



# 计量泵

METERING PUMP

液压隔膜式计量泵  
HYDRAULIC DIAPHRAGM METERING PUMP

► 使用说明书  
THE USER MANUAL

# 敬告

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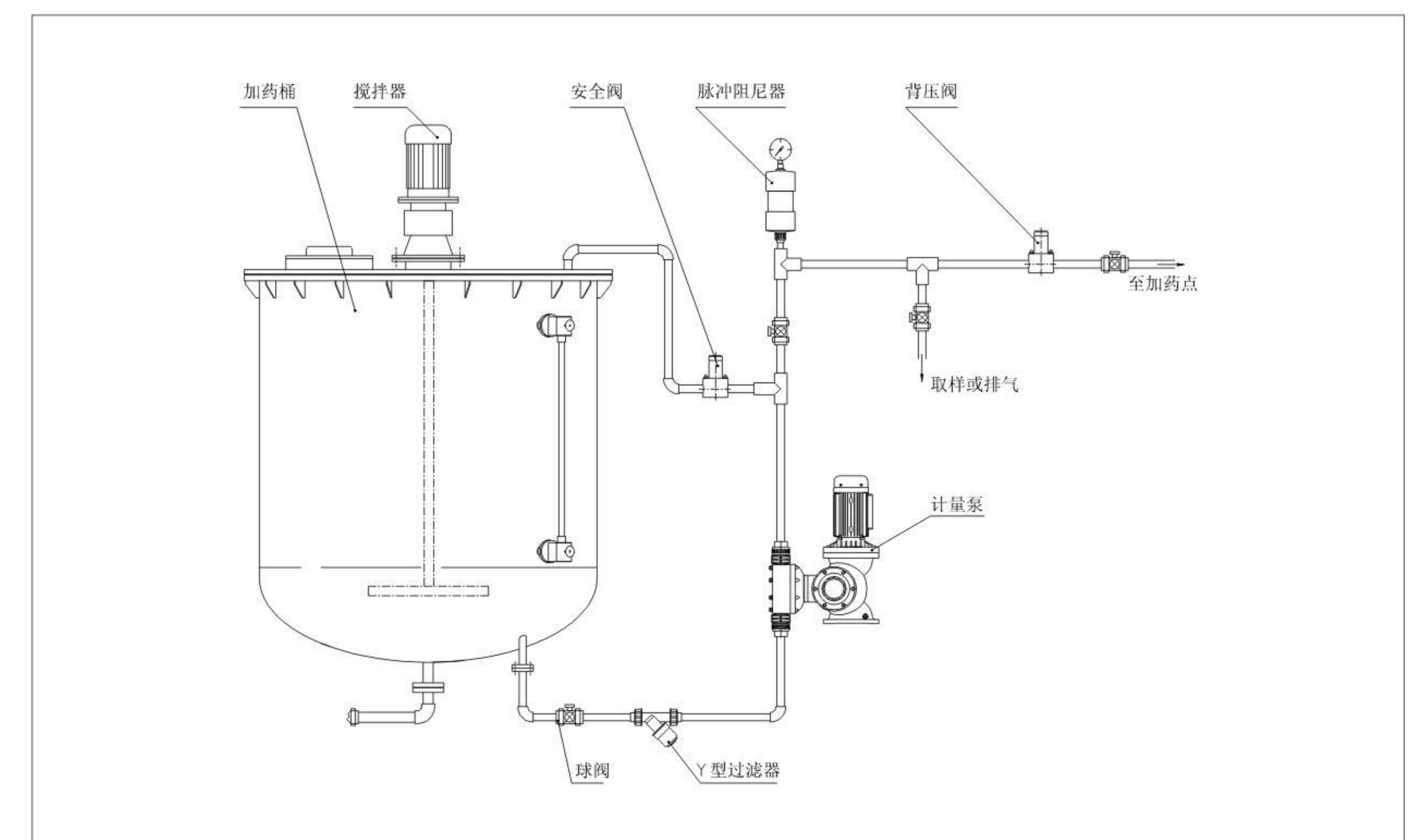
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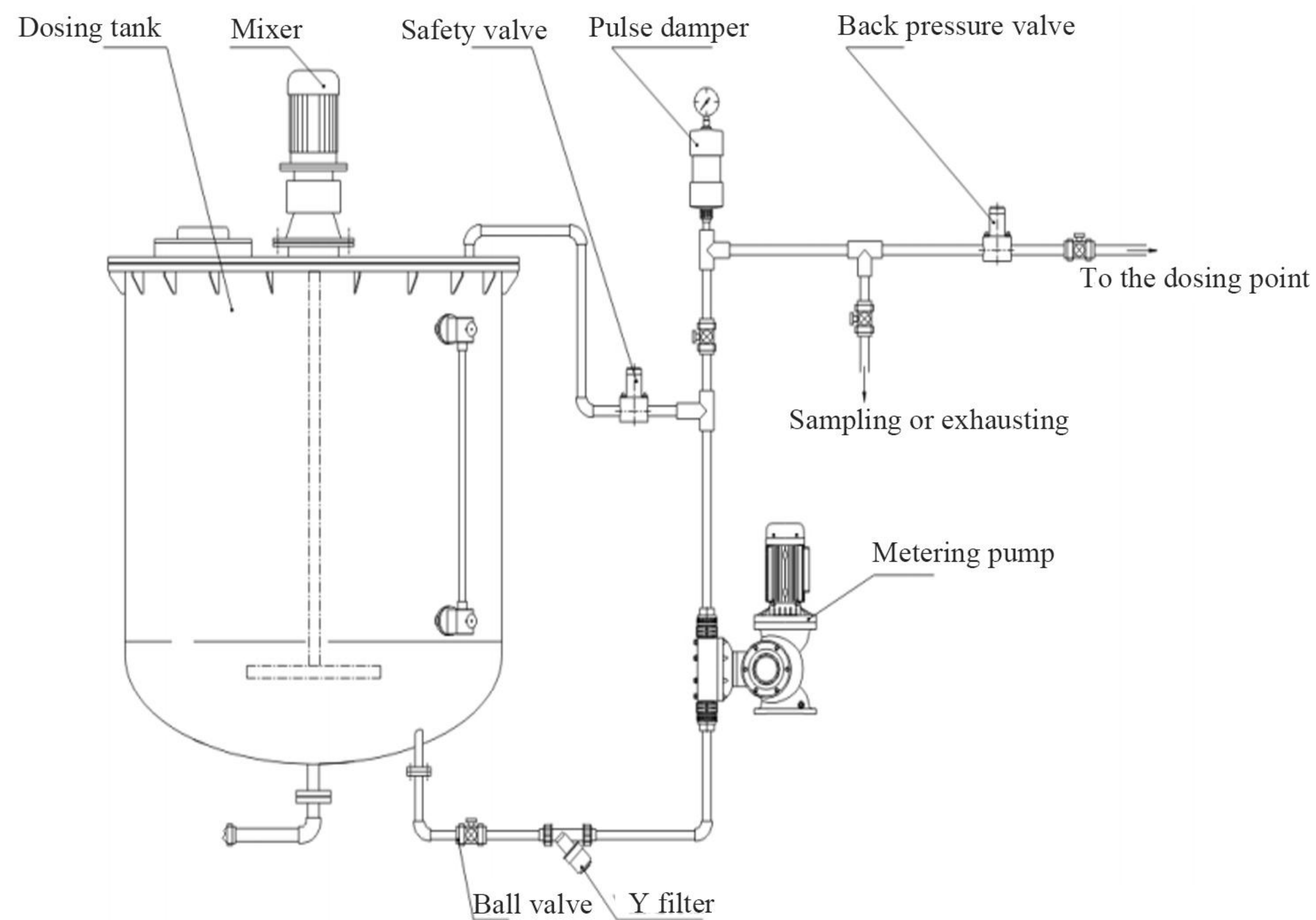


