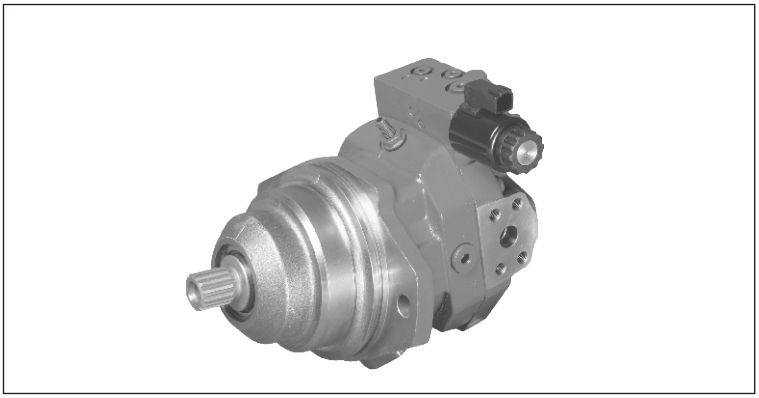
A6VE Series
Variable plug-in motor

Product show and brief introduction

open and colsed circuits

Series 63
Sizes 55,107
Nominal pressure 40MPa
Maxmum pressure 45MPa



Features

- Varible plug-in motor with axial tapered pistion rotary group of bent-axis design,for hydrostatic drives in open and closed circuits
- Far-reaching integration in mechanical gears due to recessed mounting flange located in the center of the case (extemely space-saving construction)
- Easy to install,simple to plug into the mechanical gearbox (no configuration specifications to be observed)
- Tested unit ready to install
- For use preferably in mobile applications
- The displacement can be continuously changed from $V_{g\,max}$ to $V_{g\,min}$=0.
- The wide control range enables the variable motor to satisfy the requirement for high speed and high torque
- The output speed depends on the flow of the pump and the displacement of the motor
- The output torque increases with the pressure differential between the high and low pressure sides and with increasing displacement.

Model Code

A6V	E	55	HD1	D	/63	W	-V	Z	L	010	F	P	B
Axial piston unit	Operating mode	Size	Control unit	Pressure control	series	Driection of rotation	Sealing material	Drive shaft	Mounting flange	Port plate for working line	Speed sensor	Connector for solenoids	Beginning of control
A6V: bent-axis design, variable	E: plug-in motor	55 107	See below	(only for HD,EP) D: pressure control, fixed setting	63	Viewed on drive shaft, bidirec-tional	FKM (fluoroel-astomer)	See below	L: ISO 3019-2 2-hole	See below	No code: without speed sensor F: Prepared for HDD speed sensor	No code: without solenoid P: DEUTSCH molded connector, 2-pi, without suppressor diode	A: at Vg min (standard for HA) B: at Vg max (standard for HD,HZ, EP,EZ

Control unit

		55	107	
Proportional control,hydraulic	△Pst=10bar	√	√	HD1
	△Pst=25bar	√	√	HD2
Proportional control,electric	U=12V	√	√	EP1
	U=24V	√	√	EP2
Two-point control,electric	U=12V	√	√	EZ3
	U=24V	√	√	EZ4
Two-point control,hydraulic		/	/	HZ1
		√	√	HZ3
Automatic control, high-pressure related	With minimum pressure increase △p≤approx.10bar	√	√	HA1
	With pressure increase △p=100bar	√	√	HA2

Drive shafts

	55	107	
Splined shaft DIN5480	√	√	A
	√	√	Z

Port plate for working line

		55	107	
SAE working ports A and B at rear	without valve	√	√	010
	Flushing and boost-pressure valve, mounted	√	√	017
SAE working ports A and B opposite	without valve	√	√	020
	Flushing and boost-pressure valve, mounted	√	√	027

Technical Data

Hydraulic fluid

The A6VE fixed displacement motor is suitable for use with mineral oil

Viscosity range

We recommend that a viscosity (at operating temperature)for optimum efficiendy and service life purposes of

V_{opt} = optimum viscosity16...36mm²/s

Be chosen,taken the tank temperature(open circuit) into account.

