

公司简介

Company Profile

浙江优机机械科技有限公司（原永嘉县特优机械有限公司）是专业研发和制造阀门试压检测设备的公司，是行业的先行者，有多年的生产历史和众多国内外客户。公司是中国阀门协会会员单位、浙江泵阀协会理事单位、永嘉县爱心企业、温州市科技创新型企业拥有 11 项国家技术专利和自主知识产权。近几年来生产规模、销售收入、开发新产品逐年上升，企业稳步发展成熟。被国内外各大阀门制造商定点采购和重点工程项目的指定选用单位。

Zhejiang Youji Machinery Technology Co. Ltd. (used to call Zhejiang Wenzhou Yongjia Super-refine Machinery Factory) is a professional R & D and manufacturing company of valve pressure-testing inspecting equipment. Our company is the pioneer of this industry with many years of production history and lots of customers at home and abroad. The company is the member unit of China Valve Association, council member of Zhejiang Valve Association, Yongjia County philanthropic enterprise, and Wenzhou City technological innovation-based enterprise with 11 national technology patents and independent intellectual property rights. In recent years, the scale of production, sales revenue and development of new products has been in rise year by year, and the company has been in steady development and become more and more mature. The company has been designated as the procurement unit of major domestic and foreign valve manufacturers and as the unit of key projects.

公司在多年生产阀门检测设备技术经验的基础上，根据 GB/T13927-92《通用阀门压力试验》和 ZBJ16006-90《阀门的试验与检测》及 API598 美标等有关标准规范的技术要求，我公司生产的“JWZ/JWZQ 型阀门检测设备”与“JLD/JWT/JWTQ 型阀门试验台和 JLA 安全阀性能测试台”系列产品，集高科技于一体，将机械、液压、电器结合在一起，具有结构合理、动作灵敏、自动化程度高等特点，产品性能及各项技术指标均领先于行业同类产品，适用于各类高中低压阀门的强度试验和密封试验。产品广泛应用于阀门制造业和石油、石化、天然气、冶金、电厂等重点行业阀门安装前的测试，产品远销美国、韩国、土库曼、德国、澳大利亚、巴基斯坦、印度、中东及南美地区等国家。

Based on years of experience in production technology of valve inspecting equipment, according to the requirements of technical parameters related to GB/T13927-92 Pressure Testing for General Purpose Valves and ZBJ16006-90 Valve Testing and Inspection, API598 American Standard Specifications and other relevant standards, our company produces the "JWZ/JWZQ type valve inspecting equipment" and "JLD/JWT/JWTQ type valve test bench and JLA valve performance test jig" series of products with collection of high-techs. These products combine mechanical, hydraulic and electrical appliances together, achieving the advantages of reasonable structure, flexible action and high degree of automation. Our product performance and technical indicators of each item are all leading similar products of the industry, which are applicable to various types of high-and-medium-and-low pressure valve strength test and seal test. Our products are widely used in the valve manufacturing industry and petroleum, petrochemical, natural gas, metallurgy, power plant and other key

industries for testing before installing the valve. Our products are exported to countries like South Korea, America Turkmenistan, Germany, Australia, Pakistan, India, the Middle East and South America, etc..

“优机科技员工”坚持以技术为先导，以精心塑造优良产品，以诚信赢得客户。竭诚为广大用户提供优质的阀门检测设备和完善的售后服务，真诚希望与国内外新老客户携手合作，共叙价值创新辉煌。

All “Youji Technology staff” adheres to considering technology as the company’s life-line, manufacturing excellent products with carefulness and elaboration, and winning customers’ faith with honesty and sincerity. We will wholeheartedly provide the high quality valve testing equipment and perfect after-sale service for the customers, and we sincerely hope to cooperate with new and old customers at home and abroad for brilliant value innovation.

一、安全须知



I. Safety notice

使用本设备前请仔细阅读本说明书!

Please read the instruction carefully before use!

(一) 工作人员的安全须知

(I) For working personnel

设备必须按要求接好保护接地! 并应定期检查是否可靠! 本测试台操作人员必须熟悉操作技术, 掌握本说明书安全须知, 及了解本机各部件结构, 方可允许参加本机工作。

Follow the requirement to conduct **protective earthing!** Also **regularly check** its firmness! The operators shall well know the relevant operating process, master the safety notice, also understand the structure of each component, then can be allowed to operate the equipment.

(二) 测试台运转前准备工作的安全须知

(II) For preparations prior to test bench running

检查设备现状和完好状态, 检查各仪表的压力表, 按钮在运输过程是否损坏, 当测试台发现故障及液压系统出现异常噪音时, 要切断电源终止工作, 排除故障, 严禁超范围规格被试阀门在本机上测试。

Check the the current status and perfect status for the equipment, check the pressure gauge and the button of each instrument to ensure they are not damaged, when there is a fault on the test bench and the hydraulic system has a noise, cut off the power to stop work and eliminate the fault, the test valve with improper specification is not allowed to be tested on the machine.

(三) 有关电器方面安全须知

(III) For the electric

测试台采用三相四线电源，设备必须按要求接好保护接地!交流电源：电压 220V、60HZ；控制电路电压 220V、60HZ；非专业工作人员禁止触及电力控制装置以免危险。由于测试台电器按钮较多，因此提醒操作维修人员必须对安全问题引高度重视，未经过学习本须知，严禁上岗。

The test bench is used the three-phase four-wire power, the equipment shall be connected the protective earthing on request! AC power: 220v voltage, 60HZ; the power for control circuit 220v, 60HZ; the non-professional working personnel is not forbidden to contact the electric unit for fear of danger. As there are many test buttons, the operating maintenance personnel thus shall attach great importance to the safety problem, and is not allowed to work without learning this notice.

1、检查电源接地线是否可靠，线径是否符合要求

1. Check the firmness of power earthing, whether the wire dia meets the requirement

2、检查电源相序是否正确，检查电器按钮是否正确。

2. Check the accuracy of phase sequence of the power and the electric button.

2、测试台电器出现故障时，应首先关闭电源，故障不解除，任何人不准送电

3. When the electric of the test bench has a fault, firstly disconnect the power, no one is allowed to connect the power unless the fault is removed.

2、电器维修人员必须按电工操作规程穿电工绝缘工具进行工作，维修期间必须有专人看管，或在电源处挂牌警示。

4. The electrical maintenance personnel shall wear insulating tools as per the operation procedure for an electrician, there must be a special guard during maintenance, or hang warning in the power.

特别提醒

Specially reminds



使用本设备前请仔细阅读本说明书!

- 1 当测试口径较小、压力偏低的阀门，按“夹紧油缸压力对照表”选定的压力值 $< 5.0\text{MPa}$ 时，若有可能由于压力过大，而造成阀门损伤时，应将系统压力调低（油泵表）到表中规定的压力值！

When testing smaller caliber & lower pressure valve and deciding on pressure value less than 5.0 MPa according to pressure comparative table for clamping cylinder (refer to enclosed graph), ought to adjust system pressure down to the stipulation value in the table if it is possible that too high pressure does harm to the valve.

- 2、设备开启后，“电气按钮台”（附图）的“卸荷开关”应置为“开”的位置，使系统处于卸荷状态，这有利于降低油温、节能和延长设备寿命。当要进行液压动作操作时，不必关闭“卸荷开关”，系统会自动恢复正常工作！

After starting test-bed, the button of “hydraulic discharge” on electrical button board (refer to enclosed graph) must be at “on” position, have the system to be discharge state. So that it's the advantage of reducing the oil temperature, saving energy and increasing of service life of the equipment. When hydraulic operation is starting, the system will self-recovery normal work but not need shutting off “hydraulic discharge” button.

- 3、高压水泵启动前所有压力表开关应置为关闭状态，测试时根据测试压力开启相应压力量程的压力表开关！

All the pressure gauge switch must be close before start high pressure pump. During testing according to test pressure, open the gauge switch of corresponding range.

- 4、油泵、低压水泵严禁在无介质的情况下空运转！

No running if oil pump and low pressure water pump without tested medium.

- 5、试压时，操作人员不要站在测试阀门法兰装夹面的位置，以防意外！

During testing, the operator does not have to stand in the side for the tested valve flange surface fixed and clasped in order to prevent the accident.

二、概 述

II Brief Introduction

JLTD 型立式顶压系列阀门液压测试台是我公司在累积多年生产阀门测试检测设备技术的基础上,按照国家 GB/T13927-2008《通用阀门压力试验》和 ZBJ16006-90《阀门的试验与检测》等标准,参照国际标准 ISO5208《工业用阀门的压力试验》和美国石油学会标准 API1598《阀门检验和试验》的标准规范要求而研制产品,可对焊接式和螺纹式闸阀、截止阀、止回阀等阀门进行密封和强度性能试验。自行设计改进新一代系列阀门液压阀门试验台。

JLTD-type vertical top pressure series of hydraulic valve test bench is the product developed by our company on the basis of accumulated years of valve inspecting equipment production technology according to the national GB/T13927-2008 GB/T13927-92 Pressure Testing for General Purpose Valves and ZBJ16006-90 Valve Testing and Inspection, as well as to the international standard ISO5208 Industrial Valves—Pressure Testing of Valves and API598 Valve Inspection and Testing, standard of American Petroleum Institute. This series of equipments can be used in seal test and strength performance test of welding type and thread type gate valve, globe valve, check

valve and other valves. And the company is to design and improve a new generation of series of hydraulic valve test bench.