- 1、计量泵使用前请在齿轮箱内加220 # 蜗轮蜗杆油或50 # 齿轮油至油标，并在液压油池内加L-HM32-46液压油至油标。
- 2、计量泵电机接线一定要按照电机铭牌的电压接线（380V或220V）
- 3、计量泵开机之前一定要确保出口管路通畅（阀门全开）。
- 4、不锈钢管路接头焊接时，切不可把焊渣或杂物掉入管路或阀体内（从而会造成计量泵不出水、压力变小或流量变小）  
计量泵要停止工作时先关闭计量泵，再关闭出口阀门。
- 5、出口管路压力一定要高于进口管路压力，如果低于进口压力,一定要加装背压阀，防止产生虹吸。
- 6、出口管路口径一定要大于或等于，相应计量泵的标配口径。

计量泵标准安装图（供参考）



## Standard installation drawing of metering pump (for reference)



- 1, Metering pump before use, please add 220 # worm gear and worm oil or 50 # gearoil to oil standard. And add L-HM32-46 hydraulic oil to the oil standard in the hydraulic oil tank.
- 2, Metering pump motor wiring must according to of motor nameplates voltage wiring(380V or 220V).
- 3, Metering pump boot before must be sure that the export pipeline clear (the valve is fully open).
- 4, Stainless steel pipe welding joints, must not regard the welding slag or debris fall into the pipe or body (which will cause the metering pump no more water, pressure or flow becomes smaller) metering pump to stop work first closes the metering pump outlet valve is closed again.
- 5, Export line pressure must be high import line pressure, if less than inlet pressure be sure to add back pressure valves. Prevent to produce siphon.
- 6, Export pipe diameter must be greater than or equal to, corresponding the metering Pump with standard caliber.

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### 一、概述

液压隔膜式计量泵常用单联的独立参数提供用户。也可根据用户需要制造同机座同规格的多联组合或不同机座不同规格组合。多联式适用于工艺流程中需多种介质的比例配送。该泵可广泛用于石油、化工、纺织、食品、造纸、原子能技术、电厂、塑料、制药、水厂、环保等工业和科技部门。用来向加压或常压容器及管道内精确定量输送不含固体颗粒的液体。其流量可以开机（或定机）时从0-100%范围内无级调节。（根据计量泵的特性，最少行程一般不小于总行程的10%）单缸泵适用于单一液体的场合；组合泵可作比例泵使用，也可并联使用；泵组合可作为三比例泵使用，也可三泵并联，以达到较大排量，增高了液体的脉冲频率，促使液体连续顺畅加入。

该型泵可输送温度-30℃-100℃，粘度为0.3-800mm<sup>2</sup>/s不含固体颗粒等腐蚀性或非腐蚀性液体介质。不同型号的计量泵均可根据用户要求装配变频电机（能接收4-20mA电流信号）或防爆电机。泵的型号规格及参数请参考本公司的产品样本。

液压隔膜式计量泵采用两种调节方式：一是改变泵的柱塞行程长度，可在停机或运行状态进行。计量精度在±1%以内，用于手动调节的有调量表，千分尺来指示柱塞相对行程值。二是采用变频电机与变频器组合，改变输入的电源频率调节泵速，改变流量大小。此方法适用于自动、遥控及计算机管理等调节方式（另见计量泵自动控制使用说明书）。

液压隔膜式计量泵是具有无泄漏高压力的特点，被广泛采用于易燃、易爆、易挥发、强腐蚀、放射性、剧毒、悬浮液以及昂贵的液体介质输送；达到高压加注液体目的。

本计量泵严格执行国家标准（GB/T7782-1996《计量泵》）的参照规定组织生产。不同型号的计量泵均可根据用户要求装配电机或防爆电机。

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## 1.Summarize

Hydraulic diaphragm metering pumps are commonly used to provide users with independent parameters of a single connection. It is also possible to manufacture multiple combinations of the same base and the same specifications or combinations of different bases with different specifications according to user needs. The multi-connection type is suitable for the proportional distribution of multiple media in the technological process. The pump can be widely used in petroleum, chemical, textile, food, paper, atomic energy technology, power plants, plastics, pharmaceuticals, water plants, environmental protection and other industrial and technological sectors. It is used to accurately and quantitatively transport liquids without solid particles into pressurized or atmospheric vessels and pipelines. Its flow can be steplessly adjusted from 0-100% when starting up (or setting the machine). (According to the characteristics of the metering pump, the minimum stroke is generally not less than 10% of the total stroke) Single-cylinder pumps are suitable for single liquid occasions; combined pumps can be used as proportional pumps or in parallel; pump combinations can be used as three-proportional pumps, Three pumps can also be connected in parallel to achieve a larger displacement, which increases the pulse frequency of the liquid and promotes the continuous and smooth addition of the liquid.

This type of pump can transport a temperature of -30℃-100℃, a viscosity of 0.3-800mm<sup>2</sup>/s no corrosive or non-corrosive liquid medium such as solid particles. Different types of metering pumps can be equipped with variable frequency motors (can receive 4-20mA current signals) or explosion-proof motors according to user requirements. For pump model specifications and parameters, please refer to our company's product catalog.

The hydraulic diaphragm metering pump adopts two adjustment methods: one is to change the plunger stroke length of the pump, which can be carried out in shutdown or running state. The measurement accuracy is within ±1%, and it is used for manual adjustment as an adjustable gauge and a micrometer to indicate the relative stroke value of the plunger. The second is to use the combination of variable frequency motor and frequency converter to change the input power frequency to adjust the pump speed and change the flow rate. This method is suitable for adjustment methods such as automatic, remote control and computer management (see also the manual for automatic control of metering pumps).

Hydraulic diaphragm metering pump has the characteristics of non-leakage and high pressure, and is widely used in the transportation of flammable, explosive, volatile, strong corrosive, radioactive, highly toxic, suspension and expensive liquid media; to achieve the purpose of high-pressure liquid filling .

