THM HYDRAULICS

DIGP Series

Double Internal Gear pump
Frame Sizes: DIGP21, DIGP22
DIGP32, DIGP33
Max. pressure up to 315 bar

Revised 09.24

Index

Double Internal Gear Pump

- Combination pump

- IGP(H)2 series+ IGP1 series
  25, 32, 40, 50, 63 + 8, 10, 13, 16, 20, 25
- IGP(H)2 series+ IGP(H)2 series
  25, 32, 40, 50, 63 + 25, 32, 40, 50, 63
- IGP(H)3 series + IGP(H)2 series
  80, 100, 125, 145, 160 + 25, 32, 40, 50, 63
- IGP(H)3 series + IGP(H)3 series
  80, 100, 125, 145, 160 + 80, 100, 125, 145, 160

Features

- Floating spline coupling structure is adopted, and the rotating shafts are connected in series, which plays a role of self-centering before and after, ensuring stable operation of the pump and low noise.
- The combination is flexible and covenient, the front and rear displacements of the same series can be combined arbitarily.
- Sharing the same drive greatly reduces equipment system costs and reduces installation space.
- The assembly pump has a compact structure, low production cost, small size, light weight, and is covenient for installation and maintenance of the front and rear pumps.
- It can be widely used in industries such as hydraulic systems in plastic machines, shoe machines, die-casting machinery and electric forklifts.
- It is suitable for the energy-saving system of servo frequency conversion drive.

Ordering code

DIGP	H	2	1	-100	-050	02T/	R	P	W	-S	-S10

Double Internal gear pump = DIGP

Standard = No code
large suction & Delivery port (Only For) = H

Front Pump code
Size 08...25 = 1
Size 25...63 = 2
Size 80...160 = 3

Rear Pump code
Size 08...25 = 1
Size 25...63 = 2
Size 80...160 = 3

Front Pump Displacement cc/rev

FS-2					FS-3				
25	32	40	50	63	80	100	125	145	160

Rear Pump Displacement cc/rev

FS-1						FS-2					FS-3				
08	10	13	16	20	25	25	32	40	50	63	80	100	125	145	160

Series = 02T

Direction of rotation (Views on shaft)
Clockwise = R
Counter-clockwise = L

Shaft
Parallel = P
Splined = S

Seals
FKM Seals = V
NBR Seals = W

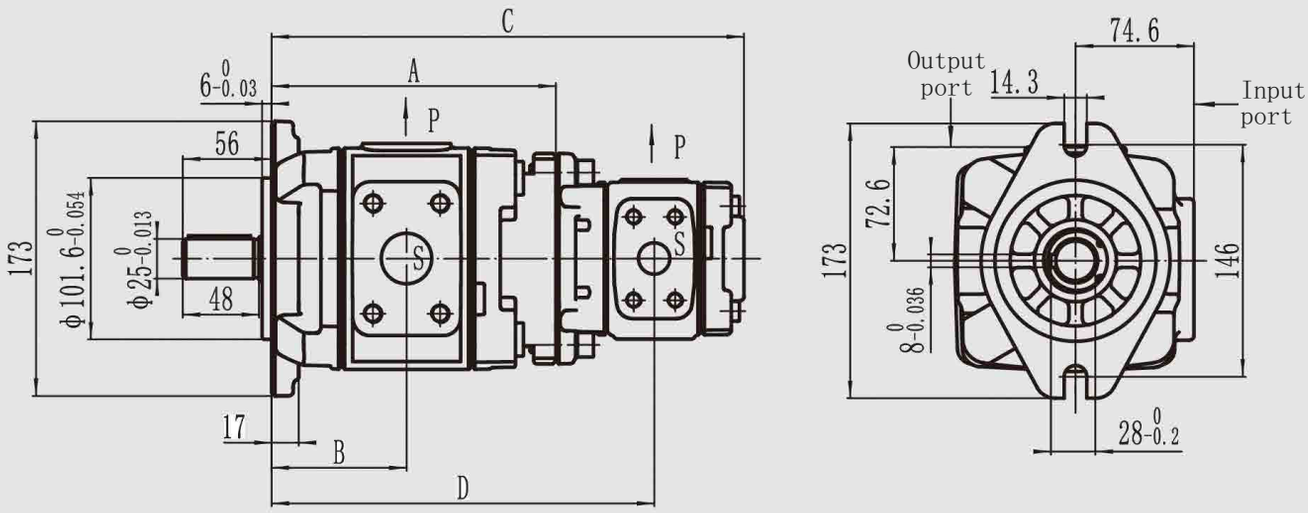
Flange installation form
SAE 2 hole mounting flange = S