本机集机械系统、液压系统、液压系统采用了卸荷保压回路设计，有效地控制了连续开机条件下液压油的温升，节省了试验过程中的能耗，并提高了液压密封元件的寿命。电器系统和测压系统组成,具有功能完善、性能稳定、自动化程度高等特点。对被测阀门无任何附加外力影响的情况下，广泛应用于公称通径 DN50-DN400mm 的各种直通式和焊接式结构，高、中、低压阀门进行壳体和密封性能试验。测试介质：水、气、油，各种高压力测试。可以极大地提高了工作效率和减轻劳动力,是阀门制造业和使用及维修等单位必备的一种先进理想的阀门试验检测设备。

This equipment integrates mechanical system, hydraulic system which adopts loop design of unloading charge but retaining pressure. These systems can effectively control the temperature rise of hydraulic oils under condition of continuous operation, save power consumption in the testing process, and improve the life of use of hydraulic sealing elements Composition of the electrical system and pressure measurement system has the characteristics of perfect function, stable performance, high degree of automation and so on. Without any additional external influence on the measured valve case, the equipment is widely

used in housing test and seal test of all kinds of nominal diameter DN50-DN400mm straight and welded structure with nominal diameter of DN50-DN400mm and of high-medium-and-low pressure valves. Test mediums include: water, oil, gas, and various high pressure tests. This equipment can greatly improve work efficiency and reduce the labor force, which is a must-have advanced and ideal valve inspecting equipment in valve manufacturing and use and repair units.

三、工作原理

III Operating Principle

JLTD 型立式顶压系列液压阀门测试台，以上边的顶压油缸压紧阀门法兰来实现，密封盘和被测试阀门内孔为定位，焊接阀门坡口和密封盘为密封，由该机的油缸移动来夹紧被测试阀门两端平面进行试验工作。上下密封盘为固定装置，上面顶压油缸移动来活动，根据被试阀门的距离进行调节。下面用密封盘为固定被测阀门，上面以顶压夹紧被测阀门，以便被测试阀门有无泄露。并具有性能好，结构简单，紧凑等特点。该机配有低压水泵和高压供压水泵装置。低高压水泵及介质循环水箱系统组成一体，使介质循环使用，压力表水路控制阀门和电器按钮开关，全部设计在测试台前方进行操作控制，能使各机构协调动作，操作方便，安全可靠，满足广大用户测试需要。

JLTD-type vertical top pressure series of hydraulic valve test bench is achieved by the pressure above the top pressing cylinder valve flange. Its sealing disc and the tested valve hole can serve for positioning, its welding groove and the sealing disc can serve for sealing and its oil cylinder can assist in operating the test by moving to fix both ends of the tested valve. Upper and lower sealing disc is

devices for fixture and the top pressure oil, cylinder can work by moving activities, and be adjusted according to the distance of the tested valve. The lower sealing disc is for fixing the tested valve by fixing the tested valve with top pressure so as to prevent leakage of the tested valve. This equipment has good performance, simple structure, compact structure and other advantages. It is equipped with low-pressure pump and high-pressure pressure-supply water pump Low-and-high pressure water pumps and medium circulating water system can be composed as one integrity to make recycling of the mediums. The pressure gauge waterway can control switch buttons of valves and electric machines. All of the elements mentioned are designed to be operated in front of the test bench so as to coordinate operations of all departments with convenient operation, safety and reliability, which can meet customer demand of testing.

四、使用注意事项和要求

IV. Attentions & requirements

1. 设备安装：校好设备安装水平，设备底平面应用混凝土固定脚底螺栓。试验周围应设置排水沟和给水系统。

1. Equipment installation: check the level for installation, the bottom face of the equipment shall be used the concrete to fix the anchor bolt. It is required to set the drain and the water supply system around the test.

2. 选用 N32-46#普通液压油, N46#抗磨液压油或 20-30#机械油。注入油箱, 油量不能低于油位计的下限。

2. Select N32-46# common hydraulic oil, N46# abrade oil or 20-30# machine oil. Inject the oil box with the oil capacity not lower than the lower limit of oil level gauge.

3. 接通电源：按油泵启动按钮，检查电机方向，是否正确（顺时针方向）进行 5-10 分钟空载运转后，调节溢流阀将系统压力调整到 5.0Mpa 进行试机,按钮面上的“左右爪夹紧”和“左右爪放松”各按钮动作是否正常,检查各油管路有无泄露,如有发现不良现象,应立即停机排除。

3. Connect the power: press the start button of oil pump, check whether the motor direction is correct, (clockwise) conduct no-load running for 5-10 minutes, after that, regulate the relief valve to adjust the system pressure to 5.0Mpa as a trial run, check whether each button such as “left&right talons clamping” and “left&right talons loosening” normally works, check whether each oil pipeline has a leakage, if bad phenomenon appears, then immediately stop the machine for fault removal.

4. 手工对各活动摩擦部位加入适量的润滑油。

4. Add enough lubricating oil at each friction part.

5. 试验的介质选空气、氮气、水（水源用户自备）不污染环境等优点.因而应用广泛,要确保对被试阀门不会腐蚀,在试验台介质要求所需要。

5. Select air, nitrogen, water (source equipped by user) for test medium, which do good to the environment, so are widely used, also ensure which are non-corrosive to the test valve, and are the desired medium for test table.

6. 试验阀门时，首先根据被试阀门的试验压力，要求参照《压紧油缸所需压力对照表》中液压系统压力值，进行增压压力调节，严禁增压压力值超高，防止被试阀门变形损坏。

6. When the valve test is conducted, firstly according to the pressure of test valve, referring to the pressure value of hydraulic system in *The Parallel Table for Desired Pressure for Compacting Oil Cylinder*, to increase pressure for adjustment, it is strictly prohibited to over-increase the pressure for fear of the test valve deformed and damaged.

7. 高压水泵开始工作前，先调节好电接点压力表（高压调节表）与被测试阀门试验压力相同，然后进行工作。阀门在试验中，操作人员应注意安全，正确使用。阀门试验完毕，应将阀门内的介质压力排尽才可按爪放松按钮。

7. Before the high-pressure water pump starts working, firstly adjust the electro connecting pressure gauge (high-pressure regulating gauge) to keep the same pressure with the test valve, and then start working. During the valve test, the operators shall be careful of safety to properly use. After valve test is finished, fully eliminate the medium pressure in the valve, and then press the talon loosening button.

8. 压力试验装置的压力表必须经当地计量部门鉴定合格，并在合格证有效期内使用，做水压测试时，水压压力不能超过压力表的三分之二，压力表精度不能低于 1.6 级。

8. The pressure gauge for pressure test device shall be verified qualification by local metrological service, and shall be used in the validity of the certificate of approval. When hydrostatic test is conducted, the hydrostatic pressure shall be not exceeding 2/3 of the pressure gauge, and the accuracy of the pressure gauge shall be lower than level 1.6.

9、注意事项：

9. Attentions:

1. 测试台工作面应保持干净、清洁、被试阀门的法兰与密封盘的接触面不允许有其他杂物，时刻检查 O 形圈损坏。
1) . Keep the test table clean, there should not be sundries on the contact face of flange and sealing disc of test valve, check the O-ring at any time to ensure it is in good condition.
2. 液压系统（油泵表）压力值应调整在 3.0~5.0MPa 之间，不得设置过高压力。
2) . The pressure valve of hydraulic system (oil pump gauge) shall be regulated between 3.0~5.0MPa, ultra-high pressure is not allowed to set.
3. 测试台各部件的活动处，要经常加润滑油，保持清洁润滑使用。
3) . Measure the motion part of each part, regularly lubricate it to keep clean.
4. 液压油在定期检查，对新投入的使用设备，3 个月即清洗油箱，更换新油，以后每隔一年进行清洗和更换一次，油量不低于油位计下限，油箱内的油温不能超过 55 度。
4) . Regularly check the hydraulic oil, as for the new service equipment, clean the oil box every 3 months and replace it with new oil, after that, conduct cleaning and replacement every one year, the oil capacity shall be not lower than the lower limit of oil level gauge, and the oil temp in the oil box shall be not exceeding 55 degrees.
5. 高压或超高压的被试阀门用液体做试验时，应排除阀门内腔的气体，在高压升压过程人体不要靠近被试阀门，注意人身安全，应采用安全防护措施。
5) . When the test valve for high-pressure or ultra-high pressure is used for test,

remove the air in the valve chamber, during the process of high-pressure increasing, never close the human body to the valve, be careful of personal safety, take safety protective measure.

6. 阀门在工作试验过程中，发现阀体表面有气孔及砂眼等其他现象外，严禁在测试台上电焊和风割等操作，以免防止电器、电线及设备零件烧坏和损坏。

6) . During the process of valve test, if appearing air hole or sand hole on the valve, it is prohibited to execute welding and wind cutting on the test table, for fear of the appliance, wire and equipment component burnt off and damaged.

