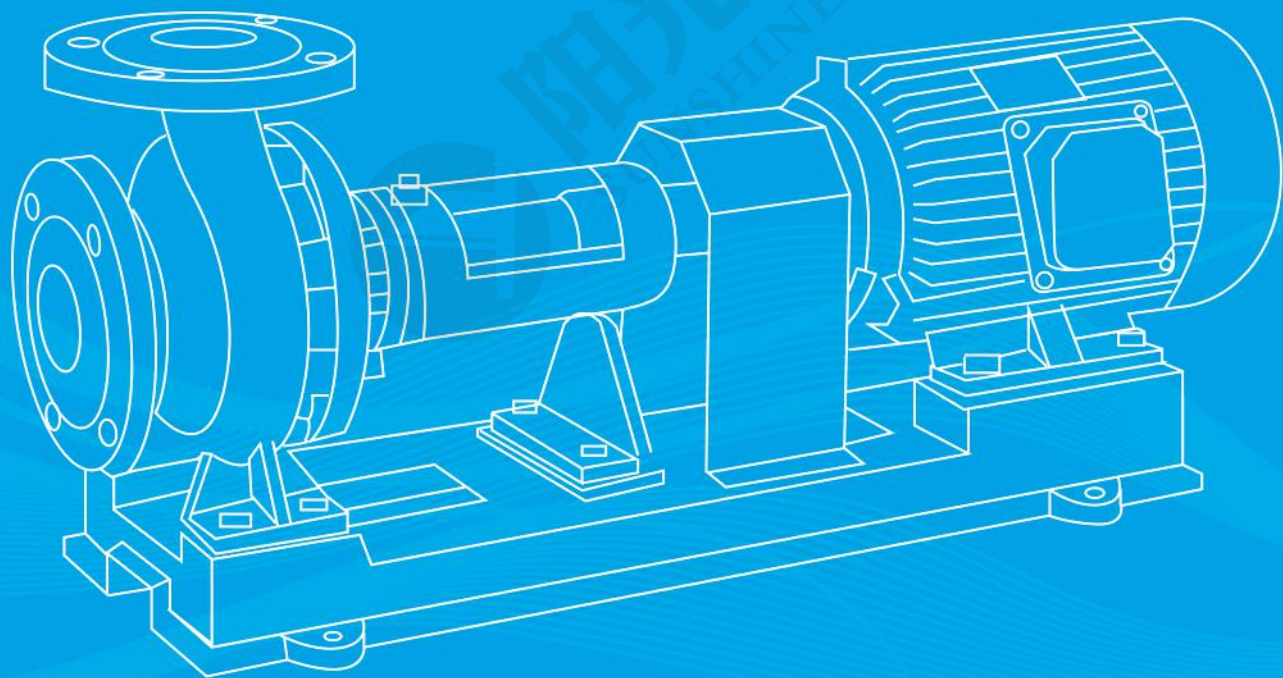




LQRY系列热油泵

LQRY SERIES HOT OIL PUMP

使用说明书 USER'S MANUAL



上海阳光泵业制造有限公司

Shanghai Sunshine Pump Manufacture Co., Ltd.

公司概况

上海阳光泵业制造有限公司座落于上海市金山工业园区，是国内一家著名的集研制、开发、生产、销售、服务于一体
的大型多元化企业。主导产品包括：螺杆泵、隔膜泵、液下泵、磁力泵、排污泵、化工泵、多级泵、自吸泵、齿轮油泵、
计量泵、卫生泵、真空泵、潜水泵、转子泵等类别。产品以优越的性能，精良的品质已获得各项专业认证证书及客户的认可。
公司拥有多名水泵专家和各类中高级工程师，不断的开发制造，升级换代产品年年都有问世。

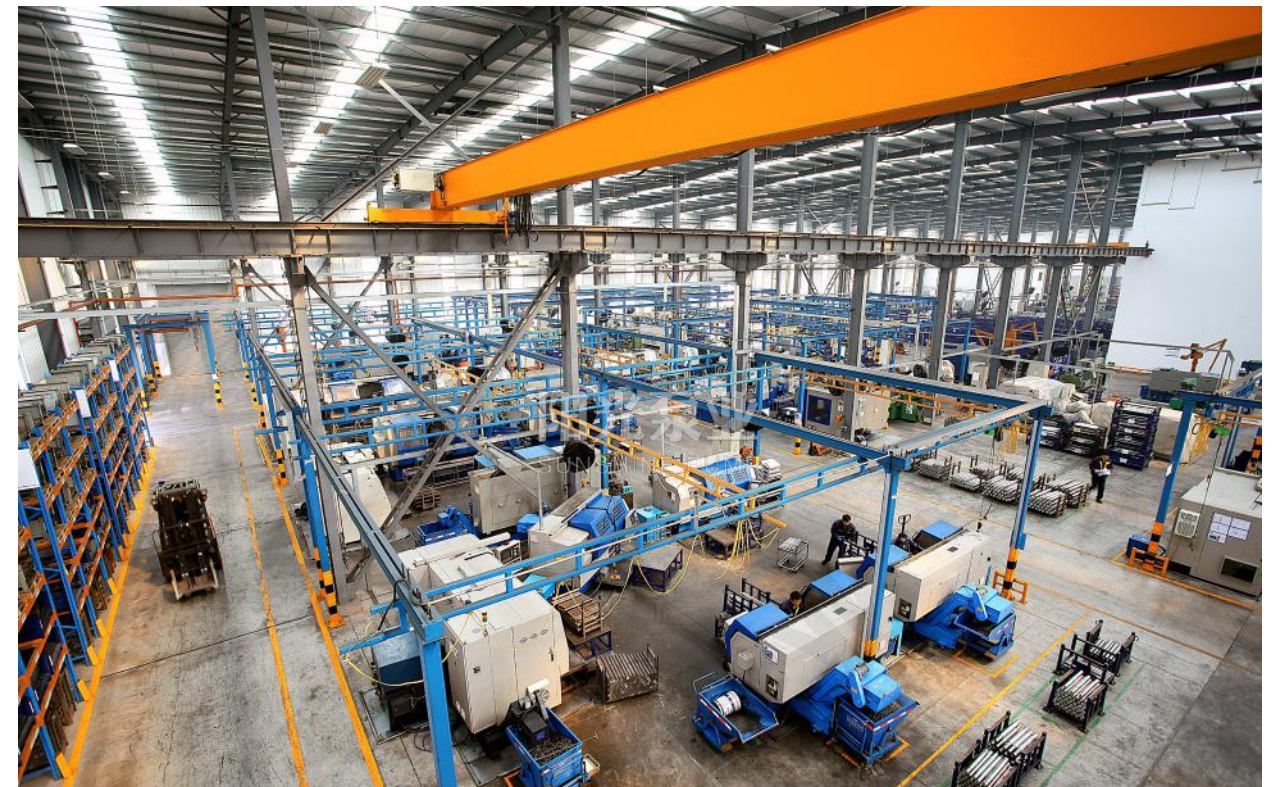
公司拥有国内高水准的水泵性能测试中心，产品全部采用 CAD 设计软件和 CFD 计算流体力学软件等先进设计手段，
产品经过精密铸造、热锻压、焊接、热处理、精加工、装配等十多道工序。使用先进的数控加工中心、等离子焊接机、全
自动气体保护、半自动真空熔焊机、超频真空热处理设备、高效加工专机、理化和探伤设备等各类高精密加工检测设备。
齐全的加工检测设备，于同行业中处领先地位，更加充分保证了产品的质量。公司产品达二十大系列，一万多种规格。产
品广泛应用于：工业生产，建筑城镇供水，环保污水处理，市政工程，食品制药，水利电力，石油船舶等多种领域。客户
包括大庆油田、胜利油田、中国水利水电、浦项集团等世界知名企业。

