

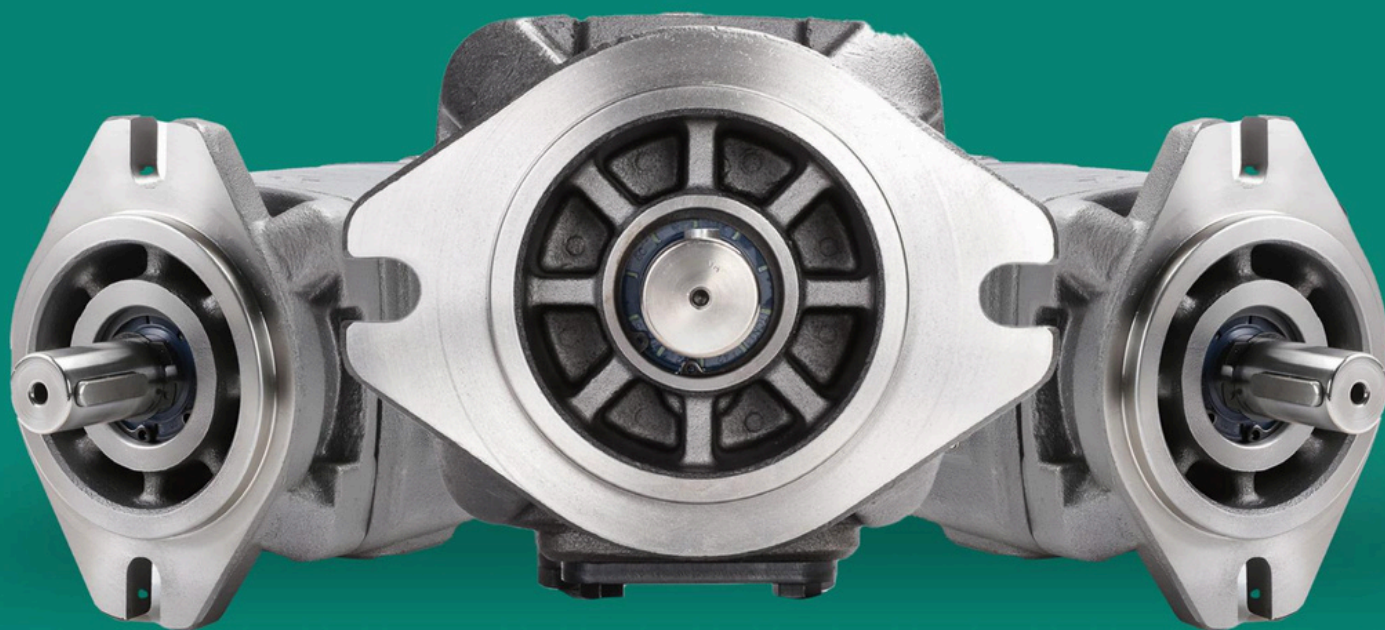
FOST®

专注液压传动&控制

HYDRAULIC TRANSMISSION AND CONTROL

内啮合齿轮泵

INTERNAL GEAR PUMP



弗斯特液压科技(常州)有限公司

FOST HYDRAULIC TECHNOLOGY (CHANGZHOU) CO., LTD.

特点 Features

FG系列齿轮泵是我公司新研发的一款应用于高压领域的高性能内啮合齿轮泵。

- 1.可广泛适用于工业，如注塑机、油压机、锻压机、压铸机、冲床、折弯机、剪板机、鞋机以及橡胶加工、冶金、船舶、叉车等行业的液压系统，尤其适用于伺服变频驱动的节能系统。采用轴向和径向压力补偿设计，即使在低转速和低粘度下仍保持较高的容积效率。
- 2.超低的噪音，采用高强度铸铁和内部独特的消音设计，使噪音更低。
- 3.采用了特殊型齿轮及泵体，加强了齿轮及泵体的旋转精度和刚性。
- 4.极低的流量和压力脉动，在低速状况仍可保持稳定的流量和压力输出。
- 5.高压设计，最高使用压力可达到35MPa。
- 6.转速范围宽广，最高转速可达3000r/min。
- 7.可进行组合形成双联泵。
- 8.对油液污染不敏感，使用寿命长。

FG series gear pump is a new developed by our company for high pressure field of high performance internal gear pump.

