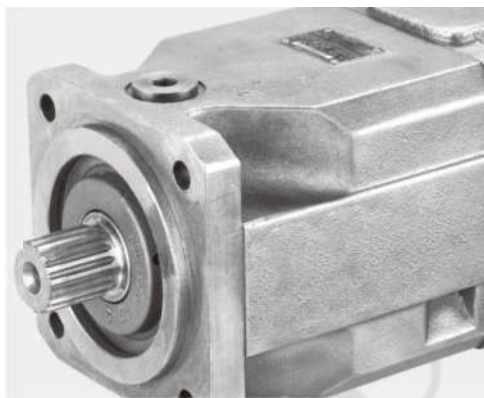


Used for hydraulic drives in
Open and closed circuits



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Features

- Axial piston swashplate Motor
- Output speed is proportional to input flow ,
and inversely proportional to motor displacement.
- Long service life, high-precision bearings
- Have the structural design of compact ,light
weight ,low noise characteristics
- Hydrostatic balance slipper ,improve service
life of motor

1、Model Description

Axial Piston unit

Fixed displacement pump, Fixed swashplate design

A4F

Mode of operation

Motor

M

Size

△Displacement Vg max(ml/r)	40	71	125	180	250
----------------------------	----	----	-----	-----	-----

Series

	★	◇	★	☆	★	3
	◇	★	◇	◇	◇	1

Index

	★	◇	◇	◇	◇	2
	◇	★	★	☆	★	0

Direction of Rotation

Viewed on shaft end alternating

W

Seals

NBR (nitril- caoutchouc)

P

FKM (fluor- caoutchouc)

V

Shaft end [★ : available ; ☆ : in preparation ; ◇ : not available]

Parallel shaft

	◇	☆	★	☆	★	P
--	---	---	---	---	---	---

Splined shaft DIN 5480

	★	☆	★	☆	★	Z
--	---	---	---	---	---	---

Mounting flange

	40	71	125	180	250	
ISO 2 hole	★	◇	◇	◇	◇	C
ISO 4 hole	◇	★	★	☆	★	B

Service line connections

Port A and port B at rear	◇	★	★	☆	★	01
Port A and port B at side	★	☆	☆	☆	☆	02

◆Ordering code

HL	—	A4F	M	/			W	—				
HILEAD series												
Axial piston unit												
Mode of operation												
Size												
Series												
Index												
Direction of rotation												
Seals												
Shaft end												
Mounting flange												
Service line connexions												

2. Specifications terms

$$q_v = \frac{V_g \cdot n}{1000 \cdot \eta_v} \text{ L/min}$$

$$T = \frac{V_g \cdot \Delta p \cdot \eta_{mh}}{2 \cdot \pi} \text{ L/min}$$

$$P = \frac{T \cdot n}{9549} = \frac{2\pi \cdot T \cdot n}{60000} \text{ kW}$$

$$= \frac{q_v \cdot \Delta p \cdot \eta_t}{60}$$

Note : V_g =displacement ml/r ΔP =pressure MPa n =speed rpm
 η_v = Volumetric efficiency η_{mh} =mechanical hydraulic efficiency η_t =overall efficiency

3. Technical data

3.1 Performance parameters

Size			40	71	125	250
Displacement	$V_{g_{max}}$	cm^3/r	40	71	125	250
Max. speed	n_{max}	continuous rpm	4000	3200	2600	2200
Max flow	$n = n_{max}$	L/min	160	227	325	550
	$n = 1500$ rpm	L/min	60	107	186	375
	Torque constants	Nm/bar	0.64	1.13	1.99	3.97
	Max. torque ($\Delta P=35$ MPa)	Nm	223	395	696	1391
	Weight	Kg	15	356	212	2

3.2 The working pressure range of hydraulic pump.: The Max pressure of oil hoe A & B showing as below.

Size	40	71	125	250
Nominal pressure [MPa]	35	35	35	35
Peak pressure [MPa]	40	40	40	40

3.3 Direction. of flow

- Clockwise rotation, A to B.
- Anti-clockwise rotation, B to A.