7. 阀门试验完毕后，必须先打开泄压开关，将被试阀门内压力排除后，放松被试阀门。

7) . After valve test is finished, it is required to open the pressure relief switch firstly, after the pressure inside the test valve is removed, loosen the test valve.

8. 下班时，应泄掉液压系统和测试介质系统的压力，擦净水迹，关闭电源。

8) . After work, remove the pressure of hydraulic system and test medium system, clean the water stain, close the power.

9. 操作人员在操作过程中必须带防护眼镜和安全帽与安全服，注意人身安全，严禁接触机器运动部件伤及身体。

9) . The operator must wear protective goggles safety helmet and safety suit, be careful of personal safety, strictly forbidden to contact the motion part and bring the body injury.

10. 要定期检查保养，检修保养或非使用时间时应切断电源。

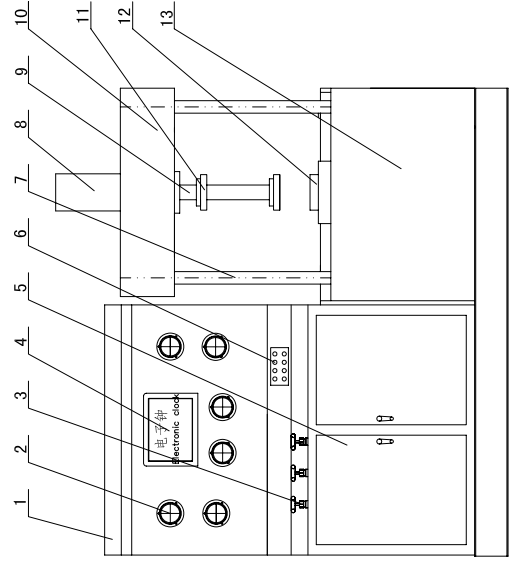
10) . Regularly examine and maintain, cut off the power in examination, maintenance or non-service time.

五、 主要技术参数及规格

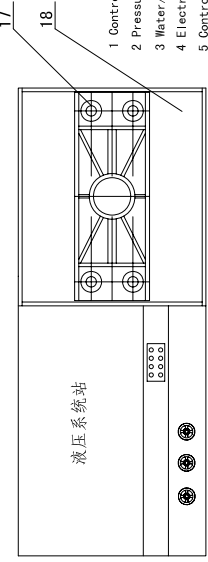
V. Main technical parameter & specification

型号规格 Specification		JLTD-400
允许阀门 测试通径 Allowable valve test dia	公称通径 DN/mm Nominal dia	50-400
	最小阀门公称压力 PN/MPa Min. nominal pressure	0.6-4.0
	最大阀门公称压力 PN/Mpa Max.nominal pressure	0.6-1.6
拉杆间距 Spacing of pull rod	拉杆之间宽度 mm Width of pull rod	760
有效开档 Effective opening	最大开档 mm Max. opening	600
	最小开档 mm Min. opening	210
液压系统 工作压力 Work pressure for hydraulic system	调压范围 MPa Range of pressure regulating	0-6.3
	流量 L/min Flow	16
	高压(增压)MPa High-pressure (pressure-charging)	3.0-31.5
	油泵压力 MPa Pressure of oil pump	0-5.0
电源 Power supply	电压 V Voltage	220
	频率 HZ Frequency	60
电机 Motor	功率 KW Power	2.2
	极数 P Number of poles	6
本机 外形尺寸 Dimension	L mm	2250
	B mm	1000
	H mm	1950
重量 Weight	kg	2200

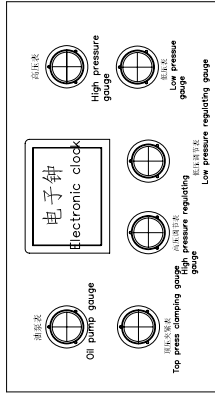
六、JLTD型外观示意图
VI. JLTD Outside view



- 1. 控制柜
- 2. 压力表
- 3. 水气控制开关
- 4. 电子钟
- 5. 控制柜门
- 6. 操作按钮
- 7. 机架拉杆
- 8. 顶压油缸
- 9. 顶压活塞杆
- 10. 上排坊
- 11. 上密封盘
- 12. 下密封盘
- 13. 水箱
- 14. 液压系统
- 15. 水泵系统
- 16. 油箱
- 17. 拉杆拼帽
- 18. 工作台



- 1 Control Cabinet
- 2 Pressure Gauge
- 3 Water/Gas Control Switch
- 4 Electronic Clock
- 5 Control Cabinet Gate
- 6 Operating Button
- 7 Bracket Pull
- 8 Top Pressure Oil Cylinder
- 9 Top Pressure Piston Cylinder
- 10 Upper Release
- 11 Upper Seal Disc
- 12 Lower Seal Disc
- 13 Water Tank
- 14 Hydraulic System
- 15 Water Pump System
- 16 Oil Tank
- 17 Draw-Bar Cap
- 18 Work Tray

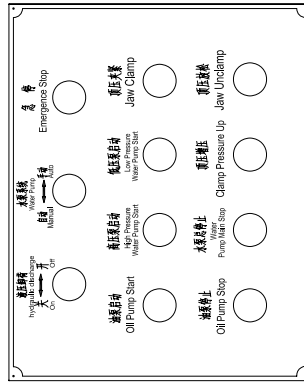


仪表盘
Instrument panel



水总开关 Water Main Switch
气总开关 Air Main Switch
泄压开关 Pressure relief switch

管路控制阀
Pipeline control valve



按钮面板
Button panel

七、使用操作方法

VII Use and Operation Methods

1. **被试阀门的装夹：**按下（油泵启动）按钮，先启动油泵，再将（顶压放松）有效开档调整最大位置，在工作盘上放置好适当直径的已装好的 O 形圈密封盘，根据被试阀门直径大小，将移动密封盘进道被试阀门试压的相应位置旁边，然后将被试阀门一端端面校正在下面的密封盘中心位置上，按（顶压夹紧）按钮，将上面密封盘移动到被试阀门的另一端靠近相碰，将被试阀门夹紧，如果顶压力不够就按（顶压增压）按钮。如果气密试验，就打开（气总开关）就可以，装夹测试方法步骤参照（示意图）。

1. Fixture of tested valve: To press (oil pump start) button to turn it on at first and then to press (release top pressure) button to effectively begin adjusting the maximized position. To put equipped O-type sealing disc with appropriate diameter on the work tray, to put mobilizing sealing disc near the corresponding pressing position of the tested valve according to its diameter, and then to adjust one end of the tested valve to the central position of the sealing disc below it. After that, to press (top pressure fixture) button and to move the sealing disc above to make it close to the other end of the tested valve so as to tightly clamp the tested valve. If the top pressure is not sufficient, to press (top pressure boost) button. If it is to operate air-tight test, to press (gas main switch) button as necessary. The procedures of fixture testing methods are as follows (See the schematic drawing).

注：阀门的种类不同阀门在测试时必须按照常规试验方法要求进行装夹试验

Note: As there are various kinds of valves, their fixture test should be operated according to general testing requirements.

2. 顶压油缸增压：按照被试阀门公称口径 DN 和公称压力 PN，参照《夹紧油缸所需压力对照表》，按（增压按钮）将夹紧油缸压力增压到所需压力要求，同时可调节（增压调节阀）以免增压压力过高将被试阀门的阀体变形和损坏。

2. Top Pressure Oil Cylinder Pressure Rise: According to the nominal diameter DN and the nominal pressure PN of the tested valve, to refer to (Pressure Required by Oil Cylinder Fixture Comparison Table). To press (pressure rise) button to increase the pressure needed for fixing oil cylinder and in the meanwhile to press (pressure rise control valve) so as to prevent over-rise of the pressure which may cause deformation or damage of the tested valve.

（注：顶压增压按钮可要多次点动，每次相隔时间需在 5-10 秒钟左右。）

(Note: Top pressure rise button is required for multiple pressings with interval around 5 to 10 seconds.)

3. 高低压水泵供水过程：（旋涡泵和液压供压水泵）
Water Supply Process of High-and-Low Pressure Water Pumps: (Vortex pump and hydraulic pressure-supply water pump)

a) 电接点压力表作用和水泵的手动和自动:电接点压力表共两只：低压水泵一只（低压调节表）和高压水泵一只（高压调节表）。低压水泵和高压水

泵进水分为手动 和自动，当选择手动：低压水泵压力到达低压调节表位置时会自动停止，然后用手按高压水泵（高压泵启动）按钮，压力会逐步加压到高压调节表位置时会自动停止。如选择自动：当低压水泵压力到达低压调节表位置时会自动停止，然而高压水泵会自动启动，压力逐步加压到高压调节表位置时会自动停止。

a) Electric-Contact Pressure Gauge Functions and Manual and Automatic

Operations of the Water Pump: There are two electric-contact pressure gauges: one low-pressure water pump (low-pressure regulation gauge) and one high-pressure water pump (high-pressure regulation gauge). Water intake of the lo-pressure and high-pressure water pumps can be operated manually and automatically. When the manual operation is chosen: pressure rise of the low-pressure water pump will stop as long as it reaches the position shown in the low-pressure regulation gauge and then it is required to press (high-pressure pump start) button manually, with which the pressure will increase gradually until the position in high-pressure regulation gauge. When the automatic operation is chosen: the low-pressure water pump will stop as long as it reaches the position in the low-pressure regulation gauge, while the high-pressure water pump will launch automatically and stop until the pressure reaches the position in the high-pressure regulation gauge.

b) **低压进水:**首先要调好低压电接点压力表，（低压调节表）调到一般在 1.0-1.6Mpa 之间,再按(低压水泵启动)按钮,旋涡泵开始工作,向腔

内不断地进水,压力到达低压调节表所调的位置时会自动停止,然后打开低压表开关查看低压表是否压力到达在 1.0Mpa 之间,如果未能到达 1.0Mpa,就用低压调节表再调高位置,达到 1.0Mpa 之间为止,再关闭低压表开关,转换高压水泵增压。

- b) **Low-Pressure Intake:** At first, it is required to adjust low-pressure electric-contact pressure gauge, which needs to be generally regulated between 1.0Mpa and 1.6Mpa, and then to press (low-pressure water pump start) button. After the vortex pump begins to work, water intake will be continuous into the cavity. And when the pressure reaches the position in low-pressure regulation gauge, it will stop rising. Then it is required to press on switch of the low-pressure gauge to check whether the pressure has reached between 1.0Mpa and 1.6Mpa. If it has not reached required pressure, it is required to adjust the position of low-pressure regulation gauge to reach the required pressure and then turn off the low-pressure gauge to replace it with high-pressure water pump for pressure rise.

