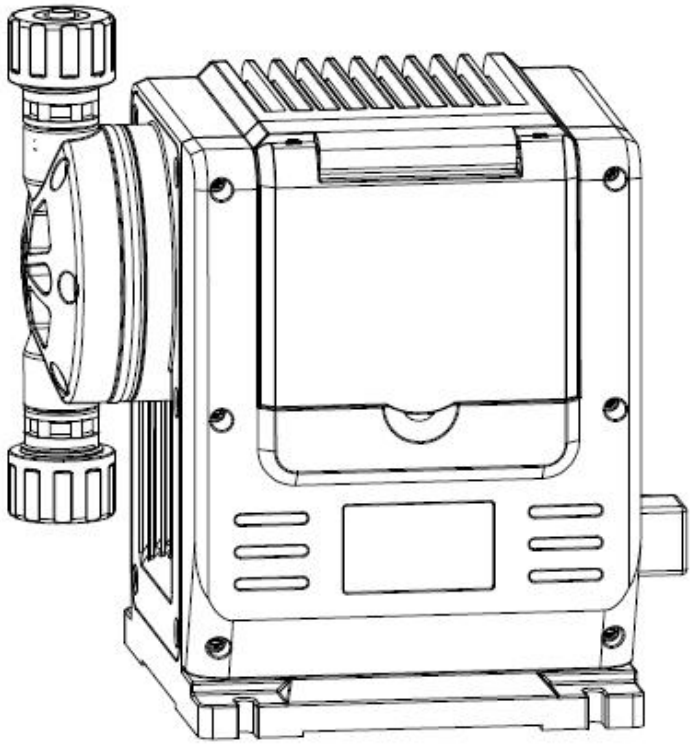
DMA Digital Metering Pump Manual



Please read and understand all precautions carefully before installation and use!

Cautions

1. The setting of the control system must refer to the instruction manual, and must be completed by professionals with corresponding qualifications.

2. Before starting up, make sure that the metering pump outlet pipe is unobstructed (the valve is fully open), otherwise the metering pump and related pipes will be damaged.

3. The diameter of the inlet and outlet pipelines of the pump must be greater than or equal to the standard diameter of the corresponding metering pump.

4. Make sure that the metering pump outlet pipe pressure is higher than the inlet pipe pressure. If the outlet pipeline pressure is lower than the inlet pipeline pressure, a back pressure valve must be installed at the metering pump outlet.

5. Before shutting down the system, shut down the metering pump before closing the outlet valve.

6. When welding stainless steel pipes, do not drop welding slag or debris into the pipeline and valve body. Foreign matter falling into the metering pump may cause a series of problems such as liquid not coming out of the metering pump. In serious cases, it may cause damage to the metering pump.

Equipment Installation Quick Guide

1. Before installing the metering pump, the user must verify whether the piping system is compatible with the pump, and determine the size of the front and rear pipe diameters of the pump. Full consideration should be given to the pump's peak flow, medium viscosity, and pipeline characteristics.

2. Before the pump is connected to the pipeline, ensure that there are no welding slag, debris, and blockage in the pipeline.

In order to prevent foreign matter from being sucked into the pump cavity, it is recommended to install a filter on the suction side of the pump, and also install corresponding shut-off valves and pipe joints for inspection and cleaning.

3. The installation of the pump is recommended to be self-filling, that is, the pump's feed inlet should be lower than the minimum level of the liquid storage irrigation; if a lifting installation is required, a bottom valve should be installed at the suction pipe of the pump.

4. It is recommended to install a pulse damper in the outlet pipe of the pump to ensure the uniform flow rate of the medium, reduce the damage to the pipeline caused by the pulse of the medium, and install corresponding safety valves to prevent abnormal pressure in the pipeline.

5. Signal wiring must refer to the instruction manual and be completed by qualified professionals.

6. Before using the pump, following items must be checked:

→ Check whether the piping system is normal;

→ Check if the valve is open;

→ Check if the input power matches the drive motor of the pump;

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

→ Start metering pump;

→ Slowly adjust the stroke to 100%;

→ Identify the pump for noise or other abnormalities;

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

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

→ Stop / start the metering pump 3-5 times repeatedly, run for 3-5 minutes each time;

→ After determining that there are no abnormalities, operate and use the pump normally.

7. For abnormalities or failures during operation, please refer to the relevant content of this manual for judgment or telecommunications after-sales service;

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

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1. Overview

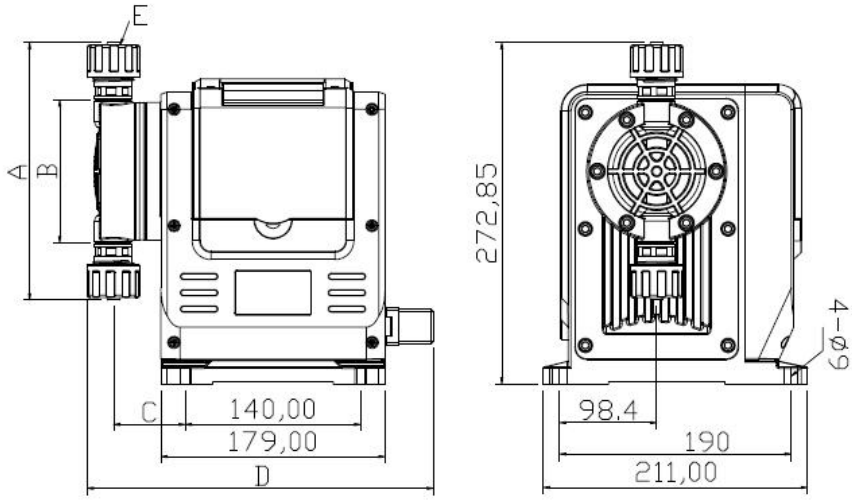
Our company is a professional manufacturer integrating R & D, manufacturing and sales of high-quality metering pumps. The company's leading products are: mechanical diaphragm metering pumps, electromagnetic diaphragm metering pumps, plunger metering pumps, hydraulic diaphragm metering pumps, rotor pumps, automatic dosing devices, and complete sets of equipment.

The DMA digital metering pump can transport corrosive or non-corrosive media such as solid particles and other materials with a temperature of -15 ℃ ～ 60 ℃ and a viscosity of 0.3 ～ 1000cps. The flow rate of the pump is in the range of 15 ~ 120L / h, and the corresponding maximum output pressure is 10 bars. The pump is adjustable from 0% to 100%. In the range of 30% to 100% flow rate, the steady-state accuracy is ± 1%. It is a metering pump with simple structure, low energy consumption and accurate metering. Widely used in petroleum, chemical, food, pharmaceutical, paper-making, light industry, agriculture, water plant environmental protection and other industrial and scientific and technological departments. Different liquid end materials are selected according to different media requirements. The standard configuration is PVC material, and the selected configuration is SS304, SS316, PVDF and other materials.