This metering pump strictly implements the national standard (GB/T7782-1996 (Metering Pump")) to organize production. Different types of metering pumps can be equipped with motors or explosion-proof motors according to user requirements.

## 二、结构原理

液压隔膜式计量泵由电动机传动机构、液压系统等组成。

### 2. 1传动机构

2. 1. 1由电机动力传递给蜗杆、蜗轮实现减速旋转，促使曲轴、连杆机构作往复运动，带动柱塞产生液力。

2. 1. 2行程调节机构由曲轴、偏心轮、调节螺母、调节丝杆、调节手轮（柄）、刻度盘（指针）和标尺构成，由改变偏心距来达到柱塞的相对行程。

### 2. 2液压系统

2. 2. 1液压隔膜式计量泵的液压系统，其结构由柱塞、缸体、缸盖、进出口阀、液压隔膜式和三阀组成（即：放气过载阀、限位阀、补偿阀）。在工作中由膜片隔开液压油和介质，故液压隔膜式计量泵有无泄漏的优点。

2. 2. 2液压隔膜式计量泵液力端的柱塞由传动端的曲柄连杆机构的往复运动带动进行工作。柱塞在液压腔内作往复运动，促使液压油的压力变化，使液压隔膜式挠曲位移来输送介质，液压腔内液压油量的相对稳定，由三阀的功能来保持。

2. 2. 3过载阀（见图2）自动排出液压油中进入液压腔内的气体，保证工作的平稳，避免了液压油过多或排放管道受阻产生超压自动开启载阀，达到保护目的。

2. 2. 4限位补偿装置（见图3）是借助液压隔膜式推动限位阀的开放，按液压腔内的真空度随时补充油量，保证液压腔内液压油的充满。

### 三、运行前的准备工作

3. 1泵应安装在坚固的专用基础上，校正后紧定地脚螺栓，如果安装在混凝土基础上应高出地面100-150毫米以上。

3. 2吸入与排出管径应不少于进出口管径，吸入管路应尽量短。如吸入管路过长或弯管接头过多，应进行NPSHa核算。以满足必须净正

吸入压头的要求。

3. 3连接管路应装测量仪表。（如压力表等、用户自备）

3. 4吸入管路末端应装有过滤装置。（用户自备也可向我公司订购）

3. 5排出管路应装有安全阀或安全溢流阀和背压阀（用户自备）。如需减少出口压力脉冲，可在最近泵排出路上设稳压装置。（用户自备）

3. 6电器控制设备根据使用情况应尽可能安装在泵工作地点，（不涉及安全的前提下），电器控制设备应装设与输送介质相应的控制保护装置，以确保安全。

3. 7泵安装的其它技术要求应符合《机械设备安装及验收规范》TJ231（五）-78中的有关规定。

## 四、泵的使用

### 4. 1运行前检查

4. 1. 1安装验收合格后，开机前应检查各连接处螺栓、螺母不允许有任何松动，新泵应清除泵上的防腐或污垢，清除时应用煤油擦洗，切用铲刮。

4. 1. 2传动箱内注入适量的L-CKE460蜗轮油（SH/T0094-199）或L-CKC460工业闭式齿轮油（GB5903-1995），油量以油标水平中线为准。

4. 1. 3液压油箱内注入适量的L-HM46液压油，油量以油标水平中线为准。

4. 1. 4用手动联轴器或电机，使柱塞全行程往复移动若干次，不得有任何卡阻现象。

4. 1. 5按电机铭牌接通电源，启动电机，检查电机的旋转方向是否与转向标志一致。（注：此时管路上的进出口阀应处于完全敞开状态，否则后果自负）

### 4. 2泵的流量调节

4. 2. 1根据工艺流程的流量要求，将调量表或刻度盘转相应的指示值。流量的调节应从小到大的原则。若需从大到小调节时（流量表），观察指

## 2. Structure principle

The hydraulic diaphragm metering pump is composed of a motor drive mechanism and a hydraulic system.

### 2, 1 Transmission mechanism

2. 1. 1 The motor power is transmitted to the worm and worm wheel to achieve decelerated rotation, which promotes the reciprocating movement of the crankshaft and the connecting rod mechanism, and drives the plunger to generate hydraulic power.

2, 1, 2 The stroke adjustment mechanism is composed of crankshaft, eccentric wheel, adjusting nut, adjusting screw, adjusting handwheel (handle), dial (pointer) and ruler. The relative stroke of the plunger is achieved by changing the eccentricity.

### 2.2 Hydraulic system

2.2.1 Hydraulic system of hydraulic diaphragm metering pump, its structure is composed of plunger, cylinder block, cylinder head, inlet and outlet valve, hydraulic diaphragm type and three valves (i.e., bleed overload valve, Limit valve, compensation valve). The hydraulic oil and medium are separated by the diaphragm during work, so the hydraulic diaphragm metering pump has the advantage of leaking.

2, 2, 2 The plunger of the hydraulic end of the hydraulic diaphragm metering pump is driven by the reciprocating motion of the crank connecting rod mechanism at the transmission end. The plunger reciprocates in the hydraulic chamber to promote the pressure change of the hydraulic oil, so that the hydraulic diaphragm flexural displacement is used to transport the medium. The hydraulic oil volume in the hydraulic chamber is relatively stable, which is maintained by the function of the three valves.

2. 2, 3 overload valve (see Figure 2) automatically discharge the gas in the hydraulic oil into the hydraulic chamber to ensure stable work, avoid excessive hydraulic oil or obstruction of the discharge pipeline, and automatically open the load valve to achieve the purpose of protection .

2. 2. 4 The limit compensation device (see Figure 3) uses a hydraulic diaphragm to push the limit valve to open and replenish the oil at any time according to the vacuum in the hydraulic chamber to ensure the hydraulic oil in the hydraulic chamber is full.

## 3. Preparation before operation

3.1 The pump should be installed on a solid dedicated foundation. After correction, the anchor bolts should be tightened. If installed on a concrete foundation, it should be 100-150 mm above the ground. 3.2 The suction and discharge pipe diameter should be no less than the inlet and outlet pipe diameter, and the suction pipe should be as short as possible. If the suction pipeline is too long or there are too many elbow joints, NPSHa calculation should be performed. To meet the requirement that the positive suction head must be met.

3, 3 The connecting pipeline should be equipped with measuring instruments. (Such as pressure gauge, etc., prepared by the user)

3.4 The end of the suction pipeline should be equipped with a filter device. (Users can also order from our company)

3,5 The discharge pipeline should be equipped with safety valve or safety relief valve and back pressure valve (users prepare). If you need to reduce the outlet pressure pulse, you can install a voltage stabilizing device on the nearest pump discharge path. (Prepared by the user)

3.6 Electrical control equipment should be installed at the pump work site as much as possible according to the use situation. (Under the premise of not involving safety), the electrical control equipment should be equipped with a control and protection device corresponding to the conveying medium to ensure safety .

3.7 Other technical requirements for pump installation shall comply with the relevant regulations in "Specification for Installation and Acceptance of Mechanical Equipment" TJ231(5)-78.