Water Glycol Applications

The secret extension type of the rear pump is only the spline shaft type.

Unit Dimensions (Dimensions in mm)

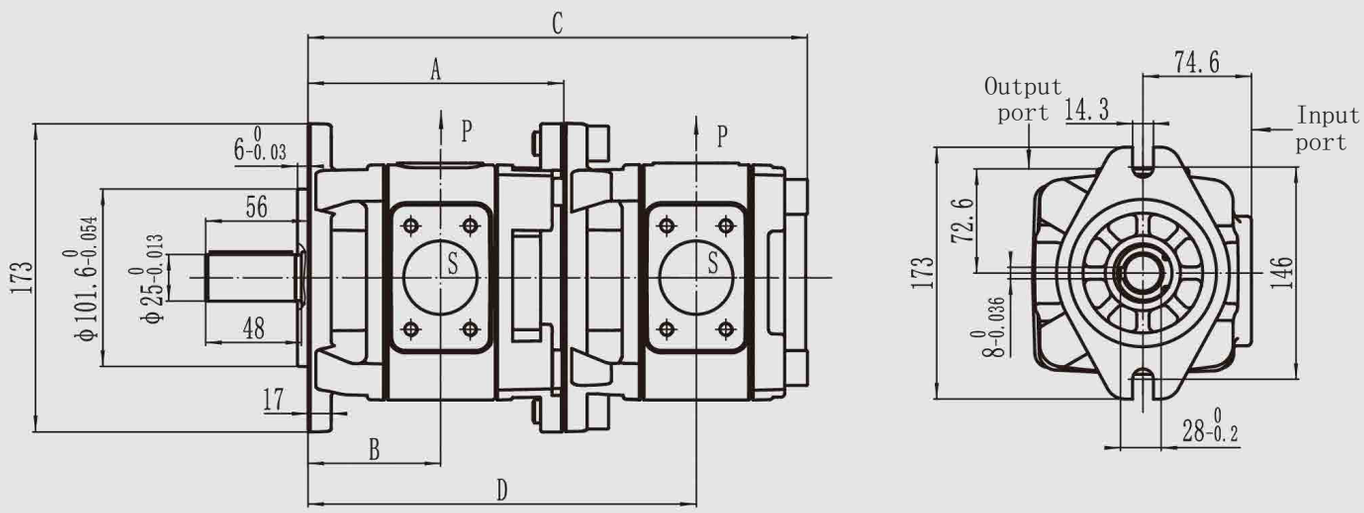
DIGP(H)21-*-***-S10**



First Pump Displacement cc/rev.	A	B	Rear pump displacement cc/rev.									
			08		10		13		16		20	
			C	D	C	D	C	D	C	D	C	D
25	155	73	257.5	209	261.5	211	268	214.3	273.5	217	281.5	221
32	162	76.5	264.5	216	268.5	218	275	221.3	280.5	224	288.5	228
40	169	80	271.5	233	275.5	225	282	228.3	287.5	231	295.5	235
50	179	85	281.5	233	285.5	235	292	238.3	297.5	241	305.5	245
63	193	92	295.5	247	299.5	249	306	252.3	311.5	255	319.5	259

Unit Dimensions (Dimensions in mm)