注： 低压调节表开始使用之前先调节好， 以后不需要调节表。

Note: it is required to adjust the low-pressure regulation gauge before the use and it will not be required to be adjusted then.

- c) **高压进水:** 先要调好高压电接点压力表（高压调节表）调到阀门所需压力 值，按（高压泵启动）按钮，高压增压，工作已经开始，压力逐步升压到与电接点压力表（高压调节表）相同等值时，加压工作自

动停止。

c) High-Pressure Intake: At first, it is required to adjust the high-pressure electric-contact pressure gauge (high-pressure regulation gauge) to the pressure required for closing the valve, then to press (high-pressure pump automatic) button. As the high pressure starts to rise, the work begins. As the pressure gradually rises till it is the same as the pressure of the electric-contact pressure gauge (high-pressure regulation gauge), the pressure rise will stop automatically。

d) 进水和泄压操作过程: 先调节好低高压调节表, 打开(水总开关)阀门, 选择水泵手动和自动, 手动(低压水泵升到要再按高压水泵)自动(低压水泵升到会自动转换高压水泵)详细参照(a)来操作。压力持续保压时间按阀门测试标准要求。当阀门压力试验完毕后, 打开(泄压开关), 把被试阀体内腔压力排泄完后, 按被试阀门的装夹的相反程序, 将阀门放松, 卸下被试阀门试压程序完成。

d) Operation Process of Water Intake and Pressure Relief: At first, it is required to adjust the high-pressure regulation gauge, to open (water main switch) valve, and then to chose manual operation or automatic operation of the water pump. To operate manually (after the low-pressure water pump reaches certain position, it is required to press high-pressure pump start button manually) or automatically (after the low-pressure water pump reaches certain position, the high-pressure pump will turn on automatically) both require to refer to (a) for standard operations. Continuous holding time of pressure is to be determined

according to valve testing standard requirements. After the valve pressure test is finished, press (pressure relief) button for pressure relief of the valve. After all the pressure in the cavity has been relieved, to launch opposite procedures of valve fixture so as to loose and unload the tested valve to make the pressure test done.

4. 被试阀门常规试验方法:

4. General Testing Methods of the Tested Valve:

a) **上密封试验:** 检测阀杆与阀盖密封副密封性能的试验, 封闭阀门进口和出口, 放松填料压盖 (如果阀门设有上密封检查装置, 且在不放松填料压盖的情况下能够可靠地检查上密封的性能, 则不必放松填料压盖) 阀门处于全开状态, 使上密封关闭, 给体腔充满试验介质, 并逐渐加压到试验压力, 然后检查上密封性能。

a) **Upper Seal Test:** This is the test for detection of valve stem and for seal performance of the valve cover seal. It is required to seal the entry and exist hole of the valve, loose the packing gland (if there is no upper seal inspecting device, but inspection of upper seal performance can be reliably launched without loosening the packing gland, then the packing gland is not required to be loosen) so as to make the valve fully open. Then close the upper seal, fill the cavity with testing mediums and gradually increase the pressure to the testing one, and at last inspect the upper seal performance.

b) 壳体试验: 对阀体和阀盖等连接组成的整个阀门外壳进行压力试验，目的是检查阀体壳体的密封性和耐压能力，封闭阀门进口和出口，压紧填料压盖以便保持试验压力，启闭件处于部分开启状态。调节好电接点压力表（高压调节表）于被试阀门密封压力的 1.5 倍压力，给体腔充满试验介质，并逐渐加压到试验压力，压力逐步加压到与电接点压力表（高压调节阀）相同值时，加压工作自动停止。关闭（水总开关），持续保压时间按阀门试验规定要求。然后对壳体（包括填料函及阀体与阀盖联结处）进行检查。观察被试阀门承压壁及阀体与阀盖联结处不得有可见泄露。

b) Housing Test: Pressure test of the valve housing composed by connection of various components like valve body and valve cover and the like is aimed for inspecting the seal performance and pressure proof performance of the valve housing. It is required to seal the entry and exist hole of the valve, press tightly the packing gland so as to keep testing pressure, and make the on-off components partially open. To adjust the pressure of electric-contact pressure gauge (high-pressure regulation gauge) to 1.5 times of that of testing pressure of the tested valve, fill the cavity with testing mediums and gradually increase the pressure to the testing one. When the pressure increases to the same as that of the electric-contact pressure gauge, the pressure rise will then stop. Turn off (water main switch) and the continuous holding time is to be determined according to general valve testing standard requirements.

Then, it is required to carry out inspection on the housing (including packing box and connection place of the valve body and cover). There should be no visible leakage found in the pressure-bearing wall and connection place of the body and cover.

c) **密封试验:** 检验启闭件和阀体密封副密封吻合性能试验, 在 ZBJ16006 中

又分为高压和低压密封试验, 在进行密封试验时, 应注意阀门的试验姿态。

C) Seal Test: Test for inspection of the conformity of on-off components to valve sub-seal performance. It can be divided into high-pressure seal test and low-pressure seal test in the ABJ16006. During the seal test, please pay attention to the testing status of the valve.

(2) **高压密封试验:** 高压密封试验与低压密封试验基本相同, 不同之处在于高压密封试验压力为公称压力的 1.1 倍, 低压密封试验压力为 0.5-0.7Mpa, 高压密封试验介质为气体或液体一般是液体, 低压密封试验压力为气体, 持续保压时间按阀门试验规定要求。

(2) **High-Pressure Seal Test:** High-pressure seal test is basically the same as the low-pressure one. The difference lies in that the nominal pressure for high-pressure seal test is 1.1 times of that for low-pressure one, whose testing pressure is 0.5-0.7Mpa. Testing mediums of the high-pressure seal test is usually fluid, while the low-pressure one the gas. Continuous holding time of pressure is to be determined according to valve testing

standard requirements.

5、液体介质加压注意事项：

5、Practice Considerations of Fluid Medium Pressure Rise:

(1) 由于被试阀门各种规格的公称通径和公称压力不同，在试压过程中应注意高压压力表与低压压力表转换，被试阀门压力大于低压表的三分之二时，关闭低压压力表的开关，以免低压表损坏。

(1) Because of the difference in nominal diameter and nominal pressure of valves of various specifications, attention should be paid to the transfer from low-pressure gauge to high-pressure gauge during the test. When pressure of the tested valve is two thirds higher than the low-pressure gauge, it is required to turn off the low-pressure gauge in order to prevent damage of the low-pressure gauge.

(2) 试验介质由用户自行选择，但应符合规定：壳体、高压上密封、高压密封试验，其试验介质应用于煤油、水（可以加入防锈粉）或粘度不大于水的其他适宜非腐蚀性液体；低压密封试验：其试验介质温度应采用空气或其他适宜的气体。

(2) Testing mediums can be chosen by the user but must conform requirements: testing mediums for seal test of housing, high-pressure upper seal and high-pressure seal test should be kerosene, water (rust preventative powders can be added) or other appropriate non-corrosive fluids whose viscosity is not larger than that of water; and testing mediums for low-pressure seal test should be air or other appropriate gas.