## 4. The use of pump

### 4, 1 Inspection before operation

4, 1.1 After the installation and acceptance are qualified, check the bolts and nuts at each connection before starting the machine. No looseness is allowed. The new pump should be cleaned of corrosion or dirt on the pump. When cleaning, use kerosene to scrub and cut. Scrape with a shovel.

4, 1, 2 Inject an appropriate amount of L-CKE460 worm gear oil (SH/T0094-199) or LCKC460 industrial closed gear oil (GB5903-1995) into the transmission box. The oil quantity is subject to the horizontal center line of the oil standard.

4.1.3 Inject an appropriate amount of L-HM46 hydraulic oil into the hydraulic oil tank, and the amount of oil shall be based on the horizontal center line of the oil standard.

4, 1.4 Use a manual coupling or motor to make the plunger move back and forth several times in the full stroke without any jamming.

4.1.5 Turn on the power according to the motor nameplate, start the motor, and check whether the rotation direction of the motor is consistent with the turning mark. (Note: At this time, the inlet and outlet valves on the pipeline should be fully open, otherwise the consequences will be at your own risk)

### 4.2 Pump flow adjustment

4.2.1 According to the flow requirements of the process flow, turn the adjustment meter or dial to the corresponding Indicating value. The flow rate should be adjusted from small to large. If you need to adjust from large to small (flow meter), observe that the pointer moves with the rotation of the adjustment handwheel. When the pointer reaches the required position and exceeds a few bars, adjust the pointer to the required value in the direction of large flow. After adjustment, the handwheel needs to be locked.

针随调节手轮的旋转而游动，当指针到要求位置时，并超过数格，再向大流量方向使指针调要求值。调节完毕，需将手轮锁紧。

4. 2. 2流量调节可以在停车或运转中进行，调定后泵的流量约需1-2分钟才能稳定，流量越大，稳定时间就越长。

4. 2. 3过载阀的调整，在出厂前已按额定排出压力调定，如实际排出压力与额定排出压力不同时按下表（1）进行调整。

表（1）

单位：MPa

实际排出压力	0.2 - 1.0	1.3 - 4.0	5.0 - 8.0	10.0 - 16.0
阀开启压力 %	0.15P	0.3P	0.2P	0.1P

注：P为额定压力。为了安全，建议非专业人员不得随意调动。

完成上述各项工作后，确认无误，方可投入运行。

4. 3. 4停机前首先使出口节流阀处于完全开状态，排出压力降至常压，此时才能切断电源停止运行。

## 五、泵的维护及拆装

### 5. 1维护

5. 1. 1传动箱、液压油箱内应保持指定的油位，不应过多或过少。

5. 1. 2润滑油和液压油应干净无杂后，并按下表（2）周期进行更换。

表（2）

油类	使用期限	换油周期
润滑油	开始3-6个月	每3个月更换一次
润滑油	6个月以后	每6个月更换一次
液压油	开始2-5个月	每2个月更换一次
液压油	5个月以后	每5个月更换一次

5. 1. 3泵运转2000-3000小时以后，应拆开检查内部零件，进行检修和更换易损件。

5. 1. 4泵若长期停用，应将液缸内的介质排净放干，并把表面清洗干净，外露加工表面需防锈油。存放期内泵应置于干燥处。

### 5. 2拆卸与装配

5. 2. 1液压隔膜式计量泵液力端的拆卸。拧开液压油箱底处的内六角螺塞，放掉箱内的液压油，盘动电机联轴器，把活塞移向前死点，将活塞从十字头上拆出，将液压端从机座上拆下来然后按以下顺序拆下液力端各部件：

1. 拆下放气过载阀和补偿阀总成；
2. 拆下进出口压阀法兰，依次取出阀套，（阀芯、弹簧）阀座；
3. 拧开缸盖上的固定螺母，拆下缸盖，依次取液压隔膜式；
4. 拆下缸体与油箱的螺栓，取下缸体、柱塞、液缸，再取下限位阀组件。
5. 卸下液压油箱与传动箱的联接螺母，取下油箱。

5. 3装配按下列顺序进行：

按液压隔膜式计量泵液力端拆卸顺序的逆序装在传动箱上。调节好补油阀和放气过载阀，在装放气过载阀前，从放气过载阀油孔加足液压油，使液压腔内的气体排出。装配完毕，转动联轴器，应运转自如，无卡阻现象。

## 六、安装

### 6. 1泵的安装

6. 1. 1泵应安装在高于地面300-500毫米高混凝土上，将泵以水平状态校正：多联系安装应注意以泵的相间联轴器为校正基准，同心度偏差不得超过0.15毫米（弹性联轴器），钢性联轴器应在0.05毫米之内；

6. 1. 2吸排管路上不应有急剧的弯头（不大于90°），并应尽量减少管路中弯曲和增加阻力的部件。

4.2.2 Flow adjustment can be carried out during shutdown or operation. After adjustment, the flow of the pump takes about 12 minutes to stabilize. The larger the flow, the longer the stabilization time.

4.2.3 The adjustment of the overload valve has been set according to the rated discharge pressure before leaving the factory. If the actual discharge pressure is different from the rated discharge pressure, adjust it according to Table (1).

Table (1)

Unit:MPa

Actual discharge pressure	0.2 – 1.0	1.3 – 4.0	5.0 – 8.0	10.0 – 16.0
Valve opening pressure%	0.15P	0.3P	0.2P	0.1P

Note: P is the rated pressure. For safety, it is recommended that non-professionals should not be arbitrarily transferred.

After completing the above-mentioned work, it can be put into operation after confirming that it is correct.

4.3.4 Before stopping the machine, first make the outlet throttle valve fully open, and the discharge pressure will drop to normal pressure, then the power supply can be cut off to stop the operation.

## 5.Pump maintenance and disassembly and assembly

### 5.1 Maintenance

5.1.1 The specified oil level should be maintained in the transmission box and hydraulic oil tank, and should not be too much or too little.

5.1.2 After the lubricating oil and hydraulic oil should be clean and free of impurities, they should be replaced periodically according to the following table (2) .

Table(2)

Oil type	Life span	Oil change period
Lubricating oil	Within three to six months	Change every three months
Lubricating oil	More six months	Change every six months
Hydraulic oil	Within two to five months	Change every two months
Hydraulic oil	More five months	Change every five months

5.1.3 After the pump has been running for 2000-3000 hours, the internal parts should be disassembled and inspected, repaired and wearing parts replaced. 5, 1, 4 If the pump is not used for a long time, drain the medium in the cylinder and clean the surface. The exposed processing surface needs anti-rust oil. The pump should be placed in a dry place during storage.

