

LY 型压力滤油机

使用说明书

*INSTRUCTION MANUAL FOR
MODEL LY PRESS OIL FILTER*

自贡川滤设备制造有限公司

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一、用 途

滤油机是专为电厂、电站、工矿企业的变电所（室）润滑油库、拖拉机站、石油化工、冶金、国防工业等单位，用来过滤变压器油、透平油、航空液压油及其它液体油液中的水份和杂质。

因受齿轮结构的限制，对汽油、煤油等无润滑性的油类，不适用。

当油中水份过多时，应先将油加热，使水份蒸发一部分之后再过滤，如油很脏，需经处理后再过滤。

二、技术规格

型 号			LY-50	LY-100	LY-120	LY-150	LY-200
滤油能力		升/分	>50	>100	>120	>150	>200
工作压力		兆帕	0-0.5				
过滤面积		米 ²	0.39	1.30	1.54	1.89	2.46
压紧方式			手动螺旋压紧				
滤框数量			8	10	12	15	20
滤板数量			9	11	13	16	21
齿 轮 泵	流 量	升/分	>50	>100	>120	>150	>200
	最高压力	兆帕	0.6				
	齿 数		10	17			
	模 数		5	4			
电 动 机	型 号		Y90s-4	Y100L2-4		Y100L ₂ -4B5	Y112M-4
	功 率	千瓦	1.1	3		3	4
	电 源		380V 50Hz				
进油口直径			G1	G1 1/4			G2
出油口直径			G 3/4	G1 1/4			G1 1/4
外 形 尺 寸	长	毫米	800	990	1050	1140	1290
	宽	毫米	370	540			
	高	毫米	620	740			
重 量		千克	134	300	330	360	420
滤纸尺寸		毫米	200×200	296×296			

三、主要组成部份的结构特征

滤油机是由过滤床，油泵和粗滤器等部分组成的可移动装置。

过滤床是一种连续操作的，在压力作用下向侧面过滤的过滤器组，它

是由成套的顺序交替排列的滤板和滤框以及包括有手动螺旋压紧装置、压紧板、机架所组成，滤板和滤框的侧面有“耳子”支撑于机架的托板上，滤板和滤框间衬有作为过滤介质的滤纸（或滤布），借压紧装置的作用，将滤板和滤框压紧在不动的止推板和可移动的压紧板之间，从而形成了一个单独的过滤室，被压紧在滤板和滤框之间的滤纸（或滤布），起过滤作用。在滤板和滤框相应位置上设有两个通液孔，当压紧后构成为两条完整的通道。耳子呈三角形的一边导入脏油，与滤板相通的通道（在耳子呈扇形的一边）引出干净的油。

过滤时脏油经输入通道分配到各个滤框内，通过滤纸泄于滤板上，而汇集于输出通道内，排出机外，而脏物留在滤纸表面上，脏油中的少量水份被滤纸中的毛细管所吸收，当滤纸表面的滤渣逐渐增厚及滤纸中水份含量增多，过滤阻力增加，当增加到一定程度（一般为 $0.3-0.35\text{MPa}$ ）应停止过滤，更换滤纸后，继续使用。

齿轮泵与电动机用弹性橡胶垫联接，为避免压力过高造成机械事故，在油泵的下部设有安全阀（产品出厂时已调节在规定的最高压力值）。根据用户需要可将安全阀定在较低的数值上，但不允许调节到超过规定的最高压力值。

油泵和电动机装在过滤部分的下面，油泵输出的液体通过铁管、止推板输送到过滤部分。

油泵齿轮由滚动轴承支承，它是靠油泵本身运输的油液来润滑的。粗滤器安装在油泵的吸入端，它的作用一方面洁净油液，另一方面防止大的硬颗粒进入油泵，破坏油泵。当拧掉粗滤盖上的螺栓，取下粗滤器盖，就可直接将过滤网取出清洗，因为粗滤器内如果布满脏物，不但使滤油能力迅速下降，还有可能将过滤网损坏。

当箱内有存油时，可将回油阀打开，吸走存油。

四、机器的调整和试转

使用前应首先检查过滤部分的滤板、滤框安装位置，从止推板这一端开始，第一片是板、第二片是框、第三片又是板、第四片又是框……以此类推进行排列，板的数量比框多一片。板和框不能左右放反，如装反将不能起过滤作用。必须将涂在板、框、止推板和压紧板上的油脂清掉，同时清洗粗滤器，试车前在各板框之间须夹好滤纸，将滤板和滤框压紧。

