



Axial Piston Variable Motor HA6VE Series 63

Size: 28-160 mL/r
Rated pressure: 40 MPa
Max. pressure: 45 MPa



Features



- Plug-in piston motor of bent-axis design for hydrostatic drives in open and closed circuits
- The output speed depends on the flow of the pump and the displacement of the motor
- The torque increases with the pressure differential between the high- and low-pressure sides and with increasing displacement
- Easy to install, simple to plug into the reducer
- The displacement can be continuously changed from $V_{g \max}$ to $V_{g \min}=0$
- Various control options

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> Model Code

	c	A	B	E	H		I	K	L		M	N	P	R	V	X	Y	Z
HA6V	E					/	63	W		-			L					-

Axial piston unit

—	Bent-axis design, variable displacement piston motor	HA6V
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Operating mode

c		28	55	80	107	160	
	Motor(Plug-in)	●	●	●	●	●	E

Displacement

A	Geometric displacement, in mL/r	28	55	80	107	160	
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Control device

B			28	55	80	107	160	
	Hydraulic control Pilot-pressure dependent	$\Delta p=1.0\text{MPa}$	●	●	●	●	●	HD1
		$\Delta p=2.5\text{MPa}$	●	●	●	●	●	HD2
	Hydraulic control, two-point		—	●	●	●	●	HZ3
	Electric control With proportional solenoid	U=12V	●	●	●	●	●	EP1
		U=24V	●	●	●	●	●	EP2
	Electric control With switching solenoid	U=12V	—	—	—	—	●	EZ1
		U=24V	—	—	—	—	●	EZ2
		U=12V	—	●	●	●	—	EZ3
		U=24V	—	●	●	●	—	EZ4
	Automatic control High-pressure related	Without pressure increase	●	●	●	●	●	HA1
		With pressure increase, $\Delta p=10\text{MPa}$	●	●	●	●	●	HA2

Pressure control (for HD/EP/EZ¹⁾)

E			28	55	80	107	160	
	Without pressure control (without code)		●	●	●	●	●	
	Pressure control	Fixed control	●	●	●	●	●	D
		Two-point hydraulic override control	○	○	○	○	○	E
Hydraulic remote proportional control		—	—	—	—	—	G	

Override control (only for HA)

H			28	55	80	107	160	
	Without override control (without code)		●	●	●	●	●	
	Hydraulic override control/remote control/proportional control		●	●	●	●	●	T
	Two-point electronic override control	U=12V	○	○	○	○	○	U1
		U=24V	○	○	○	○	○	U2

¹⁾ : No fixed setting of D for sizes 28 to 80.



> Model Code

	c	A	B	E	H		I	K	L		M	N	P	R	V	X	Y	Z
HA6V	E					/	63	W		-			L					-

Series

I		28	55	80	107	160	
	Series 63	●	●	●	●	●	63

Direction of rotation (viewed on drive shaft)

K		28	55	80	107	160	
	Bi-directional	●	●	●	●	●	W

Setting range for displacement

L		28	55	80	107	160	
	V _{g min} =0 to 0.7 V _{g max} (without code)	●	●	●	●	●	
	V _{g min} =0 to 0.4 V _{g max} V _{g max} =V _{g max} to 0.8 V _{g max}	●	●	●	●	●	1
	V _{g min} >0.4 V _{g max} to 0.8 V _{g max} V _{g max} =V _{g max} to 0.8 V _{g max}	●	●	●	●	●	2

Sealing material

M		28	55	80	107	160	
	NBR seal	●	●	●	●	●	P
	FKM seal	●	●	●	●	●	V

Drive shaft

N		28	55	80	107	160	
	Splined shaft DIN 5480	●	●	●	●	●	A
		●	●	●	●	●	Z

Mounting flange

P		28	55	80	107	160	
	2-hole, ISO 3019-2	●	●	●	●	●	L

Working port

R		28	55	80	107	160		
	Working ports A/B at rear SAE flange ports Metric fastening thread		●	●	●	●	●	010
		With flushing and boost-pressure valve	●	●	●	●	●	017
	Working ports A/B at opposite sides SAE flange ports Metric fastening thread		●	●	●	●	●	020
With flushing and boost-pressure valve		●	●	●	●	●	027	



> Model Code

	c	A	B	E	H		I	K	L		M	N	P	R	V	X	Y	Z
HA6V	E					/	63	W		-			L					-

Speed sensor

S		28	55	80	107	160	
	Without speed sensor (without code)	●	●	●	●	●	
	With speed sensor, without connector	●	●	●	●	●	F
	With DT04-4P speed sensor	○	●	●	●	●	F1
	With DT04-M4P speed sensor	○	○	○	○	○	F2
	With DT04-6P speed sensor	○	○	○	○	○	F3

Connector for solenoids(for EP/EZ)

U		28	55	80	107	160	
	Without solenoid connector (without code)	●	●	●	●	●	
	DEUTSCH molded connector, 2-pin, without suppressor diode	●	●	●	●	●	P

Beginning of control

V		28	55	80	107	160	
	At $V_{g \text{ min}}$ (standard for HA)	●	—	●	●	●	A
	At $V_{g \text{ max}}$ (standard for HD, EP, EZ)	●	●	●	●	●	B

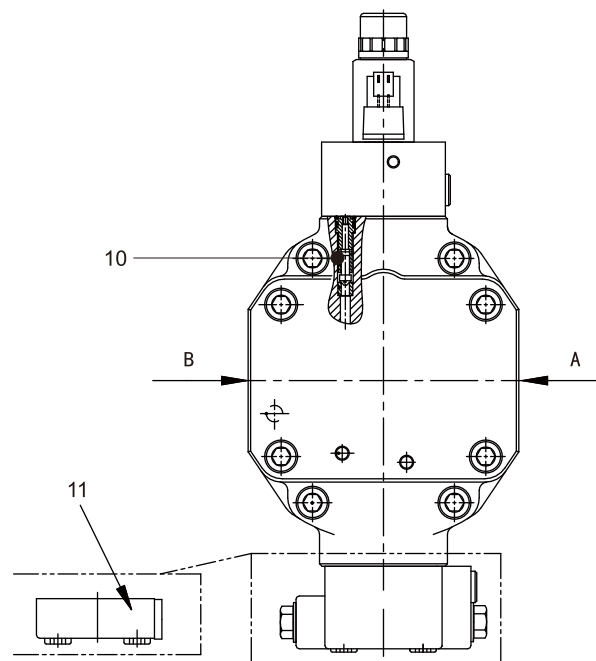
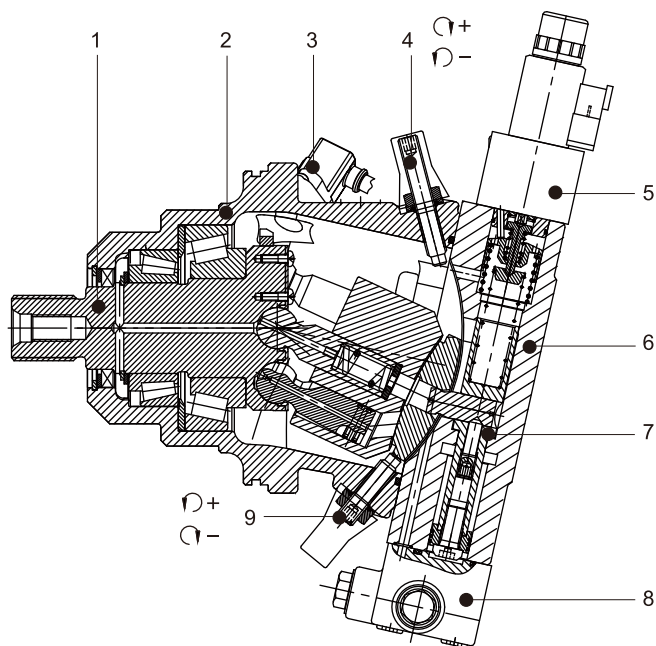
Special configuration

Y		28	55	80	107	160	
	Without special configuration(without code)	●	●	●	●	●	
	Special configuration	○	○	○	○	○	***

● Available ○ On request — Not available ■ Recommended model



> Structure



- 1. Drive Shaft
- 2. Housing
- 3. Speed Sensor
- 4. Min. Displacement Regulating Screw
- 5. Control Valve
- 6. Rear Cap
- 7. Stroking Piston
- 8. Flushing Valve
- 9. Max. Displacement Regulating Screw

- 10. Check Valve Assembly
- 11. End Cap



> Hydraulic Fluid

Mineral oil

> Working Viscosity

In order for the optimum efficiency and service life, it is recommended to select the working viscosity at working temperature within the range below:

$$V_{opt} = \text{optimal working viscosity } 16 \dots 36 \text{ mm}^2/\text{s}$$

It is subject to the circuit temperature of a closed circuit and the reservoir temperature of an open circuit.

> Limit Viscosity

Limit viscosity:

$$V_{min} = 5 \text{ mm}^2/\text{s}$$

Short-term operation ($t < 3 \text{ min}$),

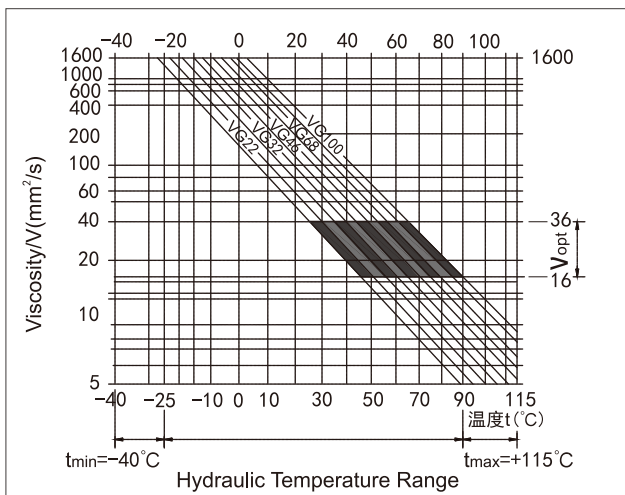
permissible maximum temperature $t_{max} = +115 \text{ }^\circ\text{C}$

$$V_{max} = 1600 \text{ mm}^2/\text{s}$$

Short-term operation ($t < 3 \text{ min}$),

cold start ($p \leq 3 \text{ MPa}$, $n \leq 1000 \text{ rpm}$, $t_{min} = -40 \text{ }^\circ\text{C}$)

> Selection Diagram



> Instructions on Selection of Hydraulic Fluid

The working temperature dependent on the ambient temperature is required for correct selection of hydraulic fluid. It refers to the circuit temperature of a closed circuit and the reservoir temperature of an open circuit.

The hydraulic fluid should be so selected that the working viscosity in the working range is within the optimum range (V_{opt} , the shaded area on the selection diagram). The higher viscosity is recommended in all applications.

For example: At an ambient temperature of $X \text{ }^\circ\text{C}$, the working temperature of the circuit is $60 \text{ }^\circ\text{C}$. The viscosity within the optimum range (V_{opt} , shaded area) is VG46 or VG68 and the latter should be selected.

Note: The case drain temperature depends on the pressure and speed, and it is always higher than the circuit temperature. The temperature at any point within the system should not exceed $+115 \text{ }^\circ\text{C}$.

If the above condition cannot be maintained due to extreme working conditions, it is recommended to flush the housing via port U or through the flushing and boost-pressure valve.

> Filtration

Finer filtration improves the cleanliness level of the hydraulic fluid, thus increasing the service life of the axial piston unit. To ensure normal operation of the axial piston unit, a cleanliness level of at least 20/18/15 according to ISO 4406 is to be maintained.

When the hydraulic fluid has a high temperature ($90 \text{ }^\circ\text{C}$ to $115 \text{ }^\circ\text{C}$), the cleanliness level should at least reach 19/17/14 according to ISO 4406. Please contact us if the above cleanliness level cannot be reached.

> Working Pressure Range

Max. pressure at port A or B

Nominal pressure P_N _____ 40MPa

Maximum pressure P_{max} _____ 45MPa

Total pressure(A+B) P_{max} _____ 70MPa

Note:

For Z type drive shaft, the permissible nominal pressure P_N is 31.5 MPa if there is radial load (gear and V-belt) on the drive shaft of the drive unit.

> Flow Direction

Direction of rotation, viewed on drive shaft

CW	CCW
A to B	B to A

No limit to minimum speed n_{min} .

If uniformity of motion is required, n_{min} must not be less than 50 rpm.

> Shaft Seal

Permissible pressure load

The service life of the shaft seal depends on the motor speed and case drain pressure. It is recommended that the average lasting case drain pressure at working temperature is no greater than 0.3MPa absolute pressure (as the speed falls, the maximum permissible case drain pressure is 0.6MPa) and the short-term ($t < 0.1 \text{ s}$) permissible absolute pressure peak may reach 1MPa. The service life of the shaft seal decreases with increasing frequency of pressure peaks.

The case pressure must be equal to or greater than the external pressure at the shaft seal.

> Temperature Range

The FKM shaft seal may be used for case temperatures from $-25 \text{ }^\circ\text{C}$ to $+115 \text{ }^\circ\text{C}$.

In applications below $-25 \text{ }^\circ\text{C}$, an NBR shaft seal is required (permissible temperature range: $-40 \text{ }^\circ\text{C}$ to $+90 \text{ }^\circ\text{C}$).

> Effect of Case Pressure on Beginning of Control

An increase in case pressure affects the following control options at the beginning of control:

HD/EP _____ increase
The factory settings for the beginning of control are made at $P_{abs} = 0.2 \text{ MPa}$.



