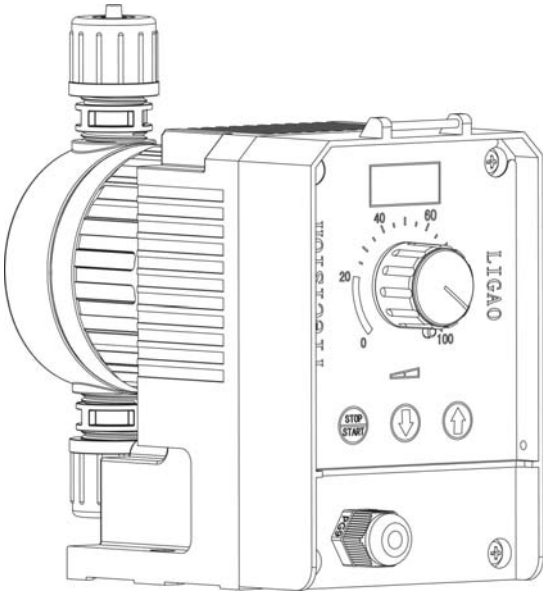
Instruction Manual

JLM Solenoid Metering Pump



Carefully read and understand all precautions before installing and servicing.

Content

1 Precautions

The following precautions should be taken when operating metering pumps. Please read all sections carefully prior to installation.

Protective Clothing

Wear protective clothing, face shield, safety glasses and gloves when operate or near your metering pump. Additional precautions should be taken depending on the pumped solution. Please refer to MSDS precautions from your solution supplier.

Water Test

All metering pumps are tested with water before delivered from the factory. If your solution is not compatible with water, disassemble the pump head assembly. Thoroughly dry the pump head, check valves, seal rings, valve balls and the diaphragm. Reassemble head assembly and tighten the screws. Refill the pump head with the solution before start the pump.

Tubing Connections

Inlet and outlet tubing size must not be reduced. Make certain that all tubing is securely attached to fittings

before start-up. Always use the supplied tubing with your pump, as the tubing is specifically designed for use with the pump fittings. It is recommended that all tubing be shielded to prevent possible injury in case of rupture or accidental damage. If tubing is exposed to sunlight, black UV resistant tubing should be installed. Check tubing frequently for cracks and replace as necessary.

⚠ Plumbing Code

Please adhere to your local plumbing codes and requirements. Be sure installation does not constitute a cross connection. Check local plumbing codes for guidelines. Our company is not responsible for improper installations.

⚠ Back Pressure/Anti-Syphon Valve

If it is pumping downhill or into low or no system pressure, a back pressure/anti- syphon valve should be installed. Contact your local distributor for further information.

⚠ Electrical Connections

Warning： To prevent the risk of electrical shock, the metering pump must be plugged into a grounded power

with ratings conforming to the data plate on the pump. All wiring must confirm to local electrical codes. If the pump power cable fails, change it by the factory, distributor or authorized repair shop, in case cause any injury.

Warning：To prevent the risk of electrical shock, install on a circuit protected by a ground-fault circuit-interrupter.

⚠ Tubing Depressure

All tubing should be depressured when disassembling or maintenance, in order to prevent solution from splashing.

⚠ Over-pressure Protect

Suggest install safety/pressure relief valve, to prevent over pressure causing the pump or system damage.

2 Product Introduction

2.1 Overview

JLM metering pump is a microprocessor controlled solenoid diaphragm pump with changeable frequency. It is capable for all kinds of solutions dosing, including corrosive solutions. It is widely used in petroleum, chemical, food, pharmaceutical, paper, light industry, agriculture, water conservancy and other industrial and technological sectors, in the process solution metering and dosing.

Solenoid metering pump is the use of electromagnetic push rod driven diaphragm in the pump head reciprocating movement, causing the pump head chamber volume and pressure changes. Changes in pressure caused by suction valve and discharge valve opening and closing, to achieve quantitative liquid suction and discharge.

