



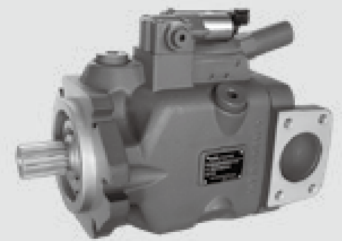
# HP5V SERIES

## Swash-plate Type Axial Piston Variable Displacement Pump

HP5V series piston pump is high pressure open circuit axial piston pump specially designed with a new structure, and has lighter weight, higher power density, and longer life compared with HP3V pump.

Apply to open hydraulic circuit

Displacements (cc/rev):	(S)28	28	45	60	76	85	105
Rated pressure (bar):	250	320	320	250	320	280	350
Peaking pressure (bar):	315	350	350	280	350	320	400



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## Features

- Variable pump in swash-plate design for open circuit.
- High continuous pressure.
- Exceptional self-priming capability.
- Available with American (SAE) and Japanese (JIS) mounting flanges and shafts.
- Excellent reliability and long life.
- High power to weight ratio.
- Variety of control options.
- Optional through drive.
- Quick control response.
- Low pressure pulsation and low noise.
- Developed for engineering, mobile vehicles, industrial, other industrial application and agricultural machinery.

## Technical Data

Size	HP5VS28	HP5V28	HP5V45	HP5V60	HP5V76	HP5V85	HP5V105
Displacement (cc/rev)	28	28	45	60	76	85	104.3
Pressure	Rated pressure (bar)	250	320	320	250	320	350
	Peak pressure (bar)	315	350	350	280	350	400
Rotation speed	Max for self-priming <sup>1</sup> (rpm)	3000	3000	2700	2400	2400	2200
	Max <sup>2</sup> (rpm)	3600	3600	3250	3000	3000	2600
Weight (Kg)	17.2	20	24	24	28	28	45
Quantity of oil to fill pump case (L)	0.55	0.6	0.6	0.6	0.8	0.8	1
Input torque rating (Nm)	198	155	225	225	400	400	530
Temperature Range (°C)		-20~95					
Viscosity Range (mm <sup>2</sup> /s)		10-1000 <sup>*3</sup> (The best use of viscosity range 16~36 mm <sup>2</sup> /s)					

### Permissible through drive torque

Input shaft code	S1	S2	S3	S4	S5	K1	K2	K3
Input torque rating (Nm)	171	272	552	925	1470	145	230	430

1. Steady state suction pressure should be 0 bar and above(at normal condition);
2. If suction pressure less than 0 bar, Boost pressure should be required;
3. In case of 200-1000mm<sup>2</sup>/s, please allow system to warm up before using machine.

## Type introduction

HP5V	76	/	A	V	1	O	R	B2	S1	M	S	—	L1/1	—	D	2	—	T
①	②		③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪		⑫		⑬	⑭		⑮

### Product series

①	Product series	HP5V
	Compact product series	HP5VS

### Displacement

②	Displacement	cc/rev	28	45	60	76	85	105
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### Design series

③	Design series	A Series	A
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### Seals

④	Seals	FKM (Viton rubber: DIN ISO 1629)	V
		NBR (Nitrile rubber: DIN ISO 1629)	N

### Hydraulic circuit

⑤	Hydraulic circuit	Open circuit	I
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### Through Drive

		S28	28	45	60	76	85	105	Code	
⑥	Without through drive	●	●	●	●	●	●	●	O	
	Without through drive, SAE flange ports, rear	●	○	●					NO1	
	Without through drive, Thread ports, rear			●					NO2	
	Standard configuration with gear pump 6cc/rev			●	●	●	●	○	X1	
	Standard configuration with gear pump 10cc/rev			○	○	○	○	○	X2	
	Mounting Flange	Spline shaft								
	SAE A 82-2	SAE J744-16-4 9T 16/32DP		●	●	●	●	●	●	A1
		SAE J744-19-4 11T 16/32DP			○	○	●	●	●	A2
	SAE B 101-2	SAE J744-22-4 13T 16/32DP	○	●	●	●	●	●	●	B1
		SAE J744-25-4 15T 16/32DP			●	●	●	●	●	B2
	SAE C 127-2	SAE J744-32-4 14T 12/24DP					●	●	○	C1
		SAE J744-38-4 17T 12/24DP							○	C2
SAE C 127-4	SAE J744-32-4 14T 12/24DP					●	●	●	C3	
	SAE J744-38-4 17T 12/24DP							●	C4	

## Type introduction

### Direction of Rotation

⑦	Viewed on drive shaft	Clockwise	R
		Counter-clockwise	L

### Input Mounting flanges

⑧	Mounting flanges size	S28	28	45	60	76	85	105	Code
	SAE B 101-2	●	●	●	●				
SAE C 127-2						●	●	●	C2
SAE C 127-4						●	●	●	C4

