



1.1

HP6V SERIES

Axial Piston Variable Pumps

Mainly suitable for applications in construction machinery, mobile machinery, industrial vehicles, general industrial machinery, agricultural machinery, etc.

Apply to open circuits

Size:	18	28	35	47	65	76	85	105
Nominal pressure(bar):	300	300	300	320	320	320	320	350
Peak pressure(bar):	320	320	320	350	350	350	350	400



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Features

- ★ Swash plate type axial piston pumps for hydraulic open circuits.
- ★ Adoption of reinforced spindle, high strength cylinder material, high working pressure.
- ★ Good self-priming performance.
- ★ Adopt heavy-duty bearings to improve load carrying capacity and long service life.
- ★ High pollution resistance and high volumetric efficiency.
- ★ A variety of control options.
- ★ Flow, pressure, power electronic three closed-loop control optional.
- ★ Optional through-shaft drive.
- ★ Optimised pump oil flow path, lower noise level.

Technical Data

Size		18	28	35	47	65	76	85	105
Displacement(cc/rev)		18	28	35	47	65	76	85	104.3
Speed	Rated(rpm)	3300	3000	2850	2700	2600	2400	2400	2200
	Max(rpm)	3900	3600	3400	3250	3140	3000	3000	2600
	Min(rpm)	600							
Pressure	Rated(bar)	300	300	300	320	320	320	320	350
	Peak(bar)	320	320	320	350	350	350	350	400
Case pressure (Relative)	Rated(bar)	2							
	Peak(bar)	4							
Suction pressure (Absolute)	Rated(bar) Oil viscosity $\leq 30\text{mm}^2/\text{s}$	1							
	Peak(bar)	5							
Case oil filling volume (L)		0.4	0.55	0.55	0.6	0.65	0.8	0.9	1
Oil viscosity (mm^2/s)		10~1000, optimal range 16~36							
Oil temperature ($^{\circ}\text{C}$)		-20~100							
Oil cleanliness		20/18/15 (ISO 4406) and above							
Weight (kg) Without auxiliary flange		15.9	17	18.7	21.5	25	28	33	45

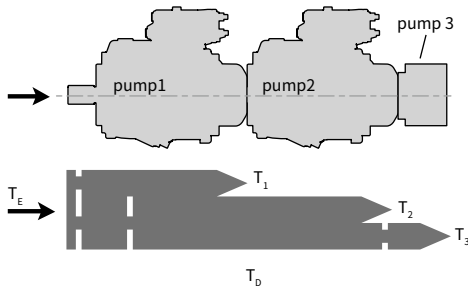
•Theoretical Calculation

Flow	$Q = \frac{V_g \cdot n \cdot \eta_v}{1000}$ (L/min)	V_g	= Displacement (cc/rev)
		Δp	= Pressure (bar)
Torque	$T = \frac{V_g \cdot \Delta p}{20 \cdot \pi \cdot \eta_{mh}}$ (N·m)	n	= Speed (rpm)
		η_v	= Volume efficiency
Power	$P = \frac{2\pi \cdot T \cdot n}{60000} = \frac{Q \cdot \Delta p}{600 \cdot \eta_t}$ (kW)	η_{mh}	= Mechanical-hydraulic efficiency
		η_t	= Total efficiency ($\eta_t = \eta_v \cdot \eta_{mh}$)

Technical Data

Permissible input torque and through-drive torque									
Size		18	28	35	47	65	76	85	105
Torque (At $V_{g,max}$ and P_{nom}) N·m	T	86	133	167	239	330	386	432	581
Max.input torque of the drive shaft (N·m)									
ANSI B92.1	5/8 in 9T 16/32DP	$T_{E,max}$	59						
	3/4 in 11T 16/32DP	$T_{E,max}$	124						
	7/8 in 13T 16/32DP	$T_{E,max}$		171	171	171	171		
	1 in 15T 16/32DP	$T_{E,max}$		272	272	272	272	272	
	1 1/4 in 14T 12/24DP	$T_{E,max}$					552	552	552
	1 1/2 in 17T 12/24DP	$T_{E,max}$							925
	1 3/4 in 13T 8/16DP	$T_{E,max}$							1470
Max.through-drive torque (N·m)	$T_{D,max}$	-	124	124	171	272	272	552	552

•Torque Distribution



Pump 1	T_1
Pump 2	T_2
Pump 3	T_3
Input torque	$T_E = T_1 + T_2 + T_3$
	$T_E < T_{E,max}$
Through-drive torque	$T_D = T_2 + T_3$
	$T_D < T_{D,max}$

Type introduction

HP6V	65	/	A	V	00	R	B2S2	MG	DR	S
①	②		③	④	⑤	⑥	⑦	⑧	⑨	⑩

Product series

①	Swash plate variable piston pumps, single pump, open circuit	HP6V
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Size

②	Size	18	28	35	47	65	76	85	105
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Design series

③		18	28	35	47	65	76	85	105	Code
	A series	●	●	●	●	●	●	●	●	A

Seal

④		18	28	35	47	65	76	85	105	Code
	FKM (Fluoro rubber: DIN ISO 1629)	●	●	●	●	●	●	●	●	V
	NBR (Nitrile rubber: DIN ISO 1629)	●	●	●	●	●	●	●	●	N

Note: Temperature range 08/40.

Through drive

⑤		18	28	35	47	65	76	85	105	Code
	Without through shaft drive, flange ports on both sides	●	●	●	●	●	●	●	●	00
	Without through shaft drive, rear flange ports		●	●	●	●	●	●	●	N1
	Without through shaft drive, thread ports on both sides		●	●	●					N3
	Without through shaft drive, rear thread ports	●			●					N2
	Without through shaft drive, with gear pump 6cc/rev*						●			X1
	Without through shaft drive, with gear pump 10cc/rev*						●			X2
	Without through shaft drive, with gear pump 15cc/rev*				●	●				X3
	Mounting flanges									
	Through shaft splines									
	SAE A J744-82-2		●	●	●	●	●	●	●	A1
			●	●	●	●	●	●	●	A2
	SAE B J744-101-2		●	●	●	●	●	●	●	B1
						●	●	●	●	B2
	SAE C J744-127-2						●	●	●	C1
									●	C2
	SAE C J744-127-4						●	●	●	C3
									●	C4

Note: "*" Only available with right-handed gear pumps.

Type introduction

Clockwise

		18	28	35	47	65	76	85	105	Code
⑥	CW	●	●	●	●	●	●	●	●	R
	CCW	●	●	●	●	●	●	●	●	L

Note: view from shaft end.

Input mounting flange

		18	28	35	47	65	76	85	105	Code	
⑦	SAE A J744-82-2	ANSI B92.1 5/8 in 9T 16/32DP	●							A2S	
		ANSI B92.1 3/4 in 11T 16/32DP	●							A2S0	
	SAE B J744-101-2	ANSI B92.1 7/8 in 13T 16/32DP		●	●	●	●			B2S1	
		ANSI B92.1 1 in 15T 16/32DP		●	●	●	●	●		B2S2	
		ANSI B92.1 1 1/4 in 14T 12/24DP					●	●		B2S3	
		BS46-1 A6.35×28 parallel key		●	●					B2K1	
		BS46-1 A6.35×32 parallel key				●	●			B2K2	
		ANSI B92.1 1 in 15T 16/32DP						●	●		C2S2
SAE C J744-127-2	ANSI B92.1 1 1/4 in 14T 12/24DP	ANSI B92.1 1 1/2 in 17T 12/24DP					●	●	●	C2S3	
		ANSI B92.1 1 3/4 in 13T 8/16DP						●	●	C2S4	
		ANSI B92.1 1 3/4 in 13T 8/16DP							●	●	C2S5
		BS46-1 A7.94×44 parallel key					●	●	●	C2K3	
SAE C J744-127-4	ANSI B92.1 1 in 15T 16/32DP	ANSI B92.1 1 1/4 in 14T 12/24DP				●	●	●		C4S2	
		ANSI B92.1 1 1/2 in 17T 12/24DP				●	●	●	●	C4S3	
		ANSI B92.1 1 3/4 in 13T 8/16DP						●	●	C4S4	
		ANSI B92.1 1 3/4 in 13T 8/16DP							●	●	C4S5
		BS46-1 A7.94×44 parallel key					●	●	●	C4K3	
ISO 3019-2	DIN 6885 parallel key		●	●	●		●		AP *		

Note: "*" is non-standard customised model, please contact Hengli if you need to select the model.