2. Structural Principle and Technical Parameters

DMA digital metering pump consists of control system, drive motor, transmission end and hydraulic end. The motor drives and drives the eccentric shaft to rotate through gear deceleration. The eccentric shaft drives the ejector rod and pushes the diaphragm to reciprocate. The flow is changed by changing the stroke. The hydraulic end automatically works to convey liquid through the suction and discharge valve group. (For the dimensions, see Figure 1).

Dimension（Figure 1）



Model	A	B	C	D	E
					6x10 PE Hose
DMA	205.7	114	57.3	276.3	DN15 Glue union

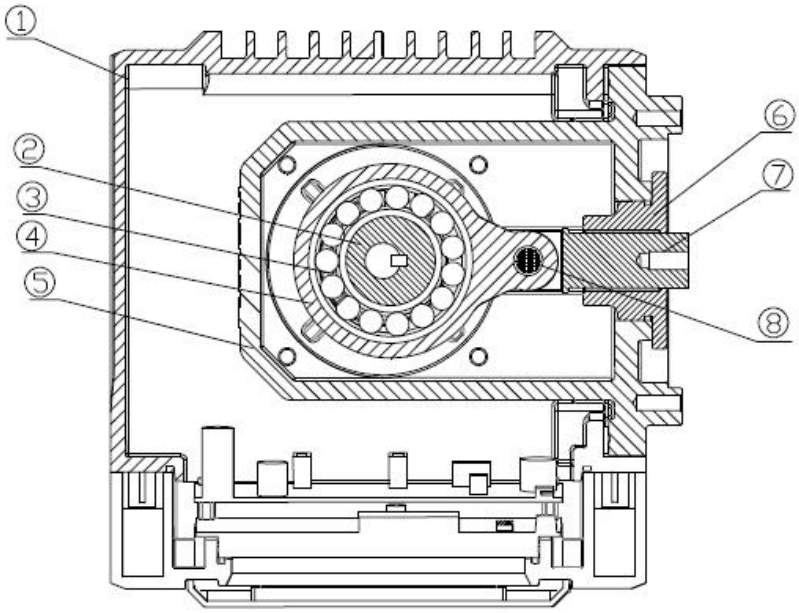
2.1 Drive End Structure and Principle

2.1.1 Drive End Structure (Figure 2)

The drive end consists of control system, motor, housing, eccentric shaft, rolling bearing, connecting rod, casing, mandril sleeve, mandril, pin and other components.

2.1.2 Working Principle

The eccentric shaft (2) is driven by the supporting motor, and the connecting rod (4) is driven, and the mandril rod (7) is driven by pins to provide power for reciprocating motion.



Drive end structure diagram (Figure 2)

1. housing 2. eccentric shaft 3. rolling bearing 4. connecting rod 5. casing 6. mandril sleeve 7. mandril 8. pin

2.2 Hydraulic End Structure and Principle (Figure 3)

2.2.1 Hydraulic End Structure

The hydraulic end is one of the important components of a metering pump. It consists of a pump head, a diaphragm, and an inlet and outlet check valve.

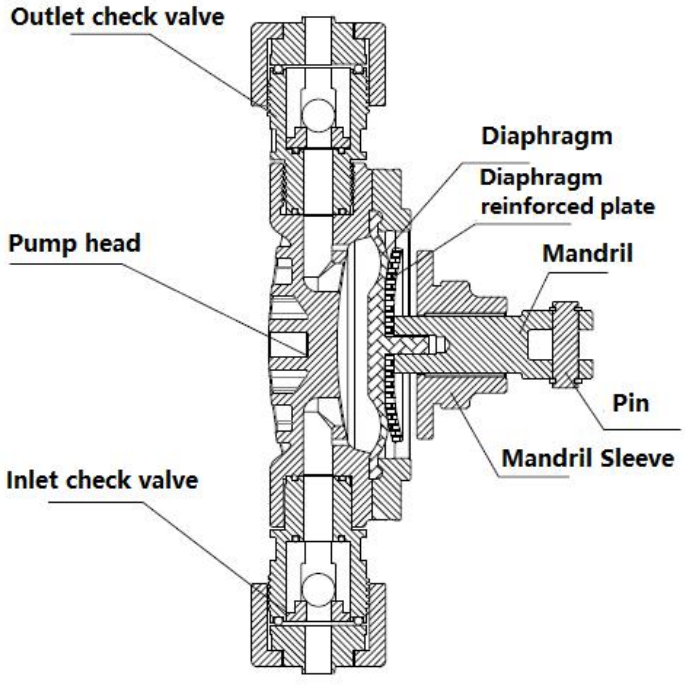
The diaphragm used by our company is a five-layer composite structure. (The first layer of PTFE, the second layer of elastic rubber, the third layer of the support core, the fourth layer of reinforced nylon fiber cloth, and the fifth layer of elastic rubber completely covered), which can effectively improve the service life of the diaphragm. The addition of a stainless steel reinforcement plate design behind the diaphragm also increases the life of the diaphragm.

The check valve for the inlet and outlet of the pump head mainly adopts a ball valve structure. With the opening and closing movement of the ball valve, the ball continuously rotates, thereby achieving self-cleaning of the contact surface of the valve group, and ensuring that the metering pump has a good accuracy.

The inlet and outlet check valves are detachable, and each part of the valve group is easy to disassemble, clean and replace.

2.2.2 Working Principle

The diaphragm assembly and the mandril rod are threaded, and perform linear reciprocating motion simultaneously with the mandril rod. During the suction stroke, the diaphragm begins to move backwards, and the pressure in the pump head decreases. When the pressure in the pump head is lower than the pressure in the suction line, the ball of the check valve at the inlet is pushed up, and the medium in the inlet line is sucked into the pump head chamber under the effect of negative pressure. When the suction stroke is over, the inlet check valve ball resets. During the discharge stroke, the diaphragm begins to move forward, at this time the inlet check valve is closed, and the pressure in the pump head immediately increases. The internal pressure increases, the check valve ball of the discharge port is "pushed away" upwards, and the medium in the pump head is sent into the outlet pipe. When the discharge stroke ends, the check valve ball of the outlet is reset. Then start the next cycle.