不仅如此，阳光泵业同时拥有完善的一体化服务体系：包括前期的专业技术人员快速解答各项技术咨询，应对您的需
求，为您选择合适的产品，提供合理可靠的建议；对产品质量、供货周期等的承诺，提供具体货品方案及报价。售后包括：
提供产品安装、使用、维护、排除故障等服务。欢迎广大新老客户光临指导，洽谈业务，我们将不断的努力，为您提供优
质的产品和服务。





生产加工车间



轴加工车间



装配车间

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注意：

为了确保安全，在使用阳光牌 LQRY 系列热油泵前，请你认真阅读使用说明书
note:

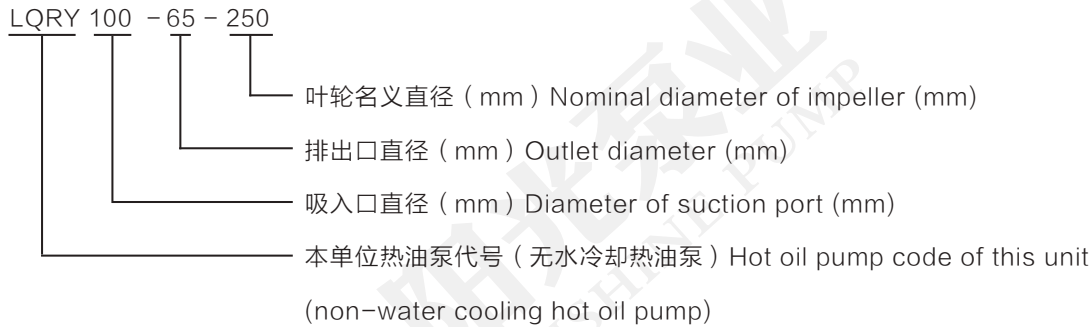
In order to ensure safety, please read the operating instructions carefully before using
the Sunshine LQRY series hot oil pump

产品用途 Product Usage

LQRY 型系列热油泵在我国载热体加热系统中得到了广泛的使用，已经进入石油、化工、橡胶、塑料、制药、纺织、印染、筑路、食品等各个工业领域，主要用于输送不含固体颗粒的弱腐蚀性高温液体，使用温度 $\leq 350^{\circ}\text{C}$ ，是一种理想的燃油循环泵。

The LQRY series hot oil pump has been widely used in the heating system of heating medium in our country. It has entered various industrial fields such as petroleum, chemical industry, rubber, plastics, pharmacy, textile, printing and dyeing, road construction, food, etc. It is mainly used for conveying Weakly corrosive high temperature liquid containing solid particles. The use temperature is $\leq 350^{\circ}\text{C}$, which is an ideal fuel circulating pump.

型号说明 Model Description



结构特点 Structural features

LQRY 系列热油泵是本单位消化吸收国外油泵的基础上研制的第二代产品，基本形式为单级单吸悬臂式脚支撑结构、泵的进口为轴向吸入，出口为中心垂直向上，和电机同装于底座上。

LQRY 系列热油泵的支撑采用了双端球轴承支撑的结构形式，前端采用润滑油润滑，后端采用润滑脂润滑，中间有一导油管，用以随时观察密封情况和回收导热油。采用自热散热结构，改变了传统的水冷却结构，使结构简单，体积小，节约运行费用，性能好，使用可靠。

LQRY 系列热油泵，（1）采用填料密封和机械密封相结合的形式，填料密封用耐高温的填料，具有良好的热态适应性，而机械密封则采用机械强度高，耐磨性好的硬质合金材料，保证了高温情况下的密封性能。

（2）采用第三代聚四氟乙烯（简称 PTFE）做唇形密封，使密封性能产生了飞跃，比橡胶类密封可靠性提高 25 倍，耐腐蚀性能极强。

The LQRY series hot oil pump is the second generation product developed on the basis of the digestion and absorption of foreign oil pumps by this unit. The basic form is a single-stage single-suction cantilever foot support structure. The inlet of the pump is axial suction, and the outlet is centered vertically upwards, and The motor is also installed on the base.

The support of LQRY series hot oil pump adopts the structure of double-end ball bearing support. The front end is lubricated with lubricating oil, and the back end is lubricated with grease. There is an oil pipe in the middle to observe the sealing condition and recover the heat transfer oil at any time. The self-heating

heat dissipation structure is adopted to change the traditional water cooling structure, making the structure simple, small in size, saving operating costs, good performance, and reliable in use.

LQRY series hot oil pump, (1) adopts a combination of packing seal and mechanical seal. The packing seal uses high temperature resistant packing, which has good thermal adaptability, while the mechanical seal adopts high mechanical strength and good wear resistance. The high-quality alloy material ensures the sealing performance under high temperature conditions.

(2) The third-generation polytetrafluoroethylene (PTFE for short) is used as the lip seal, which makes the sealing performance a leap, and the reliability is 25 times higher than that of rubber seals, and the corrosion resistance is extremely strong.

LQRY 系列热油泵性能参数
LQRY series hot oil pump performance parameters

表 1Table 1

泵型号 model	流量 flow		扬程 Lift (m)	转速 Speed (r/min)	电机功率 Motor power (KW)	效率 η %	汽蚀余量 Cavitation margin NPSH (m)
	m³/h	L/min					
26-20-100	4.5	1.3	15	2825	0.75	40	0.8
50-32-150	8	2.2	22	2840	1.5	42	1.6
50-32-160	10	2.8	25	2840	2.2	42	1.8
65-40-160	12.5	3.5	25	2900	3	45	2.2
50-50-170	12.5	3.5	32	2890	4	45	2.5
50-50-150	24	6.7	18	2880	4	46	1.8
65-40-190	18	5	40	2900	5.5	52	2.8
65-50-180	32	8.9	32	2930	5.5	52	2.7
65-50-170	40	11.1	25	2930	5.5	52	2.7
65-50-150	52	14.4	16	2900	5.5	52	2.8
65-40-200	25	6.9	50	2900	7.5	63	3.1
80-50-180	40	11.7	40	2940	7.5	63	3.1
80-50-170	60	16.7	20	2930	7.5	63	3.1
100-65-190	60	16.7	38	2940	11	68	3.5
100-65-200	80	22.2	40	2950	15	70	3.5
100-65-220	58	16.1	50	2970	15	68	3.5
100-65-210	90	25	45	2950	18.5	70	3.6
100-65-230	58	16.1	60	2970	18.5	62	3.5
100-65-235	100	27.8	55	2970	22	70	3.6
125-100-190	155	43.1	30	2970	22	72	3.8
100-65-240	100	27.8	70	2970	30	70	4.1

