

A10V(S) 变量柱塞泵

配件示意图



A10VSO系列柱塞泵配件

1、摇摆 swash plate

2、回程盘 retainer plate

3、柱塞 piston shoe

4、顶针 press pin

5、球铰 ball guide

6、垫片 spacer

7、缸体 cylinder block

8、轴瓦 saddle bearing

9、卡簧 snap ring

10、传动轴 drive shaft

11、配油盘 valve plate

12、ED72 控制阀 ED72 control valve

13、LR 阀 LR valve

14、小轴承 small bearing

15、大轴承 big bearing

16、大弹簧 coil spring

17、控制阀芯阀套 control piston

118、反向阀芯阀套 counter piston

A10V(S) 变量柱塞泵

结构示意图

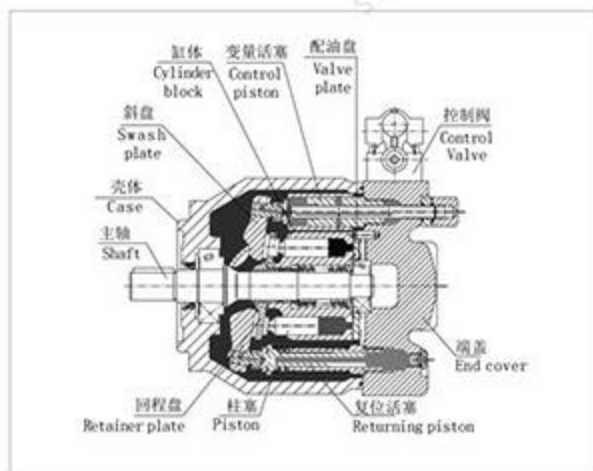
OH-A10V(S) 0/31 系列变量柱塞泵

Variable Displacement Piston Pump OH-A10V(S) 0/31

概述 Overview

OH-A10V(S) 0/31 系列变量柱塞泵均为斜盘式轴向柱塞变量泵，分别为工业用和行走机械用设计，都是专为开式回路液压驱动设计的，采用通轴结构，额定工作压力可达28MPa。

OH-A10V(S) 0/31 series variable displacement piston pump swash plate axial plunger variable pump, respectively for industrial use and for mobile machinery design, is designed for open loop hydraulic driven design, adopts a shaft structure, rated working pressure up to 28Mpa.



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特点

- ※ 泵的流量正比于泵的转速和排量，通过调节斜盘摆角调节排量，实现无级变量；
- ※ 有多种变量控制形式，控制响应时间短；
- ※ 允许连续运行的工作压力可达28MPa；
- ※ 有两个壳体泄油口；
- ※ 高的功率/重量比；
- ※ 驱动轴能承受轴向及径向负载；
- ※ 采用通轴结构，可形成组合泵；

Features

- ※ The capacity of the pump is in proportion to its rotating speed and displacement; the stepless adjustment of the displacement can be materialized by regulating the swivel angle of its swash plate.
- ※ There are many variable control forms, Fast control response;
- ※ Allows for continuous operating pressures up to 28MPa;
- ※ There are two shell discharge ports;
- ※ High power / weight ratio;
- ※ The drive shaft is able to bear the axial and radial load;
- ※ With through-shaft structure, able to form combination pump;

OH-A10VS0/31 变量柱塞泵

Variable Displacement Piston Pump OH-A10VS0/31

型号标识 Type Code

OH-		A10VS	0	28	DR	/	31	R	—	V	P	A	12	KB3
	1	2	3	4	5		6	7		8	9	10	11	12

1-工作介质 Operating Medium

矿物油 Mineral oil (无代号 No Code)	
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2-结构分类 Machinery Classification

轴向柱塞, 斜盘式, 可变量, 工业用 Axial piston, swash plate design, variable, used in industry	A10VS
轴向柱塞, 斜盘式, 可变量, 行走机械用 Axial piston, swash plate design, variable, used in industry	A10V

3-运行模式 Operational Mode

开式回路 Open circuit	0
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4-规格 Size

公称排量 Nominal displacement mL/r	18	28	45	71	100	140	
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5-控制机构 Control Devices

直接控制, 两位调节 Two point control, directly operated DG	●	●	●	●	●	●	DG
压力控制 Pressure Control DR	●	●	●	●	●	●	DR
远程压力控制 Remote pressure control DRG	●	●	●	●	●	●	DRG
压力流量控制 Pressure and flow control DFR	●	●	●	●	●	●	DFR
压力流量控制 Pressure and flow control DFR1	●	●	●	●	●	●	DFR1
压力功率控制 Pressure and power control DLR	-	●	●	●	●	●	DLR
压力流量功率控制 Pressure and flow and power control DFLR	-	●	●	●	●	●	DFLR

6-系列 Series

	31
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7-旋转方向 (从轴端看) Rotating Direction (View on Shaft End)

顺时针 Clockwise	R
逆时针 Counterclockwise	L

8-密封 Seals

丁腈橡胶 NBR, 轴封氟橡胶 Shaft seal FKM	P
氟橡胶 Viton FKM	V

图表说明 Chart shows: ●=可以供货 Available, ○=在准备中 In preparation, -=无 Not available

9-轴伸 Shaft End

	18	28	45	71	100	140	
平键轴伸Keyed shaft DIN6885	●	●	●	●	●	●	P
英制平键轴伸Parallel shaft SAE with key J744(ISO3019-1)	●	●	●	●	●	●	K
花键轴伸Splined shaft ANSI B92.1a, standard shaft	3/4"	7/8"	1"	1 1/4"	1 1/2"	1 3/4"	S
花键轴伸Similar to shaft S 较高通轴驱动转矩	3/4"	7/8"	1"	1 1/4"	-	-	R
花键轴伸Splined shaft to SAE J744, reduced diameter 不适用于通轴驱动not for through drive	5/8"	3/4"	7/8"	1"	1 1/4"	-	U
花键轴伸Splined shaft SAE	-	-	-	-	1 1/4"	-	W

10-安装法兰 Mounting Flange

	18	28	45	71	100	140	
ISO 2孔	●	●	●	●	●	-	A
SAE 2孔	●	●	●	●	●	●	C
ISO 4孔	-	-	-	-	-	●	B
SAE 4孔	-	-	-	-	-	●	D

11-工作油口 Service Line Ports

	18	28	45	71	100	140	
吸油口S和压力油口B在两侧, SAE法兰, 公制螺纹 Port S and port B at opposite sides, SAE flanged, metric	●	●	●	●	●	●	12
	-	-	-	●	-	-	42
吸油口S和压力油口B在两侧, SAE法兰, 英制螺纹 Port S and port B at opposite sides, SAE flanged, UNC mounting bolts	●	●	●	●	●	●	62
	-	-	-	●	-	-	92

12-通轴驱动 Through Drive

	18	28	45	71	100	140	
无通轴驱动 Without through drive	●	●	●	●	●	●	N00
带通轴驱动, 从泵连接尺寸如下 With through drive, the second pump connection dimension as follows							
安装法兰 Mounting flange	轴伸 Spline shaft	可接受的从泵 The second pump					
SAE82, 2孔	U轴5/8in9T16/32DP	OH10VS018/31		●	●	●	K01
SAE82, 2孔	S轴3/4in11T16/32DP	OH10VS018/31		●	●	●	K52
SAE101, 2孔	S轴7/8in13T16/32DP	OH10V028/31		-	●	●	K68
SAE101, 2孔	S轴7/8in13T16/32DP			-	●	●	K02
SAE101, 2孔	S轴1in15T16/32DP	OH10V045/31		-	-	●	K04
SAE127, 2孔	S轴1 1/4in14T12/24DP	OH10V071/31		-	-	●	K07
SAE127, 2孔	S轴1 1/2in17T12/24DP	OH10V0100/31		-	-	●	K24
SAE152, 4孔	S轴1 3/4in13T8/16DP	OH10V0140/31		-	-	-	K17
ISO80, 2孔	S轴3/4in11T16/32DP	OH10VS018/31		●	●	●	KB2
ISO100, 2孔	S轴7/8in13T16/32DP	OH10VS028/31		-	●	●	KB3
ISO100, 2孔	S轴1in15T16/32DP	OH10VS045/31		-	-	●	KB4
ISO125, 2孔	S轴1 1/4in14T12/24DP	OH10VS071/31		-	-	●	KB5
ISO125, 2孔	S轴1 1/2in17T12/24DP	OH10VS0100/31		-	-	●	KB6
ISO180, 4孔	S轴1 3/4in13T8/16DP	OH10VS0140/31		-	-	-	KB7
ISO 80, 2孔	平键轴 Φ18	OH10VS018/31		●	●	●	K51
SAE82, 2孔	平键轴 Φ19.05	OH10VS018/31		●	●	●	K40
ISO 100, 2孔	平键轴 Φ22	OH10VS028/31		-	●	●	K25

			18	28	45	71	100	140	
无通轴驱动 Without through drive			●	●	●	●	●	●	N00
带通轴驱动, 从泵连接尺寸如下 With through drive, the second pump connection dimension as follows									
安装法兰 Mounting flange	轴伸 Splined shaft	可接受的从泵 The second pump							
SAE101, 2孔	平键轴 Φ22.225	OH10VS028/31	-	●	●	●	●	●	K03
ISO 100, 2孔	平键轴 Φ25	OH10VS045/31	-	-	●	●	●	●	K26
SAE101, 2孔	平键轴 Φ25.4	OH10VS045/31	-	-	●	●	●	●	K05
ISO 125, 2孔	平键轴 Φ32	OH10VS071/31	-	-	-	●	●	●	K27
SAE127, 2孔	平键轴 Φ31.75	OH10VS071/31	-	-	-	●	●	●	K08
ISO 125, 2孔	平键轴 Φ40	OH10VS0100/31	-	-	-	-	●	●	K37
SAE127, 2孔	平键轴 Φ38.1	OH10VS0100/31	-	-	-	-	●	●	K38
ISO 180, 4	平键轴 Φ45	OH10VS0140/31	-	-	-	-	-	●	K59
SAE152, 4孔	平键轴 Φ44.45	OH10VS0140/31	-	-	-	-	-	●	K21

组合泵说明: 两台泵首尾串联, 即以通轴形式装配成一体, 称为组合泵, 串联的第二台泵称为从泵。

如果订购组合泵, 组合泵的型号为第一台泵的型号 + 第二台泵的型号。

Description of combination pump: Two pumps can be connected in series by their head and end, namely integrated to be a combination pump, by the means of through-shaft, and the second pump of the series combination is called the subordinate pump.

In case of placing an order, the combination pump model equals to the model of the first pump + the model of the second.

组合泵型号示例 Illustration of combination pump model: OH4VS045DR/31R-PPA12KB3 + OH10VS028DR/31R-PSA12N00

技术参数 Technical Data

■ 参数表 Parameters Table

规格 Size			18	28	45	71	100	140
排量 Displacement	V_{gmax}	mL/r	18	28	45	71	100	140
吸入口压力 (绝对压力) Pressure at suction port S (Absolute pressure)	最低压力 Minimum pressure	P_{smin} bar	0.8					
	最高压力 Maximum pressure	P_{smax} bar	10					
出油口压力 (绝对压力) Pressure at Outlet port B (Absolute pressure)	额定压力 Rated pressure	P_N bar	280					
	峰值压力 Peak pressure	P_{max} bar	350					
	最小压力 Minimum pressure	bar	10					
压力变化速率 Rate of pressure change	R_A	bar/s	16000					
泄油口 L ₁ 压力 (绝对压力) Drain port L ₁ pressure (Absolute pressure)	P_t	bar	≤2					
最大转速 ^① Max. speed $P_s = 1\text{bar}$	$V_g = V_{gmax}$ 时	n_{max} r/min	3300	3000	2600	2200	2000	1800
	$V_g < V_{gmax}$ 时	r/min	3900	3600	3100	2600	2400	2100
最大流量 Max. flow	$n = n_{0max}$ 时	q_{vmax} L/min	59.4	84	117	156	200	252
	$n = 1500$ r/min 时	L/min	27	42	68	107	150	210

规格 Size			18	28	45	71	100	140	
排量 Displacement		$V_{e,max}$	ml/r	18	28	45	71	100	140
最大功率 Maximum power ($\Delta p = 280$ bar)	$n = n_{0,max}$ 时	$P_{0,max}$	kW	27.7	39	55	73	93	118
	$n = 1500$ r/min 时		kW	12.6	20	32	50	70	98
扭矩 Torque ($V_e = V_{e,max}$)	$\Delta p = 280$ bar 时	T_{max}	Nm	80.1	125	200	316	445	623
	$\Delta p = 100$ bar 时	T	Nm	28.6	45	72	113	159	223
旋转刚度 Torsional stiffness	轴伸 P Shaft extension P		Nm/rad	13158	25656	41232	80627	132335	188406
	轴伸 S Shaft extension S		Nm/rad	11087	22317	37500	71884	121142	169537
	轴伸 R Shaft extension R		Nm/rad	14850	26360	41025	76545	-	-
	轴伸 U Shaft extension U		Nm/rad	8090	16695	30077	52779	91903	-
	轴伸 K Shaft extension K		Nm/rad	13340	26189	43905	82112	135303	196844
旋转总成转动惯量 Moment of inertia of the rotating assembly		J	kgm ²	0.00093	0.0017	0.0033	0.0083	0.0167	0.0242
最大角加速度 Max. angular acceleration			rad/s ²	6800	5500	4000	3300	2700	2700
壳体容积 Volume of case			L	0.4	0.7	1.0	1.6	2.2	3.0
重量 Weight			kg	12	15	21	33	45	60
驱动轴的允许负载 Drive shaft Allowable load	最大轴向力 Max. axial force		N	700	1000	1500	2400	4000	4800
	最大径向力 Max. radial force		N	350	1200	1500	1900	2300	2800

1) $V_e = V_{e,max}$ 时的数值适用于吸油口 S 的进口压力为 $P_s = 1$ bar (绝对压力) 时的情况, 当进口压力 P_s 增加或排量减小, 则转速可增加, 当进口压力为 $P_{s,lim} = 0.8$ bar 时, 转速应减小至 90%。 $V_e < V_{e,max}$ 时的数值为转速极限。

1) Once $V_e = V_{e,max}$, the value is applicable to the inlet pressure at suction port S is $P_s = 1$ bar (absolute pressure), when the inlet pressure P_s increase or decrease the displacement, the speed can be increased, when the inlet pressure $P_{s,lim} = 0.8$ bar, the speed should be reduced to 90%. $V_e < V_{e,max}$ value when the speed limit.

