

2CY 型齿轮油泵

使用说明书

*INSTRUCTION MANUAL FOR
MODEL 2CY GEAR OIL PUMP*

自贡川滤设备制造有限公司

ZIGONG CHUANLU EQUIPMENT MANUFACTURE CO., LTD.

一、用 途

我厂生产的 2CY 型系列齿轮油泵，适用于化肥厂、炼油厂、榨油厂、电厂、电站、变电站（室）、润滑油库、电容器厂、油漆厂、粮食部门等各工矿企业作为输送透平油、变压器油、航空油、机械油、柴油、食用油等液体油液。

2CY 型系列齿轮油泵，具有外形美观，结构紧凑，性能稳定，轮齿脉动冲击值低，噪音低，安全可靠，维护保养方便等优点。本厂长期为客户提供易损零件。

本厂生产的系列齿轮油泵，亦广泛用于国防、科研、石油、化工、冶金、制药、纺织、交通、食品等工业部门，输送介质温度在 60℃以下，运动粘度 80cst 以下重油、中油、工业轻油、食用油以及其它类似油液。但不适用于输送含硫成分过高、腐蚀性的，含有硬质颗粒杂物的，以及含有纤维的油液，也不适用于输送高度挥发性的，闪点低的油类。

二、主要技术参数

型 号	规 格			吸油 高度	电机型号	功率	电源
	流 量		压力			kW	
	L/min	m ³ /h	MPa	m			
2CY-1/5.0-1	16.7	1	0.5	5	Y90S-4	1.1	380V 50Hz
2CY-2/14.5-1	33.3	2	1.45	5	Y100L ₁ -4	2.2	
2CY-3.3/4-1	55	3	0.4	4	Y100L ₁ -4	2.2	
2CY-4/10-1	66.6	4	1.0	4	Y100L ₁ -4	3	
2CY-6.3/2.0-1	105	6.3	0.2	4	Y100L ₂ -4	3	
2CY-6.3/3.6-1	105	6.3	0.36	4	Y100L ₂ -4	3	
2CY-6.3/4.0-1	105	6.3	0.4	4	Y100L ₂ -4	3	
2CY-9/3.3-1	150	9	0.33	3.5	Y112M-4	4	
2CY-10/3.0-1	167	10	0.30	3.5	Y112M-4	4	
2CY-12/6-1	200	12	0.6	3	Y132S-4	5.5	
2CY-18/3.6-1	300	18	0.36	3	Y132S-4	5.5	
2CY-29/3.6-1	483	29	0.36	3	Y160M-4	11	
2CY-38/2.8-1	633	38	0.28	2.5	Y160L-6	11	
2CY-60/2.8-1	1000	60	0.28	2	Y180L-4	22	

