Used for hydraulic
drives in open circuits

Index

Features

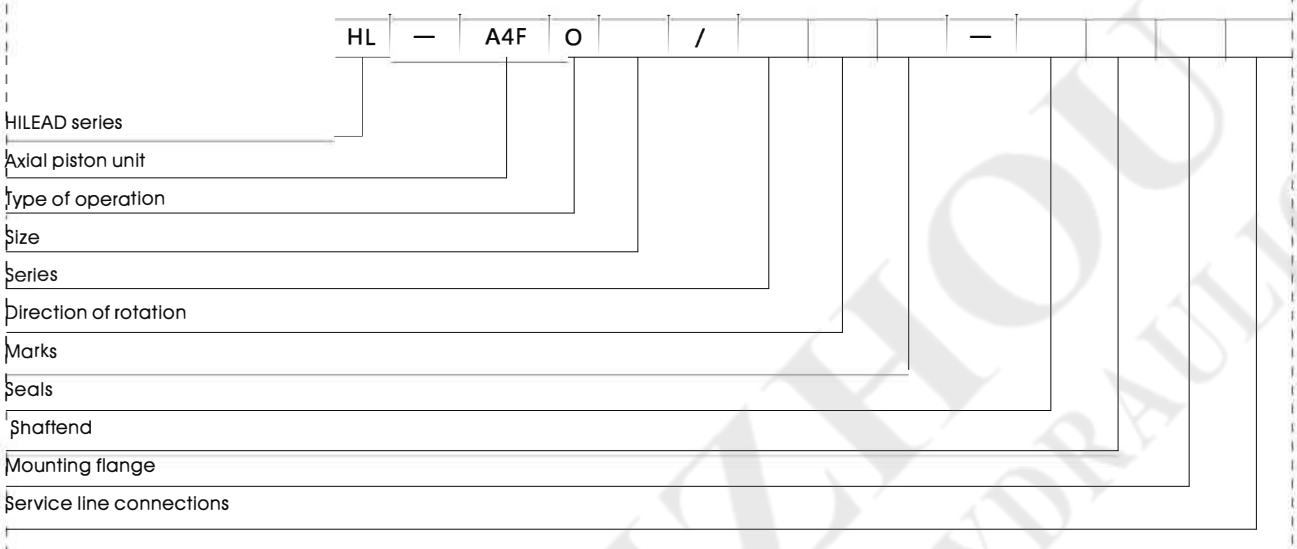
- Fixed displacement swashplate axial Piston pump
- Flow is proportional to the driver speed and to the displacement
- Norminal pressure reach to 35 MPa
- Good suction characteristic
- Long service life, high-precision bearings
- Have the structural design of compact, light weight, low noise characteristics
- Hydrostatic balance Slipper, improve the life of pump

1.Model Description

Axial piston unit							
Fixed displacement pump, Fixed swashplate design							A4F
Type of operation							
Pump, open circuits							O
Size							
▵Displacement Vg max(ml/r)	40	71	125	180	250	500	
Series							
	★	◇	★	◇	★	☆	3
	◇	★	◇	☆	◇	◇	1
Marks							
	★	◇	◇	◇	◇	◇	2
	◇	★	★	☆	★	☆	0
Direction of Rotation							
Viewed on shaft end	clockwise						R
	countclockwise						L
Seals							
NBR (nitril- caoutchouc)							N
FKM (fluor- caoutchouc)							V
Shaft extension [★ : available ; ☆ : in preparation ; ◇ : not available]							
Parallel shaft	☆	★	★	☆	★	☆	P
Splined shaft SAE	★	◇	◇	◇	◇	◇	T
Splined shaft DIN 5480	☆	★	★	☆	★	☆	Z
Mounting flange	40	71	125	180	250		
ISO 2 hole	★	◇	◇	◇	◇	◇	C
ISO 4 hole	◇	★	★	☆	★	◇	B
ISO 8 hole	◇	◇	◇	◇	◇	☆	H
Working fluid port							
Port B and port S at side, connected by flange	★	◇	◇	◇	◇	◇	12
Port B and port S rotated by 90, (metric fixing screws), auxiliary pressure port B1 opposite B.	☆	★	★	☆	★	★	25

1.Model Description

◆ Ordering code



2. Specifications terms

The output flow: : $Q=Vg.n.\eta v/1000$ L/min

Torque : $M=1.59\ Vg.\Delta P/10\eta mh$ N.m

Power: : $P=M.n/9549=Q.\Delta P/60\eta t$ kW

Note : V_g=displacement mL/r Δ_p=pressure MPa n=speed rpm

η_v =Volumetric efficiency η_{mh}=mechanical hydraulic efficiency η_t=overall efficiency

3.Technical data

3.1Performance parameters [these figures did not consider the efficiency of mechanical and volumetric efficiency.]

