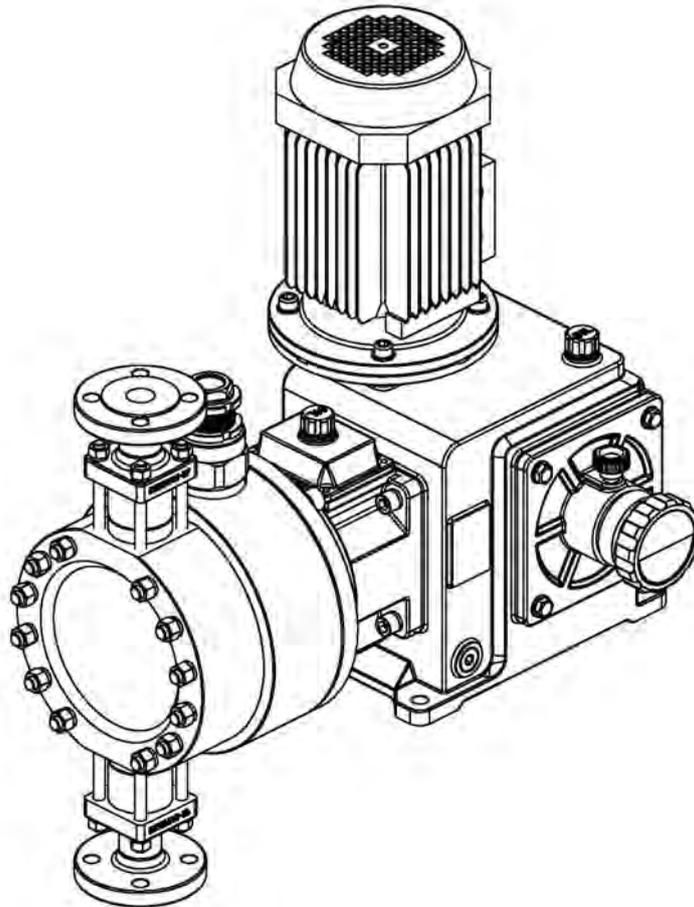


JP Series User Manual

— JPX、JPZ、JPR、JPD、JPT

— JYPX、JYPZ、JYPR、JYPD、JYPT



Zhejiang Ligao Pump Technology Co.,Ltd

Add: No.227 Huishu Road, Linhai, Zhejiang

Tel: +86 576 85289780

Web: www.ligaopumps.com

E-mail: sales@ligaopumps.com

ATTENTION

- 1. The wiring of the drive motor must refer to the wiring marks on the motor nameplate and junction box, and must be completed by a professional electrician with corresponding qualifications.**
- 2. Before use, please make sure that the metering pump has been filled with lubricating oil to the midline of the oil mark or slightly higher. The lubricating oil is recommended to use 220# worm gear oil or 150# gear oil, and stop running when the ambient temperature is lower than -10°C.**
- 3. Before starting the machine, make sure that the outlet pipe of the metering pump is unobstructed (the valve is fully open), otherwise the metering pump and related piping will be damaged.**
- 4. The diameter of the inlet pipeline must be greater than or equal to the standard diameter of the corresponding metering pump, otherwise it will cause problems such as insufficient flow of the metering pump.**
- 5. Ensure that the outlet pipe pressure of the metering pump is higher than the inlet pipe pressure. If the outlet pipeline pressure is lower than the inlet pipeline pressure, the metering pump The outlet needs to be equipped with a back pressure valve.**
- 6. Before shutting down the system, please stop the metering pump first, and then close the inlet and outlet valves.**
- 7. When welding non-embroidered steel pipes, do not drop welding slag or debris into the pipeline and valve body. Foreign objects falling may cause a series of problems such as the metering pump not being able to discharge water, and the metering pump may be damaged in severe cases.**
- 8. The metering pump and metering system must be equipped with a safety valve or other safety protection device on the discharge line to prevent pressure overload.**
The hydraulic diaphragm liquid end is equipped with a built-in pressure limiting valve, which is used to protect the metering pump rather than the entire system.
- 9. The installation of the metering pump must make the centerline of the plunger connecting rod/plunger horizontal and the centerline of the valve vertical.**

Equipment Installation Guide

Plunger/hydraulic diaphragm metering pump installation:

1. Before installing the metering pump, the user must verify whether the piping system matches the pump, and determine the size of the front and rear pipe diameters of the pump, taking full account of the peak of the pump.

Value flow, material viscosity and pipeline characteristics and other parameters.

2. Before connecting the pump to the pipeline, make sure that there is no welding slag, debris, or blockage in the pipeline.

3. If the fouling of the conveying medium cannot be avoided, a filter must be installed, and the corresponding shut-off valve and pipe union must be installed at the same time.

For inspection and cleaning.

4. The installation method of the pump is recommended to adopt self-filling installation, that is, the inlet of the pump should be lower than the minimum liquid level of the liquid reservoir; if it is necessary to use the lifting installation

If installed, a foot valve must be installed at the suction pipe port of the pump.

5. It is recommended to install a pulse damper in the outlet pipeline of the pump to ensure uniform flow rate of the material and reduce the impact on the pipeline due to the pulse of the material.

And install the corresponding safety valve to prevent abnormal pipeline pressure.

6. The wiring of the drive motor must refer to the wiring mark on the motor nameplate and junction box, and be completed by a professional electrician with corresponding qualifications.

7. Check the oil level before starting the pump, and add lubricating oil to the center line of the oil mirror or slightly higher at the oil filling port; for pumps that have not been used for a long time, check the oil and oil level before starting the pump.

8. Before using the pump, a trial run must be carried out:

→Check whether the piping system is normal;

→Check whether the valve is open;

→Confirm whether the input power supply matches the pump drive motor;

→Adjust the adjustment stroke of the pump to the 0% position;

→Start the metering pump;

→Slowly adjust the stroke to 100%;

→Identify whether the pump has noise or other abnormalities;

→Observe whether there is material at the outlet of the pump or the system outlet;

→Check whether the output material flow of the system changes with the stroke adjustment;

→ Repeatedly stop/start the metering pump 3-5 times, running for 3-5 minutes each time;
→ After judging that there is no abnormality, the pump can be operated and used normally.

9. For abnormalities or failures in operation, please refer to the relevant content of this manual for judgment or telecommunications our company's after-sales service;

10. For the basic maintenance and maintenance of the equipment, please refer to the relevant contents of this manual.

Contents

1. Overview.....	1
2 Safety Operation.....	2
2.1 Operator Qualifications and Training.....	2
2.2 Safety Operation.....	2
2.3 Potential Dangers.....	2
3 Pump Structure and Principle.....	3
3.1 Driving end Structure and Principle.....	3
3.1.1 Driving end Structure.....	3
3.1.2 Working Principle.....	3
3.1.3 Features of Adjustment Mechanism.....	3
3.2 Plunger Type Liquid End Structure and Principle.....	5
3.2.1 Liquid End Structure.....	5
3.2.2 Working Principle.....	5
3.3 Hydraulic Diaphragm Type Liquid End Structure and Principle.....	6
3.3.1 Liquid End Structure.....	6
3.3.2 Working Principle.....	7
4 Technical characteristics.....	8
4.1 Plunger Metering Pump Has the Following Remarkable Characteristics.....	8
4.2 The Hydraulic Diaphragm Metering Pump Has the Following Remarkable Characteristics.....	8
5 Installation.....	9
5.1 Pipeline Installation.....	9
5.1.1 General Rule.....	9
5.1.2 Outdoor Installation.....	10
5.1.3 Suction Pipeline.....	10
5.1.4 Discharge Pipeline.....	11
5.1.5 Configuration of a Typical Pipe System.....	11
5.2 Electrical.....	12
6 Start.....	13
6.1 Check the Fastener.....	13
6.2 Oil Filling.....	13
6.3 Flow Adjustment.....	13
6.4 Pump Head Priming.....	14
6.5 Calibration.....	15
6.6 Plunger Type Plunger and Packing Seal Adjustment.....	16
6.7 Hydraulic Diaphragm Type Hydraulic End Overload Valve Opening Pressure Adjustment.....	16
7 Troubleshooting.....	17
8 Maintenance.....	19
8.1 Lubrication.....	19
8.2 Liquid End Disassembly, Inspection and Reinstallation.....	20

8.2.1 Plunger Type Liquid End (refer to "15.1").....	2 0
8.2.2 Hydraulic diaphragm pump liquid end (refer to "section 15.2").....	2 1
8.3 Check Valve.....	2 2
8.3.1 Summary.....	2 2
8.3.2 Check valve disassembly and reinstallation (refer to "Section 12").....	2 3
8.4 Liquid End Disassembly and Reassembly (refer to "14").....	2 3
8.4.1 Drive Adjustment Part.....	2 3
8.4.2 Transmission Mechanism Part.....	2 4
9 Hydraulic Double Diaphragm Metering Pump.....	2 4
9.1 Performance overview.....	2 4
9.2 Operation Manual.....	2 4
10 Storage.....	2 6
10.1 Short-term Storage.....	2 6
10.2 Long Term Storage.....	2 6
11 Open Box Check.....	2 6
12 Check Valve Assembly.....	2 7
12.1 Double-Ball Thread Valve Assembly (DN6PN700, DN10PN700).....	2 7
12.2 Single Ball Thread Valve Assembly (DN15PN110)	2 8
12.3 Flanged Double-Ball Valve (DN15PN700TG /PN420TG)	2 9
12.4 Flanged Single Ball Valve.....	3 0
(DN25PN260TG/PN110TG/PN40RF、DN40PN110TG/PN40RF)	3 0
12.5 Flange Type 90° Angle Valve.....	3 1
(DN50PN40RF、DN65PN25RF、DN80PN16RF、DN100PN16RF)	3 1
13 Installation Drawing.....	3 2
13.1 Plunger Pump Installation Drawing.....	3 2
13.2 Hydraulic Pump Installation Drawing.....	3 7
14 Drive End Installation Drawing.....	4 2
15 Liquid End Drawing.....	4 4
15.1 Plunger Pump Liquid End Drawing.....	4 4
15.2 Hydraulic Pump Liquid End Drawing.....	4 5
15.2.1 JYPX Serial Liquid End Drawing.....	4 5
15.2.2 JYPZ/JYPR/JYPD/JYPT Serial Liquid End Drawing.....	4 6
15.2.3 Hydraulic Double-diaphragm Pump Liquid End Drawing.....	4 7
15.2.4 Split Type Exhaust Overload Valve (JYPX Series).....	4 8
15.2.5 Integral Overload Valve Assembly (JYPZ, JYPR, JYPD, JYPT Series).....	4 9
15.2.6 Oil Supplement Valve.....	5 0
15.2.7 Limit Valve Drawing.....	5 1
Warranty Regulations.....	5 2

Overview

Our company is a professional manufacturer integrating R&D, manufacturing and sales of high-quality metering pumps. The company adheres to the company's values to do a good job of every pump for customers, and it has become the work norm and code of conduct for every employee to do a good job of every pump. In recent years, the company has invested a lot of money to purchase advanced automated processing equipment and testing equipment, which minimizes human errors and ensures that the quality of each pump we manufacture is stable and reliable. After more than ten years of unremitting efforts, the metering pumps produced by our company have fully reached the international advanced level to ensure that users can buy and use with ease.

The company's leading products include: mechanical diaphragm metering pumps, electromagnetic diaphragm metering pumps, plunger metering pumps, hydraulic diaphragm metering pumps, rotor pumps, pneumatic diaphragm pumps, automatic dosing devices, complete sets of equipment, etc.

The metering pumps produced by the company are designed and manufactured in strict accordance with the national standard GB/T 7782-2020 "Metering Pumps" and the "API Standards" of the American Petroleum Institute for their technical requirements and inspection rules. The quality has reached the international advanced level. .

Metering pumps are widely used in petroleum, chemical, textile, food, paper, atomic energy, power plants, plastics, pharmaceuticals, water plants, environmental protection and other industrial and technological sectors. They are responsible for strong corrosiveness, toxicity, high viscosity and high pressure during the process. The medium dosing task.

★The plunger/hydraulic diaphragm metering pump is composed of three main components: (1) driving device, (2) adjusting device, (3) liquid device. The flow rate of the pump is determined by the driving speed, plunger diameter, and stroke length. The stroke length can be adjusted by the adjustment mechanism (handwheel) to achieve the required flow rate.

★The plunger/hydraulic diaphragm metering pump includes: JPX/JYPX, JPZ/JYPZ, JPR/JYPR, JPD/JYPD, JPT/JYPT. If there are multiple pumps in series, the Arabic numerals are added in front (example: 2 sets JYPD connected together marked as 2JYPD); If it is a hydraulic double-diaphragm metering pump, add 2 at the end (for example, double-diaphragm hydraulic pump JYPD dis marked as JYPD2).

★ The plunger/hydraulic diaphragm metering pump realizes the delivery of specific liquids through the inlet and outlet pressure difference, and has a steady-state accuracy within the flow adjustment range of 30% to 100%. The pump can be adjusted arbitrarily from zero flow to rated flow, and the metering accuracy of the pump is within $\pm 1\%$.

★ Please refer to our company's product catalog for the model specifications of plunger/hydraulic diaphragm metering pumps. Different types of metering pumps can be equipped with frequency conversion or explosion-proof motors according to customer needs.

Among them, the hydraulic diaphragm metering pump is suitable for ordinary clean water at room temperature or even strong corrosive, volatile, flammable, explosive, highly toxic, foul, corrosive, high specific, medium viscosity, radioactive or other precious liquids. At the same time, it can also transport suspended liquid. To prevent accidents caused by the mixing of the medium and hydraulic oil after the diaphragm ruptures, a double diaphragm metering pump can be selected with a diaphragm rupture alarm device

2 Safety Operation

This manual contains the basic safety knowledge of installation, operation and maintenance. Before installation and operation, relevant engineering and technical personnel and operators must read it carefully.

2.1 Operator Qualifications and Training

The operator must ensure that all commissioning, operation, preventive maintenance and installation work are carried out by authorized and qualified professionals, and that these professionals have carefully studied the operating instructions and obtained sufficient information.

2.2 Safety Operation

1. A reliable grounding wire must be installed before the pump is used.
2. When operating and installing equipment, use appropriate tools, wear protective clothing and goggles to ensure safety.
3. Appropriate lifting equipment must be used for products or parts exceeding 20Kg.
4. When the pump is working, it is never allowed to reach in and touch the high temperature parts of the coupling or equipment.
5. Observe the corresponding precautions listed in other chapters of this manual;
6. Comply with relevant national laws and regulations on the safe use of industrial products.

2.3 Potential Dangers

If you do not read the product instruction manual, you will be numb to operate the equipment, which may cause damage to people, the environment and the machine, and you will not receive the corresponding compensation.

The hazards that may result from not reading the product manual are as follows:

- ★ Damage to an important part or function of the machine or equipment;
- ★ The machine cannot be repaired and maintained;
- ★ People are injured by machines, media or electricity;
- ★ Leakage of medium causes workshop or environmental pollution, etc.;

3 Pump Structure and Principle

The plunger/hydraulic diaphragm metering pump consists of a power end, a hydraulic end and related components. The flow is generated by the periodic reciprocating motion of the preset stroke volume (determined by the plunger cross-sectional area and stroke length). Flow adjustment can be achieved by changing the stroke length or changing the stroke frequency.

3.1 Driving end Structure and Principle

3.1.1 Driving end Structure

The driving end includes a driving device and an eccentric adjusting device. The driving device is composed of motor, worm (15), worm gear (13), tapered roller bearing (16) and other components; the eccentric adjusting device is composed of main shaft (12), adjusting mandrel (6), adjusting screw (2), eccentric It is composed of wheels (11), transmission pins (9), sliding blocks (10) and other components.

3.1.2 Working Principle

A set of worms are driven by a matched motor to drive the worm gear to convert the force into torque, and the worm gear is transmitted to the eccentric gear assembly to provide power for it, and then the rotation movement of the eccentric gear is converted into reciprocating movement, thereby driving the reciprocating circulation of the hydraulic components.

The eccentric adjustment device uses the main shaft (12) to insert an adjusting mandrel (6) with an oblique slide groove, and the adjusting mandrel (6) is axially displaced by the rotation of the adjustment screw (2). The upper chute pushes the sliding block (10) to drive the drive pin (9) to make the eccentric wheel (11) move radially to form the required stroke, which can be adjusted from 0 to 100% relative stroke.