技术参数 Technical Data

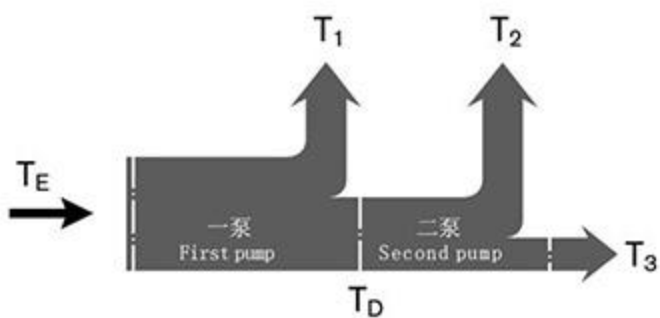
■ 允许的输入扭矩和通轴驱动扭矩 Permissible input torque and through drive torque

规格 Size			18	28	45	71	100	140	
扭矩 Torque ($V_{e,max}$ 且 $\Delta p = 3$ bar 时)		T_{max}	Nm	80.1	125	200	316	445	623
最大输入扭矩 ^① Max. input torque ^①	轴伸 Shaft P	T_{max}	Nm	88	137	200	439	857	1206
		Φ	mm	18	22	25	32	40	45
最大输入扭矩 ^② Max. input torque ^②	轴伸 Shaft S	T_{max}	Nm	124	198	319	626	1104	1620
		Φ	in	3/4	7/8	1	1 1/4	1 1/2	1 3/4

规格 Size			18	28	45	71	100	140	
扭矩 Torque ($V_{g,max}$ 且 $\Delta p=280$ bar时)		T_{max}	Nm	80	125	200	316	445	623
最大输入扭矩 ¹⁾ Max. input torque ¹⁾	轴伸 Shaft R	T_{max} Φ	Nm mm	160 3/4	250 7/8	400 1	644 1 1/4	- -	- -
	轴伸 Shaft K	T_{max} Φ	Nm in	104 3/4	145 7/8	212 1	433 1 1/4	750 1 1/2	1186 1 3/4
最大通轴驱动扭矩 Max. Through drive torque	轴伸 Shaft S	$T_{D,max}$	Nm	108	160	319	492	778	1266
	轴伸 Shaft R	$T_{D,max}$	Nm	120	176	365	548	-	-
	轴伸 Shaft K	$T_{D,max}$	Nm	104	145	212	433	750	1186

1) 适用于无径向力作用的传动轴 For drive shaft free of radial load

扭矩分布 Torque Distribution



■ 液压油 Hydraulic oil

工作粘度范围 Operating viscosity range

为了获得最佳效率和使用寿命,我们建议在以下最佳范围内选择工作粘度(工作温度下)

For optimum efficiency and service life, we recommend that the operating viscosity in the range of the following best (at operating temperature)

最佳工作粘度

Optimum operating viscosity $v_{opt} = 16 \sim 36 \text{ mm}^2/\text{s}$

粘度范围限制 Limits of viscosity range

在临界工作条件下,适用以下数值:

Under critical operating conditions the following values apply:

$v_{min} = 10 \text{ mm}^2/\text{s}$ 短时间 Short time ($t \leq 1 \text{ min}$)

最高允许壳体泄油温度为90℃

Max. permissible case drain temperature of 90℃

$v_{max} = 1000 \text{ mm}^2/\text{s}$ 短时间 Short time ($t \leq 1 \text{ min}$)

$p \leq 30 \text{ bar}$, $n \leq 1000 \text{ r/min}$, $\theta \geq -25 \text{ }^\circ\text{C}$

选择液压油的注意事项

Selection Considerations of hydraulic oil

为了选择正确的液压油,必须确定环境温度下油箱内的工作温度(开式回路)。在工作温度范围内选择液压油,以获得最佳粘度范围,建议选择相应情况下较高的粘度等级。壳体泄油温度受压力和输入速度的影响,并且始终高于油箱温度。但是,柱塞泵任何部位的温度均不得超过90℃。轴承区域的油液温度一般比壳体平均泄油温度高5℃左右。In order to select the correct hydraulic oil, it must be determined at ambient temperature within the tank temperature (open circuit). Select the hydraulic fluid in the working temperature range for optimum viscosity range, it recommended to choose where relevant, the higher viscosity grade.

The case drain temperature is influenced by pressure and input speed and is always higher than the tank temperature. However, any part of the piston temperature shall not exceed 90℃. The fluid temperature in the bearing area is generally higher than the average case drain oil temperature high around 5℃.

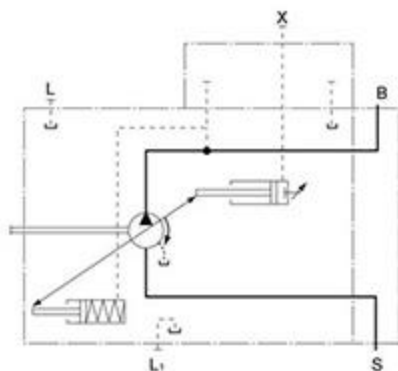
控制装置 Control Devices

1、直接控制DG Direct Control DG

通过在油口X施加一个外部切换压力使变量泵达到最小摆角。控制油可直接供给控制活塞,需要的最小压力为50bar。变量泵只能在 $V_{g,max}$ 与 $V_{g,min}$ 之间切换。
注意:油口X所需的切换压力与压力油口B的实际工作压力直接相关。

An external switching pressure can be applied to Port X to minimize the swivel angle of the variable pump. Control oil can be supplied directly for the control piston under the necessary minimum pressure of 50 bar. The variable pump can only be shifted between $V_{g,max}$ and $V_{g,min}$.

Note: the switching pressure needed at Port X is in direct correlation with the actual working pressure of Pressure Port B.



2、压力控制DR Pressure Control DR

压力控制使泵的出口压力保持恒定,因此变量泵只提供液压系统的执行元件所需的液压油流量。出口压力可在控制阀上无级设定。

The pressure control will keep the outlet pressure constant. Therefore, the variable pump only delivers as much fluid as required by the actuator elements of the hydraulic system. The outlet pressure can be set through stepless adjustment on the control valve.

3、远程压力控制DRG Remote Pressure Control DRG

恒压控制的功能及装置与DR相同。可在外部将一个溢流阀与油口X相连来实现远程控制。溢流阀不包括在DRG控制的供货范围内。

The function and equipment of constant control is similar to that of DR. The remote control can be realized by connecting an external relief valve with Port X. Relief valve is not included in the scope of supply for DRG control.

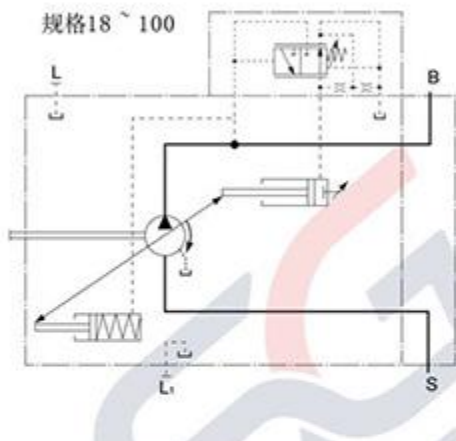
规格140



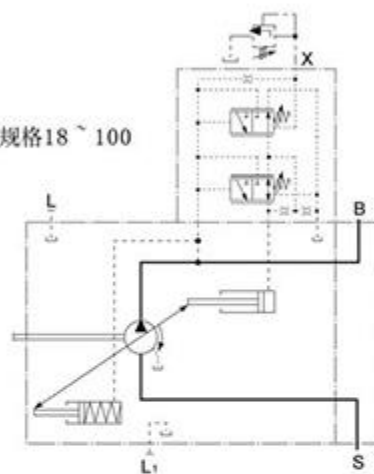
规格140



规格18~100



规格18~100



4、压力流量控制DFR/DFR1

Pressure and Flow Control DFR/DFR1

除了压力控制功能之外，泵的输出流量可通过安装于供油管线上节流阀上的压差进行调节，变量泵提供液压系统的执行元件实际需要的流量，不受工作压力变化的影响。压力控制优先于流量控制。

节流阀不包括在DFR/DFR1控制的供货范围之内。
DFR1控制阀的油口X与泵腔之间的节流孔被封闭。

5、压力流量功率控制DFLR

Pressure and Flow and Power Control DFLR

为了在工作压力变化的工况下获得恒定的驱动扭矩，通过改变输出流量，使流量和压力的乘积保持恒定，即泵的输出功率保持恒定。

流量控制只能在恒功率控制曲线以下进行。
节流阀不包括在DFLR控制的供货范围之内。

控制装置 Control Devices

In addition to the pressure control function, the outlet flow of the pump can be adjusted by the differential pressure of the throttle valve installed on the oil supply pipe. The variable pump delivers the fluid needed by the actuator elements of the hydraulic system and is free from the influence of the changes in actual working pressure. Pressure control takes precedence over flow control.

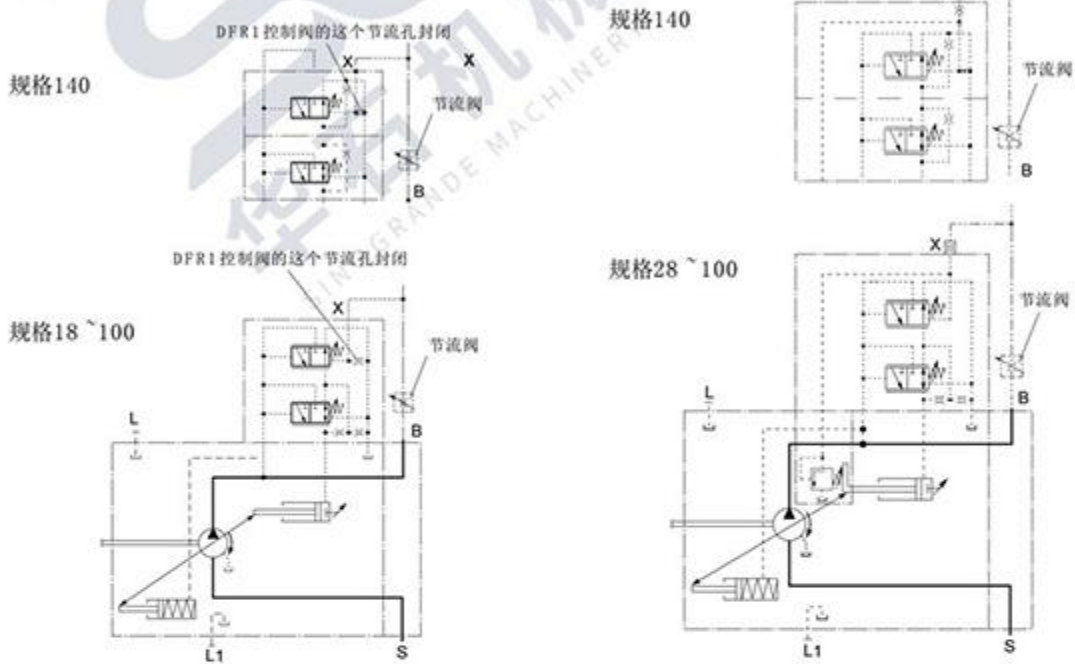
Relief valve is not included in the scope of supply for DFR/DFRI control.

The throttle orifice between Port X of DFRI control valve and the pump chamber is enclosed.

In order to gain constant driving torque under the working conditions with changeable working pressure, the output flow can be changed to keep the product of flow and pressure constant, namely to keep the output powerful of the pump constant.

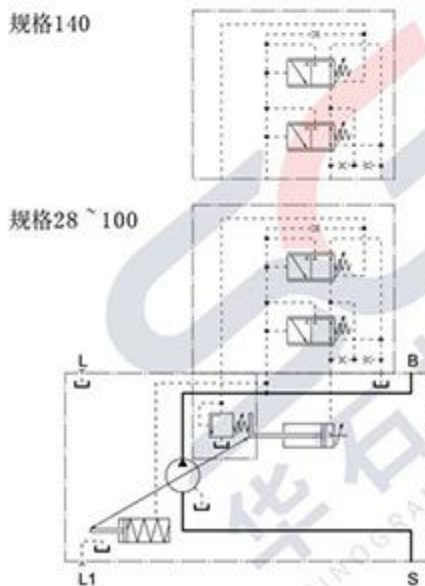
Flow control can only be conducted below the constant power control curve.

Relief valve is not included in the scope of supply for DFRL control.



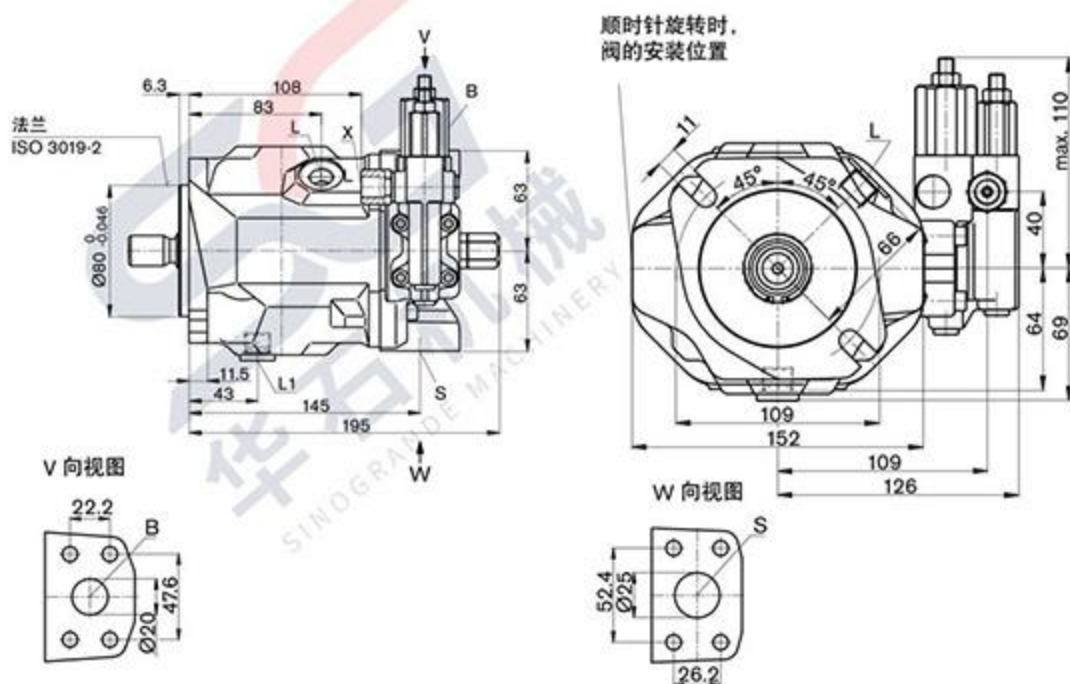
6、压力功率控制 Pressure and Power control DLR

这种控制方式没有流量控制。The control unit no flow control.