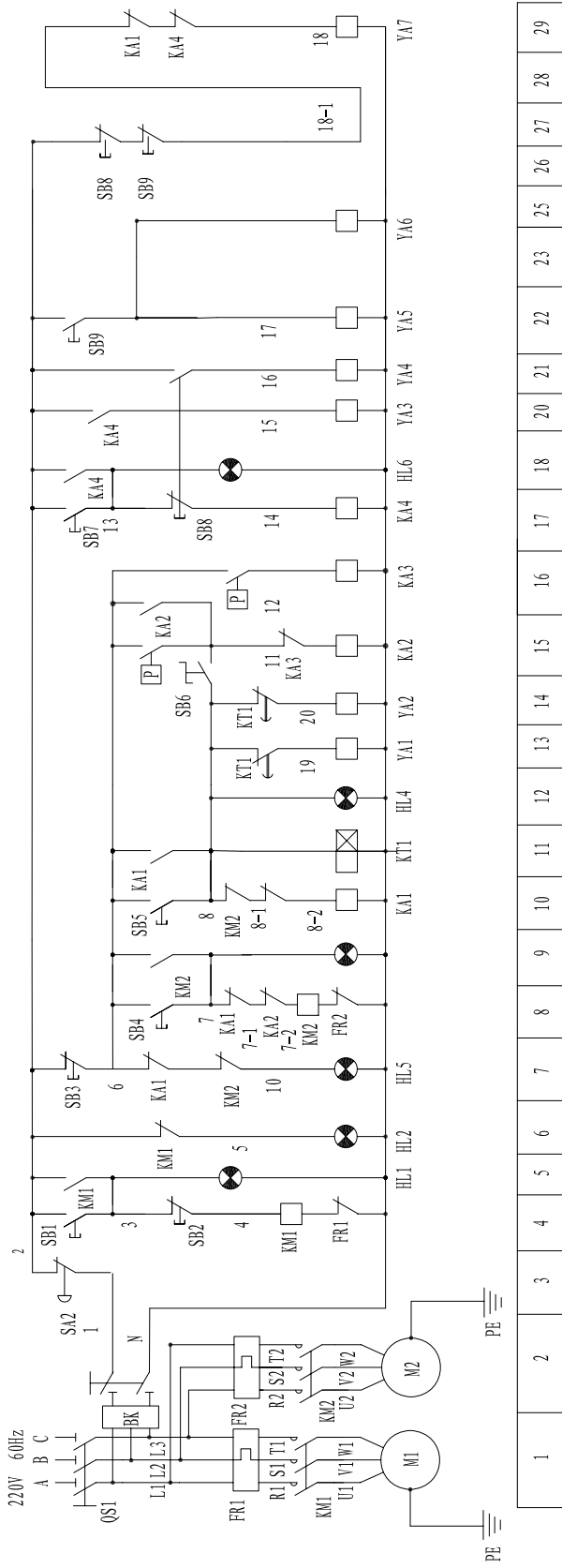
(3) 用液体作试验时，应排除阀门腔体内气体。用气体作试验时，应采用安全防护措施

(3) When the testing medium is fluid, it is required to release the gas in the valve cavity; and when it is gas, safety protection measures should be taken.

八、JLTD 电器原理图

VIII. JLTD Electric Diagram

油泵 Oil Pump	低压水泵 Low pressure Water pump	控制电源 及指示 Control power and indication	油泵启动 与停止 (指示灯) Oil pump start/stop (indicator lamp)	低/高压水泵 启动/停止 (指示灯) Low/high pressure water pump start/stop (indicator lamp)	低/高压水泵 启动/停止 (指示灯) Low/high pressure water pump start/stop (indicator lamp)	电液压力控制 pressure control	顶压 放松油缸 Top press oil cylinder	顶压油缸增压 Top press charging	油压泄荷 Oil pressure unloading
	水泵 停止 (指示灯) Water pump stop (indicator lamp)	水泵 启动 (指示灯) Water pump start (indicator lamp)	高压水泵 启动 (指示灯) High pressure water pump start (indicator lamp)	高压水泵 运行 High pressure water pump running	高压 水泵 High pressure water pump	夹紧 (指示灯) Clamping (self-holding) (indicator lamp)	夹紧 电磁铁 Clamping electromagnet	增压阀1 Pressurization valve 1	增压阀2 Pressurization valve 2

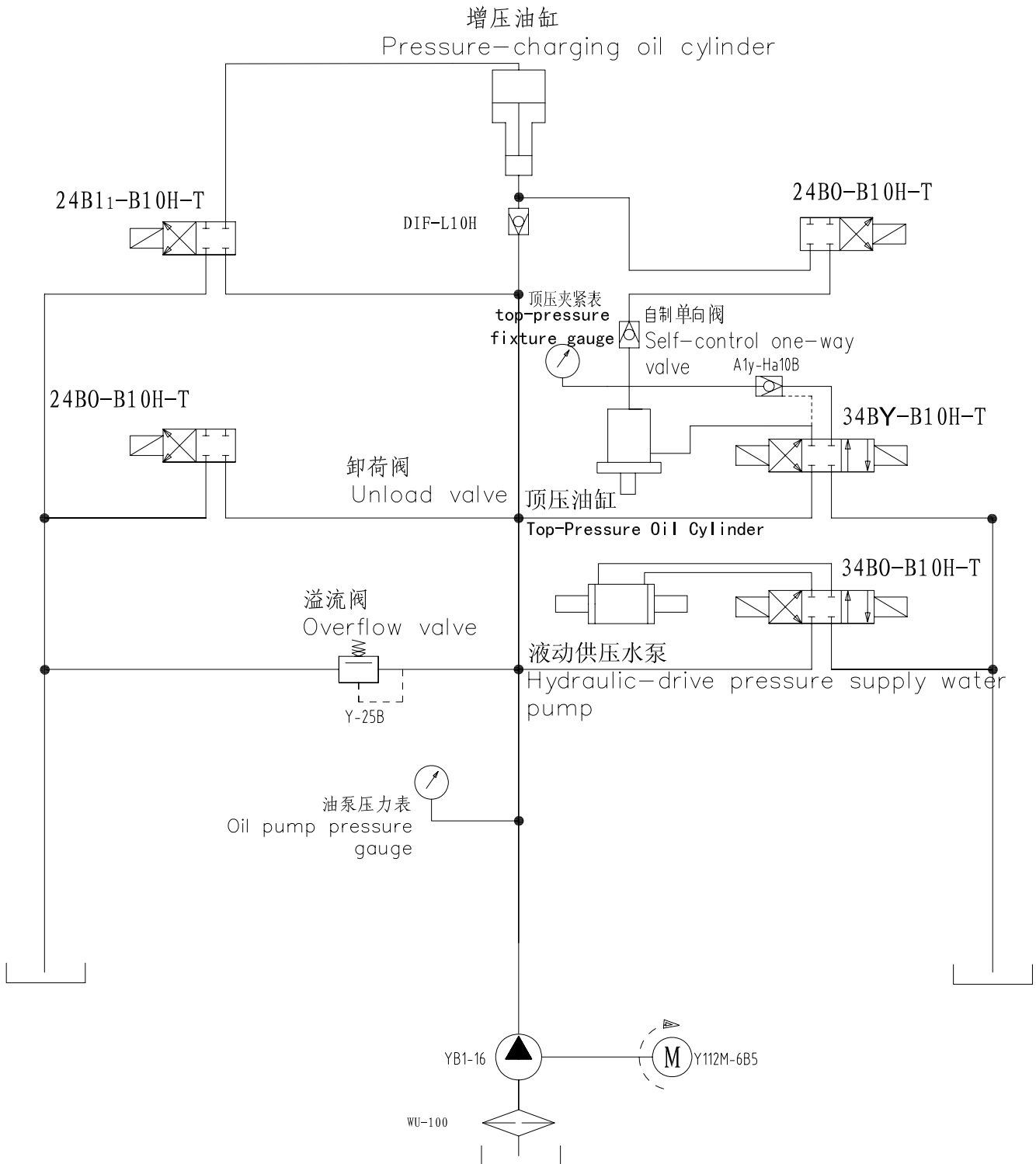


注：电路若有改动，恕不另行通知。

Note: circuit if changes, without any further notice.