Size		40	71	125	250	500
Displacement Vg_{max}	cm^3/r	40	71	125	250	500
Max. speed n_{max} 1)	rpm	2750	2200	1800	1500	1320
Output flow at n= n_{max}	L/min	110	156	225	375	660
Max. power (ΔP=35MPa)	KW	64	91	131	219	385
Max. torque (ΔP=35MPa)	Nm	223	395	696	1391	2782
Weight	Kg	17	35	62	122	223

Note : 1) As long as at the oil-absorbing hole S ,the absolute pressure reach 0.1Mpa ,what have shown numerical set up

3.2The working pressure range of hydraulic pump.

3.2.1 Port S [suction port] absolute pressure Ps min=0.08Mpa Ps max=0.2Mpa [Size 40]

Ps min=0.08Mpa Ps max=3Mpa [Size 71.125.250.500]

3.2.2Port B [drain port] pressure Nominal pressure =35MPa Peak pressure =40MPa

The matters needing attention:

a. When tries the movement, the pump body must full filled the fluid, and maintains the fills condition in work time.

b. To reduce the noise, all connection pipeline isolates with the flexible part and the fuel tank.

c. The divulges pipeline need to return the fuel tank directly, releases pressure (top pressure which the oil pressure in shell permits) is 0.2 Mpa (absolute pressure).

d.When vertical installs, we recommendation carries on the bearing flushing, ensure that the front bearing and the axis seal have the enough lubrication. We can use approaching the variable displacement pump flange's oil port U to complete, the flushing fluid flows through the front bearing, and discharge to fluid leak port with the leak fluid of pump together. Port U with leak fluid port T maintains approximately the 2 bar pressure Gap. Each size pumping station needs the flushing fluid flow sees the next table:

Size	40	71	125	180	250	500
Flow L/min	4	5	6	8	12	20

e.When the hydraulic pump continuously moves under the nominal pressure or the interrupted peak pressure, must use the auxiliary unit cooling fat liquor, guaranteed that the fluid temperature does not surpass the prescribed limit.

4. Implementation standard of the hydraulic pumps

JB/T 7043-2006 hydraulic axial piston

5.Installation position

In the start-up and operation of hydraulic pump, the pump body must fill hydraulic fluid, and take in the low-speed and no-load start-up circumstances, until the normal work of the hydraulic pump.

After stopping in a long time, Shell's oil pipeline may flow out through the working pipe , when re-start ,you should confirm the oil pump body filled with hydraulic fluid, in the suction port S, the minimum pressure shall not be less than absolute pressure 0.8bar.

The Installed should be below the liquid level in the tank [recommend].

Minimum immersion depth of the suction line or drain line in the tank: 200 mm (relative to the min. oil level in the tank).the recommended installation method as shown below.

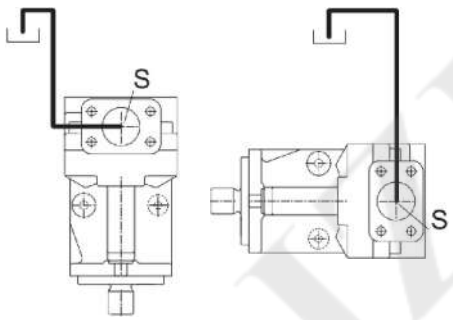


Diagram FO-01

The installation should above the liquid level of fuel tank

The max. permission suction pipe length is 800 mm ,[as opposed to the minimum level fuel tank], does not allow the use of drive shaft axis upward and horizontal direction <suction port installation location at the bottom>. Recommend installed way as shown below.