3.1.3 Features of Adjustment Mechanism

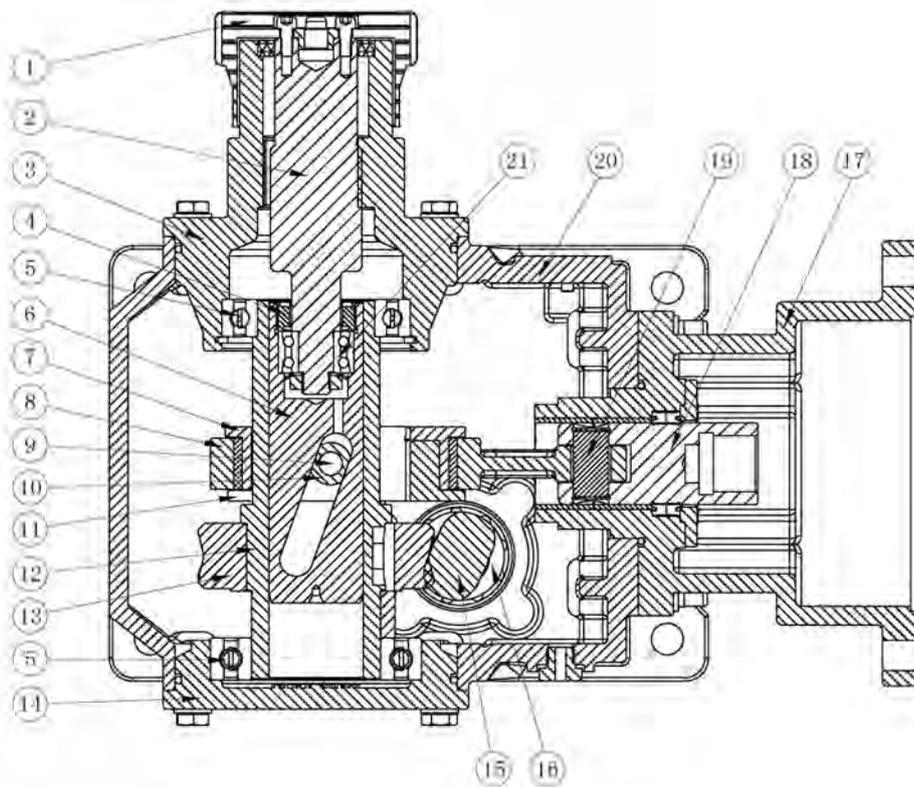
1. The main shaft (12) bears the radial impact force from the connecting rod (8) and the torsion force of the worm gear (15). Due to the independent support of the bearings (5) at both ends of the main shaft (12), the axial force generated by the adjustment stroke and operation of the adjusting mandrel (6) is little affected, so the worm gear (13) has a good centering effect and avoids In the past, the worm gear (13) could not be well centered under the action of the axial force of the N crankshaft, which caused the eccentric wear of the worm gear and the worm and the loss of the power source.

2. Since the adjusting mandrel (6) of the adjusting mechanism is in the inner cavity of the main shaft (12), it mainly bears the axial force and is not affected by the radial force, so it can be adjusted easily and accurately, and it can be accurately positioned .

3. The mechanism has the advantages of compact structure; good lubrication conditions; low operating noise; easy adjustment; high positioning accuracy; no displacement, etc., and it is an ideal adjustment mechanism for metering pumps.

4. There is a linear relationship between the movement of the adjustment mechanism and the stroke length of the plunger.

Typical schematic diagram of plunger/hydraulic diaphragm driving end



1. Hand wheel 2. Adjusting screw 3. Adjusting seat 4. Bearing screw cap 5. Deep groove ball bearing 6. Adjusting mandrel 7. Connecting rod bearing 8. Connecting rod assembly 9. Drive pin 10. Sliding block 11. Eccentric gear 12. Main shaft 13. Worm gear 14. Bearing cover 15. Worm 16. Tapered roller bearing 17. Oil-bath 18. Connecting rod joint 19. Connecting rod pin 20. Chamber 21. Angular contact ball bearing

3.2 Plunger Type Liquid End Structure and Principle

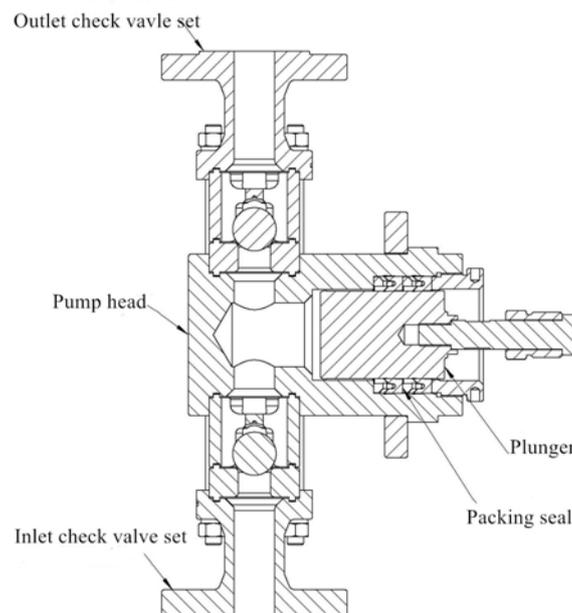
3.2.1 Liquid End Structure

The hydraulic end is one of the important parts of the metering pump, which is composed of the pump head, plunger, suction and discharge valves, and packing.

The suction and discharge valves of the pump head mainly adopt the ball valve structure (the angle valve is used for large flow). With the opening and closing movement of the ball valve, the sphere continuously rotates and moves, thus realizing the self-cleaning of the contact surface of the valve group and ensuring that the metering pump is relatively stable. It has high measurement accuracy over a long period of time.

Both the suction and discharge valves are detachable, and the various zeros of the valve group. The parts are easy to disassemble, clean and replace.

Typical schematic diagram of plunger liquid end



3.2.2 Working Principle

The plunger reciprocates in the pump cavity, and under the action of the one-way check valve group, the liquid is sucked and discharged cyclically. When the pump is in the suction stroke, the plunger moves backwards, and a certain negative pressure is generated in the pump cavity. At this time, the outlet check valve is closed, the suction check valve is opened, and the liquid enters the cavity; in the discharge stroke, the plunger moves forward, the pressure in the pump chamber gradually rises, so that the inlet one-way valve is closed and the outlet one-way valve is opened to discharge the liquid. In each suction stroke, the discharge valve is in place (closed), and in each discharge stroke, the suction valve is in place (closed). This working principle prevents backflow

and ensures that the liquid is discharged from the suction side through the pump chamber to discharge side. Only when the discharge pressure is greater than the suction pressure, accurate flow control can be obtained.

3.3 Hydraulic Diaphragm Type Liquid End Structure and Principle

3.3.1 Liquid End Structure

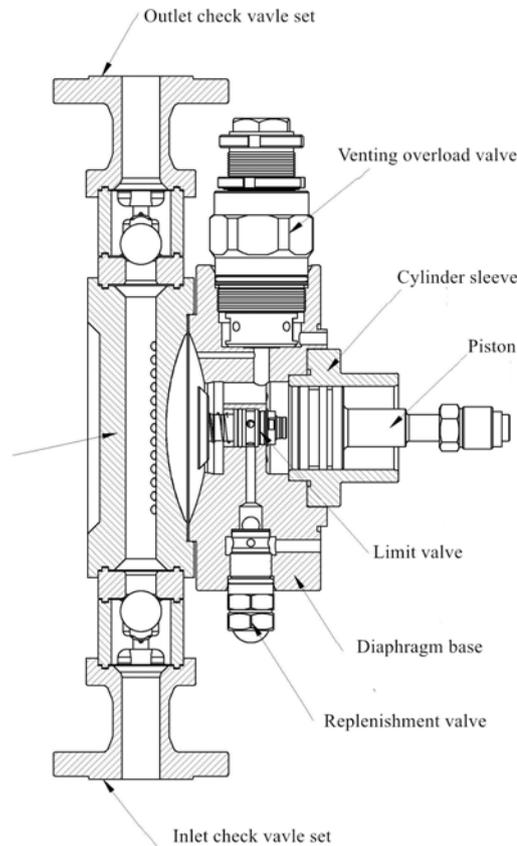
The hydraulic end is one of the important components of the metering pump. Its structure consists of a plunger, a cylinder liner, a pump head, a diaphragm base, an inlet and outlet check valve, a diaphragm, and a hydraulic three-valve (overload valve, limit valve, replenishment valve). Valve) composition; the diaphragm is used to separate the conveying medium from the hydraulic oil, so the hydraulic diaphragm metering pump has the advantage of leaking.

Sandwich diaphragm with diaphragm detection: Two diaphragms superimposed on each other separate the working chamber from the hydraulic chamber. The two diaphragms are mechanically connected together by the diaphragm holder on the one hand, and hydraulically connected together by the injected intermediate hydraulic oil on the other hand. Once one of the two diaphragms ruptures, the metering medium or hydraulic oil will enter between the diaphragms. In the subsequent discharge stroke, the liquid entering between the membrane will enter the external pressure gauge and the sensor connection, the pressure will change to contact the sensor and trigger an alarm to stop the metering pump, effectively protecting the safety of use.

The venting overload valve has two functions. One is venting, which can automatically remove the gas generated in the hydraulic chamber to ensure stable work; the second is overload protection: it is responsible for emergencies (overpressure) in the hydraulic chamber, such as pipeline and nozzle blockage , The super high pressure state caused by the misoperation of the valve is automatically released to protect the safety of the diaphragm and other parts.

The limit valve and the oil supplement valve constitute the limit compensation device, which is driven by the hydraulic diaphragm to open the limit valve, and the oil volume is refilled at any time according to the vacuum degree in the hydraulic cavity to ensure the balance of the hydraulic oil in the hydraulic cavity.

Typical Schematic Diagram of Hydraulic Diaphragm Liquid End



3.3.2 Working Principle

The hydraulic diaphragm metering pump is driven by the driving device to drive the piston to reciprocate in the pump cavity. When the pressure of the hydraulic oil changes, the diaphragm is flexed and displaced, and the medium is alternately sucked and discharged from the pump cavity. During the pump suction stroke (rearward), the piston generates a certain negative pressure in the pump cavity. The suction liquid pressure causes the suction port check valve to automatically open, and the liquid flows into the pump cavity. When the plunger runs to the rear dead point, it stops forward. When the point starts, the inlet one-way valve is automatically closed; during the discharge stroke, the plunger moves forward, so that the liquid is gradually pressurized, and the outlet one-way valve automatically opens to discharge the liquid under the action of the pressure. In each suction stroke, the outlet check valve is closed, and in each discharge stroke, the inlet check valve is closed. The relatively stable amount of hydraulic oil in the hydraulic chamber is maintained by the function of the three valves.

4 Technical characteristics

4.1 Plunger Metering Pump Has the Following Remarkable Characteristics

1. The structure is simple, the maintenance is convenient.
2. The pump uses a wide range of discharge pressure, and it should be made into a high-pressure pump with a pressure up to 50MPa.
3. The sealing group is a packing seal, and there is leakage. The pre-tightening force of the packing needs to be adjusted periodically. The packing and the plunger are a pair of wearing parts.
4. The flow rate is within the range of 30% to 100%, and the measurement accuracy can reach within $\pm 1\%$.
5. It is necessary to install a safety valve on the outlet pipe of the pump.
6. Plunger metering pumps can adjust the flow rate by adjusting the stroke length; equipped with variable frequency motors, frequency converters can change the motor Frequency to control the flow, and remote control can be achieved.

1. It can be made into various types of heat preservation pump heads (steam, hot water, electric heating and other pump heads), and can be made into multiple sets in series.

For adding different media and materials with different flow rates and pressures.

4.2 The Hydraulic Diaphragm Metering Pump Has the Following Remarkable Characteristics

1. The hydraulic diaphragm metering pump has no dynamic seal, no leakage, low noise, and easy maintenance.
2. The working pressure of the pump can reach 70MPa, and the measurement accuracy can reach $\pm 1\%$.
3. The metering accuracy is better than the mechanical diaphragm pump, and the sealing performance is better than the plunger pump.
4. The operating temperature of the medium should not exceed 120°C, and should not be lower than -20°C, otherwise the service life of the diaphragm will be affected.
5. The advanced three-valve mechanism of overload, limit and oil supplement is used to ensure the satisfaction of hydraulic oil in the hydraulic chamber, avoid excessive oil supplement and

prevent hydraulic shock, so as to balance the forces on both sides of the diaphragm and increase the service life of the diaphragm. The life of the diaphragm can be increased to more than 8000h.

6. When transporting special media, a double diaphragm with diaphragm rupture alarm device can be used to prevent accidents caused by the mixing of the medium and hydraulic oil when the diaphragm ruptures.

7. It can transport flammable, explosive, highly toxic, foul-smelling, and corrosive materials.

8. There is no safety relief device, it is recommended to install a safety valve on the outlet pipeline of the pump.

9. The pump can adjust the flow rate by adjusting the stroke length; equipped with a variable frequency motor and a frequency converter to change the motor frequency to control the flow rate, remote control can be achieved.

10. It can be made into multiple units in series to add different media and different flow rates and pressures

5 Installation

The standard metering pump design is expected to be installed in a dry room without corrosive gas. Other environmental conditions (such as installed outdoors, drilling platforms, dairy factories, etc.), are only allowed to be used when they are specifically designed for this special purpose (such as drives with appropriate protection or special anti-corrosion measures).

Install the pump horizontally (use gaskets if necessary) on a solid, vibration-free concrete 300-500mm higher than the ground level to prevent flooding during washing. At the same time, the layout of the foundation should be easy for drain plugs and fill valves. The removal, installation and adjustment of the pumps should correspond to the holes of the anchor bolts, and the multiple pumps should be based on the coupling between the pumps as a leveling reference to prevent misalignment of the axes between the series pumps.

5.1 Pipeline Installation

5.1.1 General Rule

1. When selecting piping materials, attention should be paid to prevent chemical corrosion of the sealing gasket at the hydraulic end connection of the pump.

2. Choose a pipe with sufficient wall thickness to withstand the maximum pressure.
3. The size of the pipe diameter should be adapted to the peak instantaneous flow of the pump, which is 3.14 times the average flow of the pump.
4. In order to reduce the flow energy loss of the viscous liquid, the diameter of the viscous liquid pipeline should be larger than the diameter of the pump inlet and outlet.
5. Remove burrs, sharp edges and scum in the pipeline. Clean the pipeline before the final connection between the pump and the pipeline to ensure that there is no debris in the pipeline.
6. There must be no tension or pressure in the connection between the suction and discharge pipes and the hydraulic end.
7. When installing the pump and connecting the pipeline, do not twist the pipe or forcibly twist the connecting flange.
8. When transporting hot fluid, expansion joints should be used, and the pipeline should be supported to avoid excessive load on the pump.
9. When transporting fluids containing suspended solids, avoid the "U"-shaped vertical pipeline arrangement to prevent the media from settling and clogging, and install a four-way plug with a cock at the 90-degree pipeline bend so that the pipeline does not need to be dismantled. Perform line flushing.
10. The connection of the pipeline should be easy to handle the operation of the valve (removal, installation and adjustment), and easy to remove the hydraulic end of the diaphragm pump to replace the diaphragm.

5.1.2 Outdoor Installation

1. When the ambient temperature exceeds 35°C outdoors, the continuous operation of the pump will cause the oil temperature to be too high, which will affect the lubrication effect of the parts in the pump. Correct installation method: add a sunshade above the pump, remove debris around the pump, and open both sides to ensure good air circulation around the pump, thereby effectively cooling the temperature.
2. When the pump is placed in the ambient temperature below 0°C, the pump is not allowed to start frequently. A detachable electric heater with an insulating shell should be installed on the pump and the installation base to keep the pump oil temperature above 0°C.

5.1.3 Suction Pipeline

1. The suction pipeline should preferably be arranged in priming manner, so that no gas remains in the pump cavity during the suction process and ensure the metering accuracy of the pump, especially for the suction pipeline that transports high-viscosity and liquefied gas media.

2. A filter should be used on the suction pipeline to prevent foreign particles from entering the liquid cavity, prevent fouling and blockage in the suction and discharge valves, and increase the maintenance-free use time. The filter should be checked regularly to prevent blockage and damage to the metering pump.
3. Make the suction pipe as short and straight as possible, and prohibit the "Ω"-shaped arrangement to prevent air storage at the top from affecting the normal delivery of the pump.
4. The suction pipe should be absolutely sealed to ensure the metering accuracy of the pump. Compressed air and soapy water can be used to check the tightness of the suction pipe.

5.1.4 Discharge Pipeline

1. The discharge pipe diameter of the pump should meet the principle of "larger than or equal to the standard outlet pipe diameter of the pump" to reduce the pressure loss of the pump during the discharge stroke. The maximum pressure of the fluid in the discharge pipeline should not be greater than the rated pressure on the pump nameplate.
2. The pump can effectively control the output flow only when the discharge line pressure is greater than the suction line pressure. A back pressure valve can be used to increase the positive pressure difference.

5.1.5 Configuration of a Typical Pipe System

In order to ensure the normal delivery and metering accuracy of the metering pump, protect the safety of the pipeline, and facilitate equipment maintenance, it is recommended to configure the following valves and instruments in the suction and discharge pipelines. The typical pipelines are shown in the figure:

Various commonly used piping accessories are introduced as follows:

※ **Pulsation damper**

The pulse is instantly absorbed to obtain a stable flow and pressure, which can smooth 90-95% of the pulse and reduce the vibration and noise of the pipeline. The pulsation damper and the back pressure valve are used at the same time to improve the effect of the rapid opening/closing of the back pressure valve and reduce the wear of the valve.

※ **Back pressure valve**

If the pressure difference between the suction side and the discharge side is insufficient, we recommend using a back pressure valve. This prevents the flow through the hydraulic end from being uncontrollable.

