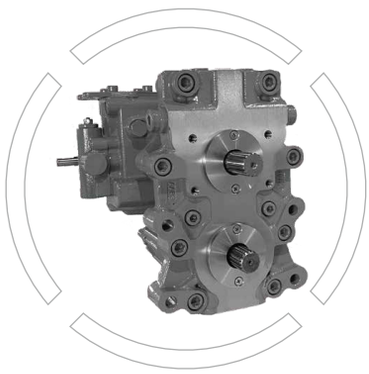
HT S10 Series

Hydrostatic Transmission
Displacement: 56 mL/r
Rated pressure: 320 Bar
Maximum pressure: 390 Bar



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Features

The HT S10 series hydrostatic transmission is an integrated unit of pump + motor developed for the agricultural machinery field. This series of devices can give full play to the driving performance of agricultural machinery and meet the application requirements of agricultural machinery customers for harsh working conditions such as high pressure and high speed.

- The integrated plunger unit developed specifically for agricultural machinery enables the operation performance of agricultural machinery to be fully utilized.
- High volumetric efficiency, output volumetric efficiency can reach over 90%.
- Output speed and displacement are proportional and steplessly adjustable.
- The output speed increases from zero to the maximum value as the swash plate angle increases.
- The pump and motor are integrated into one, effectively reducing the layout of connecting pipes.
- Compared with traditional split hydraulic pumps, it has smaller pipeline pressure loss

Ordering code

HT									

Hydrostatic transmission

Swash plate variable displacement pump	HT

Displacement

Geometric displacement, unit: mL/r	48	56

Variable control method

	48	56	
Mechanical servo, without handle	○	●	HW1
Mechanical servo, with flat handle	○	●	HW2
Mechanical servo, with Z handle	○	●	HW3
Electric proportioal control,12V, connector type: Deutsch DT04-2P	○	○	EP1
Electric proportioal control, 24V, connector type: Deutsch DT04-2P	○	○	EP2

Brake valve

	48	56	
No brake valve	○	●	0
With brake valve, 12V, electric brake, connector model: Deutsch DT04-2P	○	○	1
With brake valve, 24V, electric brake, connector model: Deutsch DT04-2P	○	○	2
With brake valve, 12V, power-off brake, connector model: Deutsch DT04-2P	○	○	3
With brake valve, 24V, power-off brake, connector model: Deutsch DT04-2P	○	○	4

Additional features

	48	56	
No additional features	○	●	0

Serial number

	48	56	
S10 series	○	●	10

Enter rotation

	48	56	
Clockwise (CW)	○	●	R
Counterclockwise (CCW)	○	●	L

Variable cylinder position (viewed from input shaft end)

	48	56	
The pump is located on the top and the variable cylinder is on the left	○	●	L

Front cover type

	48	56	
Pump stop flange Ø72, Motor stop flange Ø72, Oil inlet port G1/2, Pump end mounting bolt holes Spacing: M8x92x56	○	●	F3

Pump shaft configuration

	48	56	
JIS D 2001, 20x18x1.25, shaft extension length 50	○	●	J1
JIS D 2001, 20x18x1.25, shaft extension length 59	○	●	J2

Ordering code

Accessories

	48	56	
No special accessories	○	●	0
With external filter	○	○	A

Special hardware features

	48	56	
No special hardware	○	●	0

High pressure relief valve, right side
(The pump is located at top, Viewed from input shaft end, The high pressure relief valve is on right side)

	48	56	
High pressure relief valve without throttle hole (Open at set pressure, relief)			**A
High pressure relief valve set pressure 39MPa	○	●	39A
High pressure relief valve with orifice			**B
High pressure relief valve set pressure 39MPa	○	●	39B

High pressure relief valve, left side
(The pump is located at top, Viewed from input shaft end, The high pressure relief valve is on left side)

	48	56	
High pressure relief valve without throttle hole (Open at set pressure, relief)			**A
High pressure relief valve set pressure 39MPa	○	●	39A
High pressure relief valve with orifice			**B
High pressure relief valve set pressure 39MPa	○	●	39B