Working port

		18	28	35	47	65	76	85	105	Code
⑧	UNF Thread	Inlet and outlet flange connection thread	●	●	●	●	●	●	●	SA
		British thread		●	●	●	●		●	SG
		Metric Thread	●	●	●	●	●		●	SM
	Metric Thread	UNF Thread	●	●	●	●	●	●	●	MA
		British thread		●	●	●	●		●	MG
		Metric Thread	●	●	●	●	●		●	MM

Type introduction

Control type

		18	28	35	47	65	76	85	105	Code
Pressure cut-off		●	●	●	●	●	●	●	●	DR
Pressure cut-off + Electro-proportional pressure negative control(Deusch DT04-2P; 2-pin)	12V	●	●	●	●	●	●	●	●	ER1
	24V	●	●	●	●	●	●	●	●	ER2
Pressure cut-off + Load sensitive		●	●	●	●	●	●	●	●	L1
Pressure cut-off + Load sensitive + Throttling unloading		●	●	●	●	●	●	●	●	L0
Pressure cut-off + Remote pressure		●	●	●	●	●	●	●	●	P0
⑨ Electro-proportional displacement + Pressure cut-off + Load sensitive(Deusch DT04-2P; 2-pin)	12V		●	○	●	●	●	○	●	ED1
	24V		●	○	●	●	●	○	●	ED2
Constant power control + Pressure cut-off + Remote pressure		●	●	●	●	●	●	●	●	LP0
Constant power control + Pressure cut-off + Load sensitive		●	●	●	●	●	●	●	●	LP1
Constant power control + Pressure cut-off + Load sensitive + Throttling unloading		●	●	●	●	●	●	●	●	LP2
Electro-proportional power control + Pressure cut-off + Load sensitive(Deusch DT04-2P; 2-pin)	12V	●	●	●	●	●	●	●	●	LE1
	24V	●	●	●	●	●	●	●	●	LE2
Flow + Pressure + Power triple closed loop control(Electronic pump)			●		●					PPQ1

Standard / Special version

		18	28	35	47	65	76	85	105	Code
⑩	Standard version	●	●	●	●	●	●	●	●	None
	Special version	○	○	○	○	○	○	○	○	S

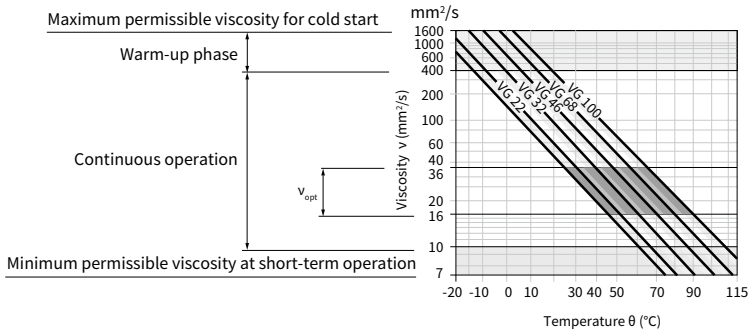
Note: ● = Available ○ = On request

Hydraulic fluid

Viscosity and temperature of the hydraulic fluid

	Viscosity(mm ² /s)	Oil seal	Temperature	Note
Cold start	$v_{max} \leq 1600$	NBR	$\theta_{St} \geq -40^{\circ}C$	$t \leq 3$ minutes, no load($p \leq 50$ bar), $n \leq 1000$ rpm, Maximum permissible temperature difference between the rotating parts of the system and the hydraulic fluid 25° C.
		FKM	$\theta_{St} \geq -25^{\circ}C$	
Warm-up phase	$v = 1600 \cdots 400$			$t \leq 15$ minutes, $p \leq 0.7 \times p_{nom}$, $n \leq 0.5 \times n_{nom}$
Continuous operation	$v = 400 \cdots 10$	NBR	$\theta \leq +85^{\circ}C$	Measured at oil port T
		FKM	$\theta \leq +110^{\circ}C$	
	$v_{opt} = 36 \cdots 16$			Optimum operating viscosity and efficiency range
Short-term operation	$v_{min} = 10 \cdots 7$	NBR	$\theta \leq +85^{\circ}C$	$t \leq 3$ minutes, $p \leq 0.3 \times p_{nom}$, Measured at oil port T
		FKM	$\theta \leq +110^{\circ}C$	

Selection chart



Detailed information on the selection of hydraulic fluids

To select the hydraulic fluid correctly, it is necessary to know the operating temperature in relation to the ambient temperature: in open circuits the tank temperature.

When selecting a hydraulic fluid, the operating viscosity should be in the optimum range for the operating temperature range (v_{opt} see shaded area of the selection chart). We recommend selecting a higher viscosity grade in all cases.

Example: When the operating temperature in the circuit is 60° C, in the optimum operating viscosity range (shaded area of the v_{opt}), corresponding to viscosity grades VG46 or VG68; VG68 should be selected.

Caution

The case drain temperature (influenced by pressure and speed) may be higher than the oil line temperature or tank temperature.

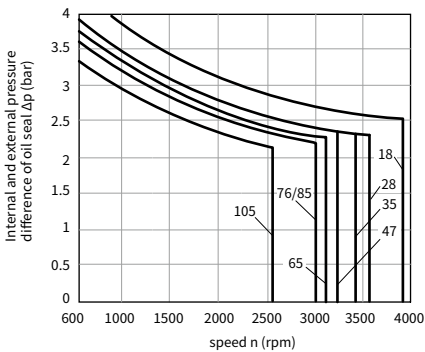
However, the temperature of any part of the component must not exceed 100° C.

Hydraulic fluid

Filtration of hydraulic fluid

Finer filtration improves the cleanliness of the hydraulic fluid, thereby extending the life of rotating parts. A cleanliness of at least 20/18/15 (ISO 4406) should be maintained. When the viscosity of the hydraulic fluid is less than $10\text{mm}^2/\text{s}$ (e.g. due to high temperatures during short-term operation, a cleanliness level of at least 19/17/14 (ISO 4406) is required.

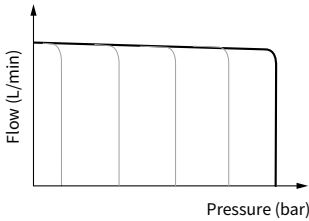
Oil seals



▲ Note

- When using mineral oil based hydraulic fluid, refer to the left diagram for the range of pressures used for oil seals, please contact us if other hydraulic fluids are used.
- The service life of the oil seal is affected by the rotational speed and the pressure difference between the inside and outside of the seal, in addition to the hydraulic oil and temperature.
- The pressure difference between the inside and outside of the seal must be greater than or equal to zero.

Control module function introduction



Pressure cut-off control

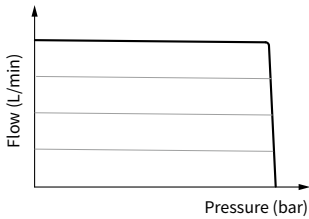
Function introduction

The pressure cut-off control is used to limit the maximum pressure of the main pump, which provides the flow required by the load at the set pressure. When the outlet pressure reaches the set value, the main pump displacement starts to decrease, keeping the pump outlet pressure constant.

Adjustment range

Standard setting: 250bar

Adjustable range: 50~350bar(Maximum not exceeding rated pump pressure)



Load-sensitive control

Function introduction

Load-sensitive control senses the differential pressure between the main pump outlet and the load side. When the differential pressure reaches the set value, the main pump displacement starts to decrease, keeping the pump differential pressure constant.

Adjustment range

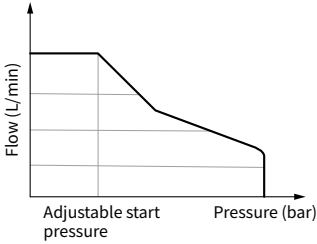
Standard setting: 15bar

Adjustable range: 10bar~25bar(Please contact Hengli if you exceed this range)

Hydraulic connection

If the piping from the control port to the main valve does not have sufficient unloading capacity, an unloading function can be added to the pump control valve, please specify when ordering.

Control module function introduction



Constant power control

Function introduction

Constant power control adjusts the displacement according to the working pressure of the pump, when the working pressure of the main pump increases, the displacement will decrease gradually, so as to maintain the power not to exceed the set value, the constant power control can effectively prevent the engine from overpowering operation.

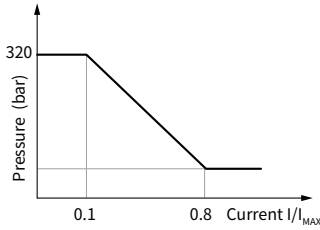
Adjustment range

Starting pressure for displacement change can be set

Standard setting: 180 bar

Adjustment range: 80bar~300 bar

When ordering, it is necessary to specify [drive torque N·m] or [power kW @ rpm].



Electro-proportional pressure negative control

Function introduction

The maximum output pressure of the main pump is controlled by a proportional solenoid, so that the pressure is regulated inversely proportional to the current. The main pump provides the flow required by the load according to the set pressure. When there is no electrical signal input, the main pump can achieve the maximum pressure output, and as the control current increases, the working pressure of the main pump decreases.

Adjustment range

Control pressure range: 30 bar~320 bar (maximum not exceeding the rated pressure of the pump).

Electrical connection

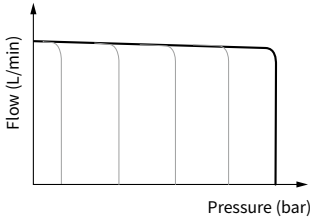
Voltage(V)	12 (+20%)	24 (+20%)
Max.current(mA)	1300	650
Rated resistance(20°C)(Ω)	7.1	29
Recommended chattering frequency(Hz)	100	100
Mounting connector	Deutsch DT04-2P	Deutsch DT04-2P
Protection rating	IP69K	IP69K

Control module function introduction

Remote pressure control

Function introduction

Remote pressure control controls the output pressure by means of an external relief valve or the like. The main pump provides the flow required by the load at the set pressure. When there is no pressure at the control port, the main pump maintains a minimum operating pressure, and as the pressure at the control port increases, the main pump operating pressure increases.