Schematic diagram of the hydraulic end (Figure 3)

3. Open Box Inspect

⚠ **After the equipment arrives at the station, it must be carefully unpacked and inspected:**

- 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 corrosion and damage. If there are obvious defects, you must contact the dealer immediately;
- Check the completeness of spare parts, spare parts, manuals, etc. against the packing list, and hand over the spare parts that do not need to be installed to prevent loss;

4. Installation

4.1 Ground

- When choosing an installation location and designing a chemical feed system, consider providing access to routine maintenance. The pump can be used indoors or outdoors, but a hood or cover should be used when running outdoors. When the pump is placed at an ambient temperature below 0 ° C, the pump is not allowed to start frequently. A detachable electric heater with an insulated casing should be installed on the pump and the mounting base to make the pump oil temperature higher than 0 ° C. The pump should be fixed on a solid and flat foundation to minimize vibrations, otherwise it may cause loose connections. The foundation should be higher than the ground to avoid being washed by water. The horizontal deviation of the pump should be guaranteed within 1 ° to ensure the normal operation of the check valve.

4.2 Piping Installation

4.2.1 General Rules

1. The weight of the pipeline cannot be supported by the valve or the pump head component, because the stress may cause leakage, the pipeline should be fixed by another stand.
2. When selecting pipeline materials, care should be taken to prevent chemical corrosion of the seals at the hydraulic end connection of the pump.

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 viscous liquid, the pipe diameter of the viscous liquid pipeline should be larger than the pump inlet and outlet diameter.

5. Remove burrs, sharp edges and dross in the pipeline, and clean the pipeline before the pump and pipeline are finally connected to ensure that there is no debris in the pipeline.

6. For the connection of pipes such as plastic or PVC, in order to reduce the stress of the pipes, a flexible connection method should be adopted.

7. When transporting hot fluids, expansion joints should be used, and the pipelines should be supported to avoid the pump from overloading.

8. When transporting fluids containing suspended solids, "U" -shaped vertical pipelines should be avoided to prevent blockage of media sedimentation, and a tee with a cock must be installed at a 90-degree pipeline bend so that the pipeline can be removed Flush the tubing.

4.2.2 Suction Line

1. The suction line is best to be arranged in a reverse-filling manner so that no gas remains in the pump cavity during the suction process to ensure the metering accuracy of the pump.This is especially for suction lines that transport high-viscosity and liquefied gas media.

2. A filter should be used on the suction line to prevent foreign particles from entering the liquid cavity and prevent scaling and blockage in the suction and discharge valves and increase maintenance-free use time. Filters should be checked regularly to prevent blockages that could cause damage to the metering pump.

3.Make the suction pipe as short and straight as possible, avoid excessive bending arrangements, and use large radius turns to reduce the loss of pipeline resistance. "Ω" layout is prohibited to prevent the top air from affecting the normal delivery of the pump.

4. The suction pipe should be absolutely sealed to ensure the pump's metering accuracy. Compressed air and soapy water can be used to check the seal of the suction pipe.

4.2.3 Discharge Line

1. The discharge pipe diameter of the pump should meet the principle of "equal to or larger than 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 line should not be greater than the rated pressure on the pump nameplate.

2. The pump can effectively control the output flow only when the pressure of the discharge line is greater than the pressure of the suction line. The method of increasing the positive pressure difference can be a back pressure valve.

4.2.4 Configuration of a Typical Piping System

In order to ensure the normal delivery and measurement accuracy of the metering pump, to protect the safety of the pipeline and facilitate the maintenance of the equipment, it is recommended to configure the following valves and meters in the suction and discharge pipelines, which are typical pipelines (see Figure 4).

Various common pipeline accessories are introduced as follows:

※ Pulsation damper

Instantly absorb pulses to obtain smooth flow and pressure, smooth 90-95% pulses, and reduce vibration and noise in the pipeline. The use of pulsation damper and back pressure valve at the same time can improve the impact of rapid opening / closing of the back pressure valve and reduce valve wear.

※ Back pressure valve

A device for increasing pipeline pressure. When the pressure at the dosing point is lower than the inlet pressure of the metering pump, a back pressure valve must be installed at the exit of the metering pump to reduce siphoning and backflow and ensure that the metering accuracy of the pump is not affected.

※ Safety valve

In order to prevent the pump, pipeline or other equipment from being damaged due to the blockage of the discharge pipeline, a safety valve should be set on the discharge pipeline of the pump to obtain maximum safety and reliability of the system. The opening (take-off) pressure of the safety valve should be 1.25-1.3 times higher than the actual maximum pressure of the pump. 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 if the valve is accidentally closed). The outlet of the safety valve must be connected back to the storage tank or other auxiliary storage tank, and ensure that the operator can observe the release of the safety valve.

※ Non-return valve

When the discharge pressure of the system is high, a non-return valve should be provided. This valve will prevent back-flow of liquid from the discharge line and isolate the discharge end of the pump from the system pressure.

※ Shut-off valve

Stop valves are installed near the pump's suction and discharge pipelines to facilitate maintenance of the pumps and pipelines.

※ Filter

It is used to filter impurities or large particles in the conveying medium and 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 pipe of the pump, and its over-flow diameter should be larger than the inlet diameter of the pump to avoid cavitation or outflow at the inlet end. Commonly used are Y-type filters and basket filters.

※ Pressure gauge

Used to detect the operating pressure of the pump discharge line. A stop valve should be installed at the inlet of the pressure gauge to adjust the flow rate into the pressure gauge to prevent damage to the pressure gauge due to pulsating shock. It is recommended to use shockproof pressure gauges and corrosion-resistant pressure gauges.

5. Start-up

5.1 Fastener Inspection

All fasteners should be inspected before the pump is started. Fasteners include pump head mounting bolts, and connectors that secure the pump to the foundation, checking for looseness.

5.2 Calibration

All metering pumps must be calibrated to precisely set the stroke length to the required flow. The table above is a typical calibration table. Although the stroke length setting is linear with the output, an increase in outlet pressure will reduce the output flow, drawing a series of parallel lines, one for each pressure (only two are shown in the table). The theoretical output flow when the outlet pressure is atmospheric pressure depends on the diaphragm size, the stroke length of the pump and the number of strokes. When the

outlet pressure increases, the output flow will decrease accordingly. The pump has a rated flow at rated pressure (see the nameplate). Calibration should be performed under practical operating conditions as far as possible (ie using the same or similar process fluids under system operating pressure). To create a calibration table, you need to measure the flow multiple times at three or more stroke settings (ie 25, 50, 75, and 100), take the average, draw these values on a line drawing, and place the values A closest approximation curve is connected between them. Under the same conditions, this curve can be used as a basis for adjusting the required flow.