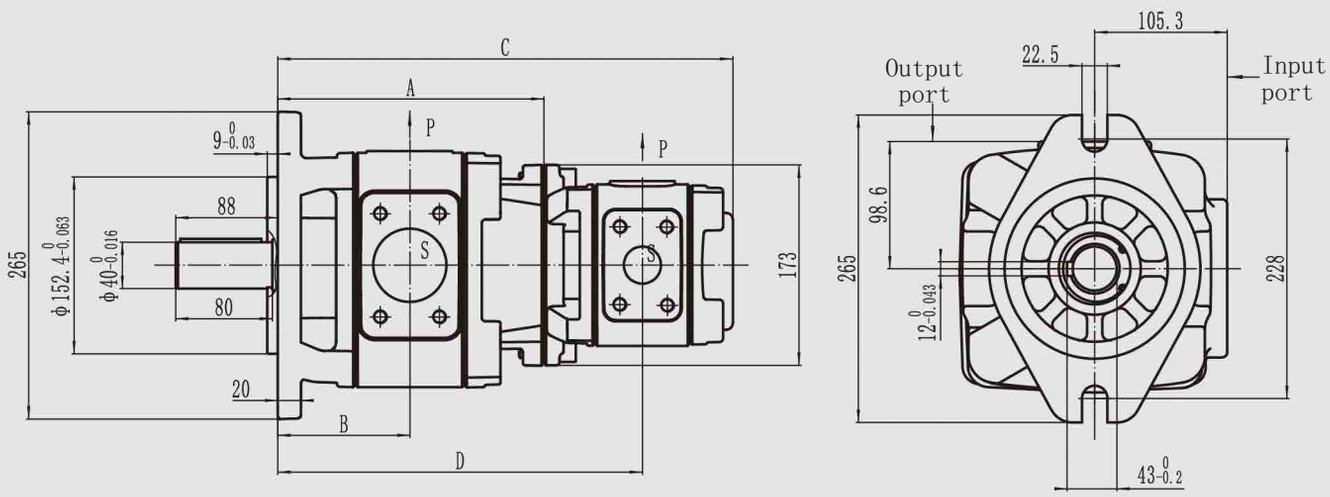
DIGP(H)22-*-***-S10**



First Pump Displacement cc/rev.	A	B	Rear pump displacement cc/rev.									
			25		32		40		50		63	
			C	D	C	D	C	D	C	D	C	D
25	142.5	73	282	215.5								
32	149.5	76.5	289	222.5	296	226						
40	156.5	80	296	229.5	303	233	310	236.5				
50	166.5	85	306	239.5	313	243	320	246.5	330	251.5		
63	180.5	92	320	253.5	327	257	334	260.5	344	265.5	358	272.5

Unit Dimensions (Dimensions in mm)