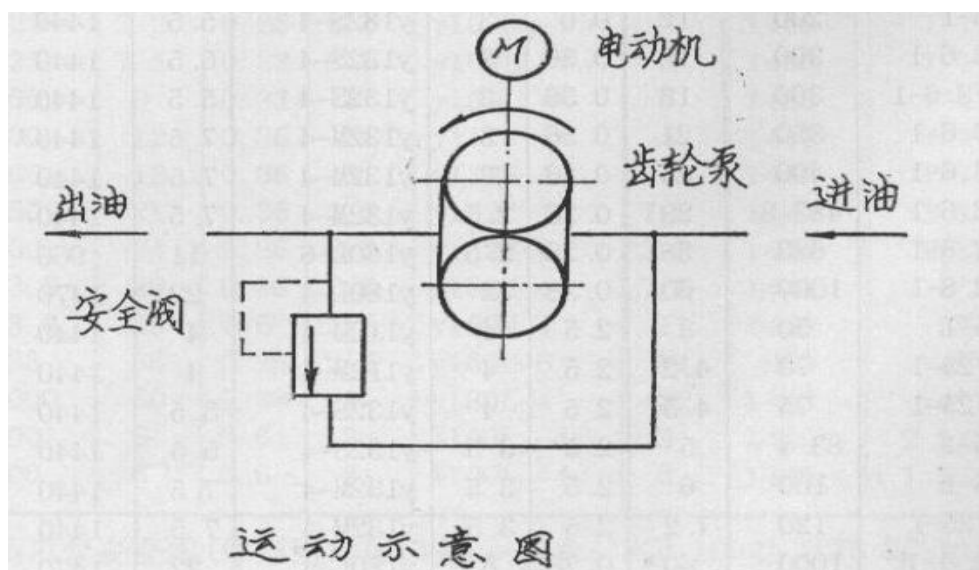
三、工作原理

1、结构

齿轮泵由泵体、前后端盖、主动齿轮、被动齿轮、轴承、轴承座、油封、联轴器、电动机、底盘、进出口法兰及接管，安全阀等组成。

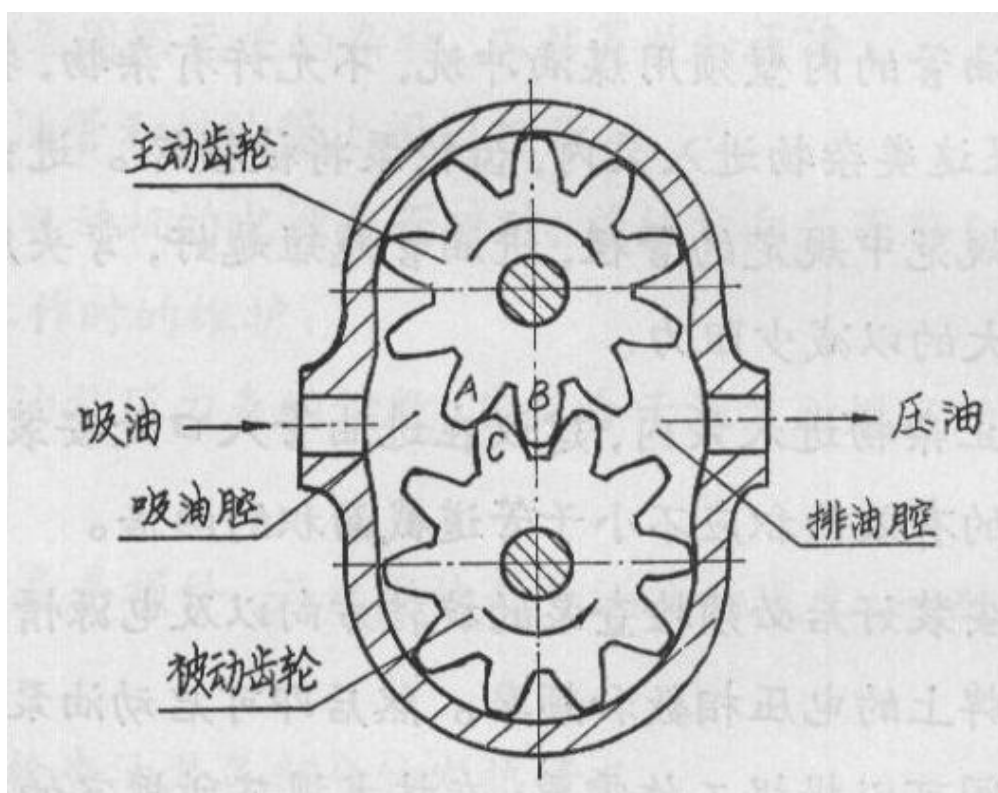
齿轮由轴承通过轴承支承在前后端盖上，油封起着主动轴转动时的密封作用。电动机的转动通过联轴器传递到齿轮泵的主动齿轮，使齿轮泵工作。安全阀为一单独整体，内部的孔与泵体的吸油空间和排油空间相通，中间由安装有弹簧的阀杆隔开。