6. Troubleshooting

Common faults and troubleshooting:

Trouble	Cause Analysis	Solution
Pump does not start	Power failure	Check power
	Fuse blown, circuit interrupted	Eliminate overload, replace fuse
	Disconnected	Find and handle the location of the break
	Incorrect wiring	View wiring diagram
	Blocked pipe	Open the valve and clean the blockage
No flow	Motor not run	Check the wiring
	Tank empty	Fill the tank
	Pipe blocked	Clean and flushing the pipe
	Pipe valve shut-off	Open the valve
	Check valve blocked	Clean the check valve
	Cavitation	Increase suction pressure
	Priming problem	Re-priming
	Filter blocked	Remove and clean,replace the filter if
Low flow	Non-return valve wear	Clean or replace non-return valve
	Incorrect calibration	Calibration correctly
	Viscosity too high	Reduces viscosity and increases pipe size
	Cavitation	Increase suction pressure, reduce suction height, install foot valve
Flow unstable	Suction pipe leakage	Find out where the leak is and deal with it
	Cavitation	Increase suction pressure
	Liquid with air	Consult the manufacturer
	Check valve clogged	Clean, replace if damaged
Flow above rated value	Inlet pressure is higher than outlet pressure	How to install a back pressure valve or consult the factory for pipe laying
	Back pressure valve is set too low	Increase the set pressure
	Back pressure valve leaks	Repair, clean or replace
Motor over heating	Pump overload	Verify pump technical parameters
	Voltage not stable	Check power
	Wiring loose	Find out where the looseness and fix

7. Maintenance and Repair

Before disassembling the pump head or valve (hydraulic end) for maintenance, please ensure that the piping system has been depressurized, especially in the working conditions of transporting corrosive, flammable and explosive dangerous media, and proper cleaning must be performed to protect people And environmental safety, wear protective clothing and use protective equipment if necessary.

The accurate record of the pump's early operation will reflect the basis for the pump's maintenance parts under the corresponding operating conditions. The maintenance plan based on this record can reduce the incidence of operating failures. Hydraulic ends (such as diaphragms and check valves) have different service life due to different working conditions and different media, so each metering pump must be considered according to its specific working conditions.

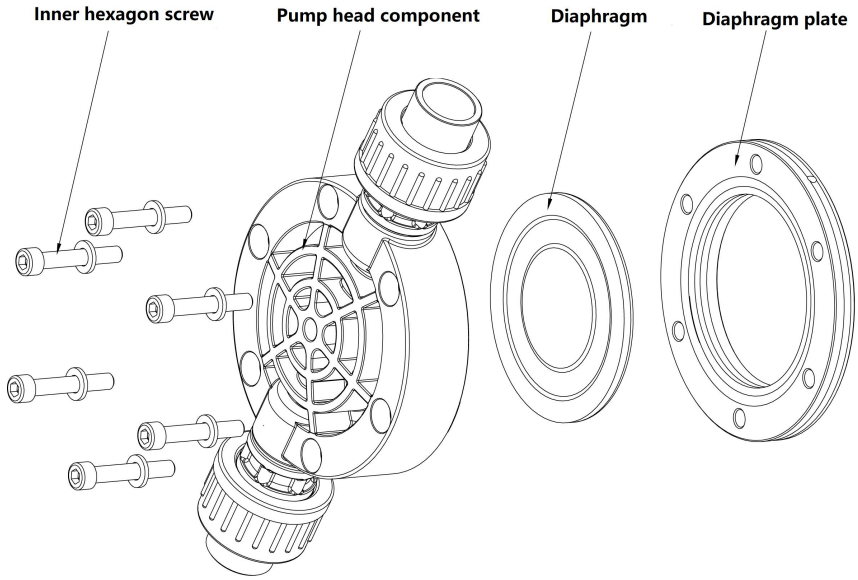
Pump spare parts In addition to daily maintenance, the recommended wearing parts are: diaphragm, seal ring, check valve assembly, etc.

7.1 Replace the Diaphragm (Figure 4)

If the diaphragm fails, the pumped media may have contaminated the pump and the environment, so handle it carefully.

The diaphragm does not have a fixed service life, but the debris and material accumulation can cause the diaphragm to deform and rupture, eventually causing system failure. System over-voltage or chemical corrosion can also cause malfunctions. Regular inspection and replacement of the diaphragm is recommended. Users check regularly to determine the appropriate maintenance intervals based on their system conditions.

Replace the diaphragm (Figure 4)



- Disconnect drive motor power.
- Relieve all pressure from the piping system.
- Close the inlet and outlet shut-off valves.
- Place a basin at the bottom of the pump head to contain the leak.
- Disconnect the pipe from the pump head and drain all media in accordance with material safety measures.
- Remove all screws leaving only one screw on top of the pump head. The medium leaks from the pump head when the screws are loosened.
- Tilt the pump head to pour the remaining media from the check valve into a suitable container.
- Remove the remaining screw, remove the pump head assembly, and flush or clean the pump head with a suitable medium.

7.2 Check Valve

7.2.1 Overview

Most flow problems are related to check valves. Problems are usually caused by the accumulation of particles between the check valve and the valve seat, corrosion of the valve seat surface, wear of the valve seat and ball, or foreign matter.

Check valves include ball, valve body and valve seat. In the flow direction, lift the valve

ball from the valve seat to allow the medium to flow through the valve body. When flowing in the opposite direction, the liquid presses the valve ball back to its original position, and the sharp edges of the valve ball and the valve seat serve as a seal. The ball is allowed to rotate, but the vertical and lateral movement of the ball is restricted to reduce "Back flow" or counter current. The rotation of the valve ball uniformly wears the entire ball surface, thereby increasing the service life. Since the ball relies on gravity, the check valve must be in the vertical position to operate normally.

7.2.2 Check Valve Disassemble

The check valve is a cartridge design and should be replaced as a component

- Remove power from the motor.
- Relieve pressure in all piping systems.
- Take necessary precautions to prevent dangerous media from polluting the environment or causing damage to humans.
- Close the inlet and outlet shut-off valves.
- Remove the pipe joint connected to the suction end.
- Loosen and remove the inlet check valve assembly, drain the medium from the pump head; and place each part of the valve in the correct order.
- Remove the pipe joint connected to the discharge end.
- Loosen and remove the outlet check valve assembly, drain the residual medium, and place the valve parts in the correct order.
- Carefully clean and remove the accumulation in the valve, check the wear of the valve ball, valve seat, etc., and correct or replace it if necessary.
- Reinstall the check valve assembly (reverse assembly in the order in which they were removed).
- Reconnect to the piping system.