Charge pump

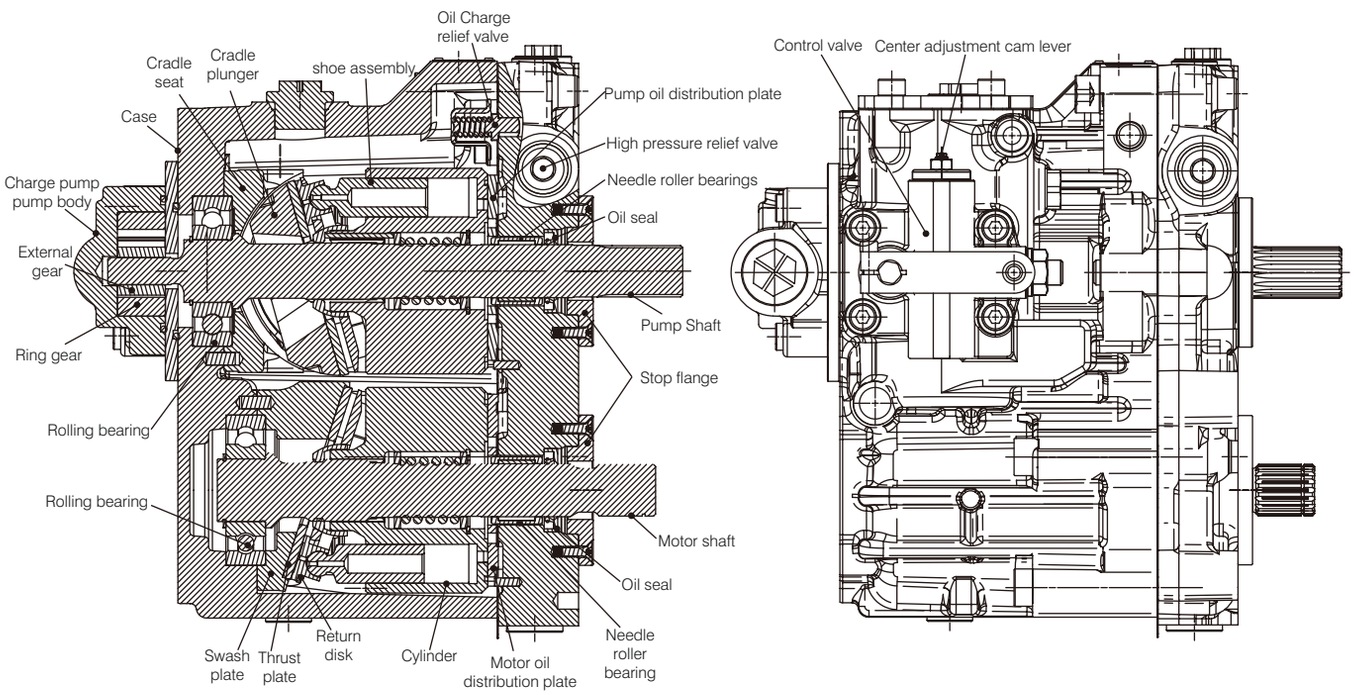
	48	56	
Charge pump left rotation, Disp. 13.6 mL/r, Oil inlet G3/4, Oil outlet G1/2	○	●	L1
Charge pump left rotation, Disp. 13.6 mL/r, Oil inlet G3/4, Oil outlet G3/4	○	○	L2
Charge pump right rotation, Disp. 13.6 mL/r, Oil inlet G3/4, Oil outlet G1/2	○	●	L3
Charge pump right rotation, Disp. 13.6 mL/r, Oil inlet G3/4, Oil outlet G3/4	○	●	L4

Motor shaft configuration

	48	56	
JIS D 2001, 20x18x1.25, shaft extension length 37, The distance between retaining ring groove & shaft end face is 5mm	○	●	J1
JIS D 2001, 20x18x1.25, shaft extension length 56, The distance between retaining ring groove & shaft end face is 5mm	○	●	J2
JIS D 2001, 20x18x1.25, shaft extension length 56, The distance between retainingring groove & shaft end face is 2.5mm	○	●	J3
JIS D 2001, 20x18x1.25, shaft extension length 56.5, The distance between retaining ring groove & shaft end face is 2.65mm	○	●	J4

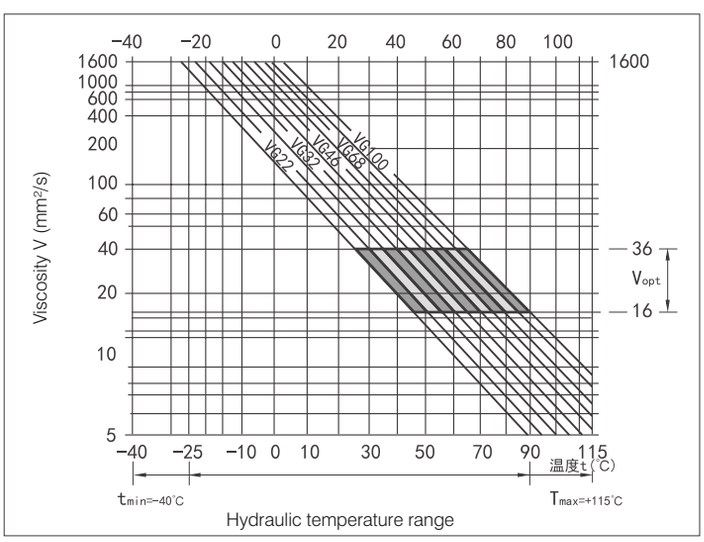
● Available ○ Supply upon request – Not available ▭ Recommended models

Product structure



Technical data

Hydraulic oil
mineral oil
Working viscosity range
To obtain optimum efficiency and service life, we recommend that the operating viscosity (at operating temperature) be selected within the following range:
V_{opt} = optimal working viscosity 16...36mm²/s
Dependent on circuit temperature (closed circuit)
Viscosity limit range, The viscosity limits are as follows:
V_{min} =5mm²/s
Short-term (t<3min)
Maximum allowable temperature:
t_{max} = +115°C;
V_{max} =1600mm²/s
Short-term (t<3min)
Cold start (p≤3Mpa, n≤1000rpm, t_{min}=-40°C)
Only suitable for no-load starting, the optimum working viscosity must be reached within 15 minutes.