☆☆ **Back pressure valve is not suitable for use as globe valve**

※ **Pipeline safety valve**

In order to prevent damage to the pump, pipeline or other equipment due to the blockage of the discharge pipeline, a safety valve should be installed on the discharge pipeline of the pump to maximize the safety and reliability of the system. The safety valve on the discharge line should be installed between the pump and the nearest shut-off valve (to prevent damage to the pump when the valve is accidentally closed). The outlet of the pipeline safety valve must be connected back to the storage tank or other auxiliary liquid storage tank, and ensure that the operator can observe the relief of the safety valve. The opening (take-off) pressure of the pipeline safety valve is specified in the following table:

Unit: Mpa

Rated Discharge Pressure P_{dr}	0.2~5.0	>5.0~20	>20~50
Safety Valve Opening Pressure P_k	1.2 P_{dr}	1.15 P_{dr} , and not less than 6 MPa	1.1 P_{dr} , and not less than 23 MPa

※ **Check valve**

When the discharge pressure of the system is high, a check valve should be installed. This valve will prevent backflow of liquid in the discharge line and isolate the discharge end of the pump from the system pressure.

※ **Shut-off valve**

Set shut-off valves on the suction pipe and discharge pipe of the pump near the pump to facilitate the maintenance of the pump and the pipe.

※ **Filter**

It is used to filter impurities or large particles in the conveying medium to prevent foreign particles from being brought into the liquid cavity to ensure the normal operation of the metering pump. The filter is installed on the inlet pipeline of the pump, and its flow diameter should be larger than the inlet diameter of the pump to avoid cavitation or leakage at the inlet. Commonly used are Y-type filters and basket-type filters.

※ **Pressure gauge**

Used to detect the operating pressure of the pump discharge line. A shut-off valve should be installed at the inlet of the pressure gauge to adjust the flow into the pressure gauge to prevent damage to the pressure gauge due to pulsation and impact. It is recommended to use shock-proof pressure gauges and corrosion-resistant pressure gauges.

5.2 Electrical

1. Before wiring, first check the nameplate on the pump drive motor and confirm that the electrical characteristics of the power supply match it.

2. In hazardous areas, the metering pump must be grounded.
3. The complete installation must be equipped with an "emergency shutdown" switch by the user, and the staff should easily and quickly approach the switch from the work site.
4. After ensuring that the power supply parameters match the pump motor nameplate parameters, perform wiring according to the motor wiring diagram (possibly in the junction box) and the operation manual.
5. Check the rotation direction mark on the pump or motor. From the rear of the motor (fan end), the motor turns in a clockwise direction.

Warning: Reverse rotation of the motor will damage the pump or fail to work normally.

6 Start

6.1 Check the Fastener

The pump shall be checked for all fasteners before startup. Fasteners include pump head mounting bolts, motor connection bolts, and connections fixing the pump to the foundation to check for loosening.

6.2 Oil Filling

To ensure transportation before leaving the factory, the lubricating oil in the pump body is drained, and lubricating oil must be added to the case before the first start (refer to section "8.1" for specific operations).

6.3 Flow Adjustment

The metering pump is equipped with a manual adjustment handwheel, which can be adjusted arbitrarily within 0-100%. This value represents the percentage value of the flow rate (relative to the percentage of the rated flow rate, and is subject to the actual measured flow rate). When calibration for the first time, it is recommended to measure the corresponding flow value according to the scale value on the adjustment handwheel, and draw the flow curve graph as the standard value when adjusting the flow.

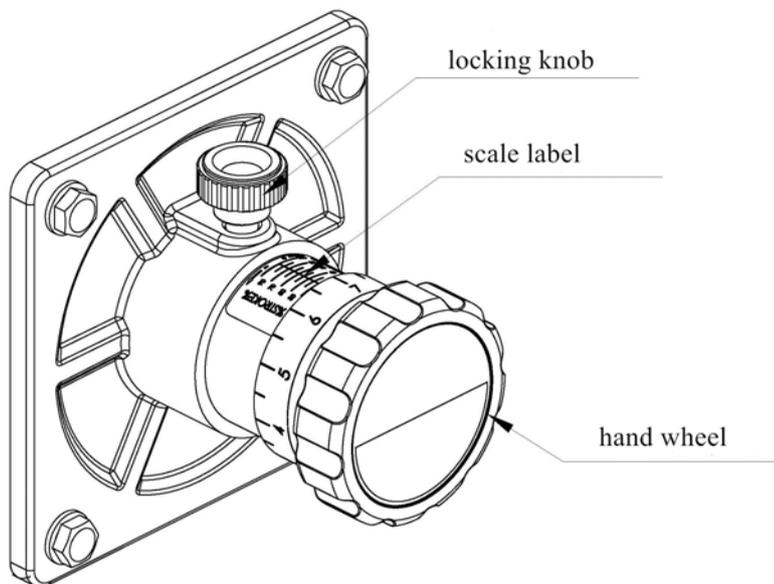
1. Only after loosening the "locking knob" can the "adjusting hand wheel" be rotated, otherwise the mechanical device may be damaged.

2. Rotate the "adjustment handwheel" to achieve the purpose of adjusting the flow rate. For example: To set the pump flow rate to 60% (the default value is 0%). Turn the handwheel clockwise until the flow scale value reaches 60%, which is 60% of the rated flow. 0-9 on the handwheel is one week, which corresponds to 10% of the rated flow value on the scale label.

3. After the flow rate is adjusted, the "locking knob" should be tightened to avoid automatic displacement.

☆☆ **Flow adjustment can be performed during pump operation and stop.**

Schematic of typical adjustment device



6.4 Pump Head Priming

If the pump is installed at a high position and cannot self-prime, it is necessary to prime the inlet end of the pump:

- Make sure that the system and piping have been installed correctly;
- Install a bottom valve at the bottom of the inlet end;
- Before filling, make sure that the stop valve at the inlet of the pump has been opened;
- Install a bypass pipe at the inlet of the pump to facilitate filling;
- Ensure that the filled liquid is compatible with the liquid delivered by the pump.

6.5 Calibration

Flow adjustment can be achieved by changing the stroke length or by changing the reciprocating frequency of the variable speed drive.

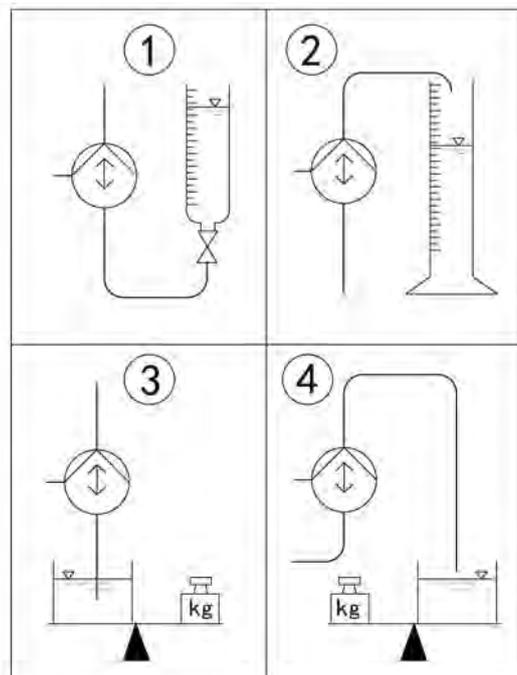
The effective metering flow rate depends on the discharge pressure.

If you need to know the precise relationship between metering flow and stroke. It is best to calibrate the metering pump under operating conditions. For this reason, it is necessary to measure the metering flow under different stroke length settings.

4 ways to determine volume or weight:

1. Dropper method suction end volume measurement
2. Measuring the discharge volume by the measuring cylinder method
3. Measurement of weight loss in inhalation container
4. Measurement of weight gain of discharge container

Please select a suitable measurement method. In order to obtain sufficient accuracy, it is recommended to measure the displacement of no less than 100 strokes. The metering pump can also be calibrated through a flow meter.



6.6 Plunger Type Plunger and Packing Seal Adjustment

Before the pump runs, pay attention to the following points for the plunger and packing seal:

1. This series of pumps adopts combined packing seal, which has good sealing performance, and can achieve the ideal sealing effect without too much pre-tightening force (the pump will loosen the packing compression nut appropriately after the factory test to prevent permanent failure). Check the packing compression nut before run with a wrench to properly tighten the compression nut of the packing seal group (about 0.5-1kgf is sufficient).

2. When the equipment runs for the first time, the system pressure must be adjusted to increase the output pressure of the pump to 30-50% of the rated pressure, so that the packing will automatically adjust the sealing surface under the action of this pressure, and run for about 15-30 minutes. If a large leak is found at the packing seal during operation, the nut must be tightened again (about 1/6 turn) until the leakage is reduced. Do not tighten it too hard, otherwise it will greatly reduce packing seal life, even scrapped.

3. If the packing seal temperature is found too high during use, it may be caused by excessive force. The packing compression nut must be properly loosened to prevent damage to the packing seal.

4. Generally, 3-5 drops per minute are allowed at the sealing compression nut. The leaked liquid can help cool and lubricate the packing seal and the plunger, which can greatly extend the service life. The leaked liquid can be connected to the storage tank or sewage outlet.

The first 24 hours of the first operation are critical to the life of the packing seal. If the packing seal is too tight, it will quickly heat up and fail; If the packing seal is too loose, it will cause excessive leakage. Proper packing pre-tightening can ensure that the sealing lip of the packing exerts a good sealing effect.

6.7 Hydraulic Diaphragm Type Hydraulic End Overload Valve Opening Pressure Adjustment

The overload valve on the hydraulic end has been set according to the requirements when leaving the factory, and it does not need to be adjusted under normal circumstances. If it is necessary to adjust after maintenance or other conditions, press 1.1 times to 1.25 times of the rated pressure of the pump, and at least 0.5 MPa greater than the rated pressure.

7 Troubleshooting

Trouble	Cause	Solution
pump could not start	Power failure	Check the power supply
	The fuse is burned and the circuit interrupted	Eliminate overload-replace the fuse
	Wire disconnected	Find the disconnected location and process it
	Error wiring	View the wiring diagram
	The pipe is blocked	Open the valve and clean the blockage
No flow rate	The motor does not run	Check the power supply for correct wiring
	The supply tank is empty	Filling the medium
	The pipe is blocked	Clean and rinse
	The pipe valve is closed	Open the valve
	The spherical check valve is blocked with particles	Clean and check, and rinse with a clean liquid
	Vaporization	Increase the suction mouth pressure and reduce the suction range
	There was a problem with priming	Priming, leak check
	Filter block	Remove and clean, replace filter screen (if required)
	Adjustment is set to zero	Increase the length settings
Low flow	The motor speed is too low	Check the current voltage frequency and check the nameplate
	The check valve is worn or severe dirt	Clean, and must be replaced if damaged
	Error calibration	Assvaluand recalibrated
	The medium viscosity is too high	Increase material temperature, dilution to reduce material viscosity, increase pipe caliber
	Media steam etching	Increase the suction port pressure, reduce the suction height, and install the bottom valve
Flow gradually declined	Stop valve leakage	Clean, replace if damage
	Inhalation pipe leakage	Find the location of the leak and fix it
	Filter stoppage	Clean and replace the filter screen
	Media change	Verify the material viscosity and other material
	The supply tank vent was plugged in	Open the ventilation hole

Trouble	Cause	Solution
The flow is unstable	Suction pipe leakage	Find out the location of the leak and process it
	Liquid cavitation	Increase inlet pressure
	Medium with compressed air or gas	Consult the manufacturer for the exhaust method
	Motor speed is unstable	Check the voltage and frequency
	The stop valve is blocked	Clean it up and replace it if damaged
Flow is higher than the rated value	The inlet pressure is higher than the outlet pressure	Install the back pressure valve or consult the factory for pipe laying
	Back pressure valve is set up too low	Increase the setting pressure
	The back pressure valve leaks	Repair it, clean it, or replace it
Pump operation noise and vibration	Outlet pressure is too high	Reduce export pressure
	Water hammer	Install the pulse damper
	The length is set in the middle position	Certain operating noise is characteristic of inactive metering pumps
	The oil volume is low	Add or replace the lubricating oil
Pipe noise	The pipe size is too small	Increase the pipe size and install the pulse damper
	The pipeline is too long	Install a pulse damper in the pipe and secure the pipe
	The pulse damper did not act or showed an overflow	Charge air, check and replace diaphragm and inflate
	Adjustment room or damper is not used	Install the pulse damper
The motor overheated	Pump overload	Verify the pump technical parameters
	Voltage is too high or too low	Check the power supply
	The wiring is loose	Find out where it is loose and fix it

8 Maintenance

Before disassembling the pump head or valve (liquid end) for maintenance, please ensure that the piping system has been depressurized, especially in working conditions that are corrosive, flammable and explosive, etc., and must be properly cleaned to protect people And the environment is safe, wear protective clothing and use protective equipment when necessary.

The accurate record of the early operation of the pump will reflect the basis of the parts that the pump needs to maintain under the corresponding working conditions. The maintenance plan based on this record can reduce the incidence of operating failures. The service life of the liquid end (such as diaphragm and one-way valve) is difficult to estimate, because different working conditions and different media have different service lives of materials, so each metering pump must be considered according to its specific working conditions.

In addition to the daily maintenance requirements, the recommended spare parts for the pump are as follows:

1. The plunger type includes plunger, packing seal, check valve components, etc.
2. The hydraulic diaphragm type includes piston, cylinder sleeve, diaphragm, piston ring, check valve assembly and so on.

8.1 Lubrication

The pump has been completely lubricated before leaving the factory, but the oil must be added to the middle line of the oil mark or slightly higher before the first start-up, otherwise the transmission components will be damaged.

The first oil change is 300-500 hours. In order to achieve the best performance of the pump under normal conditions, the lubricating oil should be changed every 1500 hours (220# worm gear oil or 150# industrial gear oil is recommended). When operating under extreme temperature or dusty environment, the time interval should be shortened. Also check the oil level in the tank regularly and irregularly, and add oil of the same brand and model when necessary.

The hydraulic diaphragm oil pool needs to be filled with hydraulic oil: L-HM22 (commonly environment); L-HV22 (-5° to 25° environment);

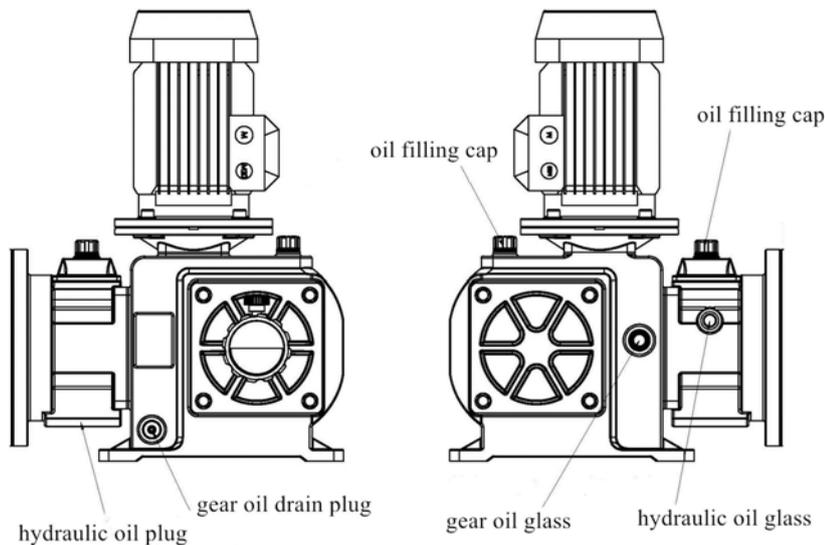
※ Lubricating oil contaminated by chemical substances will cause excessive wear, corrosion and seal leakage.

Operation steps for filling or replacing oil products are as follows:

1. Disconnect the power supply of the drive motor and release all the pressure in the pipeline system;
2. Unscrew the oil drain plug (pay attention to whether the sealing ring is damaged, replace if necessary), drain off the lubricating oil (or hydraulic oil) in the tank, and clean it. Clean the dead corners in the washing box to ensure that it is clean and free of debris, and screw the plug of the oil port;
3. Unscrew the lubricating and venting screw plug, and add new lubricating oil (or hydraulic oil) to reach the calibrated oil level;
4. Re-tighten the lubricating and venting plugs.

※ Pay attention to the risk of scalding when draining the hot lubricating oil and changing the oil!

※ When discharging and disposing of waste lubricating oil, pay attention to protecting the environment.



8.2 Liquid End Disassembly, Inspection and Reinstallation

8.2.1 Plunger Type Liquid End (refer to "15.1")

When the packing seal fails, the medium will be discharged from the bottom, but it may also cause damage to the pump casing, please be careful when repairing and maintaining it.

Impurities and debris accumulations near the packing seal will shorten the service life of the packing seal and eventually cause system failure; system overpressure or chemical corrosion can also cause failure. Therefore, it is recommended that the user check and clean the packing seal and the pump cavity regularly. If the packing seal is found to be abnormal, it must be replaced in time.