### 5.2 Disassembly and assembly

5.2.1 Disassembly of the hydraulic end of the hydraulic diaphragm metering pump. Unscrew the hexagonal screw plug at the bottom of the hydraulic oil tank, release the hydraulic oil in the tank, turn the motor coupling, move the piston to the front dead center, remove the piston from the cross head, and remove the hydraulic end from the base Remove the upper part and then remove the components of the hydraulic end in the following order:

1. Remove the bleed overload valve and compensation valve assembly;
2. Remove the inlet and outlet pressure valve flanges, and take out the valve sleeve in turn (spool, spring) Valve seat;
3. Unscrew the fixing nut on the cylinder head, remove the cylinder head, and take the hydraulic diaphragm in turn;
4. Remove the bolts between the cylinder block and the fuel tank, remove the cylinder block, plunger, and hydraulic cylinder, and then remove the limit valve assembly.
- 5.Remove the coupling nut between the hydraulic oil tank and the transmission box, and remove the oil tank.

5.3 Assembly is carried out in the following order:

Install on the transmission box in the reverse order of the hydraulic end of the hydraulic diaphragm metering pump. For the oil valve and the bleed overload valve, before installing the bleed overload valve, add enough hydraulic oil from the bleed overload valve oil hole to discharge the gas in the hydraulic chamber. After the assembly is completed, the coupling should be rotated freely without jamming resistance phenomenon.

## 6.Install

### 6.1 Pump installation

6, 1.1 The pump should be installed on the concrete 300-500 mm higher than the ground, and the pump should be calibrated in a horizontal state: the installation of multiple pumps should pay attention to the phase coupling of the pump as the calibration reference, and the concentricity deviation should not exceed 0.15 Mm (flexible coupling), rigid coupling should be within 0.05 mm;

6, 1.2 There should be no sharp elbows (not greater than 90°) on the suction and discharge pipelines, and the parts that bend and increase resistance in the pipeline should be minimized.

- 6. 1. 3勿将泵浦及药槽安装在日光直接照射之处。
- 6. 1. 4药槽平时应补充药液及保养检查之需，请置于较宽敞的场所。
- 6. 1. 5将泵浦安装在高于药槽200-300mm的坚固基础上，并水平安装。
- 6. 1. 6请勿安装在易接触湿气或腐蚀性气体之处。
- 6. 1. 7泵浦安装之周围温度在 $-20^{\circ}\text{C}\sim+40^{\circ}\text{C}$ ，高度在海拔1000M以下使用。

#### 6. 2管路安装

6. 2. 1吸入配管通径不能少于泵的吸入阀口径，并应尽量缩短吸入管道长度，一般1-2米为宜；如必须增加长度时，则应适当加长，但长度不得超过3米（但启动时的吸入液体时间相对延长）。

6. 2. 2与吸入、排出阀（法兰）联接的管道，不能强行结合而使泵阀增加负荷，不得将管道及阀门等的重量由泵和吸排阀承担。管路安装完毕应支承并固定好管件。

#### 6. 3特殊液体对管道通量的增加

6. 3. 1对于输送悬浮液及易产生沉淀的介质，在泵的吸入及排出附近应增设阀门及三通，以便在泵运行停止时不拆开管路就能进行缸体内冲洗。

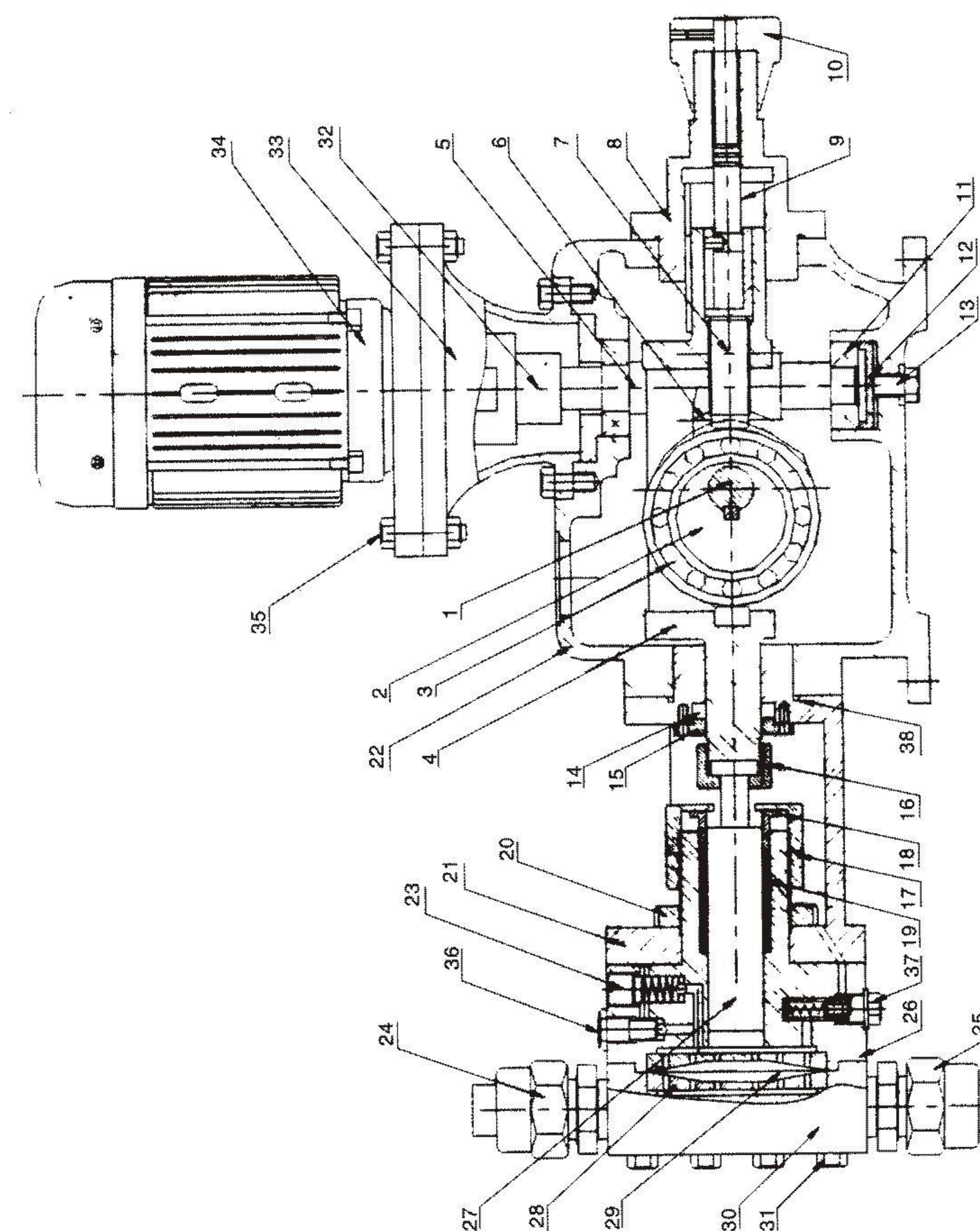
6. 3. 2为了确保泵的安全运行以及管路系统的安全，应在排出管道上设置安全阀，如需要减少被输送液体的脉冲，可在靠近泵排出管路上安装缓冲器。