Hydraulic temperature range

Hydraulic oil selection instructions
In order to select the right hydraulic oil, it is necessary to know the operating temperature in relation to the ambient temperature, or in a closed circuit the circuit temperature. Hydraulic oil should have the best viscosity (Vip) within the working range (see the shaded part of the selection chart). We recommend choosing a higher viscosity grade under the same conditions.
Example: At the ambient temperature of XC, the operating temperature in the circuit is 60°C. Within the optimum working viscosity range (V: shaded area), corresponding to viscosity grades VG46 or VG68, VG68 should be selected.
Note: The case drain temperature is affected by pressure and speed and is always higher than the circuit temperature. The temperature at any point in the system cannot exceed 115°C.

Filter
The finer the oil is filtered, the higher the oil cleanliness and the longer the service life of the axial piston element.
In order to ensure the normal operation of the axial piston element, the oil cleanliness level should be at least:
20/18/15 according to ISO4406
Depending on the system and application,
we recommend: Filter ß20 ≥ 100
The filter element must not be reduced when the pressure difference increases.
At higher oil temperatures (90°C to a maximum of 115°C), the cleanliness level should be at least: 19/17/14 according to ISO4406

Working pressure range
Variable pump
Oil Charge pressure (n= 2000 rpm)Psp 2.3 Mpa
Charge pump
Suction pressure Psmin (V≤30mm²/s) ≥0.8 MPa

Shaft sealing ring
Allowable pressure load≥0.08Mpa
The service life of the shaft seal is affected by the pump speed and case drain pressure. It is recommended that the average sustained case oil drain pressure at operating temperature should not exceed 0.3Mpa (when the speed decreases, the maximum case oil drain pressure is 0.6Mpa), and the short-term (t<0.1s) absolute peak pressure is allowed to reach 1MPa. The higher the frequency of pressure peaks, the shorter the service life of the shaft seal ring. The pressure inside the case must be equal to or greater than the external pressure of the shaft seal.
Temperature range Fluoro rubber shaft seals are suitable for housing temperatures ranging from -25°C to +115°C.

Technical Parameter table

Specifications				56
Displacement	Variable pump	Vgmax	mL/r	56
	Dosing motor	Vgmax	mL/r	56
	Oil charge pump (P= 2.3MPa)	Vgmax	mL/r	13.6
Speed	Input Speed	nmax	rpm	3000
		nmin	rpm	800
	Output Speed	nmax	rpm	3000
		nmin	rpm	0
Flow	When $n_{o\ max}$ continues and V_{gmax}		L/min	168
Relief pressure			Mpa	39
Weight			kg	32

Specification calculations:

Flow $q_v = \frac{V_g \cdot n \cdot \eta_v}{1000}$ [L/min]

Torque $T = \frac{V_g \cdot \Delta P}{20 \cdot \pi \cdot \eta_{mh}}$ [Nm]

Power $P = \frac{2\pi \cdot T \cdot n}{60000} = \frac{q \cdot \Delta P}{600 \cdot \eta_t}$ [KW]

V_g = Displacement per revolution mL/r

ΔP = Pressure difference bar

n = Speed rpm

η_v = Volumetric efficiency

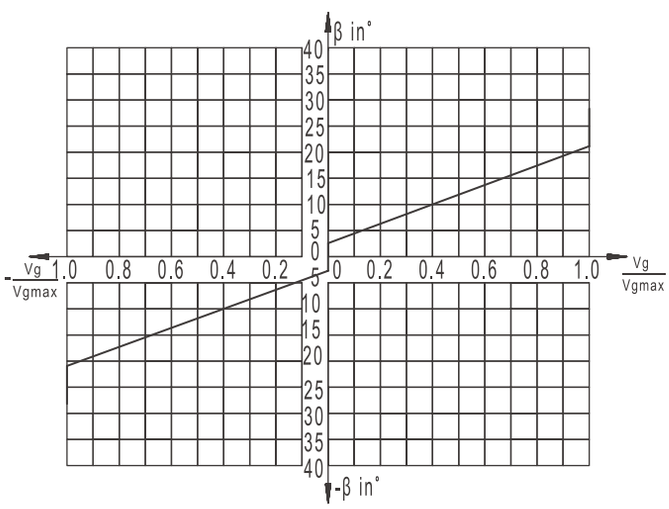
η_{mh} = Mechanical hydraulic efficiency