外形尺寸 规格18 (控制机构DR、DRG、DFR/DFR1)

Dimensions size 18 (Control devices DR, DRG, DFR/DFR1)

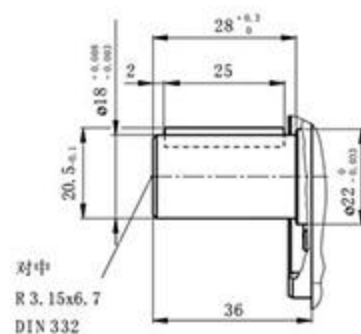
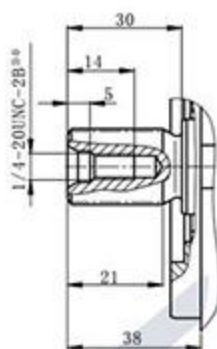


轴伸 Shaft

S 花键轴, 3/4 in 11T 16/32DP⁰²
(SAE J744)

R 花键轴, 3/4 in 11T 16/32DP⁰²
(SAE J744)

P 平键轴 DIN6885, A6×6×25



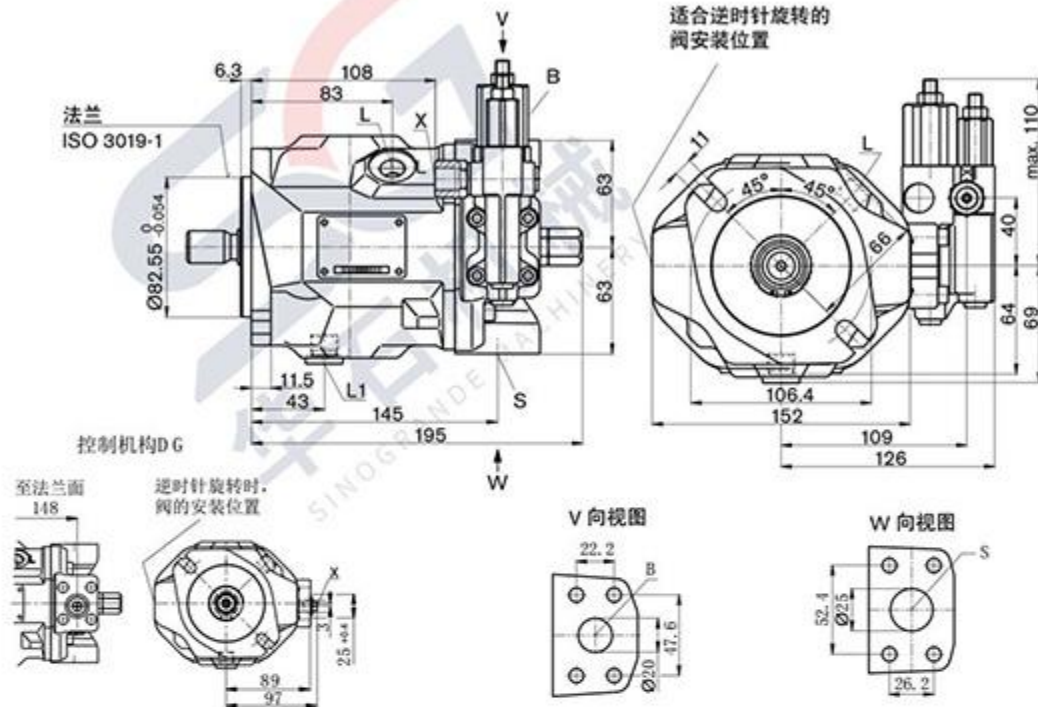
油口 Ports

- | | | |
|----|----------------------|--|
| B | 出油口Outlet port | 法兰Flange SAE J518 3/4in (标准系列Standard series) 螺孔Fixing thread M10深17 |
| S | 吸油口Suction port | 法兰Flange SAE J518 1in (标准系列Standard series) 螺孔Fixing thread M10深17 |
| L | 泄油口Drain port | M16×1.5深12 |
| L1 | 泄油口Drain port | M16×1.5深12 |
| X | 控制油口Control pressure | M14×1.5深12 |
| X1 | 控制油口Control pressure | G1/4深12 用于DG控制For DG Control |

注: 根据安装位置选择L口或L1口, 必须连接油箱。

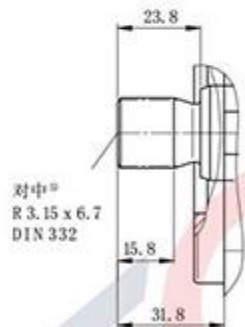
Dependent on the installation position, port L or port L1 must be connected.

外形尺寸 规格18 (控制机构DR、DRG、DFR/DFR1)
 Dimensions size 18 (Control devices DR, DRG, DFR/DFR1)

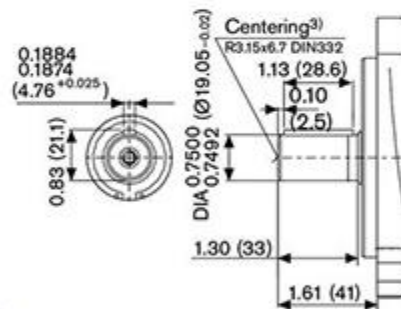


轴伸 Shaft

U 花键轴, 5/8 in 9T 16/32DP^{①②}
 (SAE J744)



K 花键轴, Parallel with key
 ISO 3019-1 22-1



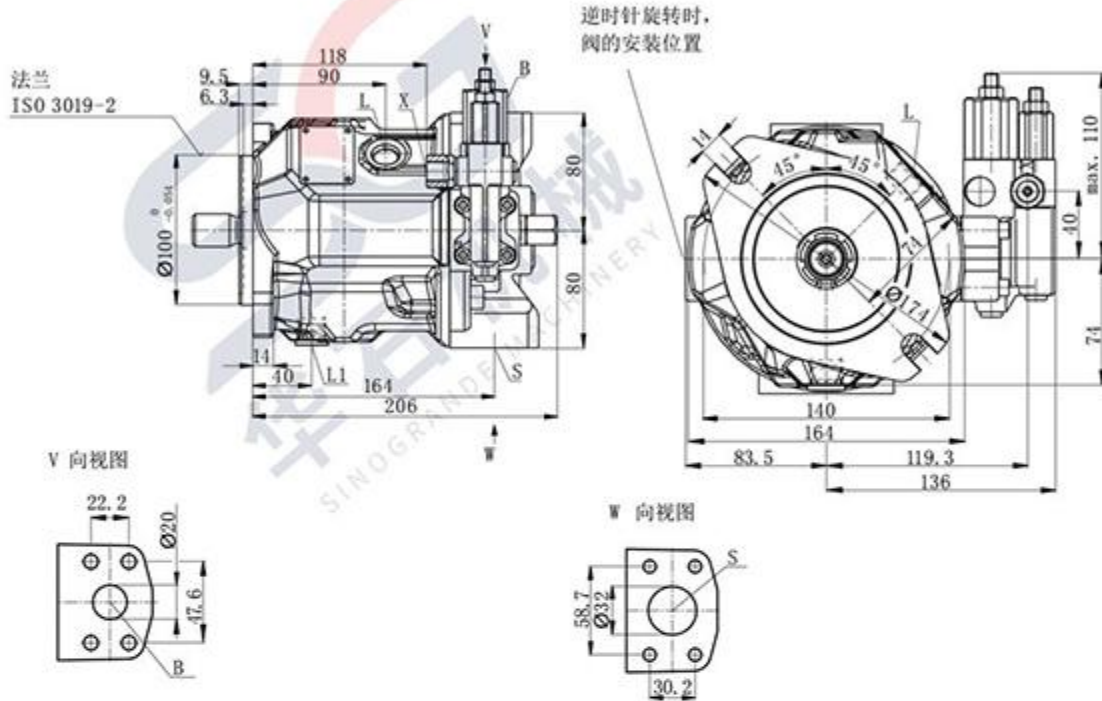
油口 Ports

B	出油口Outlet port	法兰Flange SAE J518 3/4in (标准系列Standard series) 螺钉孔Fixing thread M10深17
S	吸油口Suction port	法兰Flange SAE J518 1in (标准系列Standard series) 螺钉孔Fixing thread M10深17
L	泄油口Drain port	M16×1.5深12
L1	泄油口Drain port	M16×1.5深12
X	控制油口Control pressure	M14×1.5深12
X1	控制油口Control pressure	G1/4深12 用于DG控制For DG Control

注: 根据安装位置选择L口或L1口, 必须连接油箱。
 Dependent on the installation position, port L or port L1 must be connected.

外形尺寸 规格28 (控制机构DR、DRG、DFR/DFR1)

Dimensions size 28 (Control devices DR, DRG, DFR/DFR1)



轴伸 Shaft

S 花键轴, 7/8 in 13T 16/32DP¹⁾
(SAE J744)

R 花键轴, 7/8 in 13T 16/32DP¹⁾
(SAE J744)

P 平键轴 DIN6885, A6×6×32



油口 Ports

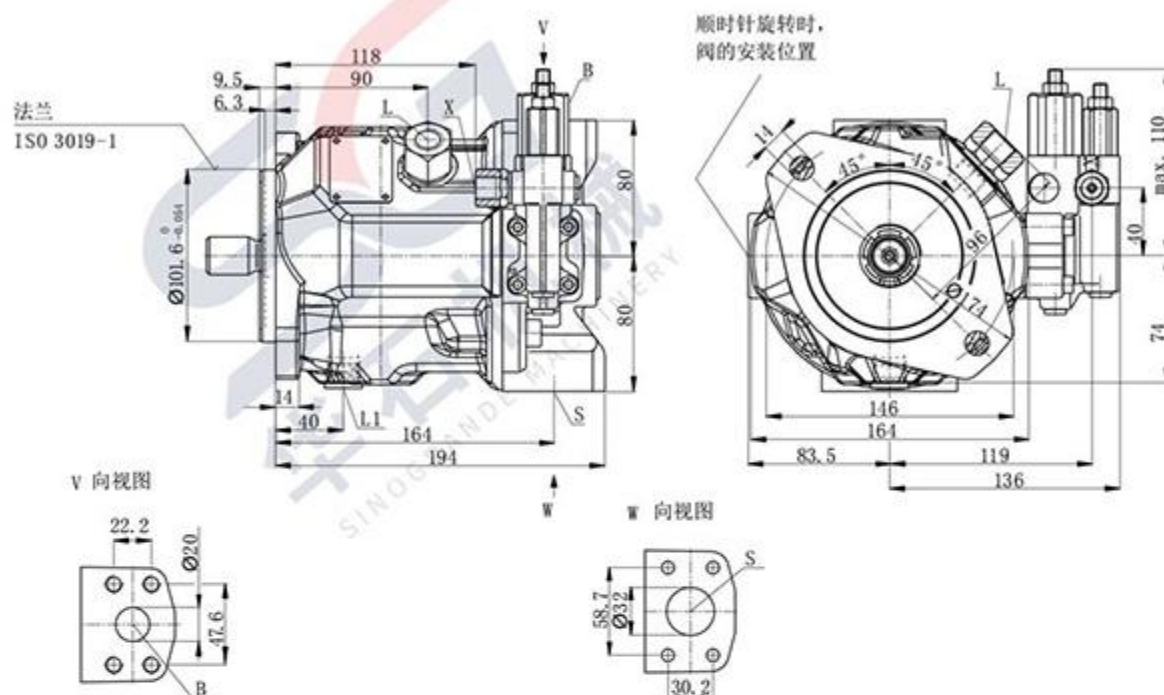
- | | | |
|----|----------------------|---|
| B | 出口口Outlet port | 法兰Flange SAE J518 3/4in (标准系列Standard series) 螺钉孔Fixing thread M10深17 |
| S | 吸油口Suction port | 法兰Flange SAE J518 1-1/4in (标准系列Standard series) 螺钉孔Fixing thread M10深17 |
| L | 泄油口Drain port | M18×1.5深12 |
| L1 | 泄油口Drain port | M18×1.5深12 |
| X | 控制油口Control pressure | M14×1.5深12 |
| X1 | 控制油口Control pressure | G1/4深12 用于DG控制For DG Control |

注: 根据安装位置选择L口或L1口, 必须连接油箱。

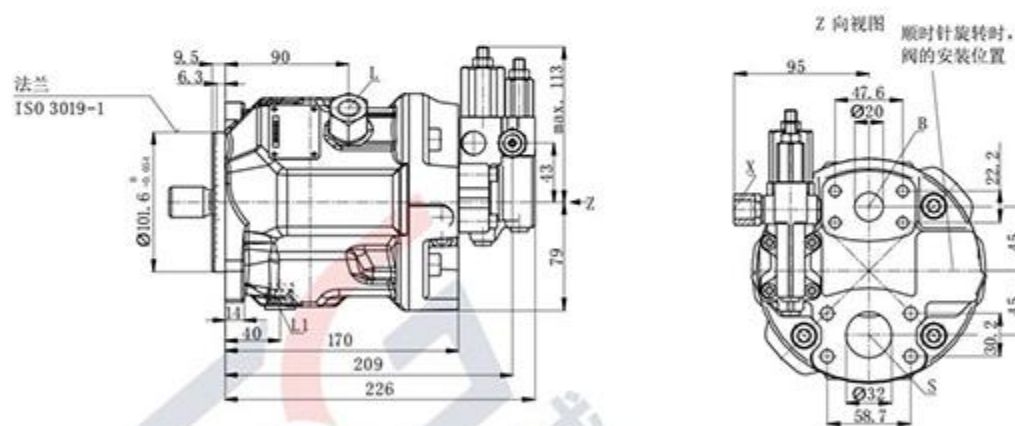
Dependent on the installation position, port L or port L1 must be connected.