九、JLTD型液压原理图

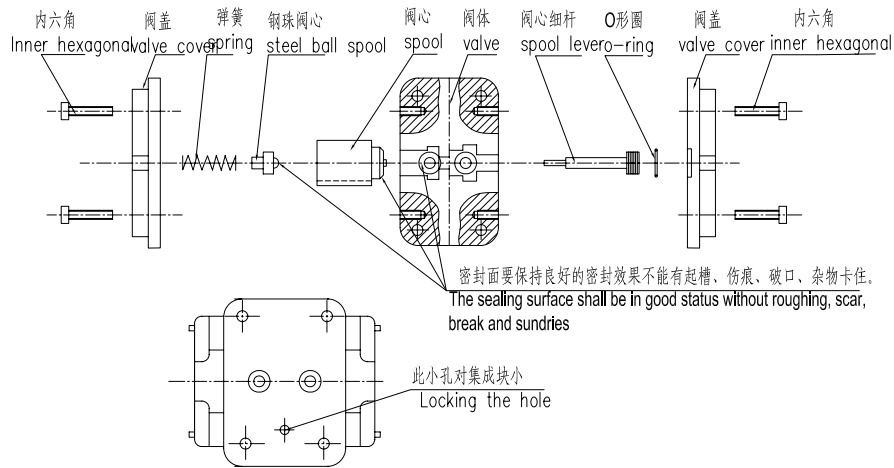
IX. JLTD Hydraulic diagram



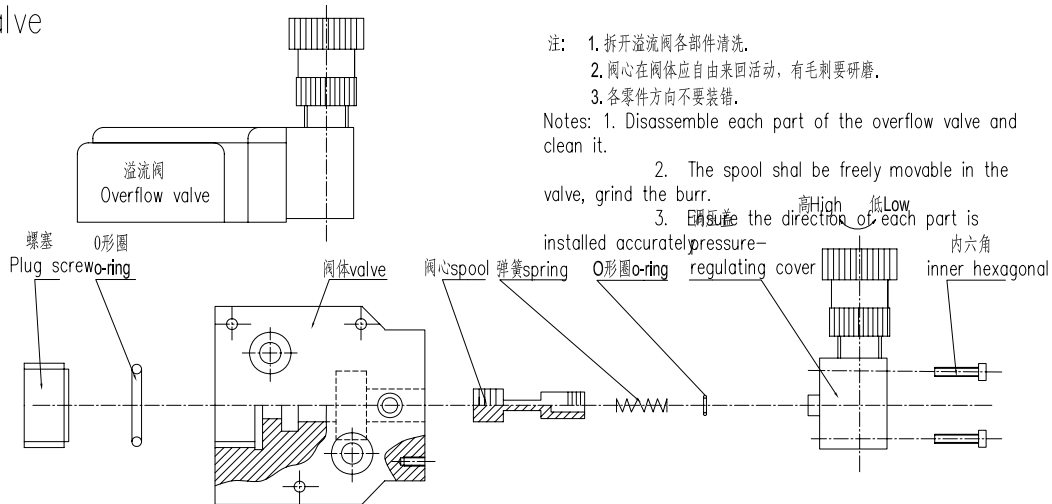
十、液控单向阀和溢流阀拆装图

X. Dismounting diagram for hydraulic-control one-way valve and overflow valve

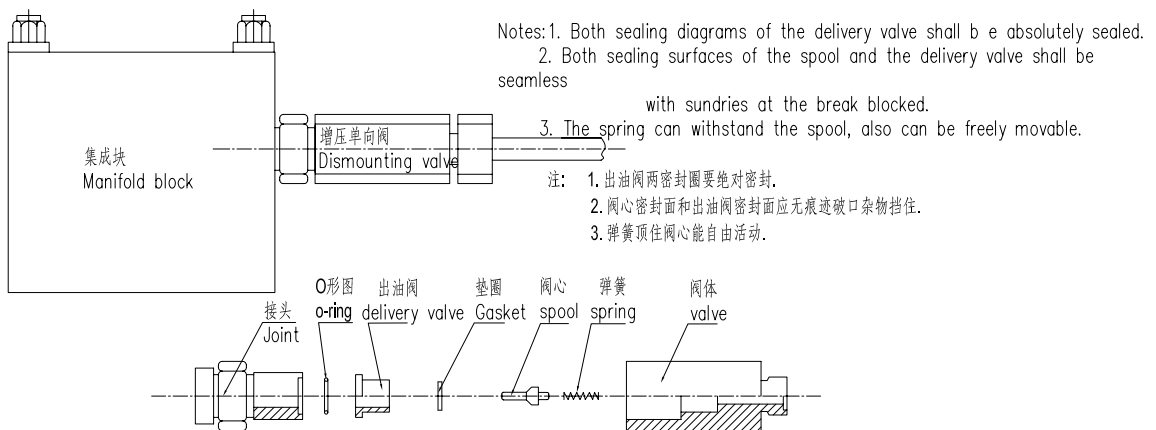
液控单向阀拆装图 Dismounting valve for hydraulic-control one-way valve



油泵溢流阀拆装图 Dismounting diagram for oil pump overflow valve



增压单向阀拆装图 Dismounting diagram for pressure-charging one-way valve



十一、液压装置维护保养

XI. Maintenance for hydraulic unit

电 器 Ele ctric i 31	被检查 元件名称 Element name	检查项目 Items examined	检查方法 (测量仪器名称) Examined method (instrument name)	周期次 /期间 Cycle/per iod	检查时		维护保养的要求 Maintenance requirement	修理(更换)要求 Repair (replacement) requirement	备注 Remarks
					运转 Runnin g	停机 Stopp ed			
液 压 Hy dra ulic	电动机 Motor	绝缘 Insulating	用 500 伏兆 欧表测量 Use 500v megger for measurement	1 年 1 year	0	0	与地线之间绝缘电阻 应在 10Mn 以上 The insulation resistance connected with the earthing line shall above 10Mn	按有关电动机标准要求 According to the relevant standard for the motor	
	控制电器 Control electric								
	电器 Electric								
液 压 Hy dra ulic	液压缸 Hydraulic cylinder	油量 Oil capacity	观察油位计 Observe the oil level gauge	1/天 1/day	0	0	要在规定油位中间 At the center of specified oil level on request		
		油温 Oil temp	温度计 Thermometer	1/天 1/day	0	0	在 20℃-55℃之间 Between 20℃-55℃		
		清洁程度 Cleaning degree		1/3 个月 1/3 month	0	0	按液压标准规定 According to the hydraulic standard		
	压力表 Pressure gauge	压力测量 Pressure test	计量 Metering	1/年 1/year	0	0	误差在最小刻度 1/2 之内 The error is within 1/2 of the min. scale	误差大或损坏时更换 Replace it for large error or damaged	
	电磁阀 Electromagnetic valve	工作声音 Work sound	耳听 Hearing	1/年 1/year			不能有异常声音 Abnormal sound is not allowed	检查修理 Examine and repair	

Electro magnetic valve	推杆磨损	检查形状 Check the shape	1/年 1/year		0	端面不得有磨损 Abrasion is not allowed at the end face	磨损时更换 Replace it when abraded	造成泄露增大动作不良 Cause large leakage and poor running
	螺钉松动 Screw looseness	接线柱、壳体、螺钉松动、脱落 Binding post, shell and screw loose and fall off	1/3个月 1/3 month		0	各部件均不能松动 Each part can not be loose	脱落的螺钉要装上 Mount the fallen screw	螺钉松动、造成线圈烧坏、动作不良 Coil burnt off and poor running caused by screw looseness
液压缸 Hydraulic cylinder	动作状态 Motion status	检查动作平稳性 Check the stability of motion	1/3个月 1/3 month	0		按设计要求 According to the design	动作不良、检查修理 Poor running, examine and repair	密封老化、更换 Sealing aged, replace it
	外泄露 External leakage		1/3个月 1/3 month	0		各部件不能有泄露 Each part can not leak	检查更换密封圈 Check and replace the seal ring	
	内泄露 Internal leakage	活塞密封泄露 The piston sealing leaks	1/3个月 1/3 month	0		按油缸动作要求 According to the oil cylinder requirement	密封圈老化内泄露 Seal ring aged, internal leakage	检查、更换 Check and replace
软管 Flexible pipe	外部损坏 External damage	眼睛看、手摸 Observe and touch	1/3个月 1/3 month	0		不能损伤 Can not be damaged	有损伤时、更换 Replace it when damaged	可用乙烯管套、粘在软管上 Use the ethylene pipe sleeve to stick to the flexible pipe
	漏油 Oil leakage	眼睛看、手摸 Observe and touch	1/3个月 1/3 month	0		不能漏油 Can not leak	漏油、修理、更换O形圈 Oil leakage, repair and replace the O-ring	
	扭曲 Twisted	眼睛看 Observe	1/3个月 1/3 month	0		不能扭曲 Can not be twisted	及时校正 Timely correct	

