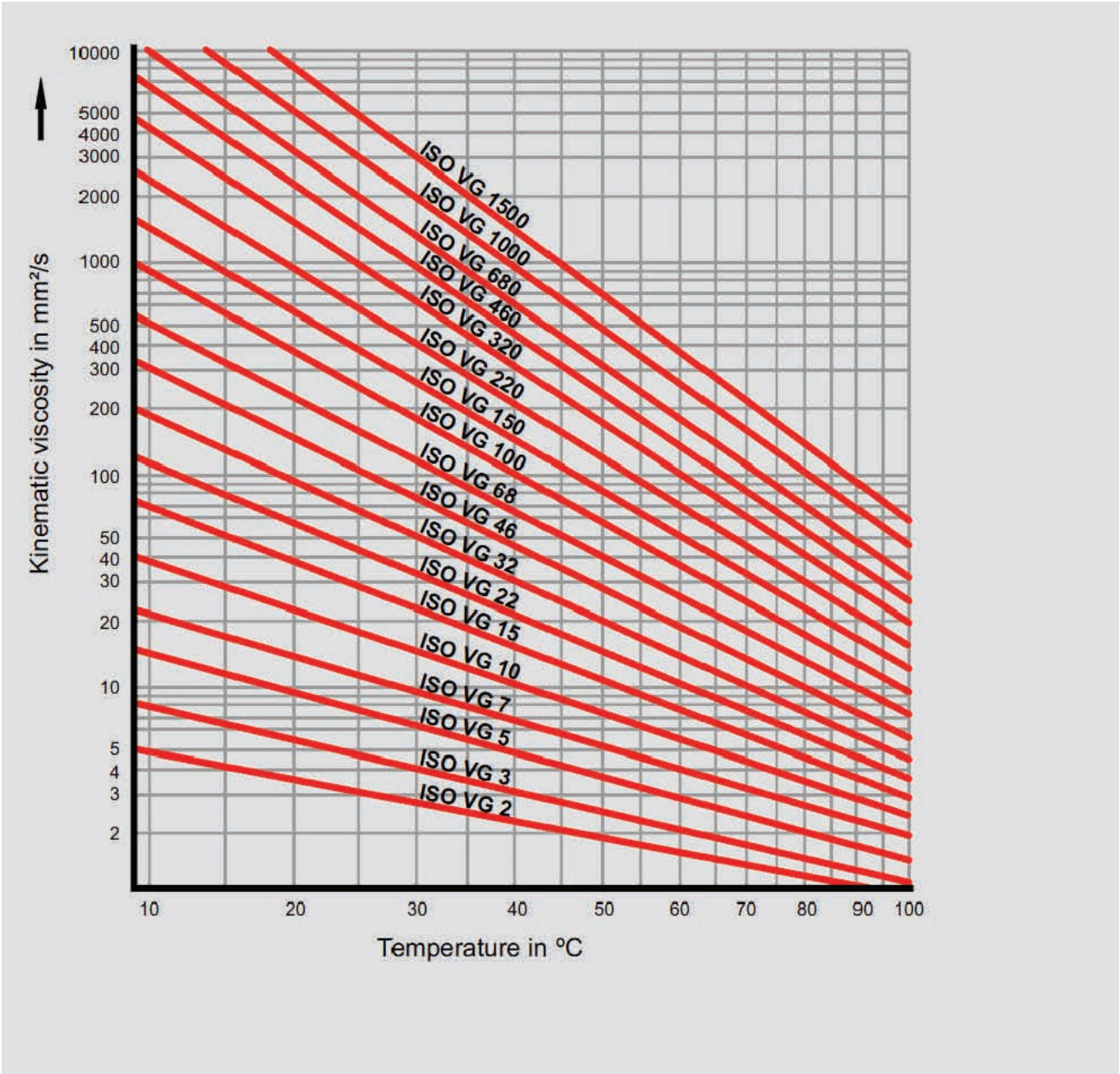
MOTOR SELECTION
HOLLOW SHAFT (DIRECT DRIVE)