- 1. It can be widely used in industries such as injection molding machines, hydraulic presses, forging machines, die-casting machines, punching machines, bending machines, shearing machines, shoe machines, as well as hydraulic systems in industries such as rubber processing, metallurgy, shipbuilding, forklifts, etc., especially in energy-saving systems driven by servo frequency conversion. Adopting axial and radial pressure compensation design, it maintains high volumetric efficiency even at low speeds and low viscosity.
- 2. Ultra low noise, using high-strength cast iron and unique internal noise reduction design, making the noise lower.
- 3. Special gear and pump body are adopted to strengthen the rotation accuracy and rigidity of gear and pump body.
- 4. Extremely low flow and pressure pulsation, stable flow and pressure output can still be maintained at low speeds.
- 5. High pressure design, with a maximum operating pressure of up to 35MPa.
- 6. Wide speed range, with a maximum speed of up to 3000r/min.
- 7. It can be combined to form a dual pump.
- 8. Not sensitive to oil pollution and has a long service life.

型号说明 Model Description

FG	1	-40	-01	R	-V	P	C
							法兰安装形式 Flange installation form
							SAE 2孔 SAE 2 hole
							C
							轴伸形式 Shaft extension form
							平键轴 Flat key shaft
							P
							花键轴 Spline shaft
							S
							密封形式 Sealed form
							氟橡胶 Fluororubber
							V
							旋转方向（从轴端看）Rotation direction (viewed from the shaft end)
							顺时针 Clockwise
							R
							逆时针 Counterclockwise
							L
							设计号 Design number
							01
							规格 Specification
							排量 (mL/r) Displacement (mL/r)
							48101316202532405063
							80100125145160
							系列号 Serial Number
							排量4…25 Displacement 4…25
							0
							排量25…63 Displacement 25…63
							1
							排量63…160 Displacement 63…160
							2
							泵类型 Pump type
							内啮合齿轮泵 Internal gear pump
							FG

★注：逆时针旋转仅限于FG系列单泵
★Note: Counterclockwise rotation is limited to FG series single pump