2、工作原理



啮合的齿 A、C、B、将由泵体、端盖、齿轮密封的空间分隔成吸入腔和排出腔。当一对齿轮按图示方向旋转时，位于吸入腔的齿 C 逐渐退出啮合，使吸入腔的容积逐渐增大，压力降低，液体沿吸入管进入吸入腔，直至充满整个齿间。随着齿轮的转动，进入齿间的液体被带至排出腔，此时由于齿 B 的啮入，占据了齿间容积，使排出腔容积变小，液体即被强行排出。

当油路中的阻力（压力）超过安全压力时，安全阀就启动，使排油腔的油



回到吸油腔，从而减少压力，安全阀起过载保护作用。

四、齿轮油泵的安装与调试运转

油泵须安装在坚固的水泥基础上，并用油泵的地脚螺栓和螺母紧固在基础上。移动式油泵在运行使用前须将轮子垫平，并适当固定。油泵须安装在干燥的明亮的场所，便于管理人员能察看泵在运转时的情况，如果油泵需靠近墙壁装置必须预留空间便于拆卸检修，不要将泵装在潮湿和日晒、风吹雨打的场所。

如果安装场所有受水淹的可能，则油泵须位于最高水位之上。

进出油管的内壁须用煤油冲洗，不允许有杂物，特别是摩擦物质，如果这类杂物进入泵内，齿轮泵将被损坏。进出口油管应符合技术规范中规定的管径，进油管越短越好，弯头应采用弯曲半径比较大的以减少阻力。

为防止杂物进入泵内，建议在进油管入口处安装金属滤网，但滤油网的有效面积应不小于管道截面积的两倍。

油泵安装好后必须检查泵的旋转方向以及电源情况是否符合电动机铭牌上的电压相数和频率。然后即可启动油泵。

安全阀可以根据工作需要，在技术规范所规定的压力范围内调节。但必须注意，回放压力调低后，泵在额定排出压力时的流量将减少。安全阀在出厂时都经检验并调节（调节压力为额定排出压力的 140%左右），如非必要，不可任意进行调节，以免启闭压力不正常，造成泵的机件损坏等事故。

五、使用时应注意事项及维护方法

（一）、在油泵开动前的准备：

- 1、在油泵未开动之前应对泵内部进行仔细检查：
 - a、检查油泵的各螺母及底座上各螺栓是否紧固；
 - b、检查油泵齿轮转动是否灵活；
 - c、检查油封盖是否拧紧；
 - d、把油泵周围无关的杂物、工具等收拾干净。
- 2、把吸油管和排油管上阀门打开。
- 3、检查电动机的电源是否接对，旋转方向是否符合规定。

(二)、油泵工作时的维护:

- 1、注意油泵压力表的读数，应符合于油泵所规定的技术规范以内。
- 2、油封是易损坏，若出现油封处漏油的现象，一般情况应更换油封。
- 3、定时检查油泵各部分的发热情况。
- 4、当发现油泵有不正常的噪音或发热过高时，应立即停止工作，进行检查。
- 5、经常保持油泵及其周围地方的清洁。
- 6、为了能使齿轮油泵维护和保障正常的工作条件，必须及时清除在工作上所发觉的全部毛病。

六、设备存放

- 1、机械设备不能重叠堆放，以免损坏机械部件；
- 2、电气元件（含电动机）须存放在室内，保持室内干燥且通风良好；
- 3、机械设备若放置室外，应有防雨及防潮措施；
- 4、机械设备如果需要长期存放，应在设备表面加装防尘罩；
- 5、成套机械设备应整体存放在室内；
- 6、机械设备在装卸过程中，应避免与异物进行碰撞，造成设备的损坏。