外形尺寸 规格28 Dimensions size 28

工作油口12 (控制机构DG、DFLR、DLR) Port 11 (Control devices DG, DFLR, DLR)



工作油口11 (控制机构DG、DFLR、DLR) Port 11 (Control devices DG, DFLR, DLR)



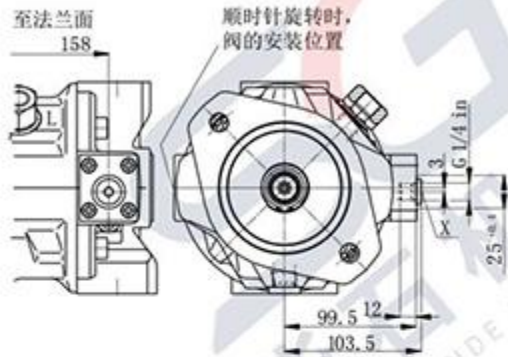
油口 Ports

B	出口口Outlet port	法兰Flange SAE J518 3/4in (标准系列Standard series) 螺钉孔Fixing thread M10深17
S	吸油口Suction port	法兰Flange SAE J518 1 1/4in (标准系列Standard series) 螺钉孔Fixing thread M10深17
L	溢油口Drain port	M18×1.5深12
L1	溢油口Drain port	3/4-16UNF-2B深14
X	控制油口Control pressure	M14×1.5深12
X1	控制油口Control pressure	G1/4深12 用于DG控制For DG Control

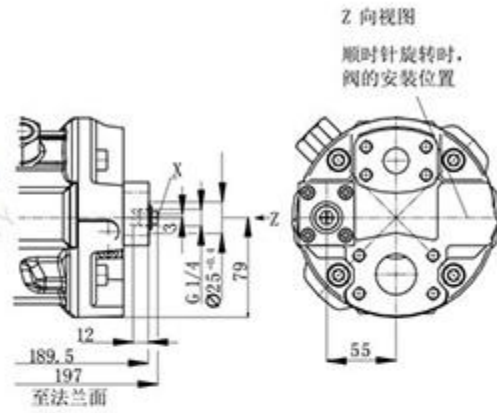
注：根据安装位置选择L口或L1口，必须连接油箱。

Dependent on the installation position, port L or port L1 must be connected.

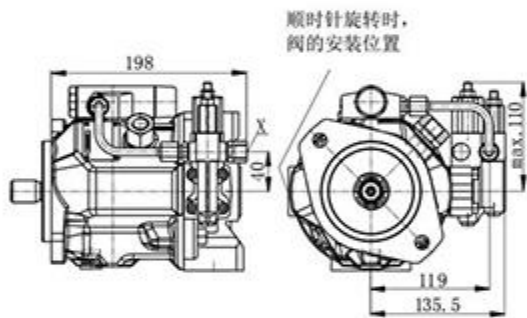
外形尺寸 规格28 Dimensions size 28
控制型式DG 工作油口12
Control devices DG port 12



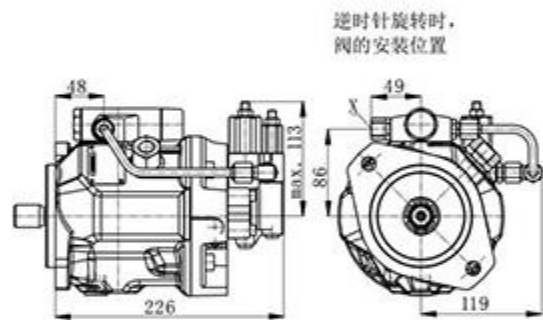
控制型式DG 工作油口11
Control devices DG port 11



控制型式DFLR、DLR 工作油口12
Control devices DFLR, DLR port 12

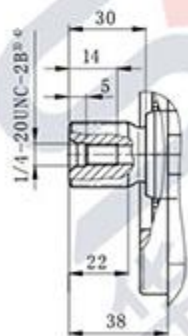


控制型式DFLR、DLR 工作油口11
Control devices DFLR, DLR port 11

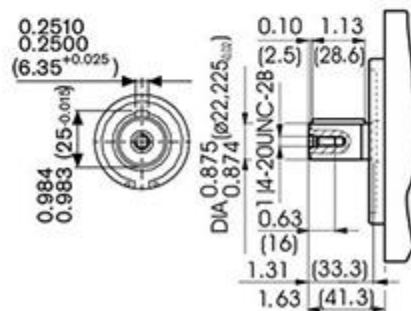


轴伸 Shaft

U 花键轴, 3/4 in 11T 16/32DP¹⁾
(SAE J744)

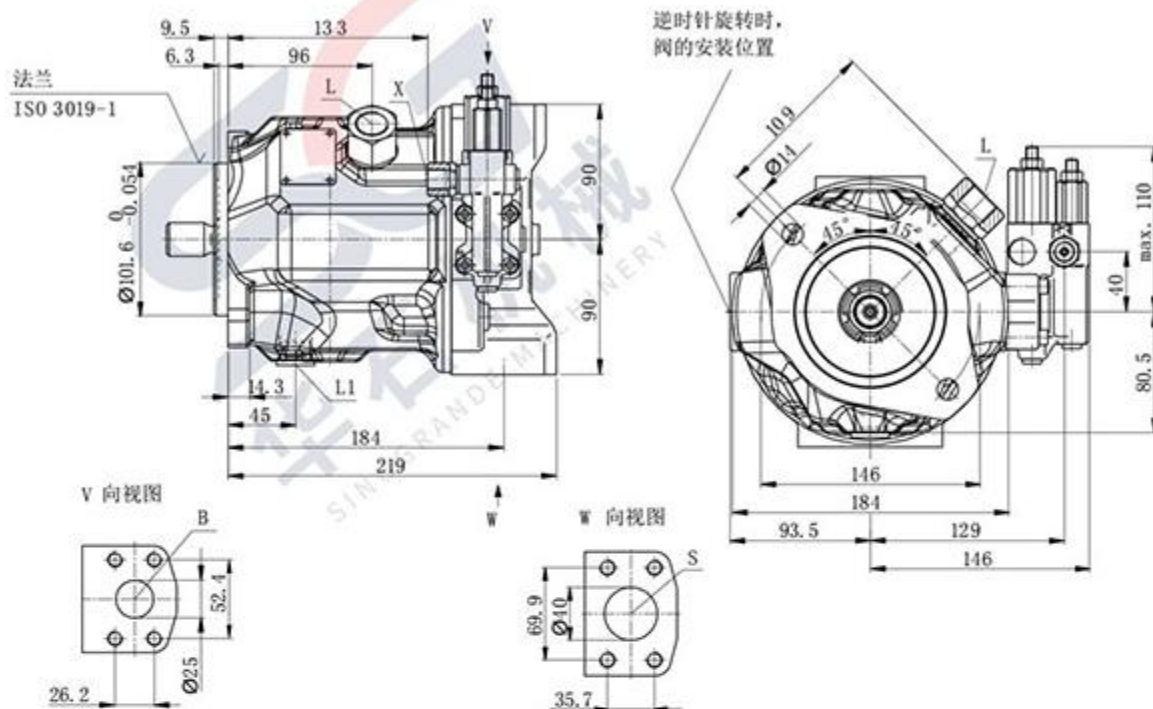


K 花键轴, Parallel with key ISO 3019-1 22-1

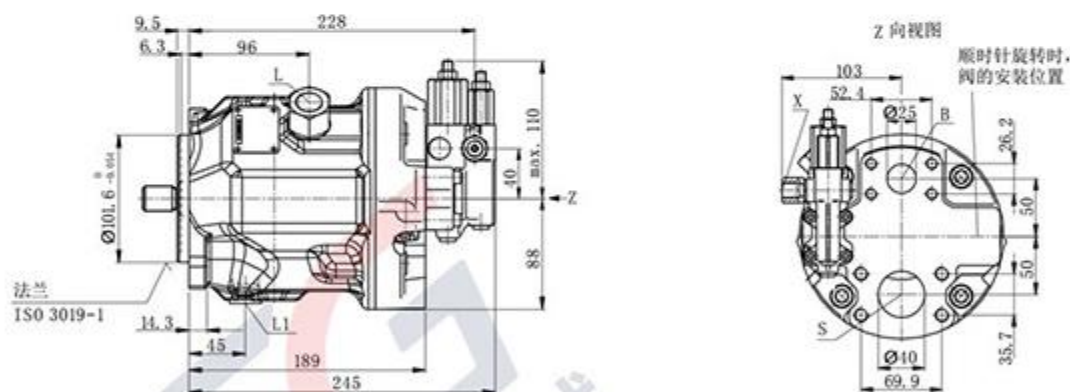


外形尺寸 规格45 Dimensions size 45

工作油口12 (控制机构DG、DFLR、DLR) Port 12 (Control devices DG, DFLR, DLR)



工作油口11 (控制机构DG、DFLR、DLR) Port 11 (Control devices DG, DFLR, DLR)



油口 Ports

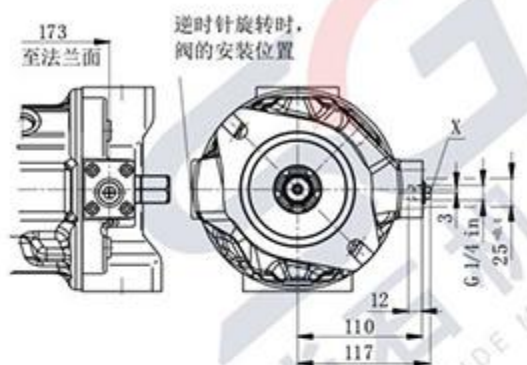
B	出油口Outlet port	法兰Flange SAE J518 1in (标准系列Standard series) 螺钉孔Fixing thread M10深17
S	吸油口Suction port	法兰Flange SAE J518 1 1/2in (标准系列Standard series) 螺钉孔Fixing thread M12深20
L	溢油口Drain port	M22×1.5深14
L1	溢油口Drain port	7/8-14UNF-2B深16
X	控制油口Control pressure	M14×1.5深12
X1	控制油口Control pressure	G1/4深12 用于DG控制For DG Control

注：根据安装位置选择L口或L1口，必须连接油箱。

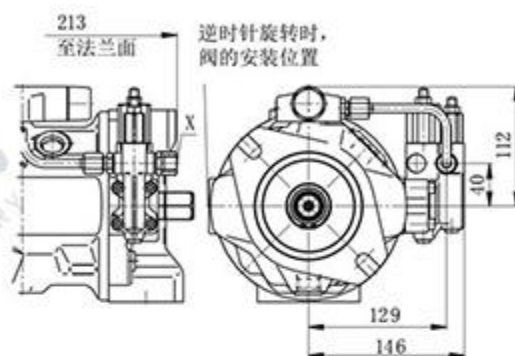
Dependent on the installation position, port L or port L1 must be connected.

外形尺寸 Dimensions

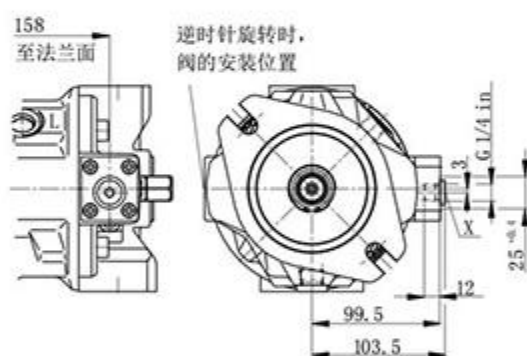
规格45 控制型式DG
Size 45 control devices DG



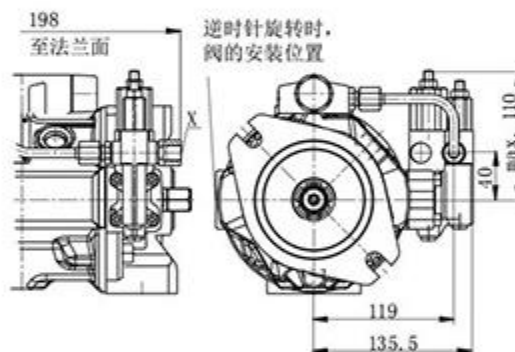
规格45 控制型式DFLR
Size 45 control devices DFLR