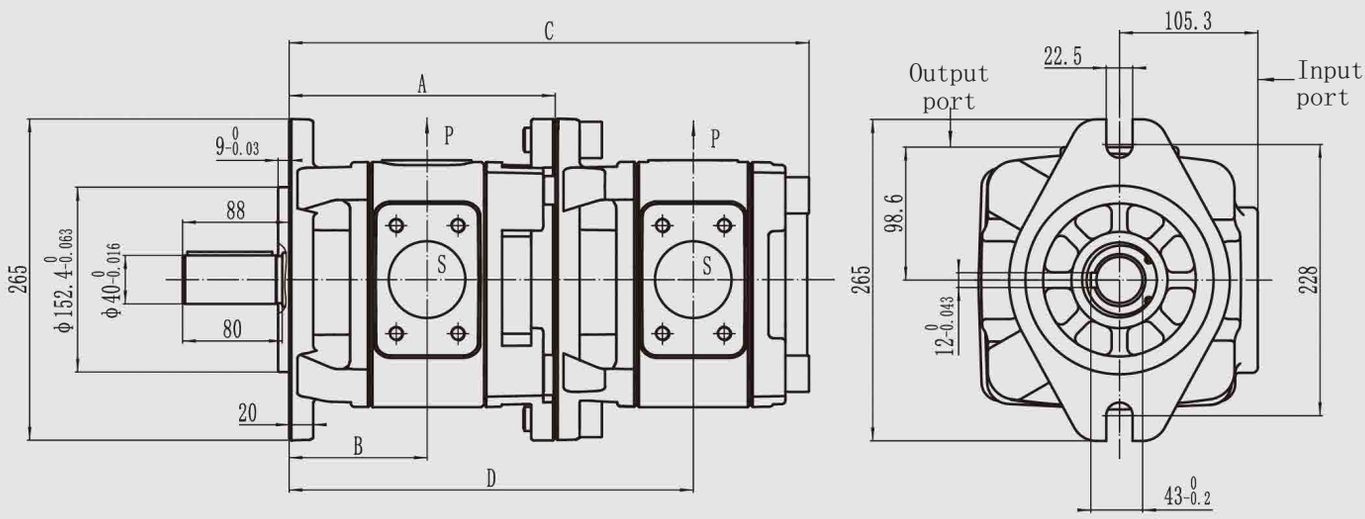
DIGP(H)32-*-***-S10**



First Pump Displacement cc/rev.	A	B	Rear pump displacement cc/rev.									
			25		32		40		50		63	
			C	D	C	D	C	D	C	D	C	D
80	220.5	109.5	359.5	293.5	346.5	297	373	300.5	383.5	305.5	397.5	312.5
100	229.5	114	368.5	302.5	375.5	306	382.5	309.5	392.5	314.5	406.5	321.5
125	241.5	120	380.5	314.5	387.5	318	394.5	321.5	404.5	326.5	418.5	333.5
145	251	124.8	390	324	397	327.5	404	331	414	336	428	343
160	259.5	129	398.5	332.5	405.5	336	412.5	339.5	422.5	344.5	436.5	351.5

Unit Dimensions (Dimensions in mm)

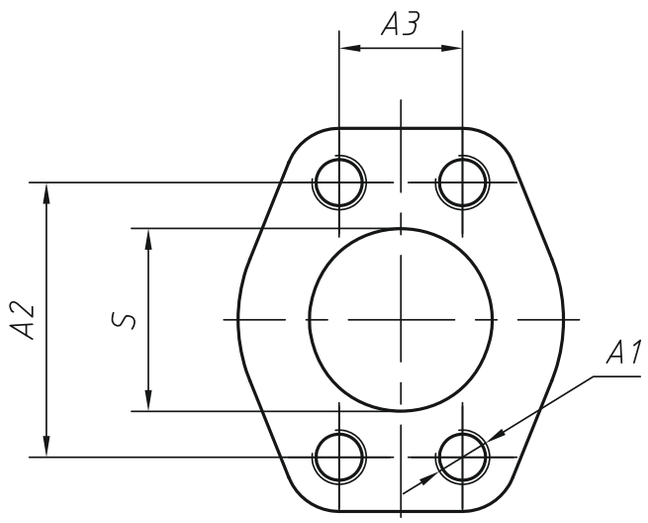
DIGP(H)33-*-***-S10**



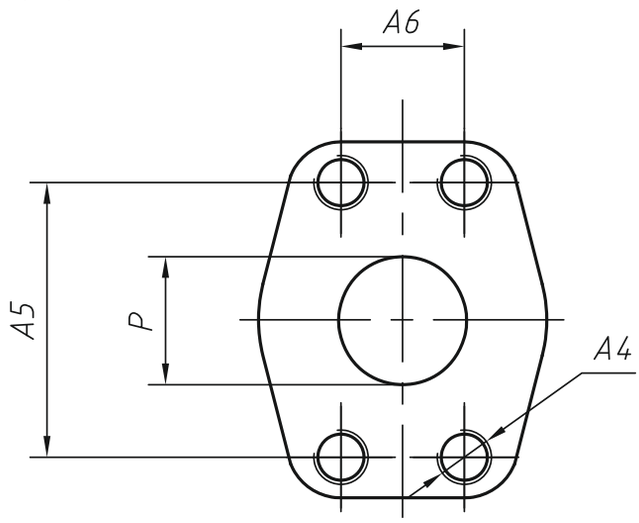
First Pump Displacement cc/rev.	A	A2	Rear pump displacement cc/rev.									
			80		100		125		145		160	
			C	D	C	D	C	D	C	D	C	D
80	211	190.5	410	319.5								
100	220	114	419	329.5	428	334						
125	232	120	431	341.5	440	346	452	352				
145	241.5	124.8	440.5	351	449.5	355.5	461.5	361.5	471	366		
160	250	129	449	359.5	458	364	470	370	479.5	374.5	488	379