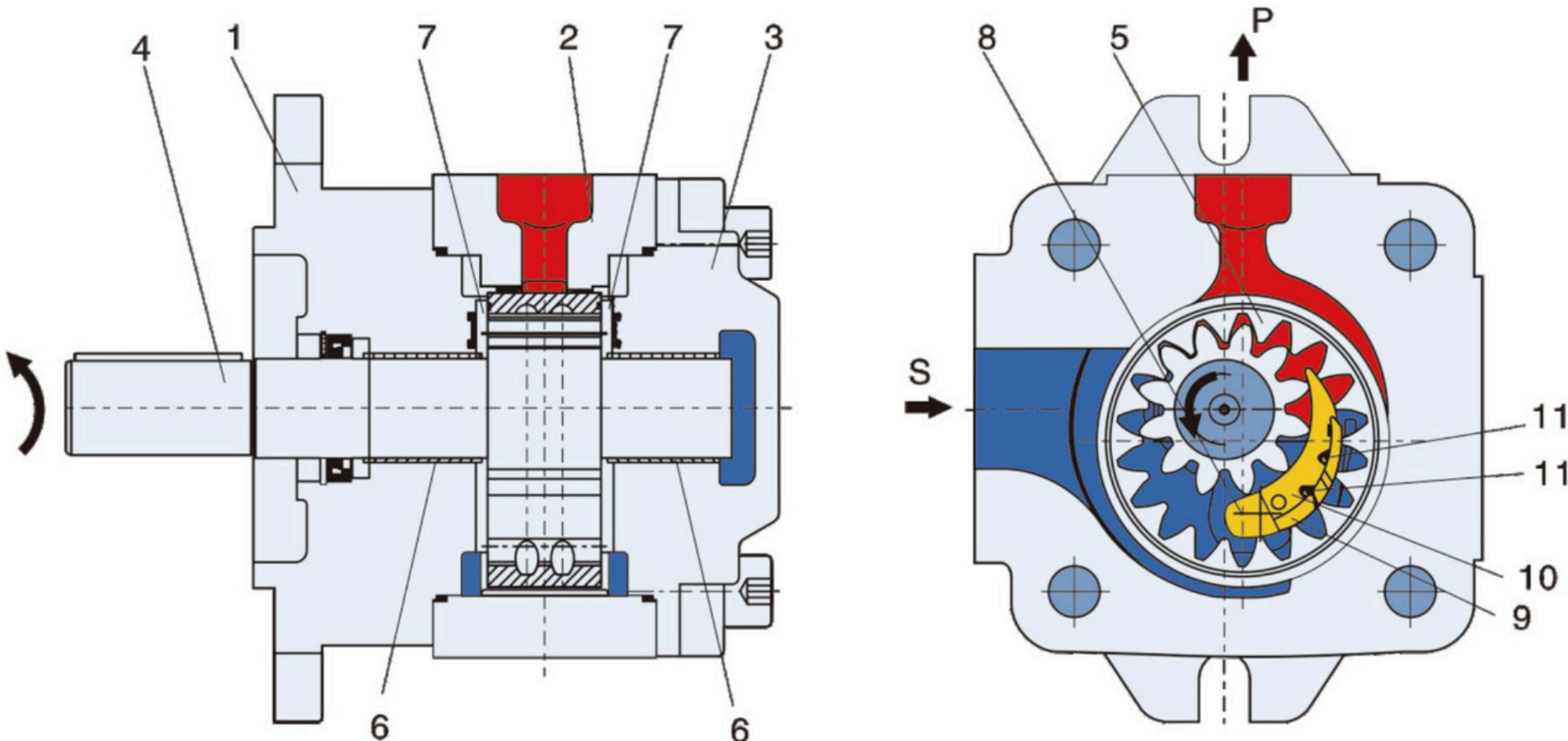
机能，剖面

Function, profile

结构 Structure

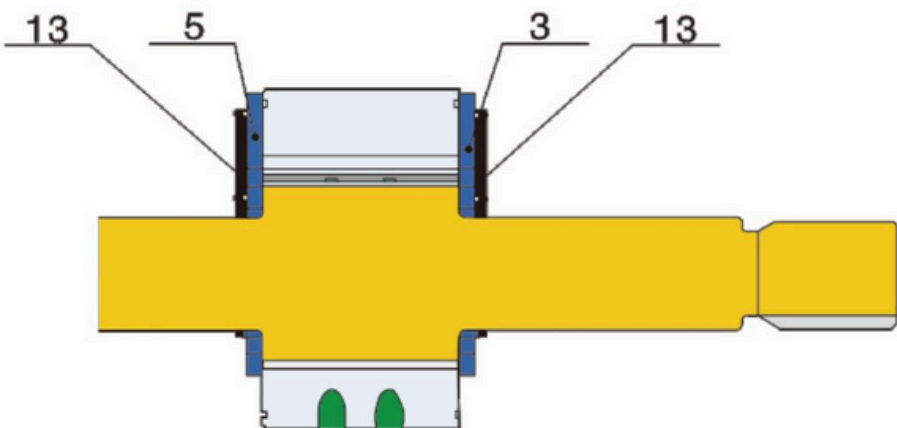
FG系列液压泵为具有固定排量的间隙补偿内啮合齿轮泵。
其基本构成是：前盖(1)，泵体(2)，后盖(3)，齿轮轴(4)，内齿圈(5)，滑动轴承(6)，前后侧板(7)和定位杆(8)，以及由月牙副板(9)，月牙主板(10)和塑料棒(11)组成的径向补偿功能

The FG series hydraulic pump is a backlash compensation internal gear pump with a fixed displacement.
Its basic composition is: front cover (1), pump body (2), rear cover (3), gear shaft (4), ring gear (5), sliding bearing (6), front and rear side plates (7) and positioning Rod (8), and the radial compensation function composed of the crescent sub-plate (9), the crescent main plate (10) and the plastic rod (11)