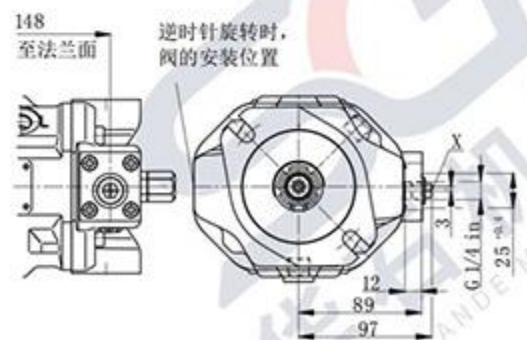
规格28 控制型式DG
Size 28 control devices DG



规格28 控制型式DFLR
Size 28 control devices DFLR

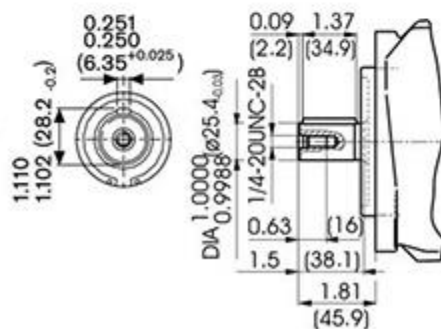


规格18 控制型式DG
Size 18 control devices DG



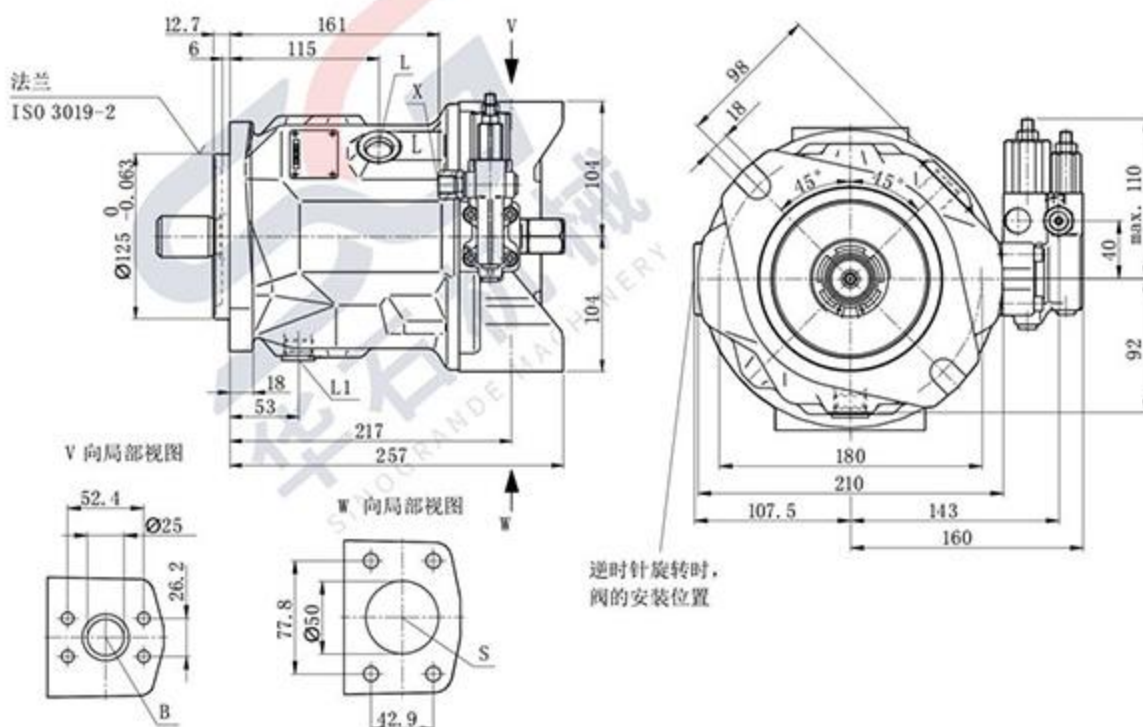
轴伸 Shaft

K花键轴, Parallel with key ISO 3019-1 25-1



外形尺寸 规格71 (控制机构DR、DRG、DFR/DFR1)

Dimensions size 71 (Control devices DR, DRG, DFR/DFR1)

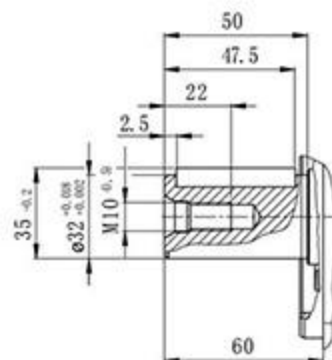
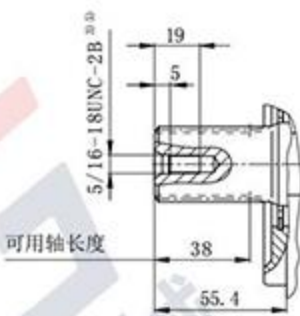
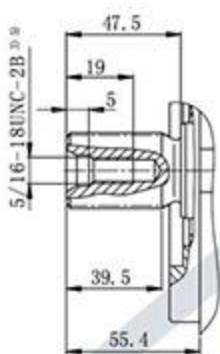


轴伸 Shaft

S 花键轴, 1 1/4 in 14T 12/24DP^①
(SAE J744)

R 花键轴, 1 1/4 in 14T 12/24DP^①
(SAE J744)

P 平键轴 DIN6885, A10×8×45



油口 Ports

B 出油口Outlet port

S 吸油口Suction port

L 泄油口Drain port

L1 泄油口Drain port

X 控制油口Control pressure

X1 控制油口Control pressure

法兰Flange SAE J518 1in (标准系列Standard series) 螺钉孔Fixing thread M10深17

法兰Flange SAE J518 2in (标准系列Standard series) 螺钉孔Fixing thread M12深20

M22×1.5深14

M22×1.5深14

M14×1.5深12

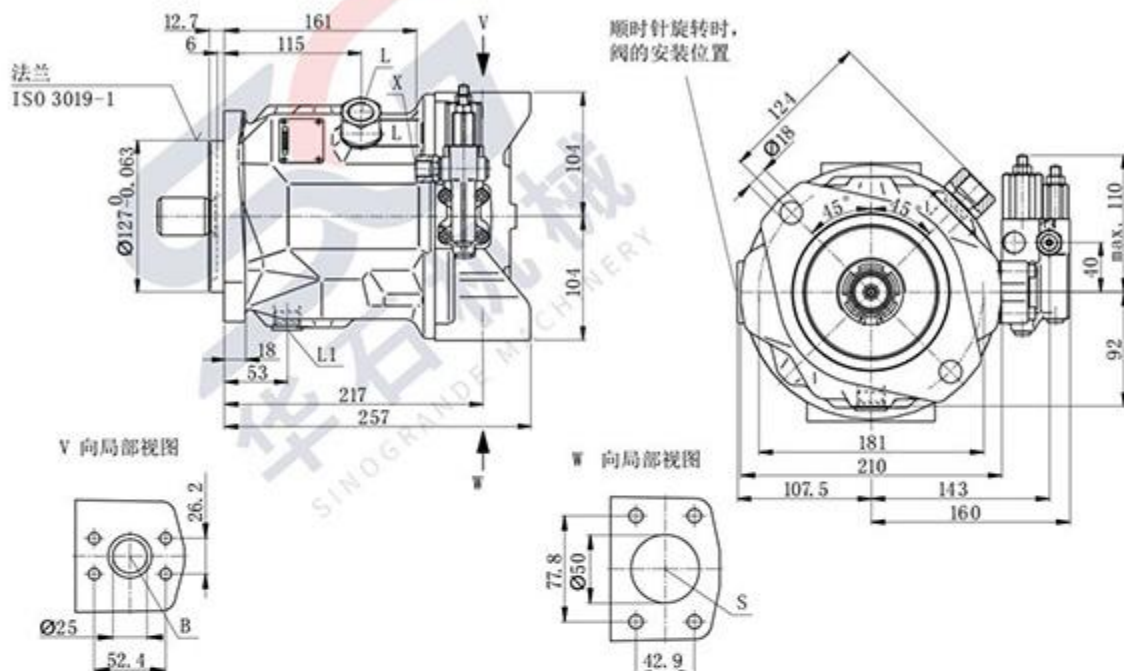
G1/4深12 用于DG控制For DG Control

注: 根据安装位置选择L口或L1口, 必须连接油箱。

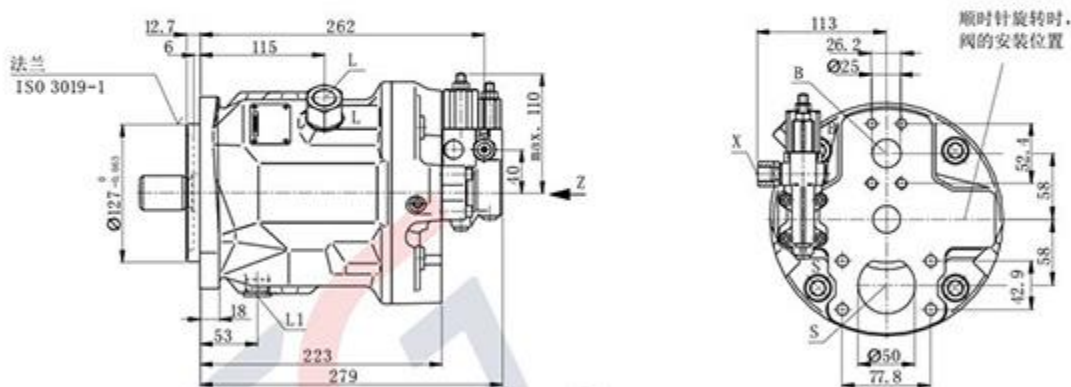
Dependent on the installation position, port L or port L1 must be connected.

外形尺寸 规格71 Dimensions size 71

工作油口42 (控制机构DG、DFLR、DLR) Port 42 (Control devices DG, DFLR, DLR)



工作油口41 (控制机构DG、DFLR、DLR) Port 41 (Control devices DG, DFLR, DLR)



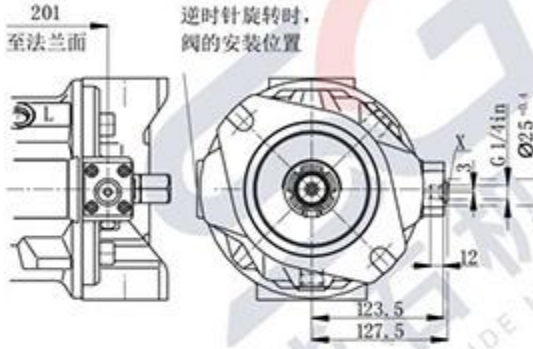
油口 Ports

B	出油口Outlet port	法兰Flange SAE J518 1in (标准系列Standard series) 螺钉孔Fixing thread M10深17
S	吸油口Suction port	法兰Flange SAE J518 2in (标准系列Standard series) 螺钉孔Fixing thread M12深20
L	泄油口Drain port	M22×1.5深14
L1	泄油口Drain port	7/8-14UNF-2B深16
X	控制油口Control pressure	M14×1.5深12
X1	控制油口Control pressure	G1/4深12 用于DG控制For DG Control

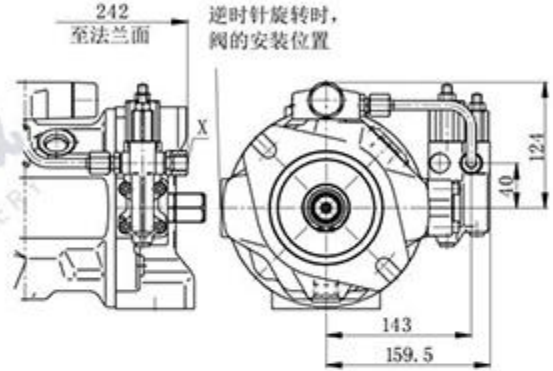
注: 根据安装位置选择L口或L1口, 必须连接油箱。

Dependent on the installation position, port L or port L1 must be connected.

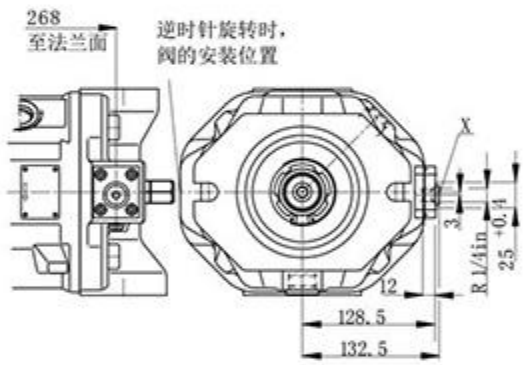
外形尺寸 Dimensions
规格71 控制型式DG
Size 71 control devices DG



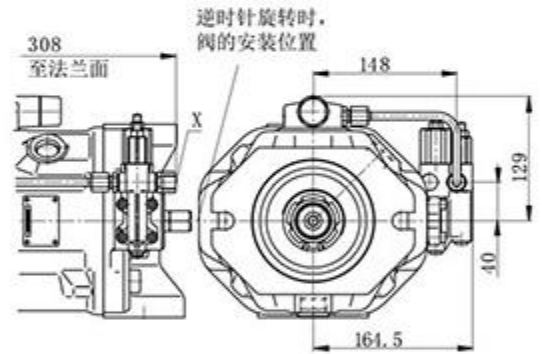
规格71 控制型式DFLR
Size 71 control devices DFLR



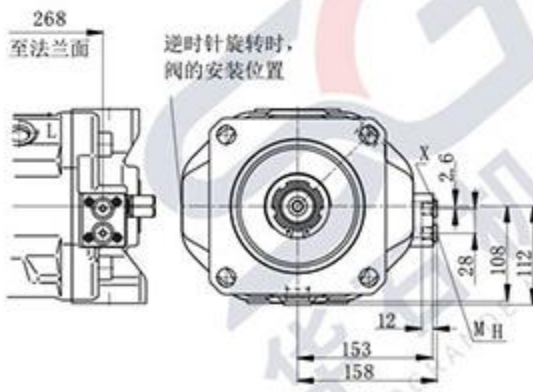
规格100 控制型式DG
Size 100 control devices DG



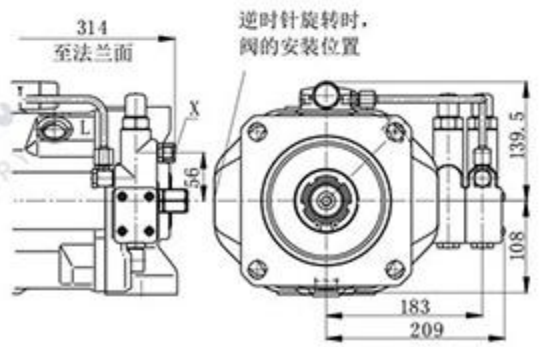
规格100 控制型式DFLR
Size 100 control devices DFLR