1. Stop the pump and release the system pressure, drain the medium in the pump head, and disconnect it from the source of the medium;
2. Separate the inlet and outlet valves from the system;
3. Open the connection cover of the pump head and remove the plunger lock nut on the plunger and connecting rod joint;
4. Remove the bolts on the pressure plate of the pump head, leaving only one bolt on the top of the pump head (when the bolts are loosened, the residual medium will leak from the pump head and cause injury, pay attention to safety);
5. The remaining bolt can be removed only when lifting or holding the pump head;
6. Pull out the plunger, remove the packing seal press cap, packing seal, support ring, etc. from the pump head in order to clean the pump head;
7. Carefully check the wear of the plunger and packing seal, and replace if necessary;
8. Reinstall after replacing the plunger or packing seal, and reinstall all parts in the reverse order of disassembly;
9. Remove the connecting bolts of the pump head connection and the box body, and remove the pump head connection seat, oil seal pressure plate, oil seal, etc. in turn;
10. Install the bolts of the pump head and tighten them alternately to ensure uniform force;
11. After confirming that the assembly is correct, connect the pipeline and start the metering pump;
12. Check the operation of the pump. If the packing seal needs preload adjustment, please refer to "Section 6.6" of this manual for operation.

8.2.2 Hydraulic diaphragm pump liquid end (refer to "section 15.2")

1. Stop the pump and release the system pressure, drain the medium in the pump head, and disconnect it from the source of the medium;
2. Separate the inlet and outlet valves from the system;
3. Open the hydraulic oil tank cover, remove the oil drain plug at the bottom of the tank, and drain the hydraulic oil;

4. Remove the plunger and cap on the plunger and connecting rod joint;
5. Remove the bolt connecting the diaphragm base and the oil chamber, and slowly separate the liquid end assembly from the oil chamber;
6. Remove the piston, cylinder liner, exhaust overload valve assembly and make-up valve assembly in turn;
7. Remove the bolts connecting the pump head and the diaphragm base, and remove the spacers to clean all sealing surfaces (note: the spacers are vulnerable parts and must be regularly inspected and replaced);
8. Remove the limit valve assembly;
9. Remove the connecting bolts between the hydraulic oil chamber and the gear box, and remove the oil chamber, oil seal pressure plate, oil seal, etc. in turn;
10. Arrange all the disassembled parts in order, and check the wear of all parts, especially vulnerable parts (such as plungers, diaphragms, O-rings, oil seals, etc.) to be replaced when necessary;
11. Assemble according to the order of disassembly, the reverse order of assembly can be reversed.

8.3 Check Valve

8.3.1 Summary

The metering accuracy of metering pumps is mainly related to the check valve, and the problems are usually caused by the accumulation of particles between the valve cover and the valve seat, corrosion, wear of the valve seat surface, or damage caused by foreign impurities.

Check valve is mainly composed of valve ball, valve seat, valve cover, and valve body. When the pump is working, under the action of the negative pressure in the pump cavity, the medium lifts the valve ball from the valve seat, so that the liquid flows through the valve body and enters the pump cavity. On the contrary, under the action of the positive pressure in the pump chamber, the liquid presses the valve ball back to its original position, and the sharp edge of the valve ball and the valve seat serves as a seal. In order to reduce "backflow" or reverse flow, the valve ball moves vertically in the valve cover and rotates irregularly during operation, which also makes the surface of the valve ball wear evenly, thereby increasing the service life. Since the ball reset relies on gravity, the

check valve must be in a vertical position to operate normally. These parts are generally sealed with PTFE gaskets.

8.3.2 Check valve disassembly and reinstallation (refer to "Section 12")

The check valve is a cartridge design, so it can be replaced as a component

1. Disconnect power to the motor.
2. Relieve pipeline pressure.
3. Take necessary measures to prevent hazardous media from causing harm to the environment and humans.
4. Close the inlet and outlet shut-off valves.
5. Remove the pipe joint connected to the suction end.
6. Loosen and disassemble the inlet check valve assembly to drain the liquid in the pump cavity; and place the valve parts in the correct order.
7. Remove the discharge pipe joint connected to the discharge end.
8. Loosen and disassemble the outlet check valve assembly, drain the remaining liquid, and place the valve parts in the correct order.
9. Carefully clean and remove the deposits in the valve, check the degree of wear of the valve ball, valve core, valve seat, and gasket; correct or replace if necessary.
10. Reinstall the check valve assembly (reversely put it back in the reverse order of the position when it was disassembled).
11. Reconnect to the piping system.

8.4 Liquid End Disassembly and Reassembly (refer to "14")

8.4.1 Drive Adjustment Part

1. Remove some small accessory parts, such as locking knob, scale panel, etc., and drain the lubricating oil in the box;
2. Unscrew the locking screw on the adjusting seat;
3. Remove the adjusting handwheel;
4. Loosen the adjusting seat and separate the adjusting seat from the box body;
5. Loosen the locking screw on the eccentric seat, and use two hexagon socket screws to push out the eccentric seat in parallel;
6. Take out the adjustment and drive components (including connecting rod components);

7. Disassemble the connecting rod assembly and check the wear of each part;
8. Take out the cylindrical pin on the eccentric wheel and separate the eccentric wheel;
9. Take out the adjustment assembly, loosen the lock nut, pull out the adjustment screw, and disassemble each part on the adjustment screw;
10. Disassemble the bearing, worm gear, and main shaft;
11. Clean and check the wear of the sliding block, eccentric wheel, worm gear, connecting rod and other parts, and replace if necessary;
12. Assemble, just install it in the reverse order of disassembly.

8.4.2 Transmission Mechanism Part

1. Cut off the power supply and remove the motor and motor base;
2. If there is a coupling, pull out the coupling first, and check whether the elastic element is damaged, and replace it if it is damaged;
3. Remove the bearing housing or bearing cover, and take out the worm.
4. Clean and check the wear of the worm and bearing, and replace if necessary;
5. Assemble, just install it back in the reverse order of disassembly.

9 Hydraulic Double Diaphragm Metering Pump

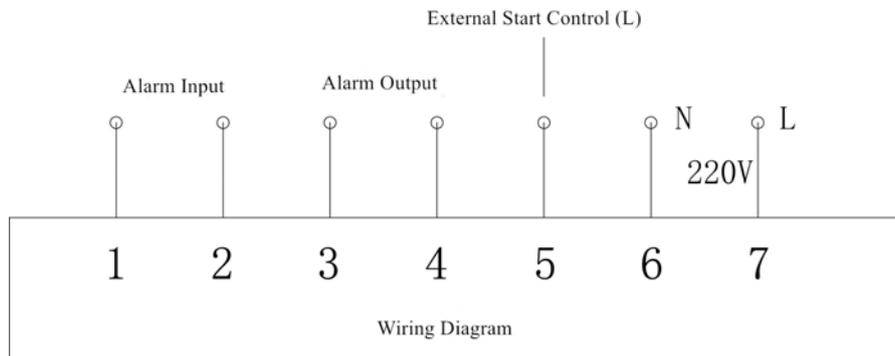
9.1 Performance overview

Hydraulic double-diaphragm metering pump diaphragm rupture alarm device is mainly used in toxic liquids, explosive dangerous liquids, food safety, sanitation and other environments; Its characteristic is that it can detect the diaphragm working condition of the metering pump in use at any time, once the diaphragm ruptures , It can send out sound and light alarm and stop the metering pump within 0.2~2S; (according to the user's use characteristics, it can be connected to the centralized control room), which effectively protects the safety of use.

9.2 Operation Manual

1. Refer to ordinary hydraulic diaphragm metering pump for installation.

2. The power supply of the alarm box is AC 220V connected to the designated positions of terminals 6 and 7 (the wiring diagram below); the external start terminal 5 should be connected to the start button in the control box.



3. Refer to ordinary hydraulic diaphragm metering pump for startup and commissioning.

4. The operating specifications for replacing the diaphragm after the diaphragm ruptures:

- ① Once the diaphragm is broken, the alarm will make sound and light alarm, and the metering pump will automatically stop working at the same time, waiting for processing;
- ② Press the reset button on the alarm box to stop the alarm from alarming;
- ③ Close the valve and release the pressure in accordance with the safe operation procedure of the metering pump maintenance, and disassemble it after confirming the safety;
- ④ Remove the pump head → take out the diaphragm → intermediate sheet → diaphragm in order, carefully clean and check the pump cavity and intermediate sheet for damage, and replace if damaged;
- ⑤ Assembly: first loosen the vent knob under the sensor; then reverse the assembly in the order of removal (note that the diaphragm has a small hole on the side of the first diaphragm), then install it in the reverse order, and tighten the pump head bolts;

5. After the assembly is completed, start according to the normal start-up operation of the metering pump. At this time, it will take about a few minutes for the metering pump to automatically adjust the oil replenishment and exhaust. When the liquid is discharged and the pressure reaches normal, turn off and tighten the vent knob under the sensor.

10 Storage

10.1 Short-term Storage

The storage of the pump under 6 months is short-term storage, and the following short-term storage precautions should be noted:

※ Store in a normal greenhouse in a dry and ventilated environment, and must not be stored for a long time in a humid environment;

※ Preventive measures can be taken to isolate from the outside world, such as: adding an isolation protective film to the original packaging;

10.2 Long Term Storage

In addition to observing the above short-term storage precautions, the motor should be energized every 12 months and the pump should run for at least one hour (lubricating oil must be added before operation). When performing this operation, there must be liquid (such as water) in the pump head to prevent dry grinding of the filler.

If the pump is stored for more than 12 months, the above-mentioned susceptible to aging and damp components must be inspected and replaced before starting the equipment. The cost of such replacement shall be borne by the purchaser.

11 Open Box Check

After the equipment arrives, the unpacking inspection must be done carefully:

※ Check whether the outer packaging is damaged. If there is abnormal damage, stop unpacking and contact the carrier immediately;

※ After unpacking, check all parts of the equipment for rust and damage. If there is any damage, you must contact our company immediately;

※ Compare with the packing list, check whether the inventory of parts, accessories, spare parts, manuals, etc. are complete;

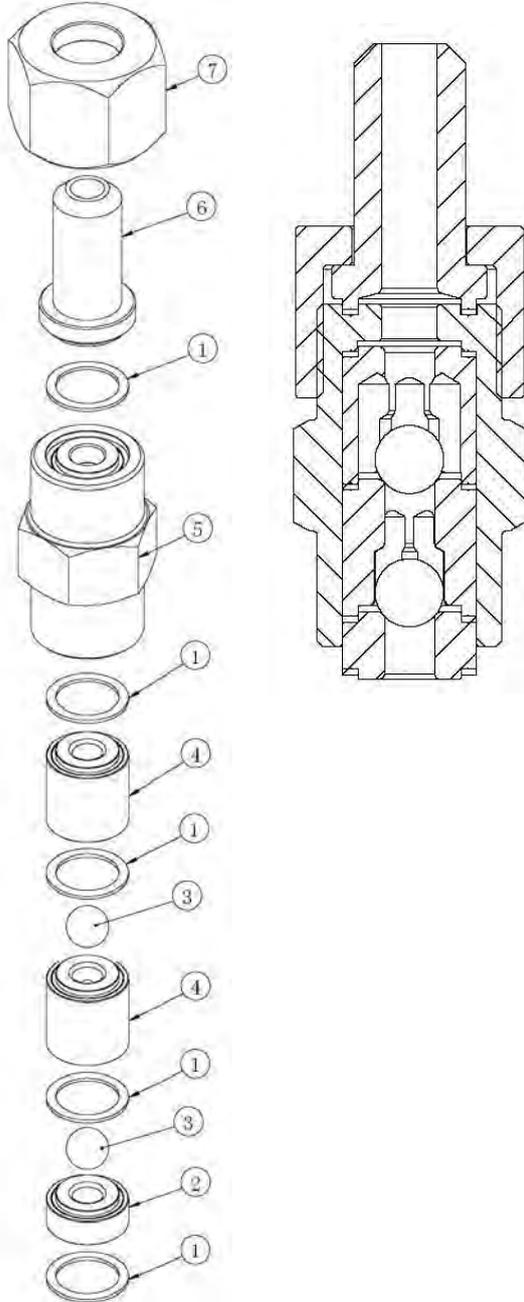
※ The spare parts that do not need to be installed should be properly packed and stored, and transferred collectively to prevent loss;

※ If there are missing accessories or spare parts, please report to the sales representative or distributor immediately.

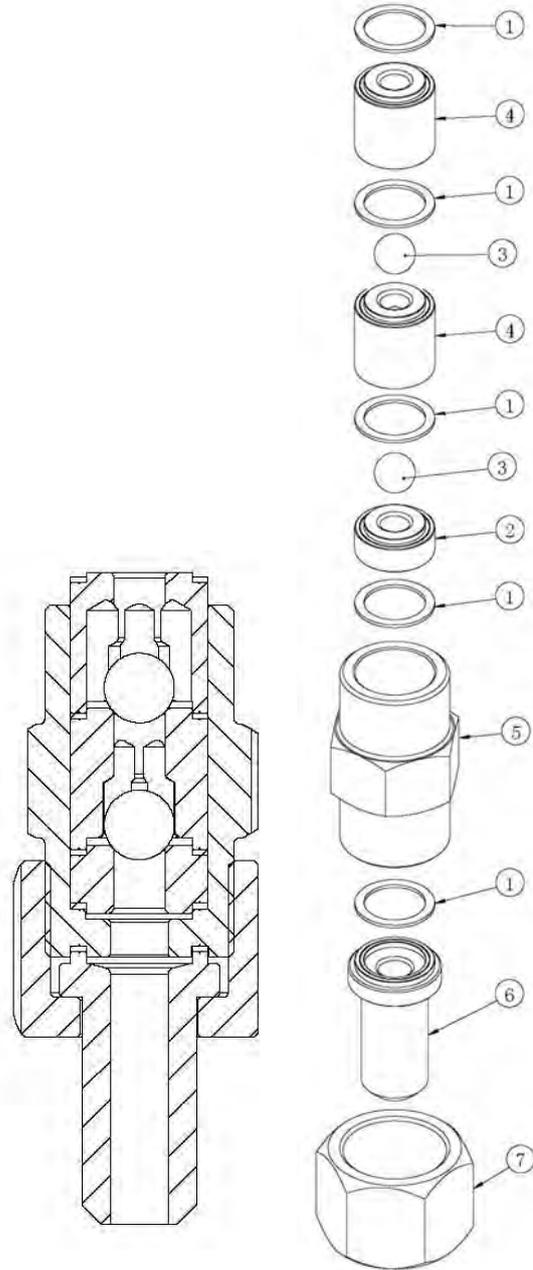
12 Check Valve Assembly

12.1 Double-Ball Thread Valve Assembly (DN6PN700, DN10PN700)

Discharge Valve



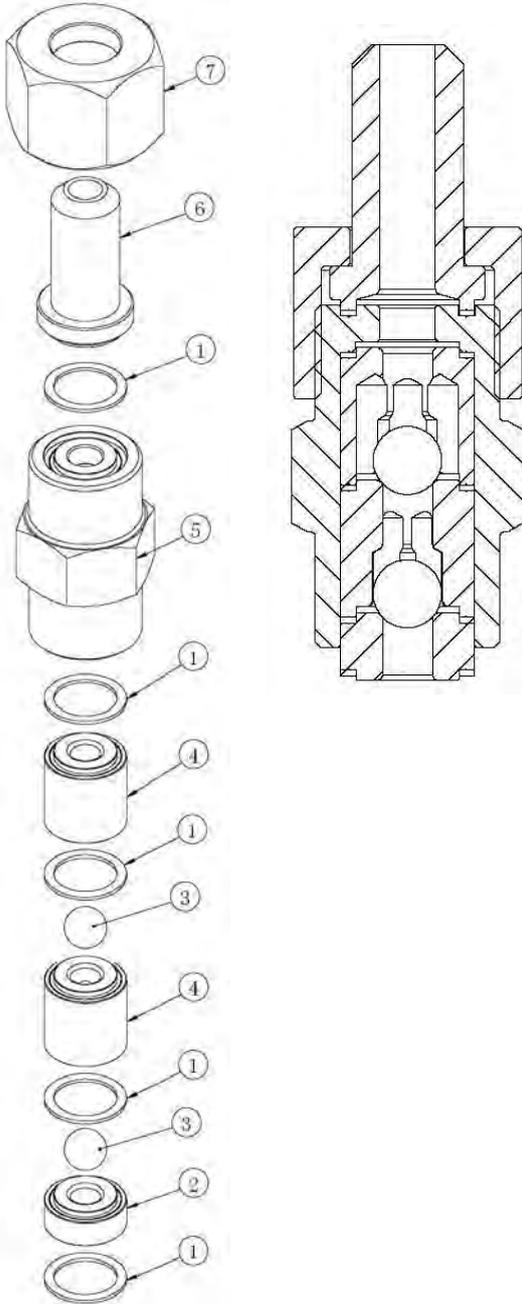
Suction Valve



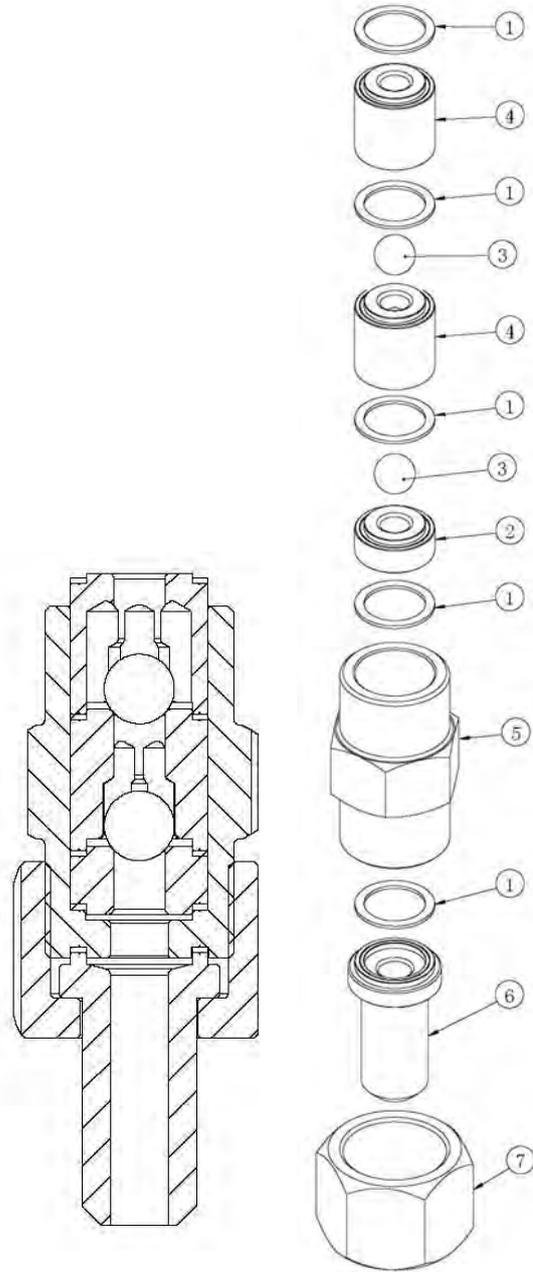
No.	1	2	3	4	5	6	7
Name	Spacer	Valve seat	Valve ball	Valve cover	Valve body	Union	Union cap