开车前必须先用手将油泵轴转动两、三转，认为转动灵活，没有卡住现象，并将取样油嘴关闭，再将耐油胶管（或铁管）与滤油机的吸油端和排油端联系好，被使用的管子应事先检查，不应有堵塞，和漏油漏气现象。此时方可开车。

电动机正确的转动方向是油泵盖上箭头所指示的方向，不能反转。

如一切正常，开车后几秒钟内就会吸油和排油，如到半分钟仍未吸油，这说明油泵吸入端和油样阀有漏气现象，应立即停止工作，排除故障后再试，防止齿轮泵在无润滑油时研坏。

如开车后发现压力表指示的数值很高 0.4—0.6MPa，油泵有不正常的响声，应立即停止找出故障进行排除。

五、机器的操作规程

操作前将冲好孔的滤纸，仔细地夹在每个滤板、板框之间，滤纸的数量一般为 2—3 张，视过滤的要求和滤纸的质量而定，在夹放滤纸时，必须使滤纸上的两个通油孔和滤板滤框的通油孔一致，不要偏移造成泄漏，影响过滤效果。

滤纸在使用前应进行干燥，干燥温度 120℃ 左右。

使用已用过的滤纸时，滤纸必须经过烘干，并应无任何破损，注意有

滤渣的一面（即脏的一面）应对着滤框放置，不对着滤板，以免滤渣在过滤时被冲洗下来，污染过滤后的油液。

当过滤压力较高，发现滤纸有冲破现象时，可以在靠滤板的一面衬以滤布，以增加滤纸的强度。

放好滤纸后，推上紧板，转动手轮将滤板压紧，压紧滤板时，只许一个人操作，并且不能加长压紧手柄进行压紧，以免损坏机器。

将取样油嘴关闭，如排油管道上用户有阀门时，应将阀门旋开。

接通电动机的电源，使滤油机工作。滤油机的正常工作压力随被过滤油的粘度大小，及排出管道的阻力而变，一般在 $0.05—0.3\text{MPa}$ 范围内，过滤的初始压力较低，随着过滤，滤渣和滤纸吸收水分的增多而使压力逐渐增高，达到一定程度时在（随用户对油的要求而异），应更换滤纸。

在滤油过程中，抽取油样时，可以旋开油嘴取样。

过滤完毕，松开压紧装置，逐片的取出滤纸，清洗滤纸和滤框内的滤渣，更换滤纸重新夹好压紧，盖上油箱。

最后清洗粗滤器，清洗后重新盖好拧紧螺栓，待下次再用。

六、机器的维护和安全技术

1、要经常保持机器的整洁。

2、滤板滤框耳子比较脆弱，使用时要注意轻拿轻放。

3、推动滤油机时，速度不要太快，并要避免机器受到猛烈冲击。

4、在压紧螺杆螺母上应经常加润滑油。

5、在使用滤油机时，应将电机外壳用电线接地，防止电机绝缘不良发生事故。

6、上箱和后箱打开时，用力不要过大避免零件受损。

7、电机和支架的连接螺栓应经常检查，防止松动。

8、如发现滤油量不足，可检查下列 5 个方面：

- (1)、吸入管、粗滤器、油样阀、回油管及接头等处是否漏气。
- (2)、吸入管过长（一般不超过 5 米）或管径不符合规定。
- (3)、进油管和粗滤器网是否堵塞。
- (4)、吸管部分是否装有其它附件，而引起阴力过大。
- (5)、齿轮泵，安全阀是否松动或不严。

七、滚动轴承目录

滤油机型号	LY-50	LY-100	LY-120	LY-150
滚动轴承代号	203	205	205	205
数 量	4 个	4 个	4 个	4 个

1. APPLICATION

The oil filter is used to filter out water and impurities from transformer oil, turbine oil, aviation hydraulic pressure oil and other liquid oils in lubricating oil depots of power plants and various kinds of transformer stations, tractor stations, and the units in petrochemical industry, metallurgical industry and defence industry.

Limited by the gear structure, the product is not applied to gasoline, kerosene and other oil without lubricity.

If there is too much water in oil, the oil should be heated to have some water evaporated before filtering. If the oil is too dirty, this trouble must be handled before the oil is filtered.