Limits of viscosity range

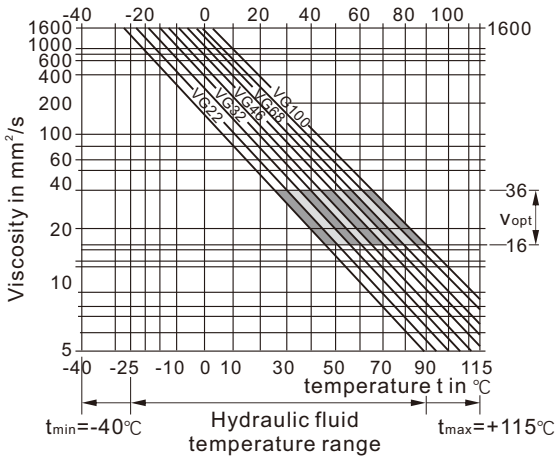
The following values apply in extreme cases:

Vmin = 5 mm²/s
short term(t < 3 min)at max.permitted temperature
tmax=115℃

Vmax = 1600 mm²/s
short term(t < 3 min) with cold start(P < 3MPa,
n≤1000rpm t_{min}=-40℃)

Note that the maximun hydraulic fluid temperature must not be exceeded locally either (e.g.bearing area).The temperature in the bearing area is-depending on pressure and speed-up to 12K higher than the average case drain temperature.

Setlection diagram



Details regarding the choice of hydraulic fluid

The correct selection of hydraulic fluid requires knowledge of the operating temperature in relation to the ambient temperature, in an open circuit the tank temperature.

The hydraulic fliuid should be selected so that within the operating temperature range, the operating viscosity lies within the optimun range (V_{opt})(see shaded section of the selection diagram).We recommend that the highest possible viscosity range should be chosen in each case.

Example:At an ambient temperature of X℃ an operating temperature of 60℃ is set in the circuit. In the optimun operating viscosity range(V_{opt}; shaded area) this corresponds to the viscosity classes VG 46 or VG68; to be selected: VG 68.

Please note: The leakage fluid temperature, which is affected by pressure and rotational spaad,is always higher than the tank temperature . At no point in the system may the temperature be higher than 115℃.

Filtartion

The finer the filtration, the cleaner the fluid and the longer the service life of the axial piston unit.

To ensure proper function of the axial piston unit,the hydraulic fluid must have a cleanliness level of at least

20/18/15 according to ISO 4406.

At very high hydraulic fluid temperatures
(90℃ to max.115℃),a cleanliness level of at least

19/17/14 according to ISO 4406 is required.

Operational pressure range

maximum pressure in port A or B

Nominal pressure PN _____ 40MPa
Maximum pressure Pmax _____ 45MPa
Total pressure (A+B) Pmax _____ 70MPa

Please note:
For Z axis stretch,if driving gear drive shaft radial load (gear and triangle belt),allowing the nominal pressure of P_N=31.5MPa.

Direction of flow

Direction of rotation,viewed on drive shaft	
clockwise	counter-clockwise
A to B	B to A

The minimum speed nmin is unlimited.For uniform,nmin should not be less than 50 rpm.

Shaft seal

Permissible pressure loading

The service life of the shaft seal is influenced by the rotational speed of the axial piston unit and the leakage pressure in the housing (case pressure).Momentary (t < 0.1s) pressure peaks of up to1MPa are allowed.Case pressure of a continuous 0.2MPa maximum are permitted to be able to utilize the entire speed range.Higher case pressure are permissible at lower rotational speeds.
The service life of the shaft seal decreases with increasing frequency of pressure peaks and increasing mean differential pressure.
The case pressure must be equal to or higher than the ambient pressure.

Temperature range

The FKM shaft seal ring may be used for leakage temperature from -25℃ to +115℃.For application cases below -25℃,an NBR shaft seal is required(permissible temperature range:-40℃ to +90℃).