12.2 Single Ball Thread Valve Assembly (DN15PN110)

Discharge Valve



Suction Valve

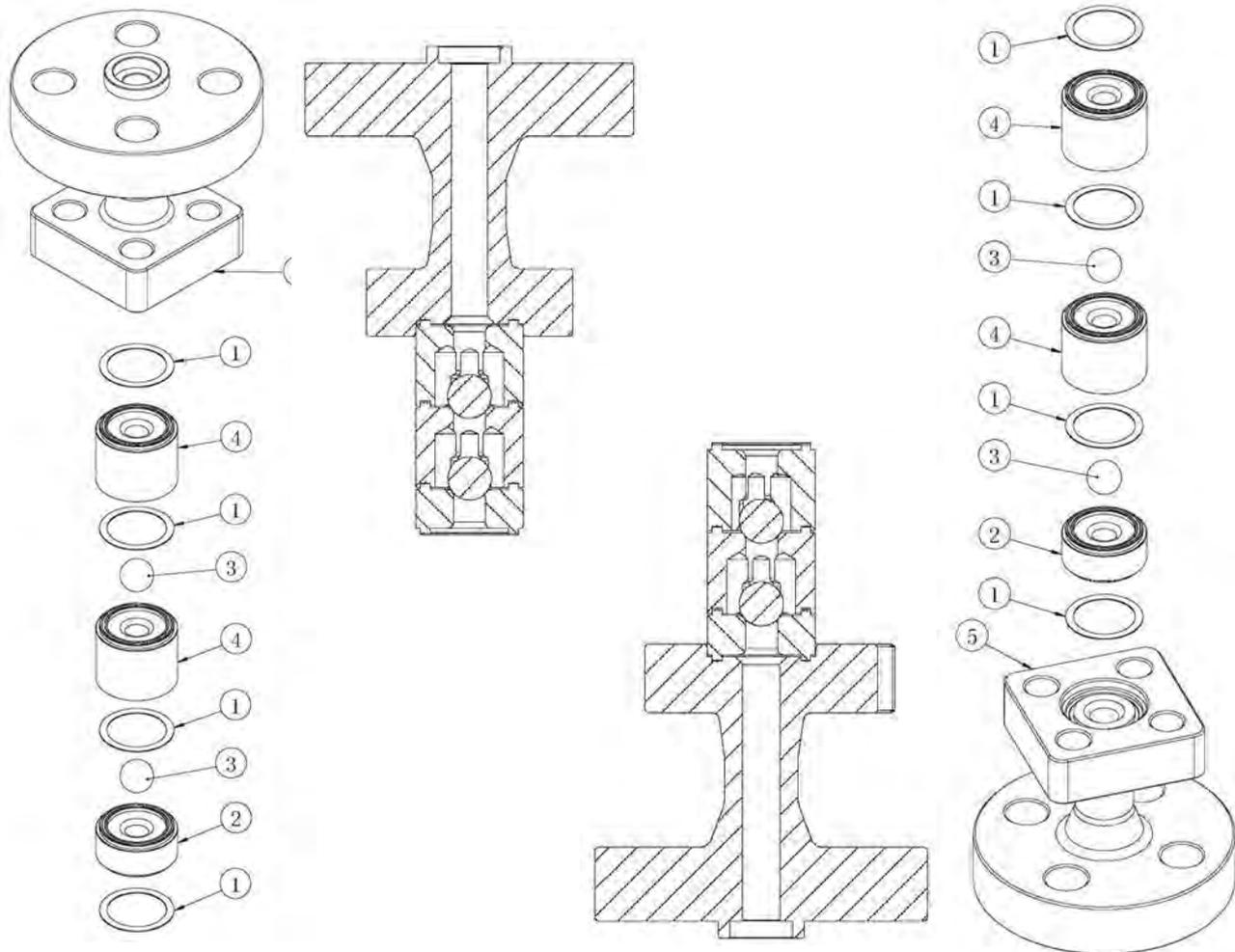


No.	1	2	3	4	5	6	7
Name	Spacer	Valve seat	Valve ball	Valve cover	Valve body	Union	Union cap

12.3 Flanged Double-Ball Valve (DN15PN700TG /PN420TG)

Discharge Valve

Suction Valve



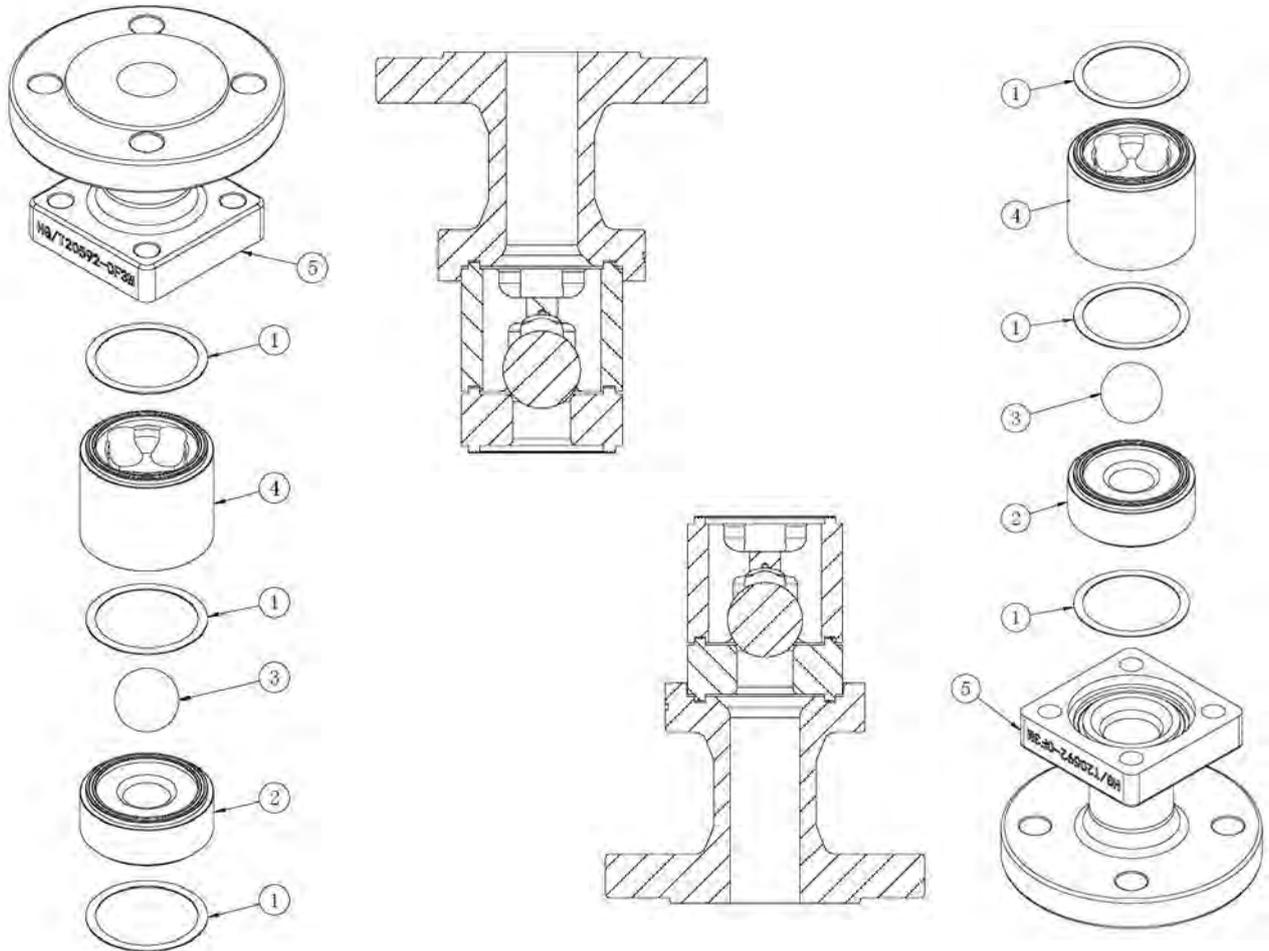
No.	1	2	3	4	5
Name	Spacer	Valve seat	Valve ball	Valve cover	Flange

12.4 Flanged Single Ball Valve

(DN25PN260TG/PN110TG/PN40RF、DN40PN110TG/PN40RF)

Discharge Valve

Suction Valve



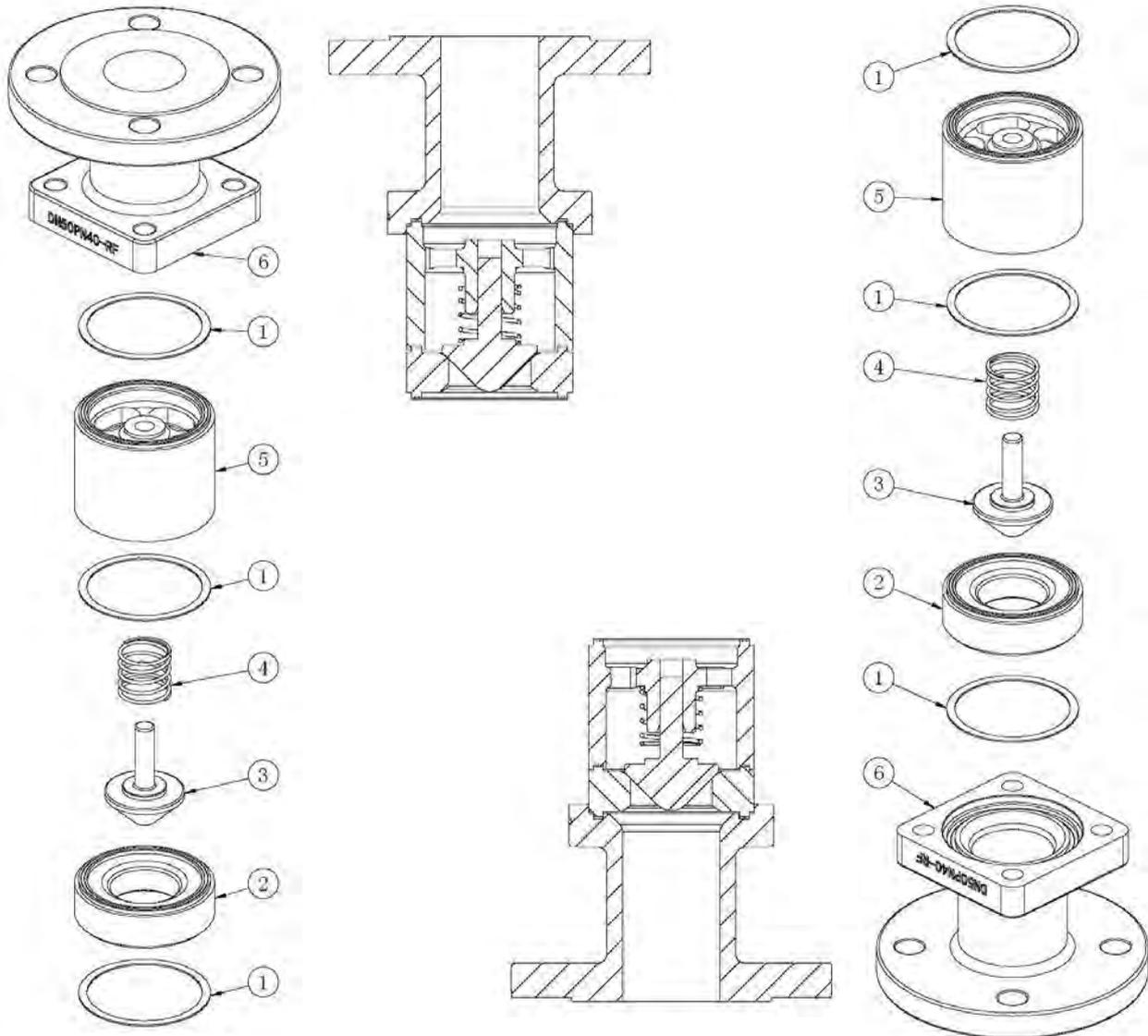
No.	1	2	3	4	5
Name	Spacer	Valve seat	Valve ball	Valve cover	Flange

12.5 Flange Type 90° Angle Valve

(DN50PN40RF、DN65PN25RF、DN80PN16RF、DN100PN16RF)

Discharge Valve

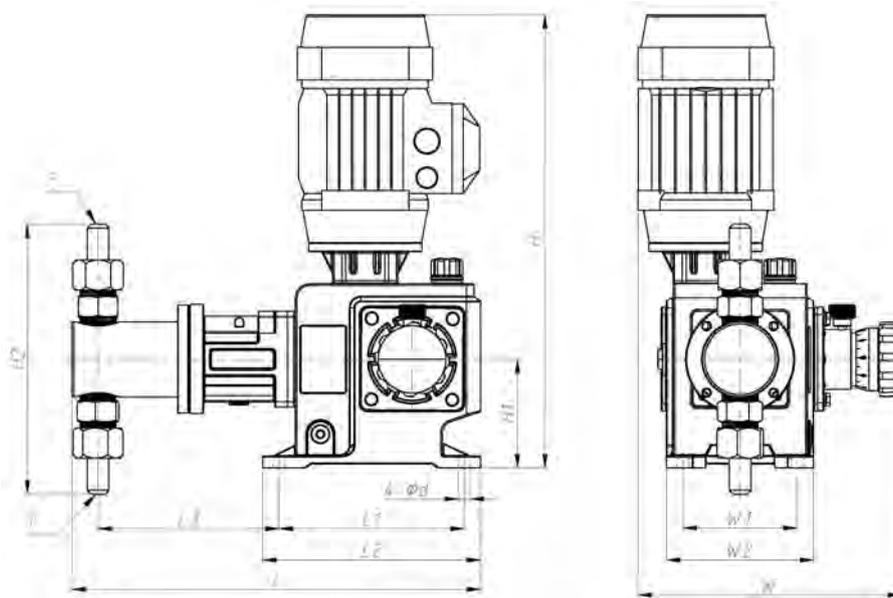
Suction Valve



No.	1	2	3	4	5	6
Name	Spacer	Valve seat	Valve core	Spring	Valve cover	Flange

13 Installation Drawing

13.1 Plunger Pump Installation Drawing



JPX Serial Installation Drawing

Unit: mm

Model	L	L1	L2	L3	H	H1	H2	W	W1	W2	d	F
JPX1/40	350	170	200	147	100	417	190	242	105	135	11.5	Φ6 union for welding
JPX2/40	350	170	200	147	100	417	190	242	105	135	11.5	
JPX5/33	350	170	200	147	100	417	190	242	105	135	11.5	
JPX8/21	350	170	200	147	100	417	190	242	105	135	11.5	
JPX12/15	361	170	200	158	100	417	190	242	105	135	11.5	Φ10 union for welding
JPX20/8	375	170	200	166	100	417	248	242	105	135	11.5	
JPX33/5	375	170	200	166	100	417	248	242	105	135	11.5	
JPX52/3.3	375	170	200	166	100	417	248	242	105	135	11.5	
JPX65/2.6	375	170	200	166	100	417	248	242	105	135	11.5	
JPX88/2.1	375	170	200	166	100	417	248	242	105	135	11.5	Φ15 union for welding
JPX105/1.7	375	170	200	166	100	417	248	242	105	135	11.5	
JPX125/1.4	383	170	200	169	100	417	242	242	105	135	11.5	
JPX155/1.1	383	170	200	169	100	417	242	242	105	135	11.5	
JPX190/1.1	383	170	200	169	100	417	242	242	105	135	11.5	
JPX230/1.0	383	170	200	169	100	417	242	242	105	135	11.5	