► Technical Data

Size	Unit		28	55	80	107	160	
Displacement	$V_{g \max}$	mL/r	28.1	54.8	80	107	160	
	V_{g0}	mL/r	0	0	0	0	0	
Maximum speed	In compliance with maximum permissible flow	n_{\max} at $V_{g \max}$	rpm	5500	4450	3900	3550	3100
		$n_{\max1}$ at $V_g < V_{g \max}$	rpm	8750	7000	6150	5600	4900
		n_{\min} at V_{g0}	rpm	10450	8350	7350	6300	5500
Max. flow	$q_{v \max}$	L/min	156	224	312	380	496	
Max. torque	T_{\max} at $V_{g \max}$	Nm	179	349	509	681	1019	
Rotary stiffness		Nm/rad	360	700	1150	1560	2320	
Moment of inertia of drive shaft	J	kgm ²	0.0014	0.0042	0.0080	0.0127	0.0253	
Case volume	V	L	0.5	0.75	1.2	1.5	2.4	
Weight	m	kg	16	26	34	47	64	

For more information, see HA6VM technical data.

- permissible displacement and inlet pressure depending on the rotational speed
- permissible radial and axial loading on the drive shaft

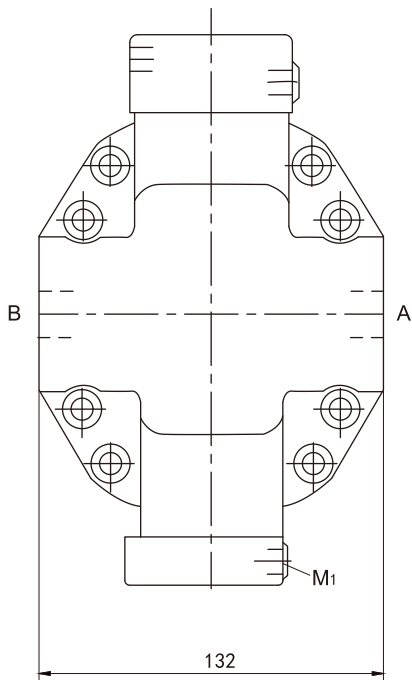
► Specification Calculation

Input flow	$q_v = \frac{V_g \cdot n}{1000 \cdot \eta_v}$	[L/min]	V_g = Displacement, mL/r
Torque	$T = \frac{V_g \cdot \Delta p \cdot \eta_{mh}}{2 \cdot \pi}$	[Nm]	Δp = Differential pressure, MPa n = Speed, rpm
Power	$P = \frac{2\pi \cdot T \cdot n}{60000} = \frac{q_v \cdot \Delta p \cdot \eta_t}{60}$	[KW]	η_v = Volumetric efficiency η_{mh} = Mechanical-hydraulic efficiency
Speed	$n = \frac{q_v \cdot 1000 \cdot \eta_v}{V_g}$	[rpm]	η_t = Total efficiency

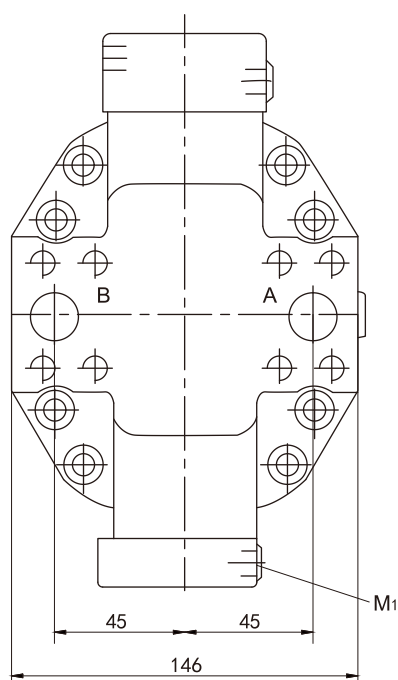


► Installation Dimensions

Z-direction



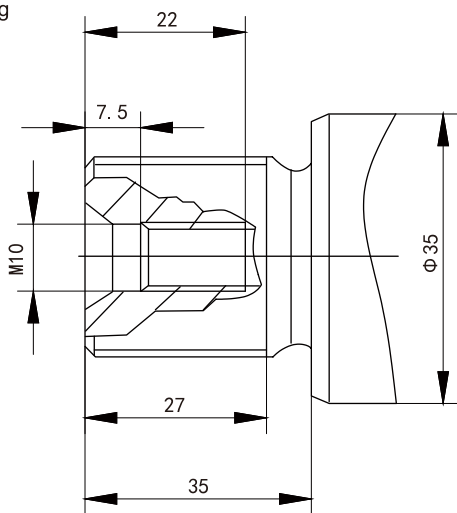
SAE flange ports A/B at side, opposite(02)



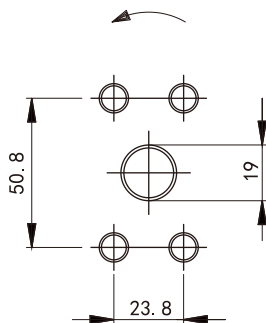
SAE flange ports A/B at rear, opposite(01)

Drive shaft

Splined shaft A DIN 5480
W30x2x30x14x9g



Working ports (Detail Y)

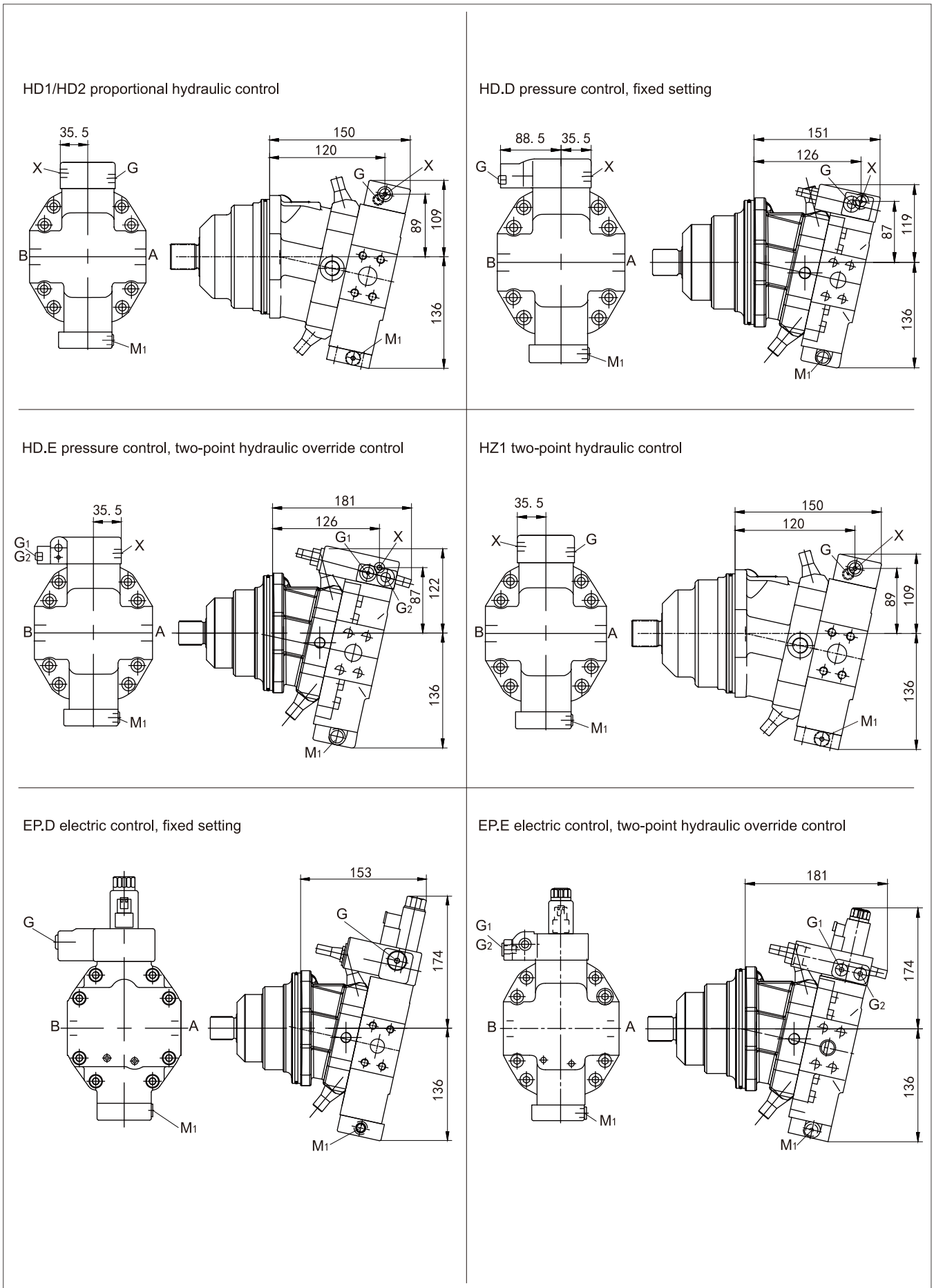


Ports

A/B	Working port	3/4 in
	Fastening thread A/B	M10x1.5, 17deep
T1	Case drain port	M18x1.5, 12deep
T2	Case drain port	M18x1.5, 12deep



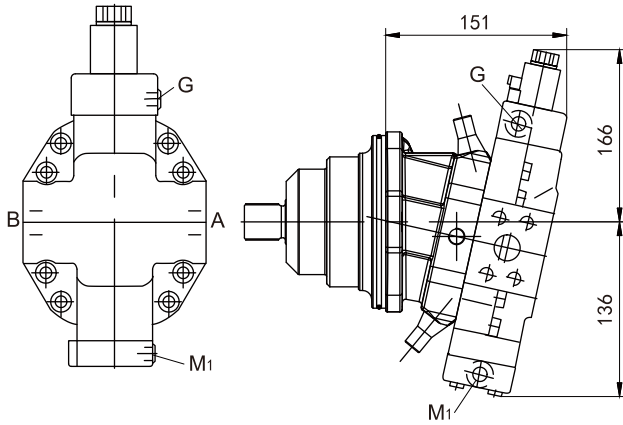
► Installation Dimensions



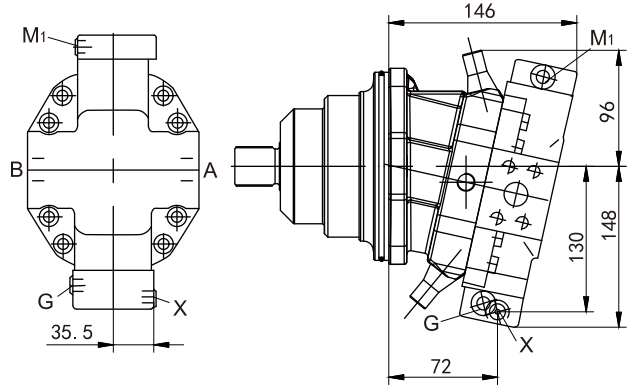


► Installation Dimensions

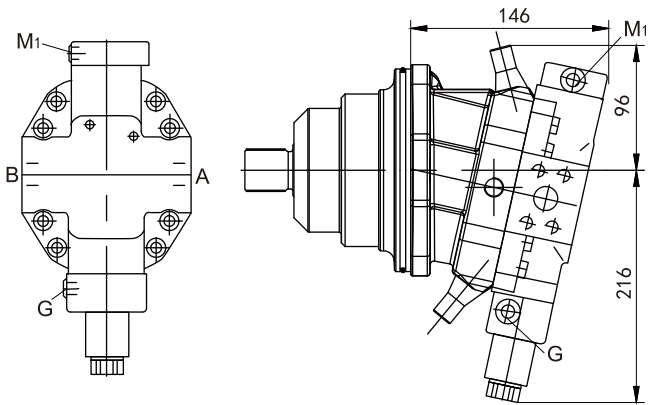
EZ1/EZ2 electric control, with switching solenoid



HA1/HA2, HA1T/HA2T automatic control
High-pressure related,
with hydraulic override control, remote control and proportional control



HA1U1/HA2U2 automatic control
High-pressure related,
with two-point electronic override control