LQRY 系列卧式热油泵性能参数
LQRY series horizontal hot oil pump performance parameters

表 2Table 2

泵型号 model	流量 flow		扬程 Lift (m)	转速 Speed (r/min)	电机功率 Motor power (KW)	效率 η %	汽蚀余量 Cavitation margin NPSH (m)
	m³/h	L/min					
100-65-257	100	27.8	80	2970	37	67	3.6
125-100-220	160	44.4	45	2970	37	75	3.6
125-80-250	160	44.4	60	2970	45	74	5
125-80-270	150	41.7	85	2970	55	73	5
125-100-250	200	55.6	60	2970	55	76	6
125-100-257	260	62.1	70	2970	75	77	6.8
125-100-265	200	97.2	80	2970	75	74	6
125-100-245	300	83.3	55	2970	75	74	7.5
125-100-260	300	62.1	70	2970	90	78	8
125-100-270	220	111.4	85	2970	90	76	6
125-100-280	260	72.2	85	2970	90	76	6.8
150-125-250	350	97.2	60	2980	90	76	8.6
150-125-240	400	111.1	50	2980	90	76	9.8
150-125-270	340	94.4	76	2980	110	78	8.5
150-125-250	350	97.2	60	2980	110	76	8.6
150-125-280	400	111.1	78	2980	132	80	9.8
150-125-285	370	102.8	85	2980	132	80	9.7
250-200-500	500	138.9	80	1450	160	76	8.5
300-250-500	600	166.7	80	1450	185	70	9
250-200-550	700	194.4	80	1480	220	81	14

LQRY 系列立式热油泵性能参数
LQRY series vertical hot oil pump performance parameters

表 3Table 3

泵型号 model	流量 flow		扬程 Lift (m)	转速 Speed (r/min)	电机功率 Motor power (KW)	效率 η %	汽蚀余量 Cavitation margin NPSH (m)
	m³/h	L/min					
25-25-135	4	1.1	20	2900	0.75	36	2.3
25-25-170	4	1.1	32	2900	1.5	32	2.3
32-32-135	5	1.4	20	2900	0.75	44	2.3
32-32-170	6.5	1.8	32	2900	1.5	44	2.3
32-32-210	4.5	1.3	50	2900	3	32	2
40-40-135	6.2	1.7	20	2900	1.1	46	2.3
40-40-170	6.2	1.7	32	2900	2.2	40	2.4
40-40-210	6.2	1.7	50	2900	4	33	2.3
40-40-260	6.2	1.7	80	2900	7.5	28	2.2
40-40-135F	12.5	3.5	20	2900	1.5	58	2.4

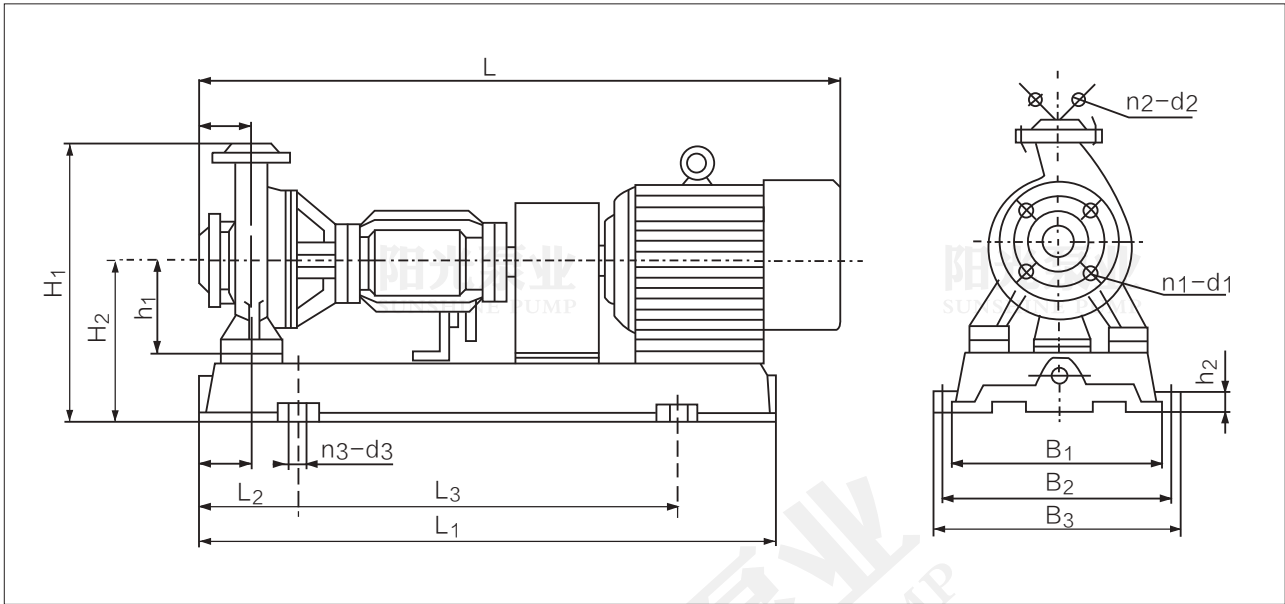
LQRY 系列立式热油泵性能参数
LQRY series vertical hot oil pump performance parameters

表 4Table 4

泵型号 model	流量 flow		扬程 Lift (m)	转速 Speed (r/min)	电机功率 Motor power (KW)	效率 η %	汽蚀余量 Cavitation margin NPSH (m)
	m ³ /h	L/min					
40-40-170F	12.5	3.4	32	2900	3	52	2.3
40-40-210F	12.5	3.5	50	2900	5.5	46	2.3
40-40-260F	12.5	3.5	80	2900	11	38	2.3
50-50-135	12.5	3.5	20	2900	1.5	58	2.3
50-50-170	12.5	12.5	32	2900	3	52	2.5
50-50-210	12.5	3.5	50	2900	5.5	46	2.3
50-50-260	12.5	3.5	80	2900	11	38	2.1
50-50-135F	25	6.9	20	2900	3	68	2.4
50-50-170F	25	6.9	32	2900	4	63	2.5
50-50-210F	25	6.9	50	2900	7.5	58	2.5
50-50-260F	25	6.9	80	2900	15	50	2.5
50-50-325F	25	6.9	125	2900	30	40	2.4
65-65-170	25	6.9	32	2900	4	63	2.5
65-65-210	25	6.9	50	2900	7.5	58	2.5
65-65-260	25	6.9	80	2900	15	50	2.4
65-65-325	25	6.9	125	2900	30	40	2.5
65-65-170F	50	13.9	32	2900	7.5	71	3
65-65-210F	50	13.9	50	2900	15	67	3
65-65-260F	50	13.9	80	2900	22	59	3
80-80-170	50	13.9	32	2900	7.5	71	3.1
80-80-210	50	13.9	50	2900	15	67	3.1
80-80-260	50	13.9	80	2900	22	59	3.5
80-80-170F	100	27.8	32	2900	15	76	3.4
80-80-210F	100	27.8	50	2900	22	74	3.6
100-100-170	100	27.8	32	2900	15	76	4
100-100-210	100	27.8	50	2900	22	74	4
100-100-170F	160	44.4	32	2900	22	79	5.6
125-125-170	160	44.4	32	2900	22	78	4
150-150-170	160	44.4	32	2900	22	75	4.1