JPZ Serial Installation Drawing**Unit:** mm

Model	L	L1	L2	L3	H	H1	H2	W	W1	W2	d	F
JPZ6/50	418	220	255	199	480	125	160	333	150	186	13.5	Φ6 union for welding
JPZ10/45	418	220	255	199	480	125	160	333	150	186	13.5	
JPZ15/30	418	220	255	199	480	125	160	333	150	186	13.5	
JPZ26/17	441	220	255	246	480	125	179	333	150	186	13.5	Φ10 union for welding
JPZ42/10	441	220	255	246	480	125	179	333	150	186	13.5	
JPZ66/7	441	220	255	246	480	125	179	333	150	186	13.5	
JPZ85/5.5	441	220	255	246	480	125	179	333	150	186	13.5	
JPZ110/4.0	441	220	255	246	480	125	179	333	150	186	13.5	
JPZ135/3.3	451	220	255	252	480	125	184	333	150	186	13.5	Φ15 union for welding
JPZ160/2.8	451	220	255	252	480	125	184	333	150	186	13.5	
JPZ200/2.3	451	220	255	252	480	125	184	333	150	186	13.5	
JPZ225/2.0	451	220	255	252	480	125	184	333	150	186	13.5	
JPZ280/1.7	451	220	255	252	480	125	184	333	150	186	13.5	
JPZ335/1.3	492	220	255	197	480	125	344	333	150	186	13.5	DN25 Flange (HG/T20592 RF)
JPZ400/1.1	492	220	255	197	480	125	344	333	150	186	13.5	
JPZ500/1.0	492	220	255	197	480	125	344	333	150	186	13.5	
JPZ600/0.8	492	220	255	197	480	125	344	333	150	186	13.5	

JPR Serial Installation Drawing

Unit: mm

Model	L	L1	L2	L3	H	H1	H2	W	W1	W2	d	F
JPR18/50	486	275	310	169	574	144	240	369	185	220	14	Φ10 union for welding
JPR32/31	503	275	310	186	574	144	250	369	185	220	14	
JPR52/20	503	275	310	186	574	144	250	369	185	220	14	
JPR80/12	499	275	310	182	574	144	250	369	185	220	14	
JPR100/10	499	275	310	182	574	144	250	369	185	220	14	
JPR135/8	508	275	310	186	574	144	254	369	185	220	14	Φ15 union for welding
JPR160/6.5	508	275	310	186	574	144	254	369	185	220	14	
JPR190/5.5	508	275	310	186	574	144	254	369	185	220	14	
JPR232/4.5	508	275	310	186	574	144	254	369	185	220	14	
JPR268/4.0	508	275	310	186	574	144	254	369	185	220	14	
JPR332/3.2	508	275	310	186	574	144	254	369	185	220	14	DN25 Flange (HG/T20592 RF)
JPR400/2.5	565	275	310	215	574	144	354	369	185	220	14	
JPR480/2.2	565	275	310	215	574	144	354	369	185	220	14	
JPR565/1.8	565	275	310	215	574	144	354	369	185	220	14	
JPR655/1.6	565	275	310	215	574	144	354	369	185	220	14	
JPR750/1.4	561	275	310	201	574	144	381	369	185	220	14	DN40 Flange (HG/T20592 RF)
JPR855/1.2	576	275	310	209	574	144	445	369	185	220	14	
JPR965/1.0	576	275	310	209	574	144	445	369	185	220	14	
JPR1080/0.9	576	275	310	209	574	144	445	369	185	220	14	
JPR1280/0.9	576	275	310	209	574	144	445	369	185	220	14	
JPR1450/0.8	576	275	310	209	574	144	445	369	185	220	14	
JPR1620/0.7	576	275	310	209	574	144	445	369	185	220	14	

JPD Serial Installation Drawing

Unit: mm

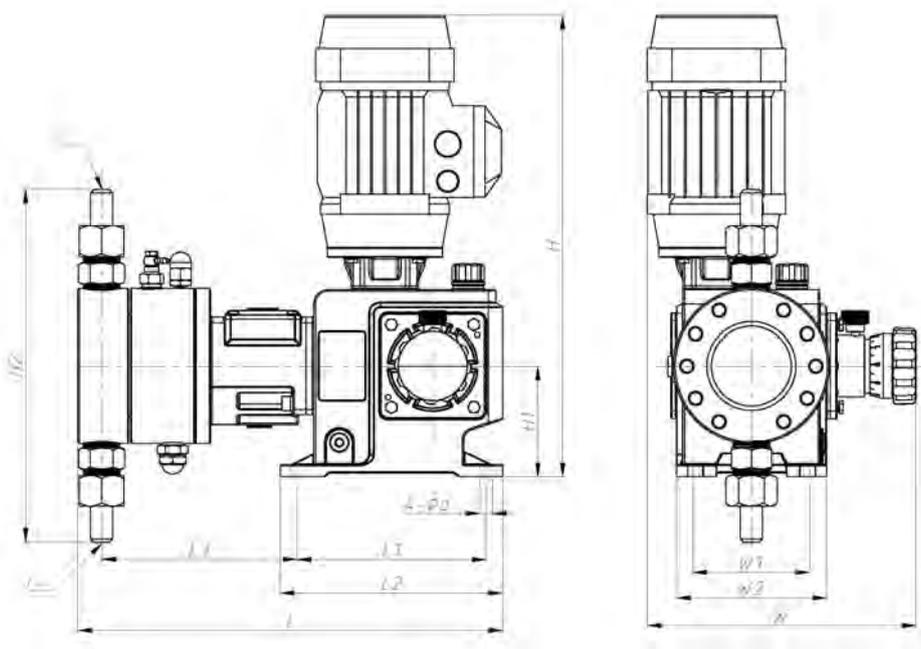
Model	L	L1	L2	L3	H	H1	H2	W	W1	W2	d	F
JPD30/50	665	350	390	265	720	180	250	506	270	310	14	Φ10 union for welding
JPD55/(50/40)	665	350	390	265	720	180	250	506	270	310	14	
JPD85/(35/25)	665	350	390	265	720	180	250	506	270	310	14	
JPD135/(22/16)	723	350	390	280	720	180	310	506	270	310	14	DN15 Flange (HG/T20615 TG)
JPD170/(17/12)	723	350	390	280	720	180	310	506	270	310	14	
JPD225/(13/9)	723	350	390	280	720	180	310	506	270	310	14	
JPD320/(9/6.8)	723	350	390	280	720	180	310	506	270	310	14	DN25 Flange (HG/T20615 TG)
JPD390/(8/5.6)	745	350	390	295	720	180	370	506	270	310	14	
JPD450/(7/4.8)	745	350	390	295	720	180	370	506	270	310	14	
JPD555/(5.6/4.0)	745	350	390	295	720	180	370	506	270	310	14	
JPD675/(4.7/3.4)	745	350	390	295	720	180	370	506	270	310	14	
JPD805/(4.0/2.8)	745	350	390	295	720	180	370	506	270	310	14	
JPD945/(3.3/2.3)	745	350	390	295	720	180	370	506	270	310	14	DN40 Flange (HG/T20592 RF)
JPD1100/(2.8/2.0)	758	350	390	306	720	180	435	506	270	310	14	
JPD1255/(2.5/1.8)	758	350	390	306	720	180	435	506	270	310	14	
JPD1435/(2.2/1.6)	758	350	390	306	720	180	435	506	270	310	14	
JPD1620/(2.0/1.5)	758	350	390	306	720	180	435	506	270	310	14	
JPD1820/(1.8/1.3)	758	350	390	306	720	180	435	506	270	310	14	
JPD2015/(1.6/1.2)	758	350	390	306	720	180	435	506	270	310	14	
JPD2250/(1.4/1.0)	758	350	390	306	720	180	435	506	270	310	14	DN50 Flange (HG/T20592 RF)
JPD2480/(1.2/0.9)	758	350	390	306	720	180	435	506	270	310	14	
JPD3050/(1.0/0.8)	770	350	390	315	720	180	498	506	270	310	14	
JPD3380/(0.9/0.7)	770	350	390	315	720	180	498	506	270	310	14	
JPD3720/(0.8/0.6)	770	350	390	315	720	180	498	506	270	310	14	

JPT Serial Installation Drawing

Unit: mm

Model	L	L1	L2	L3	H	H1	H2	W	W1	W2	d	F
JPT85/50	1024	540	600	366	1060	260	471	712	390	450	22	DN15 Flange (HG/T20615 TG)
JPT135/(50/36)	1024	540	600	366	1060	260	471	712	390	450	22	
JPT218(50/32/23)	1024	540	600	366	1060	260	471	712	390	450	22	
JPT275(40/25/19)	1024	540	600	366	1060	260	471	712	390	450	22	
JPT360(30/20/14)	1035	540	600	370	1060	260	438	712	390	450	22	DN25 Flange (HG/T20615 TG)
JPT510(21/14/10)	1035	540	600	370	1060	260	438	712	390	450	22	
JPT620(18/12/8.5)	1035	540	600	370	1060	260	438	712	390	450	22	
JPT885(12/8.2/6.0)	1035	540	600	370	1060	260	438	712	390	450	22	
JPT1070(10/6.8/5.0)	1035	540	600	367	1060	260	485	712	390	450	22	DN40 Flange (HG/T20615 TG)
JPT1280(8.7/5.6/4.1)	1035	540	600	367	1060	260	485	712	390	450	22	
JPT1500(7.5/4.9/3.5)	1035	540	600	367	1060	260	485	712	390	450	22	
JPT1750(6.5/4.2/3.0)	1035	540	600	367	1060	260	485	712	390	450	22	
JPT2000(5.5/3.7/2.6)	1035	540	600	367	1060	260	485	712	390	450	22	
JPT2300(4.8/3.2/2.3)	1035	540	600	367	1060	260	485	712	390	450	22	
JPT2600(4.3/2.9/2.0)	1035	540	600	367	1060	260	538	712	390	450	22	
JPT2900(3.8/2.5/1.8)	1040	540	600	372	1060	260	538	712	390	450	22	DN50 Flange (HG/T20592 RF)
JPT3230(3.5/2.3/1.6)	1040	540	600	372	1060	260	538	712	390	450	22	
JPT3600(3.1/2.1/1.5)	1040	540	600	372	1060	260	538	712	390	450	22	
JPT4350(2.6/1.7/1.2)	1040	540	600	372	1060	260	538	712	390	450	22	
JPT5200(2.2/1.4/1.0)	1040	540	600	375	1060	260	591	712	390	450	22	DN65 Flange (HG/T20592 RF)
JPT6050(1.8/1.2/0.9)	1040	540	600	375	1060	260	591	712	390	450	22	
JPT7050(1.6/1.0/0.8)	1040	540	600	375	1060	260	591	712	390	450	22	
JPT8100(1.4/0.9/0.7)	1045	540	600	378	1060	260	644	712	390	450	22	DN80 Flange (HG/T20592 RF)
JPT9200(1.2/0.8/0.6)	1045	540	600	378	1060	260	644	712	390	450	22	
JPT10400(1.1/0.7/0.5)	1045	540	600	378	1060	260	644	712	390	450	22	
JPT11600(0.9/0.6/0.5)	1045	540	600	380	1060	260	697	712	390	450	22	DN100 Flange (HG/T20592 RF)
JPT13000(0.8/0.6/0.4)	1045	540	600	380	1060	260	697	712	390	450	22	
JPT14300(0.7/0.5/0.4)	1045	540	600	380	1060	260	697	712	390	450	22	

13.2 Hydraulic Pump Installation Drawing



JYPX Serial Installation Drawing

Unit: mm

Model	L	L1	L2	L3	H	H1	H2	W	W1	W2	d	F
JYPX1.5/60	377	170	200	172	417	100	279	242	105	135	11.5	Φ6 union for welding
JYPX3.5/33	377	170	200	172	417	100	279	242	105	135	11.5	
JYPX6.0/25	377	170	200	172	417	100	279	242	105	135	11.5	
JYPX11/18	377	170	200	172	417	100	279	242	105	135	11.5	
JYPX18/12	377	170	200	172	417	100	279	242	105	135	11.5	
JYPX30/7.0	377	170	200	172	417	100	279	242	105	135	11.5	Φ10 union for welding
JYPX50/4.5	383	170	200	176	417	100	319	242	105	135	11.5	
JYPX80/2.8	383	170	200	176	417	100	319	242	105	135	11.5	
JYPX100/2.2	394	170	200	187	417	100	319	242	105	135	11.5	
JYPX135/1.8	394	170	200	187	417	100	319	242	105	135	11.5	Φ15 union for welding
JYPX160/1.5	400	170	200	190	417	100	313	242	105	135	11.5	
JYPX190/1.2	400	170	200	190	417	100	313	242	105	135	11.5	
JYPX210/1.0	400	170	200	190	417	100	313	242	105	135	11.5	

JYPZ Serial Installation Drawing

Unit: mm

型号	L	L1	L2	L3	H	H1	H2	W	W1	W2	d	F
JYPZ5/70	450	220	255	196	481	125	278	333	150	186	13.5	Φ6 union for welding
JYPZ8/44	450	220	255	196	481	125	278	333	150	186	13.5	
JYPZ13/30	450	220	255	196	481	125	278	333	150	186	13.5	
JYPZ20/22	450	220	255	196	481	125	278	333	150	186	13.5	
JYPZ38/12	461	220	255	202	481	125	319	333	150	186	13.5	Φ10 union for welding
JYPZ50/10	462	220	255	202	481	125	319	333	150	186	13.5	
JYPZ62/8.0	463	220	255	203	481	125	319	333	150	186	13.5	
JYPZ76/6.5	462	220	255	202	481	125	349	333	150	186	13.5	
JYPZ100/5.0	463	220	255	203	481	125	349	333	150	186	13.5	Φ15 union for welding
JYPZ140/3.5	465	220	255	205	481	125	343	333	150	186	13.5	
JYPZ165/3.2	478	220	255	214	481	125	363	333	150	186	13.5	
JYPZ210/2.5	478	220	255	215	481	125	363	333	150	186	13.5	
JYPZ260/2.0	479	220	255	216	481	125	363	333	150	186	13.5	DN25 Flange (HG/T20592 RF)
JYPZ330/1.6	518	220	255	223	481	125	442	333	150	186	13.5	
JYPZ410/1.3	519	220	255	224	481	125	442	333	150	186	13.5	

JYPR Serial Installation Drawing

Unit: mm

Model	L	L1	L2	L3	H	H1	H2	W	W1	W2	d	F
JYPR10/70	549	275	310	233	574	144	319	369	185	220	14	Φ6 union for welding
JYPR15/56	549	275	310	233	574	144	319	369	185	220	14	
JYPR30/32	549	275	310	233	574	144	319	369	185	220	14	Φ10 union for welding
JYPR46/23	549	275	310	233	574	144	319	369	185	220	14	
JYPR60/18	550	275	310	233	574	144	319	369	185	220	14	
JYPR75/15	549	275	310	233	574	144	349	369	185	220	14	
JYPR92/12.5	550	275	310	233	574	144	349	369	185	220	14	
JYPR120/9.5	550	275	310	234	574	144	349	369	185	220	14	
JYPR175/6.5	564	275	310	246	574	144	363	369	185	220	14	Φ15 union for welding
JYPR200/5.8	565	275	310	246	574	144	363	369	185	220	14	
JYPR252/4.5	554	275	310	235	574	144	363	369	185	220	14	
JYPR315/3.7	555	275	310	236	574	144	363	369	185	220	14	
JYPR400/3.0	594	275	310	244	574	144	465	369	185	220	14	DN25 Flange (HG/T20592 RF)
JYPR500/2.4	596	275	310	246	574	144	465	369	185	220	14	
JYPR600/2.0	596	275	310	246	574	144	465	369	185	220	14	
JYPR720/1.7	602	275	310	252	574	144	486	369	185	220	14	
JYPR830/1.4	602	275	310	252	574	144	486	369	185	220	14	
JYPR960/1.2	628	275	310	261	574	144	549	369	185	220	14	DN40 Flange (HG/T20592 RF)
JYPR1100/1.0	628	275	310	261	574	144	549	369	185	220	14	
JYPR1250/0.9	629	275	310	261	574	144	569	369	185	220	14	
JYPR1420/0.8	629	275	310	261	574	144	569	369	185	220	14	
JYPR1600/0.7	629	275	310	261	574	144	569	369	185	220	14	