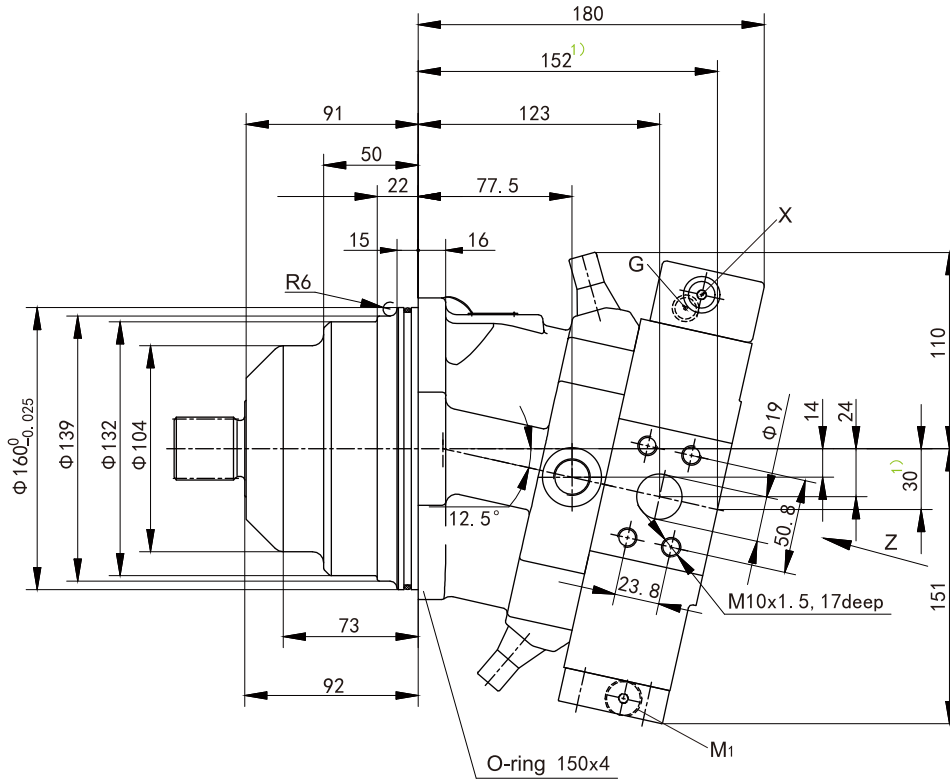




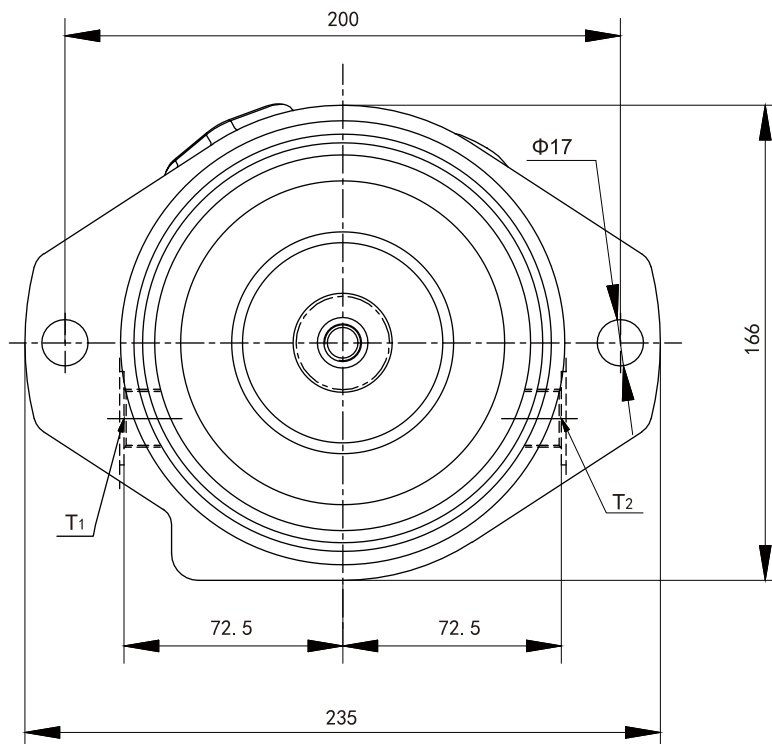
Installation Dimensions

Size 55

HD1/HD2 proportional hydraulic control
SAE flange ports A/B at side, opposite(02)



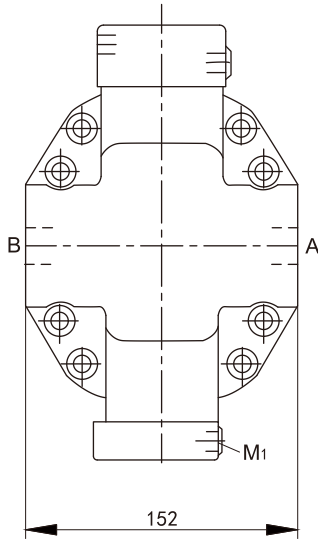
1) : Working ports A/B at rear (port plate 01)



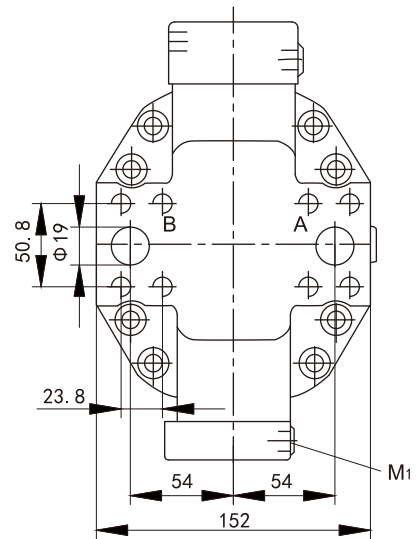


► Installation Dimensions

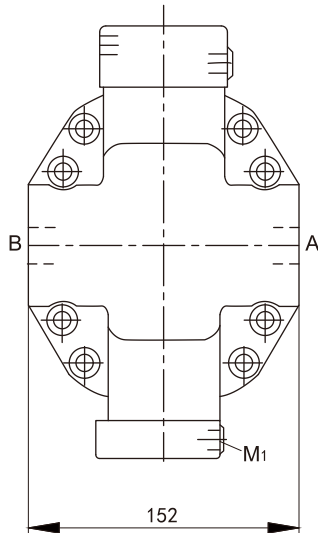
Z-direction



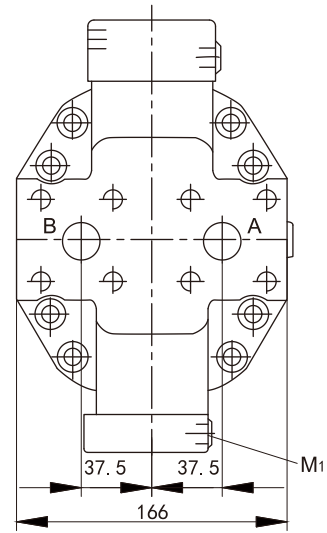
SAE flange ports A/B at side, opposite (02)



SAE flange ports A and B at rear, opposite(01)



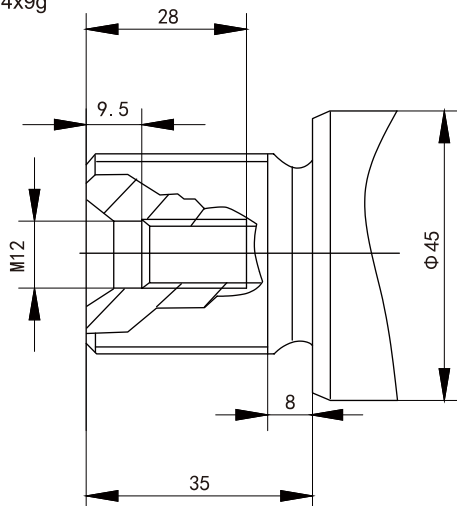
SAE flange ports A, B at side, opposite (02)
only for HZ3/EZ3/EZ4



SAE flange ports A/B at rear, opposite (01)
only for HZ3/EZ3/EZ4

Drive shaft

Splined shaft Z DIN 5480
W30x2x30x14x9g

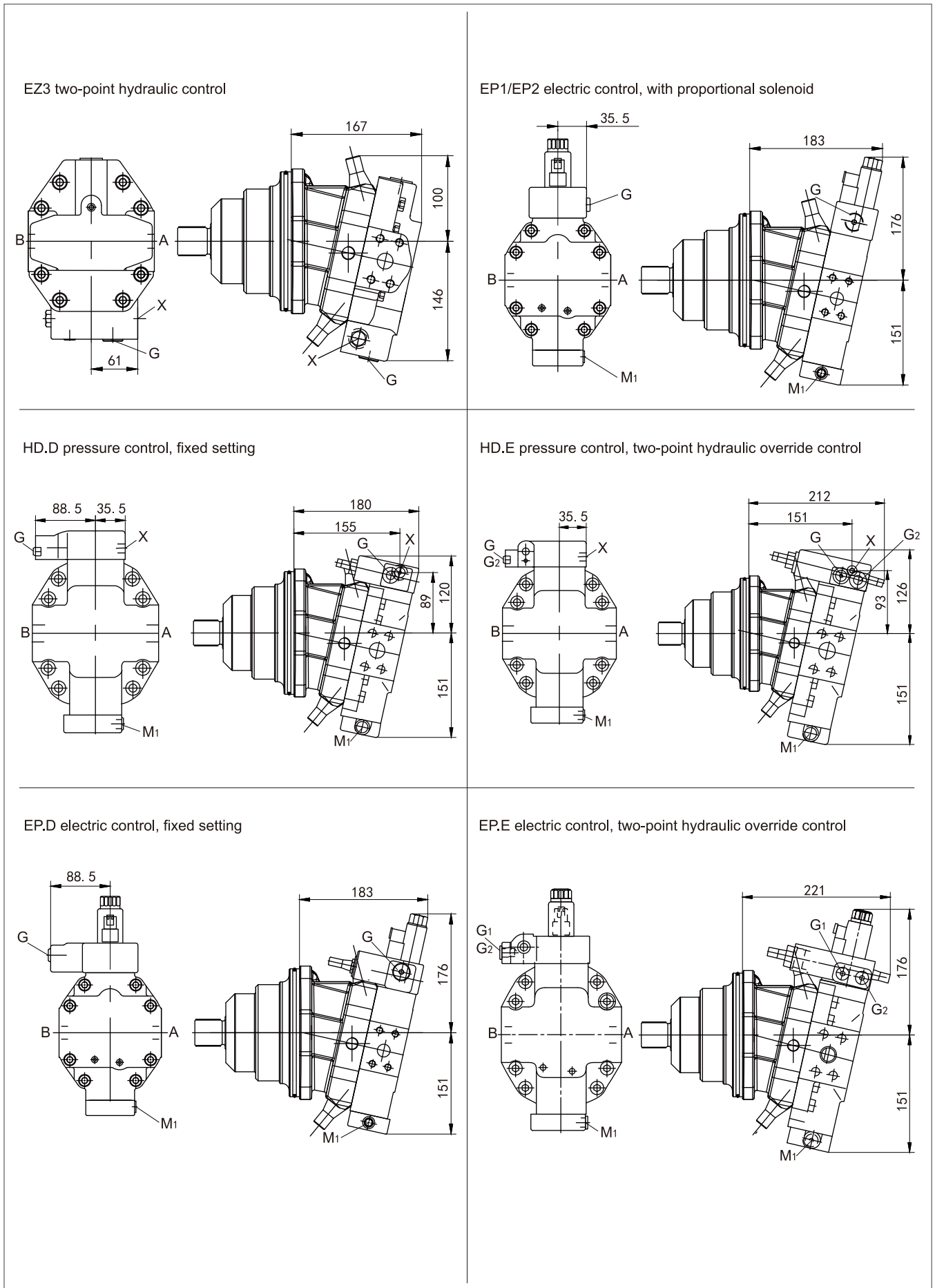


Ports

A/B	Working port (high pressure series)	3/4 in
T1	Case drain port	M18x1.5, 12deep
T2	Case drain port	M18x1.5, 12deep