规格140 控制型式DG
Size 140 control devices DG

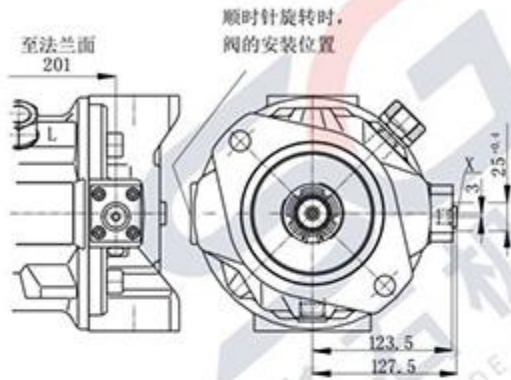


规格140 控制型式DFLR
Size 140 control devices DFLR

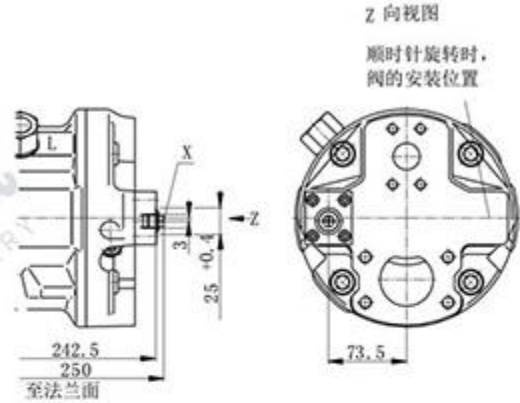


外形尺寸 规格71 Dimensions size 71

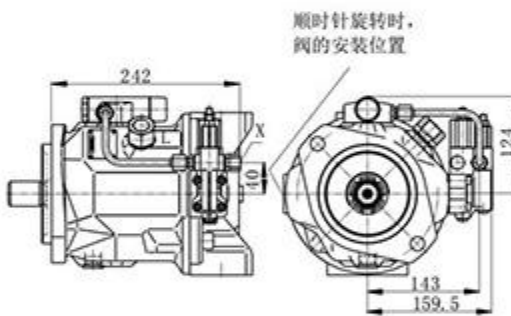
控制型式DG 工作油口42
Control device DG port 42



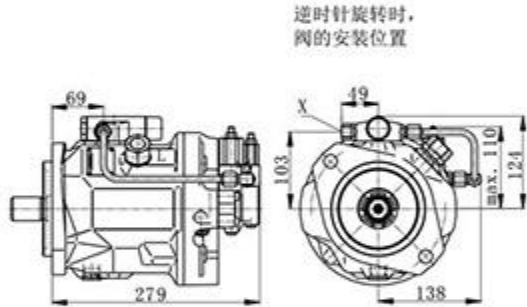
控制型式DG 工作油口41
Control device DG port 41



控制型式DFLR、DLR 工作油口42
Control device DFLR, DLR port 42

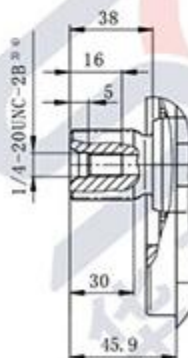


控制型式DFLR、DLR 工作油口41
Control device DFLR, DLR port 41

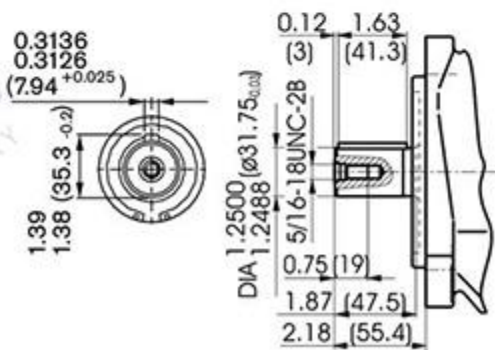


轴伸 Shaft

U 花键轴, 1 in 15T 16/32DP¹⁾
(SAE J744)

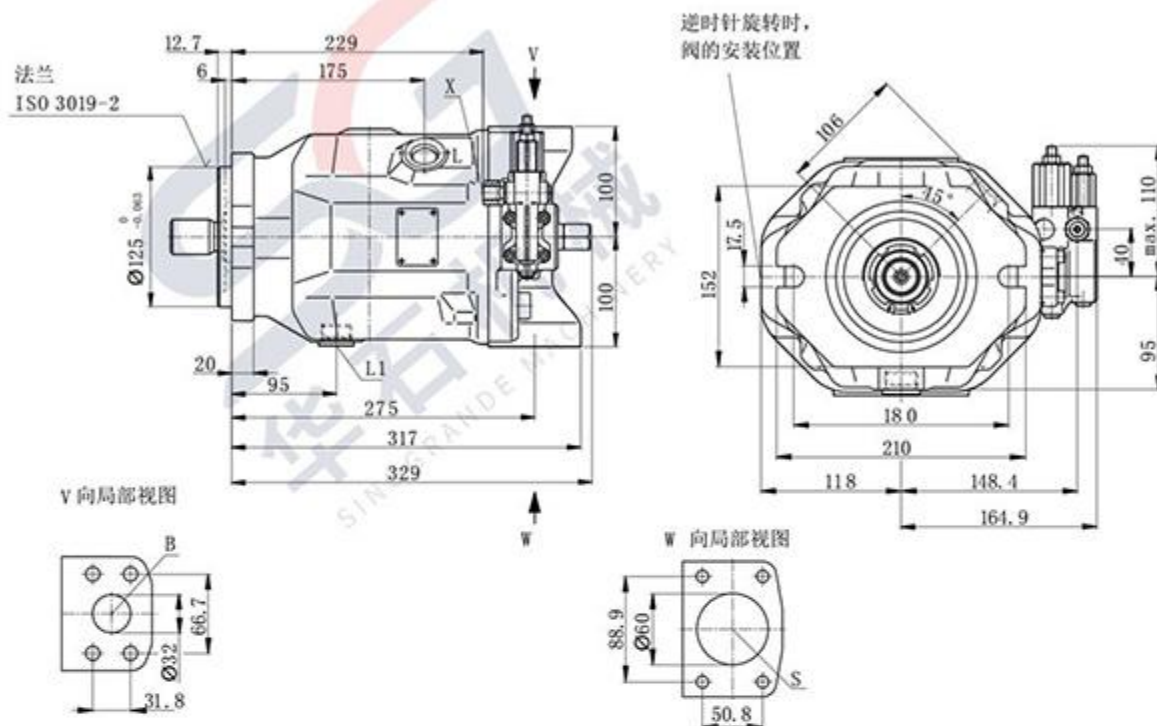


K 花键轴, Parallel with key ISO3019-1 32-1



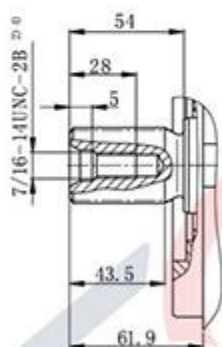
外形尺寸 规格100 (控制机构DR、DRG、DFR/DFR1)

Dimensions size 100 (Control devices DR, DRG, DFR/DFR1)

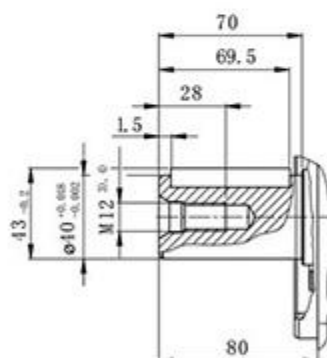


轴伸 Shaft

S 花键轴, 1 1/2 in 17T 12/24DP¹⁾
(SAE J744)



P 平键轴 DIN6885, A12×8×68



油口 Ports

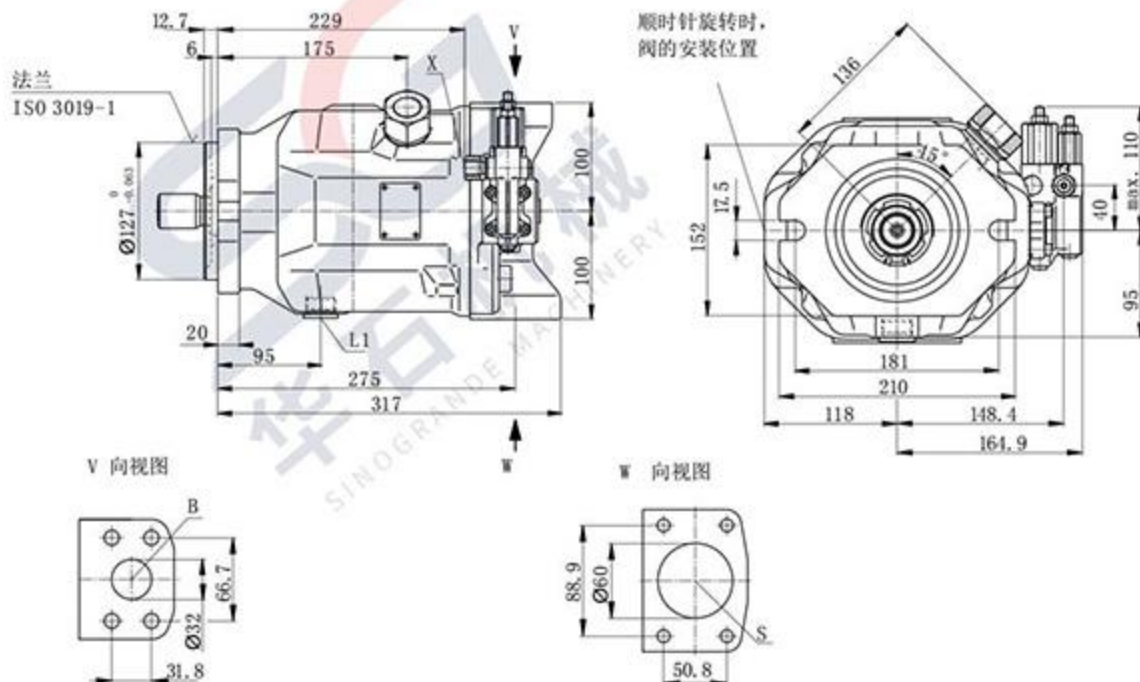
B	出油口Outlet port	法兰Flange SAE J518 1 1/4in (高压系列High-pressure series) 螺钉孔Fixing thread M14深19
S	吸油口Suction port	法兰Flange SAE J518 2 1/2in (标准系列Standard series) 螺钉孔Fixing thread M12深17
L	溢油口Drain port	M27×2深16
L1	溢油口Drain port	M27×2深16
X	控制油口Control pressure	M14×1.5深12
X1	控制油口Control pressure	G1/4深12 用于DG控制For DG Control

注: 根据安装位置选择L口或L1口, 必须连接油箱。

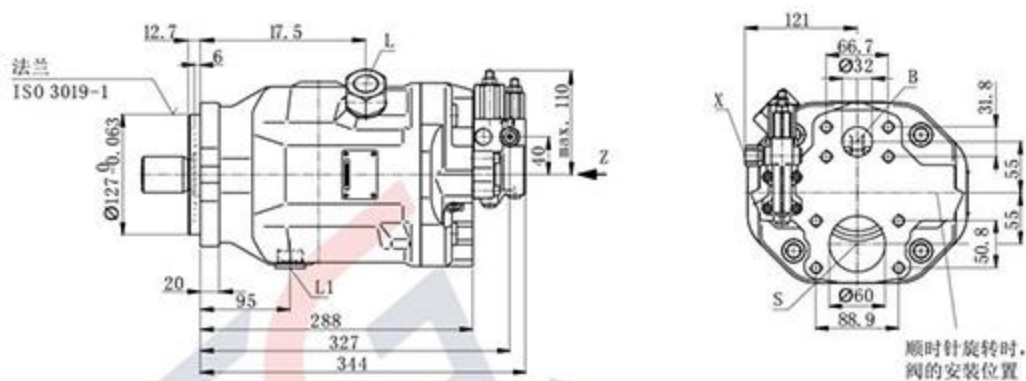
Dependent on the installation position, port L or port L1 must be connected.

外形尺寸 规格100 Dimensions size 100

工作油口12 (控制机构DG、DFLR、DLR) Port 12 (Control devices DG, DFLR, DLR)



工作油口11 (控制机构DG、DFLR、DLR) Port 11 (Control devices DG, DFLR, DLR)



油口 Ports

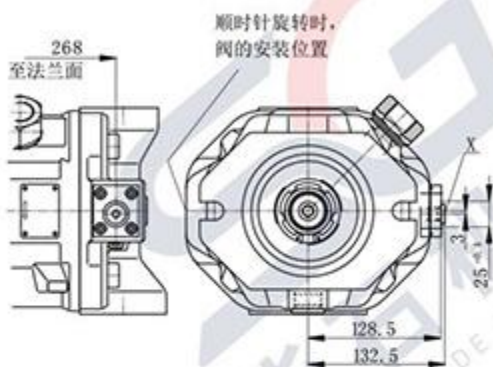
B	出油口 Out let port	法兰 Flange SAE J518 1 1/4in (高压系列 High-pressure series) 螺钉孔 Fixing thread M14 深 19
S	吸油口 Suction port	法兰 Flange SAE J518 2 1/2in (标准系列 Standard series) 螺钉孔 Fixing thread M12 深 17
L	泄油口 Drain port	M27 × 2 深 16
L1	泄油口 Drain port	1 1/16-12UNF-2B 深 18
X	控制油口 Control pressure	M14 × 1.5 深 12
X1	控制油口 Control pressure	G1/4 深 12 用于 DG 控制 For DG Control

注：根据安装位置选择L口或L1口，必须连接油箱。

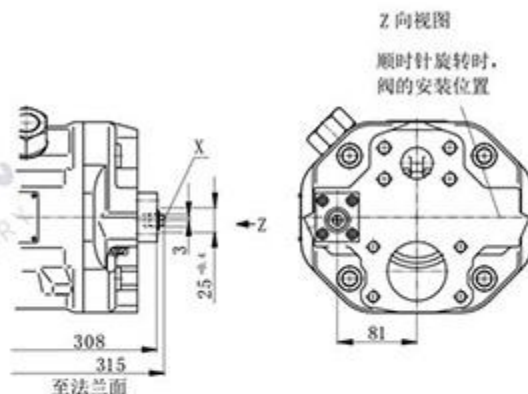
Dependent on the installation position, port L or port L1 must be connected.