### Input Shaft

⑨	Shaft size	S28	28	45	60	76	85	105	Code
	SAE J744-22-4 13T 16/32DP	●	●	●	●	○	○		
SAE J744-25-4 15T 16/32DP			●	●	●	●			S2
SAE J744-32-4 14T 12/24DP						●	●	●	S3
SAE J744-38-4 17T 12/24DP								●	S4
SAE J744-44-4 13T 8/16DP								●	S5
SAE J744-22-1 B6.35×28 straight shaft	●	●							K1
SAE J744-25-1 B6.35×32 straight shaft			●	●					K2
SAE J744-32-1 B7.94×44 straight shaft						●	●		K3
ISO straight shaft (non through shaft)		●	●	●	●	●	●	●	P

### Thread type of Flange Fixing Port

⑩	Thread type	Metric threads	M
		UNC threads	S

### Connection type (except inlet and outlet port)

⑪	UNC port, ISO 11926	A
	BSPPG thread, JIS B2351	G
	Metric port, ISO 9974	M

## Type introduction

### Control type

Control type		S28	28	45	60	76	85	105	Code	
⑫	Apply to constant displacement pump	○	○	○	○	○	○	○	N	
	Pressure cut-off	Only pressure control	●	●	●	●	●	●	○	DR
		Electro-hydraulic pressure control, positive control	○	○	○					ER1
		Electro-hydraulic pressure control, negative control	●	●	●	●	●	●	●	ER2
		+Load sensing	●	●	●	●	●	●	○	L1
		Remotely operated	●	●	●	●	●	●	○	P0
	Power Control	Pressure cut-off+ Load sensing	●		●	●	●	●	●	L1/1
		Remotely operated+ Load sensing	●		●	●	●	●	○	P0/1
		Electrically (negative control) +Pressure cut-off+ Load sensing	●				●	●	○	L1/1-E0
		Hydraulic control + Pressure cut-off + Load sensing					●	●	○	L1/1-H0
+Load sensing			●						LP1	

### Connector for solenoids

Connector for solenoid		S28	28	45	60	76	85	105	Code
⑬	Without solenoid	●	●	●	●	●	●	●	Blank
	AMP Junior timer; 2 contact pin, (without suppressor diode)					●	●	○	A
	Deutsch DT04-2P; 2 contact pin, (without suppressor diode)	●	●	●	●	●	●	●	D

### Input Voltage

⑭	Without solenoid	Blank
	12VDC	1
	24VDC	2

### Application Conditions

Application		S28	28	45	60	76	85	105	Code
⑮	Apply to excavator	●	●	●	●	●	●	●	T
	Other mobile machinery, construction machinery, industrial application	●	●	●	●	●	●	●	Blank

Remark: ● = available; ○ = On request;

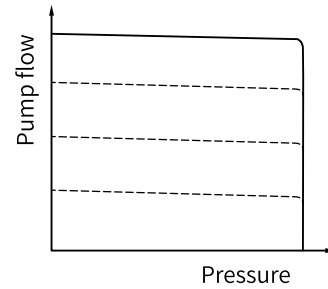
# Regulators introduction

**Code:**

**L1(DR)**

**Control Type :**

- 1. Load sensing**  
Standard setting: 15bar  
Adjustment range: 10bar-21bar
- 2. Pressure Cut-off**  
Standard setting: 320bar  
Adjustment range: 21bar-320bar



**Function and Features: Load sensing + Pressure Cut-off**

The load sensing control is a flow control option that operates as a function of the load pressure to regulate the pump displacement to match the actuator flow requirement. The load sensing control compares pressure before and after the sensing orifice and maintains the pressure drop across the orifice (differential pressure  $\Delta p$ ) and with it the pump flow constant.

If the differential pressure  $\Delta p$  increases, then the pump displacement decreases, and if the differential pressure  $\Delta p$  decreases, then the pump displacement increases until the pressure drop across the sensing orifice in the valve is restored.

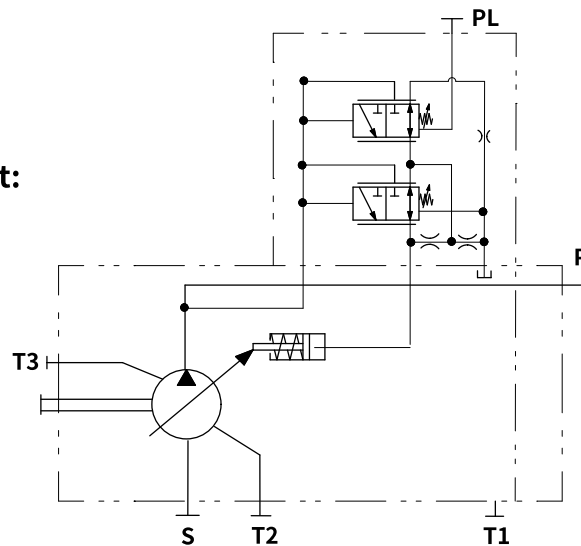
$$\Delta p = P_p - P_L$$

Pump displacement is controlled to match the flow requirement as a function of the system differential pressure (load pressure vs delivery pressure). In addition, there is a pressure cut off function incorporated into the control.