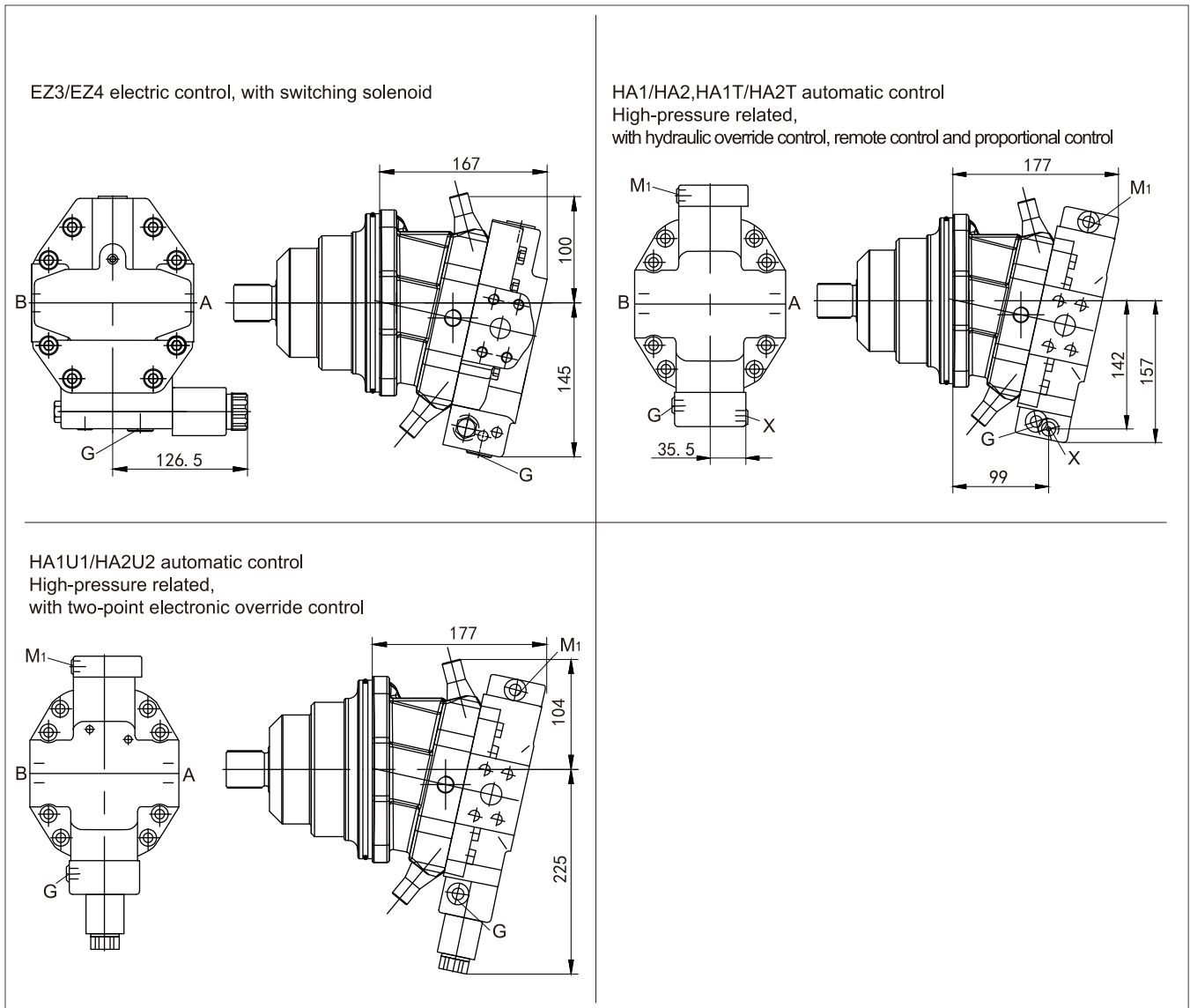


► Installation Dimensions





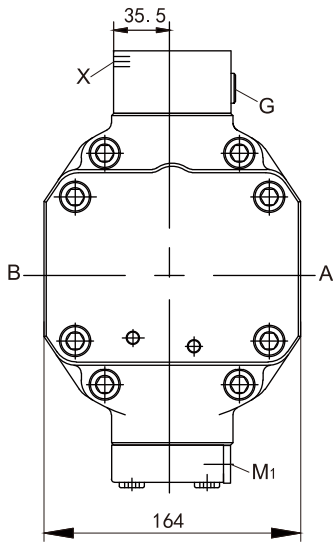
► Installation Dimensions



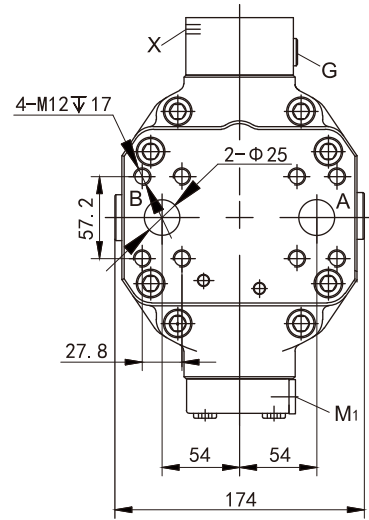


► Installation Dimensions

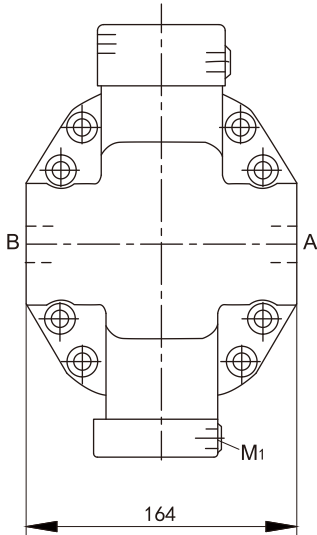
Z-direction



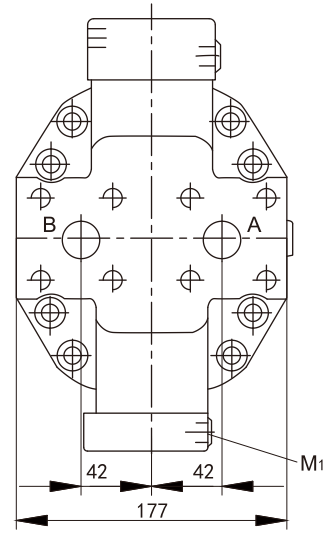
SAE flange ports A/B at side, opposite(02)



SAE flange ports A/B at rear, opposite(01)



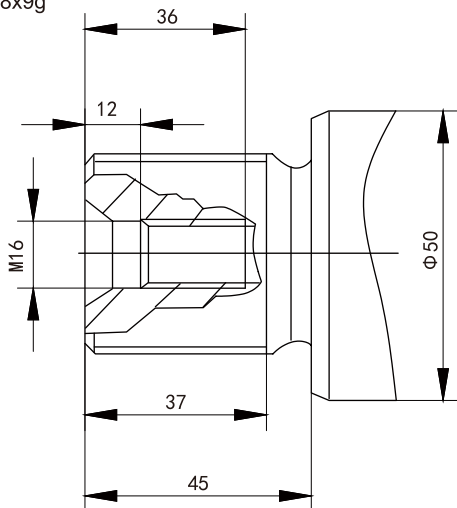
SAE flange ports A/B at side, opposite (02)
only for HZ3/EZ3/EZ4



SAE flange ports A/B at rear, opposite (01)
only for HZ3/EZ3/EZ4

Drive shaft

Splined shaft A DIN 5480
W40x2x30x18x9g



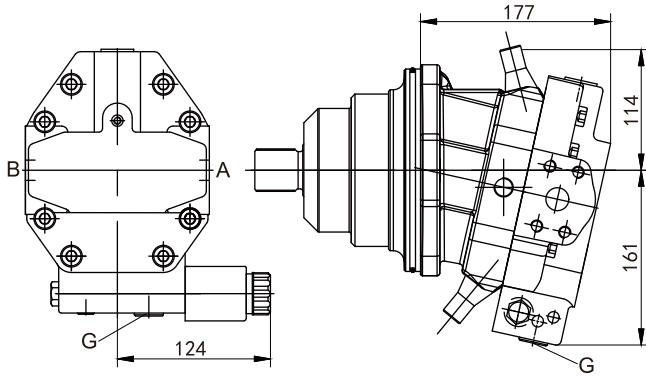
Ports

A/B	Working port (high pressure series)	1 in
T1	Case drain port	M18x1.5, 12deep
T2	Case drain port	M18x1.5, 12deep

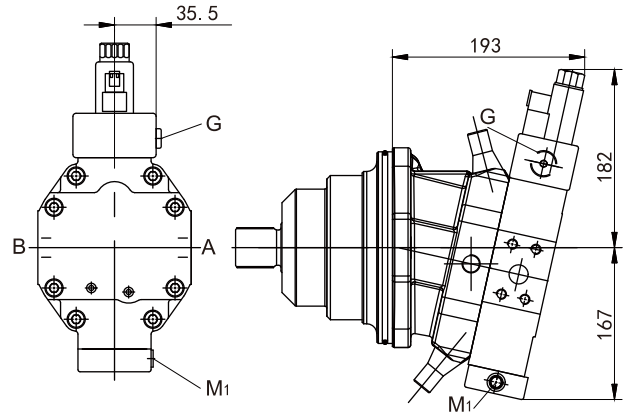


► Installation Dimensions

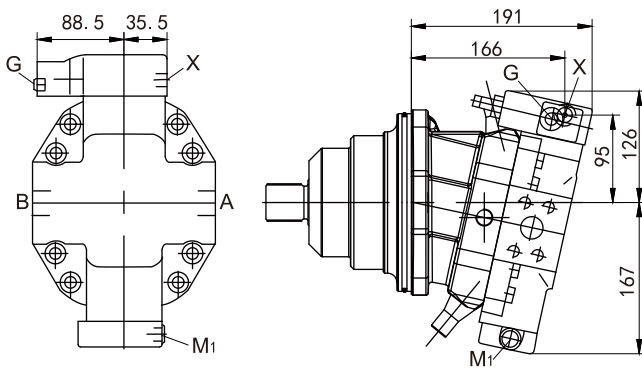
EZ3/EZ4 electric control, with switching solenoid



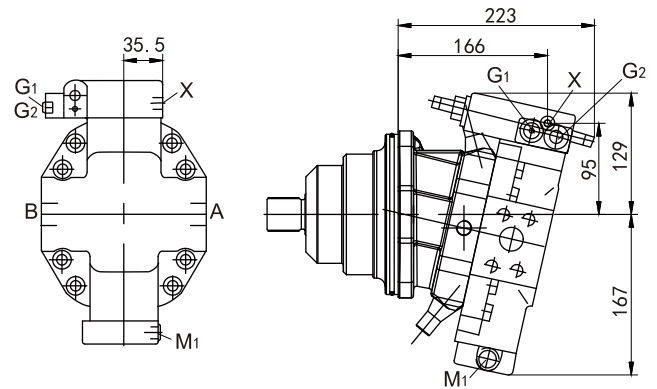
EP1/EP2 electric control, with proportional solenoid



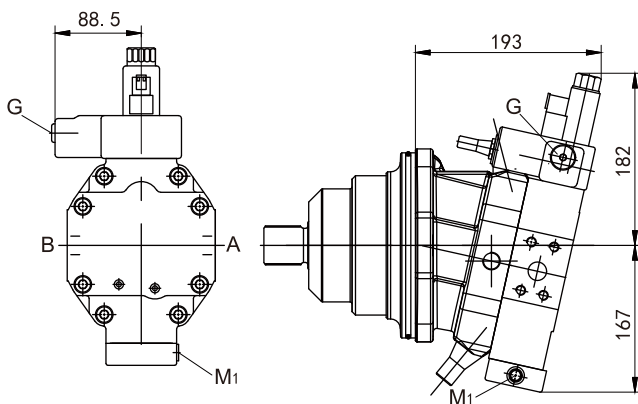
HD.D pressure control, fixed setting



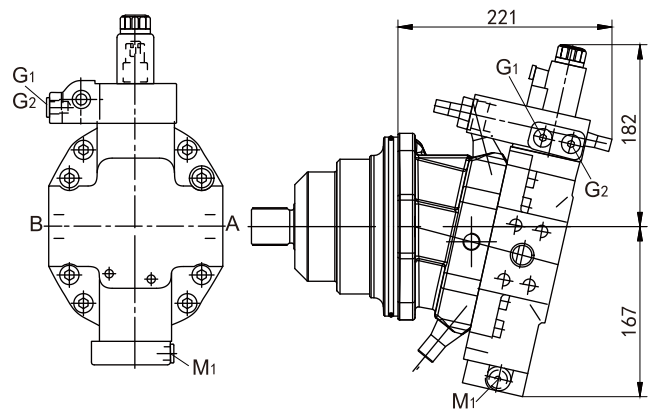
HD.E pressure control, two-point hydraulic override control