JLM solenoid metering pump rated flow range is 1 ~ 20l / h, with corresponding maximum output pressure of 10 ~ 1bar. The pump outlet displacement can be adjusted according to the pulse frequency selection switch. It is a simple structure, low energy consumption, accurate

measurement, with a new screen display of electromagnetic diaphragm metering pump.

2.2 Technical Parameter

2.2.1 General Parameter

Metering Precision：**± 2% in stable condition**

Allowable Ambient Temperature： **－10℃ ~ ＋45℃**

Power： **AC 220V or AC110V**

Frequency： **50Hz ~ 60Hz**

Input Power：

Stroke Frequency	Rated Power
90 strokes/min	**16W**
120 strokes/min	**20W**
180 strokes/min	**28W**

Protection Class: **IP65**

Insulation Degree: **F**

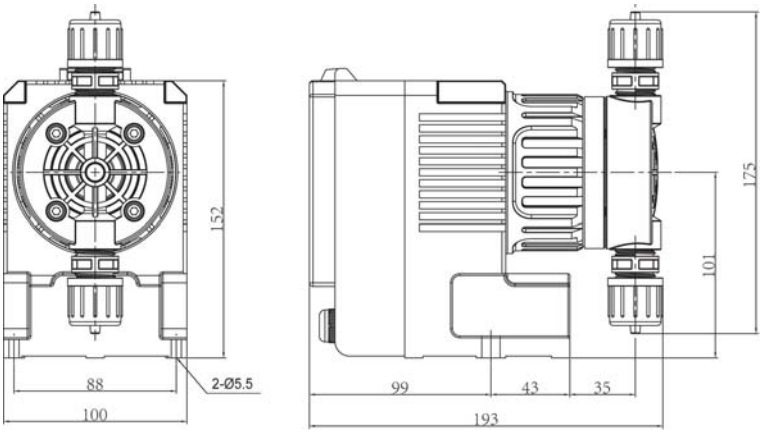
Outer Connection Control：Passive Contact Pulse Signal

Contact Load：**5V，0.5mA**

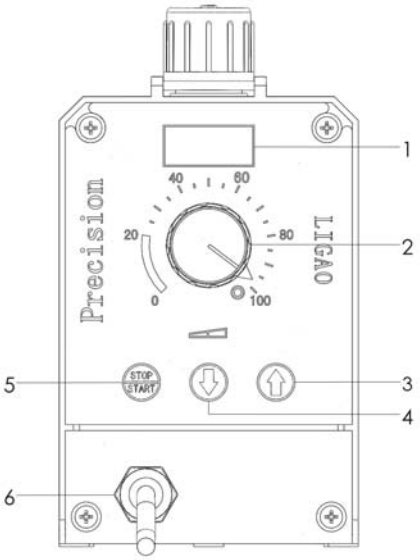
2.2.2 Performance Parameter

Model	Flow L/H	Pressure Bar	Frequency Stroke/min	Caliber mm
JLM0110	1.0	10	80	⊄5
JLM0210	2.0	10	140	⊄5
JLM0408	4.0	8.0	180	⊄5
JLM0505	5.0	5.0	140	⊄5
JLM0804	8.0	4.0	170	⊄5
JLM1003	10	3.0	130	⊄5
JLM1203	12	3.0	150	⊄5
JLM1502	15	2.0	160	⊄5
JLM2001	20	1.0	180	⊄5

2.2.3 Installation Drawing



2.3 Operation Instruction



1 Display

2 Stroke Adjustment Knob

3 Increase Button

4 Decrease Button

5 STOP/START Button

6 Power Cable

- The first digital showing “P”indicates power is on
- The first digit off indicates power is off
- The last three digits show the frequency in percentage
- The last three digits off indicate the pump is stopped

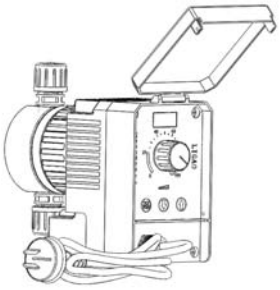
Figure 2 for the stroke length adjustment knob, the best stability range is 30% to 100%.