The matters needing attention :

- When tries the movement, the pump body must full filled the fluid, and maintains the fills condition in work time.
- To reduce the noise, all connection pipeline isolates with the flexible part and the fuel tank.
- The divulges pipeline need to return the fuel tank directly, releases pressure (peak pressure which the oil pressure in shell permits) is 0.4 MPa(absolute pressure).
- When vertical installs, we recommendation carries on the bearing flushing, guaranteed 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 fat liquor 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 kind of specification pumping station needs the flushing fluid current capacity sees the next table:

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

- Before `confirming the rotation direction of motor`, the shaft coupling must tear down first; After the motor direction confirmed, reset the motor for 2-3 times with instantaneous way, then the motor running in normal .

4. Implementation standard of the hydraulic pumps

JB/T 10829-2008 Hydraulic Motor

5. Installation position

In the start-up and operation of motor, the pump body must fill hydraulic fluid, as well as in the overall running process, 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 case drain pipe must connected to tank through upper case drain port.

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.

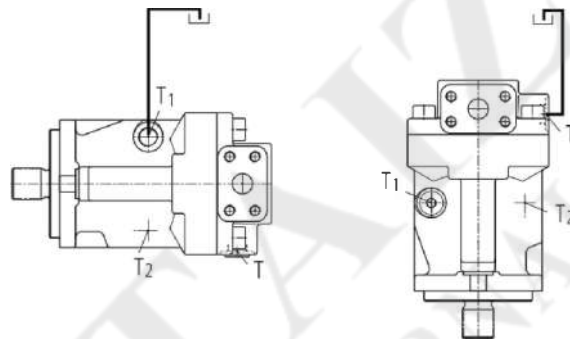


Diagram FM-01

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.

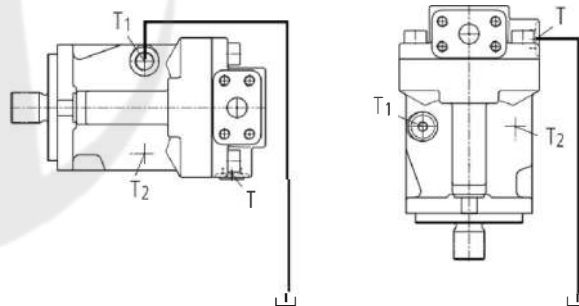


Diagram FM-02

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 6— In accordance with SAE

Grade 18/15— In accordance with ISO/DIS 4406

Fluid in the high temperature [$75\text{ °C} \leq t, t \geq 90\text{ °C}$], the lowest for cleanliness:

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

Grade 5— In accordance with SAE

Grade 17/14— In accordance with ISO/DIS 4406

6.3 In 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 °C $36\text{ mm}^2/\text{s}$. Please refer to the following chart, choose the viscosity of hydraulic fluid. Select the highest level of viscosity as possible in each working conditions.