η_t = Total efficiency

Node control mode - mechanical servo control, HW

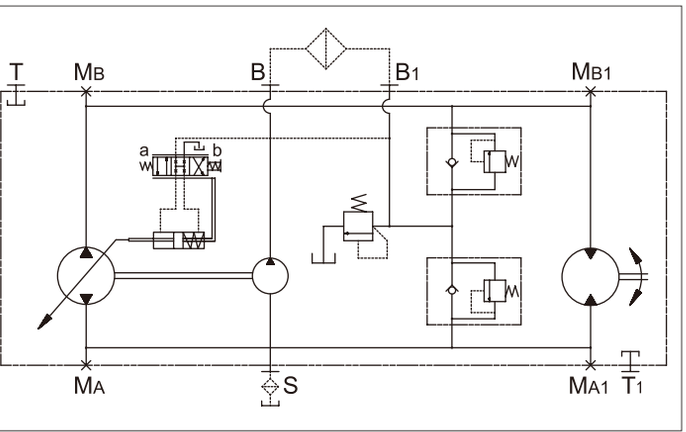
Depending on the operating direction a or b of the control lever, the oil pump control cylinder obtains the control pressure via the HW control device, so that the swash plate and thus the displacement can be infinitely adjusted. Each operating direction of the control lever corresponds to a flow direction.
The swing angle B of the control lever during swing:
Control starting point = ±2.5°
Control end point = ±21° (maximum displacement Vg max)
Mechanical limit: ±31°
The swivel of the HW joystick must be limited in the external position sensor (setpoint device).

Note: When there is no torque on the control lever of the HW control, the spring centering function automatically moves the oil pump to the zero position (V=0) (independent of the swivel angle).