#### 6. 4安装规范（安装图）

6. 4. 1泵安装的其它技术要求应符合《机械设备安装工作施工及验收规范》TJ231（五）-78—泵安装的有关规定。

## 七、各系列产品装配示意图

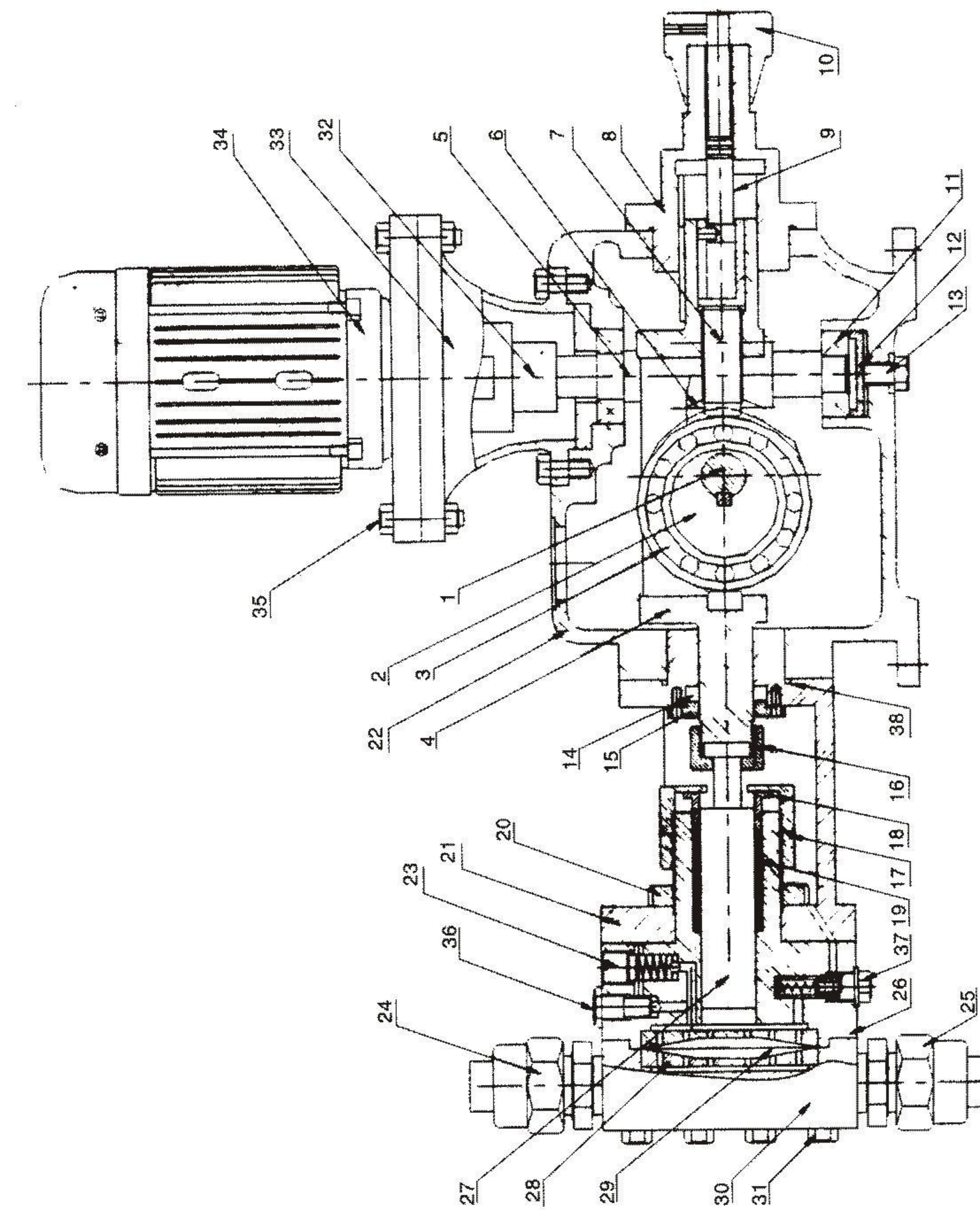
### ①HY<sup>-X</sup>/<sub>Z</sub>系列装配图



- 6, 1. 3 Do not install the pump and the medicine tank in the direct sunlight.
- 6, 1. 4 The medicine tank should be refilled with liquid medicine and required for maintenance and inspection. Please place it in a spacious place.
- 6, 1.5 Install the pump on a solid foundation 200-300mm higher than the medicine tank and install it horizontally.
- 6, 1. 6 Do not install in a place that is prone to contact with moisture or corrosive gas.
- 6, 1. 7 The surrounding temperature of the pump installation is  $-20^{\circ}\text{C}\sim+40^{\circ}\text{C}$ , and the altitude is below 1000M.
- 6.2 Pipeline installation
- 6, 2, 1 The diameter of the suction pipe should not be less than the diameter of the suction valve of the pump, and the length of the suction pipe should be shortened as much as possible, generally 1-2 meters is appropriate; if the length must be increased, it should be appropriately lengthened, but the length should not exceed 3 M (but the suction time of liquid is relatively prolonged when starting).
- 6, 2. The pipeline connected with the suction and discharge valve (flange) cannot be forcibly combined to increase the load on the pump valve, and the weight of the pipeline and valve must not be borne by the pump and suction and discharge valve. After the pipeline is installed, the pipe fittings should be supported and fixed.
- 6, 3 The increase of special liquid to pipeline flux
6. 3, 1 For transporting suspensions and media that are prone to precipitation, valves and tees should be added near the suction and discharge of the pump, so that the cylinder can be flushed without disassembling the pipeline when the pump is stopped. 6.3.2 In order to ensure the safe operation of the pump and the safety of the piping system, a safety valve should be installed on the discharge pipeline. If you need to reduce the pulse of the liquid being transported, you can install a buffer near the pump discharge pipeline.
- 6.4 Installation specification (installation drawing)
- 6.4.1 Other technical requirements for pump installation should comply with the relevant regulations of "Specification for Construction and Acceptance of Mechanical Equipment Installation" TJ231 (V)-78-Pump Installation.