Adjustment range

Differential pressure standard setting: 15 bar

Differential pressure setting range: 12bar~25 bar

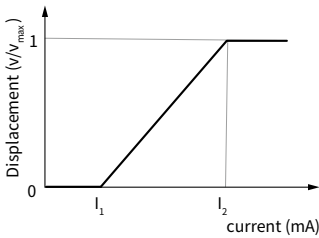
Hydraulic connection

When an external relief valve is connected to the remote pressure control port, sufficient unloading flow is required. With a differential pressure set at 15 bar, the relief flow is approximately 1.5 L/min. Without considering system influences, the pump outlet pressure always remains higher than the control pressure, with the excess value being the differential pressure set point.

Electric proportional displacement control

Function introduction

The main pump displacement is controlled by the proportional solenoid, so that the displacement is linearly adjusted with the current. When there is no electric signal input, the main pump maintains the smallest displacement state, with the increase of control current, the pump displacement becomes larger until it reaches the maximum displacement.



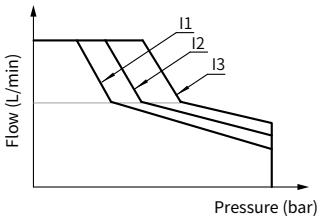
Electrical connection

Voltage(V)	12 (+20%)	24 (+20%)
Max.current(mA)	1500	750
Rated resistance(20°C)(Ω)	5.7	23.5
Recommended chattering frequency(Hz)	100	100
Mounting connector	Deutsch DT04-2P	Deutsch DT04-2P
Protection rating	IP69K	IP69K

Hydraulic connection

Safe and repeatable electroproportional operational control requires a main pump outlet of not less than 40 bar, too low a pressure will result in too little manoeuvring force on the variable mechanism, affecting control performance.

Control module function introduction



Electro-proportional power control Function introduction

On the basis of constant power control, add proportional solenoid, can control the output power to maintain at different constant values, to achieve the power requirements of different operating modes on the host.

Electrical connection

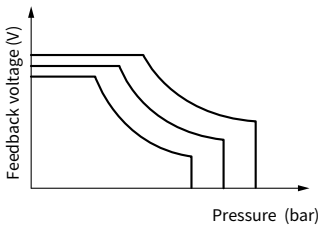
The electric proportional power control can reduce the output power up to 40%.

Voltage(V)	12 (+20%)	24 (+20%)
Max.current(mA)	800	800
Rated resistance(20°C)(Ω)	7.3	7.3
Recommended chattering frequency(Hz)	100	100
Mounting connector	Deutsch DT04-2P	Deutsch DT04-2P
Protection rating	IP69K	IP69K

Hydraulic connection

Need to connect the pilot oil, pilot oil pressure 35-45bar, consumption flow < 3L/min.

Flow + Pressure + Power triple closed loop (Electronic pump) *



Function introduction

The electronic controller integrated in the piston pump calculates and controls the displacement of the piston pump according to the feedback signals (piston pump displacement and pressure signals from the electronic sensors) and control commands, so that the output characteristics of the piston pump meet the requirements of the user inputs.

The electronic control supports flow, pressure and power control at the same time. The control commands can be input through the corresponding terminals on the electronic controller (analogue signals) or through the CAN bus, and the priority of control is pressure control > power control > flow control.

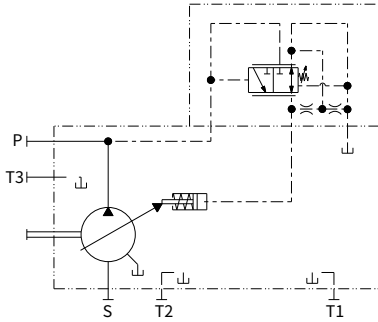
Electronic control is characterised by high control accuracy and real-time adjustable control parameters, which can flexibly cope with a variety of different application scenarios.

Note: " * "Detailed information about electronic control is shown in 《Technical sample of axial piston pump and axial piston hydraulic motor》 Chapter 5-Accessories.

Control module function symbols

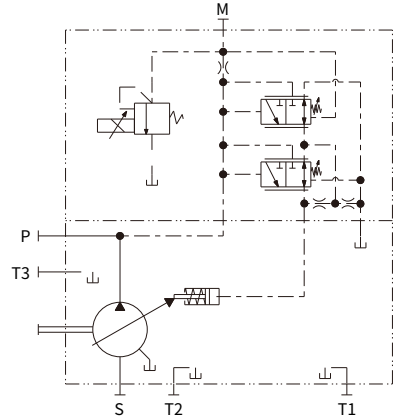
DR

Pressure cut-off



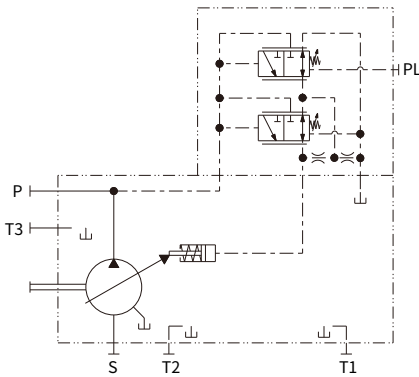
ER1/ER2

Pressure cut-off + Electro-proportional pressure negative control



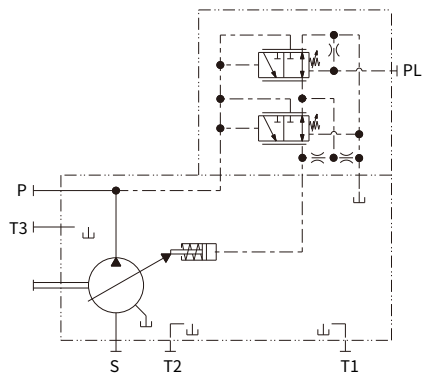
L1

Pressure cut-off + Load sensitive



L0

Pressure cut-off + Load sensitive + Throttling unloading

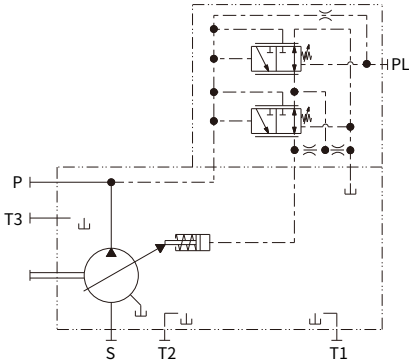


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Control module function symbols

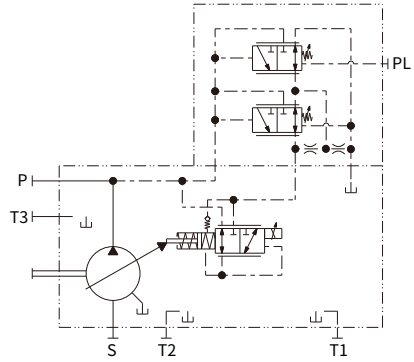
P0

Pressure cut-off + Remote pressure



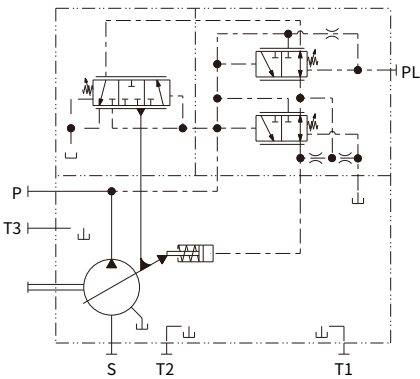
ED1/ED2

Electro-proportional displacement control + Pressure cut-off + Load sensitive



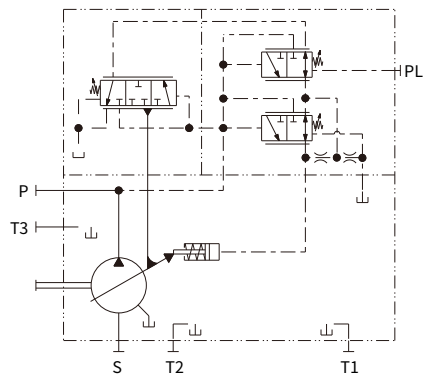
LP0

Constant power control + Pressure cut-off + Remote pressure



LP1

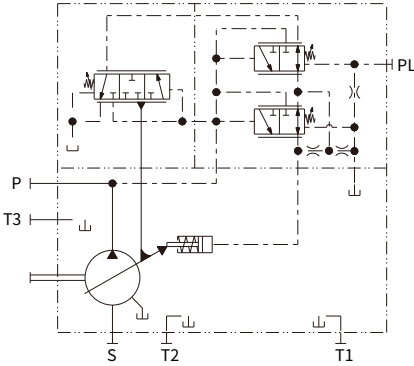
Constant power control + Pressure cut-off + Load sensitive



Control module function symbols

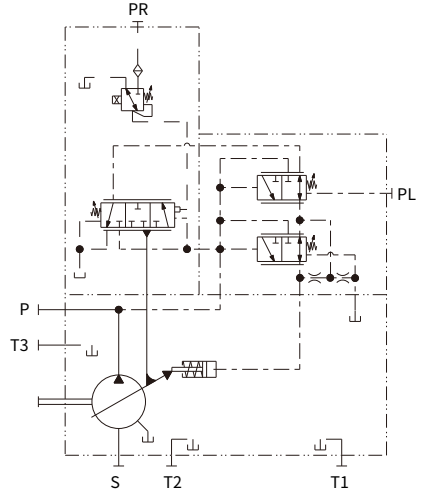
LP2

Constant power control + Pressure cut-off + Load sensitive + Throttling unloading