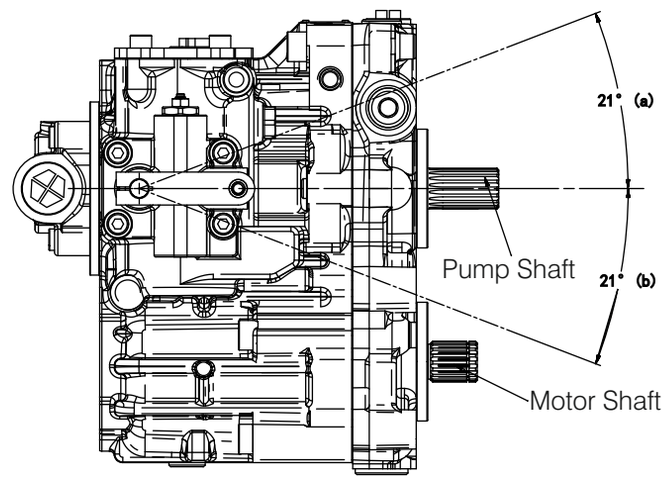
Swing angle and displacement Vg Curve

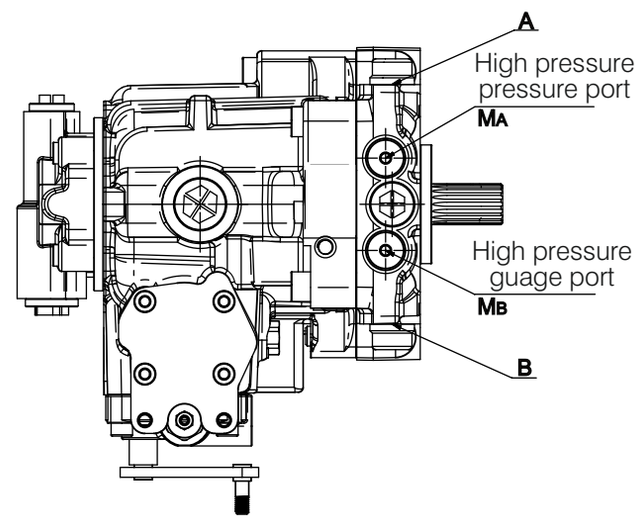
Hydraulic Schematic Diagram



Rotation direction - control - flow direction relationship

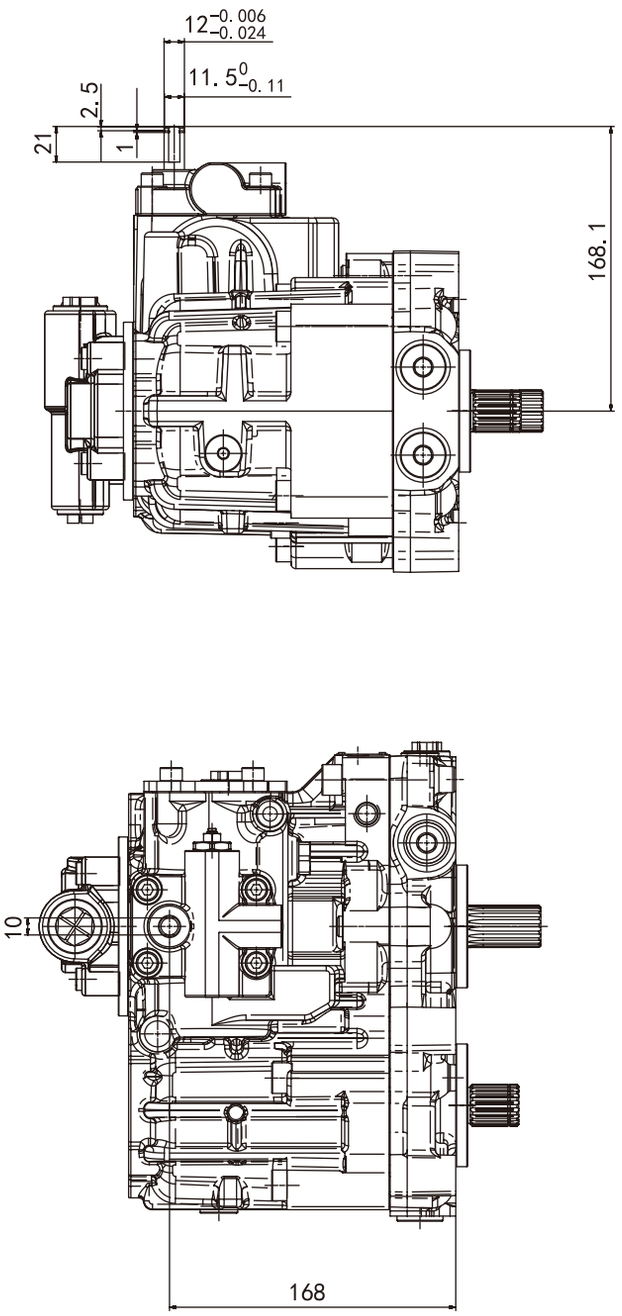
Enter rotation	Operating position	High pressure oil circuit
Clockwise	a	B
	b	A
Counter-clockwise	a	A
	b	B