8. Storage

8.1 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 dry and ventilated normal greenhouse, and do not leave it in a humid environment for a long time;

※ Take precautionary measures to isolate from the outside world, such as: adding an isolation protective film to the original packaging;

8.2 Long-term Storage

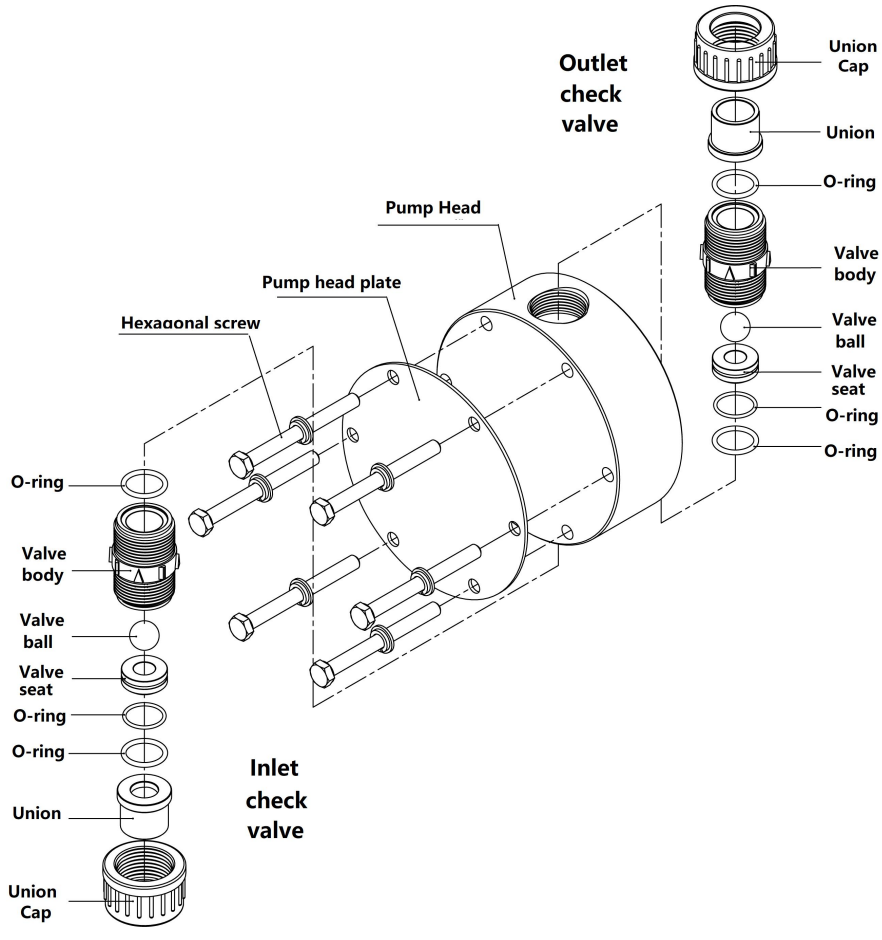
In addition to observing the above short-term storage precautions, you should also energize the motor every 12 months and allow the pump to run for at least one hour (you must add lubricant before running).

After 12 months of storage, the pump does not include parts that age over time, such as seals, diaphragms, and wet motors.

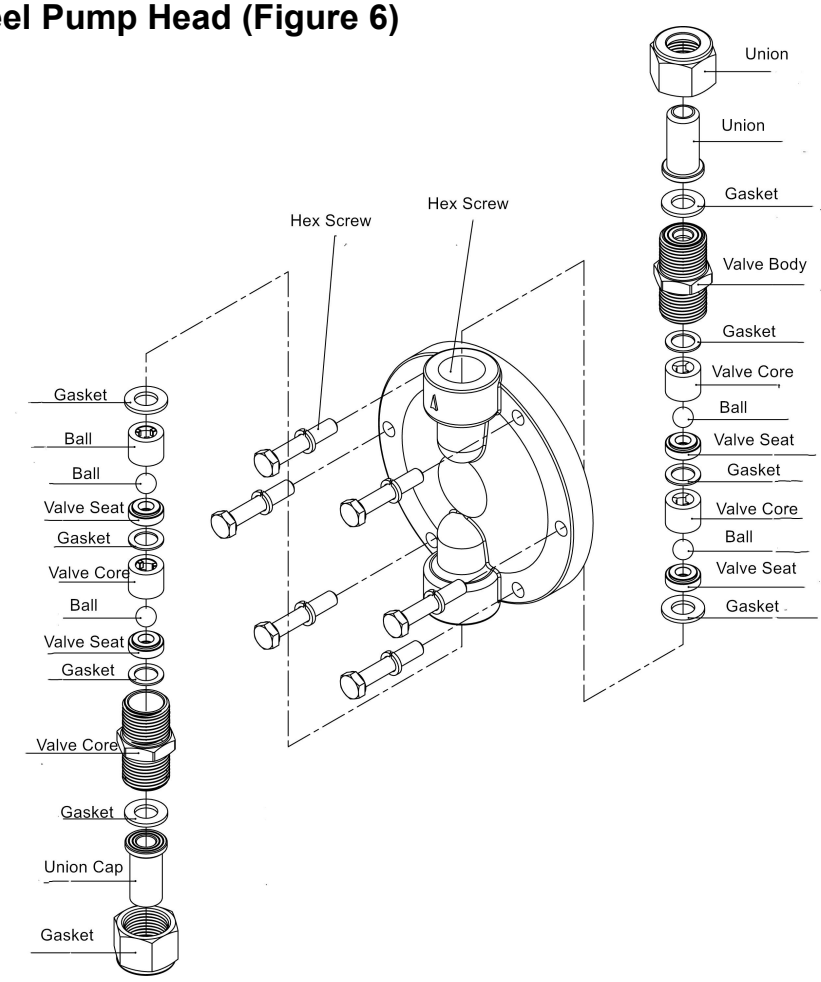
If the pump is stored for more than 12 months, the above-mentioned parts subject to aging and moisture must be checked and replaced before starting the equipment. The cost of such replacement shall be borne by the purchaser.