Figure 3 and 4 are the frequency increase and decrease buttons. Long press the button, the frequency will increase or decrease 10% per time;

Press the button one time, the frequency increase or reduce 1%.

2.4 Unpacking Check List

Your carton will contain all or some of the following items. Please notify the carrier immediately if there are any signs of damage to the pump or its parts.



Metering Pump

Foot Valve

Tubing

Ceramic Weight

Injection Valve

Air Release Valve

3 Installation

- Due to the possibility of water residue at the factory test, if the metered solution can not be in contact with water, water must be removed before starting use and the inside of the pump head can be flushed through the suction side with suitable solution.
- The metering pump should be installed near the dosing tank , where the power supply is convenient. If the pump is exposed directly to the sun, a black UV shield should be installed.
- The installation location of the metering pump should be convenient for personnel to access, operate and maintain, and do not have any obstructions in the work area.
- If the shut-off valve is closed at the discharge side of the metering pump, when the shut-off valve is closed, the back pressure generated by the metering pump may be several times the maximum allowable back pressure, which may cause the discharge tube to rupture. To prevent this from happening , It is recommended to use a relief valve to

limit the maximum back pressure within the allowable value.

➢ Only use the hose diameter corresponding to the hose, hose connector and the provisions of the specifications of the hose, or can not guarantee the connection of a solid and lasting. Do not reduce the hose specifications. Longer pipelines or medium viscous use larger cross-section pipelines and pulsating dampers.

3.1 Pump Installation

➢ To ensure safe operation of the metering pump, tighten with bolts.

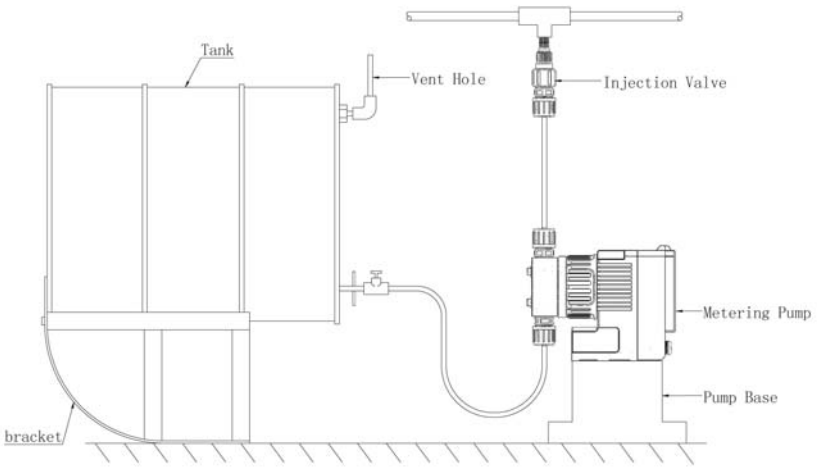
➢ To ensure proper operation, the metering pump inlet and outlet must be kept vertical during installation.

The pump has the following two installation methods:

A. Flooded Suction（ideal installation）

This method is installed by installing the pump on the base of the storage tank. This installation is the most easy, suitable for low flow, volatile, high viscosity solution. As the suction tube filled with the solution, the pump can quickly self-priming, and the chance of priming failure rarely occurs.

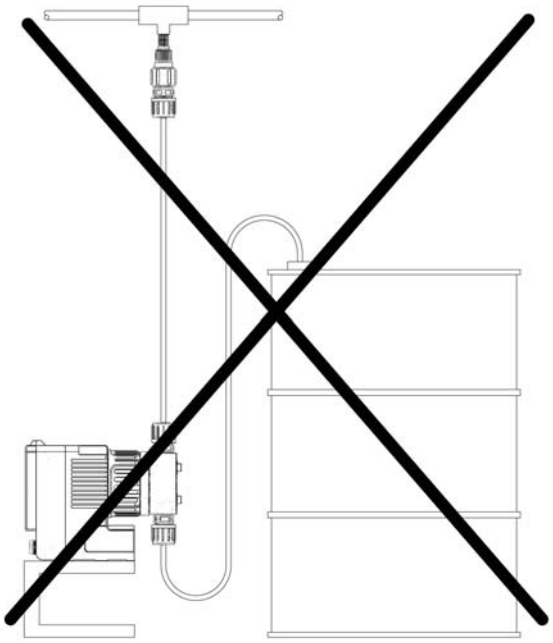
This type of installation does not require a bottom valve. If it is transported downwards or transported to a low or low pressure place, install a back pressure valve or an anti-siphon valve. All solutions can be used in this type of immersion, but this is especially recommended for high concentrations of liquids.