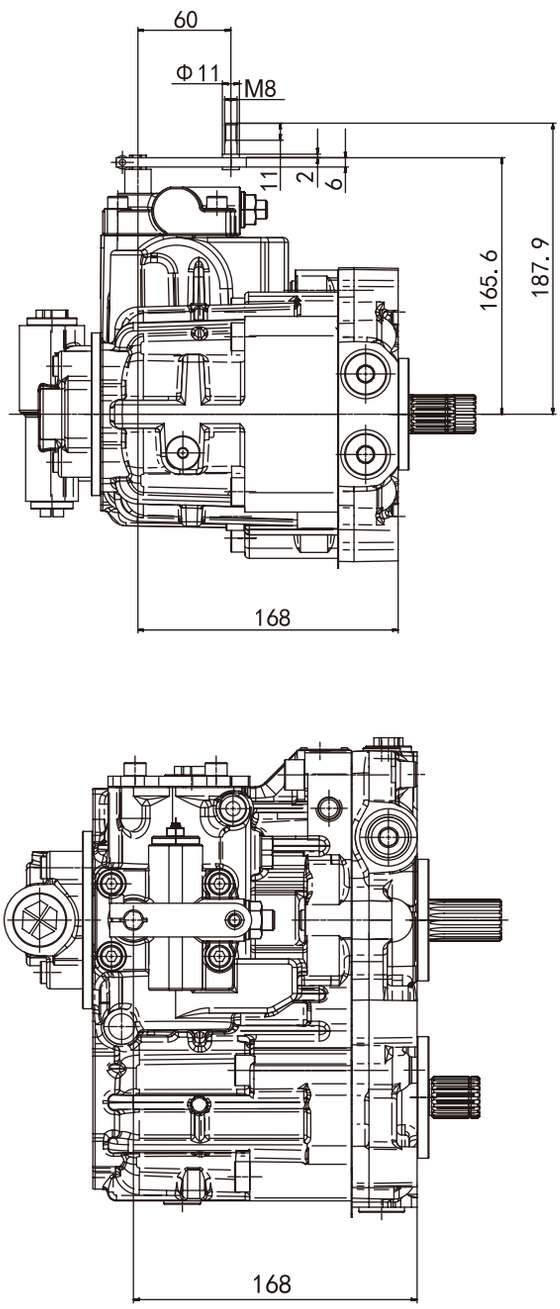


Installation Connection Dimensions

HW1-Mechanical servo, without handle

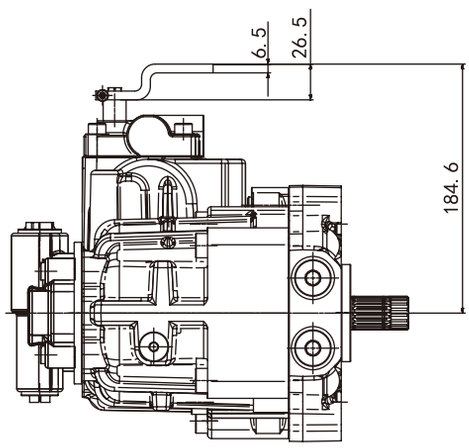


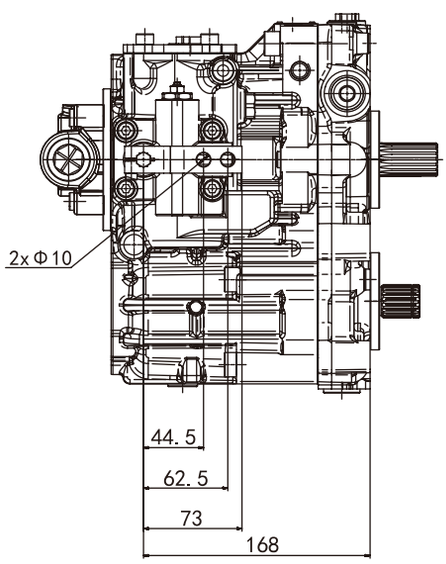
HW2-Mechanical servo, with flat handle



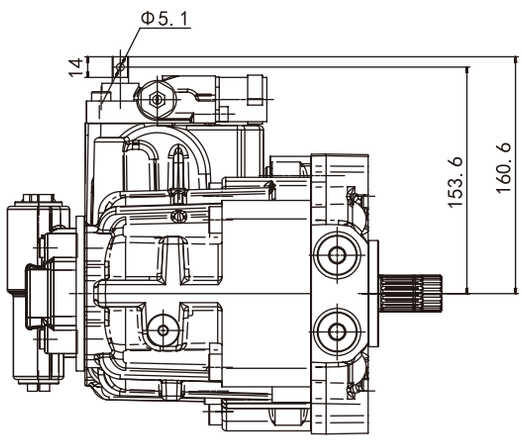
Installation Connection Dimensions

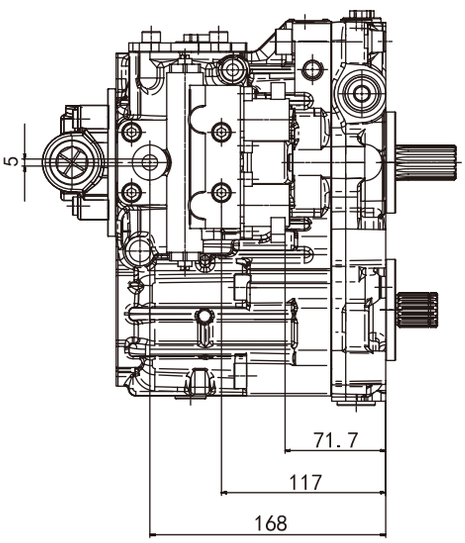
HW3-Mechanical servo, with Z handle





EP1-Electric Proportional Control

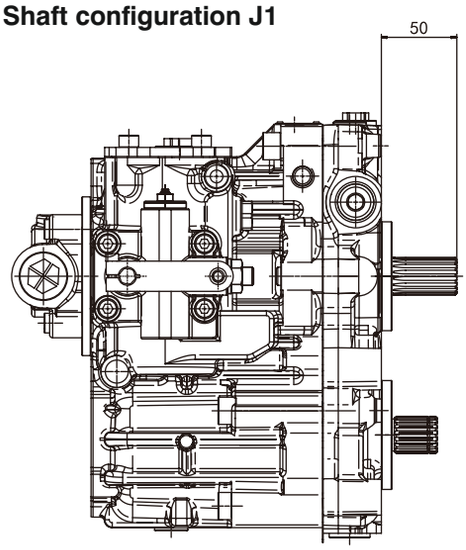