吸油和排油过程 Oil suction and drainage process

根据流体动力学安装的齿轮轴（4）按所示旋转方向转动内齿圈（5）。
通过在吸油区域中逐渐打开的齿侧间隙来吸入油液。油液通过齿轮轴和内齿圈之间的齿侧间隙从吸油区域（S）输送到压力区域（P）。
然后径向补偿内齿圈，油液从闭合的齿侧间隙排出并输送到压力油口（P）。吸油区域和排放区域由径向补偿元件（9、10、11）以及齿轮轴之间的齿轮啮合分隔开。
轴向补偿：压力区域中的排放室由前后侧板（3）（5）进行轴向密封。
轴向密封圈背对排油区域的一侧受压力场（13）的背压。这些压力场使轴向密封圈与排油区域径向压力达到平衡，从而以比较低的机械损失实现理想的密封效果。



Hydrodynamically mounted gear shaft (4) rotates the inner teeth in the direction of rotation shown Circle (5).
The oil is inhaled through the tooth side gap that gradually opens in the oil absorption area. Oil passage
The side clearance between the gear shaft and the inner gear ring transmits pressure from the oil absorption area (S) Region (P).
Then the inner gear ring is compensated radially, and the oil is discharged and transported through the closed clearance of the tooth side
Pressure oil port (P). The oil absorption area and discharge area are provided by radial compensation elements (9,10, 11) and gear shaft between the gear mesh separation.
Axial compensation: The discharge chamber in the pressure area is carried out by the front and rear side plates (3) (5) Axial seal.
Back pressure of the compression field (13) on the side of the axial seal facing the oil discharge area. this
These pressure fields balance the radial pressure between the axial sealing ring and the oil discharge area, thus Achieve the ideal sealing effect with relatively low mechanical loss.

径向补偿 Radial compensation

径向补偿元件包括月牙副板（9），月牙主板（10）和塑料棒（11）
月牙副板（9）和月牙主板（10）排列在压力场中，因此产生压力基本上由定位杆(8)承受。
一个小的压力将月牙副板和月牙主板压到齿轮轴和内齿圈的齿尖，这样即可通过自动间隙调整将排油区域与吸油区域分隔开。
这是在整个工作时间内持续保持高容积效率的先决条件。
月牙副板和月牙主板的间隙调整可通过中间的塑料棒(11)来进行。

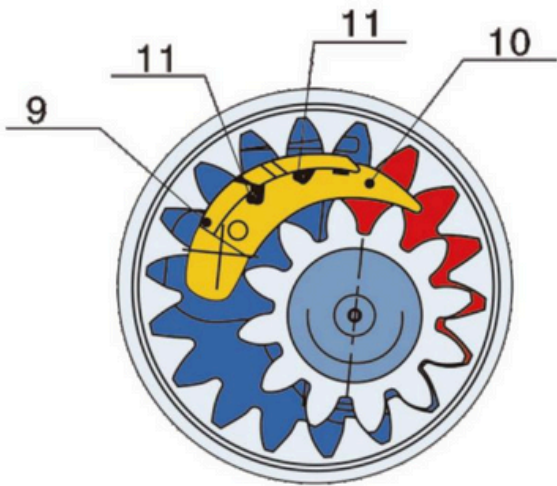
Radial compensation elements include crescent sub-plate (9), crescent motherboard (10) and plastic rod (11)
The crescent auxiliary plate (9) and the crescent motherboard (10) are arranged in the pressure field, so that the pressure generated is basically borne by the positioning rod (8).
A small pressure is applied to push the crescent auxiliary plate and the crescent motherboard to the tooth tips of the gear shaft and the inner gear ring, thus separating the oil discharge area from the oil suction area by automatic clearance adjustment.
This is a prerequisite for consistently maintaining high volumetric efficiency throughout the working time.
The clearance adjustment of the crescent sub-plate and the crescent motherboard can be carried out by means of a plastic rod (11) in the middle.