Oil Port Connection Size

Suction port S



Output port P



Model	Sizes	S	A1	A2	A3	P	A4	A5	A6
IGP1	8	Ø20	M10depth15	47.6	22.2	Ø13	M8depth13	38.1	17.5
	10			52.4	26.2				
	13								
	16								
	20	Ø26		58.7	30.2	Ø20	M10depth15	47.6	22.2
	25								
IGP2	25	Ø32	M10depth19	58.7	30.2	Ø18	M10depth17	47.6	22.2
IGP2	32								
IGP2	40	Ø32	M10depth19	58.7	30.2	Ø20	M10depth17	52.4	26.2
IGP(H)2	40	Ø38	M12depth21	69.9	35.7				
IGP2	50	Ø32	M10depth19	58.7	30.2				
IGP(H)2	50	Ø51	M12depth21	77.8	42.9	Ø25.4	M12depth21	57.2	27.8
IGP2	63	Ø32	M10depth19	58.7	30.2	Ø20	M10depth17	52.4	26.2
IGP(H)2	63	Ø51	M12depth21	77.8	42.9	Ø32	M12depth21	66.6	31.8
IGP3	80	Ø51	M12depth23	77.8	42.9	Ø32	M12depth20	69.9	35.7
IGP3	100	Ø51	M12depth23	77.8	42.9				
IGP(H)3	100	Ø64	M12depth23	88.9	50.8				
IGP3	125	Ø64	M12depth23	88.9	50.8	Ø38	M16depth25	79.4	36.5
IGP3	145	Ø64	M12depth23	88.9	50.8				
IGP(H)3	145	Ø76	M16depth30	106.4	61.9				
IGP3	160	Ø76	M16depth30	106.4	61.9				
IGP3	200	Ø76	M16depth30	106.4	61.9				

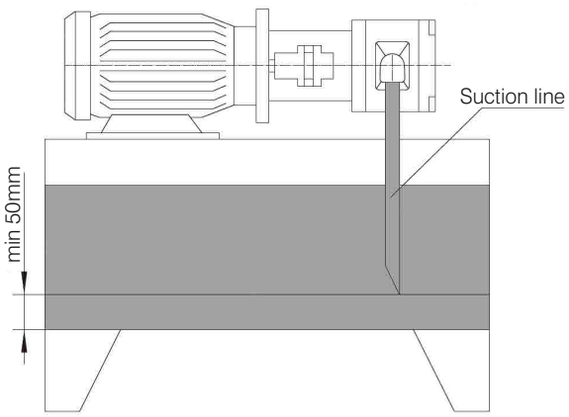
= larger suction & delivery ports

Technical descriptions

1. General Description

1.1 Intended use
THM Internal gear pump must not be used in explosive environment.

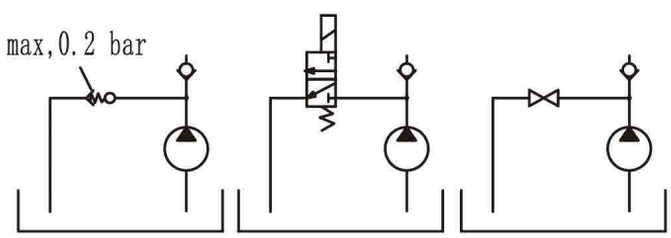
1.2 Technical data
The system of machine manufacturer must ensure compliance with the permissible technical data and working conditions.