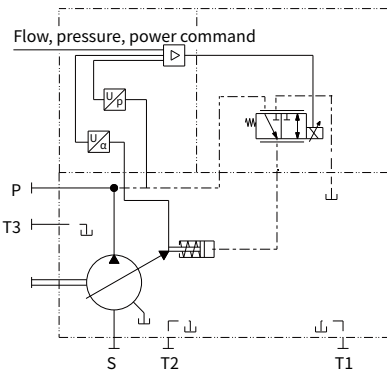
LE1/LE2

Electro-proportional power control + Pressure cut-off + Load sensitive



PPQ1

Flow + Pressure + Power triple closed loop control(Electronic pump)

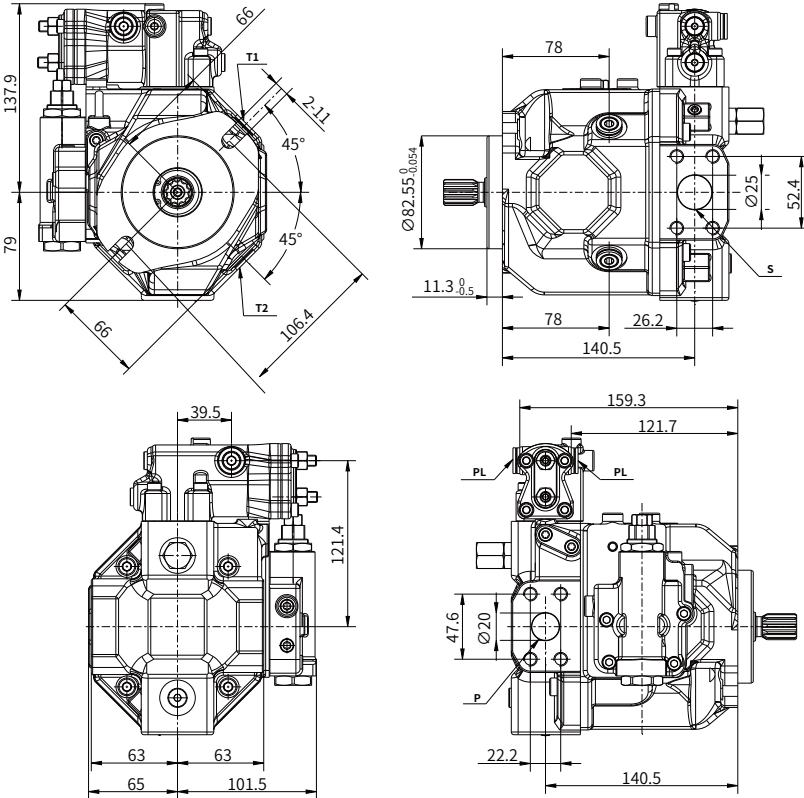


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Installation size

HP6V18 installation dimension

· HP6V18/AV00RA2S0MALP1 as an example



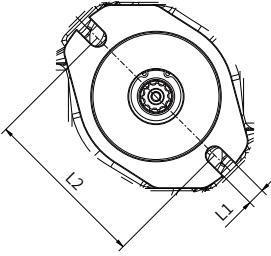
Port size

Port	Port name	Standard	Port size(Thread depth)	Max.pressure(bar)
P	Working port	SAE J518C	3/4 in M10×1.5(Thread depth 17mm)	320
S	Suction port	SAE J518C	1 in M10×1.5(Thread depth 17mm)	5
T1/T2	Drain port	ISO 11926-1	9/16-18UNF(Thread depth 13mm)	4
PL	LS Control port	ISO 11926-1	7/16-20UNF(Thread depth 11.5mm)	320

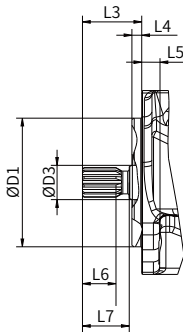
Installation size

HP6V18 mounting flange and input shaft dimensions

·A2 Flange



·Spline shaft



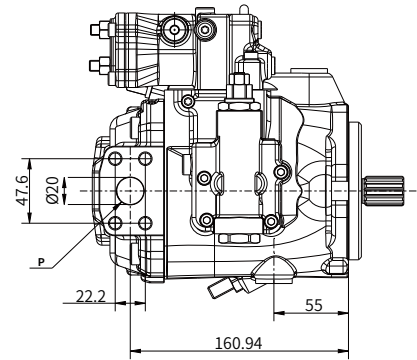
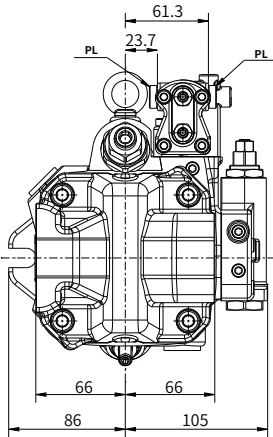
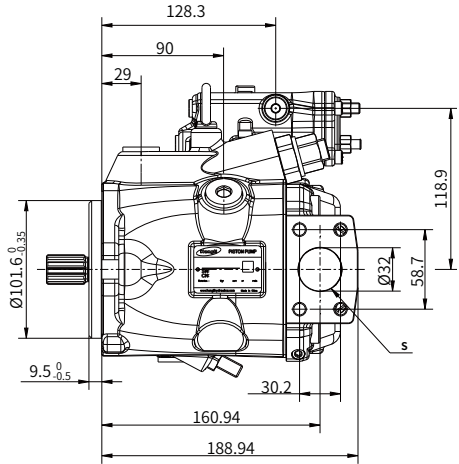
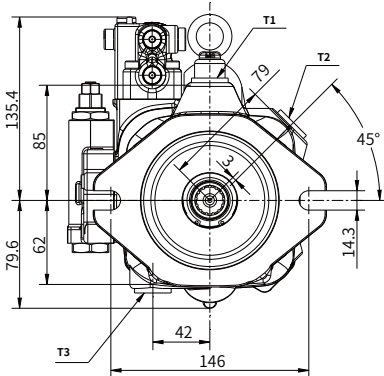
Code	L1	L2	L3	L4	L5	L6	L7	D1	D3
A2S	11	106.4	31.8	6.3	11.5	15.8	23.8	82.55	22
A2S0			38			21.5	30		
A2S*	11	106.4	36.8	11.3	11.5	15.8	23.8	82.55	22
A2S0*			43			21.5	30		

Note: "*" When selecting constant power control

Installation size

HP6V28/35 installation dimension

·HP6V28/AV00RB2S1MALP1 as an example



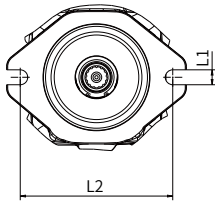
Port size

Port	Port name	Standard	Port size(Thread depth)	Max.pressure(bar)
P	Working port	SAE J518C	3/4 in M10×1.5(Thread depth 17mm)	320
S	Suction port	SAE J518C	1-1/4 in M10×1.5(Thread depth 17mm)	5
T1/T2/T3	Drain port	ISO 11926-1	3/4-16UNF(Thread depth 13mm)	4
PL	LS Control port	ISO 11926-1	7/16-20UNF(Thread depth 11.5mm)	320

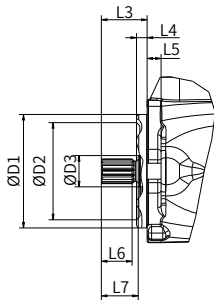
Installation size

HP6V28/35 mounting flange and input shaft dimensions

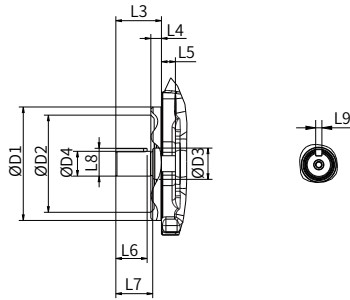
· B2/A Flange



· Spline shaft



· Parallel key



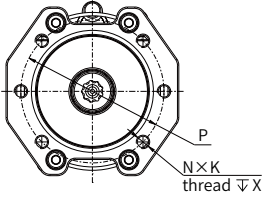
Code	L1	L2	L3	L4	L5	L6	L7	L8	L9	D1	D2	D3	D4
B2S1	14.3	146	41	9.5	12.5	28	33	-	-	101.6	87	28	-
B2S2								24.9	6.35				22.2
B2K1								24.9	6.35				22.2

AP	14.3	140	54	9.5	12.5	39	46	28	8	100	87	28	25
----	------	-----	----	-----	------	----	----	----	---	-----	----	----	----

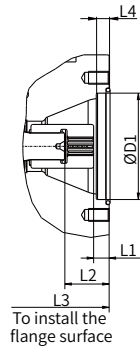
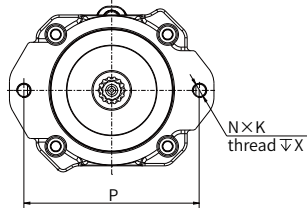
Installation size