	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

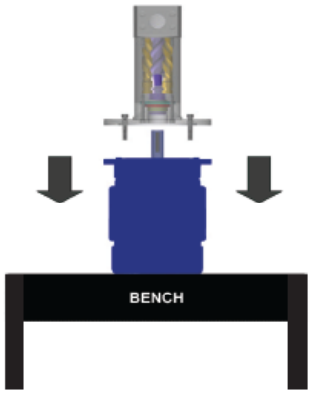
Available on request

VISCOSITY / TEMPERATURE GRAPH



WARNINGS AND RECOMMENDATIONS

HOLLOW SHAFT



Remove plastic plugs from both the inlet and outlet ports.
To facilitate venting, ensure that the suction port is always at the top.
Proceed as follows:

- The use of an IP55 / 65 motor is suggested.
- Check the motor. Verify that the concentricity of the flange to the motor shaft is within 0.05mm.
- Any warranty will be voided if the motor is outside the tolerance as recommended above.
- Position the motor vertically, as per diagram.
- The pump must be a sliding fit 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 the service life of the pump, seal, coupling, and motor by reducing bearing loads and wear.

BELTS DRIVES

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 these pumps when the application is in excess of 40 bar (580 psi) pressure. Contact HYDAC PTY LTD if you are not sure whether a particular pump can be belt driven. Belts and pulleys must be properly selected, aligned and tensioned to minimize belt wear, to eliminate possibility of belt turnover in the pulley grooves, and to avoid excessive side load on the pump shaft. Adjustable belt tensioning are recommended. Check the belt tension frequently during first 24 to 48 hours of operation. Follow the belt drive manufacturer's recommendations for alignment of pulleys and for 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 service 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 the coupling outer diameter, while rotating both shafts together one full turn (360°).
- Be sure that all coupling set-screws and bolts are tight, and that the coupling gap is properly set.
- To reduce possible FRETTING corrosion, 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. The key must be secured to motor shaft with a roll pin in most cases.

NOTES:

FRETTING: To reduce corrosion due to fretting, we recommend greasing the motor shaft with a dedicated product such as anti-sieze compound. We also recommend checking the electric motor's ground connection and that the shaft residual currents are within the norms.

LEAKAGE PREVENTION: To avoid leakage, pump flanges with hollow shafts have a threaded ¼" BSPP thread that can be used for a drainage connection in case of a worn shaft seal.

PRESERVATION AND STORAGE

Always protect the pump against entry of water or other contaminants. Store the pump in a clean, dry and indoor environment. Pumps are delivered with internals oiled (unless specified otherwise by the customer order) and protective covers in or over all openings. These covers should remain in place during the mounting and alignment procedures. The covers must be removed just prior to attaching system piping to pump. If pumps are to be stored in other than a clean, warm, dry environment, or if they are to be stored for more than six months, feel free to contact us for appropriate storage procedures.

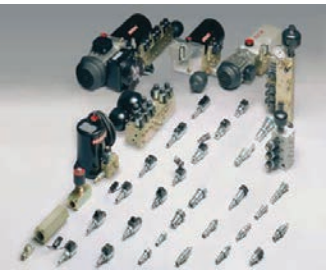
CAUTION:

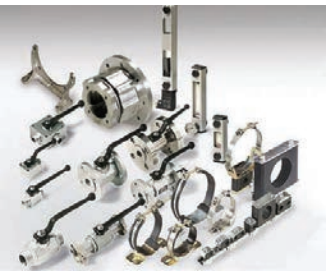
Please store Screw Pump with the suction port facing up and the shaft facing down. See image below.

In case of prolonged standstill (more than 6 months), the pumps must be protected against corrosion. In these cases, an inside preservation is to be provided. The durability of the protection against corrosion, which is limited in time, depends on the composition of the preservative to be applied and the storage conditions.
Under normal circumstances the pumps are not supplied with special preservatives. However, for an additional charge, pumps and replacement parts can be supplied ex factory with the adequate preservative for a planned storage period.

Preservation Instructions

The preservative is to be applied by filling the pump. For these purposes, the suction side of the pump must first be closed with a dummy flange. During filling, the pressure flange must be on higher level than the suction flange. Also, during the filling process, the shaft must be slowly cranked against the direction of rotation. Filling must be continued until the preservative reaches the sealing strip of the delivery flange, bubble-free.





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