2. SPECIFICATIONS

Type			LY-50	LY-100	LY-120	LY-150	LY-200
Filter oil capacity		L/min	>50	>100	>120	>150	>200
Working pressure		Mpa	0-0.5				
Filtering area		m ²	0.39	1.30	1.54	1.89	2.46
Compression mode			Screwed by hand				
Number of filter frames			8	10	12	15	20
Number of filter boards			9	11	13	16	21
Gear Pump	Flow	L/min	>50	>100	>120	>150	>200
	Max. pressure	MPa	0.6				
	Number of gears		10	17			
	Module of gear		5	4			
Electric motor	Type		Y90s-4	Y100L ₂ -4		Y100L ₂ -4B5	Y112M-4
	Power	KW	1.1	3		3	4
	Mains		380V 50Hz				
Diameter of oil inlet pipe			G1	G1 1/4			G2
Diameter of oil outlet pipe			G 3/4	G1 1/4			G1 1/4
Dimensions	L	mm	800	990	1050	1140	1290
	W	mm	370	540			
	H	mm	620	740			
Weight		kg	134	300	330	360	420
Size of filter paper		mm	200 × 200	296 × 296			

3. THE STRUCTURE FEATURES OF MAIN COMPONENTS

The oil filter is a mobile structure composed of a filter bed, an oil pump and a coarse filter device. The filter bed is a set of continuous operating filter

materials filtering out oil sideways under pressure. It consists of filter boards and filter frames lined alternately, a set of manual spiral hold-down mechanisms, a hold-down plate and the framework. There are auriform structures on the sides of the filter boards supported by the fascias of the framework. Filter paper (or filter cloth) as the filter medium lies between the filter boards and the filter frame. Under the pressure of the hold-down mechanism, the filter boards and the filter frames, compressed tightly between the immovable thrust plate and the movable hold-down plate, form a single filter room for filtering. There are two oil passage holes at the appropriate places of each filter board and filter frame. The holes form two complete passages when the boards and the frames are compressed tightly. The dirty oil is conducted into the oil filter through the passage at the triangular side of the auriform structure, and the clean oil is conducted out through the passage at the fan-shaped side of the auriform structure linked to the filter boards.

At working time the dirty oil flow through the inlet passage into the filter frames, passes through the filter paper, drops on the filter boards, gets together and flows out through the outlet passage, and becomes clean. The dirt in the oil stays on the surface of the filter paper, and a little quantity of water in the dirty oil is absorbed by the capillaries of the filter paper. When the dirt on the surface of the filter paper is piling up and the moisture content in the paper is increasing, the filter resistance is also increasing. When the filter resistance has reached a certain degree (usu 0.3-0.435MPa), the filtering should be stopped. The filter paper should be changed before the machine works again.

The gear pump and the electric motor are linked by elastic rubber pads. To avoid the pressure too high to cause any trouble to the machine, a safety valve is designed at the lower part of the pump, which has been set at the point of the stipulated maximal pressure volume before the product is dispatched from the factory. The safety valve can be set on a lower pressure volume according to the needs of the customs. But it can not be set over the stipulated maximal pressure volume.

The oil pump and the motor are installed below the filtering part of the

machine. The liquid exported out of the pump passes through the iron pipe and the thrust plate into the filtering part.

The gear pump is supported by the rolling bearings, which are lubricated by the oil passing through the pump. The coarse filter device is installed at the inlet opening of the pump. The function of it is to clean the oil and to prevent some big and hard particles from going into the pump in order to protect it. Turn out the screw on the cover of the device, then take off the cover, the filter screen can be directly taken out to be cleaned. If the dirt in the coares filter device is too much, it will not only sharply decrease the filter capacity, but may also damage the filter screen.

If some oil remains in the device , the spill valve can be turned open to draw out the oil.

4. ADJUSTING AND TRIAL RUN OF THE MACHINE

Check the fixed places of the filter boards and the filter frames on the filtering part before operation. The work should be carried on from the side of the thrust plate, first a filter board, then a filter frame, and another board, then another frame, and so on. The total number of the filter boards should be one more than the filter frames, the boards and the frames can't change their fixed positions, otherwise they can't filter oil. Before trial run of the machine, the grease on the filter boards, filter frames, thrust plate and the hold-down plate must be cleaned away. The coarse filter device should also be cleaned. Pinch the filter paper between each filter board and filter frame and compress the boards and the frames tightly.