## 7.Products assembly diagram

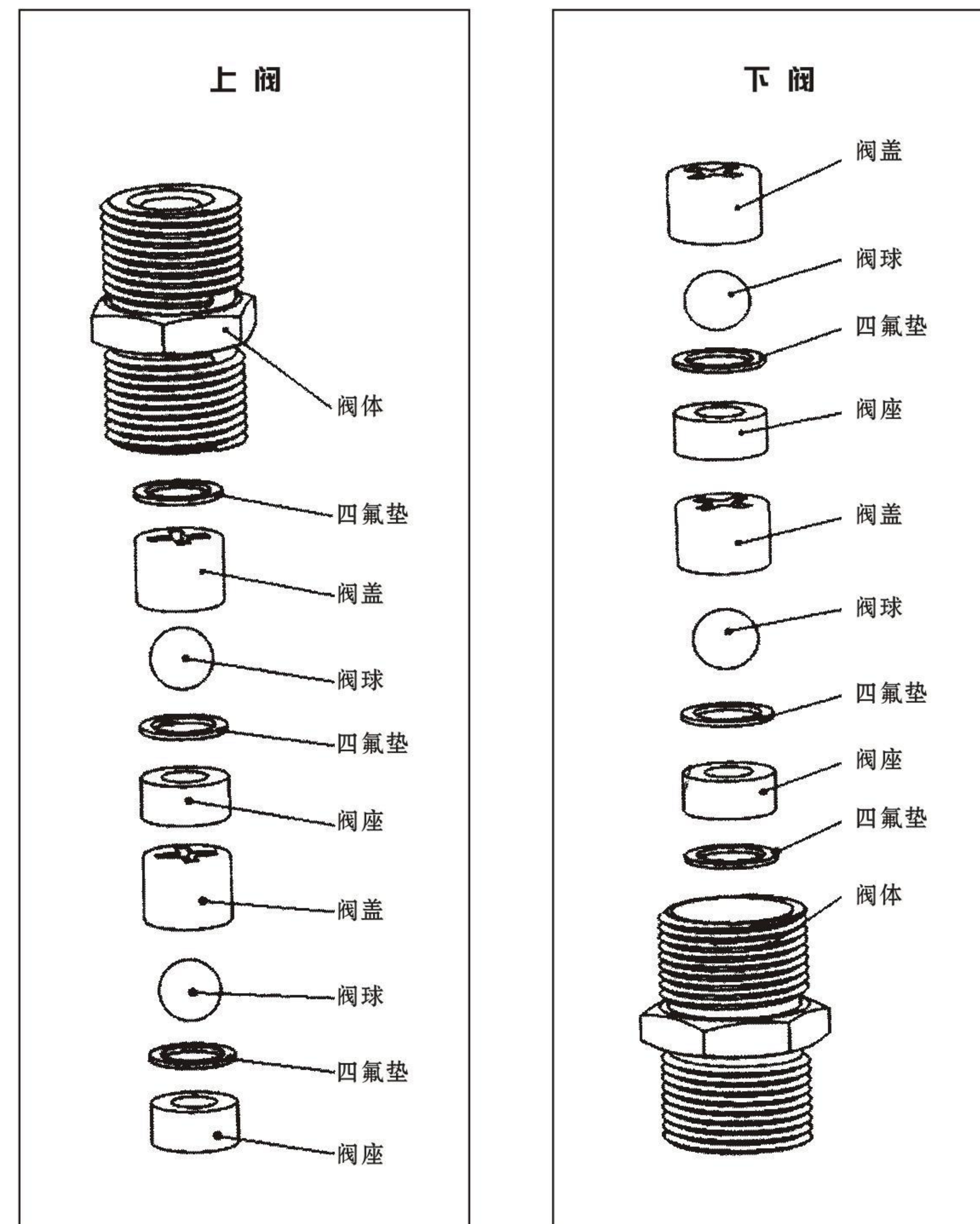
### ①HY<sup>-X</sup><sub>-Z</sub> series assembly diagram



八、HY<sub>-Z</sub><sup>-X</sup>装配图对应明细表

序号	零件名称	件数	序号	零件名称	件数
1	主轴	1	20	圆螺帽	1
2	偏心轮	1	21	泵头接头	1
3	滚轮	1	22	泵体	1
4	连杆	1	23	过载阀	1
5	蜗杆	1	24	排水阀总成	1
6	蜗轮	1	25	进水阀总成	1
7	顶杆	1	26	泵头底座	1
8	调节器	1	27	柱塞	1
9	调节杆	1	28	膜片底座	1
10	手轮	1	29	膜片	1
11	轴承	1	30	泵头	1
12	调节底板	1	31	泵头螺栓	6
13	调节螺丝	1	32	传动接	1
14	油封	1	33	电机座	1
15	油封压板	1	34	电机	1
16	联接螺帽	1	35	螺栓	4
17	填料并帽	1	36	放气螺丝	1
18	填料压板	1	37	补油阀	1
19	填料	1组	38	密封圈	1