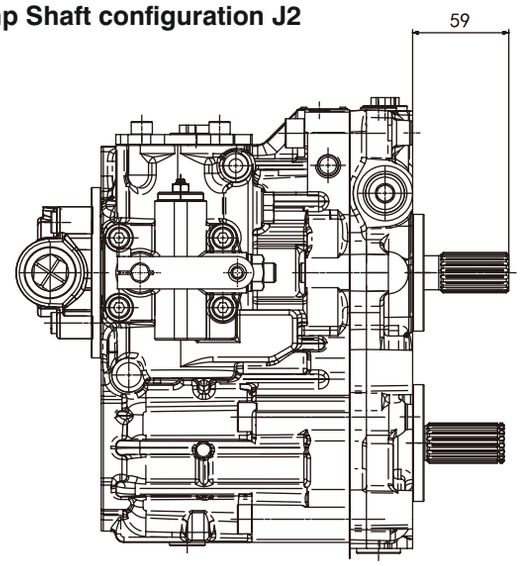
Installation Connection Dimensions

Pump Shaft configuration

Pump Shaft configuration J1

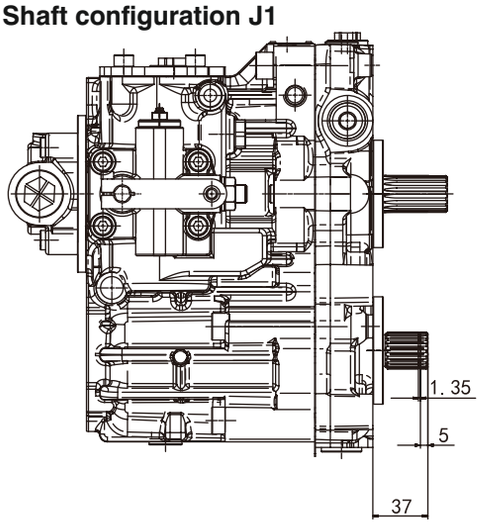


Pump Shaft configuration J2

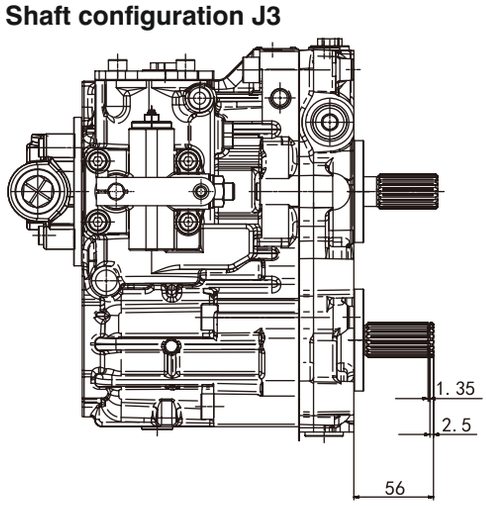


Motor Shaft configuration

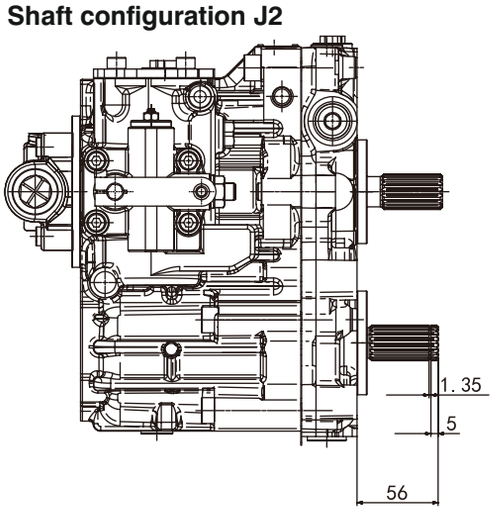
Motor Shaft configuration J1



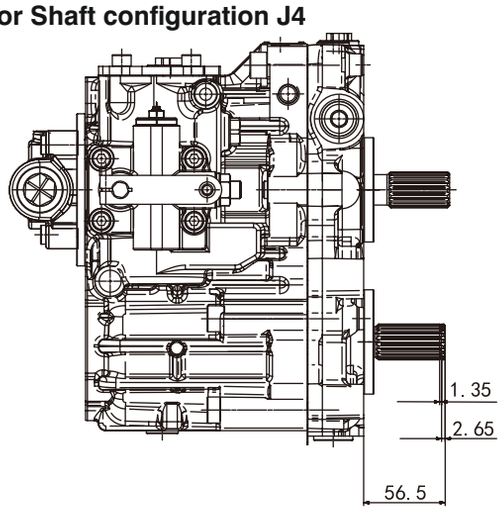
Motor Shaft configuration J3



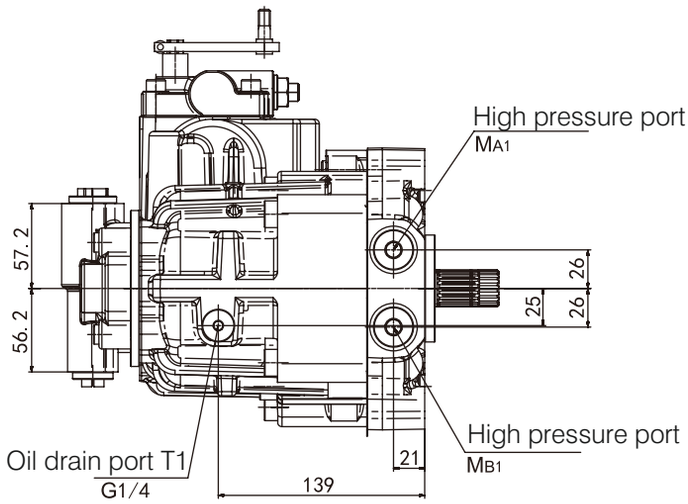