Before operation the axle of the pump must be turned two or three rounds by hand to make sure whether it turns smoothly without any trouble. This time the opening for taking oil sample should be closed. The oil-resisting rubber tube (or iron tube) should be linked with both the oil inlet side and the oil outlet side of the oil filter. The rube should be examined beforehand to see if any problems of blocking, oil leak or air leak exist. If everything is all right,

the machine can start to operate.

The correct rotation direction of the motor is the direction shown by the pump cover or the rear date plate. The motor can't turn to the opposite direction.

If everything goes well, a few seconds after starting the machine the oil would be attracted in and drained out. If after half a minute there is no sign of oil attraction, this means that air leak exists in the inlet side or the sample valve of the pump. The machine should stop working immediately. It can operate again only after the problem has been settled. Otherwise the gear pump would be damaged without lubricant oil.

During the operation if the pressure meter shows a high numerical value (0.4-0.6MPa), and some irregular sound is heard, the operation must be stopped and the trouble should be get rid of.

5. THE OPERATING INSTRUCTION OF THE MACHINE

The filter paper with holes punched beforehand should be carefully clamped tightly between each filter board and filter frame before operation. The amount of the paper is usually about 2-3 pieces. It varies according to the needs of the filter and the quality of the paper. The two holes must correspond to the holes on the filter boards and the filter frames for passing oil. Otherwise oil leak would happen and the result of the filtering would be affected.

The filter paper should be dried before putting into use. The drying temperature is about 120°C.

When a used piece of filter paper is used again, it must be dried and has no any damage sign. Be careful to put the dirty side of the paper (the side with filter residue on) to face the filter frame, not the filter board, to avoid the filter residue to drop down to dirt the filtered oil during the operation.

When the filter pressure is high and the filter paper shows the sign of break, the filter cloth should be added between the paper and the filter board to increase the strength of the filter paper.

After placing the paper in right place, put on the hold-down plate, turn the handwheel to press the filter boards. The operation of pressing the boards

can only be done by one person, and the handle for pressing can't be lengthened in order not to damage the machine.

The opening for taking oil sample should be closed. If the consumer has set up a valve on the oil outlet pipe, the valve should be turned open.

Energize the motor to make the oil filter in operation. The normal working pressure of the machine varies in the range of 0.05-0.3 MPa with the different degrees of stickness of the oil and the obstruction of the draining pipe. The initial filter pressure is relatively low. As the operation is going on, the filter residue and water attracted by the filter paper are increasing, and the pressure is also increasing. When the pressure reach some degree, (varying with the needs of the consumers to the oil), the filter paper should be changed.

During the working time, the valve at the sample opening can be turned off to take oil for sample.

After filtering, loosen the hold-down device, take out the filter paper piece by piece, clean the filter residue to the filter paper and the filter frames. The change the filter paper, put it into the right place, clamp and press it again, and then cover the oil container.

Finally clean the coarse filter device, then cover it and tighten the screws for later sue.

6. MAINTENANCE AND SAFETY REGULATIONS

- 6.1. Always keep the machine clean.**
- 6.2. The auriform structure of the filter board and frame is fragile. Great care must be taken while use them.**
- 6.3. Don't move the machine too fast and try to make the machine avoid any strong collision.**
- 6.4. The pressing screw bolts and nuts should be often lubricated.**
- 6.5. While the machine is operating, the outer casing of the motor should have wire for ground connection to avoid any accident caused by bad insulation of the motor.**
- 6.6. Be careful not to put on or take off the upper case and the back case with too much force in order not to damage the parts.**
- 6.7. The screw bolts connecting the motor and the stands should often be examined to prevent them form becoming loose.**

- 6.8. If the quantity of the oil filtered is below the standard, the following five aspects can be examined.**
- 6.8.1. If there is any air leak in the suction line, coarse filter device, oil sample valve or oil return pipe, and the connections.**
- 6.8.2. If the suction line is too long (which should be less than 5m), or if the pipe caliber doesn't accord with the specification.**
- 6.8.3. If there is any obstruction in oil inlet pipe of the nets of the coares filter device.**
- 6.8.4. If there are any accessories fixed on the suction line so as to cause the too high resistance.**
- 6.8.5. If the gear pump is not firmly fixed, or the safety valve is not close tightly.**

7. BALL BEARING LIST

Type of Oil Filter	LY-50	LY-100	LY-120	LY-150
Code Name of the Ball Baring	203	205	205	205
Number	4	4	4	4