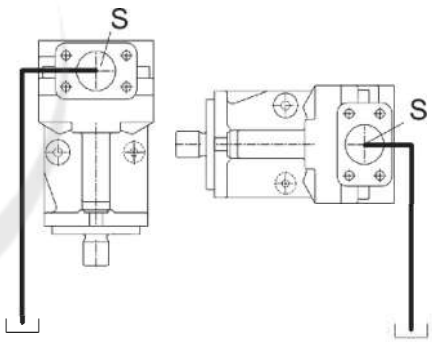


Diagram FO-02

6.Fluid choice

6.1 In order to ensure the selection of fluid trouble-free and high-performance work. In the systems design period, you should choose the hydraulic fluid of the hydraulic system be based on conditions carefully, All the mineral oil are extent applicable to the axial plunger components, which Application of the basic division of the above depends on the relationship of the water, temperature and viscosity, and consider oxidation and corrosion protection, material compatibility, air and water separation properties

6.2 In order to ensure long service life of equipment, must be good and reliable filter. Fluid pollution of particles should not exceed the following levels:

Grade 18/15 In accordance with GB/T 14039-1993

Grade 6In accordance with SAE

Grade 18/15 In accordance with ISO/DIS 4406

Fluid in the high temperature [75 ℃≤ t, t ≥90 ℃

Grade 17/14 In accordance with GB/T 14039-1993

Grade 5In accordance with SAE

Grade 17/14 In accordance with ISO/DIS 4406

6.3In order to choose the correct hydraulic fluid, you must be aware of the ambient temperature related to the working temperature, the temperature requirements is no more than 90 ℃36mm²/s. Please refer to the following chart, choose the viscosity of hydraulic fluid. Select the highest level of viscosity as possible in each working conditions.

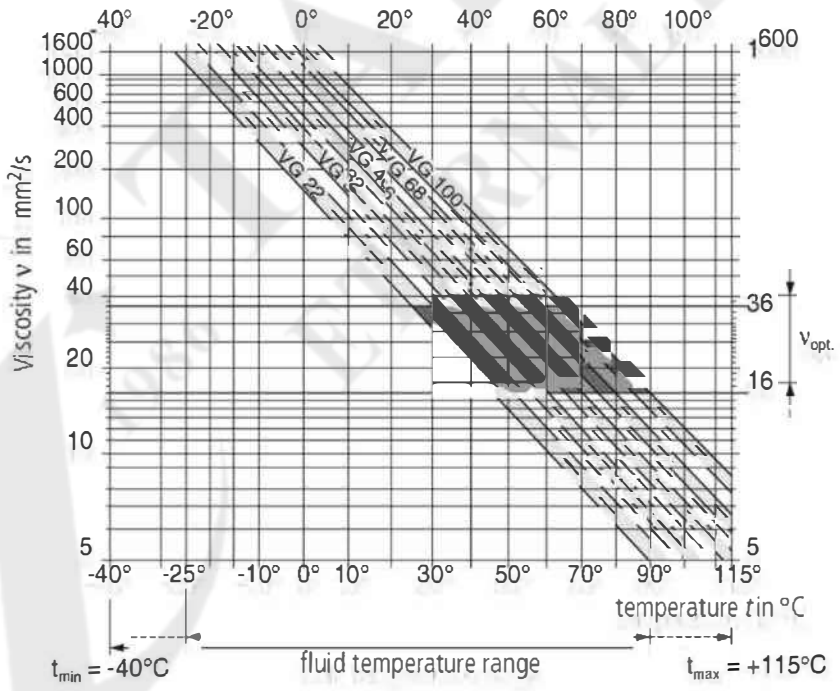
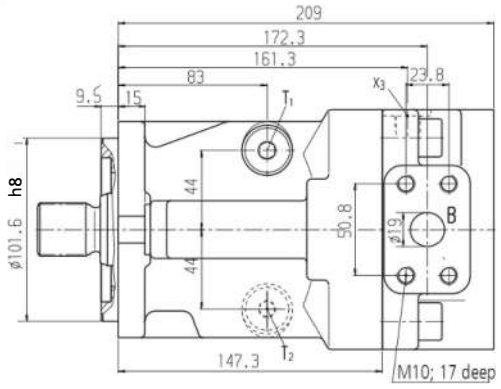
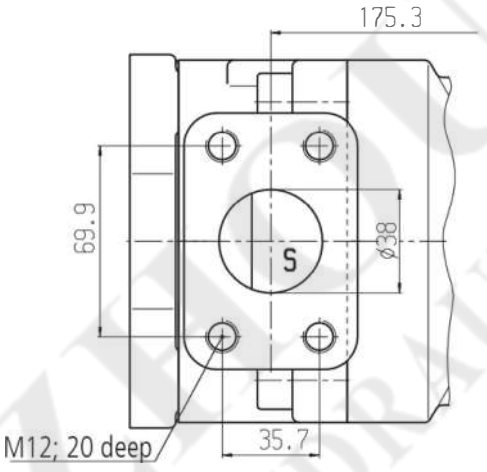