9. Parts List

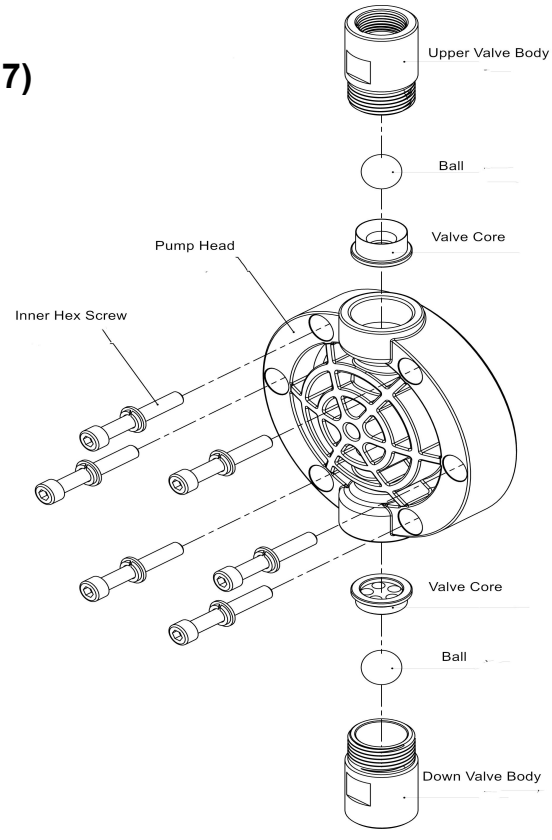
PVC Pump Head (Figure 5)



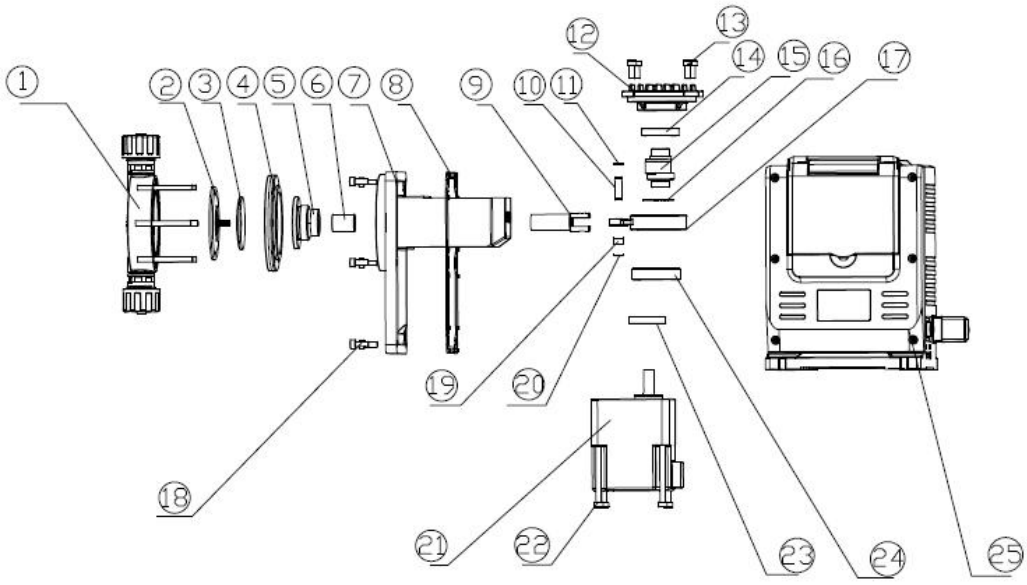
Stainless Steel Pump Head (Figure 6)



PVDF Pump Head (Figure 7)



DMA Parts Drawing (Figure 8)

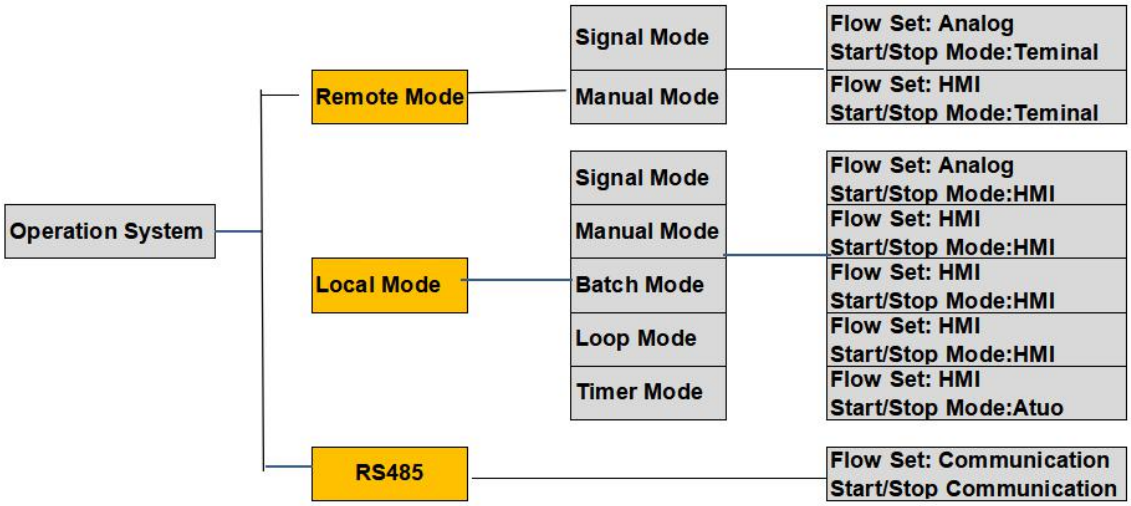


No.	Parts Name	No.	Parts Name
1	Pump head sets	14	Deep groove ball bearing
2	Diaphragm	15	Eccentric shaft
3	Reinforcing plate	16	Shaft clip
4	Diaphragm liner	17	Connecting rod
5	Mandril sleeve	18	Bolt
6	Composite bearing	19	Composite bearing
7	Pump body	20	Shaft clip
8	Gasket	21	Motor
9	Mandril	22	Bolt
10	Pin	23	Deep groove ball bearing
11	Shaft clip	24	Deep groove ball bearing
12	Upper bearing seat	25	Housing
13	Bolt		

10. Setting

10.1 System Diagram

The system operation mode and operation mode block diagram are as follows. For detailed operation, please refer to the user parameter section.



10.2 Display Instruction and Settings

10.2.1 Monitor Screen

① Manual: Pump local ON / OFF operation knob. This button is effective in local operation mode. The button points to “ON” to start the pump. The button points to “OFF”to stop the pump. Click the knob in manual mode to switch the working state of the pump.

② Local: Pump operation mode indication. The system operation mode is divided into manual mode, automatic mode, timer mode, loop mode and batch mode.

③ Local: Operation mode indication. The system operation mode is divided into local operation mode, remote operation mode and RS485 communication mode.

④ Analog/Flow: The system simulates the converted flow based on the real-time speed of the motor in L / H.

⑤ Pressure: external analog signal display.System preset unit is pressure (Bar) display and liquid level (M) display.It can be switched on the "User Settings" screen.

⑥ Total: The system accumulates the flow in real time, the unit is L.

⑦ Set Up: Click the button to pop up a dialog window, enter the password correctly, and enter the user settings.

⑧ System status display bar: Scroll to display system status in real time.