2. Hydraulic project planning

2.1 Emission options for commissioning
For THM Internal gear pumps, manual operation, on-off or automatic drain options are available for initial commissioning or recommissioning after maintenance and repair work. Incorporate the discharge point into the pressure line before the first valve or check valve. venting can be performed with a maximum back pressure of 0.2 bar.

Example of discharge circuit:
1. Automatic discharge through automatic discharge valve
2. On-off discharge
3. Manual operation and discharge



2.2 Oil suction line
The piping section must be dimensioned to achieve the design flow required to achieve the ideal suction velocity of 0.6 to 1.2 m/s on average.
The suction line must be dimensioned to comply with the permissible inlet operating pressure (0.8 to 2 bar absolute) Bending of the suction line and combinations of the suction lines of several pumps must be avoided.
If the oil suction filter must be used, it is recommend to select the oil suction filter according to the maximum flow rate of the pump, multiply the coefficient by 2-3 times and the absolute filtration accuracy is 50-180μm. It must be ensured that even if the filter is polluted, it will not exceed the minimum allowable inlet of the system work pressure.
The selected suction line immersion depth should be as deep as possible without vortex formation even at maximum flow. Otherwise there is a risk of sucking and releasing air.

When designing the oil suction pipeline, it is not recommend to install the oil suction port vertically downward. If the oil reservoir is installed below the pump, the oil suction port should face upward or be located on both sides of the horizontal.

2.3 Pressure piping
When designing the pressure line, it must be ensured that the suction pipe, hoses and connecting elements are sufficiently resistant to rupture.

2.4 Pressure limitation
The setting and limitation of the permissible operating pressure must be ensured within the system. Relief valves required for this application should be designed taking into account the allowable intermittent operating pressure is not exceeded.

2.5 Pressure holding function
In variable speed drives, the pump can also be temporarily powered on during the pressure hold function. Running below the specified minimum speed. The dwell time and the relative speed required depends on the working viscosity and pressure rating.
In deactivated conditions (speed=0), the leakage flow flows through the pump back to the reservoir, depending depending on the load pressure. If you want to prevent backflow safely and reliably, you must use a check valve.

3. Mechanical project planning

3.1 Installing and removing options
When installing and dismounting the pump, provide suitable lifting equipment if necessary, screws with a performance grade of 8.8 or 40.9 are required for installation.

3.2 Installation
After installing the screw on the machine side It must be possible to apply the required tightening torque to the screw moment.

Technical descriptions

3.3 Oil reservoir

The oil reservoir shall comply with the following requirements:

- The largest possible reservoir volume should be selected based on continuous flow or average flow in order to allow sufficient dwell time for the medium in the reservoir to separate air bubbles.
- Provides a setting area for the hydraulic oil in the reservoir so that air can be separated.
- Defectors are provided to allow contaminants to settle outside the pump suction area at the bottom of the reservoir.
- If Dimensions the surface of the reservoir with the relatively larger value according to the heat dissipated through the reservoir wall.
- Conditions permit, it is recommended that the oil reservoir be installed above the inlet of the pump, and the inlet pressure should be within the allowable value.

3.4 Required hydraulic station functions

The hydraulic station shall at least provide the following functions:

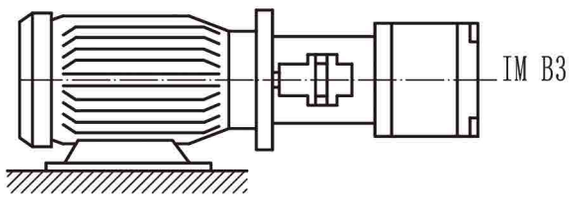
- The oil reservoir (which is designed to have an internal pressure equal to the ambient pressure) must be equipped with an air filter for pressure compensation.
- The hydraulic oil should be filled only through the oil filling port, thus eliminating the possibility of filling un filtered hydraulic oil.
- Contamination or moisture must be prevented from entering the system. Pumps used in highly polluted environments the oil reservoir should be pretensioned with filtered air pressure.