Diagram FO-03

7.Dimensions & Size of hydraulic pump

Unit Dimensions,Size HL-A4FO-40





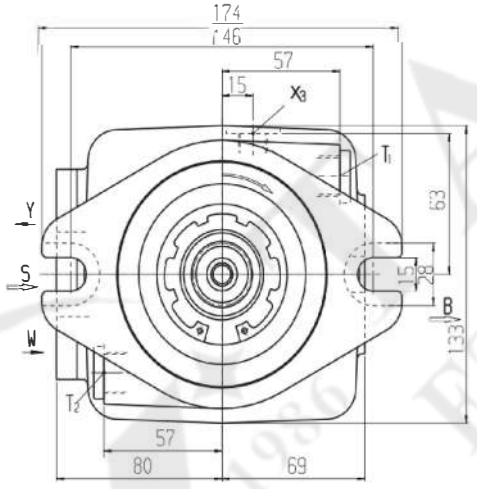
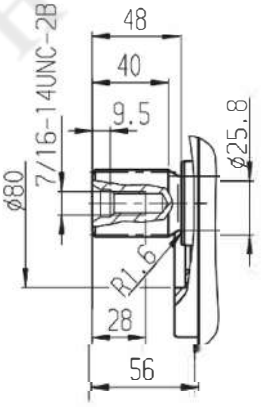


Diagram FO-04

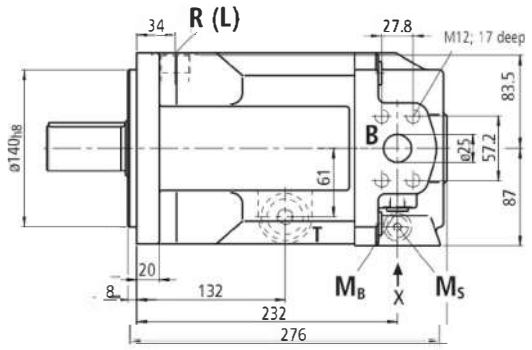
T
Shaft ends
Splined shaft SAE
pressure angle 30 °
14 teeth ,12/24 pitch
flat root ,side fit ,
tolerance class 5.
ANSI B92.1a-1976

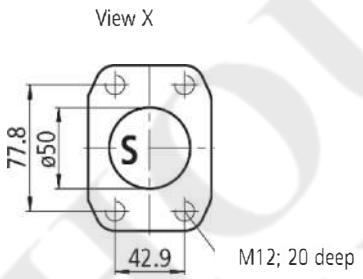


B(A)	Service line ports	SAE ¾" high pressure series
S	Suction port	SAE ¾" standard series
T_1,T_2	Case drain port , oil filling	M18*1.5;deep 12
X_3	Gauge port	M14*1.5;deep 12

7.Dimensions & Size of hydraulic pump

Unit Dimensions,Size HL-A4FO-71





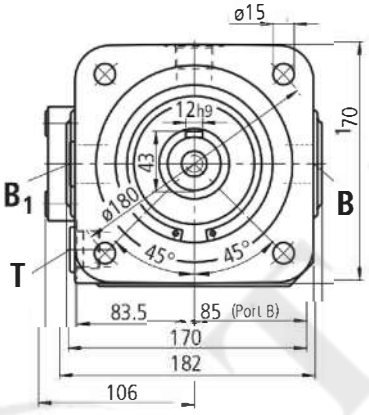
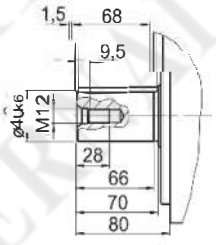
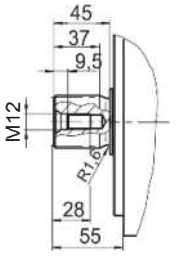


Diagram FO-05

P	Z
Parallel shaft with key	splined shaft
12*8*68	W 40*2*30*18*19g
DIN 6885	DIN 5480