Effect of pressure on beginning of control

An increase in case pressure affects the beginning of control of the variable motor when using the following control options:

HA1T: increase
HD,HA,HA.U.EP:increase

The factory setting for the begining of control are made at Pabs= 0.2MPa case pressure.

Technical Data

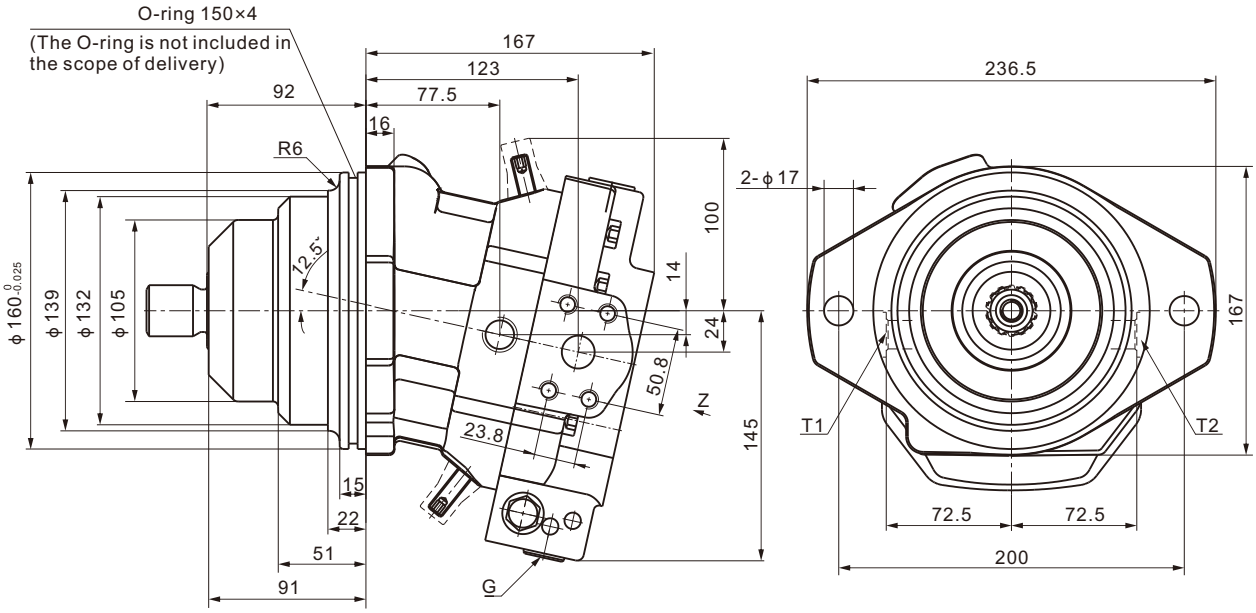
Datasheet (theoretical values)

Size			55	107
Displacement	$V_{g\,max}$	mL/r	54.8	107
	$V_{g\,0}$	mL/r	0	0
Maximum rotational speed (while adhering to the maximum permissible inlet flow)	n_{max} at $V_{g\,max}$	rpm	4450	3550
	n_{max1} at $V_g < V_{g\,max}$	rpm	7000	5600
	n_{max} at $V_{g\,0}$	mL/r	8350	6300
Maximum flow	q_{vmax}	L/min	224	380
Torque	T_{max} at V_{gmax}	Nm	349	681
Rotational stiffness		Nm/^{0}	700	1560
Moment of inertia for rotary group	J	kgm^2	0.0042	0.0127
Case volume	V	L	0.75	1.5
Weight approx.	m.	kg	26	47

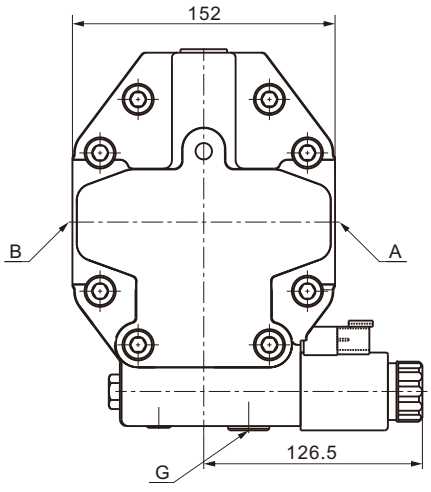
See the HA6VM technical data sheet for additional information
- Allowable displacement and intake pressure for rotational speed
- Allowable radial and axial forces on the drive shaft
- Description and specification of displacement