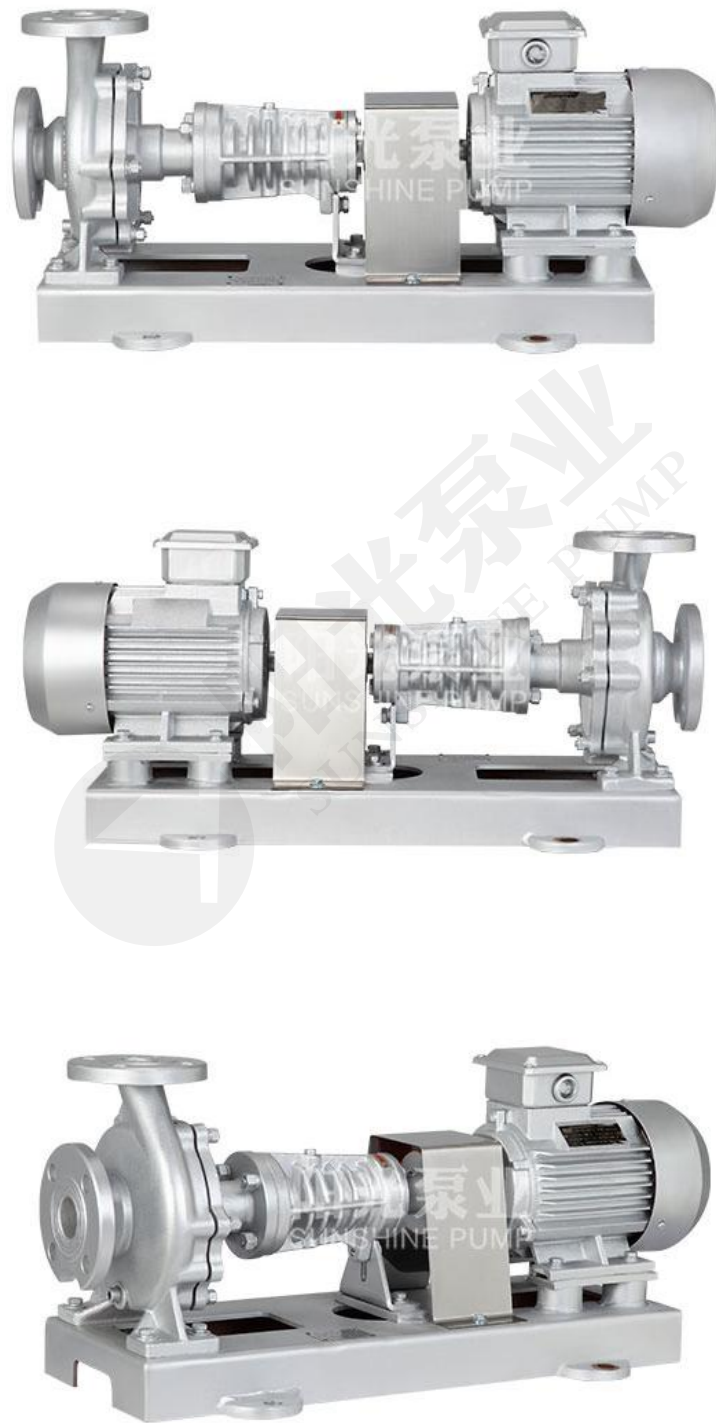
外形和安装尺寸图表 Appearance and installation size chart

仅供参考
For reference only



泵型号 model	电机 机座号 / 功率 power	外形及安装尺寸 Shape and installation dimensions																	
		L	L1	L2	L3	B1	B2	B3	A	a	h1	h2	H1	H2	D1	D2	n1/d1	n2/d2	n3/d3
26-20-100	Y801-2/0.75	700	630	108	415	200	230	270	75	80	95	25	290	180	85	75	4/14	4/14	4/14
50-32-150	Y90S-2/1.5	800	700	80	525	180	248	295	80	90	132	150	365	210	125	100	6-17.5	4-17.5	4-16
50-32-160	Y90L-2/2.2																		
65-40-160	Y100L-2/3	1000	810	110	590	280	360	410	80	100	150	420	240	145	110	125	8-17.5	6-17.5	4-20
50-50-170	Y112M-2/4		845	122.5	600	355	360	410			152	442	247	160					
65-50-180	Y132S1-2/5.5	1100	900	120	660	300	380	440	100	160	160	410	245	160	125	8-17.5	6-17.5	4-20	
80-50-180	Y132S2-2/7.5				660	300	380	440			160	410	245	160					
100-65-190	Y160M1-2/11	1200	1049	120	730	355	440	510	110	120	180	40	510	285	180	145	8-20	8-17.5	4-22
100-65-220	Y160M1-2/15				730	355	440	510	110	120	180		510	285	180	145			
100-65-200A	Y160M1-2/15	1300	1180	145	930	415	495	570	115	125	200	40	570	320	180	145	8-20	8-17.5	4-22
100-65-230	Y180M-2/22														180	145			
125-100-200	Y180M-2/22	1400	1180	145	930	415	495	570	115	125	200	40	570	320	220	180	8-22	8-22	4-24
100-65-240	Y200L1-2/30														180	145			
100-65-257	Y200L2-2/37	1400	1180	145	930	415	495	570	115	125	200	40	570	320	180	145	8-22	8-22	4-24
125-100-220	Y200L2-2/37														180	145			
125-80-250	Y225M-2/45	1513	1245	152	960	480	540	620	140	144	225	45	620	345	220	160	8-22	8-22	4-24
125-100-250	Y250M-2/50	1580	1400	230		550	600	690			150	230	50	725	438	220			
125-100-257	Y280S-2/75	1628	1510	275	960	540	620	695	150	144	230	50	725	438	220	190	8-22	8-22	4-24
125-100-260	Y280S1-2/90																		
125-100-270	Y280S1-2/90	1628	1510	275	990	540	620	695	150	144	230	50	725	438	220	190	8-22	8-22	4-24
150-125-270	Y315S-2/110	1818	1590	250	1090	628	720	780	145	150	230	45	750	440	240	210	8-22	8-17.5	4-24
150-125-270	Y315M1-2/132	1888																	