EP.D electric control, fixed setting

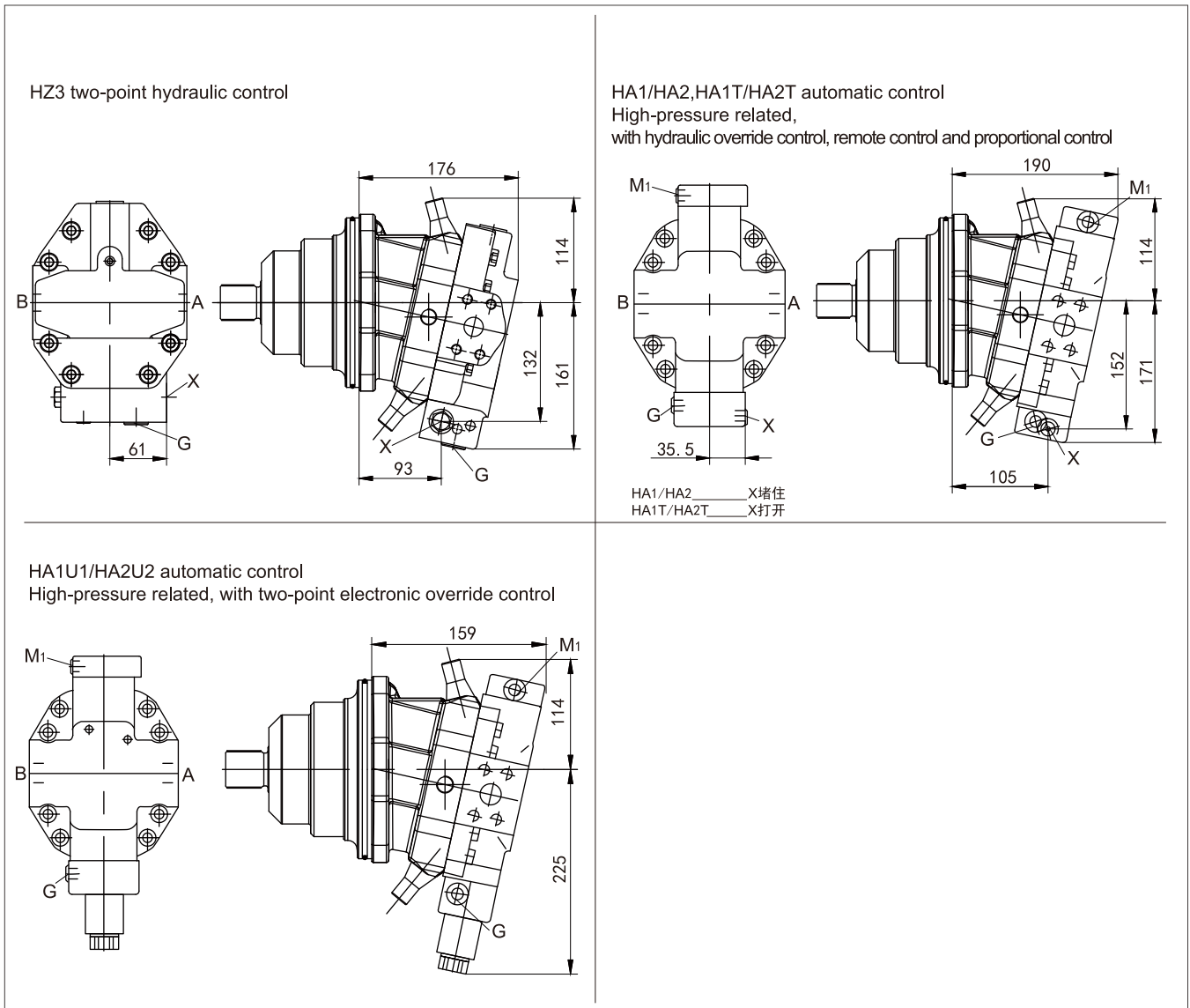


EP.E electric control, two-point hydraulic override control





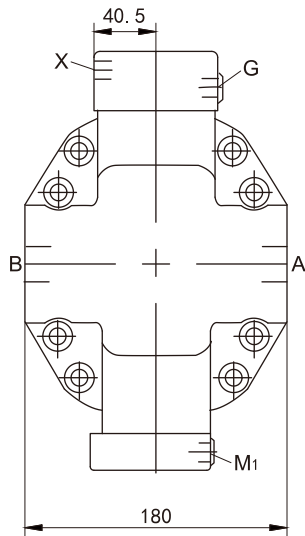
► Installation Dimensions



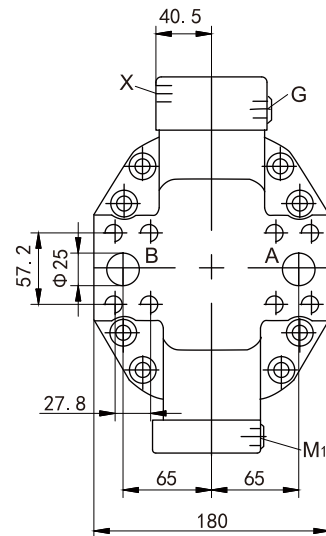


► Installation Dimensions

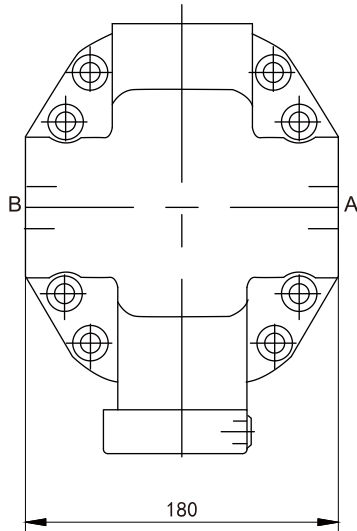
Z-direction



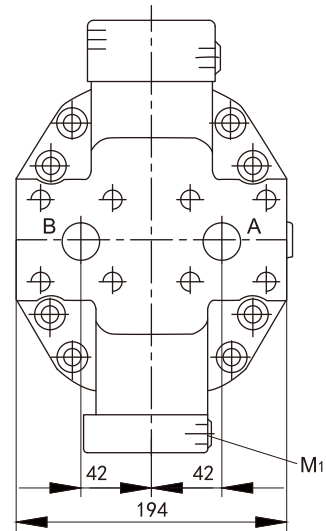
SAE flange ports A/B at side, opposite(02)



SAE flange ports A/B at rear, opposite(01)



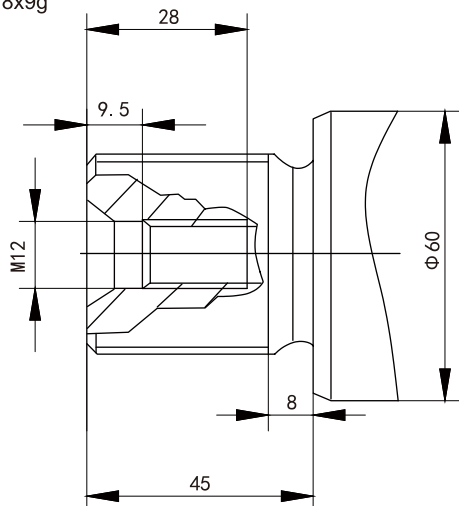
SAE flange ports A/B at side, opposite (02)
only for HZ3/EZ3/EZ4



SAE flange ports A/B at rear, opposite (01)
only for HZ3/EZ3/EZ4

Drive shaft

Splined shaft Z DIN 5480
W40x2x30x18x9g

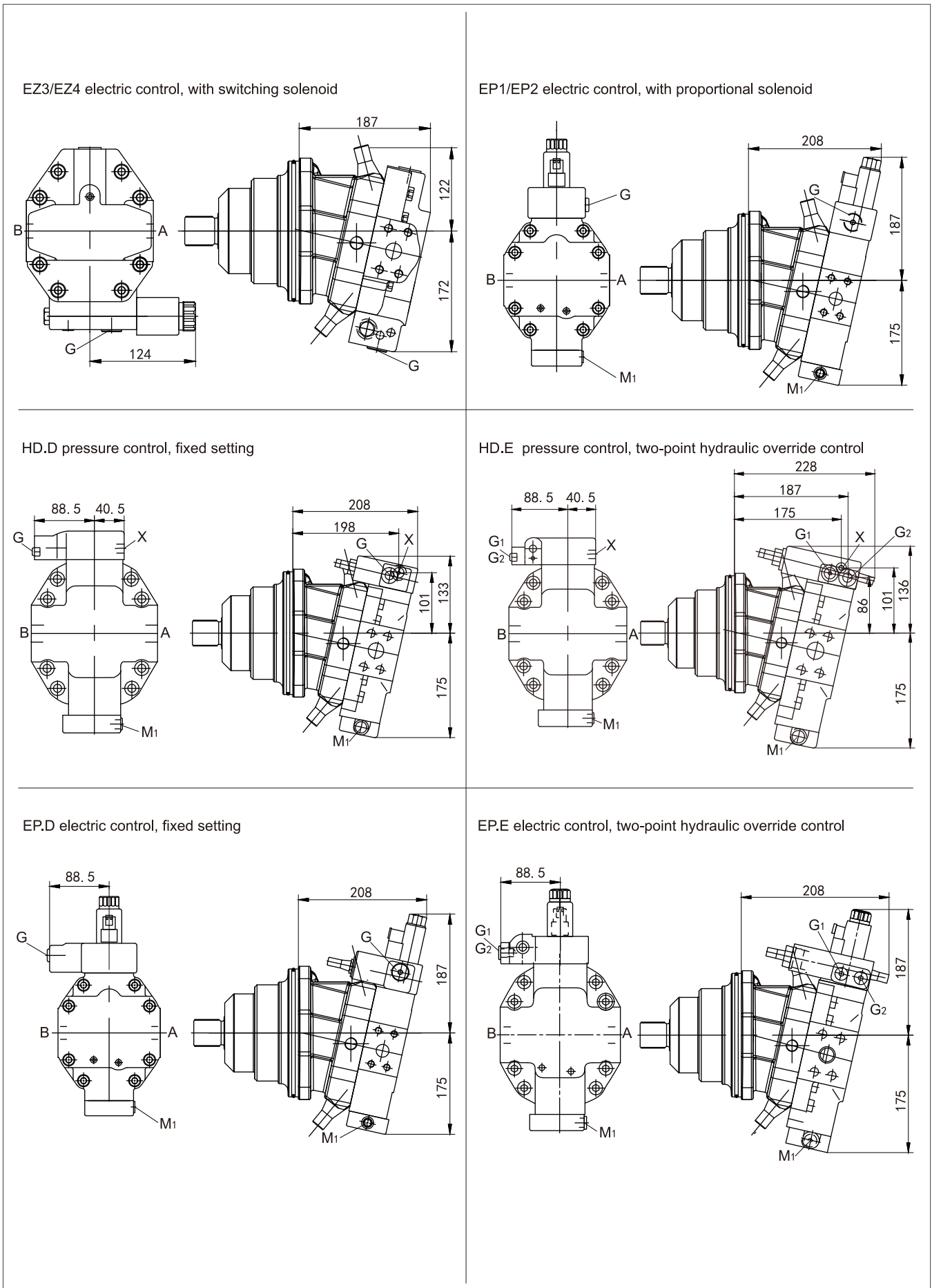


Ports

A/B	Working port (high pressure series)	1 in
T1	Case drain port	M18x1.5, 12deep
T2	Case drain port	M18x1.5, 12deep