Installation dimensions Size 55

EZ1,EZ2 two-point control,electric
SAE working ports A and B lateral,opposing

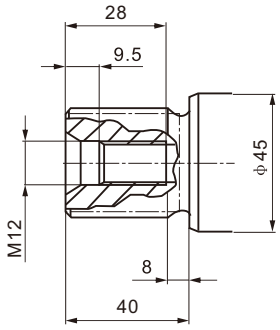


Detail Z

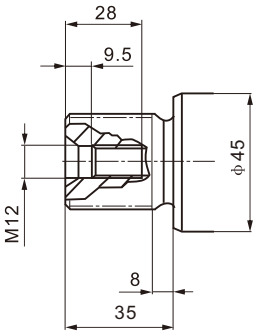


Shaft ends

A Splined shaft DIN5480
W35×2×30×16×9g



Z Splined shaft DIN5480
W30×2×30×14×9g

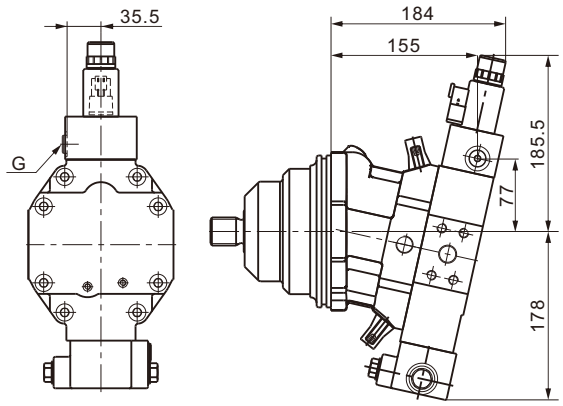


Ports

A,B	Working port	3/4in
	Fastensing thread A/B	M10,17 deep
T_1	Drain port	M18×1.5,12 deep
T_2	Drain port	M18×1.5,12 deep
G	Synchronous control	M14×1.5,12 deep