流体动力和流体静力安装 Hydrodynamic and Hydrostatic Installation

齿轮轴（4）由流体动力润滑的径向滑动轴承（6）承受。
内齿圈（5）以流体静力的方式安装在泵体（2）中。
The gear shaft (4) is supported by a hydrodynamic lubricated radial plain bearing (6).
The inner gear ring (5) is installed in the pump body (2) in a hydrostatic manner.

啮合 Engage

渐开线齿型的啮合具有用于较低流量和压力脉动的长啮合长度的优点，因此可确保低噪音进行。
Involute tooth type meshing has long meshing for lower flow and pressure pulsations
The length has the advantage of ensuring low noise.

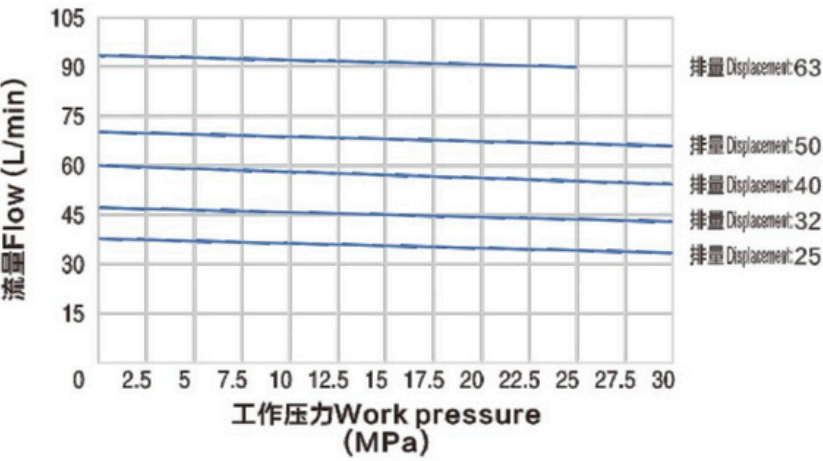


性能参数 Performance parameter

系列号 Serial Number	规格 Specification	排量 Displacement (mL/r)	工作压力Work pressure (Mpa)		转速范围Range of rotation (r/min)		重量 Weight (KG)
			额定 Rated	最高 Highest	最高 Highest	最低 lowest	
FG1	20	20.1	31.5	35	3000	600	13
	25	25.3	31.5	35	3000	200	14.5
	32	32.7	31.5	35	3000	200	15
	40	40.1	31.5	35	3000	200	16
	50	50.7	31.5	35	3000	200	17
	63	63.7	25	30	3000	200	18.5

特性曲线 Characteristic curve

F(S)G1



流量压力特性:

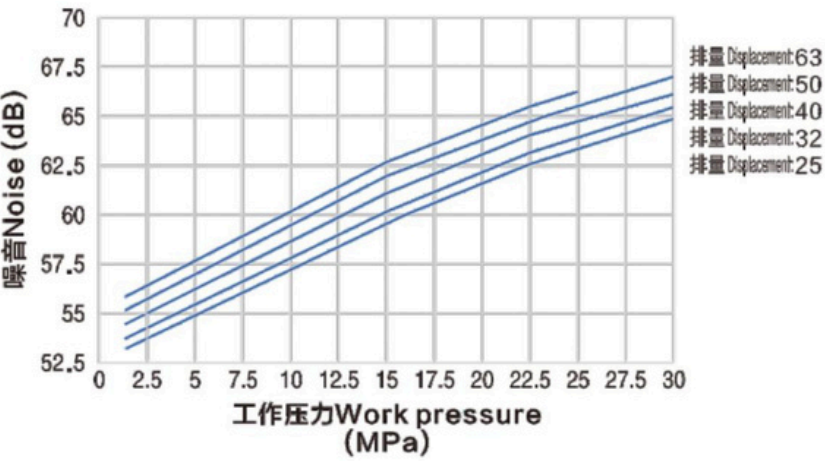
测试条件: $n=1450\text{r/min}$, $v=46\text{mm}^2/\text{s}$, $t=50^\circ\text{C}$