The pressure cut off control keeps the pressure in a hydraulic system constant within its control range even under varying flow conditions, the variable pump only moves as much hydraulic fluid as is required by the actuators. If the operating pressure exceeds the set point set at the pressure control valve, the pump displacement is automatically swivelled back until the pressure deviation is corrected.

"DR" control is on the basis of "L1" control, tighten the load sensitive valve adjust screw, and the load sensitive valve doesn't work.

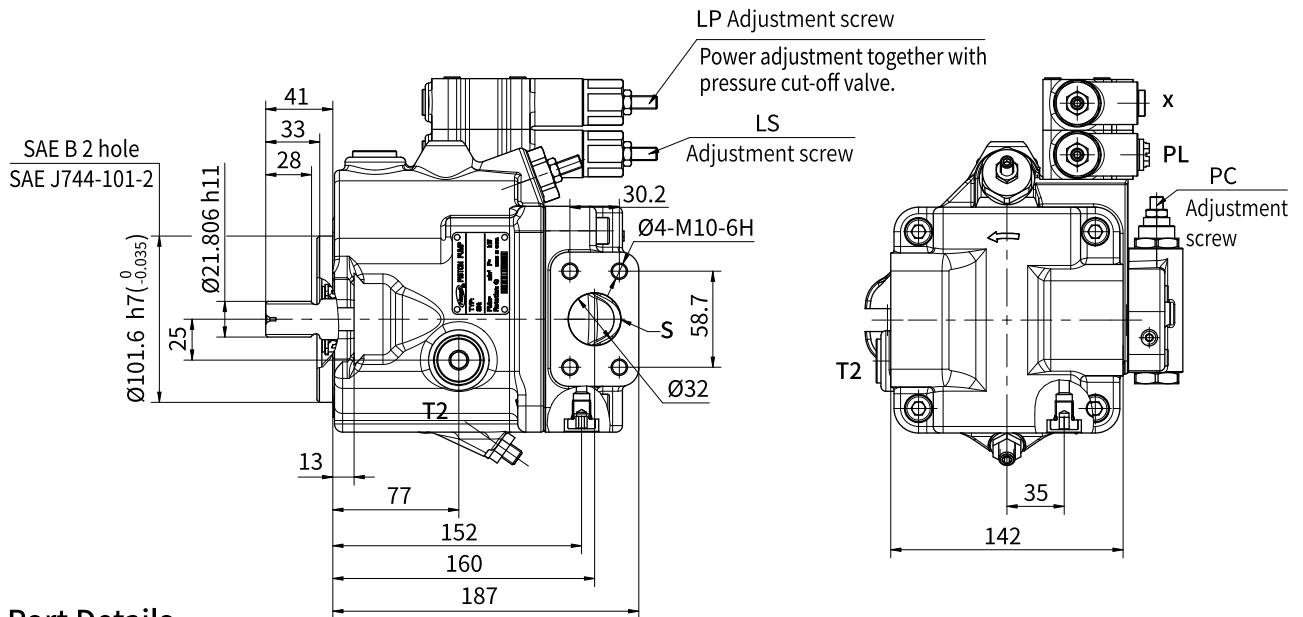
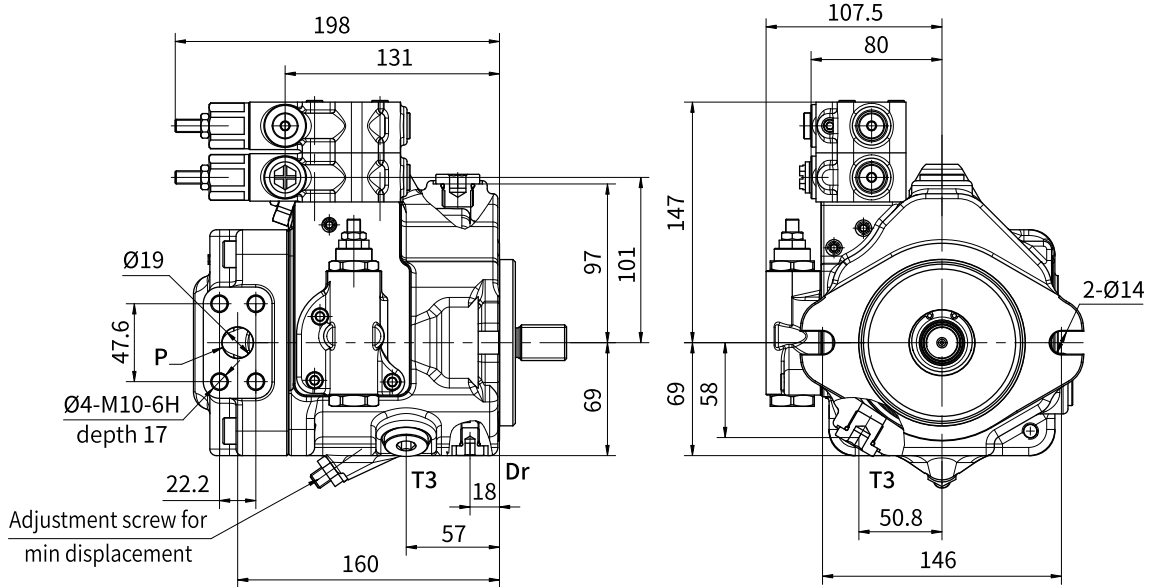
**Hydraulic Circuit:**