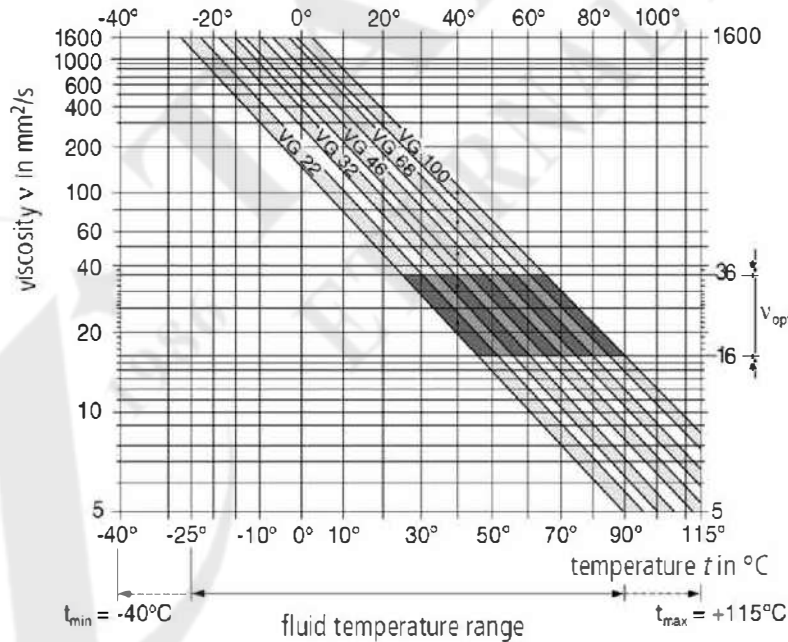
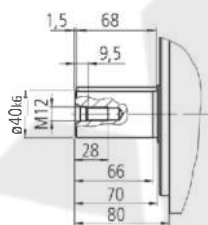
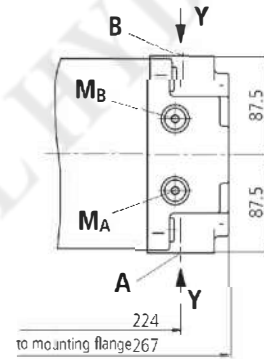
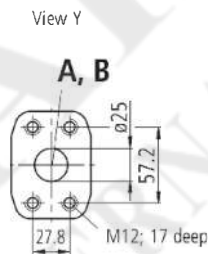
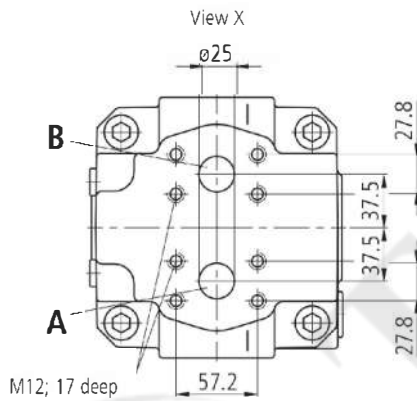
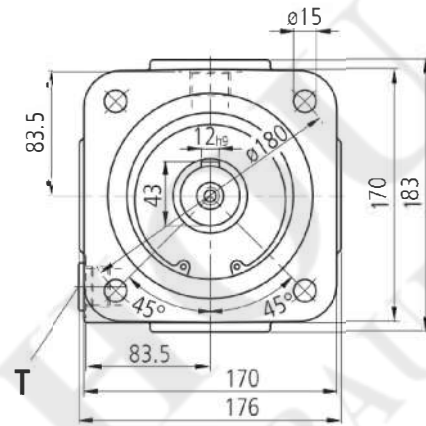
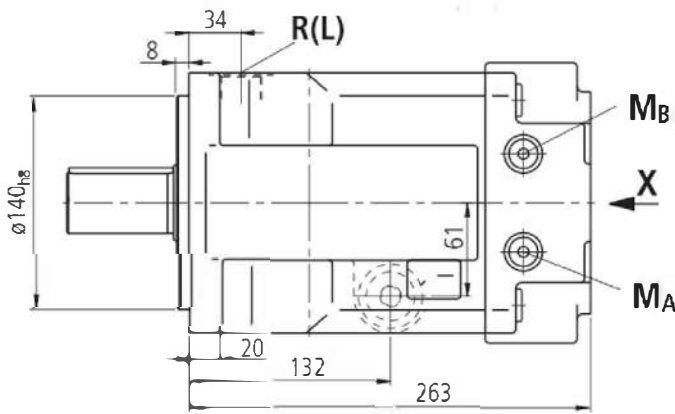


Diagram FM-03

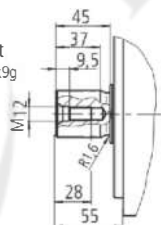
7. Dimensions & Size of hydraulic pump

Unit Dimensions, Size HL-A4FM-71



Z

Splined shaft
W40x2x30x18x9g
DIN 5480



Ports

A, B	Service line ports	SAE 1"
R (L)	Oil filling and bleed	M27*2
T	Oil drain (plugged)	M27*2
M_A, M_B	Measuring port for pressure (plugged)	M14*1.5