Flow pressure characteristics:

Test conditions: $n=1450\text{r/min}$, $v=46\text{mm}^2/\text{s}$, $t=50^\circ\text{C}$

噪音曲线 Noise curve

F(S)G1



测试条件: $n=1450\text{r/min}$, $v=46\text{mm}^2/\text{s}$, $t=50^\circ\text{C}$

传感器与泵距离=1m

Test conditions: $n=1450\text{r/min}$, $v=46\text{mm}^2/\text{s}$, $t=50^\circ\text{C}$,
distance between sensor and pump=1m

FG1-※-01R-VPC (P-type flat key shaft)

[illegible]

泵型号 Pump model	A1	A2	S	P
FG1-20-01R-VPC	134	71	Φ25	Φ19
FG1-25-01R-VPC	139	73	Φ32	Φ18
FG1-32-01R-VPC	146	76.5	Φ32	Φ18
FG1-40-01R-VPC	153	80	Φ32	Φ20
FSG1-40-01R-VPC	153	80	Φ38	Φ20
FG1-50-01R-VPC	163	85	Φ32	Φ20
FSG1-50-01R-VPC	163	85	Φ51	Φ25.4
FG1-63-01R-VPC	177	92	Φ32	Φ20
FSG1-63-01R-VPC	177	92	Φ51	Φ32

FG1-※-01R-VSC (S-type spline shaft)

[illegible]

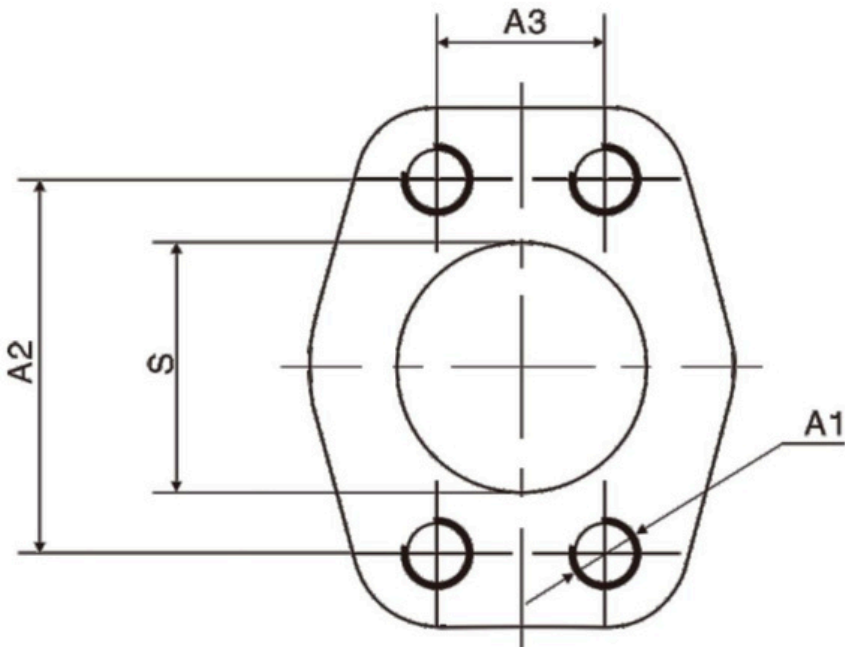
泵型号 Pump model	A1	A2	S	P
FG1-20-01R-VSC	134	71	Φ25	Φ19
FG1-25-01R-VSC	139	73	Φ32	Φ18
FG1-32-01R-VSC	146	76.5	Φ32	Φ18
FG1-40-01R-VSC	153	80	Φ32	Φ20
FSG1-40-01R-VSC	153	80	Φ38	Φ20
FG1-50-01R-VSC	163	85	Φ32	Φ20
FSG1-50-01R-VSC	163	85	Φ51	Φ25.4
FG1-63-01R-VSC	177	92	Φ32	Φ20
FSG1-63-01R-VSC	177	92	Φ51	Φ32