# Installation size

## HP5V28 installation size

Displacement is adjustable  
 HP5V28 with Cut-off/Load Sense Control with torque limit  
 (Clockwise Rotation)  
 For the CCW pump just reverse the inlet and outlet port.

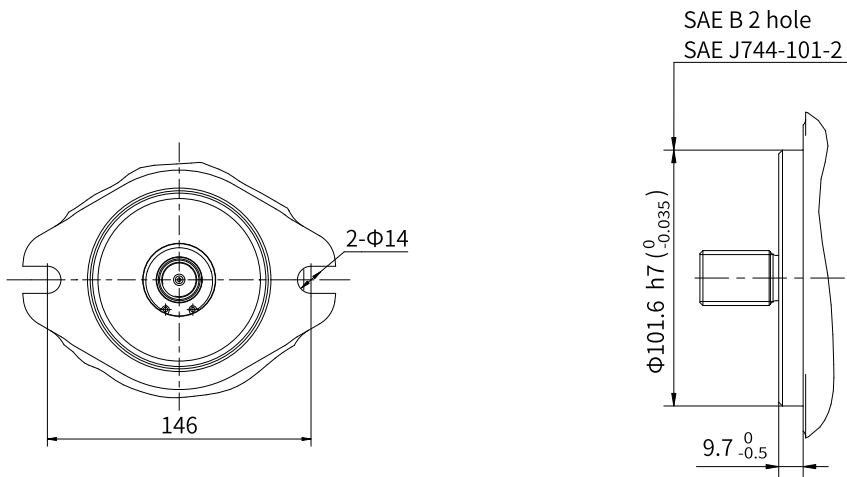


### Port Details

Port Name	Port Size and Description	Tightening Torque (N-m)	
P	Working port 3/4"SAE J518C code 61 (5000psi)	M(metric) M10×1.5 (depth 17mm)	57
		S(UNC) 3/8-16UNC-2B (depth 17mm)	
S	Suction port 1-1/4"SAE J518C code 61 (3000psi)	M(metric) M10×1.5 (depth 17mm)	57
		S(UNC) 7/16-16UNC-2B (depth 17mm)	
T1、 T2、 T3	Case drain port SAE J1926/1 ( 3/4-16UNF-2B ) depth 16mm	98	
PL	LS Control port G 1/4, depth 12mm	12	
Dr	Air bleed port SAE J1926/1 ( 7/16-20UNF-2B ) depth11.5mm	12	

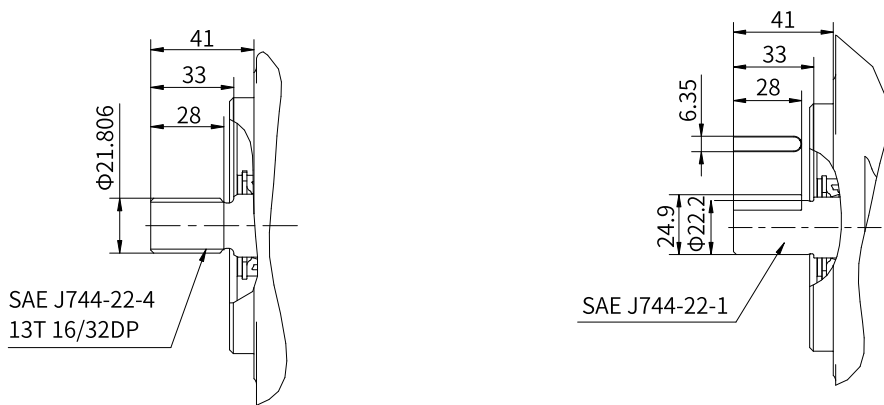
## Installation size

### HP5V28 Mounting Flange



SAE "B2" type

### HP5V28 Input Shaft type



"S1" type spline shaft

"K1" type straight shaft