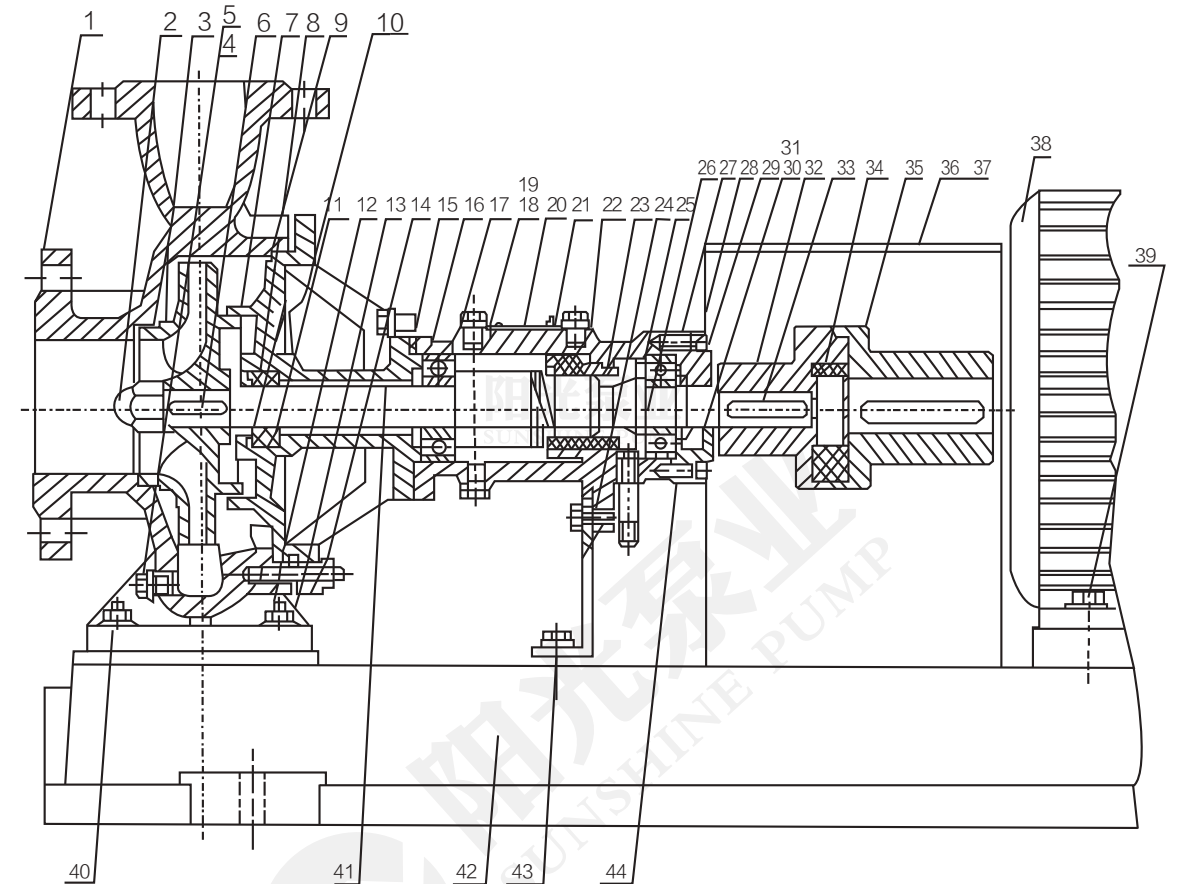
产品展示图 Product display diagram



* 展示图仅供参考，以实际收到产品为主。
*The picture shown is for reference only, based on the actual product received.

结构示意图 Schematic

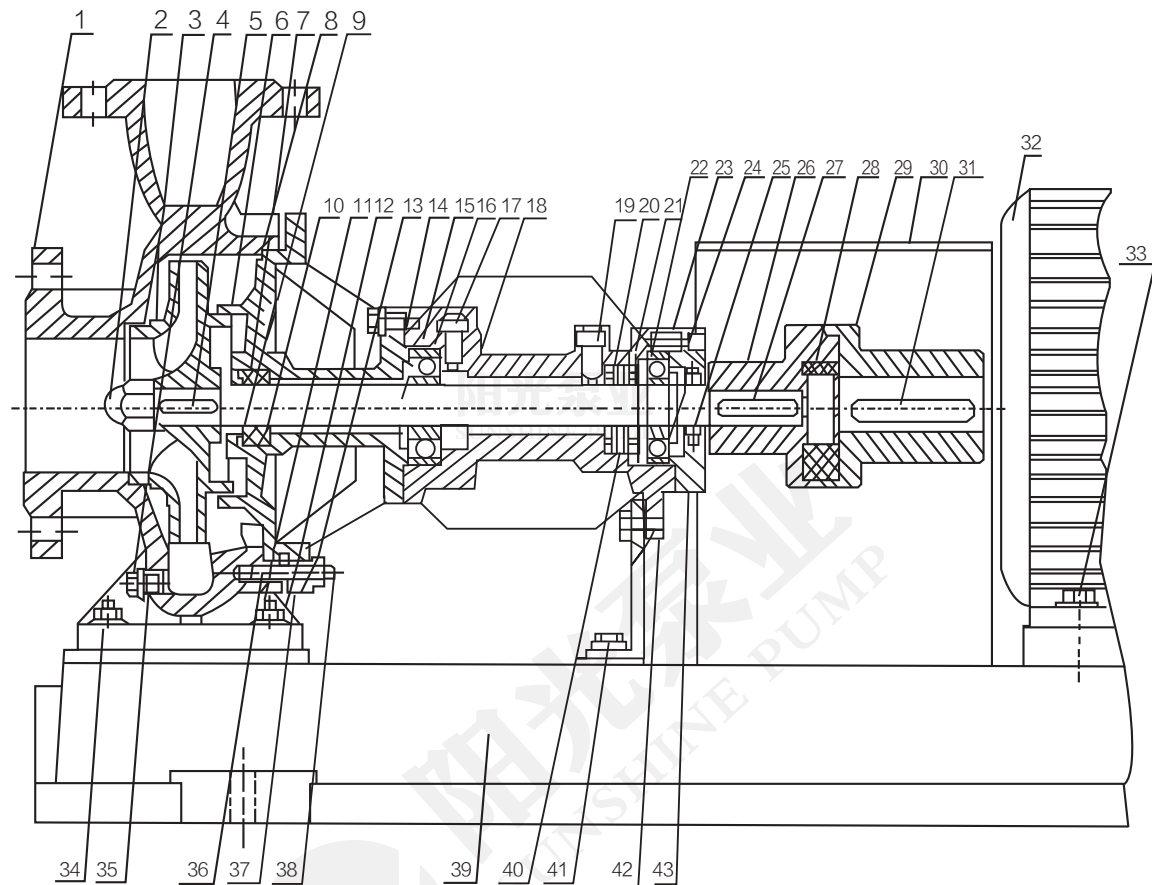
图一 Figure 1



序号 No	名称 name	序号 No	名称 name	序号 No	名称 name	序号 No	名称 name	序号 No	名称 name
1	泵体 Pump body	2	盖形螺母 Cap nut	3	叶轮 Impeller	4	螺塞 Screw plug	5	铝热圈 Thermite
6	平键 Flat key	7	泵盖 Pump cover	8	孔用弹性挡圈 Circlips for holes	9	铝垫圈 Aluminum pad	10	压圈 Pressure ring
11	垫料 Litter	12	螺母 Snail	13	垫圈 Cushion ring	14	螺栓 Bolt	15	螺栓 Bolt
16	泵轴 Pump shaft	17	球轴承 Jack joint	18	轴承座 Bearing seat	19	垫片 Pad	20	铝牌 Aluminum plate
21	铆钉 Rivet	22	机械密封 Machinery Seal	23	螺栓 Bolt	24	撑脚 Brace	25	垫圈 washer
26	导油管 Oil guide tube	27	螺钉 Screw	28	垫圈 washer	29	橡胶密封 Rubber seal	30	轴承盖 Bearing cap
31	垫片 Pad	32	泵联轴器 Pump coupling	33	平键 Flat key	34	弹性块 Elastic block	35	电机联轴器 Motor coupling
36	罩壳 Enclosure	37	螺钉 Snail	38	电动机 Electric motor	39	螺栓 Bolt	40	螺柱 Stud
41	垫圈 washer	42	底座 Bottom seat	43	垫圈 Cushion ring	44	弹性挡圈 Circlip		