七、故障及排除方法

故 障	原 因	排除方法
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<p>1、排 不出液体 或排最少</p>	<p>1、吸油高度超过额定高度; 2、吸油管路漏气; 3、旋转方向不对; 4、吸油管路阻塞或管径不符合要求; 5、油泵转速低; 6、安全阀开启; 7、安全阀密封不良。</p>	<p>1、降低吸油高度; 2、检查各联接处; 3、电动机重新接线; 4、排除; 5、纠正; 6、调节安全阀, 提高压力; 7、研究密封面。</p>
<p>2、油 泵内液体 渗漏</p>	<p>1、油封使用过久已磨损; 2、油封使用偏斜未校正; 3、密封处未压紧; 4、密封垫损坏。</p>	<p>1、更换油封; 2、校正; 3、调整; 4、更换。</p>
<p>3、电 动机超过 额定负荷</p>	<p>1、吸入液体的粘度过大; 2、排油压力过高; 3、排出阻力太大; 4、回转部分运转受阻。</p>	<p>1、预热油液; 2、降低排出压力; 3、检查并排除故障; 4、拆开检查并进行纠正。</p>

1. APPLICATION

Model 2CY gear oil pumps manufactured by our factory are suitable for chemical fertilizer factory, oil factory, Power plant, transformer substation, lube oil storehouse, capacitor plant, painting factory and grains department etc. for delivering turbine oil, transformer oil, aviation oil, machine oil, diesel oil and edible oil.

Model 2CY gear pumps feature of good appearance, Compact construction, stable performance, low impact of gear tooth, low noise, safety and reliability and easy maintenance and service. We may provide our customers with parts at any time.

Series of gear pumps made by our factory find their wide use in many industries, such as national defence, scientific research, petroleum, chemical, metallurgical, pharmaceutical, textile, traffic and foods for delivering oil below 60°C and with viscosity below 80 cst, edible oil and other kinds of oils. However, they are not applicable to delivering oils containing much sulfur, hard particles and or corrosive oils or volatile oil as well as oils with low flash points.

2. PRINCIPAL TECHNICAL DATA

Type	Sepecication			Oil suction High	Motor	Power	Mains
	Flow		Pressure				
	L/min	m ³ /h	MPa	m		kW	
2CY-1/5.0-1	16.7	1	0.5	5	Y90S-4	1.1	380V 50Hz
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3. OPERATION PRINCIPLE

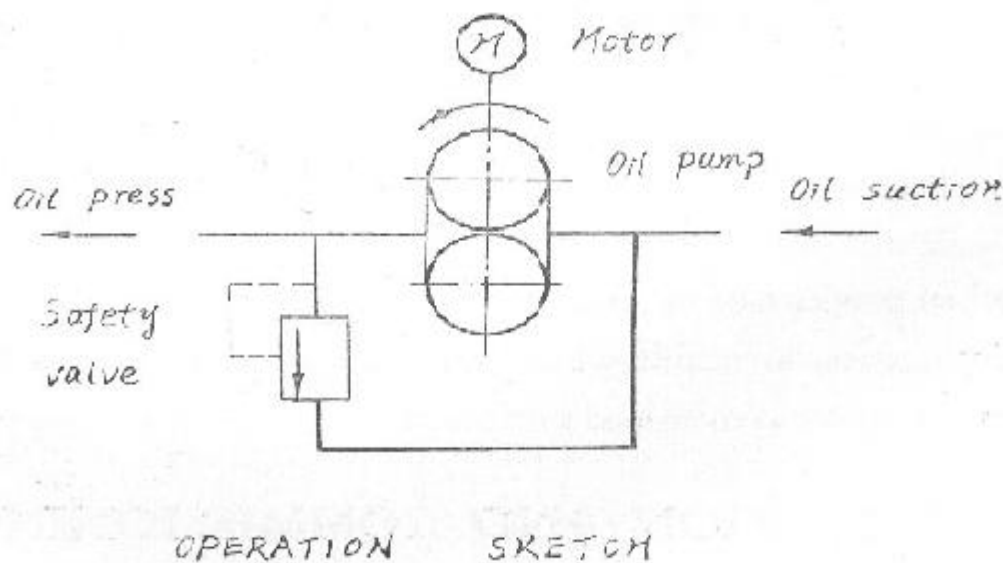
3.1. Construction

The gear pump consists of body, front/back end covers, driving gear, driven gear, bearing, bearing socket, oil seal, coupling, motor, chassis,

inlet/outlet flanges and connecting pipes and safety valve.