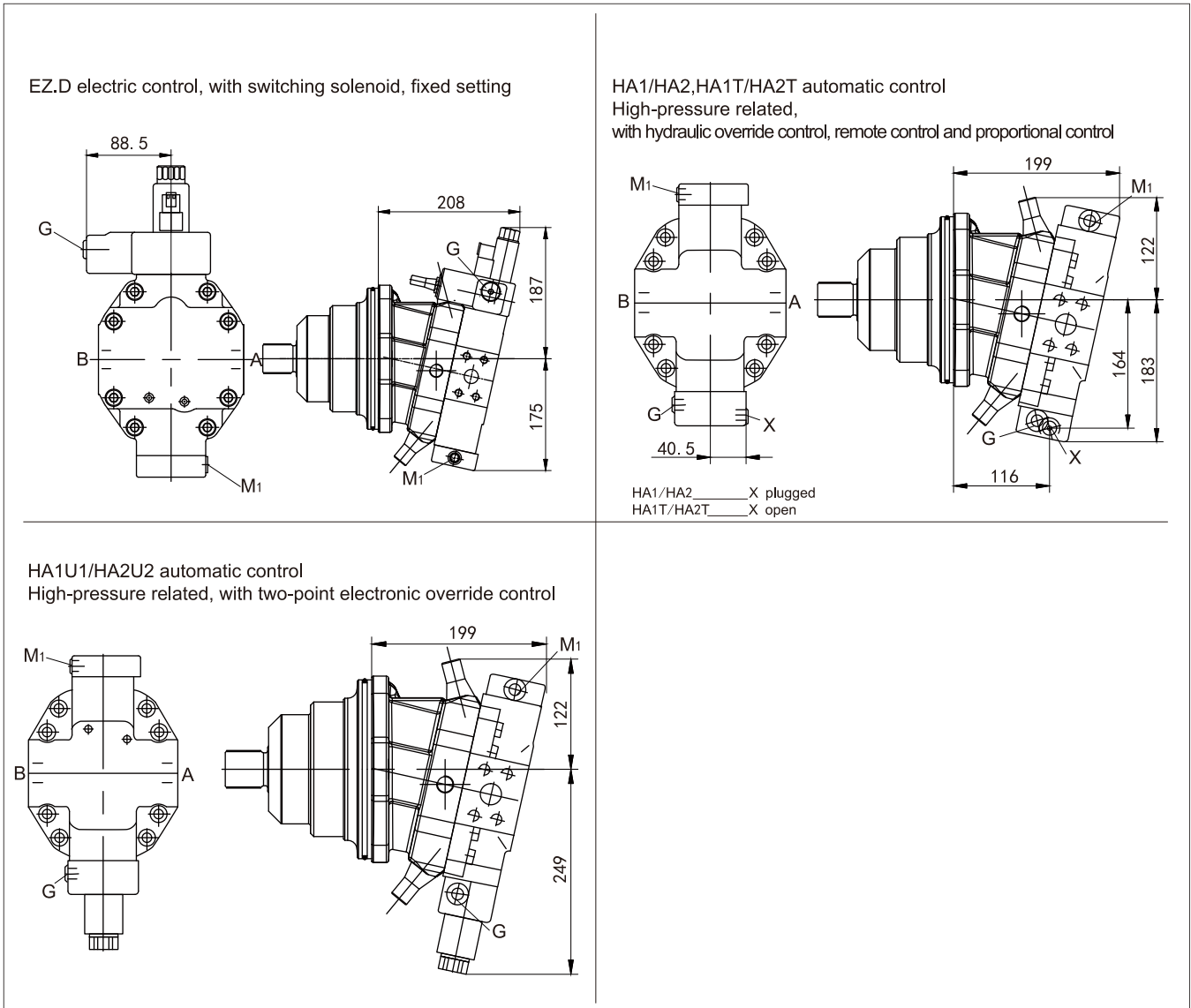


► Installation Dimensions





► Installation Dimensions

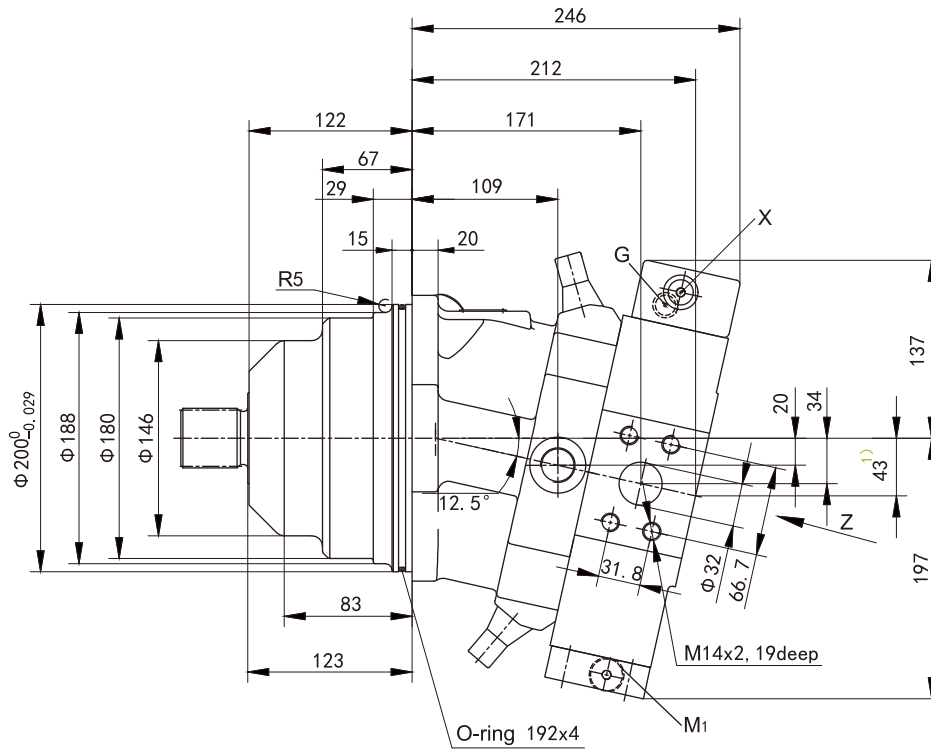




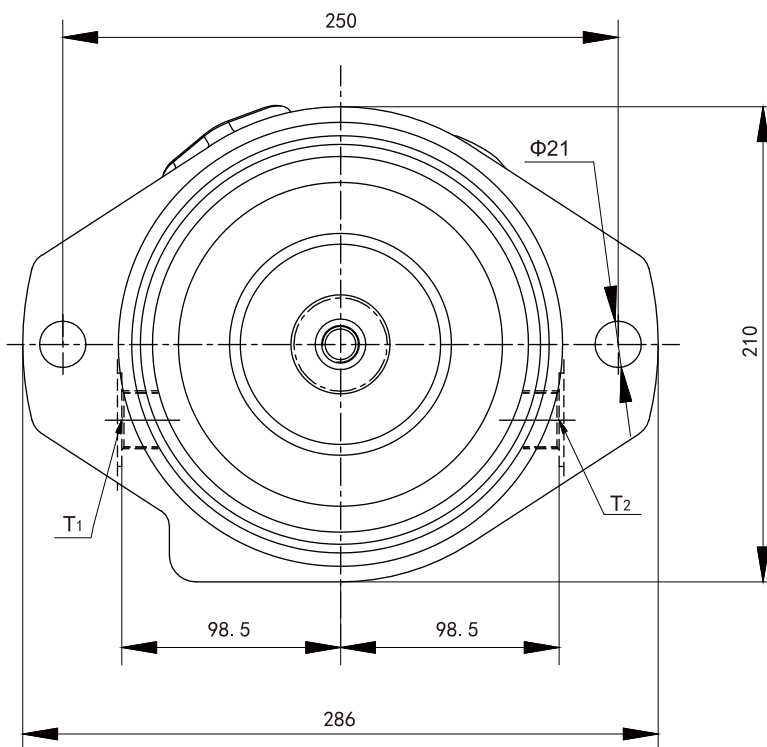
Installation Dimensions

Size 160

HD1/HD2 proportional hydraulic control
SAE flange ports A/B at side, opposite(02)



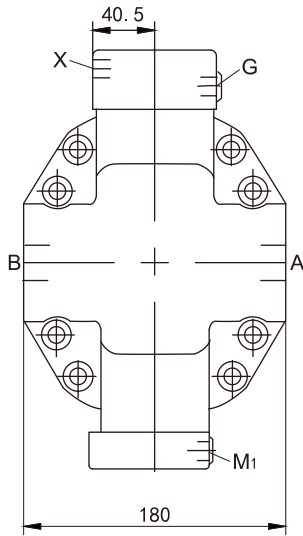
1) : Working ports A/B at rear (port plate 01)



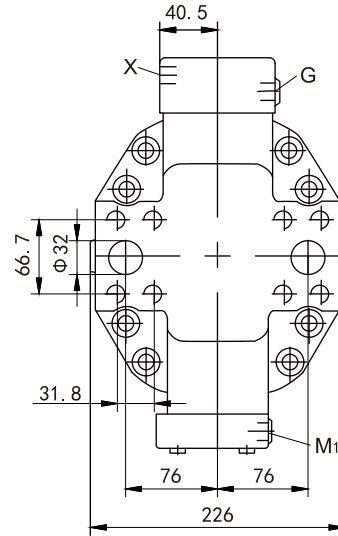


► Installation Dimensions

Z-direction



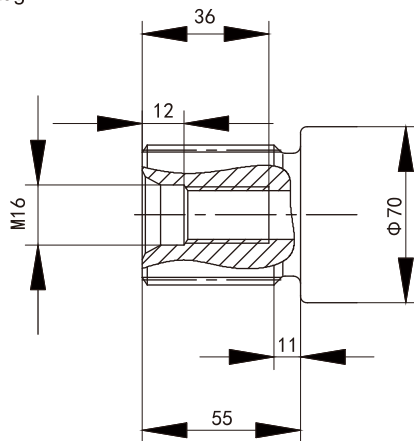
SAE flange ports A/B at side, opposite(02)



SAE flange ports A/B at rear, opposite(01)

Drive shaft

Splined shaft A DIN 5480
W50x2x30x24x9g



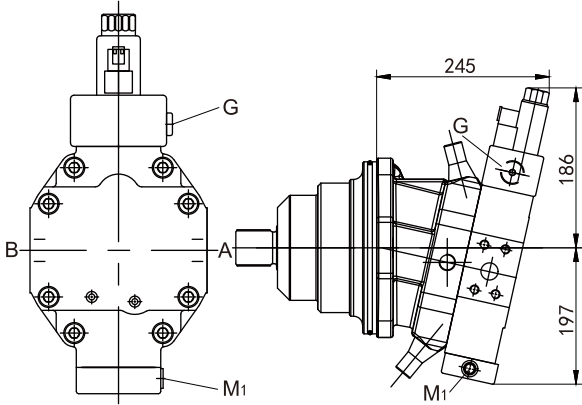
Ports

A/B	Working port (high pressure series)	1 1/4 in
T1	Case drain port	M26x1.5, 16deep
T2	Case drain port	M26x1.5, 16deep

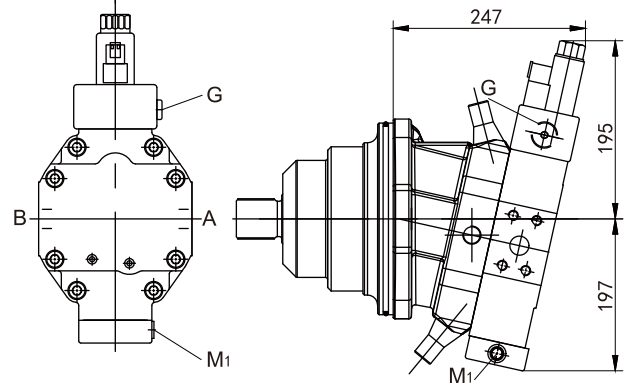


Installation Dimensions

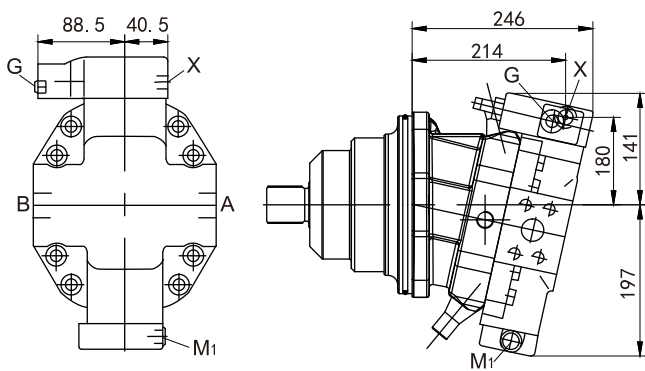
EZ1/EZ2 electric control, with switching solenoid



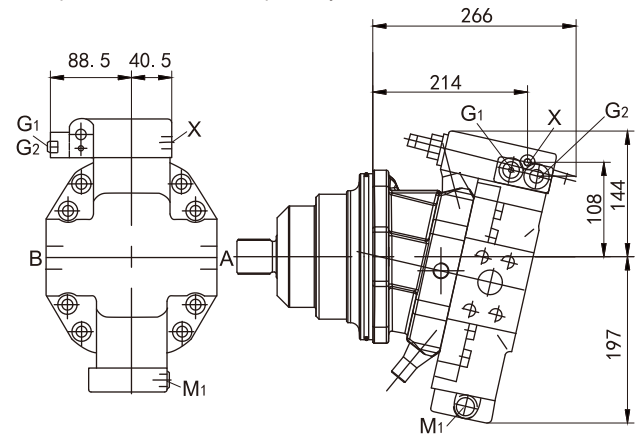
EP1/EP2 electric control, with proportional solenoid



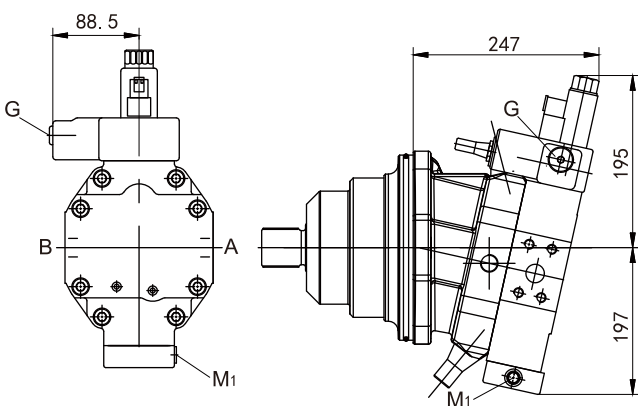
HD.D pressure control, fixed setting



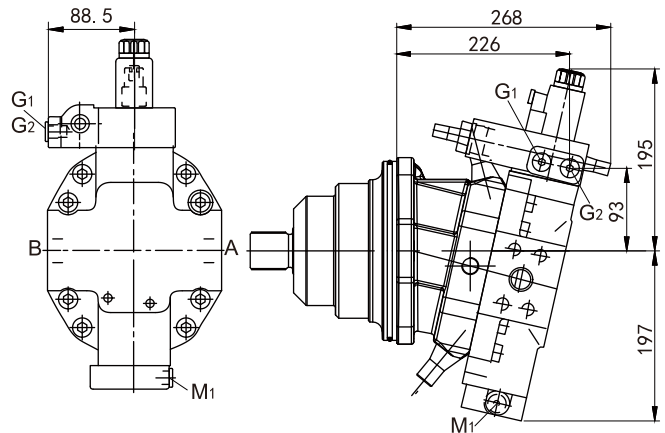
HD.E pressure control, two-point hydraulic override control