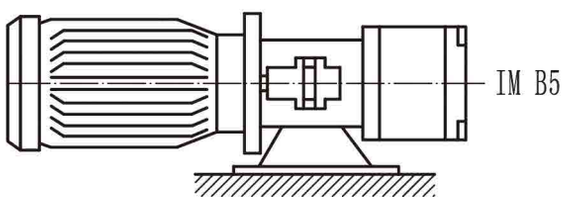
3.5 Installation location and ambient conditions

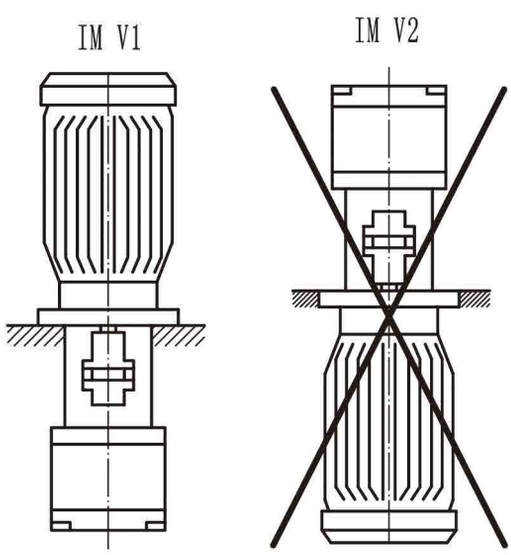
For installation above 1000m above ground level, the pump should be placed in or below the oil reservoir, or the oil reservoir should be pre-tentioned by compressed air in order to comply with the minimum permissible inlet pressure. The oil suction pipeline with a large distance from the short section should be selected and the use of curved pipelines is not allowed.

When installing the pump more than 10m below the oil reservoir, additional measures must also be taken to ensure that the inlet pressure is reduced to the maximum permissible value. When operating the pump in saline or corrosive atmospheres, or when pressurized by highly abrasive substances. it must be ensured on the system side that the sealing area of the shaft do not come into direct contact with the environment.

3.6 Installation location







Notes

The mounting position must not be below the motor and above the pump (eg.IMV2)

4. Combination pumps

- When combining pumps it must be ensured that each stage complies with the permissible work data.
- The direction of rotation of all combined pumps must be same.
- Pumps with maximum torque, pumps with variable displacement or with intermittent loads the pump shall be supplied as the first stage of a combined pump.
- The maximum thru drive torque must be checked by the project planner for each application.

Technical descriptions

Maximum allowable torque (Nm)

Type	Drive torque		Output torque
	Keyed shaft P	Splined shaft S	
IGP1	250	250	150
IGP(H)2	450	450	280
IGP(H)3	1100	1100	700

The pump stage drive torque is calculated as follows:

$$T = \frac{\Delta p \times V \times 0.0159}{n \text{ hydraulic machinery}}$$

T: Torque (Nm)
Δp= working pressure (bar)
V = displacement (ml/r)
n= hydraulic machinery efficiency

*The total torque of the combined pump must not exceed the maximum drive torque.
*Co-inhalation not permitted.
*Please contact THM before operating pump combinations with different media.
*The shaft design of the rear pump must be an "S" spline.

Maintenance planning and operational safety

In order to ensure the safe operation and long service life of the pump, it is necessary to formulate a maintenance plan for the hydraulic station, machine or system. In particular, it must be ensured that the following operating parameters are observed:
Required oil cleanliness level
Working temperature range
Grade of working medium
In addition, the following parameters of the pump and system must be checked regularly for occurrence of Variety:
- Vibration
- Noise
- Temperature difference between the pump and the hydraulic oil in the reservoir
- Foam formation in the oil reservoir
- Leakproof

Changes in these parameters indicate wear on components (such as drive motors, couplings, leeches, etc.). The cause must be determined and rectified immediately. In order to achieve a high operational safety of pumps in machines or systems, we recommend continuous automatic checking of the above mentioned parameters and automatic shutdown of the system if these parameters vary beyond the normal fluctuations of the expected working range. The plastic components of the drive coupler must be replaced periodically, but no longer than 5 years. The corresponding information of the manufacturer must also be observed. For the preventive maintenance of the pump, we recommend having an authorized THM pump after a maximum of 5 years of operation. The service company replaces the seal.