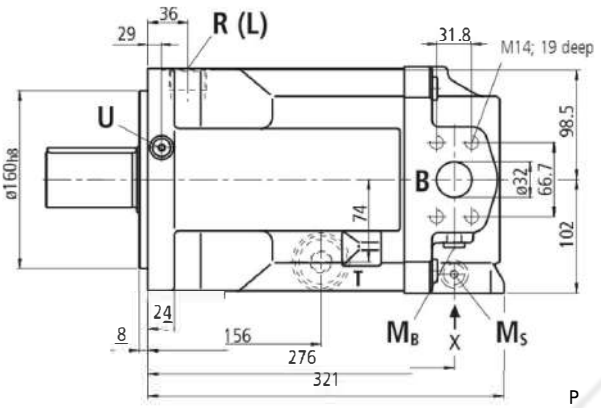




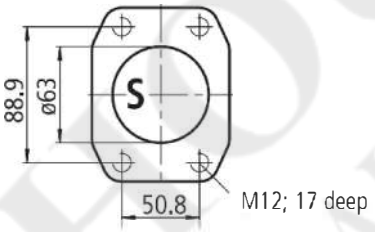
B	Service line ports	SEA 1" (high pressure series)
B_1	2nd service line ports (plugged with a flange)	SEA 1" (high pressure series)
S	Suction port	SEA 2" (standard series)
R(L)	Case drain port	M 27*2
T	Oil drain (plugged)	M 27*2
M_B	Gauge port operating	M 14*1.5 pressure (plugged)
M_S	Gauge port operating	M 14*1.5 pressure (plugged)

7.Dimensions & Size of hydraulic pump

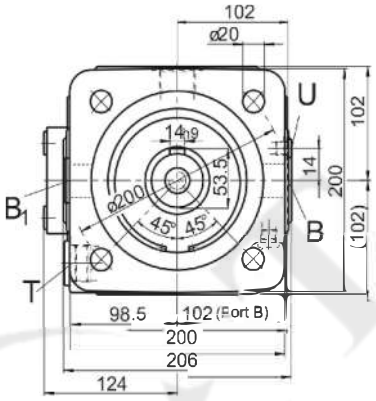
Unit Dimensions , Size HL-A4FO-125

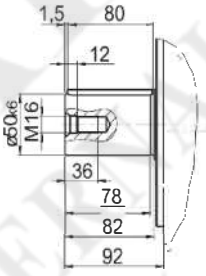


View X



P	Z
Parallel shaft with key	splined shaft
14*9*80	W 50*2*30*24*9g
DIN 6885	DIN 5480





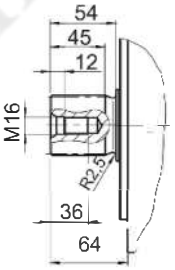
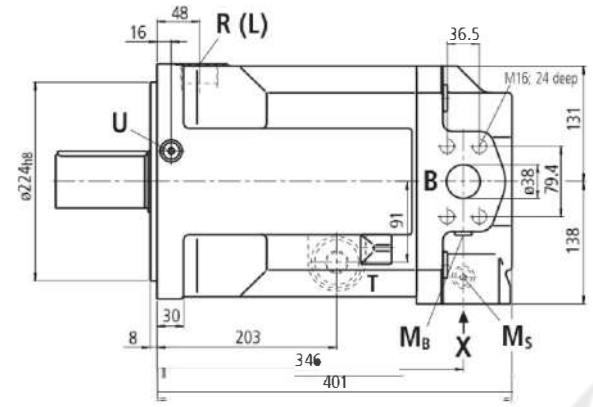


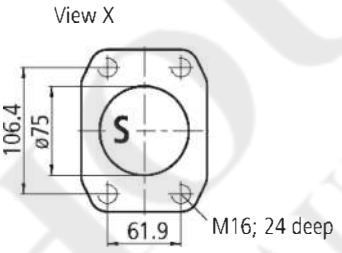
Diagram FO-06

B	Service line ports	SEA 1¼" (high pressure series)
B_1	2nd service line ports (plugged with a flange)	SEA 1¼" (high pressure series)
S	Suction port	SEA 2½" (standard series)
R(L)	Case drain port ,	M 33*2 of filling
T	Oil drain (plugged)	M 33*2
M_B	Gauge port operating	M 14*1.5 pressure (plugged)
M_S	Gauge port operating	M 14*1.5 pressure (plugged)
U	Flushing port (bearing	M 14*1.5 Flushing) (plugged)