十二、常见故障及排除

XII. Common fault and removal

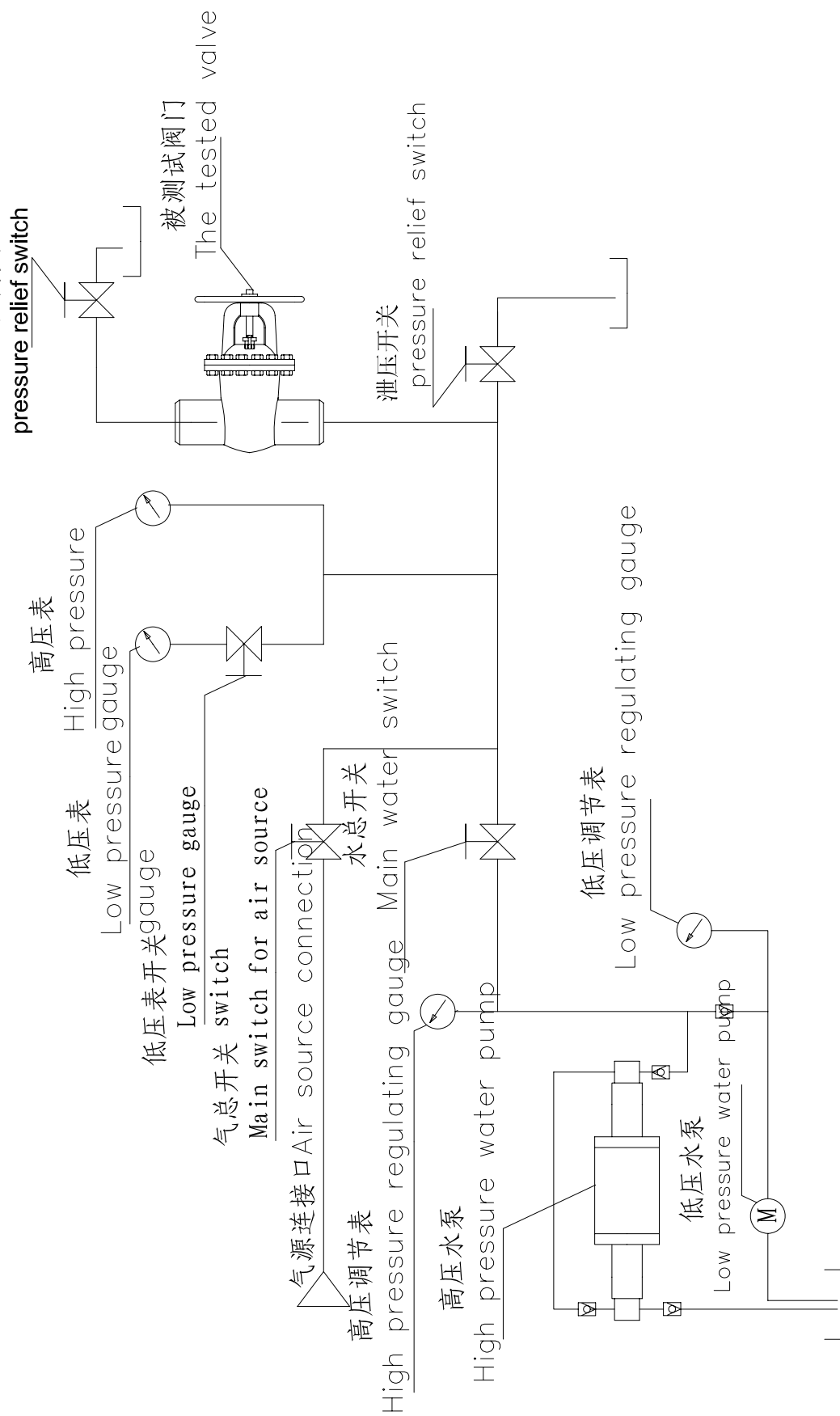
故障 Faults	产生原因 Reasons	故障排除方法 Removal	
油缸爬行 Oil cylinder creeping	液压系统 Hydraulic system	1、空气进入液压系统，油缸出现时走时停，和连续振动现象 With air into the hydraulic system, the oil cylinder stops and goes and has continuous vibration	1、松动油缸接头，往复油缸方向将空气排掉 Loosen the the connector of oil cylinder, drain off the air at the to-and-fro direction of the cylinder
		系统压力低于摩擦阻力 The system pressure is lower than the frictional resistance	2、调节系统所需压力 Regulate the desired pressure
		3、油缸、阀、不密封进入空气 Air entering the unsealed cylinder, valve	3、安装、更换密封圈 Install and replace the seal ring
油缸不动作 The oil cylinder is motionless	换向阀 Reversing valve	1、滑阀拉伤或卡死 Slide valve is pulled or locked	1、清洗修研滑阀 Clean and repair the slide valve
		2、控制压力油压力太小 Too small pressure to control the oil	2、砂光修理 Polishing repair
		3、控制油管堵塞 The control oil pipe blocked	3、疏通控制油路 Eliminate the control oil line
		4、换向不灵，阀芯不复中位 The reversing is not flexible, the spool valve is not at the center	4、检查、清洗 Examine and clean
油缸不动作 The oil cylinder is motionless	电器 Electric	1、电磁铁线圈绝缘不良 The electro magnet coil poorly insulated	1、更换电磁铁 Replace the electromagnetic iron
		2、电磁铁门铁心部位有污物 There is dirt at the iron core of electromagnet gate	2、砂光清理 Polishing cleaning
		3、控制按钮损坏 Control button damaged	3、重新更换 Re-replacement
		4、电压不对 Wrong voltage	4、改正电压 Correct voltage
		5、电线焊接不良接头松动 Poor wire welding, the connector loosens	5、重新焊接装紧螺丝 Re-weld and clamp the screw
增压油缸 Pressure cylinder	不保压 Without pressure	1、单向阀阀芯有污物卡位 There is dirt blocked at the spool valve of one-way valve	1、检查、清洗（液控单向阀） Examine and clean (hydraulic-control one-way valve)
		2、单向阀阀芯损坏 The spool valve of one-way valve damaged	2、研磨、更换（型号 FZSI01） Grinding and replacement (type FZSI01)
		3、单向阀弹簧变形 Spring for one-way valve is deformed	3、检查、更换 Examine and replace

re-charging oil cylinder	-maintaining	4、 连接部位漏油 Oil leakage at the connection	4、 检查更换 O 形圈 Check and replace the O-ring
	不增压	1、 增压电磁换向阀有污物 There is dirt at the pressure-charging electromagnetic reversing valve	1、 检查、清洗 Check and wash
	Without pressure-charging	2、 增压油缸、密封件损坏 Pressure-charging cylinder and seal element damaged	2、 更换 Replacement
	g	3、 增压调节阀锥体损坏 The conical body for pressure-charging regulating valve damaged	3、 研磨、清洗、更换 Grind, clean and replace
		4、 增压控制按钮损坏 The pressure-charging control button damaged	4、 更换 Replace
吸不上油没有压力 Without pressure for no oil absorption	油泵 Oil pump	1、 电动机旋转方向不对 Wrong motor direction of rotation	1、 互换电源进线，纠正电动机方向 Exchange the power supply, correct the motor direction
		2、 油液面过低、吸不上油液 Too low oil level, failing to absorbing oil	2、 定期检查油箱中的油液，并加油至油标规定线 Regularly check the oil in the oil box, inject oil to the specified line of the oil lever
		3、 油液粘度过高，使叶片泵叶片移动不灵活 Too high oil viscosity, making the vane pump run inflexibly	3、 更换粘度低的 Replace it with lower viscosity
		4、 压力表失灵，堵塞，无法反映压力 The pressure gauge has a failure, blocked, can not show the pressure	4、 计量、清洗、更换 Meter, clean and replace
调压失灵 Pressure-regulating loses control	溢流阀 Overflow valve	1、 阀芯卡死在全开位置，泵输出无油液进入系统 The spool valve is locked at full-open status, there is no oil entering the system for pump output	1、 排除卡死故障 Eliminate block failure
		2、 阀芯有毛刺和有污物 There is burr and dirt at the spool valve	2、 检查、修整、研磨、清洗 Check, repair, grind and clean
		3、 阻尼孔堵塞 The damping hole blocked	3、 疏通阻尼孔，清洗 Remove the damping hole, clean it
		4、 锥阀和阀座孔接触不良 Cone valve and the hole of valve seat poorly connected	4、 修复或更换锥阀 Repair and replace the conical valve
		5、 阀芯和阀体配合间隙过大 Too large gap for spool valve and body connection	5、 更换阀芯、调整间隙 Replace the spool valve and adjust the gap

严重 噪声 和振 动 Serious noise and vibrati on	油 泵 Oil pum p	1、吸油管进入空气，滤油器堵塞 Air entering the oil suction pipe, the oil filter blocked	1、检查、旋紧、排除、清洗、更换 Examine, tighten, eliminate, clean and replace
		2、油箱中油量不足，吸入空气 Insufficient oil capacity in the oil box, air entering	2、加液压油，按油位计规定线 Inject the hydraulic pressure oil to the specified line of the oil lever
		3、油泵经长年使用，内部零件如定子、叶片 拉伤磨损 With years of use, the internal parts of oil pump e.g. stator, leaf are seriously pulled and damaged	3、拆修叶片泵，修复有关零件 Dismount the vane pump, repair the corresponding parts
	溢 流 阀 Ove rfl ow valv e	1、溢流阀弹簧变形，不复原 The spring for overflow valve is deformed, can not be recovered	1、检查并更换弹簧 Examine and replace the spring
		2、至阀芯上阻尼孔被污物堵塞 The damping hole on the spool valve is blocked	2、用 1mm 钢丝穿通阀芯阻尼孔,并清洗 Use 1mm steel wire to punch through the damping hole of spool valve, clean it
		3、油液粘度过高 Too high oil viscosity	3、适当降低油液粘度 Properly reduce the viscosity
		4、和其他产生共振，和管子碰撞 Generate resonance with other pumps, collide with the pipe	4、较长油管应彼此分开 The longer oil pipes shall be separated each other