The gear is mounted on front/back end covers by means of bearing and bearing socket. Oil seal has function of sealing when driving shaft operates. The motor drives driving gear of gear pumps through coupling. Safety valve is one unit piece with inner hole connected with oil suction room and oil drain room of pump body. And the suction room and oil drain room are separated by springed valve stem.

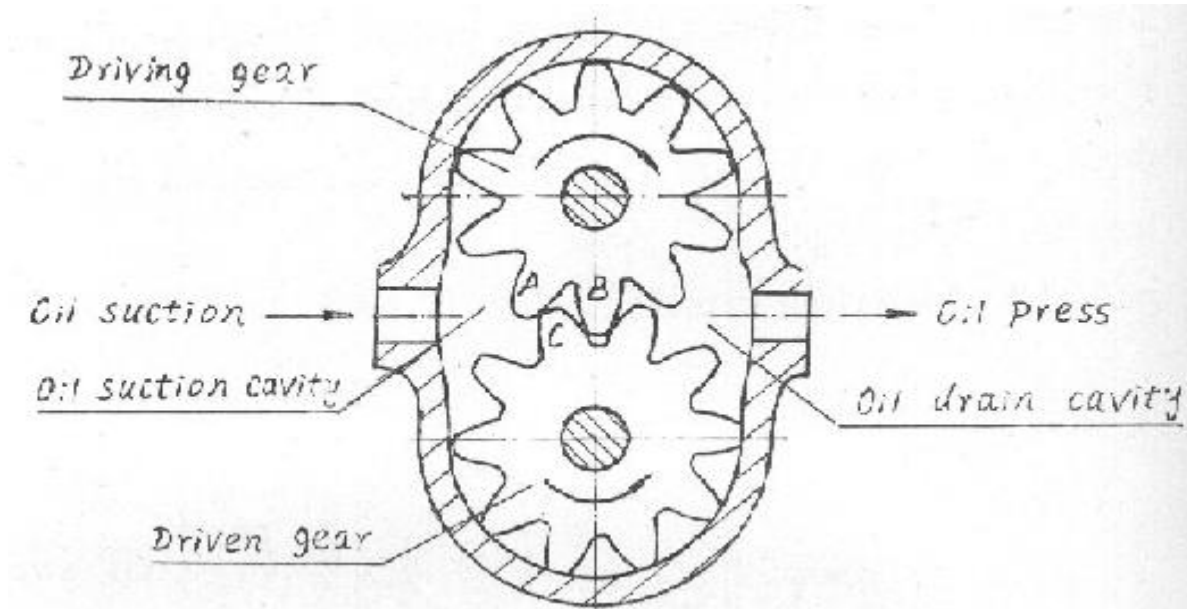
3.2. Operation principle



Engaged Tooth A, C, B divide room sealed by the body, end covers and gear into suction and drain cavities. When one pair of gears rotates according to direction shown in the Fig., Tooth C located in suction cavity disengages gradually. This causes increment of volume and decrease of pressure of suction cavity. So, fluid enters suction cavity along suction pipe until the cavity is full.

With running of gear, the fluid between teeth is delivered to drain cavity. At this moment, Tooth B is engaged and space between teeth is occupied. This leads to decrease of drain cavity volume and oil drain.

When pressure of oil circuit exceeds safety pressure, Safety valve will come



into action to enable oil in drain cavity to return to suction cavity. Safety valve serves as over-load protection.

4. INSTALLATION AND COMMISSIONING

The oil pump should be mounted on solid concrete foundation with foundation bolts and nuts. To movable oil pump Before running, the wheel of oil pump must be set level and fixed it. The installation site should be dry and bright for sake of observation. If pump is to be installed by the wall, sufficient room should be kept for easy maintenance and service. The gear pump should be kept away from sun ray, storm and rain. For risk of flooding, installation level should be above flooding height.