结构示意图 Schematic

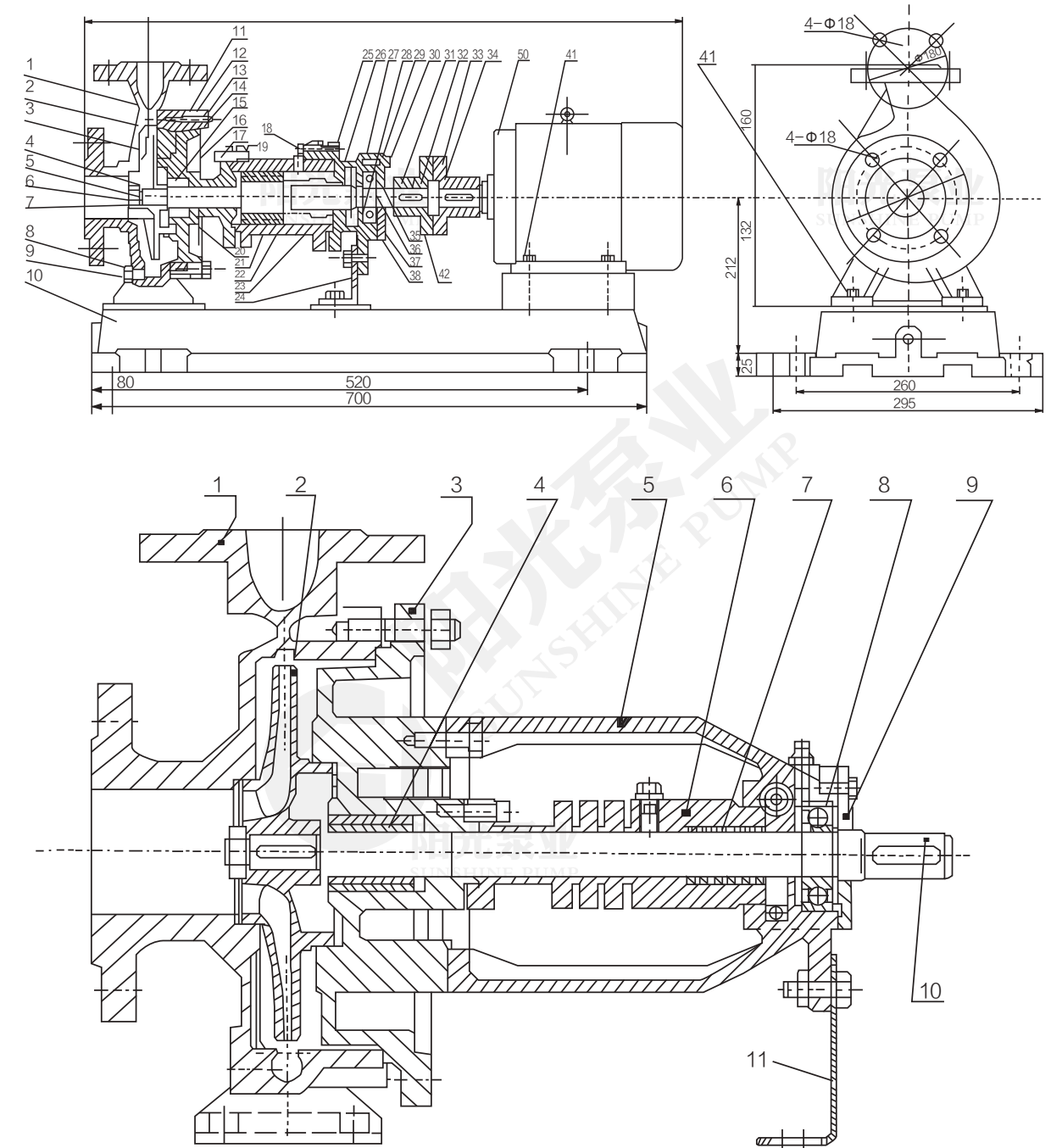
图二 Figure 2



序号 No	名称 name	序号 No	名称 name	序号 No	名称 name	序号 No	名称 name	序号 No	名称 name
1	泵体 Pump body	2	盖形螺母 Cap nut	3	叶轮 Impeller	4	螺塞 Screw plug	5	平键 Flat key
6	泵盖 Pump cover	7	孔用弹性挡圈 Circlips for holes	8	铝垫片 Aluminum gasket	9	压圈 Pressure ring	10	垫料 Litter
11	螺母 Snail	12	垫片 Pad	13	垫片 Pad	14	螺栓 Bolt	15	泵轴 Pump shaft
16	球轴承 Jack joint	17	内六角螺栓 Hexagon socket bolt	18	轴承座 Bearing seat	19	内六角螺栓 Hexagon socket bolt	20	橡胶密封 Rubber seal
21	孔用弹性挡圈 Circlips for holes	22	球轴承 Jack joint	23	内六角螺栓 Hexagon socket bolt	24	轴用弹性挡圈 Brace	25	羊毛毡 Wool felt
26	泵联轴器 Pump coupling	27	平键 Flat key	28	弹性块 Elastic block	29	电机联轴器 Motor coupling	30	轴承盖 Bearing cap
31	平键 Flat key	32	电机 Motor	33	螺栓 Bolt	34	双头螺栓 Stud bolt	35	铝垫圈 Aluminum pad
36	双头螺栓 Stud bolt	37	垫片 Pad	38	螺母 Snail	39	螺栓 Bolt	40	垫圈 washer
41	螺栓 Bolt	42	螺栓 Bolt	43	轴承盖 Bearing cap	44	底座 Base		

结构示意图 Schematic

图三 Figure three



序号 No	名称 name	序号 No	名称 name	序号 No	名称 name	序号 No	名称 name	序号 No	名称 name	序号 No	名称 name
1	泵 体 Pump body	2	叶 轮 Impeller	3	泵 盖 Pump cover	4	轴套 Shaft sleeve	5	悬臂轴承座 Cantilever bearing seat	6	密封套 Gland
7	油封 Oil seal	8	轴承 (6308) Bearing (6308)	9	轴承盖 Bearing cap	10	泵轴 Pump shaft	11	支架 Bracket		

机组的安全 Safety of the crew

1. 泵安装的好坏对泵的平稳运行和使用寿命有很重要的影响，所以安装工作必须仔细地进行，不得草率行事。
2. 泵吸水管的安装高度、长度和管径应满足计算值，力求简短，减少不必要的损失（如弯头等）。
3. 吸入和吐出管路应有管架，泵不允许承受管路的负荷。
4. 安装地点应足够宽敞、以方便检修工作和良好散热。
5. 安装顺序：
 - (1) 将机组放在埋有地脚螺栓的基础上，在底座与基础之间放成对垫，作找正用。
 - (2) 松开联轴器、用水平仪分别放在泵轴和底座上，通过调整楔块垫使机组至水平找正后，适当拧紧地脚螺栓，以防走动。
 - (3) 用混凝土灌注底座和地脚螺栓孔。
 - (4) 待混凝土干固后，检查底座和地脚螺栓是否有不良或松动等现象，检查合格后应拧紧地脚螺栓，并重新检查泵的水平度。
 - (5) 校正泵轴和电机轴的同轴度，在联轴器外圆上的偏差允许 0.1 毫米，两联轴器平面间的间隙应保证 2-3 毫米，在两联轴器端面一周上，最大和最小间隙差数不得超过 0.3 毫米。
 - (6) 在接好管路及确定原动机转动方向后，再接上联轴器，并再校核一遍圆的同轴度。
 - (7) 在机组实际试运转 3-4 小时后作最后检查，如没有不良现象则认为安装合格。
 - (8) 在安装过程中为防止杂物落入机器内，应将机组所有孔眼均盖好。
 - (9) 泵在开启前对进出管路进行清洗时，在泵的进口段需加上过滤器，以防杂物进入泵内。

1. The quality of the pump installation has a very important impact on the smooth operation and service life of the pump, so the installation work must be carried out carefully and not rashly.