Diagram FM-05

7. Dimensions & Size of hydraulic pump

Unit Dimensions, Size HL-A4FM-125

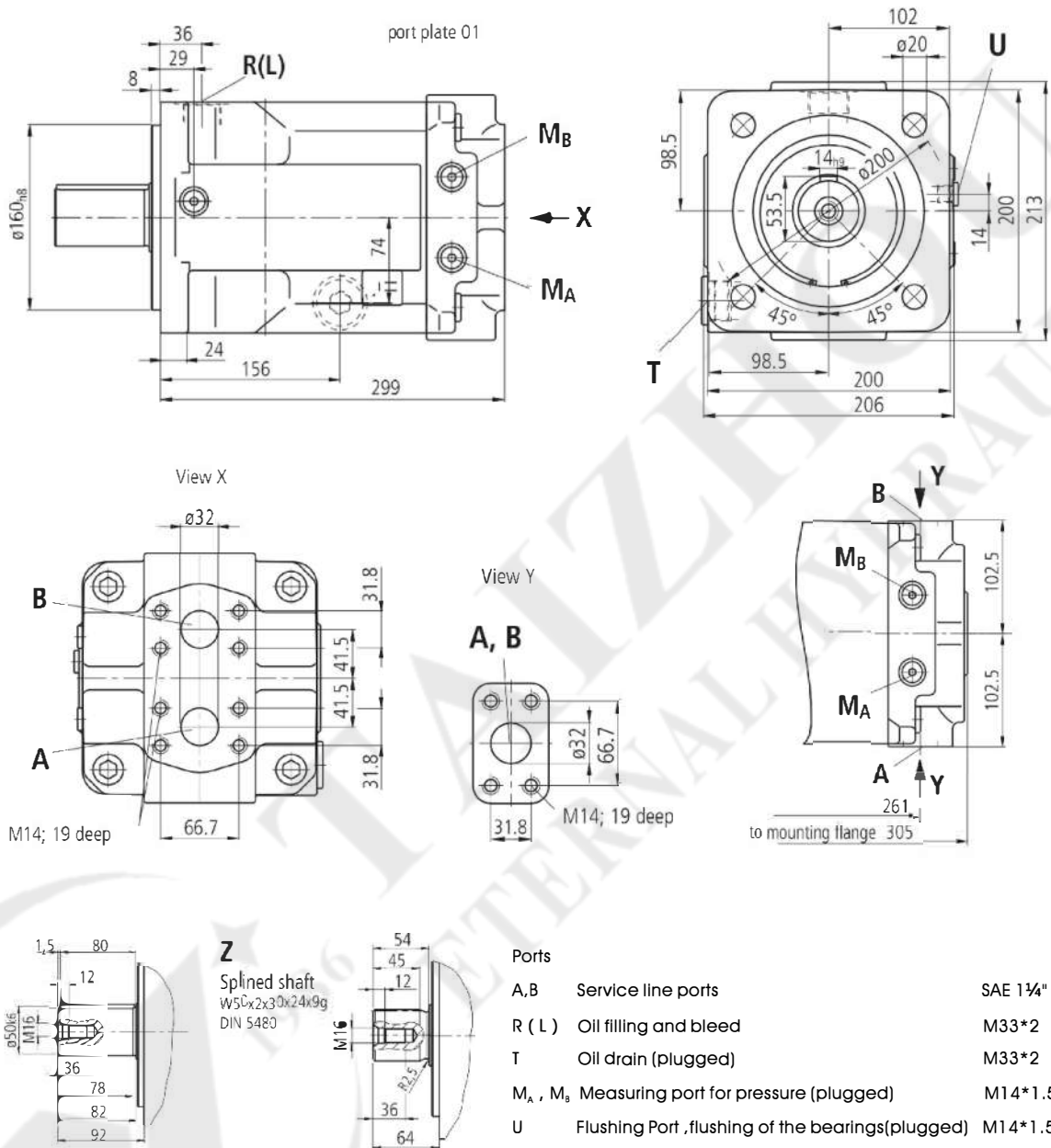


Diagram FM-06