●油口法兰连接尺寸见第13页 See page 13 for port flange connection dimensions

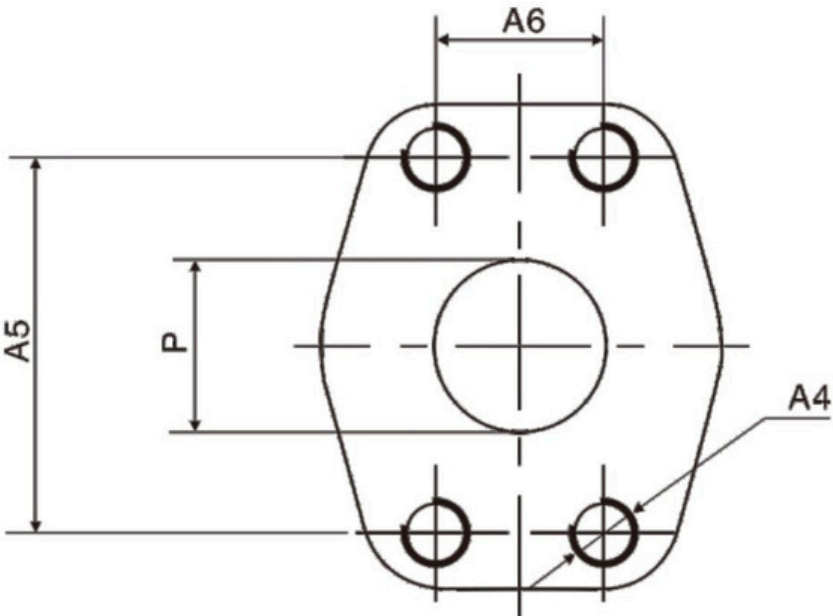
油口法兰连接尺寸

Port flange connection size

吸入口 “S” Suction port "S"



输出口 “P” Output port "P"



尺寸参数 Dimension parameters

系列 Series	规格 Specification	S	A1	A2	A3	P	A4	A5	A6
FG1	20	ø25	M10深18	52.4	26.2	ø19	M10深18	50.8	23.8
	25	ø32	M10深19	58.7	30.2	ø18	M10深17	47.6	22.2
	32	ø32	M10深19	58.7	30.2	ø18	M10深17	47.6	22.2
	40	ø32	M10深19	58.7	30.2	ø20	M10深17	52.4	26.2
	50	ø32	M10深19	58.7	30.2	ø20	M10深17	52.4	26.2
	63	ø32	M10深19	58.7	30.2	ø20	M10深17	52.4	26.2

使用前

Before

1、首先




- 使用前请仔细阅读FG泵使用说明书，理解内容后再开始使用。
- a) 使用说明书是为了让您正确安全地使用FG泵而制作的。
 - b) 请遵循使用说明书上的使用方法和限制条件。
 - c) 如未按照使用说明书上的使用方法和限制条件使用，可能发生泵停止转运、破损等事故，有可能造成人员受伤或物品受损，请立即停止不正确的使用。
 - d) 因设计变更或改良，有可能出现本使用说明书的内容与您购买的产品不一致的情况。
 - e) 如对购买的产品或使用说明书的内容有疑问，请咨询我公司油机事业室营业G处。

2、和实物对照

接收产品后，请将订购内容和实物进行对照。

3、安全事项

使用说明书按照以下符号标记显示正确安全使用泵的必要事项

-  **危险**：紧急危险状态，如不回避可能发生人员死亡或重伤的事故。
-  **警告**：潜在的危险状态，如不回避可能发生人员死亡或重伤的事故。
-  **注意**：潜在的危险状态，可能发生人员轻伤或中等程度人身伤害的事故。或者可能发生物品受损的情况。

1. First




- Please read the FG pump instructions carefully before use, and understand the contents before use.
- a) The operating instructions are made for you to use the FG pump correctly and safely.
 - b) Please follow the instructions and restrictions on use.
 - c) If the pump is not used according to the use method and restrictions in the instruction manual, it may stop the transfer of the pump, damage and other accidents, which may cause injuries or damage to the goods, please stop the incorrect use immediately.
 - d) Due to design changes or improvements, the contents of this instruction manual may be inconsistent with the products you purchased.
 - e) If you have any questions about the purchased products or the contents of the instruction manual, please contact our oil engine Business Office G.