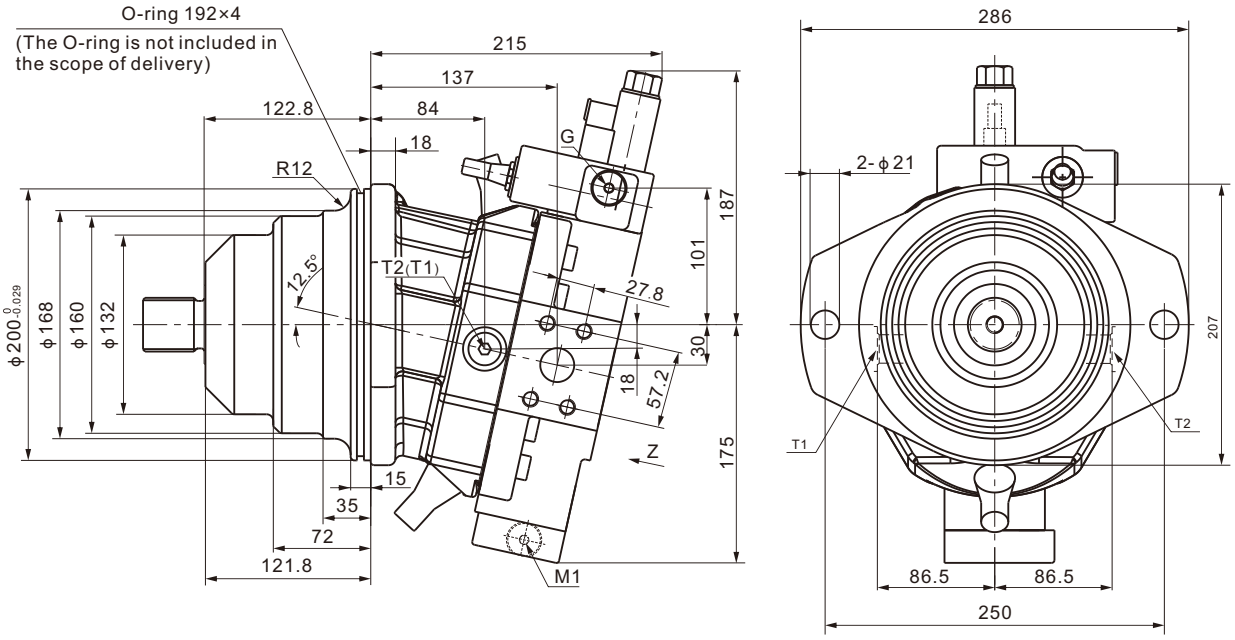
Installation dimensions Size 55

EP1,EP2:Proportional control,electric

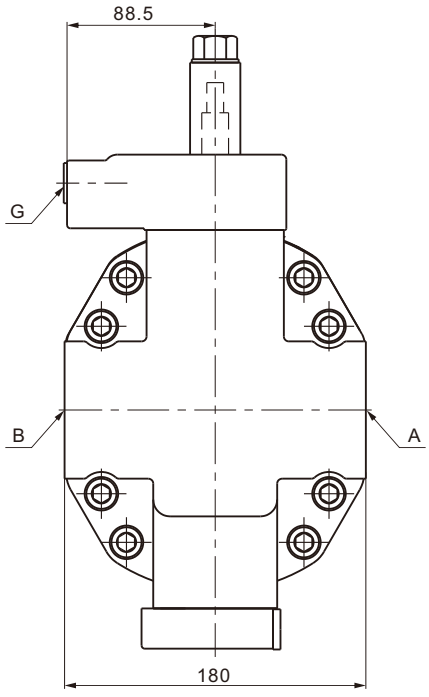


Installation dimensions Size 107

EP1,EP2:Proportional control,electric
SAE working ports A and B lateral,opposing

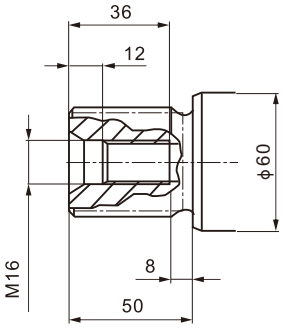


Detail Z

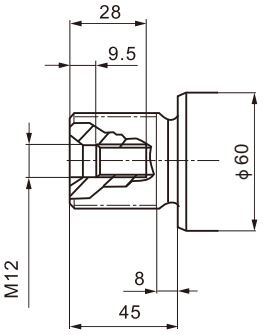


Shaft ends

A Splined shaft DIN5480
W45×2×30×21×9g



Z Splined shaft DIN5480
W40×2×30×18×9g

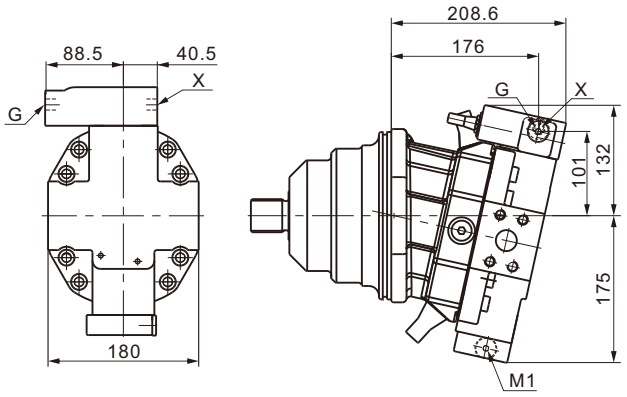


Ports

A,B	Working port	1 in
	Fastensing thread A/B	M10,17 deep
T_1	Drain port	M18×1.5,12 deep
T_2	Drain port	M18×1.5,12 deep
G	Synchronous control	M14×1.5,12 deep
M1	Control pressure measuring port	M14×1.5,12 deep