外形尺寸 规格100 Dimensions size 100

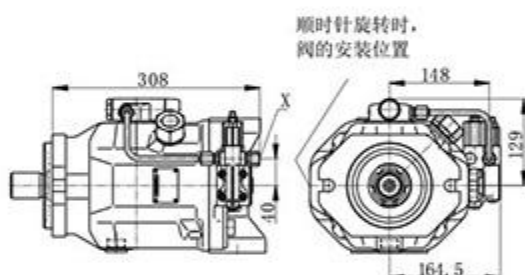
控制型式DG 工作油口12
Control device DG port 12



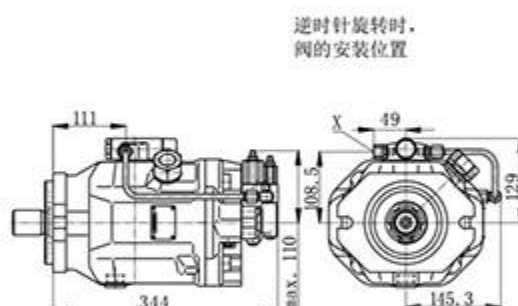
控制型式DG 工作油口11
Control device DG port 11



控制型式DFLR、DLR 工作油口12
Control device DFLR, DLR port 12

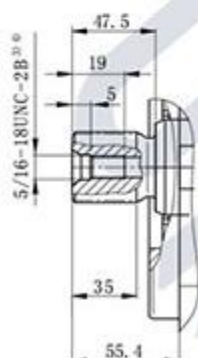


控制型式DFLR、DLR 工作油口11
Control device DFLR, DLR port 11

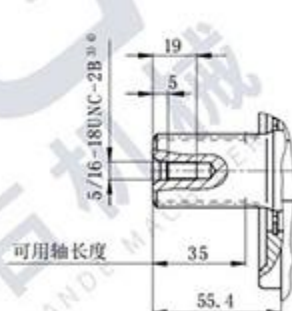


轴伸 Shaft

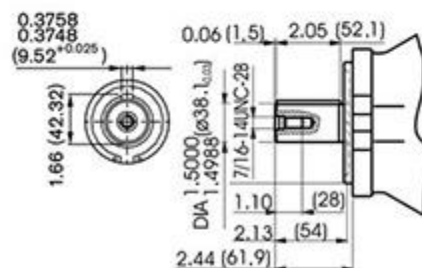
U 花键轴, 1 1/4 in 14T 12/24DP^①
(SAE J744)



W 花键轴, 1 1/4 in 14T 12/24DP^{①②}
(SAE J744)

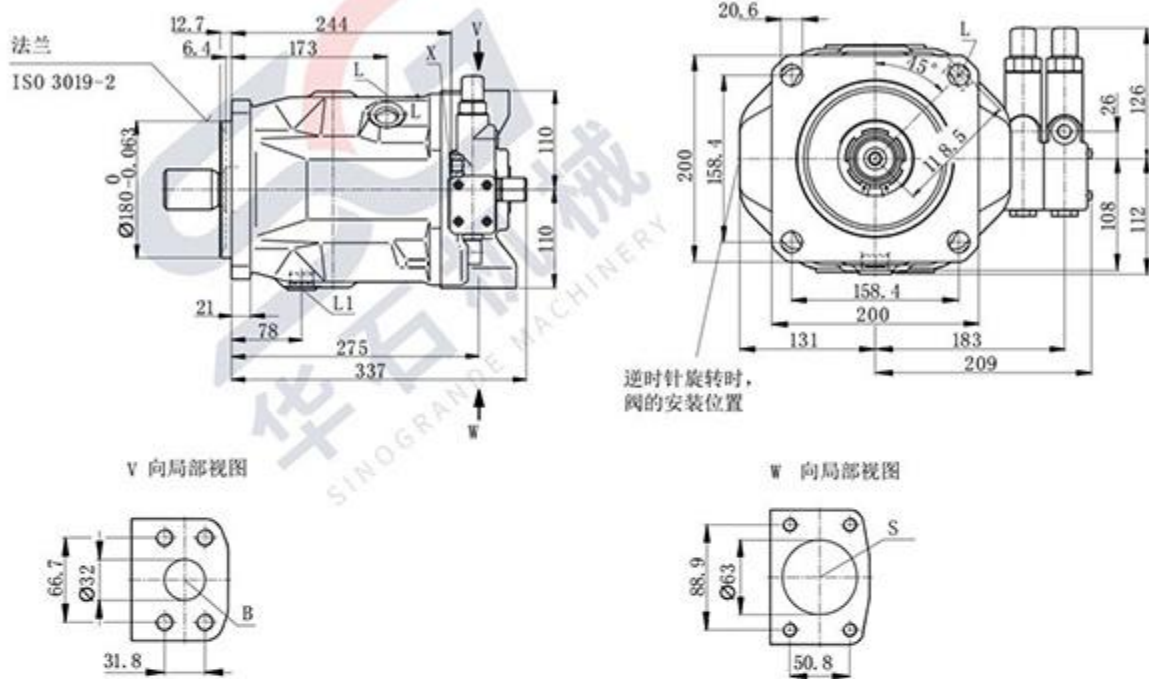


K 花键轴, Parallel with key ISO 3019-1 38-1



外形尺寸 规格140 (控制机构DR、DRG、DFR/DFR1)

Dimensions size 140 (Control devices DR, DRG, DFR/DFR1)

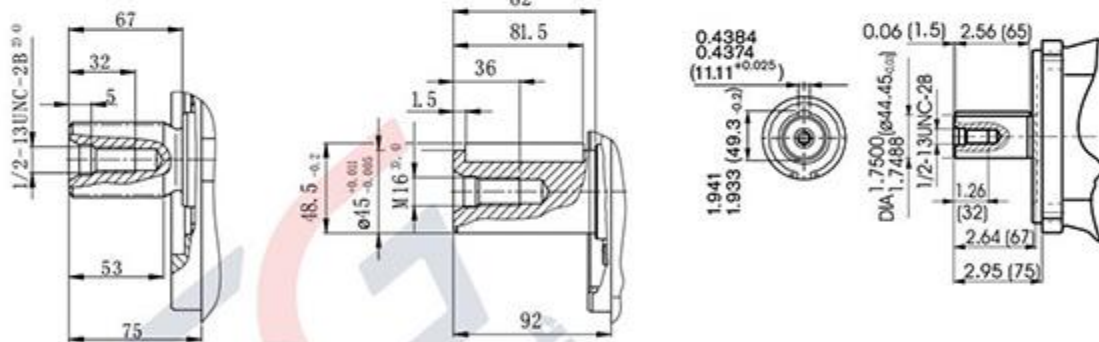


轴伸 Shaft

S 花键轴, 1 3/4 in 13T 8/16DP^①
(SAE J744)

P 平键轴 DIN6885, A14×9×80

K 平键轴 Parallel with key
ISO 3019-1 44-1



油口 Ports

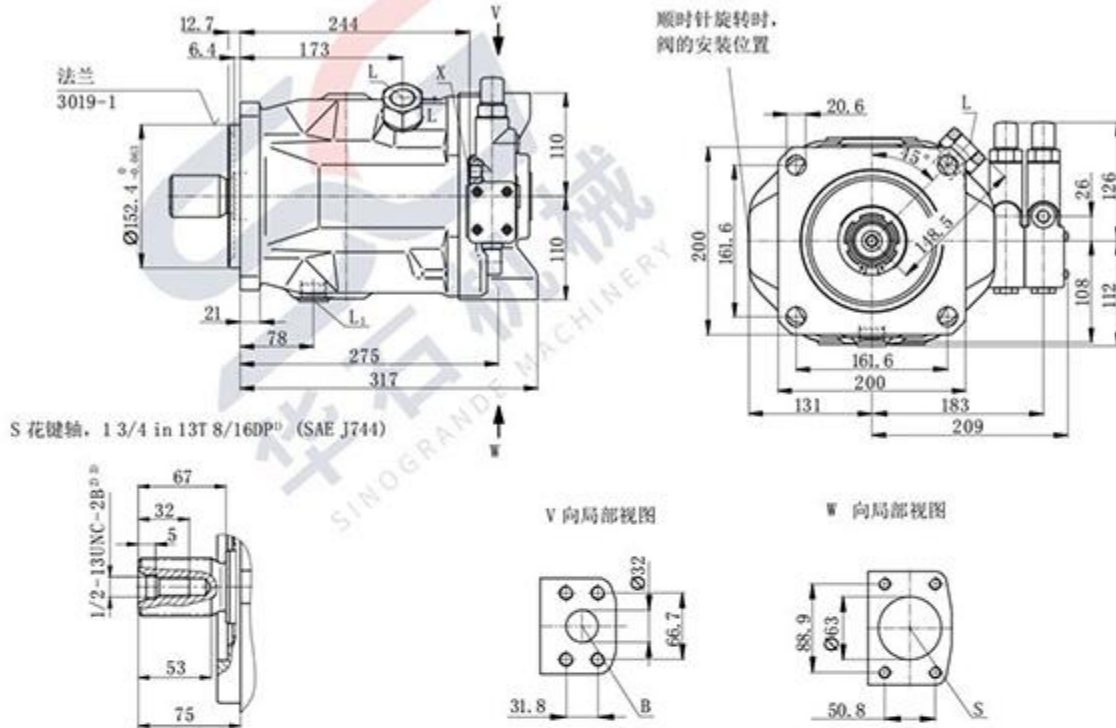
B	出油口 Outlet port	法兰 Flange SAE J518 1 1/4 in (高压系列 High-pressure series) 螺钉孔 Fixing thread M14 深 19
S	吸油口 Suction port	法兰 Flange SAE J518 2 1/2 in (标准系列 Standard series) 螺钉孔 Fixing thread M12 深 17
L	泄油口 Drain port	M27×2 深 16
L1	泄油口 Drain port	M27×2 深 16
X	控制油口 Control pressure	M14×1.5 深 12
X1	控制油口 Control pressure	G1/4 深 12 用于 DG 控制 For DG Control

注: 根据安装位置选择 L 口或 L1 口, 必须连接油箱。

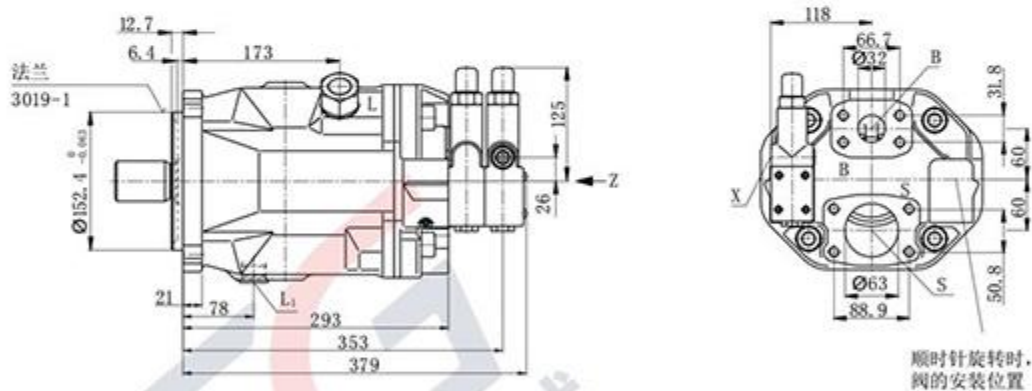
Dependent on the installation position, port L or port L1 must be connected.

外形尺寸 规格140 Dimensions size 140

工作油口12 (控制机构DG、DR、DRG、DFLR、DLR) Port 12 (control devices DG, DR, DFLR, DLR)



工作油口11 (控制机构DG、DR、DFLR、DLR) Port 11 (control devices DG, DR, DFLR, DLR)



油口 Ports

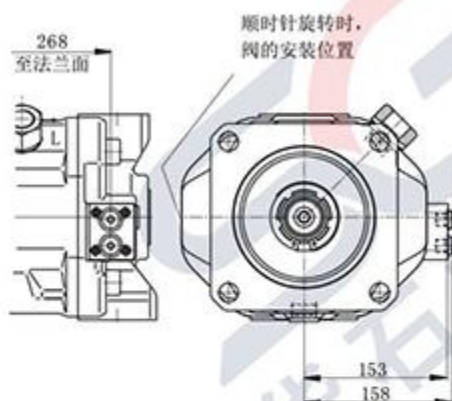
B	出口Outlet port	法兰Flange SAE J518 1 1/4in (高压系列High-pressure series) 螺钉孔Fixing thread M14深19
S	吸油口Suction port	法兰Flange SAE J518 2 1/2in (标准系列Standard series) 螺钉孔Fixing thread M12深17
L	泄油口Drain port	M27×2深16
L1	泄油口Drain port	1 1/16-12UNF-2B深18
X	控制油口Control pressure	M14×1.5深12
X1	控制油口Control pressure	M14×1.5深12 用于DG控制For DG Control

注: 根据安装位置选择L口或L1口, 必须连接油箱。

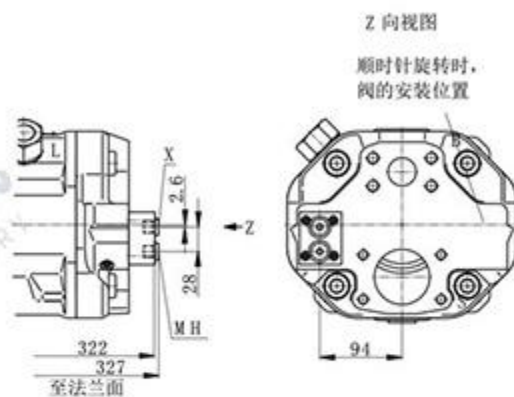
Dependent on the installation position, port L or port L1 must be connected.