HP6V28/35 through drive dimensions

·A



·B

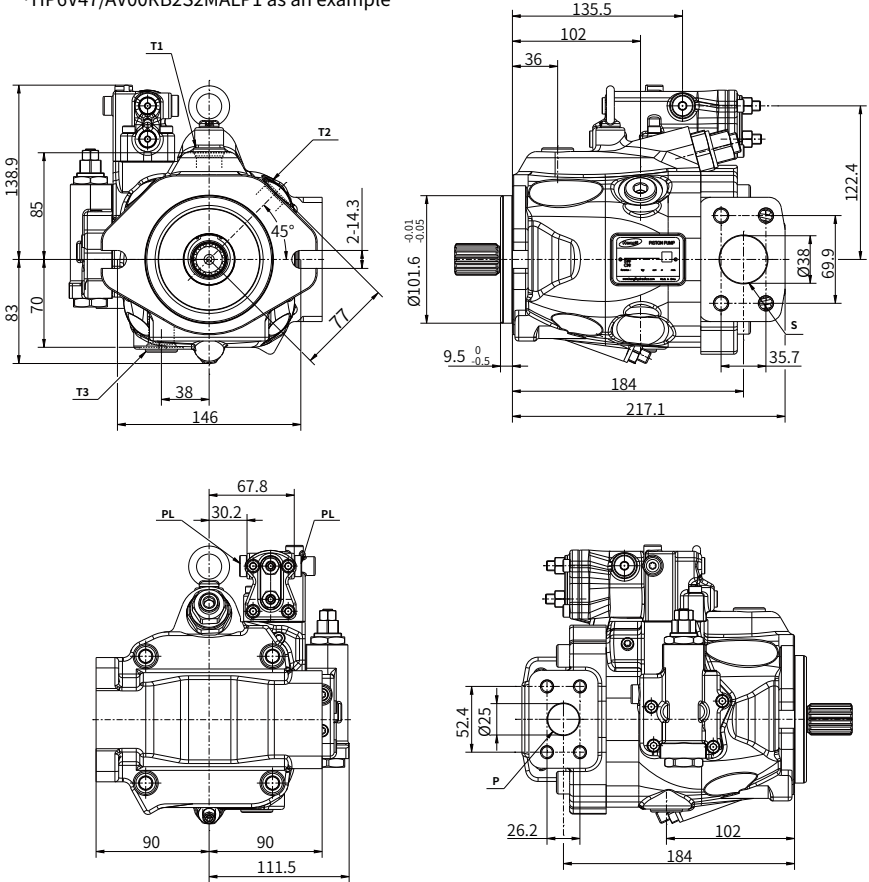


Code	N	K	X	P	D1	L1	L2	L3	L4
A1	6	M10	18	106	82.55	9.4	39.2	204	10
A2						13.4			
B1	2	M12	18	146	101.6	17.4	45.9	217.8	10

Installation size

HP6V47 installation dimension

·HP6V47/AV00RB2S2MALP1 as an example



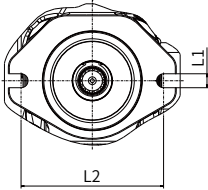
Port size

Port	Port name	Standard	Port size(Thread depth)	Max.pressure(bar)
P	Working port	SAE J518C	1 in M10×1.5(Thread depth 17mm)	350
S	Suction port	SAE J518C	1-1/2 in M12×1.75(Thread depth 20mm)	5
T1/T2/T3	Drain port	ISO 11926-1	7/8-14UNF(Thread depth 13mm)	4
PL	LS Control port	ISO 11926-1	7/16-20UNF(Thread depth 11.5mm)	350

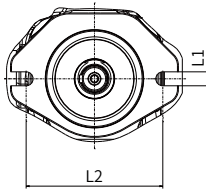
Installation size

HP6V47 mounting flange and input shaft dimensions

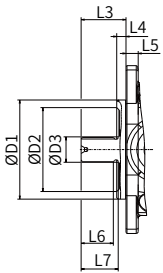
· B2 Flange



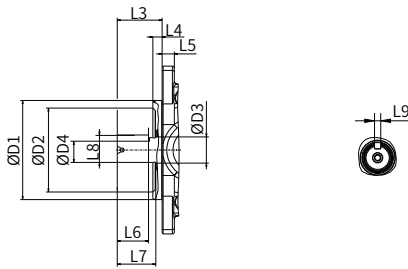
· A Flange



· Spline shaft



· Parallel key

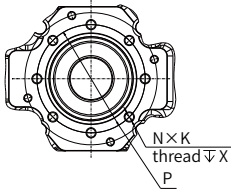


Code	L1	L2	L3	L4	L5	L6	L7	L8	L9	D1	D2	D3	D4
B2S1			41			25	29	-	-	101.6	86	28	-
B2S2	14.3	146	46	9.5	12.5	33	38	-	-				-
B2K2						32	39.5	28.1	6.35				21.75
AP	14.3	140	51	9.5	12.5	39	44	28	8	100	86	28	21

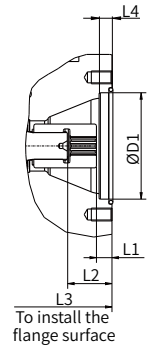
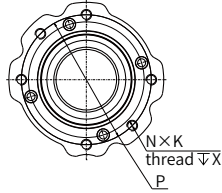
Installation size

HP6V47 through drive dimensions

·A



·B



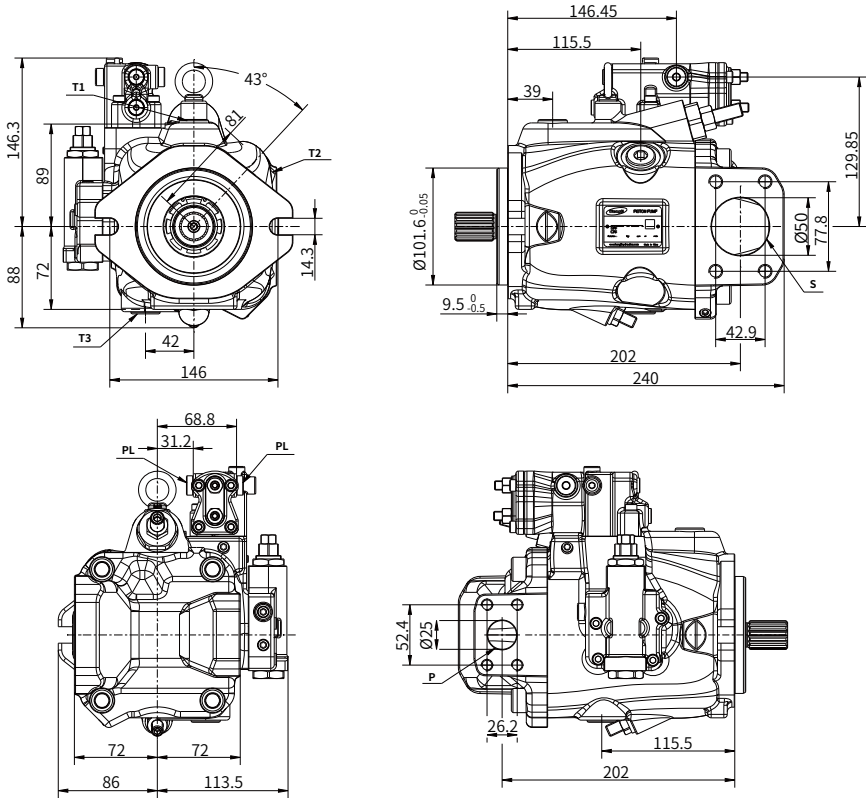
Code	N	K	X	P	D1	L1	L2	L3	L4
A1	8	M10	16	106.4	82.55	12	33.8	226	10
A2	8	M10	16	106.4	82.55	11.4	49.3	244.5	8
A3	8	M10	16	106.4	82.55	14.1	40.6	244.5	8
B1	6	M12	15.5	146	101.6	14.2	50.1	250.5	11

01

Installation size

HP6V65 installation dimension

· HP6V65/AV00RB2S2MALP1 as an example



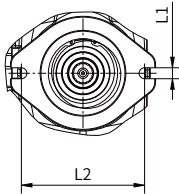
Port size

Port	Port name	Standard	Port size(Thread depth)	Max.pressure(bar)
P	Working port	SAE J518C	1 in M10×1.5(Thread depth 17mm)	350
S	Suction port	SAE J518C	2 in M12×1.75(Thread depth 20mm)	5
T1/T2/T3	Drain port	ISO 11926-1	7/8-14UNF(Thread depth 13mm)	4
PL	LS Control port	ISO 11926-1	7/16-20UNF(Thread depth 11.5mm)	350

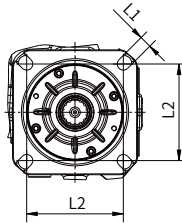
Installation size

HP6V65 mounting flange and input shaft dimensions

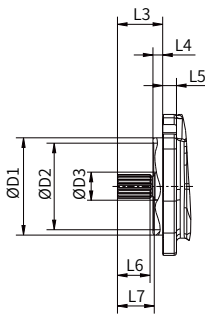
· B2 Flange



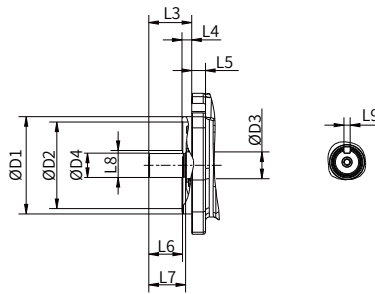
· C4 Flange



· Spline shaft



· Parallel key

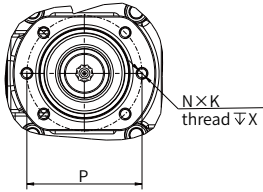


Code	L1	L2	L3	L4	L5	L6	L7	L8	L9	D1	D2	D3	D4
B2S1	14.3	146	41	9.5	12.5	29	34.5	-	-	101.6	81	35	-
B2S2			46			33	38						
B2S3			56			43	48						
B2K2			46			36	38						
C4S2	14.5	114.5	46	12.7	15	33	38	-	-	127	97.1	35	-
C4S3			46			43	48						