EP.D electric control, fixed setting

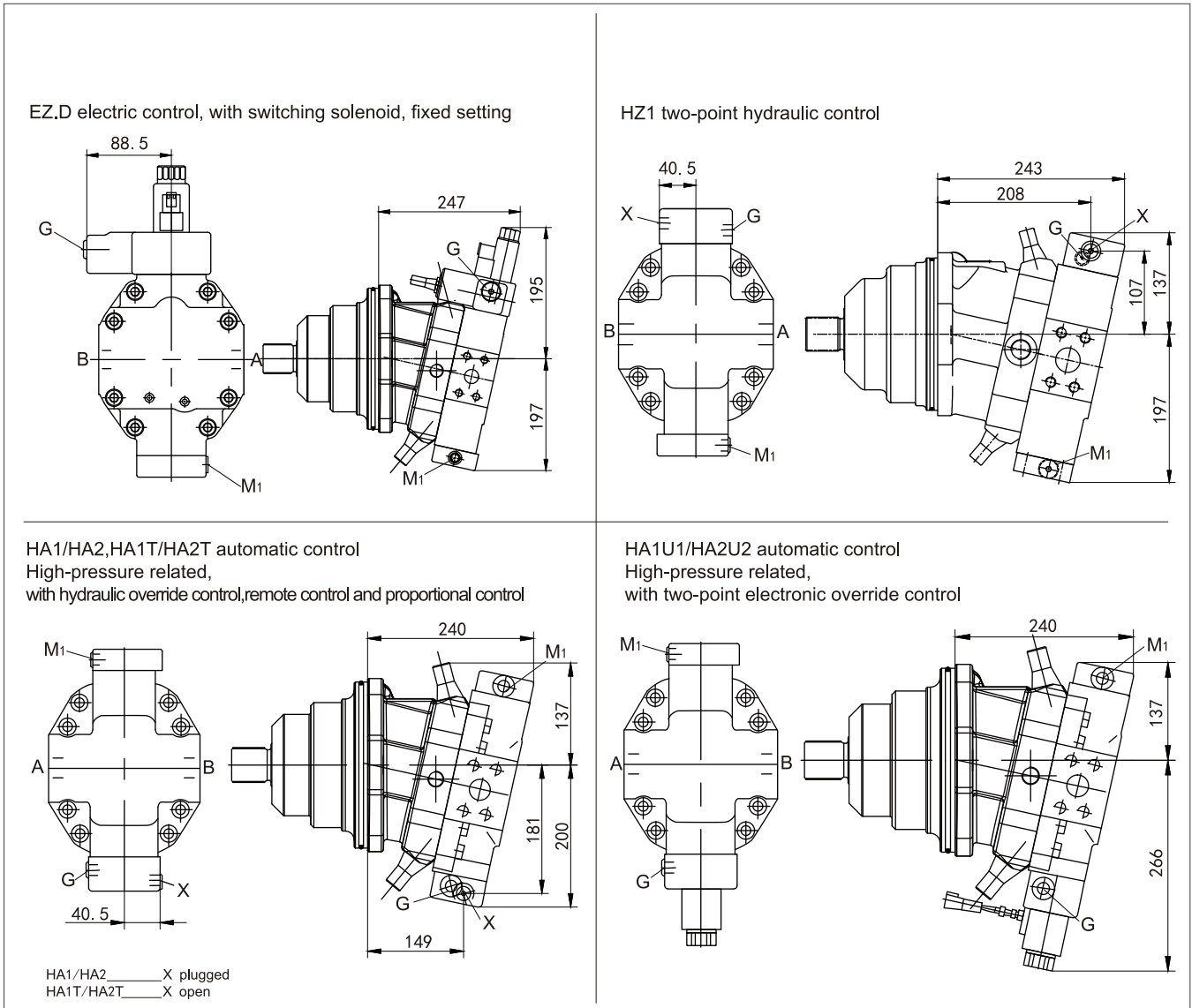


EP.E electric control, two-point hydraulic override control





> Installation Dimensions





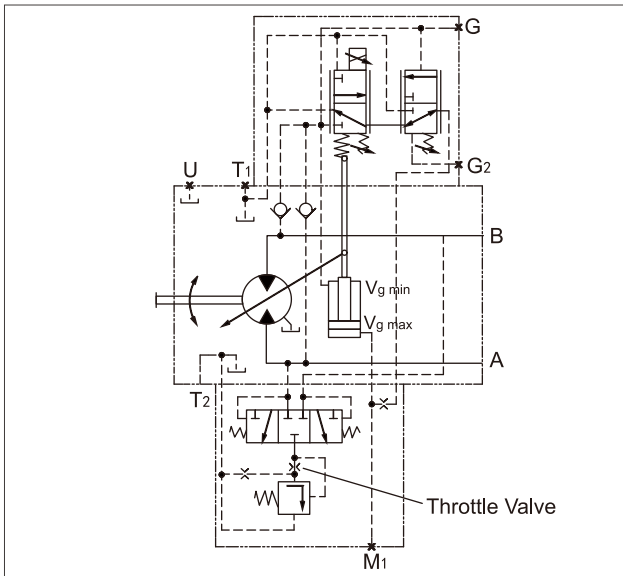
Flushing and Boost-pressure Valve

The flushing and boost-pressure valve is used to prevent over-temperature of the closed circuit and to guarantee the minimum boost pressure of the system. (Cracking pressure: 1.6 MPa; fixed setting: note the setting of primary pressure.) It is also used to flush the housing.

Hydraulic fluid is directed from the low-pressure side into the motor housing. Then, it is fed into the reservoir together with the case drain. The removed hydraulic fluid from the closed circuit must be replaced by cooled hydraulic fluid supplied by the boost pump.

In an open circuit, the flushing and boost-pressure valve is used only to flush the housing through the return line. The valve is mounted on the variable motor (or integrated in the control unit depending on the control type and size). If necessary, a throttle valve may be used to regulate the flow.

Circuit diagram



Standard Flow

At low pressure $\Delta p_{LP}=2.5$ MPa

Size	Flow
28	3.5L/min
55	3.5L/min
80	5L/min
107	8L/min
160	10L/min

Throttle valves with flow of 3.5 to 10L/min are available.

If throttle valves of nonstandard flow are required, please specify in detail when ordering.

The flow without throttle valve is approx.

12 to 14L at low pressure $\Delta p_{LP} = 2.5$ MPa.

Installation Dimensions

Size	A1	A2	A3	A4
28	152	125	161	-
55	182	133	176	176
80	194	141	192	176
107	204	143	192	186
160	245	154	220	-



➤ Counterbalance Valves BVD and BVE

Function

Counterbalance valves for travel drives/winches are designed to reduce the danger of overspeed and cavitation of axial piston motors in open circuits. Cavitation occurs if, during braking, when going downhill or during the load-lowering process, the motor speed is greater than that at the given inlet flow.

If the inlet pressure falls, the counterbalance spool moves to throttle the return flow and brake the motor until the inlet pressure returns to approx 2 MPa.

Note

- BVD available for sizes 55 to 160
- The counterbalance valve must be ordered separately. We recommend ordering the counterbalance valve and the motor as a set.

Order example:

HA6VE160HZ3/63W-VAL388FB-0700

HBVD25W38L/41B-V07K00D0600S00A piston motor

- For safety reasons, controls (e.g. HA) with beginning of control at V_{gmin} are not permissible for lifting winch drives
- Counterbalance valves cannot replace the mechanical service brake and holding brake
- For the design of the brake release device, we must know the following data for the mechanical holding brake:
 - the cracking pressure
 - the volume of the counterbalance spool between the minimum stroke (brake closed) and maximum stroke (brake released)
 - the required closing time for warming up (oil viscosity approx. 15 mm²/s)

Applications

Counterbalance valve for travel drives BVD...F

Application option

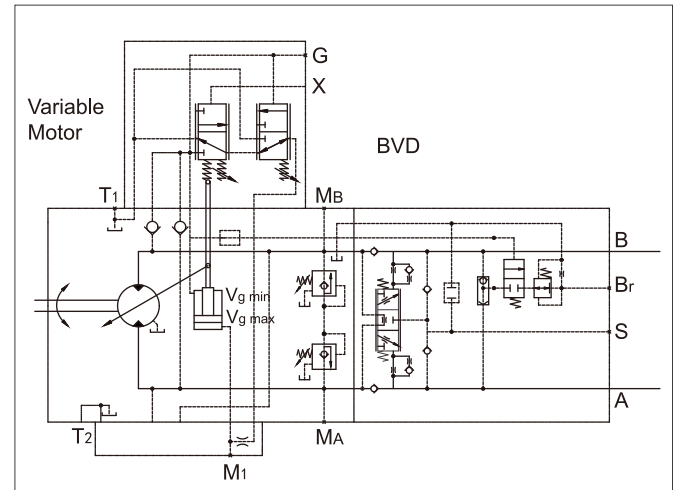
- Travel drives for wheeled excavators

Counterbalance valve for winches BVD...W and BVE

Application option

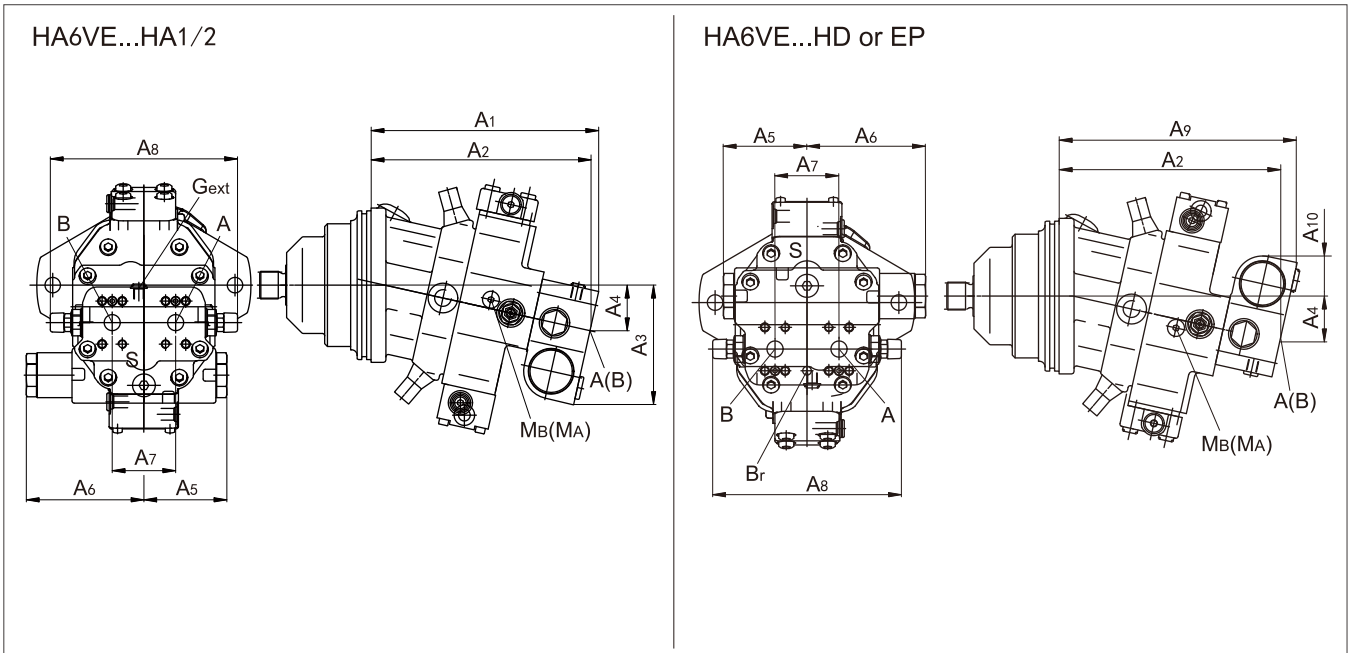
- Winch drives for cranes(BVD and BVE)
- Track drives for tracked excavators(BVD)

➤ Circuit diagram





➤ Installation Dimensions-Counterbalance Valve



Size	Type	Port A/B	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
55...38	BVD20...17	3/4 in	311	302	143	50	98	139	75	222	326	50
80...38	BVD20...27	1 in	340	331	148	55	98	139	75	222	355	46
107...37	BVD20...28	1 in	362	353	152	59	98	139	84	234	377	41
107...38	BVD25...38	1 1/4 in	380	370	165	63	120.5	175	84	238	395	56
160...38	BVD25...38	1 1/4 in	417	407	170	68	120.5	175	84	238	432	51
107...38	BVE25...38	1 1/4 in	298	288	171	63	137	214	84	238	315	63
160...38	BVE25...38	1 1/4 in	334	324	176	68	137	214	84	238	349	59

Port	Usage	Product	HA6VE Plate	Standard	Size	Max. Pressure(MPa)	State
A/B	Working line			SAE J518	See table above	42	O
S	Boost port	BVD 20		DIN 3852	M22x1.5, 14deep	3	X
		BVD 25		DIN 3852	M27x2, 16deep	3	X
Br	Brake release, reduced high pressure	L	7	DIN 3852	M12x1.5, 12.5deep	3	O
			8	DIN 3852	M12x1.5, 12deep	3	O
Gext	Brake release, high pressure	S		DIN 3852	M12x1.5, 12.5deep	42	X
MA/MB	Pressure measurement A/B			ISO 6149	M18x1.5, 14.5deep	42	X
Note: O=must be connected (plugged on delivery), X=plugged (in normal operation)							



➤ Integrated Counterbalance Valve BVI

Function

The integrated counterbalance valves are designed to reduce the danger of overspeed and cavitation of axial piston motors in open circuits. Cavitation occurs if, during brake or when going downhill, the motor speed is greater than that at the given inlet flow.

Note

- The integrated counterbalance valve must be ordered separately
- The counterbalance valve cannot replace the mechanical service brake and holding brake
- For the design of the brake release device, we must know the following data for the mechanical holding brake:
the cracking pressure
the volume of the counterbalance spool between the minimum stroke and maximum stroke
the required closing time for warming up

Application options

Track drives for excavators, ordering code:

BVI			00		-	
01	02	03	04	05		06

Counterbalance valve

01	Integrated counterbalance valve				BVI
Brake spool model		qv(L/min)	Item No.		
02	Minimum volume	≤150			51
		=150-200			52
		=210-270			53
		=270-330			54
		=330-400			55
		≥400			56

Throttle mounting		Item No.	
03	Constant throttle	0008	
	Throttle pin	0603	

Check valve		
04	Without residual opening	00

Brake release valve		Item No.	
05	With brake release valve (standard HZ)	Without disable function	1
	With brake release valve (standard HA)	With disable function	2

Standard/special model		
06	Standard model	O
	Special model	S

Data sheet

Working pressure	Nominal pressure	P	bar	350
	Max. pressure	P	bar	420
Max. flow		Q _{vmax}	L/min	400
Counterbalance spool	Start of opening	P	bar	12
	Fully open	P	bar	26
Pressure reducing valve for brake release (fixed setting)	Control pressure	P	bar	21 ⁺⁴
	Beginning of control	P	bar	10 ⁺⁴

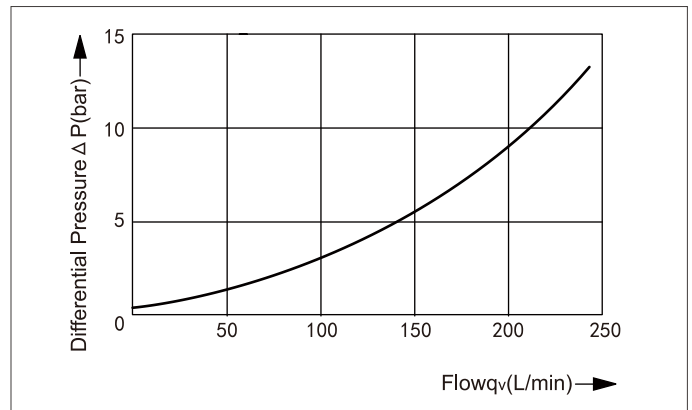
Comparison of port plates 02 and 22

Limited nominal pressure 350bar

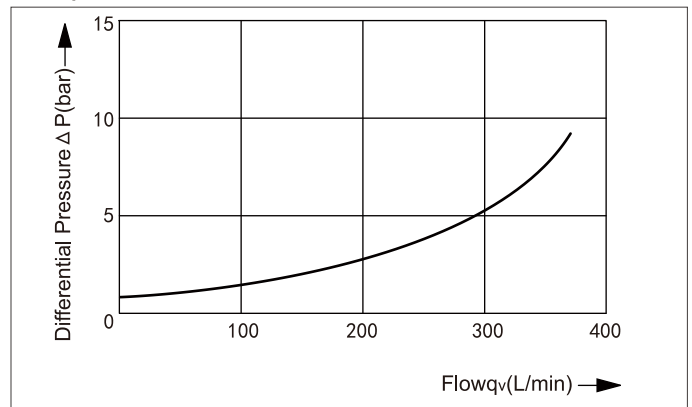
Max. permissible inlet flow at maximum pressure 420bar