Correct Installation

Note：

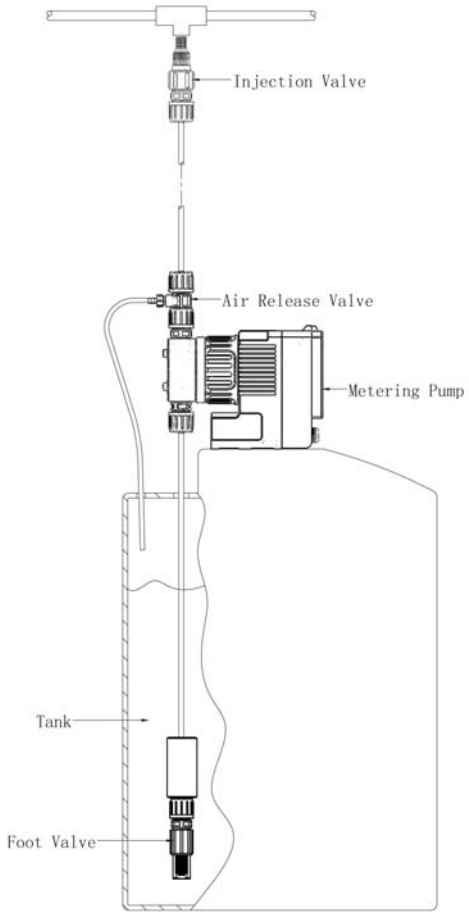
The following figure is typical wrong installation.



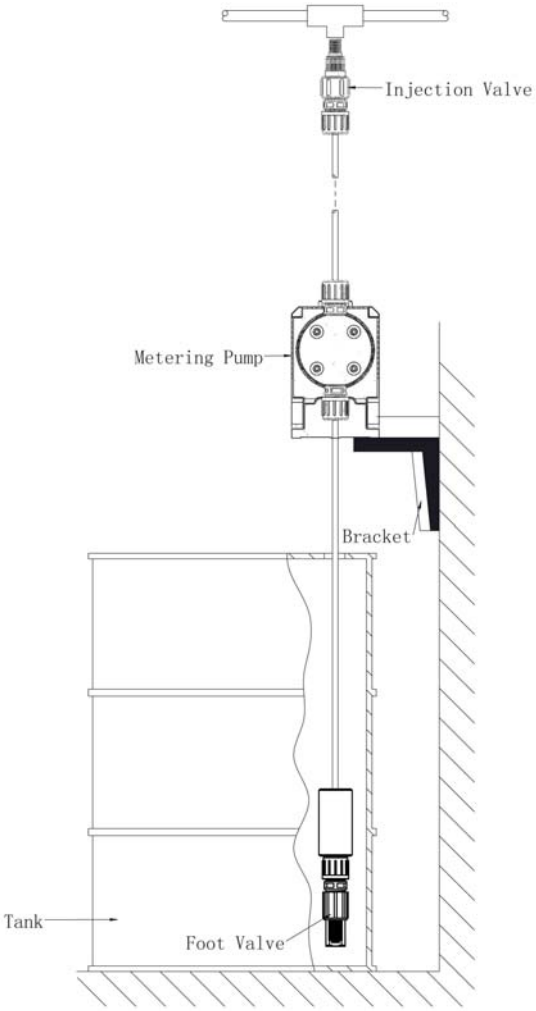
Incorrect Installation

B. Suction Lift；

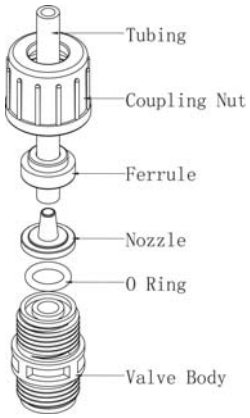
➢ Tank Mount: The pump is mounted on the top of the solution tank.