⑨ Current time display: If there is a deviation in time, it can be corrected through the "Set Up" screen.

10.2.2 User Dosed Flow Setting

In the “Monitoring Screen”, click “Analog”.The dialog box for the user to add traffic shown in the figure above will pop up.

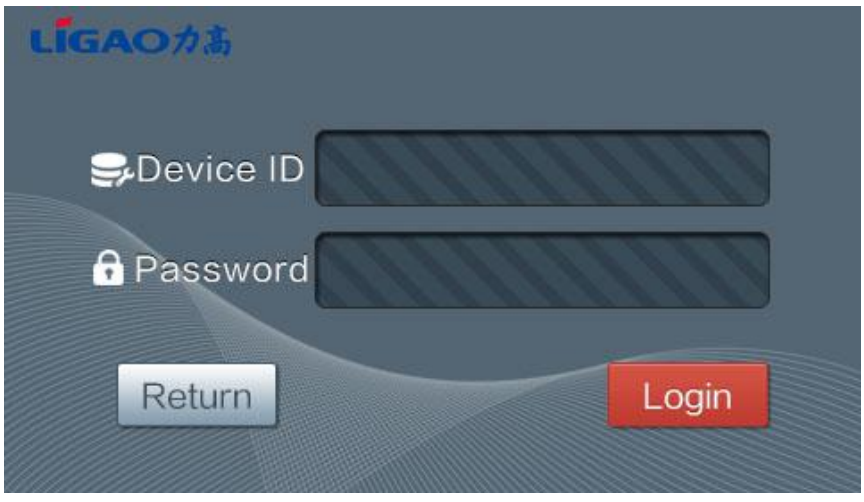
① Dosed Flow: Set the flow needed, the unit is L / H.

② Password: Click the password box, the keyboard pops up, enter the password (factory default 0000), click "Enter" to save.

③ Return: Return to the “Monitor Screen”.

④ Save: If the password is correct after you click, the current setting is saved. If the password is incorrect, it cannot be saved.

10.2.3 Login Dialog Window



Click "Set Up" to enter the login dialog window shown above. Enter the password correctly to enter the "Set up" screen

① Device ID: Factory curing parameters, cannot be modified.

② Password: Click the password box, the keyboard pops up, enter the password (factory default 0000), click "Enter" to confirm, you can modify the password on the "Set Up" screen.

③ Return: Return to the “Monitor Screen”.

④ Login: Enter the password correctly, and click to enter the "Set Up" screen.

10.2.4 User Parameter Screen

① Run Mode: The switch points to “Manual” for manual mode, and the switch points to “Signal” for automatic mode. Click this switch to switch the run mode.

② Start Mode: The switch points to “Remote” for remote operation mode, and the switch points to “Local” for local operation mode. Click the switch to switch the operation mode.

③ Signal Type: switch points to "voltage" for 0-5V voltage input, switch points to "Analog" for 4-20mA current input. This function is only available in automatic mode. (The current system only supports 4-20mA analog type)

④ RS485: Press the switch to point to "ON", the RS485 communication is turned on. The switch is pointed to close, the RS485 communication is turned off.

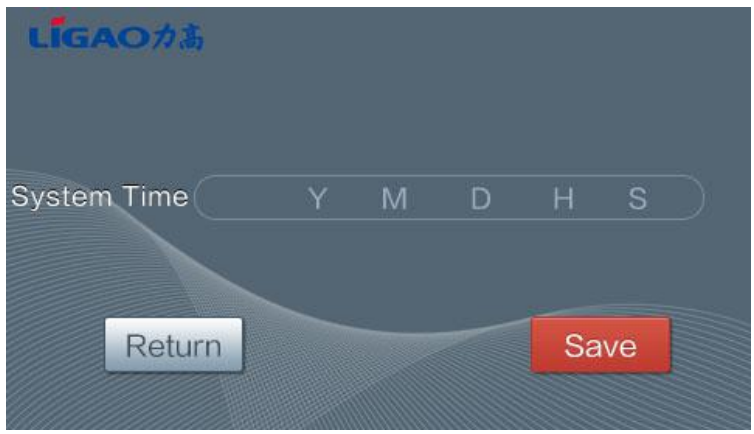
⑤ Return: Switch to "Monitor Screen".

⑥ Next: Switch to "User Parameter 2".

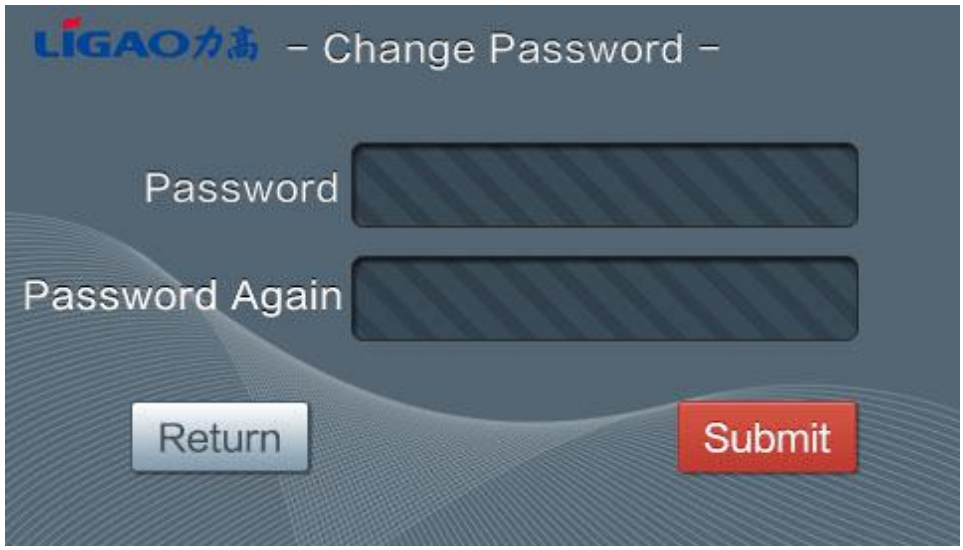
⑦ Save: Save the modified parameters.

⑧ English: Chinese and English switch button.

Set Up 2



① Time: Click to enter the "System Time" screen. In the "System Time" screen, select the correct date and time, click the "Save" button to correct the current time, and click "Return" to return to the previous screen.



② Change Password: Click to enter the "Change Password" screen, enter the new password on the "Change Password" screen, click Submit after the new password becomes effective, and click "Return" to return to the previous screen.

③ Press / Level: External analog channel display switch. The switch points to "pressure", and the system converts the external analog quantity into a pressure value to participate in the system control. The switch points to the "liquid level", and the system converts the external analog quantity into a liquid level value to participate in the system control.