外形尺寸 规格140 Dimensions size 140

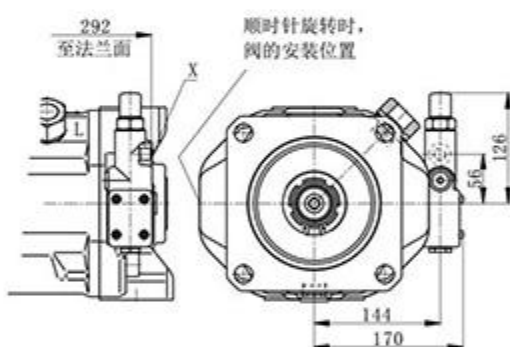
控制型式DG 工作油口12
Control device DG port 12



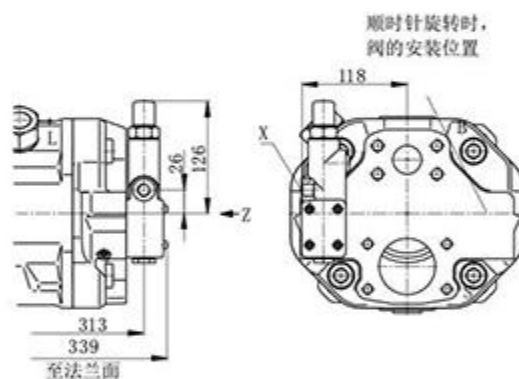
控制型式DG 工作油口11
Control device DG port 11



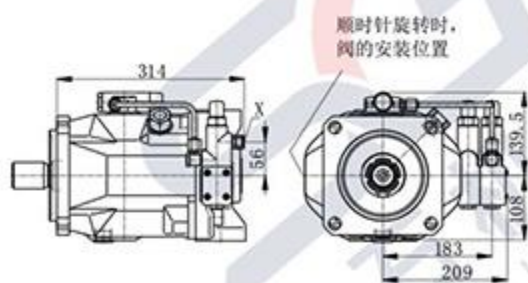
控制型式DR、DRG 工作油口12
Control device DR, DRG port 12



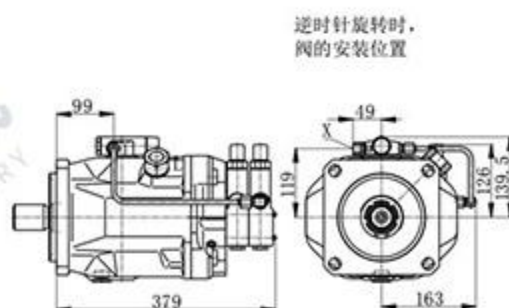
控制型式DR、DRG 工作油口11
Control device DR, DRG port 11



控制型式DFLR、DLR 工作油口12
Control device DFLR, DLR port 12



控制型式DFLR、DLR 工作油口11
Control device DFLR, DLR port 11



OH-A10V0/31 变量柱塞泵

Variable Displacement Piston Pump OH-A10V0/31

型号标识 Type Code

OH-		A10V	0	28	DR	/	31	R	—	V	S	C	12	K68
	1	2	3	4	5		6	7		8	9	10	11	12

1-工作介质 Operating Medium

矿物油 Mineral oil (无代号 No Code)	
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2-结构分类 Machinery Classification

轴向柱塞, 直轴式, 可变量, 行走机械用 Axial piston, straight shaft, variable, used in mobile machinery	A10V
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3-运行模式 Operational Mode

开式回路 Open circuit	0
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4-规格 Size

公称排量 Nominal displacement mL/r	18	28	45	71	100	140	
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5-控制机构 Control Devices

直接控制, 两位调节 Two point control, directly operated DG	●	●	●	●	●	●	DG
压力控制 Pressure Control DR	●	●	●	●	●	●	DR
远程压力控制 Remote pressure control DRG	●	●	●	●	●	●	DRG
压力流量控制 Pressure and flow control DFR	●	●	●	●	●	●	DFR
压力流量控制 Pressure and flow control DFR1	●	●	●	●	●	●	DFR1
压力功率控制 Pressure and power control DLR	-	●	●	●	●	●	DLR
压力流量功率控制 Pressure and flow and power control DFLR	-	●	●	●	●	●	DFLR

6-系列 Series

	31
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7-旋转方向 (从轴端看) Rotating Direction (View on Shaft End)

顺时针 Clockwise	R
逆时针 Counterclockwise	L

8-密封 Seals

丁腈橡胶 NBR, 轴封氟橡胶 Shaft seal FKM	P
氟橡胶 Viton FKM	V

图表说明 Chart shows: ●=可以供货 Available, ○=在准备中 In preparation, -=无 Not available

9-轴伸 Shaft End

	18	28	45	71	100	140	
花键轴伸Splined shaft SAE	●	●	●	●	●	●	S
花键轴伸Splined shaft SAE (较高的通轴驱动转矩 Higher through drive torque)	●	●	●	●	-	-	R
花键轴伸Splined shaft SAE (不适用于通轴驱动 Higher through drive torque)	●	●	●	●	●	-	U
花键轴伸Splined shaft SAE	-	-	-	-	●	-	W

10-安装法兰 Mounting Flange

	18	28	45	71	100	140	
SAE 2孔	●	●	●	●	●	-	C
SAE 4孔	-	-	-	-	-	●	D

11-工作油口 Service Line Ports

	18	28	45	71	100	140	
吸油口S和压力油口B在后部, SAE法兰 Port S and port B at rear, SAE flanged	-	●	●	-	●	●	11
	-	-	-	●	-	-	41
吸油口S和压力油口B在两侧, SAE法兰 Port S and port B at opposite sides, SAE flanged	●	●	●	-	●	●	12
	-	-	-	●	-	-	42

12-通轴驱动 Through Drive

	18	28	45	71	100	140	
无通轴驱动 Without through drive	●	●	●	●	●	●	N00
带通轴驱动, 从泵连接尺寸如下 With through drive, from the pump connection size as follows							
安装法兰 Installation of flange	轴伸 Spline shaft		可接受的从泵 To mount pump				
SAE82, 2孔	U轴5/8in9T16/32DP		OH10VS018/31		●	●	●
SAE82, 2孔	S轴3/4in11T16/32DP		OH10VS018/31		●	●	●
SAE101, 2孔	S轴7/8in13T16/32DP		OH10V028/31		-	●	●
SAE101, 2孔	S轴1in15T16/32DP		OH10V045/31		-	-	●
SAE127, 2孔	S轴1 1/4in14T12/24DP		OH10V071/31		-	-	●
SAE127, 2孔	S轴1 1/2in17T12/24DP		OH10V0100/31		-	-	●
SAE152, 4孔	S轴3/4in13T8/16DP		OH10V0140/31		-	-	●
SAE101, 2孔	S轴7/8in13T16/32DP		OH10V0140/31		-	●	●

组合泵说明: 两台泵首尾串联, 即以通轴形式装配成一体, 称为组合泵, 串联的第二台泵称为从泵。

如果订购组合泵, 组合泵的型号为第一台泵的型号+第二台泵的型号。

Description of combination pump: Two pumps can be connected in series by their head and end, namely integrated to be a combination pump. by the means of through-shaft, and the second pump of the series combination is called the subordinate pump.

In case of placing an order, the combination pump model equals to the model of the first pump + the model of the second.

组合泵型号示例 Illustration of combination pump model: 0S4VS045DR/31R-PPA12KB3 + 0S10VS028DR/31R-PSA12N00

技术参数 Technical Data

■参数表 Parameters Table

规格 Specification			18	28	45	71	100	140	
排量 Displacement	$V_{g\max}$	ml/r	18	28	45	71	100	140	
吸入口S压力(绝对压力) Pressure at suction port S (Absolute pressure)	最低压力 Minimum pressure	$P_{s\min}$	bar	0.8					
	最高压力 Maximum pressure	$P_{s\max}$	bar	10					
出口B压力(绝对压力) Pressure at Outlet port B (Absolute pressure)	额定压力 Rated pressure	P_N	bar	280					
	峰值压力 Peak pressure	P_{max}	bar	350					
	最小压力 Minimum pressure		bar	10					
压力变化速率 Rate of pressure change	R_A	bar/s	16000						
溢油口L ₁ 压力(绝对压力) Drain port L ₁ pressure (Absolute pressure)	P_L	bar	≤2						
最大转速 ¹⁾ Max. speed $P_S = 1\text{bar}$	$V_g = V_{g\max}$ 时	$n_{o\max}$	r/min	3300	3000	2600	2200	2000	1800
	$V_g < V_{g\max}$ 时		r/min	3900	3600	3100	2600	2400	2100
最大流量 Max. flow	$n = n_{o\max}$ 时	$q_{vo\max}$	L/min	59.4	84	117	156	200	252
	$n = 1500\text{ r/min}$ 时		L/min	27	42	68	107	150	210
最大功率 Maximum power ($\Delta p = 280\text{ bar}$)	$n = n_{o\max}$ 时	$P_{o\max}$	kW	27.7	39	55	73	93	118
	$n = 1500\text{ r/min}$ 时		kW	12.6	20	32	50	70	98
扭矩 Torque ($V_g = V_{g\max}$)	$\Delta p = 280\text{ bar}$ 时	T_{max}	Nm	80.1	125	200	316	445	623
	$\Delta p = 100\text{ bar}$ 时	T	Nm	28.6	45	72	113	159	223
旋转刚度 Rotational stiffness	轴伸 S Shaft extension S		Nm/rad	11087	22317	37500	71884	121142	169537
	轴伸 R Shaft extension R		Nm/rad	14850	26360	41025	76545	-	-
	轴伸 U Shaft extension U		Nm/rad	8090	16695	30077	52779	91093	-
	轴伸 W Shaft extension W		Nm/rad	-	19898	34463	57460	101847	-
旋转总成转动惯量 Moment of inertia of the rotating assembly	J	kgm ²	0.00093	0.0017	0.0033	0.0083	0.0167	0.0242	
最大角加速度 Max. angular acceleration		rad/s ²	6800	5500	4000	3300	2700	2700	
壳体容积 Volume of case		L	0.4	0.7	1.0	1.6	2.2	3.0	
重量 Weight		kg	12	15	21	33	45	60	
驱动轴的允许负载 Drive shaft Allowable load	最大轴向力 Max. axial force		N	700	1000	1500	2400	4000	4800
	最大径向力 Max. radial force		N	350	1200	1500	1900	2300	2800

1) $V_g = V_{g\max}$ 时的数值适用于吸油口S的进口压力为 $P_S = 1\text{bar}$ (绝对压力) 时的情况, 当进口压力 P_S 增加或排量减小, 则转速可增加, 当进口压力为 $P_{s\min} = 0.8\text{bar}$ 时, 转速应减小至90%。 $V_g < V_{g\max}$ 时的数值为转速极限。

1) Once $V_g = V_{g\max}$, the value is applicable to the inlet pressure at suction port S is $P_S = 1\text{bar}$ (absolute pressure), when the inlet pressure P_S increase or decrease the displacement, the speed can be increased, when the inlet pressure $P_{s\min} = 0.8\text{bar}$, the speed should be reduced to 90%. $V_g < V_{g\max}$ value when the speed limit.

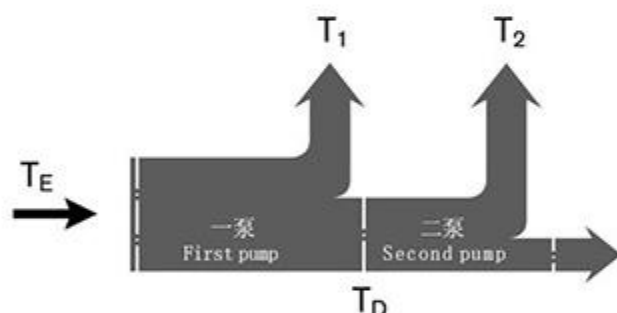
技术参数 Technical Data

■ 允许的输入扭矩和通轴驱动扭矩 Permissible input torque and through drive torque

规格 Specification			18	28	45	71	100	140		
扭矩 Torque ($V_{e,max}$ 且 $\Delta p=280$ bar时)			T_{max}	Nm	80	125	200	316	445	623
传动轴最大 输入扭矩 ¹⁾ Max. shaft input torque ¹⁾	轴伸 Shaft S	$T_{E,max}$	Nm	124	198	319	626	1104	1620	
		Φ	in	3/4	7/8	1	1 1/4	1 1/2	1 3/4	
	轴伸 Shaft R	$T_{E,max}$	Nm	160	250	400	644	-	-	
		Φ	in	3/4	7/8	1	1 1/4	-	-	
	轴伸 Shaft U	$T_{E,max}$	Nm	59	105	188	300	595	-	
		Φ	in	5/8	3/4	7/8	1	1 1/4	-	
	轴伸 Shaft W	$T_{E,max}$	Nm	-	140	220	394	636	-	
		Φ	in	-	3/4	7/8	1	1 1/4	-	
传动轴最大 通轴驱动扭矩 Max. shaft Through drive torque	轴伸 Shaft S	$T_{D,max}$	Nm	108	160	319	492	778	1266	
	轴伸 Shaft R	$T_{D,max}$	Nm	120	176	365	548	-	-	

1) 适用于无径向力作用的传动轴 For drive shaft free of radial load

扭矩分布 Torque Distribution



■ 液压油 Hydraulic oil

工作粘度范围 Operating viscosity range

为了获得最佳效率和使用寿命,我们建议在以下最佳范围内选择工作粘度(工作温度下)

For optimum efficiency and service life, we recommend that the operating viscosity in the range of the following best (at operating temperature)

最佳工作粘度 Optimum operating viscosity $v_{opt} = 16 \sim 36 \text{ mm}^2/\text{s}$

粘度范围限制 Limits of viscosity range

在临界工作条件下,适用以下数值:

Under critical operating conditions the following values apply:

$v_{min} = 10 \text{ mm}^2/\text{s}$ 短时间 Short time ($t \leq 1 \text{ min}$)

最高允许壳体泄油温度为90℃

Max. permissible case drain temperature of 90℃

$v_{max} = 1000 \text{ mm}^2/\text{s}$ 短时间 Short time ($t \leq 1 \text{ min}$)

$p \leq 30 \text{ bar}$, $n \leq 1000 \text{ r/min}$, $\theta \geq -25^\circ\text{C}$

选择液压油的注意事项

Selection Considerations of hydraulic oil

为了选择正确的液压油,必须确定环境温度下油箱内的工作温度(开式回路)。在工作温度范围内选择液压油,以获得最佳粘度范围,建议选择相应情况下较高的粘度等级。

壳体泄油温度受压力和输入速度的影响,并且始终高于油箱温度。但是,柱塞泵任何部位的温度均不得超过90℃。轴承区域的油液温度一般比壳体平均泄油温度高5℃左右。

In order to select the correct hydraulic oil, it must be determined at ambient temperature within the tank temperature (open circuit). Select the hydraulic fluid in the working temperature range for optimum viscosity range, it recommended to choose where relevant, the higher viscosity grade.

The case drain temperature is influenced by pressure and input speed and is always higher than the tank temperature. However, any part of the piston temperature shall not exceed 90℃. The fluid temperature in the bearing area is generally higher than the average case drain oil temperature high around 5℃.