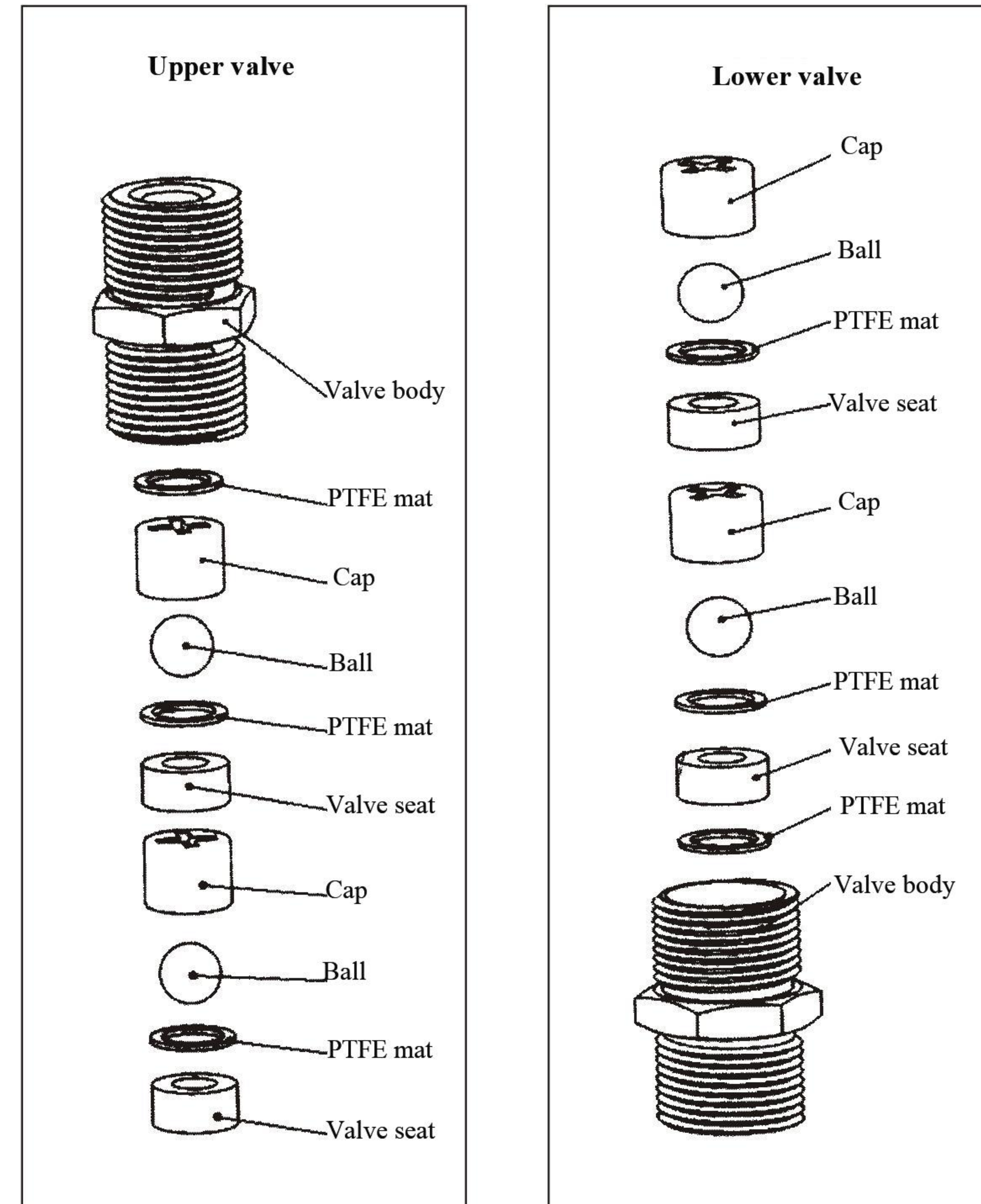
九、HY系列单向阀总成及装配结构图



8. HY  $\frac{-X}{-Z}$  series assembly drawing corresponding list

No	Part name	PC	No	Part name	PC
1	Main shaft	1	20	Round nut	1
2	Eccentric wheel	1	21	Pump head connector	1
3	Roller	1	22	Pump body	1
4	Connecting rod	1	23	Overload valve	1
5	Worm rod	1	24	Drain valve assembly	1
6	Turbine	1	25	Inlet valve assembly	1
7	Knockout pin	1	26	Pump head base	1
8	Adjustor	1	27	Plunger	1
9	Adjust rod	1	28	Diaphragm base	1
10	Handwheel	1	29	Diaphragm	1
11	Bearing	1	30	Pump head	1
12	Adjust bottom plate	1	31	Pump head bolt	6
13	Adjustment screw	1	32	Transmission connection	1
14	Oil seal	1	33	Motor base	1
15	Oil seal plate	1	34	Motor	1
16	Connection nut	1	35	Bolt	4
17	Filler cap	1	36	Bleed screw	1
18	Filler plate	1	37	Oil supplement valve	1
19	Filler	1 set	38	Sealing ring	1

9.HY series one-way valve assembly and assembly structure diagram



十、故障原因分析及排除方法

序号	故障	原因	排除方法
1	完全不排液	1、吸入高度太高 2、吸入管道阻塞 3、吸入管道漏气	1、降低安装高度或减少弯头阀门 2、清洗疏通吸入管道 3、压紧或更换法兰垫片
2	排液量不够	1、吸入管道局部阻塞 2、吸入或排出阀内有杂物卡阻 3、充油腔内有气体 4、充油腔内油量不足或过多 5、补偿阀或过载阀漏油 6、泵阀磨损，关闭不严 7、转数不足	1、清洗疏通吸管道 2、清洗吸排阀 3、人工补油使安全阀跳开排气 4、经补偿并作人工补油或排油 5、对阀进行研磨 6、修理或更换阀件 7、检查电机和频率
3	排出压力不稳定	1、吸入或排出阀内有杂物卡住 2、液压隔膜式限制板或排出管连接处漏油 3、过载阀或补偿阀动作失灵	1、清洗吸排阀 2、拧紧连接外螺钉 3、按安全阀补偿阀组的调试方法进行调整
4	计量精度不够	1、充油腔内有残余气体 2、过载阀或补偿动作失灵 3、柱塞密封漏液 4、液压隔膜式片发生永久性变形 5、吸入或排出阀磨损 6、电机转速不稳定	1、经较长时间运营后气体自然排净 2、补偿阀堵塞或过载阀弹簧折断，检查修正后按过载阀补偿阀组的调试方法进行调整 3、更换缸套与活塞环 4、更换液压隔膜式片 5、更换新件 6、稳定电源频率和电压
5	运转中有冲击声	1、传动零件松动或严重磨损 2、吸入高度过高 3、吸入管道漏气 4、液压隔膜式腔内油量多 5、介质中有空气 6、吸入管径太小	1、拧紧有关螺丝或更换新件 2、降低安装高度 3、压紧吸入法兰 4、轻压补偿作人工瞬时排油 5、排出介质中空气 6、增大吸入管径
6	输送介质油污染	1、液压隔膜式片破裂	1、更换新件

10.Failure analysis and troubleshooting.

NO.	Fault feature	Fault reason	Elimination method
1	Completely drain	1.Inhaled height is too high 2.The suction piping jams 3.The leak of the suction piping	1. Reduce the installation height or reduce the elbow valve 2. Clean and unblock the suction pipe 3. Tighten or replace flange gasket
2	Liquid discharge amount is not enough	1. Partial blockage of the suction pipe 2. There are debris jams in the suction or discharge valve 3. There is gas in the oil-filled cavity 4. The amount of oil in the oil filled cavity is insufficient or excessive 5. Oil leakage from compensation valve or overload valve 6. The pump valve is worn and closed tightly 7. Insufficient revolutions	1. Clean and dredge the suction pipe 2. Clean the suction and discharge valve 3. Manual oil replenishment makes the safety valve open and exhaust 4. After compensation and artificial oil replenishment or oil drainage 5. Grind the valve 6. Repair or replace valve parts 7. Check the motor and frequency
3	Discharge pressure instability	1. There is debris stuck in the suction or discharge valve 2. Hydraulic diaphragm restricting plate or discharge pipe, oil leakage at the connection 3. Overload valve or compensation valve action failure	1. Clean the suction and discharge valve 2. Tighten the connecting outer screws 3. Adjust according to the debugging method of the safety valve compensation valve group
4	Measurement accuracy is not enough	1. There is residual gas in the oil-filled cavity 2. Overload or compensation action failure 3. The plunger seal leaks 4. Permanent deformation of hydraulic diaphragm 5. Wear of suction or discharge valve 6. The motor speed is unstable	1. After a long period of operation, the gas is naturally exhausted 2. The compensation valve is blocked or the overload valve spring is broken. After inspection and correction, adjust according to the debugging method of the overload valve compensation valve group 3. Replace the cylinder liner and piston ring 4. Replace hydraulic diaphragm 5. Replace with new parts 6. Stable power frequency and voltage
5	An impact sound while running	1. The transmission parts are loose or severely worn 2. The suction height is too high 3. Air leakage in the suction pipe 4. There is a lot of oil in the hydraulic diaphragm cavity 5. There is air in the medium 6. The suction pipe diameter is too small	1. Tighten the relevant screws or replace with new ones 2. Reduce the installation height 3. Tighten the suction flange 4. Light pressure compensation for manual instantaneous oil discharge 5. Discharge the air in the medium 6. Increase the suction pipe diameter
6	Transport medium, oil pollution	1. The hydraulic diaphragm ruptures	1. Replace with new parts