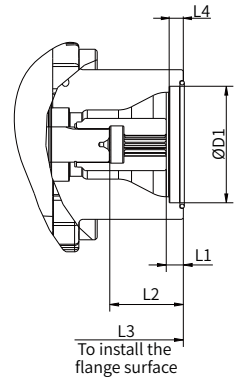
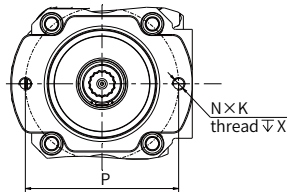
Installation size

HP6V65 through drive dimensions

·A



·B

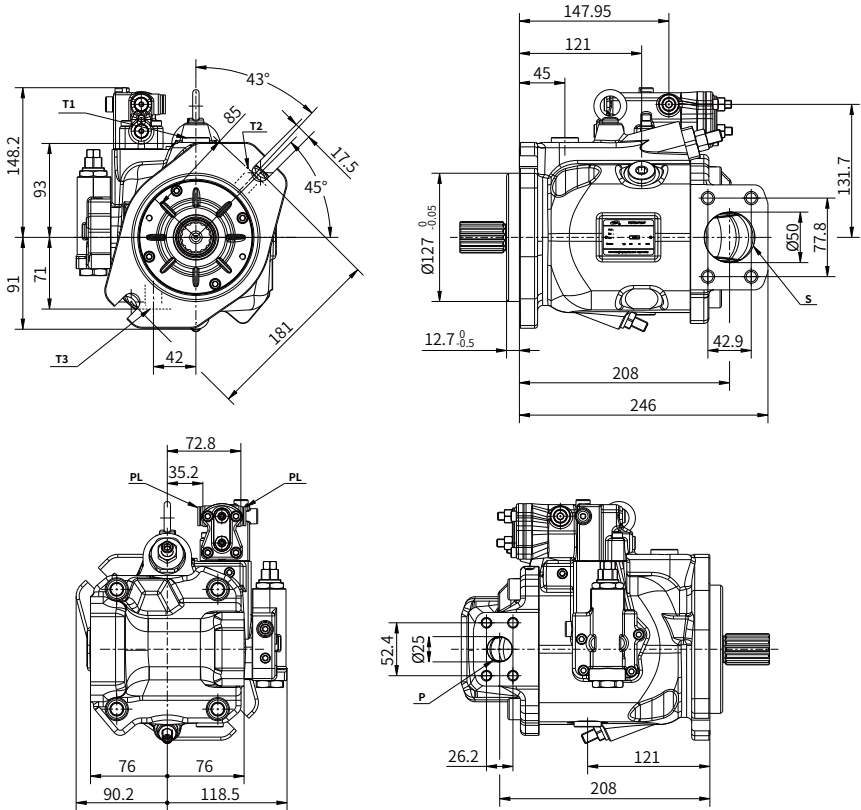


Code	N	K	X	P	D1	L1	L2	L3	L4
A1	6	M10	16	106.4	82.55	12.1	52	255	10
A2									
B1	2	M12	18	146	101.6	12.1	52	255	11
B2									

Installation size

HP6V76 installation dimension

·HP6V76/AV00RC2S3MALP1 as an example



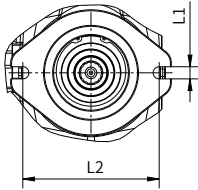
Port size

Port	Port name	Standard	Port size(Thread depth)	Max.pressure(bar)
P	Working port	SAE J518C	1 in M10×1.5(Thread depth 17mm)	350
S	Suction port	SAE J518C	2 in M12×1.75(Thread depth 20mm)	5
T1/T2/T3	Drain port	ISO 11926-1	3/4-16UNF(Thread depth 14.3mm)	4
PL	LS Control port	ISO 11926-1	7/16-20UNF(Thread depth 11.5mm)	350

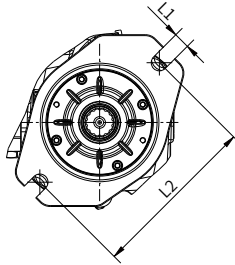
Installation size

HP6V76 mounting flange and input shaft dimensions

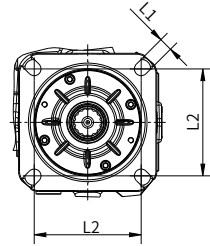
· B2 Flange



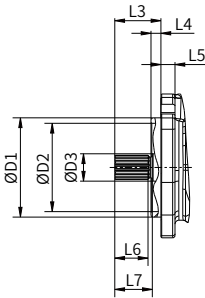
· C2/A Flange



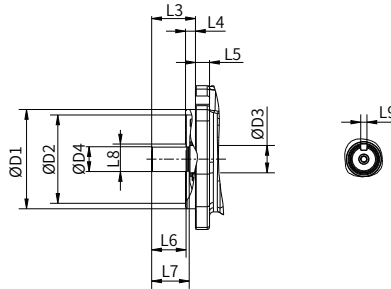
· C4 Flange



· Spline shaft



· Parallel key

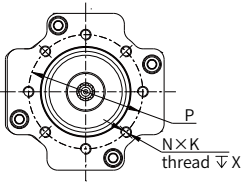


Code	L1	L2	L3	L4	L5	L6	L7	L8	L9	D1	D2	D3	D4
B2S2	13	146	39	9.7	16	33	38	-	-	101.6	80.1	35	-
B2S3			49			42.5	48						
C2S2	17.5	181	46	12.7	18	33	38	-	-	127	113	35	-
C2S3			56			42.5	48						
C2K3			56			45	48						
C4S2	14.5	114.5	46	12.7	15.5	33	38	-	-	127	113	35	-
C4S3			56			42.5	48						
C4K3			56			45	48						
AP	17.5	180	60	9	18	47	52	36	10	125	113	35	32

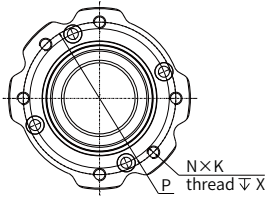
Installation size

HP6V76 through drive dimensions

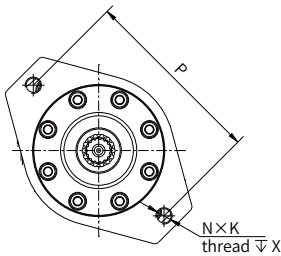
·A



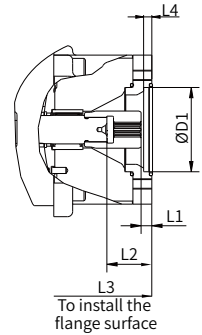
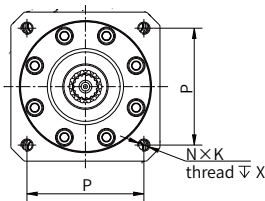
·B



·C1



·C3

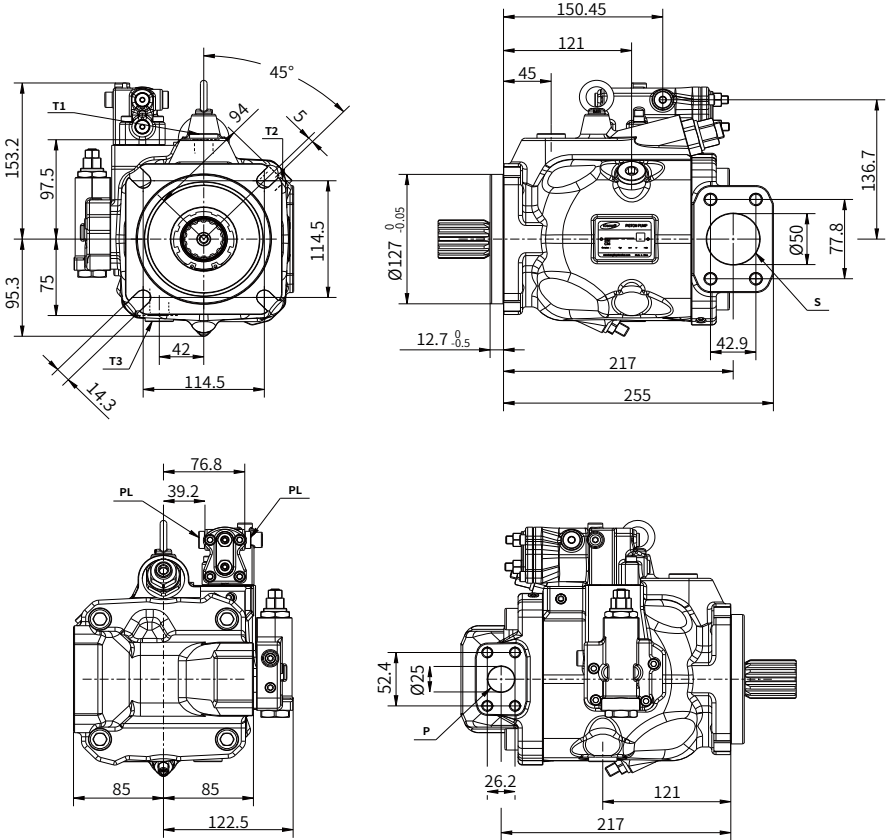


Code	N	K	X	P	D1	L1	L2	L3	L4
A1	8	M10	18.5	106.4	82.55	10.5	44	265	8
A2									
B1	6	M12	17.5	146	101.6	11.5	54	275	11
B2									
C1	2	M16	24	181	127	12.3	63.3	284.3	13.4
C3	4	M12	24	114.5	127	12.3	63.3	284.3	13.4