2. Compare with real objects

After receiving the product, please compare the ordered content with the actual product.



3. Security matters

The instruction manual shows the necessary matters for the correct and safe use of the pump in accordance with the symbols marked below



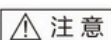
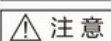
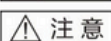
-  **Danger**：Emergency danger, if not avoided may result in death or serious injury accident.
-  **warn**：A potentially dangerous situation, such as an accident that could result in death or serious injury.
-  **Look out**：A potentially hazardous condition that may result in minor or moderate personal injury. Or there may be damage to the item.

安全上的注意事项 Safety precautions



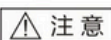
1、产品使用时的注意事项

-  **警告**：请确认产品的重量（记载于外形尺寸表）。重量超过20kg时，请勿徒手搬运。
-  **警告**：用吊具搬运过程中，绝对不要靠近。


2、产品安装、拆卸、固定时的注意事项

-  **警告**：请让专业人士进行安装、拆卸、固定作业。（专业人士：油压调整士2级水平的人）
-  **警告**：在安装、拆卸、固定产品前，请务必切断装置电源，清除管路残留压力。此外运转后产品及液压油可能处于高温状态，请确认温度降至适温（30~40℃）后再行处置。
-  **注意**：请勿对泵施加外力，如站在泵上或敲击泵。有可能造成人员受伤或产品破损。
-  **注意**：安装时请务必用适当的扭力旋紧规定的螺栓。
-  **注意**：请清洁安装面及安装孔。



3、运转中的注意事项

-  **危险**：转轴必须安装保护盖，保护盖与转动部位距离不超过一指。泵运转过程中请绝对不要接触转动部位。
-  **警告**：请在周围温度、液压油的温度、粘度等规定的使用环境条件范围内使用泵。如在使用范围外使用，可能发生机器运转失灵、损坏甚至火灾。
-  **注意**：泵的主体在运转时温度会变高，请勿直接用手触碰。






4、保养上的注意事项

-  **注意**：未经我公司同意，请勿拆卸、重组、改造泵。
- 如未经我公司同意，拆卸、重组、改造泵，则不在我公司的保修范围之内，我公司不承担任何责任。




1. Precautions for product use

-  **warn**：Please confirm the weight of the product (as shown in the dimensions chart). If the weight is greater than 20kg, do not carry it with bare hands.
-  **warn**：Do not approach during handling with spreader.


2, Product installation, disassembly, fixing precautions

-  **warn**：Please allow professionals to install, disassemble and fix. (Professional: Oil pressure regulator Level 2)
-  **warn**：Before installing, removing, or securing the product, cut off the power supply to clear the residual pressure in the pipe. In addition, the product and hydraulic oil may be in a high temperature state after operation, please confirm that the temperature drops to the appropriate temperature (30~40℃) before disposal.
-  **Look out**：Do not apply external force to the pump, such as standing on the pump or knocking the pump. May result in injury or damage to the product.
-  **Look out**：When installing, be sure to tighten the specified bolts with the appropriate torque.
-  **Look out**：Clean the mounting surface and holes.

3. Precautions in operation

-  **Danger**：The rotating shaft must be installed with a protective cover, and the distance between the protective cover and the rotating part should not exceed one finger. Never touch the rotating part of the pump during operation.
-  **warn**：Please use the pump in the ambient temperature, hydraulic oil temperature, viscosity and other specified environmental conditions. If used outside the scope of use, the machine may malfunction, damage or even fire.
-  **Look out**：The temperature of the pump body will become high during operation, do not touch it directly with your hand.

4, Maintenance precautions

-  **Look out**：Do not disassemble, reassemble or transform the pump without our consent. If without the consent of our company, disassembly, reorganization, transformation of the pump, it is not within the scope of our company's warranty, our company does not assume any responsibility.



FOST®

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2026/A-I

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