7.Dimensions & Size of hydraulic pump

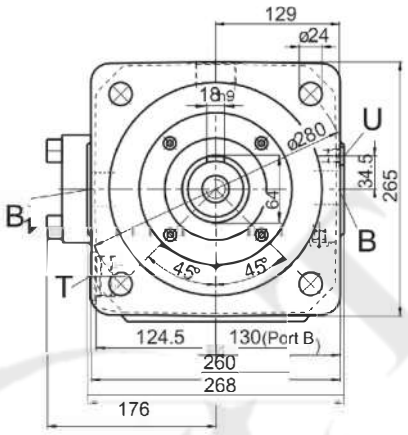
Unit Dimensions,Size HL-A4FO-250

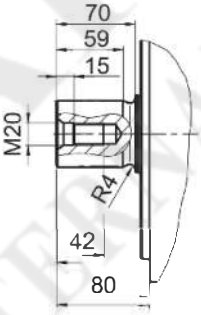




P
Parallel shaft with key
18*11*100
DIN 6885

Z
splined shaft
W 60*2*30*28*9g
DIN 5480





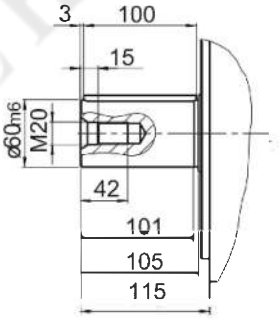
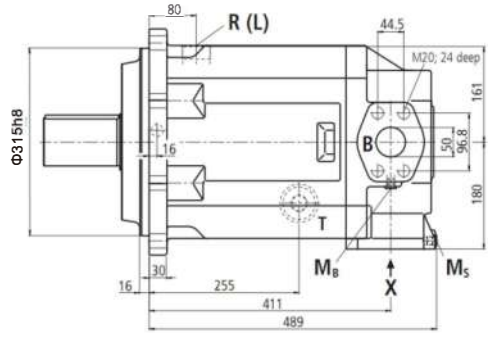


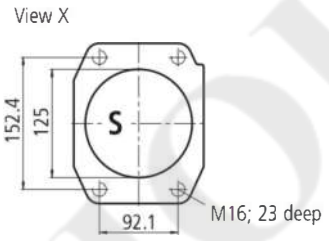
Diagram FO-07

B	Service line ports	SEA 1½" (high pressure series)
B_1	2nd service line ports (plugged with a flange)	SEA 1½" (high pressure series)
S	Suction port	SEA 3" (standard series)
R(L)	Case drain port ,	M 42*2 of filling
T	Oil drain (plugged)	M 42*2
M_B	Gauge port operating	M 14*1.5 pressure (plugged)
M_S	Gauge port operating	M 14*1.5 pressure (plugged)
U	Flushing port (bearing	M 14*1.5 Flushing) (plugged)

7.Dimension & Size of hydraulic pump

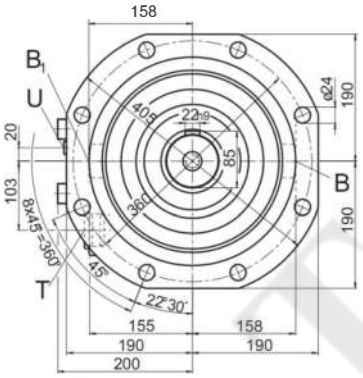
Unit Dimensions,Size HL-A4FO-500

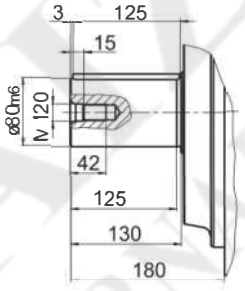




P
Parallel shaft with key
22*14*125
DIN 6885

Z
splined shaft
W 80*3*30*25*9g
DIN 5480





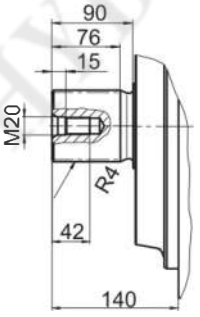


Diagram FO-08

B	Service line ports	SEA 2" (high pressure series)
B_1	2nd service line ports (plugged with a flange)	SEA 2" (high pressure series)
S	Suction port	SEA 5" (standard series)
R(L)	Case drain port ,	M 48*2 of filling
T	Oil drain (plugged)	M 48*2
M_B	Gauge port operating	M 18*1.5 pressure (plugged)
M_S	Gauge port operating	M 18*1.5 pressure (plugged)
U	Flushing port (bearing	M 18*1.5 Flushing) (plugged)