Accessories

SAE connection flange
We recommend selecting SAE flanges for suction and inlet ports according to AB22-15 (with welded connections) or AB22-13 (with threaded connections).

Other accessories
To install the THM IGP(H) internal gear pump on the motor, it is recommended to choose the pump installation Brackets and torsionally elastic couplings.

Debugging notes

Prepare:

- Check to see if the installation of the system was done in a careful, clean manner.
- Fill hydraulic oil only through filters with required minimum retention.
- Through oil suction pipe or pressurized pipe for deep filling hydraulic oil.
- Check that the rotation direction respects that of the poly type.

Emission:

- Open the discharge point of the system or switch to non-pressurized circulation according to the operating instructions of the system. During the discharge period, it must run at low speed and without pressure, and the speed should not exceed 200 revolutions per minute to ensure the discharge of zero-pressure enclosed gas. To brace the pump, turn the pump on and then immediately turn it off again (jog mode). Repeat this process until you are sure the pump is completely drained.
- Manually close the open drain again.
- Open the bypass valve in the oil outlet pipeline, and the bypass valve can be directly connected back to the oil tank. If there is no bypass pipeline, you need to fully loosen the oil outlet hose joint and discharge the air until there are no more air bubbles in the hydraulic oil produced, and then tighten the fittings or hoses.

Debugging:

- It is strictly forbidden to overspeed and run for a long time before the air is exhausted from the oil outlet (20within seconds), if the oil cannot come out, please find out the reason and then run it again.
- If it is confirmed that the pump has been completely discharged, the motor can be switched on. Allow the pump to run until the system is completely emptied, following system operating instructions when draining the system.
- Commission the system according to the system operating instructions, then load the pump.
- After a period of working time, check whether there are air bubbles or foams on the surface of the hydraulic oil in the oil

Reservoir.operate:

- Pay attention to the change of noise characteristics during operation. Due to the heating of the working medium, some slight noise is normal. A large increase in noise or a short-term random change in noise indicates that air may be drawn in if the suction line is too short or working The oil level of the medium oil filling is too low, and air may also be sucked in through the vortex.
- Changes in operating speed, temperature, increased noise or power consumption indicate wear or damage to the system or pump. re-debugging
- Check the pump and system for leaks. If there is a leak, the hydraulic fluid is leaking underneath. An increase in the hydraulic fluid level in the reservoir indicates a leak above the hydraulic fluid level.
- If the pump is placed above the hydraulic oil level, the pump may run empty due to leakage (eg worn shaft seal). In this case, the system must be drained again during recommissioning. Prepare for repair.
- After repair and maintenance work is completed, the system must be drained again.
- If the system is intact, switch on the motor.

Overview:

- Our supplies have been tested for function and performance, any kind of modification to the pump is not allowed, this will invalidate the warranty claim! Repairs should only be performed by the manufacturer or its authorized dealers and agents. Repairs performed by the user are not covered by the warranty.

Important notes:

- Fee should only be used by authorized, trained and instructed persons Install, repair and repair!
- Operate the pump only with permitted data
- Only operate without dispute!*Please depressurize the system before performing any operation!
- Without permission, any conversion that may affect safety and function is not allowed or change!!
- Protective equipment (e.g. coupler protection) should be connected, existing Protective equipment!
- Please ensure that all mounting screws are always tightened properly! (Please observe the specified tightening torque)!
  The generally valid safety regulations and accident prevention regulations must be observed!

The specified data is for product description purposes only and may not be deemed to be guaranteed unless expressly confirmed in the contract.

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