Motor Size	Standard version without limit (02)		Code	Limited values with integrated counterbalance valve (22)	
	P _{nom} /P _{max} (bar)	Q _{vmax} (L/min)		P _{nom} /P _{max} (bar)	With BVI+DBV q _v (L/min)
55	400/450	276	22	350/420	240
80		332			
107		410			
160		533			

Boost port characteristic M22x1.5



Boost port characteristic M27x2

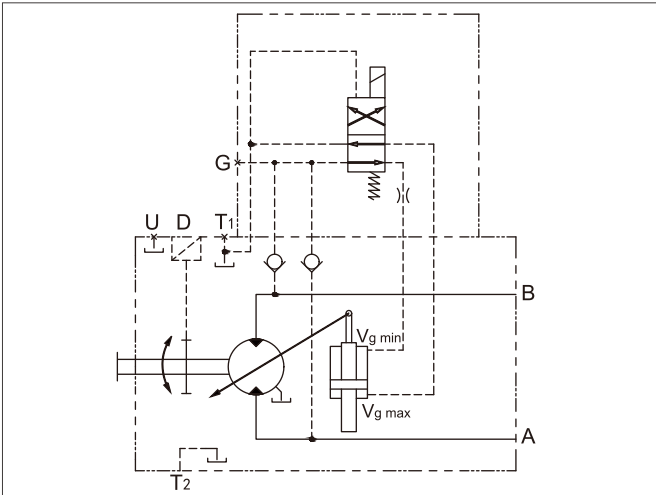




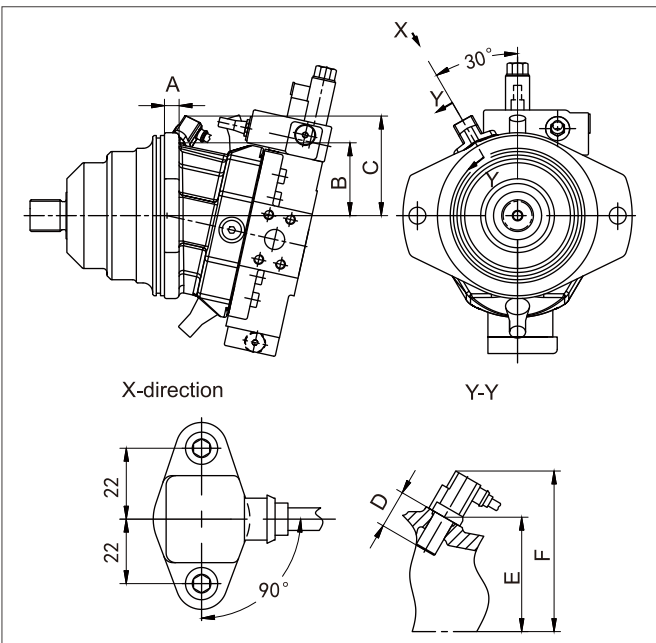
➤ Speed Measurement

The HA6VE...F version (“for speed measurement”, without sensor) has teeth on the drive shaft. A signal proportional to the rotational speed is generated as the toothed drive shaft rotates. The signal is registered by the sensor and transmitted to processing unit. Version F may be installed on the HDD Hall-effect speed sensor and the sensor is attached to a flat surface with 2 set screws.

➤ Circuit diagram



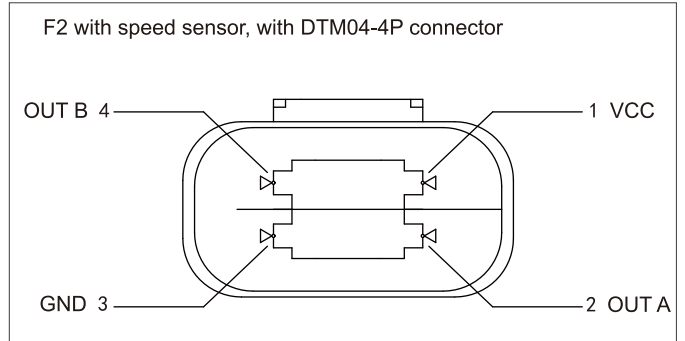
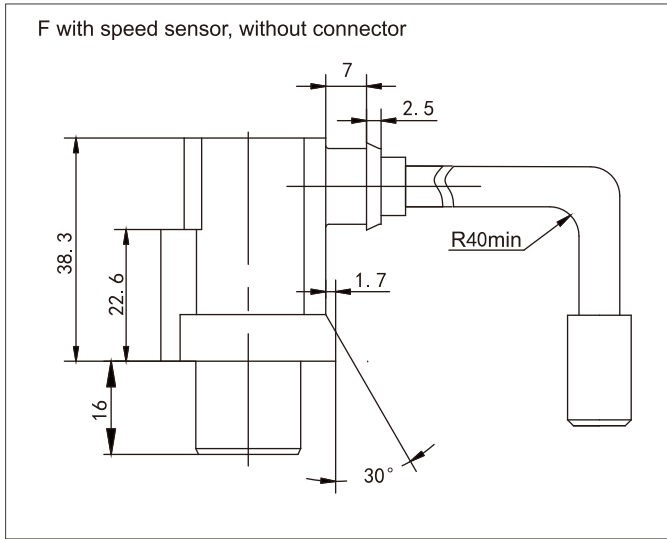
➤ Dimensions



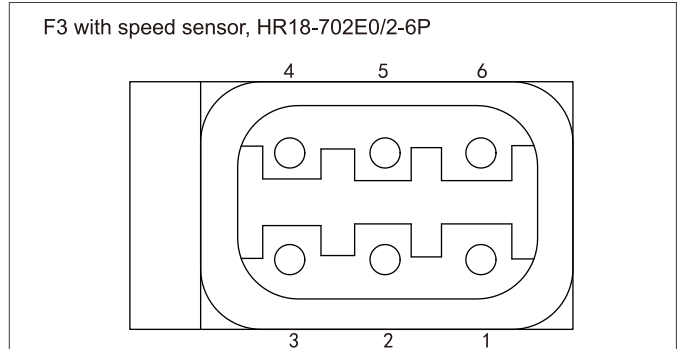
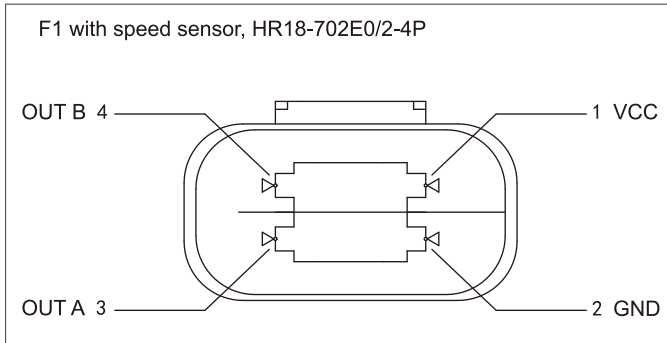
Size	Number of teeth	A	B	C	D	E	F
28	40	20.7	59.8	97.9	32	69 ± 0.1	107.3
55	54	25.8	72.2	110.3	32	83.4 ± 0.1	121.7
80	58	16.8	75.4	113.5	32	87.1 ± 0.1	124.4
107	67	14.7	83.1	121.2	32	95.9 ± 0.1	141.7
160	75	28.3	90.4	128.5	32	104.4 ± 0.1	141.7



➤ Outline Drawings - Speed Sensor



Pins of DTM04-4P connector		
Pin	Wire Color	Connected to
1	Brown VCC	Supply voltage
2	White OUT A	Speed signal A
3	Blue GND	Ground
4	Black OUT B	Speed signal B



Pins of DTM04-6P connector	
1	Speed signal 2
2	Direction signal
3	Speed signal 1
4	Supply voltage
5	Ground
6	Temperature

Pins of DT04-4P connector		
Pin	Wire Color	Connected to
1	Brown VCC	Supply voltage
2	Blue GND	Ground
3	Blac OUT A	Speed signal (Uf1)
4	White OUT B	Speed signal (Uf2)



> Installation Instructions

General

The motor housing must be filled with hydraulic fluid during startup and operation. The motor must be started at low speed under no load until air in the system is thoroughly bled.

The hydraulic fluid in the housing may leak through the working lines after a longer standstill. Make sure the housing is filled with hydraulic fluid before restart.

Below-reservoir installation (standard)

The motor is installed below the minimum fluid level of the reservoir

- Fill the axial piston motor with hydraulic fluid via the highest drain port before startup
- Run the motor at low speed until air in the system is thoroughly bled. (Bleed the air via working ports A and B if the lines are long.)
- Minimum immersion depth of drain line in reservoir: 200 mm (from the minimum fluid level of the reservoir)
- Bleed air in HA6VE variable motor in a closed circuit
- Via port G
- No air bleeding required if there is a flushing valve

Above-reservoir installation

The motor is installed above the minimum fluid level of the reservoir

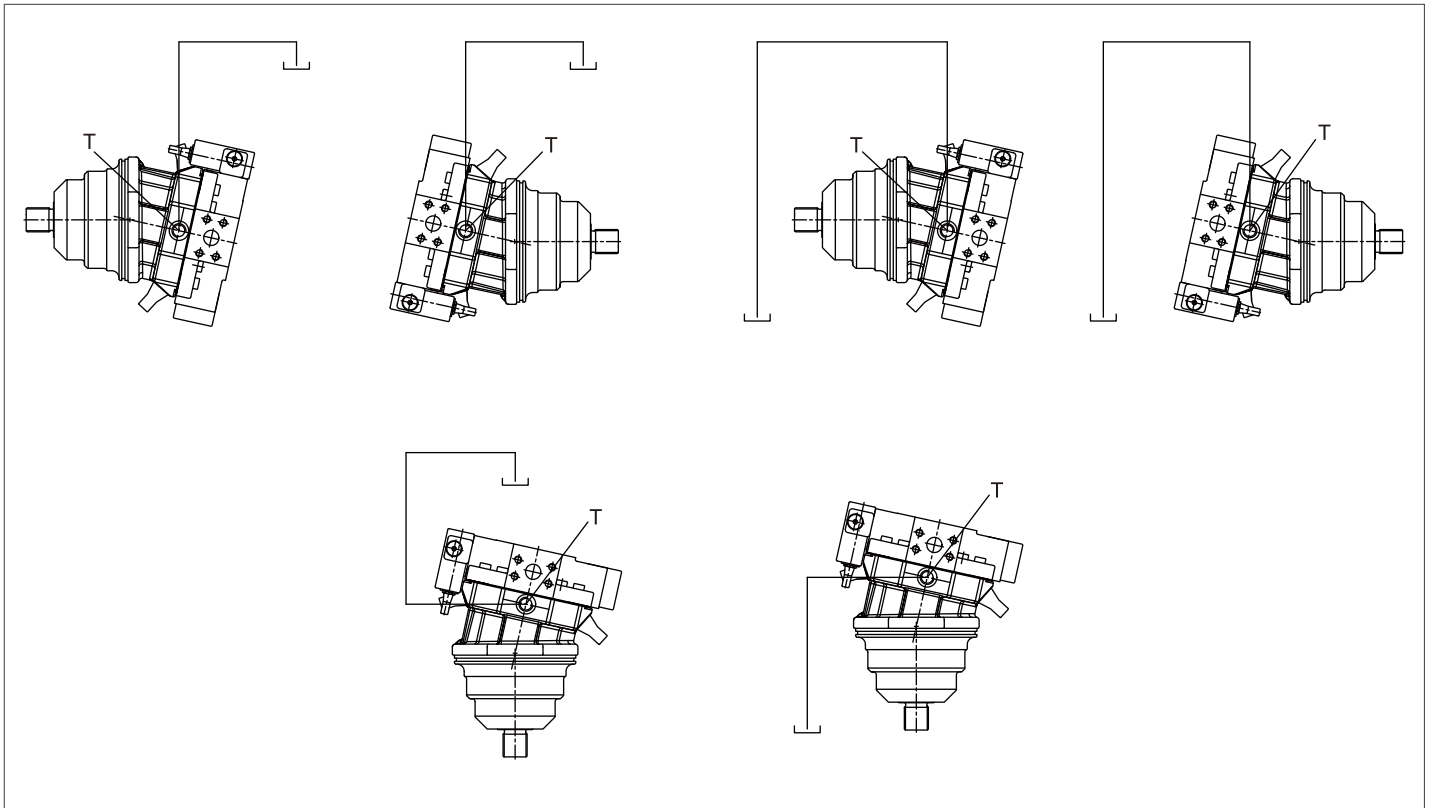
- The procedure is the same as that for below-reservoir installation
- Additional measures for "shaft horizontal" installation

The hydraulic fluid in the housing may leak via the working lines (and air may come inside through the shaft seal) in the case of a longer standstill.

This may lead to insufficient lubrication of the bearings at restart. Hence, the axial piston motor must be filled with hydraulic fluid via the highest drain port before restart.

Installation positions

Shaft horizontal or shaft downwards





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HYTEK POWER CO.,LTD.

No. 99, Shengyuan Road, Tengqiao Town, Lucheng District, Wenzhou city 325029, Zhejiang, CHINA
Email: globalsales@hytek.cn

America Canada Germany Italy Russia Türkiye Australia South Korea Thailand India Indonesia South Africa

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If there are any other modifications, no further notice will be given.