Motor Shaft configuration J2

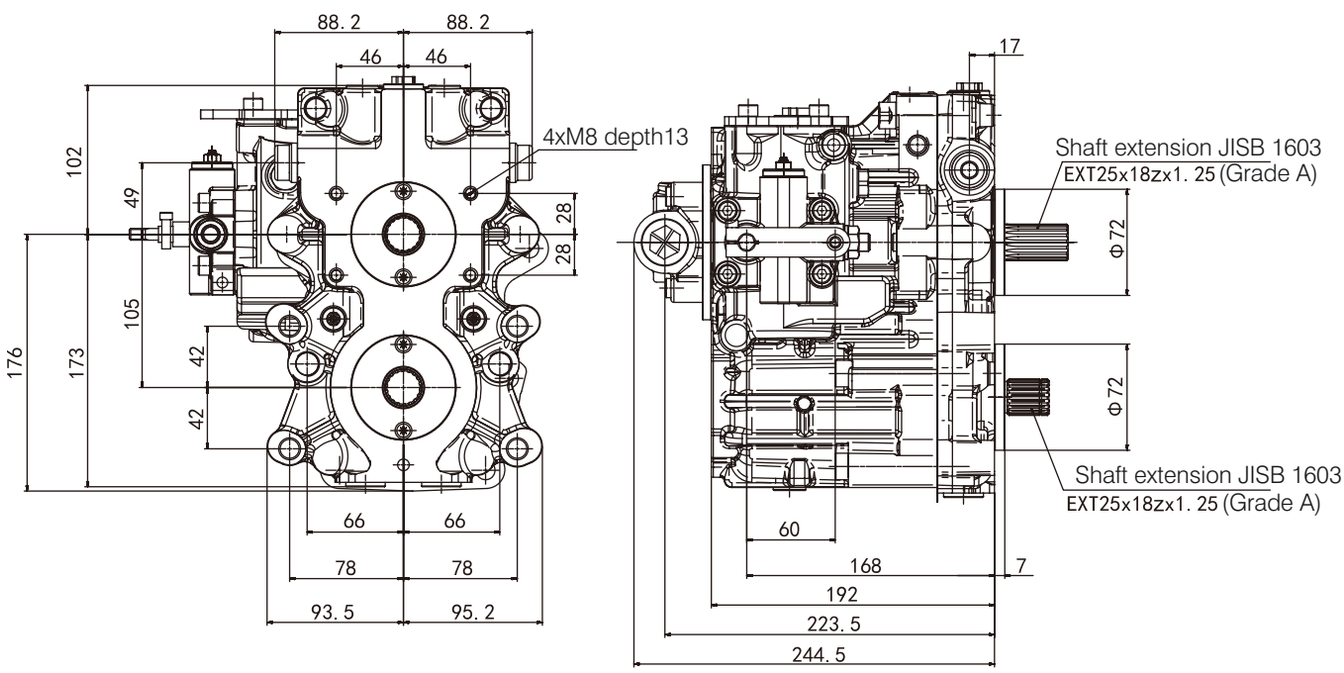


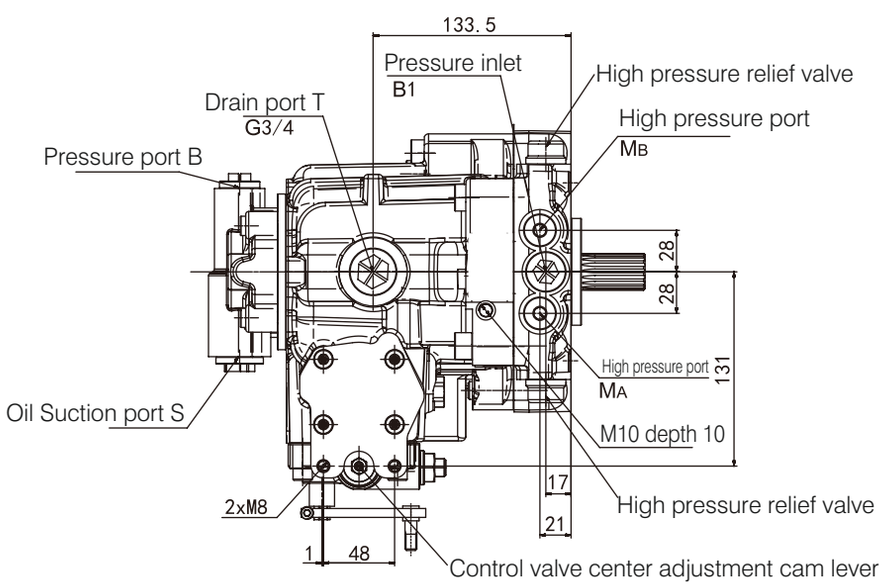
Motor Shaft configuration J4



Installation Connection Dimensions (Dimensions in mm)







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THM Huade Hydraulics Pvt Ltd
F-127, Phase-VIII, Focal Point,
Ludhiana-141010, Punjab (INDIA)
PH: 0161-2672777, 0161-2672778
E-mail: sales@thmhuade.com
Website: www.thmhuade.com

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