2. The installation height, length and pipe diameter of the suction pipe of the pump should meet the calculated value, strive to be short, and reduce unnecessary losses (such as elbows, etc.).

3. The suction and discharge pipelines should have pipe racks, and the pump is not allowed to bear the load of the pipeline.

4. The installation site should be wide enough to facilitate maintenance work and good heat dissipation.

5. Installation sequence:

(1) Place the unit on the foundation buried with anchor bolts, and place a pair of pads between the base and the foundation for alignment purposes.

(2) Loosen the coupling, place the level on the pump shaft and the base separately, adjust the wedge pad to make the unit level, and properly tighten the anchor bolts to prevent it from moving.

(3) Pouring the base and anchor bolt holes with concrete.

(4) After the concrete is dry and solid, check whether the base and anchor bolts are defective or loose. After passing the inspection, tighten the anchor bolts and recheck the level of the pump.

(5) Correct the coaxiality of the pump shaft and the motor shaft. The deviation on the outer circle of the coupling is allowed to be 0.1 mm. The gap between the two coupling planes should be 2-3 mm, on the end face of the two couplings. , The difference between the maximum and minimum gaps shall not exceed 0.3 mm.

(6) After connecting the pipeline and determining the direction of rotation of the prime mover, connect the coupling again and check the coaxiality of the circle again.

(7) The final inspection shall be conducted after the actual test operation of the unit for 3-4 hours. If there is no defect, the installation is deemed qualified.

(8) In order to prevent sundries from falling into the machine during installation, all holes of the unit should be covered.

(9) When cleaning the inlet and outlet pipelines before opening the pump, a filter must be added to the inlet section of the pump to prevent debris from entering the pump.

泵的拆卸与装配 Pump disassembly and assembly

1. 泵的拆卸顺序

- (1) 放净泵内液体及轴承托架内的润滑油。
- (2) 拧电机固定螺栓，将电机搬离底座，拆下两半联轴器。
- (3) 拆下泵盖联接，松开轴承座托架螺栓，将泵盖连同轴承托架和转子部分一起从泵体内抽出。
- (4) 拧下叶轮螺母，拆下叶轮。
- (5) 拧下泵盖与轴承座螺栓，拆下泵盖。
- (6) 拧下右端轴承盖螺栓、拆去轴承盖。
- (7) 拆下轴承挡圈。
- (8) 将泵轴从轴承座中压出。
- (9) 在泵轴压出轴承和取下机械密封件动环和“O”形圈弹簧（不损坏、无须取下）。
- (10) 在轴承座内压出静环“O”形圈。

2. 泵的装配

泵的装配顺序可按拆卸相反顺序进行。拆卸后再装配时要检查机械密封件和各零件是否失效，如有失效损坏现象等发生，一定要换新的备件，安装时务必小心谨慎、不要敲打，以免损坏零件。

1. Disassembly sequence of the pump

(1) Drain the liquid in the pump and the lubricating oil in the bearing bracket.

(2) Tighten the motor fixing bolts, move the motor away from the base, and remove the two halves of the coupling.

(3) Remove the connection of the pump cover, loosen the bolts of the bearing seat bracket, and withdraw the pump cover together with the bearing bracket and rotor part from the pump body.

(4) Unscrew the impeller nut and remove the impeller.

(5) Unscrew the bolts of the pump cover and the bearing seat, and remove the pump cover.

(6) Unscrew the right end bearing cap bolt and remove the bearing cap.

(7) Remove the bearing retainer ring.

(8) Press the pump shaft out of the bearing seat.

(9) Press out the bearing and remove the mechanical seal moving ring and "O" ring spring on the pump shaft (no damage, no need to remove).

(10) Press out the static ring "O" ring in the bearing seat.

2. Pump assembly

The assembly sequence of the pump can be carried out in the reverse order of disassembly. When disassembling and then assembling, check whether the mechanical seals and various parts are invalid. If failure or damage occurs, be sure to replace them with new spare parts. Be careful not to knock during installation to avoid damage to the parts.

泵的使用和维护 Use and maintenance of the pump

首先泵与管道安装好后，不论是采用水压、气压，泵的进出口阀门一定要关闭，方可进行试压，以防损坏密封件，造成漏油。

1. 开机准备

- (1) 清理现场，拧开轴承座螺丝，加入导热油作润滑油。
- (2) 检查电机转向是否与泵旋转方向一致。
- (3) 用手搬动联轴器泵应转动灵活。
- (4) 开车前应使用所输送的导热油将泵灌满，以驱除泵中空气，此时吐出口的管道上闸阀应关闭。
- (5) 所输送的导热油在开车前要均匀加热，预热是利用被输送的导热油不断通过泵体进行的。

预热标准：泵壳温度不得低于入口油温 40℃，预热速度为 50℃ / 时，在开车预热时应将泵支脚上的侧螺母松开 0.3-0.5 毫米，预热完毕应拧紧。

- (6) 开车前应检查基础及螺栓有无松动，密封是否正常。

2 开机

- (1) 全面检查各项准备工作是否已经完善。
- (2) 打开各种仪表的开关。
- (3) 接通电源，当泵达到正常转速，且仪表显示出相当压力后，逐渐打开输出管路上的闸阀，并调节到需要工况。在输出管路上的闸阀关闭的情况下，泵连续工作不能超过 3 分钟。
- (4) 泵初始运行期间，把生产流程中的设备缓缓加热到 100-130℃，并且保持在该温度下继续运行，脱水脱气到导热油中的水份完全蒸发，才把设备加热到操作温度。
- (5) 在初次运行 3-4 小时，把设备加热到操作温度之后关掉油泵、检查泵轴和电机轴联轴器的同轴度，泵轴和电机轴偏差应控制在允许范围内，泵轴用手转动应轻便灵活和无振动旋转，如达不到上述要求，应重新进行调整。
- (6) 开机过程中，要时时注意电动机的功率读数及振动情况，振动值不超过 0.6 毫米，如有异常应停车检查。

3. 维护

(1) 泵轴在前端设置有填补箱，密封性能较为可靠、同时在轴承座中设置有机密封装置，因此大量的泄漏不可能出现，而小量的泄漏可以通过泄满管口排出接收。在开始运行初期有少量泄漏是正常的，在经过一定时间密封面跑合后泄漏将会减少或停止。

(2) 输送介质传到泵盖和轴承上的热量，由泵盖和轴承座的表面散热、使轴承座的温度适应于轴密封性能的温度。因此选择泵的安装位置时，要使泵盖和轴承座的热量便于扩散，不出现任何蓄热现象。

(3) 轴承座中设置有两个球轴承，靠泵叶轮侧的一个球轴承用所输送的导热油润滑，靠联轴器侧的一个球轴承则用高温润滑脂润滑；

每个球轴承在运行 3000 小时之后，必须拆下用柴油清流干净后，检查接触面是否损坏，如有损坏，必须换新的轴承。

靠叶轮侧的球轴承安装时，有防尘盖的一侧要朝向叶轮安装，开机前注入导热油润滑。靠联轴器侧的球轴承，用复合钙基高温润滑脂 (ZFG-4)，该轴承重新安装时，有防尘盖的一侧同样要朝向叶轮侧安装，安装时充填润滑脂 (约 1/2) 球轴承与壳体的空间)。

在轴承运行 48 小时后，要用润滑脂枪向轴承盖上的压注油杯注入补充润滑脂。

(4) 不许用输入管上的闸阀调节流量，避免产生气蚀。

(5) 泵不宜低于 30% 设计流量下连续运转，如果必须在该条件下运转，则应在出口装旁通管，且使流量达到上述最小值以上。

(6) 经常检查地脚螺栓的松动情况、泵壳温度与入口温度是否一致，出口压力表的波动情况和泵的振动情况。

(7) 注意泵运行有无杂音，如发现异常状态时，应及时处理。

4、停机

(1) 切断电源。

(2) 将泵内液体放空，清洗且应定期把叶轮旋转 180° 以防止轴变形，直到泵体完全冷却为止。

First, after the pump and the pipeline are installed, the inlet and outlet valves of the pump must be closed, regardless of whether it is water pressure or air pressure, before the pressure test can be carried out to prevent damage to the seals and cause oil leakage.