Installation dimensions Size 107

HD1,HD2:Proportional control,hydraulic

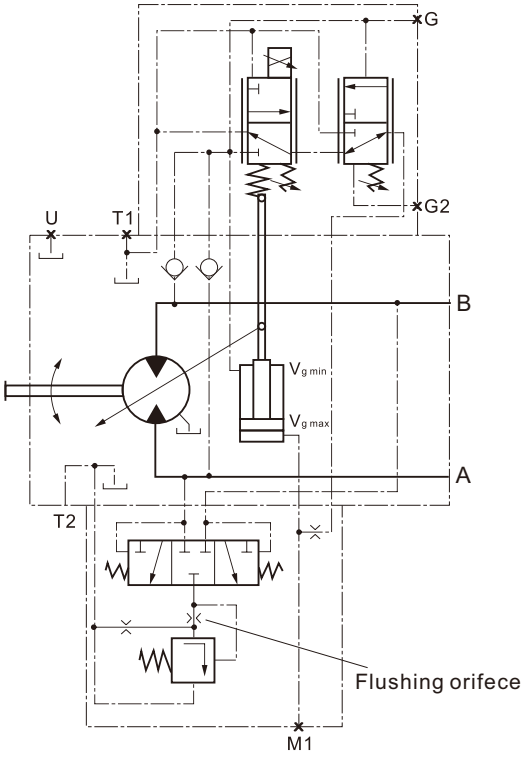


X Pilot pressure port M14×1.5,12 deep

Flushing and boost-presssure valve

The flushing and boost-pressure valve is used to remove heat from the hydraulic circuit.
In a closed circuit,it is used for flushing the case and safeguarding the minimum boost pressure.
Hydraulic fluid is directed from the respective low pressure side into the motor housing.This is the fed into the reservoir,together with the leakage.In the closed circuit, the removed hydraulic fluid must be replaced by cooled hydraulic fluid supplied by the boost pump.
The valve is mounted on the port plate or integrated(depending on the control type and size)

Characteristic curve

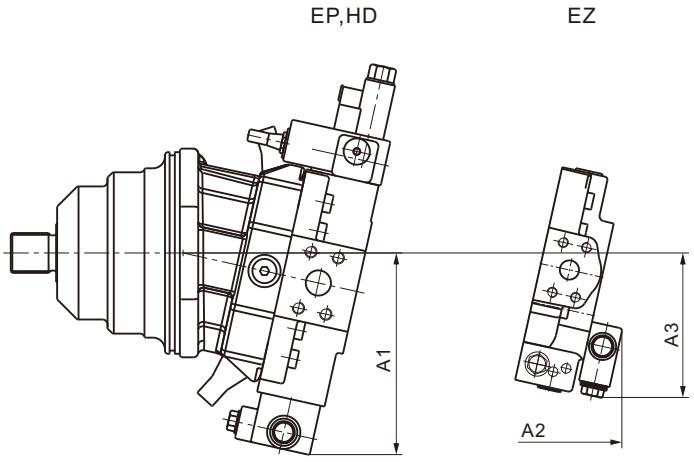


Flushing flow(at low pressure P_{lp}=2.5MPa)

Size	Flow
55	3.5L/min
107	8L/min

The flushing flows deviating from the values in the table,please state the required flushing flow when ordering.
The flushing flow without orifice is approx.12 to 14 L/min.

Installation dimensions



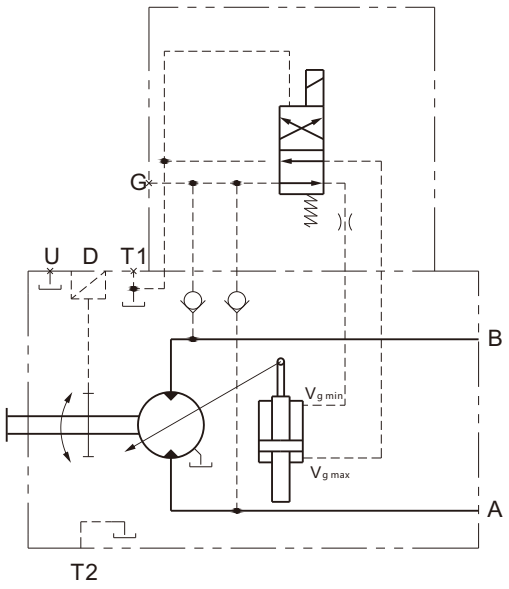
Size	A1	A2	A3
55	176	176	151
107	200	–	–