Installation size

HP6V85 installation dimension

·HP6V85/AV00RC4S4MALP1 as an example



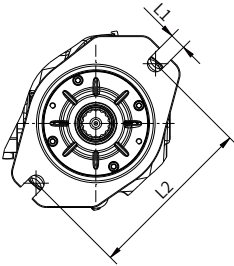
Port size

Port	Port name	Standard	Port size(Thread depth)	Max.pressure(bar)
P	Working port	SAE J518C	1 in M10×1.5(Thread depth 17mm)	350
S	Suction port	SAE J518C	2 in M12×1.75(Thread depth 20mm)	5
T1/T2/T3	Drain port	ISO 11926-1	7/8-14UNF(Thread depth 13mm)	4
PL	LS Control port	ISO 11926-1	7/16-20UNF(Thread depth 11.5mm)	350

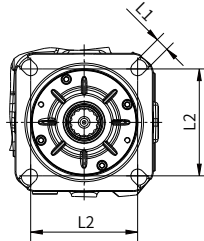
Installation size

HP6V85 mounting flange and input shaft dimensions

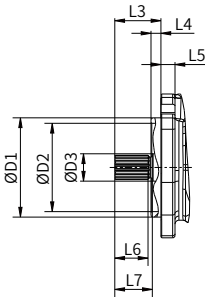
· C2 Flange



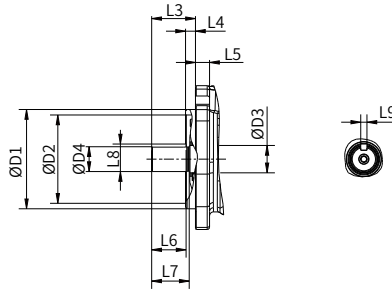
· C4 Flange



· Spline shaft



· Parallel key



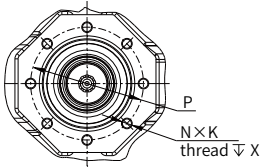
Code	L1	L2	L3	L4	L5	L6	L7	L8	L9	D1	D2	D3	D4
C2S2	17.5	181	46	12.7	18	33	38	-	-	127	112	40	-
C2S3			56			43	47.7						
C2S4			61.8			43.5	53.5						
C2K3			56			45	48	35.2	7.94				31.75

C4S2	14.3	114.5	46	12.7	16	33	38	-	-	127	112	40	-
C4S3			56			43	47.7						
C4S4			61.8			43.5	53.5						
C4K3			56			45	48						

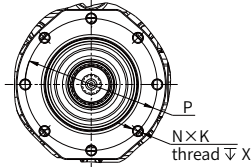
Installation size

HP6V85 through drive dimensions

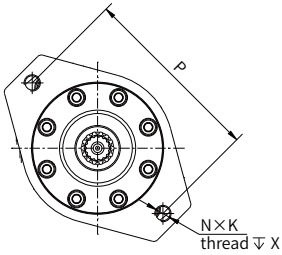
·A



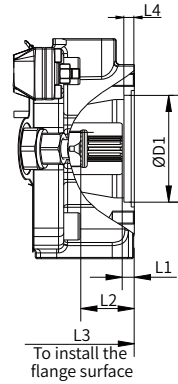
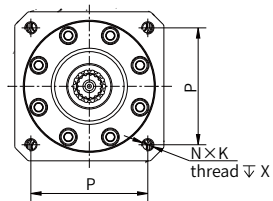
·B



·C1



·C3

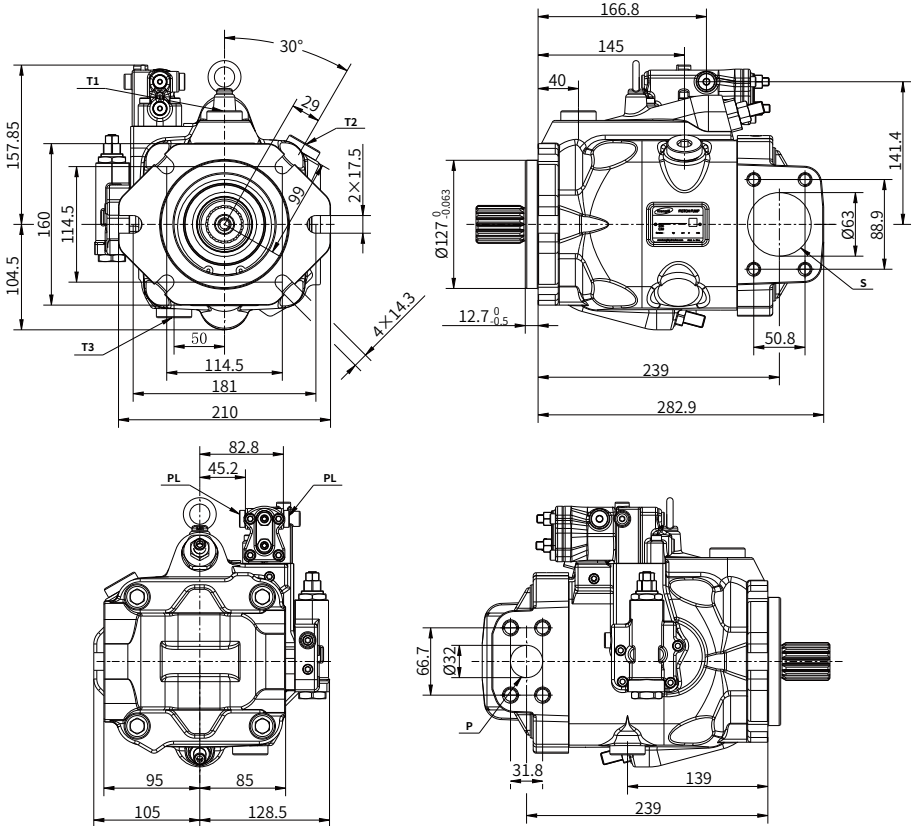


Code	N	K	X	P	D1	L1	L2	L3	L4
A1	8	M10	16	106.4	82.55	9.3	41.3	255.5	8
A2									
B1	8	M12	18	146	101.6	10.8	58.8	273	11
B2									
C1	2	M16	24	181	127	14.1	79.1	293.3	13.4
C3	4	M12	24	114.5	127	14.1	79.1	293.3	13.4

Installation size

HP6V105 installation dimension

· HP6V105/AV00RC4S4MALP1 as an example



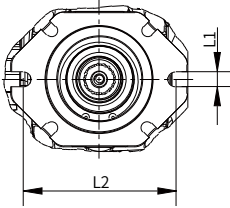
Port size

Port	Port name	Standard	Port size(Thread depth)	Max.pressure(bar)
P	Working port	SAE J518C	1-1/4 in M14×2(Thread depth 19mm)	400
S	Suction port	SAE J518C	2-1/2 in M12×1.75(Thread depth 17mm)	5
T1/T2/T3	Drain port	ISO 11926-1	1-1/16-12UNF(Thread depth 15mm)	4
PL	LS Control port	ISO 11926-1	7/16-20UNF(Thread depth 11.5mm)	400

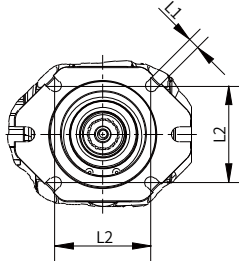
Installation size

HP6V105 mounting flange and input shaft dimensions

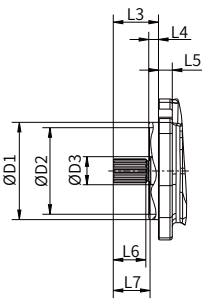
· C2 Flange



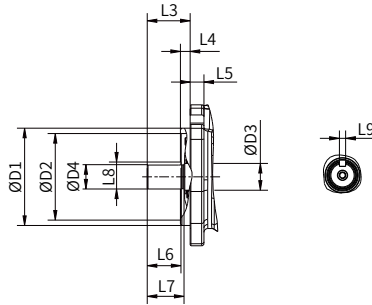
· C4 Flange



· Spline shaft



· Parallel key



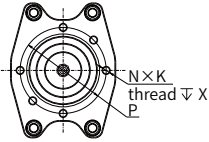
Code	L1	L2	L3	L4	L5	L6	L7	L8	L9	D1	D2	D3	D4
C2S3	17.5	181	55.5	12.7	20	35	58	-	-	127	100	50	-
C2S4			61.5			43.5	54						
C2S5			75			60	67.5						
C2K3			56			45	48.5						

C4S3	14.3	114.5	55.5	12.7	20	35	58	-	-	127	100	50	-
C4S4			61.5			43.5	54						
C4S5			75			60	67.5						
C4K3			56			45	48.5						

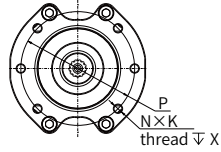
Installation size

HP6V105 through drive dimensions

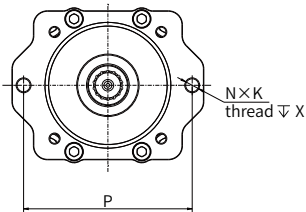
·A1/A2



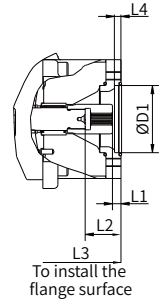
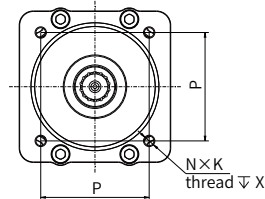
·B1/B2