1. Boot preparation

- (1) Clean up the site, unscrew the screws of the bearing seat, and add heat-conducting oil as lubricating oil.
- (2) Check whether the rotation direction of the motor is consistent with the rotation direction of the pump.
- (3) The pump should rotate flexibly when moving the coupling by hand.
- (4) Before driving, the pump should be filled with the delivered heat transfer oil to drive out the air in the pump. At this time, the gate valve on the outlet pipe should be closed.
- (5) The delivered heat-conducting oil should be evenly heated before driving. The preheating is carried out by continuously passing the delivered heat-conducting oil through the pump body.

Preheating standard: the temperature of the pump casing shall not be lower than the inlet oil temperature of 40℃, the preheating speed is 50℃ /hour, the side nut on the pump foot should be loosened 0.3-0.5mm when preheating, and tightened after preheating.

(6) Before driving, check whether the foundation and bolts are loose and whether the seal is normal.

2.boot

- (1) Comprehensively check whether all preparations have been completed.
- (2) Turn on the switches of various instruments.
- (3) Turn on the power, when the pump reaches the normal speed and the meter shows considerable pressure, gradually open the gate valve on the output pipeline and adjust it to the required working condition. When the gate valve on the output pipeline is closed, the pump should not work continuously for more than 3 minutes.

(4) During the initial operation of the pump, slowly heat the equipment in the production process to 100-130℃, and keep it at this temperature to continue to run, and the water in the heat transfer oil from dehydration and degassing to completely evaporate before heating the equipment to Operating temperature.

(5) After 3-4 hours of initial operation, turn off the oil pump after heating the equipment to the operating temperature, check the coaxiality of the pump shaft and the motor shaft coupling, the deviation of the pump shaft and the motor shaft should be controlled within the allowable range. The shaft should be light, flexible and vibration-free to rotate by hand. If it does not meet the above requirements, it should be adjusted again.

(6) During the start-up process, always pay attention to the power reading and vibration of the motor, and the vibration value should not exceed 0.6 milliseconds. If there is any abnormality, stop and check.

3. Maintenance

(1)The pump shaft is equipped with a filling box at the front end, and the sealing performance is relatively reliable. At the same time, a mechanical sealing device is installed in the bearing seat. Therefore, a large amount of leakage is unlikely to occur, and a small amount of leakage can be discharged and received through the overflow nozzle. It is normal to have a small amount of leakage at the beginning of the operation. After a certain period of time, the leakage will be reduced or stopped.

(2)The heat transferred to the pump cover and the bearing by the conveying medium is dissipated by the surface of the pump cover and the bearing seat, so that the temperature of the bearing seat is adapted to the temperature of the shaft sealing performance. Therefore, when selecting the installation position of the pump, the heat of the pump cover and the bearing seat should be easily diffused without any heat storage phenomenon.

(3)There are two ball bearings in the bearing seat, one ball bearing on the pump impeller side is lubricated with the delivered heat transfer oil, and one ball bearing on the coupling side is lubricated with high temperature grease;

After running for 3000 hours, each ball bearing must be removed and cleaned with diesel oil, and then check whether the contact surface is damaged. If damaged, a new bearing must be replaced.

When installing against the ball bearing on the impeller side, the side with the dust cover should be installed towards the impeller, and the heat transfer oil should be injected before starting the machine. The ball bearing on the coupling side uses compound calcium-based high temperature grease (ZFG-4). When the bearing is reinstalled, the side with the dust cover should also be installed toward the impeller side, and the installation is filled with grease (approximately 1 /2) The space between the ball bearing and the housing).

After the bearing has been running for 48 hours, use a grease gun to inject replenishing grease into the oil pressure cup on the bearing cover.

(4)The gate valve on the input pipe is not allowed to adjust the flow rate to avoid cavitation.

(5)The pump should not be operated continuously under 30% of the design flow rate. If it must be operated under this condition, a bypass pipe should be installed at the outlet and the flow rate should reach above the minimum value.

(6)Frequently check the looseness of the anchor bolts, whether the pump casing temperature is consistent with the inlet temperature, the fluctuation of the outlet pressure gauge and the vibration of the pump.

(7)Pay attention to whether there is noise in the operation of the pump, and deal with it in time if abnormal conditions are found.

4. Shutdown

(1)Cut off the power supply.

(2)Empty the liquid in the pump, clean it, and regularly rotate the impeller 180° to prevent shaft deformation until the pump body is completely cooled.

检查周期与检修内容 Inspection cycle and maintenance content

1. 检修周期、应根据设备使用情况和检修能力确定，下表内容供用户参考：

1. The overhaul period should be determined according to the equipment usage and overhaul capability. The content of the following table is for users' reference:

检查类别 Check category	小修 Minor repair	大修 Overhaul
检修周期 Overhaul period	2-3 个月 2-3 months	12-18 个月 12-18 months

2. 检修内容

(1) 小修内容

- 1) 检查和调整轴承，并校核联轴器同轴度。
- 2) 检查和调整地脚螺栓的松动现象。
- 3) 修复或更换在运行中个别零件曾发生缺陷。
- 4) 检查漏损情况，重压填料或检修机械密封，对填料密封可更换全部填料。

(2) 大修

- 1) 泵解体取出转子及各零部件，并进行清洗。
- 2) 检查泵内所有零件状况，测量其磨损、腐蚀程度，必要时更换掌部件。
- 3) 装配时用水平尺测量，并调整泵的水平度，检查和调整联轴器的同轴度。
- 4) 检查球轴承，必要时应更换。
- 5) 清洗泵的管线、管件、重新压填料，校核压力表和更换润滑脂等。
- 6) 检查、调整轴和转子的跳动情况。

2. Overhaul content

(1) Minor repair content

- 1) Check and adjust the bearing, and check the coaxiality of the coupling.
- 2) Check and adjust the looseness of anchor bolts.
- 3) Repair or replace individual parts that have been defective during operation.
- 4) Check the leakage, press the packing or repair the mechanical seal, and replace all the packing for the packing seal.

(2) Overhaul

- 1) The pump is disassembled and the rotor and various parts are taken out and cleaned.
- 2) Check the condition of all parts in the pump, measure the degree of wear and corrosion, and replace the palm parts if necessary.
- 3) Measure with a spirit level when assembling, and adjust the level of the pump, check and adjust the coaxiality of the coupling.
- 4) Check the ball bearings and replace them if necessary.
- 5) Clean the pipelines and fittings of the pump, re-press the packing, check the pressure gauge and replace the grease.
- 6) Check and adjust the runout of the shaft and rotor.



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