Speed sensor

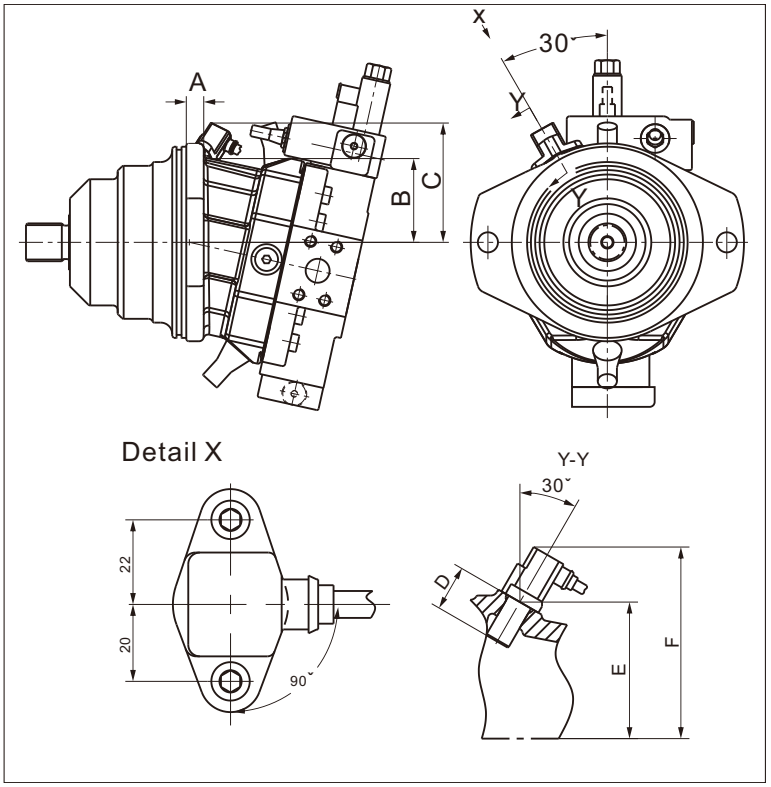
Type F is used for speed measurement

HA6VE... Type F (" for speed measurement ", no sensor) drive shaft with teeth. The toothed drive shaft rotates and generates a signal proportional to the speed. This signal is detected by the sensor and transmitted to the calculation processing part. Type F is suitable for mounting on the HDD Hall speed sensor. The HDD sensor is connected in a flat surface with two locking screws.

Circuit diagram EP



Dimensions



Size	Number of teeth	A	B	C	D	E	F
55	54	25.8	72.2	110.3	32	83.4±0.1	121.7
107	67	14.7	83.1	121.2	32	95.9±0.1	141.7

Installation instructions

General

The axial piston unti must be filled with hydraulic fluid and air bled during commissioning and operation.This must also be observed following a longer standstill as the axial piston unit may empty via the hydraulic lines. Partcularly in the installation position ”drive shaft upwards”,filling and air bleeding must be carried out completely as there is ,for example,a danger of dry running.
The leakage in the housing area must be directed to the reservoir via the highest drain port.

Installation position

See the following examples.Further installation positons are available upon request .

Below-reservoir installation(standard)

Below-reservoir installation means that the axial piston unit is installed outside of the reservoir and below the minimum fluid levle of the reservoir.

Above-reservoir installation

Above-reservoir installation means that the axial piston unit is installed above the minimum fluid level of the reservoir.
A check valve in the reservoir line(cracking pressure 0.05 Mpa) can prevent draining of the housing area.