④ 4-20mA Reverse: The switch points to "OFF", then the 4-20mA reverse is turned off, input 4mA pump run at 0% , input 20mA pump run at100%. The switch points to "ON", then 4-20mA reverse is turned on, input 4mA pump runs at100%, input 20mA pump runs at 0%.

⑤ Low level Alarm: When the switch is set to “Off”, the low level alarm function is turned off. When it is turned on, the low level alarm function is turned on. Click this switch to switch the low level alarm function (the low level signal is external source signal).

⑥ Loop: Click the "Loop" button to enter the setting screen. Click the "ON" and "OFF" switch to start and stop the loop mode function. The “Run Period” is the pump running period time during one cycle.For example, 2 minutes . "Stop Period" is the pump stop period time during one cycle, for example, 1 minute. Click the "Save" button. After starting the pump, the pump will running for 2 minutes, then stop for 1 minute, running for 2 minutes, then stop for 1 minute.This cycle continues.This function is only effective in local operation mode.

⑦ Timer: Click the "Timer" button to enter the setting screen. Click the "ON" and "OFF" switch to start and stop the time control mode function. "Start Time" is the time pump starts, such as 20 hours-10 minutes-30 seconds "Stop Time" is the time pump stops, such as 20: 30-30 minutes-00 seconds. After starting the pump, pump will run at time 20:10:30 and stops at time 20:30:30.It can set total 3 sets of time.This function is only effective in local operation mode.

⑧ Batch: Click the "Batch" button to enter the setting screen. Click the "ON" and "OFF" switch to start and stop the batch mode function. Set the accumulated flow value needed.The pump will stops after the accumulated flow is reached.

Calibr: If the actual measured flow does not match the set flow, click this button to enter the error adjustment value to calibrate.

Click in the input box to enter the difference, click the plus button above to add the current error value, and click the minus button below to subtract the current error value. (If the save is successful, switch back to the monitoring screen.)

⑨、Return: Go back and switch to "Monitor Screen".

⑩、Set Up: click to enter "Parameter Setting" screen.

⑪、Save: save the modified parameters.

10.2.5、Set Up

① Default Flow: Displays the flow rate calibrated at factory, the unit is L / H.

② Calibr Flow: Set the real calibrated flow in L / H.

③ Dosed Flow: Set the user dosed flow in need, the unit is L / H.

④ Device Code: Set Modbus communication machine code.

⑤ Baud Rate: Select the Modbus communication baud rate (9600/19200/38400).

⑥ Press Range: Set the range of the external pressure sensor.

⑦Level Range: Set the range of the external level sensor.

⑧ LL Alarm: Set the minimum liquid level according to the actual situation. When the liquid level reaches a low level, the pump will automatically stop and the system will alarm.

⑨ HH Alarm: Set the highest liquid level according to the actual situation. When the liquid level reaches a high level, the system will alarm.

⑩ LP Alarm: Set the minimum pressure value according to the actual situation. When the pressure reaches a low level, the system will alarm.

⑪ HP Alarm: Set the highest pressure value according to the actual situation. When the pressure reaches a high level, the pump will automatically stop and the system will alarm.

⑫ Save: Save the modified parameters.

⑬ Return: Return to the "User Parameters" screen.

10.3 Modbus communication address table

Each address space occupies 8 bits and one byte; each register is represented by two consecutive bytes.

HI ---- register high byte

LO ----Register low byte

Read-only area:

Address	Data	Range
2464	Switch State HI	0:OFF
	Switch State LO	1:ON
2466	Run Mode HI	0:Manual
	Run Mode LO	1:Signal
2468	Boot Mode HI	0: Local
	Boot Mode LO	1:Remote
2470	Signal Type HI	0:Voltage
	Signal Type LO	1:Current
2472	Pressure/Level HI	0：Pressure
	Pressure/Level LO	1：Level
2474	4-20MA Reverse HI	0：OFF
	4-20MA Reverse LO	1：ON
2476	Low Level HI	0：OFF
	Low Level LO	1：ON
2478	Baud Rate HI	0:9600
	Baud Rate LO	1:19200 2:38400
2480	Default Flow HI	
	Default Flow LO	
2482	Dosed Flow HI	
	Dosed Flow LO	

2484	Calibrate Flow HI	
	Calibrate Flow LO	
2486	Total Flow HI	
	Total Flow LO	

Writable Area：

Address	Data	Range
2512	Switch State HI	0:OFF
	Switch State LO	1: ON
2514	Run Mode HI	0: Manual
	Run Mode LO	1: Signal
2516	Run Mode HI	0: Voltage
	Run Mode LO	1: Current
2518	Pressure/Level HI	0：Pressure
	Pressure/Level LO	1：Level
2520	4-20MA Reverse HI	0：OFF
	4-20MA Reverse LO	1：ON
2522	Low Level HI	0：OFF
	Low Level LO	1：ON
2524	Default Flow HI	

	Default Flow LO	
2526	Calibrate Flow HI	
	Calibrate Flow LO	

10.4 Wire Connection

Line 1 group:

The aviation plug connection total 4 wires distinguished by color.

1--Black-> GND [4-1]

2--Green-> Reserved [4-2]

3--Red-> Pressure / level input [4-3]

4—Green-> Low level switch volume [4-4]

Line 2 group:

The aviation plug connection total 8 wires distinguished by color.

1—Red-> 4-20mA input + [8-1]

2--White-> 4-20ma input- [8-2]

3--Blue-> 485 port B [8-3]

4--Yellow-> 485 port A [8-4]

5--Black-> GND [8-5]

6--Green-> remote switch [8-6]

7—Brown-> 4-20mA output- [8-7]

8—Gray-> 4-20mA output + [8-8]

Warranty Regulations

1. Warranty content: The company will be responsible for the warranty of any equipment that is qualified by the company for factory sales during the warranty period due to defects caused by manufacturing and affecting the performance of the product.

2. Warranty period: Within 12 months from the date of purchasing the equipment (excluding wearing parts, such as diaphragms, seals, check valves).

3、 Not covered by warranty:

- **Failure or damage caused by failure to follow the instructions and regular maintenance of the equipment.**
- **Failure to disassemble or assemble equipment components without authorization of the company.**
- **Failure or damage caused by lack of power phase and unstable current.**
- **Damage to components due to prolonged overload.**
- **Equipment failure caused by long-term unused equipment and failure to perform regular maintenance of the equipment according to the instructions.**

Failure or damage caused by other human or force majeure factors

Due to the above equipment failure or damage, the company will not bear any costs for equipment repair. The cost of materials and labor incurred for maintenance must be borne by the user.

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