Inlet/outlet pipes should be rinsed with kerosene. Any abrasive articles are not allowed to enter the pipes because they may damage gear pump. Position of inlet/outlet pipes should be in conformity with the specified in the specification. The best result, the shortest inlet pipe. Elbow with large bent radius should be used to reduce resistance. Metal screen is recommended to be mounted at inlet of inlet pipe in order to prevent impurities from entering. But effective area of the screen should not be 2 times less than the section of the

pipe.

After completion of installation, check rotation direction of the pump and check to see whether voltage, phase no. and frequency are consistent with that of motor nameplate. If everything is O.K., start can be made.

Safety valve can be re-adjusted within specification according to need. It should be noted that low adjusted pressure will cause low flow at rated drain pressure. When the product left factory, it was adjusted to 140% of rated drain pressure. General speaking, it needs no re-adjustment to avoid parts damage.

5. PRECAUTION AND MAINTENANCE/SERVICE

5.1. Preparation Before Start

5.1.1. Before start, following inspections should be made.

- a. Check nuts and bolts of chassis for loose connection.
- b. Check gear pump for smooth running.
- c. Check oil seal for tightening.,
- d. Get rid of impurities around the pump.

5.1.1. Open valves on oil suction pipe and oil drain pipe.

5.1.1. Check motor for correct connection of power supply and correct rotation direction.

5.2. Maintenance

5.2.1. Watch gauge of pump. Readings should be within the specified.

5.2.2. Oil seal is of wear part. When leakage occurs, replacement of oil seal is required.

5.2.3. Check pump parts for over-heat regularly.

5.2.4. When abnormal noise or overheat is found, shutdown of the pump is needed. Inspection should be carried out.

5.2.5. Always keep working site clean.

5.2.6. Troubles found should be removed in time.

6. The Equipment Deposits

- 6.1 The mechanical device cannot overlap the stack, in order to avoid damages the mechanical part;**
- 6.2 The electrical part (including electric motor) must deposit in the room, in the maintenance room dry also ventilates good;**
- 6.3 Outside mechanical device if lays aside, should have rainproof and the moisture-proof measure;**
- 6.4 Mechanical device if needs the long-term storage, should in the equipment surface addition dust cover;**
- 6.5 The complete set mechanical device should the whole deposit in the room;**
- 6.6 The mechanical device in the loading and unloading process, should avoid with the foreign matter carrying on the collision, creates the equipment the damage.**

7. TROUBLESHOOTING

Trouble	Cause	Remedy
No fluid or low fluid discharged.	<ol style="list-style-type: none"> 1. Suction height exceeds the rated height. 2. Leakage of oil suction pipe. 3. Incorrect running direction. 4. Oil suction pipe clogged or the pipe diameter is not OK. 5. Low r.p.m. of pump. 6. Safety valve is opened. 7. Poor sealing of safety valve. 	<ol style="list-style-type: none"> 1. Low suction height. 2. Inspect joints. 3. Make correct connection of motor. 4. Remove. 5. Correct. 6. Adjust to increase pressure. 7. Lapping sealing surface.
Oil leakage in pump.	<ol style="list-style-type: none"> 1. Oil seal damaged. 2. Oil seal inclined. 3. Sealing points are not tight. 4. Sealing pad damaged. 	<ol style="list-style-type: none"> 1. Replace. 2. Correct. 3. Adjust. 4. Replace.

<p>Motor load exceeds the rated one.</p>	<p>1. Excessive viscosity of sucked fluid. 2. Excessive oil drain pressure. 3. Excessive drain resistance. 4. Resistance of rotary part.</p>	<p>1. Pre-heat fluid. 2. Lower the pressure. 3. Inspect and remove trouble. 4. Dismantle and correct.</p>
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