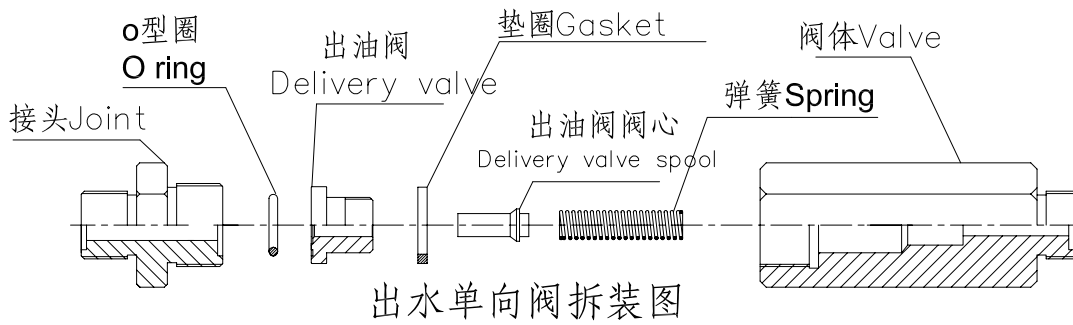
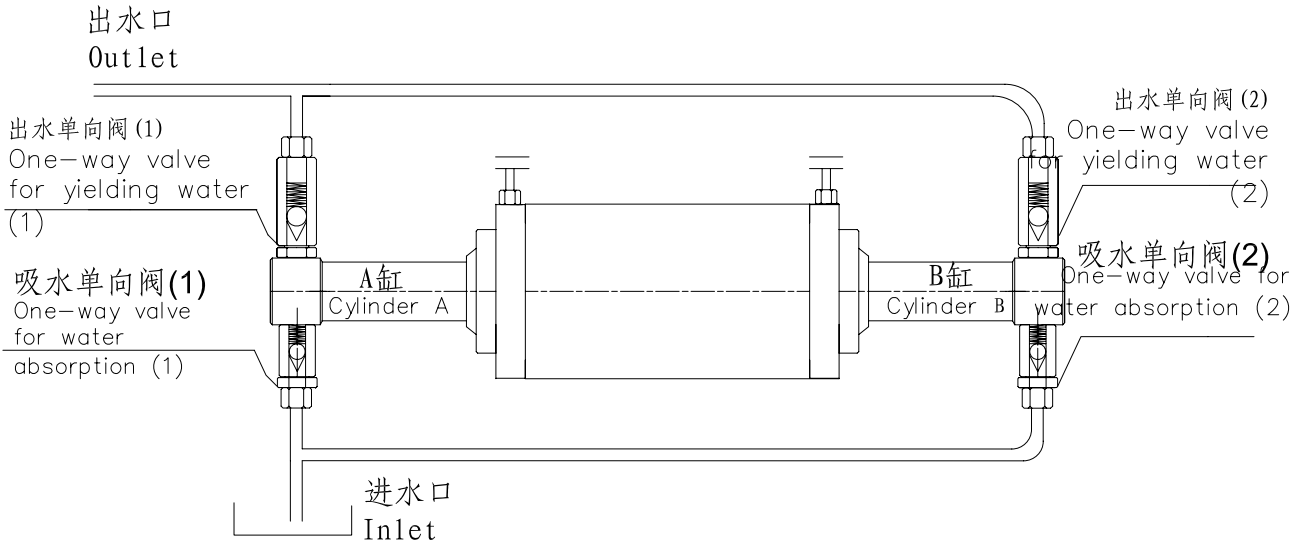
十三、JLTD水气管路原理图

XIII.JLTD Water-pipe diagram
上泄压开关

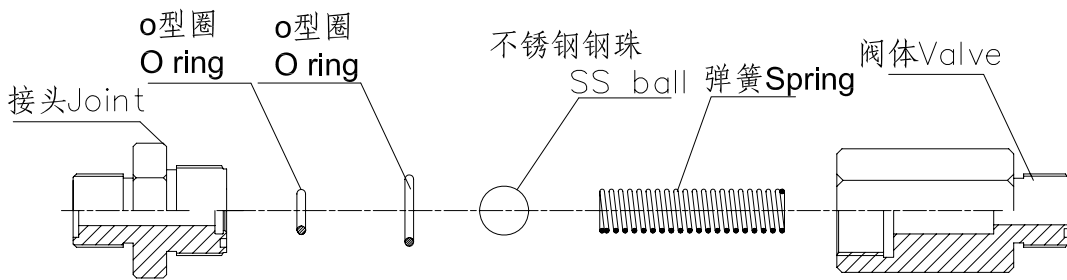


十四、液动供压装置原理图

XIV. Hydraulic-drive pressure supply diagram



Dismounting diagram for one-way valve for yielding water



吸水阀单向阀拆装图

Dismounting diagram for one-way valve for water absorption

十五、液动供压装置原理及故障排除（高压水泵）

XV. Hydraulic pressure supply diagram and fault removal (high-pressure water pump)

一、 液压系统工作原理：该泵由液压系统压力作动力，电器控制电磁换向阀，使油缸自动往复执行，设有二级水泵压力装置能提高加压流量功能，电接点控制超高压停止。

I. Working principle for hydraulic system: the pump is used the pressure of hydraulic system as the power, and the electric to control the electromagnet reversing valve to make the oil cylinder automatically reciprocating execution, also equipped with the level II water pump pressure unit to develop the pressure-charging flow, and the electro connecting control ultra-high pressure will stop.

二、 高压水泵工作原理：在液压往复运动工作过程中，A缸开始吸水，吸水单向阀打开，经过液压系统电磁换向阀自动换向推力A缸吸水单向阀关闭，A缸出水单向阀打开水源压力进入测试台，B缸开始吸水，吸水单向阀打开，经过液压系统电磁换向阀自动换向推力B缸吸水单向阀关闭，B缸出水单向阀打开水源压力进入测试台，AB两缸多次往复运动加压,达到已设定电接点压力表值,供压水泵自动停止完毕

II. Work principle for high-pressure water pump: during the hydraulic reciprocating motion, cylinder A starts water absorption, and the one-way valve for water absorption opens, the electromagnet reversing valve through the hydraulic system automatically switches to the thrust cylinder A, and the one-way valve for water absorption closes, the one-way valve for water discharge of cylinder A opens,

and the pressure of water source enters the test bench, and then cylinder B starts water absorption, the one-way valve for water absorption of cylinder B opens, the electromagnet reversing valve through the hydraulic system automatically switches to the thrust cylinder B and the one-way valve for water absorption closes, the one-way valve for water discharge of cylinder B opens and the pressure of water source enters the test bench, the two cylinders A & B conduct multi-reciprocating pressure-charging, when it reaches the set value of electro connecting pressure gauge, the water pump of pressure supply will automatically stop.

三、 高压水泵故障排除方法:

III. Fault removal for high-pressure water pump:

1. 不吸水，液压系统是正常情况下，先检查循环水位，吸水管路接头是否松动，有无空气进入。

1. Without water absorption, under the normal situation for hydraulic system, firstly check whether the recycling water location and the connector of water absorption pipe is loose and there is air entering at the same time.

2. 液压系统元件电磁换向阀阀芯卡死，拆下电磁换向阀，清洗后重新安装即可，损坏严重修磨更换。

2. The spool valve of electromagnet reversing valve for hydraulic element is locked, disassemble the electromagnet reversing valve, and re-install it after cleaned, as for the seriously damaged, repair and replace it.

3. 高压水泵不出水，拆下吸水单向阀和出水单向阀（1），检查清洗严重损坏更换。

3. No water discharging for high-pressure water pump, disassemble the one-way valve for water absorption and water discharging respectively (1), check and clean the seriously damaged, and then replace it.

4. 高压水泵出水量正常，但压力表会下降不能保压，拆下出水单向阀（2），检查清洗严重损坏更换。

4. Water discharging for high-pressure water pump is normal, but the pressure gauge may drop without pressure-maintenance, then disassemble the one-way valve for water discharging (2), check and clean the seriously damaged, and replace it.

5. 水缸密封圈在不干净的介质中使用，能缩短寿命导致水压不能提高，要及时更换介质，加适当的防锈剂。

5. The sealing ring for water cylinder is used in unclean medium, which can shorten the service life, leading the water pressure can not be developed, so immediately replace the medium, add moderate antirust agent.

十六、 JLTD-400型夹紧油缸所需压力对照表
 JLTD-400type clamping cylinder pressure contrast table

公称通径 Nominal Diameter DN		阀门公称压力 Nominal pressure of valve MPa/class													
		0.6	1.0	1.6	2.5	4.0	5.0	6.4	10.0	15.0	20.0	25.0			
		液压系统压力 (增压) MPa Hydraulic system pressure (pressure increasing)													
in	mm	PN	PS	PN	PS	PN	PS	PN	PS	PN	PS	PN	PS	PN	PS
2	50	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0
2½	65	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.5	4.0	4.5	4.0	5.0	6.0	8.0
3	80	2.0	2.0	2.0	2.0	3.0	3.0	3.0	4.0	4.5	6.0	5.0	7.0	10.5	16.0
4	100	3.0	3.0	3.0	3.0	3.0	3.0	4.0	6.0	5.0	6.5	7.0	9.5		
5	125	3.0	3.0	3.0	3.0	4.0	4.0	4.5	5.5	6.0	8.5	8.0	10.0	13.0	
6	150	3.0	3.0	4.0	4.0	4.5	5.0	7.0	8.0	11.0	10.0	14.0			
8	200	3.0	3.0	3.5	4.5	5.5	7.0	8.0	11.5	13.0	18.0				
10	250	3.0	4.0	5.0	7.0	8.0	11.0	12.5	17.0						
12	300	4.5	5.5	7.0	9.5	11.0	15.0	17.0	23.0						
14	350	5.5	7.5	9.0	12.5	14.5	19.5								
16	400	7.0	9.5	11.5	16.0										

注: 1. 测试阀门时, PN (阀门密封测试), PS (阀门强度测试).
 2. 阀门小于DN125-1.6MPa, 将液压系统压力微调于3.0MPa以下, 油缸能动作即可.
 Note: 1. When test the valve PN (Valve Airproof test), PS (Valve intension test).
 2. When the vavle less than DN125-1.6MPa, adjust the hydraulic system pressure to lower than 3.0MPa, the cylinder can work.