JYPD Serial Installation Drawing

Unit: mm

Model	L	L1	L2	L3	H	H1	H2	W	W1	W2	d	F
JYPD25/70	740	350	390	327	720	180	382	507	270	310	14	Φ10 union for welding
JYPD40/(70/52)	740	350	390	327	720	180	402	507	270	310	14	
JYPD80/(42/30)	740	350	390	327	720	180	402	507	270	310	14	
JYPD100/(32/22)	740	350	390	327	720	180	402	507	270	310	14	
JYPD125/(26/19)	764	350	390	327	720	180	524	507	270	310	14	DN15 Flange (HG/T20615 TG)
JYPD155/(21/16)	764	350	390	327	720	180	524	507	270	310	14	
JYPD200/(17/12)	764	350	390	327	720	180	524	507	270	310	14	
JYPD300/(11/8.5)	764	350	390	327	720	180	524	507	270	310	14	
JYPD330/(10/7.5)	767	350	390	330	720	180	541	507	270	310	14	DN25 Flange (HG/T20615 TG)
JYPD425/(8.3/6.0)	767	350	390	330	720	180	541	507	270	310	14	
JYPS525/(6.6/4.8)	767	350	390	330	720	180	561	507	270	310	14	
JYPD670/(5.2/3.7)	768	350	390	331	720	180	561	507	270	310	14	
JYPD820/(4.2/3.1)	768	350	390	331	720	180	581	507	270	310	14	
JYPD1000/(3.5/2.5)	786	350	390	333	720	180	571	507	270	310	14	DN40 Flange (HG/T20592 RF)
JYPD1200/(3.0/2.1)	786	350	390	348	720	180	571	507	270	310	14	
JYPD1315/(2.7/1.9)	786	350	390	348	720	180	571	507	270	310	14	
JYPD1400/(2.5/1.8)	786	350	390	348	720	180	571	507	270	310	14	
JYPD1630/(2.1/1.6)	788	350	390	350	720	180	581	507	270	310	14	
JYPD1880/(1.9/1.4)	788	350	390	350	720	180	581	507	270	310	14	
JYPD2130/(1.7/1.2)	802	350	390	352	720	180	603	507	270	310	14	
JYPD2400/(1.5/1.1)	802	350	390	352	720	180	603	507	270	310	14	DN50 Flange (HG/T20592 RF)
JYPD2700/(1.3/1.0)	815	350	390	357	720	180	636	507	270	310	14	
JYPD3000/(1.2/0.8)	815	350	390	357	720	180	636	507	270	310	14	
JYPD3350/(1.0/0.7)	815	350	390	357	720	180	636	507	270	310	14	

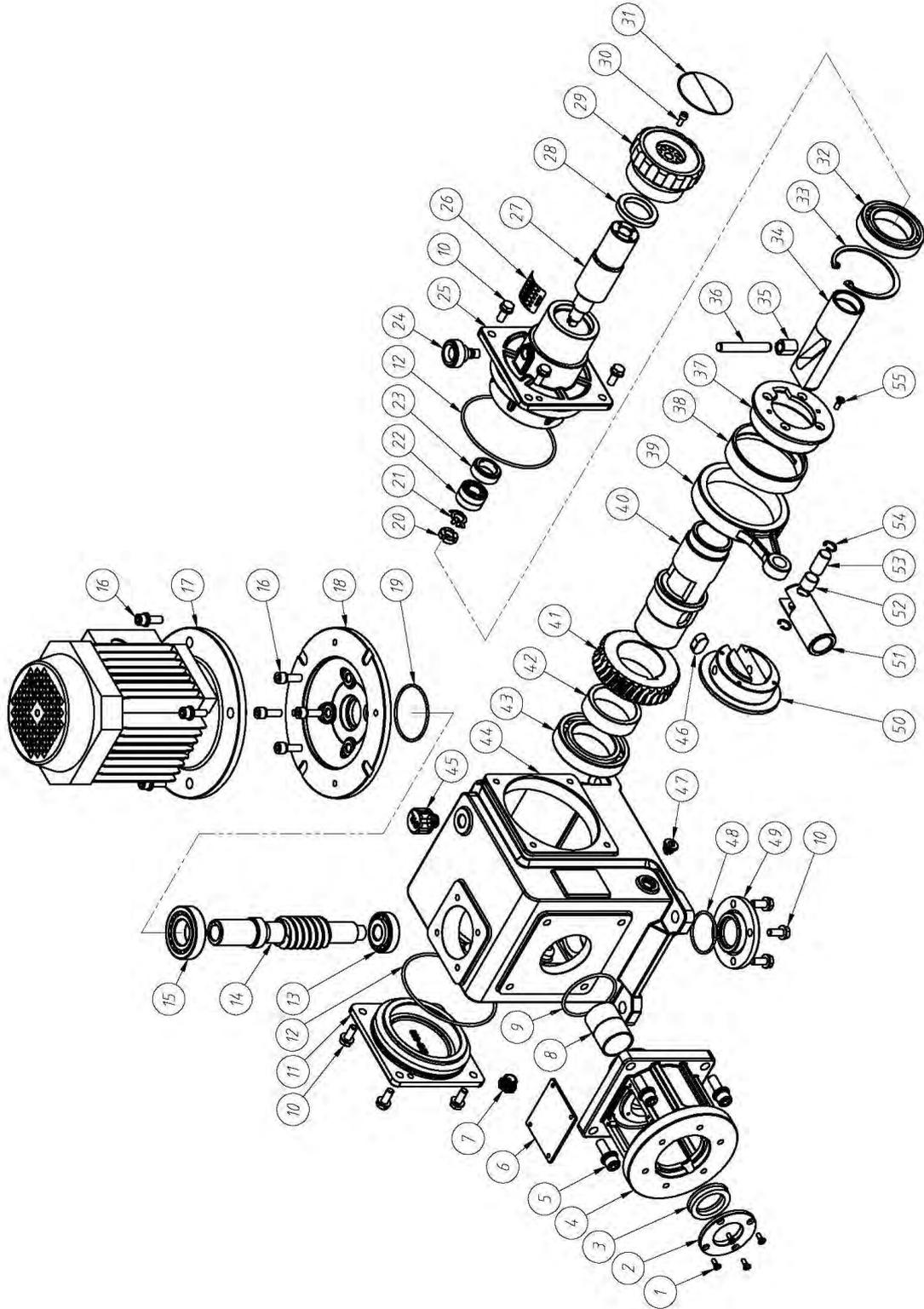
JYPT Serial Installation Drawing

Unit: mm

Model	L	L1	L2	L3	H	H1	H2	W	W1	W2	d	F
JYPT80/(70/56)	985	540	600	362	1060	260	452	712	390	450	22	DN15 Flange (HG/T20615 TG)
JYPT132/(70/51/36)	985	540	600	362	1060	260	472	712	390	450	22	
JYPT205/(48/33/24)	985	540	600	362	1060	260	472	712	390	450	22	
JYPT302/(35/23/16)	985	540	600	362	1060	260	472	712	390	450	22	
JYPT350/(30/20/14)	1019	540	600	362	1060	260	594	712	390	450	22	DN25 Flange (HG/T20615 TG)
JYPT450/(24/16/11)	1019	540	600	362	1060	260	594	712	390	450	22	
JYPT552/(20/13/9.5)	1019	540	600	362	1060	260	594	712	390	450	22	
JYPT705/(15/10/7.5)	1019	540	600	362	1060	260	594	712	390	450	22	
JYPT880/(12/8.2/6.0)	1022	540	600	375	1060	260	611	712	390	450	22	DN4 Flange (HG/T20615 TG)
JYPT1060/(10/6.8/5.0)	1022	540	600	375	1060	260	611	712	390	450	22	
JYPT1260/(8.5/5.7/4.1)	1022	540	600	375	1060	260	631	712	390	450	22	
JYPT1400/(8.0/5.2/3.7)	1023	540	600	376	1060	260	631	712	390	450	22	
JYPT1500/(7.5/4.9/3.5)	1023	540	600	376	1060	260	651	712	390	450	22	
JYPT1720/(6.3/4.2/3.0)	1023	540	600	378	1060	260	641	712	390	450	22	
JYPT2000/(5.5/3.7/2.6)	1023	540	600	393	1060	260	641	712	390	450	22	
JYPT2265/(4.8/3.2/2.3)	1023	540	600	393	1060	260	641	712	390	450	22	
JYPT2550/(4.3/2.9/2.1)	1023	540	600	393	1060	260	641	712	390	450	22	DN50 Flange (HG/T20592 RF)
JYPT2870/(3.8/2.5/1.8)	1043	540	600	395	1060	260	651	712	390	450	22	
JYPT3200/(3.5/2.3/1.6)	1043	540	600	395	1060	260	651	712	390	450	22	
JYPT3580/(3.1/2.1/1.5)	1057	540	600	397	1060	260	673	712	390	450	22	
JYPT4300/(2.6/1.7/1.2)	1057	540	600	397	1060	260	673	712	390	450	22	DN65 Flange (HG/T20592 RF)
JYPT5150/(2.2/1.4/1.0)	1070	540	600	402	1060	260	706	712	390	450	22	
JYPT6000/(1.8/1.2/0.9)	1070	540	600	402	1060	260	706	712	390	450	22	
JYPT7000/(1.6/1.0/0.8)	1070	540	600	402	1060	260	706	712	390	450	22	DN80 Flange (HG/T20592 RF)
JYPT8050/(1.4/0.9/0.7)	1082	540	600	472	1060	260	736	712	390	450	22	
JYPT9100/(1.2/0.8/0.6)	1082	540	600	472	1060	260	736	712	390	450	22	
JYPT10200/(1.0/0.7/0.5)	1082	540	600	472	1060	260	736	712	390	450	22	

14 Drive End Installation Drawing

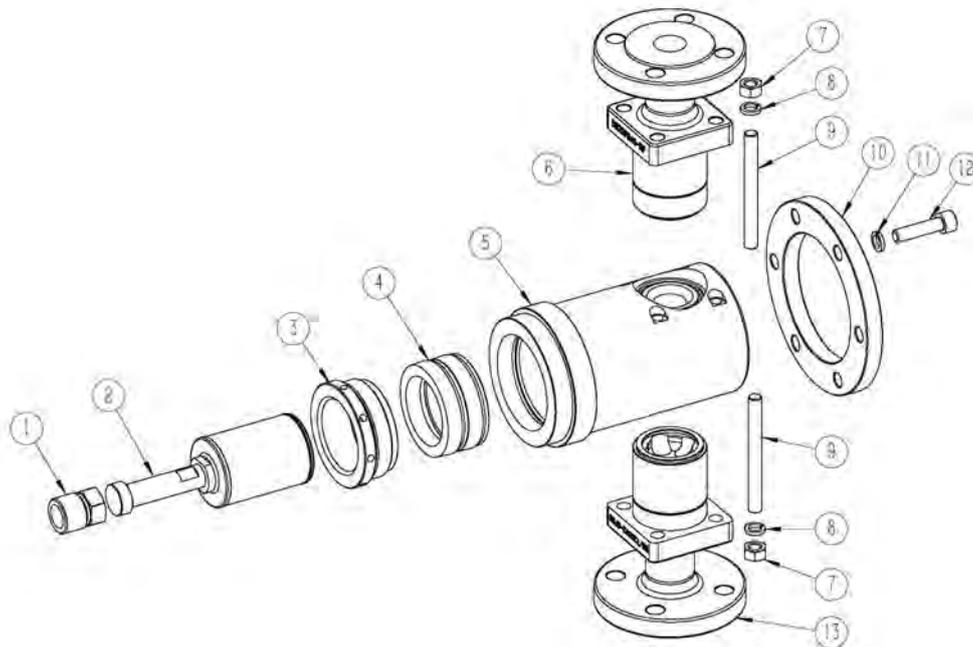
Plunger/hydraulic pump drive end drawing



No	Name	Material	QTY
1	Cross head screw	steel	4
2	Oil seal plate	45	1
3	Gasket	PU	1
4	Oil chamber	HT250	1
5	Hex screw	steel	4
6	Oil chamber cover	PVC	1
7	Oi glass	Al	1
8	Composite bearing		2
9	O ring	NBR	1
10	Hexagon bolt	steel	12
11	Main bearing seat	HT250	1
12	O ring	NBR	2
13	Tapered roller bearing		1
14	Worm	20CrMnTi	1
15	Tapered roller bearing		1
16	Hex screw	steel	8
17	Motor		1
18	Motor seat	HT250	1
19	O ring	NBR	1
20	Round nut	45	1
21	Lock washer	Q235	1
22	Angular contact ball bearing		2
23	Bearing pressing cap	45	1
24	Lock screw		1
25	Adjusting seat	HT250	1
26	Adjusting scale		1
27	Adjust screw	45	1
28	Skeleton oil seal		1

No	Name	Material	QTY
29	Hand wheel	ABS	1
30	Hex screw	steel	4
31	Name plate		1
32	Deep groove ball bearing		1
33	Hole circlip	steel	1
34	Adjusting core	42CrMo	1
35	sliding	42CrMo	1
36	Drive pin	40Cr	1
37	Connecting rod bearing	40Cr	1
38	Cooper sleeve	ZCuSn10P1	1
39	Connecting rod	ZG310-570	1
40	Main shaft	40Cr	1
41	Worm gear	ZCuSn10P1	1
42	spacer	Q235	1
43	Deep groove ball bearing		1
44	Gear box	HT250	1
45	Oil filling cap		1
46	Key	steel	1
47	Oil drain plug		1
48	O ring	NBR	1
49	Worm down bearing	HT250	1
50	Eccentric wheel	40Cr	1
51	Connecting rod joint	40Cr	1
52	Composite bearing		1
53	Connecting rod pin	20CrMo	1
54	Hole circlip	steel	1
55	Cross head screw	steel	1

15 Liquid End Drawing

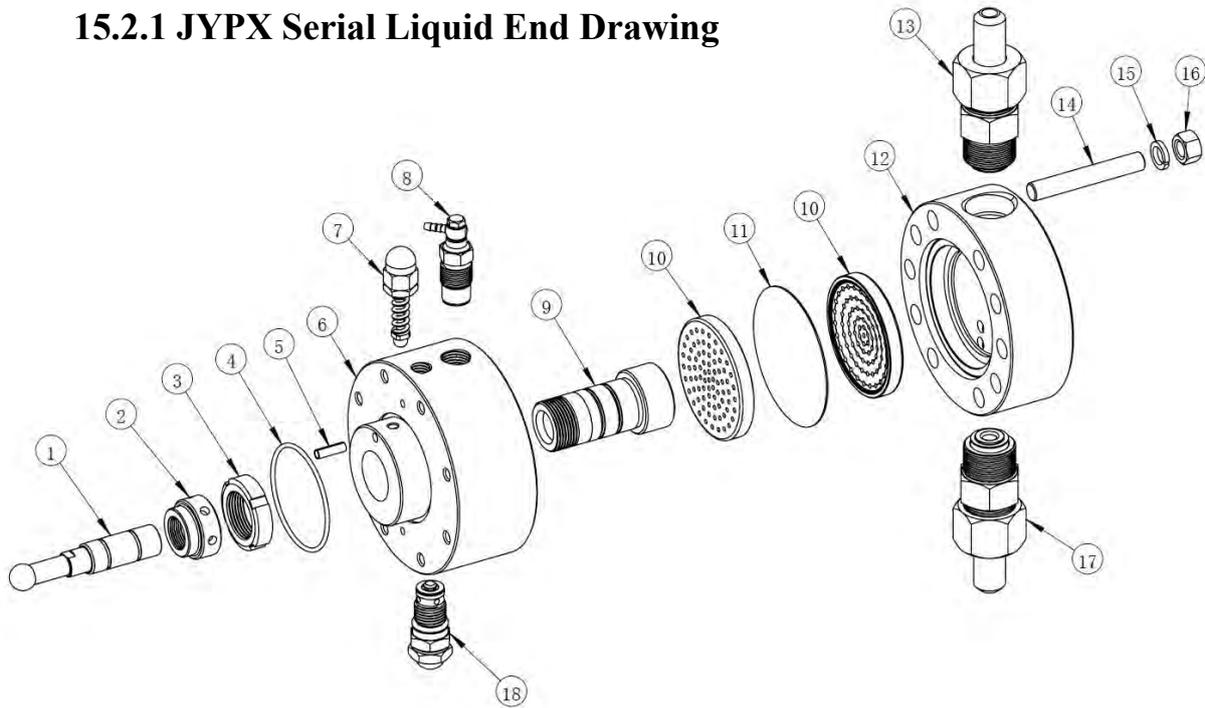


15.1 Plunger Pump Liquid End Drawing

No.	Name	Material	QTY	No.	Name	Material	QTY
1	Plunger cap	45	1	8	Spring washer	steel	8
2	Plunger	SS316	1	9	Stud bolt	steel	8
3	Packing seal cap	45	1	10	Head plate	45	1
4	Packing seal		1	11	Spring washer	steel	6
5	Pump head	SS	1	12	Hexagon screw	steel	6
6	Discharge check valve		1	13	Suction check valve		1
7	Hex screw	steel	8	14			