·C1/C2



·C3/C4



Code	N	K	X	P	D1	L1	L2	L3	L4
A1	6	M10	20	106.4	82.55	11.4	44.4	306.9	8
A2						14.4			
B1	6	M12	25	146	101.6	11.4	51.4	313.9	11
B2									
C1	2	M16	30	181	127	19	64	326.5	13
C2						13			
C3	4	M12	25	114.5	127	14	59	321.5	13
C4						8			

Installation type

Installation instructions

- △ During commissioning and operation, the plunger pump must always be filled with hydraulic oil and purged of air. After prolonged periods of inactivity, the above precautions must also be observed, as the plunger pump may drain hydraulic oil back to the tank through the hydraulic lines. Particularly when the drive shaft is in a vertical orientation (facing upward or downward), complete filling and thorough venting are essential; otherwise, risks such as dry running may occur.
- △ The plunger pump must be drained through the highest installed port among the three available drain ports: T1, T2, and T3.
- △ When multiple plunger pumps operate together, each pump must be connected to a drain line. If a common drain line is used, ensure that the line pressure does not exceed the case pressure of any pump. If pressure differences exist between the drain ports of individual pumps, the drain line must be adjusted to ensure that under no circumstances does the drain pressure exceed the permissible case pressure of all pumps. If this cannot be achieved, separate drain lines should be installed. To suppress noise generation, different lines should be isolated using elastic elements, and
- △ mounting the plunger pump directly on the oil tank should be avoided. Under all operating conditions, the suction and drain lines must extend below the minimum submerged depth in the oil tank. When the plunger pump is mounted above the oil tank, the height (h_s) from the pump's suction port to the highest oil level in the tank must not exceed 800 mm. During operation, including cold starts, the minimum suction pressure at the suction port must not fall below 0.8 bar (absolute pressure).
- △ When designing the oil tank, ensure sufficient distance between the suction line and the case drain line. Prevent heated return flow from being directly drawn back into the suction line. Under certain installation conditions, gravity, hydraulic oil, and case pressure may cause slight
- △ variations in control characteristics and alter response times.

Symbol definitions and notes

Symbol	
R	Filling / Air bleeding
S	Suction port
T1/T2/T3	Drain port
DB	Baffle plate
$h_{t \min}$	Minimum required depth of immersion depth (200mm)
h_{\min}	Minimum distance required to the bottom (100mm)
$h_{ES \min}$	Minimum height required to prevent piston unit from draining (25mm)
$h_{s \max}$	Maximum permissible suction height (800mm)

Note : The oil port R is part of the external pipework and must be supplied by the customer to make filling and venting easier.

Please refer to the following examples: Figure 1 to Figure 15.

Other installation positions are available upon request.

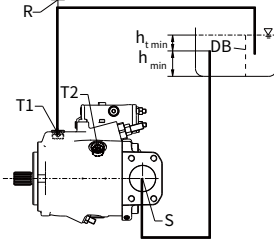
Recommended installation positions: 1 and 3.

Installation type

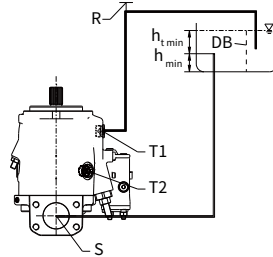
Mounting under tank (Standard)

Under tank mounting means that the piston pump is mounted outside the tank, below the lowest oil level.

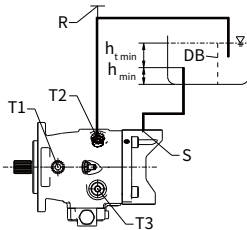
- Figure 1
Air bleed: R
Filling: T1 or T2



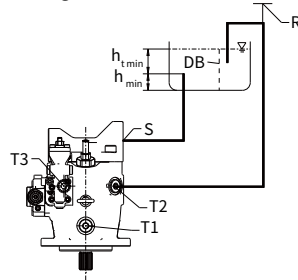
- Figure 2^{*}
Air bleed: R
Filling: T1



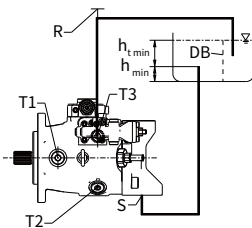
- Figure 3
Air bleed: R
Filling: T2



- Figure 4
Air bleed: R
Filling: T3



- Figure 5
Air bleed: R
Filling: T3



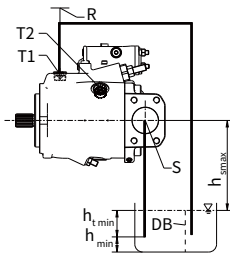
Note: ^{*}"As the pump cannot be fully vented and oiled in this position, it should be vented and oiled in a horizontal position before installation.

Installation type

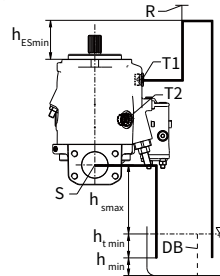
Mounting above tank

Mounting above the tank means that the piston pump is mounted above the lowest level of the tank and that the difference in height, $h_{ES,min}$, must be at least 25 mm in order to prevent the piston pump from emptying out in Fig. 7. Observe the maximum permissible suction height, $h_{s,max} = 800$ mm. The use of check valves in the drain line is only permitted in individual cases. Information can be obtained by contacting Hengli.

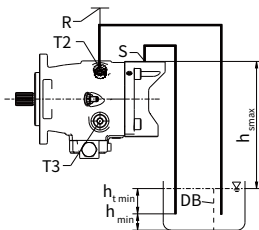
- Figure 6
Air bleed: R
Filling: T1 or T2



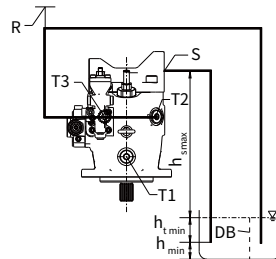
- Figure 7
Air bleed: R
Filling: T1



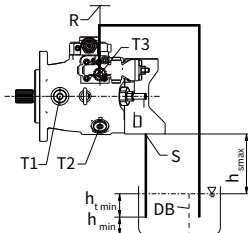
- Figure 8
Air bleed: R
Filling: T2



- Figure 9
Air bleed: R
Filling: T2



- Figure 10
Air bleed: R
Filling: T3



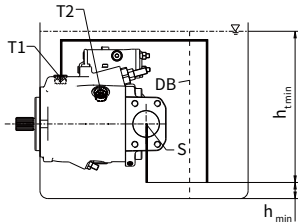
Note: " " As the pump cannot be fully vented and oiled in this position, it should be vented and oiled in a horizontal position before installation.

Installation type

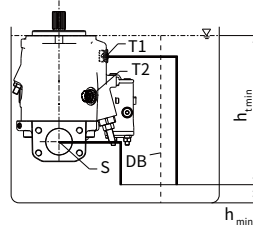
In-tank mounting

In-tank mounting means that the axial piston pump is mounted in the tank, below the lowest oil level. The axial piston pump is completely below the hydraulic oil. If the minimum oil level is equal to or lower than the upper edge of the pump, see section "Mounting above the tank". Piston pumps with electrical components (e.g. electronic controllers, sensors) cannot be mounted below the oil level in the tank.

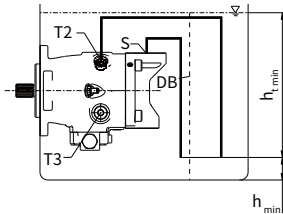
- **Figure 11***
Air bleed: Through the highest available port T1



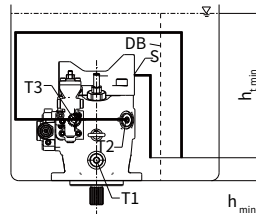
- **Figure 12***
Air bleed: Through the highest available port T1



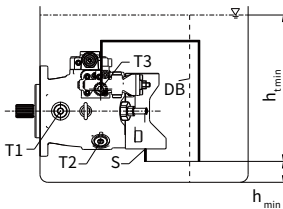
- **Figure 13***
Air bleed: Through the highest available port T2



- **Figure 14***
Air bleed: Through the highest available port T3



- **Figure 15***
Air bleed: Through the highest available port T3



Note: "*" As the position is below the hydraulic oil level, oil filling is carried out automatically via the open ports T1, T2 or T3.

Instructions

Rules of use

- △ This fluid technology product leaves the factory in a technically safe and perfect condition. In order to maintain this condition and ensure safe operation, the user must observe the instructions and warnings contained in this document.
- △ The fluid technology products may only be installed and integrated into hydraulic systems by qualified specialists who have knowledge of and observe the general standards for this technology. In addition, it must be ensured, if necessary, that the selected product is suitable for its specific application and meets environmental and legal requirements.
- △ The products may only be used as pumps in hydraulic systems.
- △ The products must operate within the specified technical parameters.

Tips for use

The hydraulic components are to be integrated into the unit with the aid of commercially available, compliant connecting elements (bolted connections, hoses, pipes...). Before dismantling, stop the hydraulic system as specified (especially in the case of equipment with hydraulic accumulators).



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