15.2 Hydraulic Pump Liquid End Drawing

15.2.1 JYPX Serial Liquid End Drawing

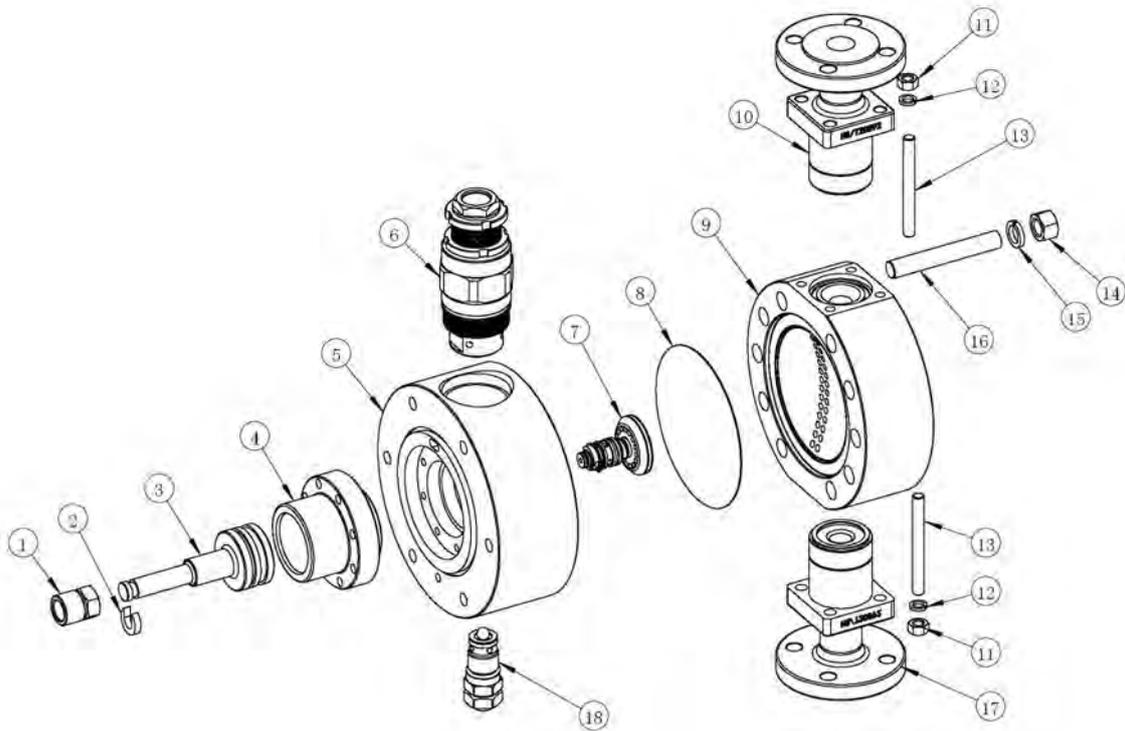


No.	Name	Material	QTY	No.	Name	Material	QTY
1	Piston		1	11	Diaphragm		1
2	Piston cap	45	1	12	Pump head	45/316L	1
3	Round nut	45	1	13	Discharge valve		1
4	O ring	NBR	1	14	Stud bolt	steel	10
5	Split pin	45	1	15	Spring washer	steel	10
6	Diaphragm base	45	1	16	Hexagon nut	steel	10
7	Overload valve		1	17	Suction valve		1
8	Air release valve		1	18	Oil supplement valve		1
9	Cylinder sleeve		1	19			
10	Diaphragm plate	45	2	20			

Note:

1. See section 12 for details of inlet and outlet check valve components.
2. See 15.2.1 and 15.2.2 for details of overload valve assembly and oil supplement valve assembly.

15.2.2 JYPZ/JYPR/JYPD/JYPT Serial Liquid End Drawing

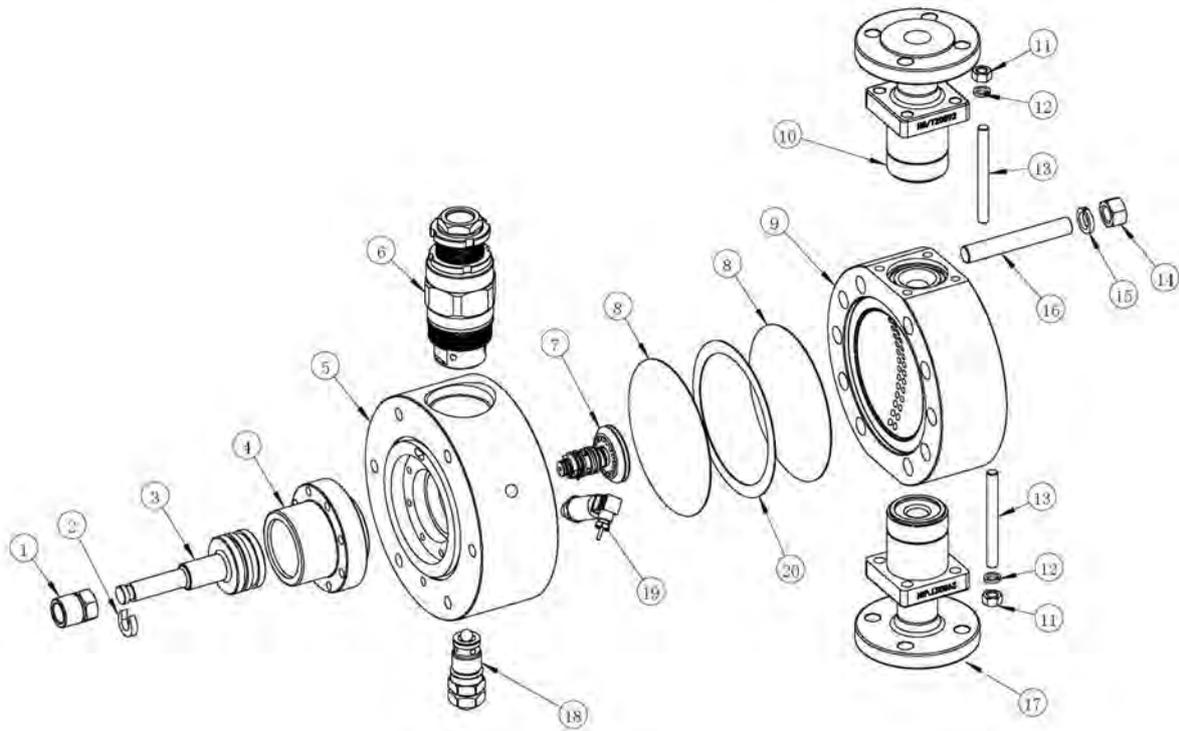


No.	Name	Material	QTY	No.	Name	Material	QTY
1	Piston cap	45	1	11	Hexagon nut	steel	8
2	Locking block	45	1	12	Spring washer	steel	8
3	Piston		1	13	Stud bolt	steel	8
4	Cylinder sleeve		1	14	Hexagon nut	steel	10
5	Diaphragm base	45	1	15	Spring washer	steel	10
6	Overload valve		1	16	Stub bolt	steel	10
7	Limit valve		1	17	Suction valve		1
8	Diaphragm		1	18	Oil supplement valve		1
9	Pump head	45/316L	1	19			
10	Discharge valve		1	20			

Note:

1. See section 12 for details of inlet and outlet check valve components.
2. For details of overload valve assembly, Oil supplement valve assembly, and limit valve assembly, see 15.2.1, 15.2.2, and 15.2.3.

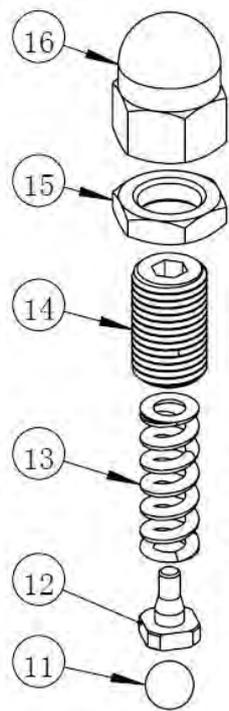
15.2.3 Hydraulic Double-diaphragm Pump Liquid End Drawing



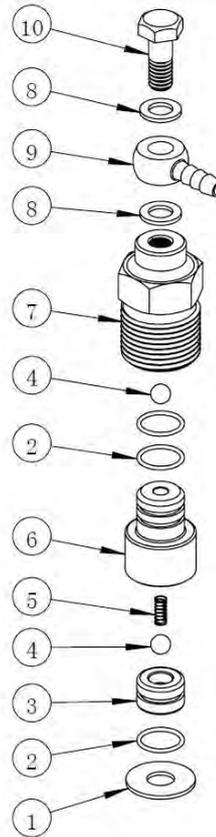
No.	Name	Material	QTY	No.	Name	Material	QTY
1	Piston cap	45	1	11	Hexagon nut	steel	8
2	Locking block	45	1	12	Spring washer	steel	8
3	piston		1	13	Stub bolt	steel	8
4	Cylinder sleeve		1	14	Hexagon nut	steel	10
5	Diaphragm base	45	1	15	Spring washer	steel	10
6	Overload valve		1	16	Stub bolt	steel	10
7	Limit valve		1	17	Suction valve		1
8	Diaphragm		2	18	Oil supplement valve		1
9	Pump head	45/316L	1	19	sensor		1
10	Discharge valve		1	20	Diaphragm spacer		1

15.2.4 Split Type Exhaust Overload Valve (JYPX Series)

Overload valve

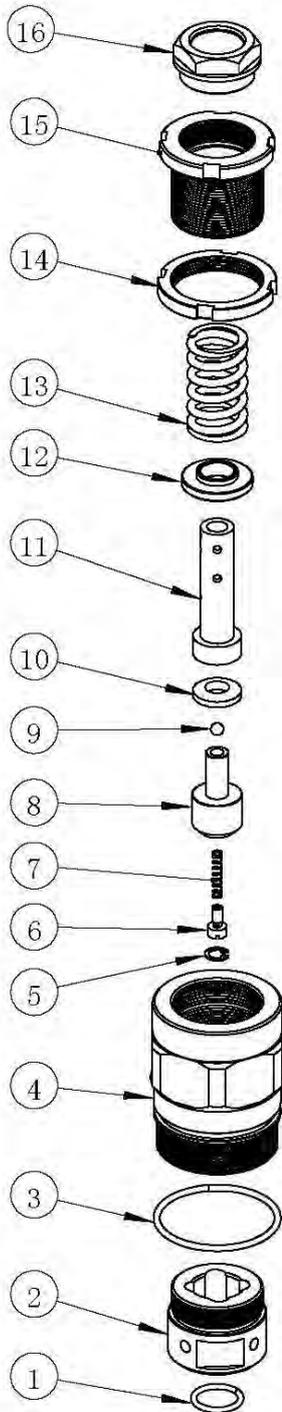


Air release valve



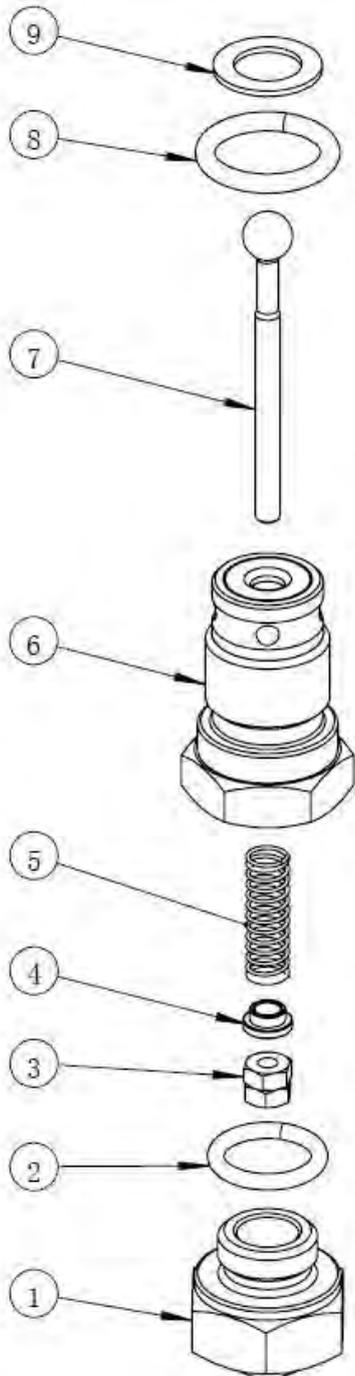
No.	Name	Material	QTY	No.	Name	Material	QTY
1	Purple copper gasket	T2	1	9	Tubing nozzle	ZQSnCu20-1	1
2	O ring	NBR	3	10	Tubing nozzle screw	ZQSnCu20-1	1
3	Valve seat	40Cr	1	11	Valve seat	Bearing steel	1
4	Valve ball	zirconia	2	12	Spring seat	45	1
5	Spring	SS	1	13	Spring	Carbon steel	1
6	Valve cover	40Cr	1	14	Adjusting screw	45	1
7	Valve body	40Cr	1	15	Locking nut	45	1
8	washer	T2	2	16	Screw cap	45	1

15.2.5 Integral Overload Valve Assembly (JYPZ, JYPR, JYPD, JYPT Series)



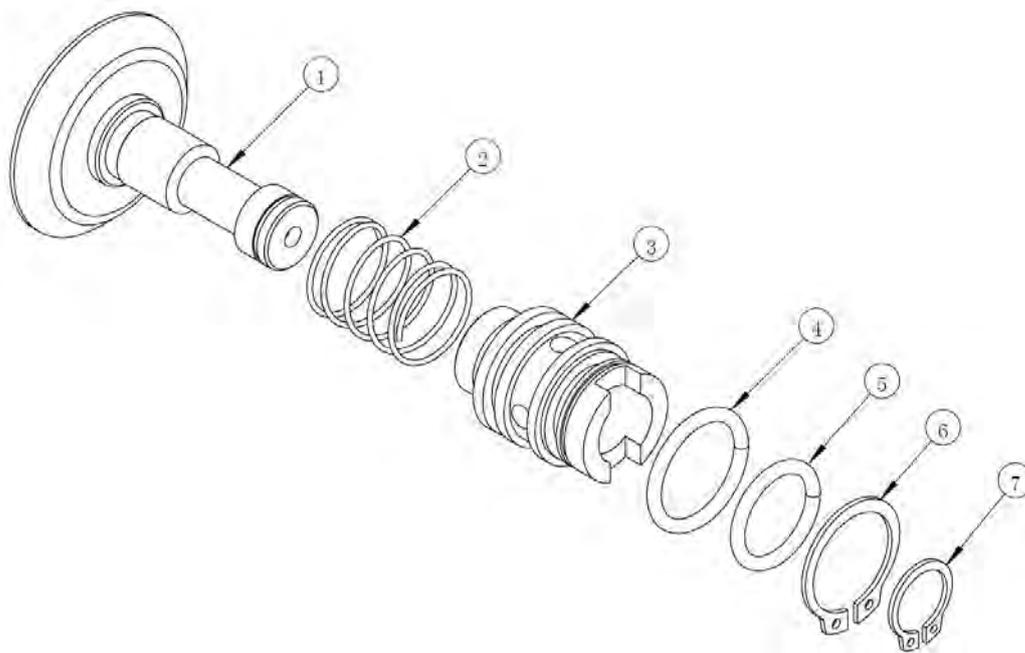
No.	Name	Material	QTY
1	O ring	NBR	1
2	Valve seat	38CrMoAl	1
3	O ring	NBR	1
4	Valve body	45	1
5	Hole circlip	65Mn	1
6	Breathe valve core	38CrMoAl	1
7	Air release valve spring	Carbon steel	1
8	Valve core	38CrMoAl	1
9	Valve ball	zirconia	1
10	Spherical gasket	45	1
11	Breathable rod	45	1
12	Spring seat	45	1
13	spring	Carbon steel	1
14	Adjusting cap	45	1
15	Adjusting bolt	45	1
16	Oil glass	steel	1

15.2.6 Oil Supplement Valve



No.	Name	Material	QTY
1	Screw	45	1
2	O ring	NBR	1
3	Hexagon nut	steel	1
4	Spring seat	45	1
5	Spring	ss	1
6	Valve body	40Cr	1
7	Valve core	38CrMoAl	1
8	O ring	NBR	1
9	Washer	T2	1

15.2.7 Limit Valve Drawing



No.	Name	Material	QTY
1	Valve core	40Cr	1
2	Spring	SS	1
3	Valve seat	40Cr	1
4	O ring	NBR	1
5	O ring	NBR	1
6	Shaft elastic ring	65Mn	1
7	Shaft elastic ring	65Mn	1

Warranty Regulations

1. Warranty period: within 12 months from the date of purchase of the equipment (excluding wearing parts, such as plungers, diaphragms, seals, and check valves).

3. Not within the scope of warranty:

Failure or damage caused by running equipment without refueling;

Failure or damage caused by failure to follow the operating procedures of the manual and regular maintenance of the equipment;

Failure or damage caused by disassembly and assembly of equipment parts without authorization of the company;

Failure or damage caused by lack of phase of the power supply and unstable current;

Parts damage caused by long-term overload;

Equipment failure caused by the equipment being left unused for a long time, and the equipment is not regularly maintained according to the instructions;

Failure or damage caused by other man-made or force majeure factors;

The company will not bear any costs for equipment repairs due to equipment failure or damage caused by the above-mentioned reasons. The cost of materials and labor incurred in the maintenance shall be borne by the user.

Contact address: No. 227, Huishu Road, Liangshui, Linhai City, Zhejiang Province

Contact number: 0086-576-85289780 E-mail: sales@ligaopumps.com

Thank you very much for your trust and support, we will do our best to serve you!



ADD: Huishu Road, Linhai, Zhejiang, China

TEL: 86-576-85289780

FAX: 86-576-85668297

MAIL: sales@ligaopumps.com

WEB: www.ligaopumps.com