➢ Wall Bracket Mount：The pump is mounted on the wall with bracket above the solution tank. This method allows for easy changing of the solution tanks.



3.2 Tubing Connections



- Insert tubing through coupling nut and clamp.
- Cut the hose at suitable length, and insert the nozzle as deep as possible.
- Enlarge the diameter of the hose if needed.
- Press the clamp and tighten the coupling nut.

3.3 Food Valve and Suction Tubing Installation

The bottom valve acts as a check valve, allowing the pump to self-priming in the case of a suction installation. The bottom valve must be dipped vertically into the bottom of the dosing medium. If the medium contains a precipitate, the bottom valve should be located approximately 50 mm from the bottom of the tank.

Ceramic weight can make foot valve and suction tube in vertical position.

- Attach the foot valve to one end of the suction tubing

(see section 3.2).

- Slide the ceramic weight over the tubing end until it contacts the top of the foot valve coupling nut.
- Place foot valve and suction tubing into the solution tank. Check if the foot valve is vertical and approximately 50mm from the bottom of the tank. Connect the other end of the tubing to the suction side of the pump head(see tubing connection, section 3.2).

3.4 Injection Valve and Discharge Tubing Installation

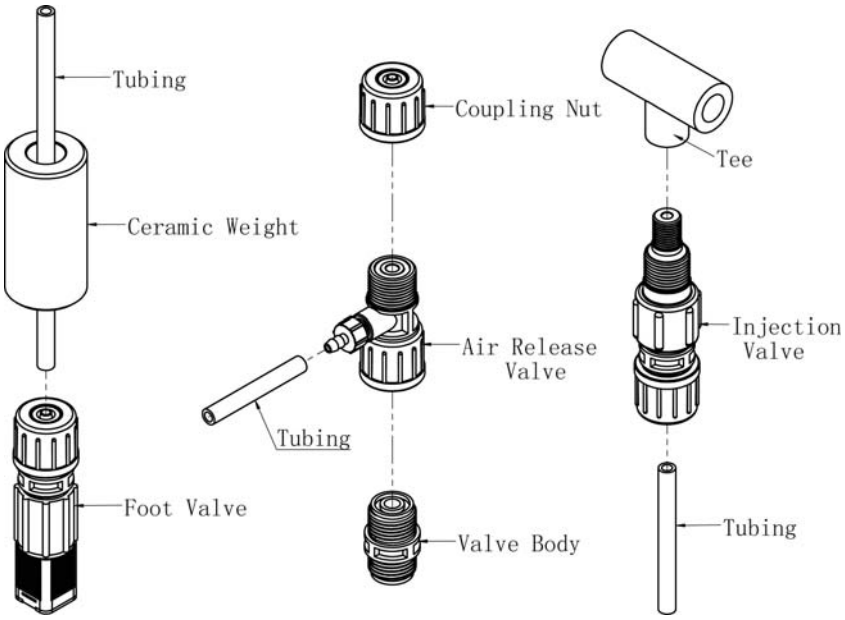
Injection valve prevents backflow. Install the injection valve at the location where chemical is being injected into the system. (see tubing connection, section 3.2)

 When installing the injection valve, make sure that the valve is vertical to the bottom of the tube and that the left and right errors are within 80 degrees.

3.5 Air Release Valve Installation

Air release valve with exhaust sampling function. The valve is mounted on the outlet check valve and is connected to the hose to allow the medium to return to the dosing tank.

⚠ In order to ensure smooth self-absorption, the tube can not be immersed in the medium.



4 Operation and Setting

4.1 Start-Up and Priming

Please read the following carefully before proceeding to the next step. After all the protective measures are done, the pump is installed, the pipe is firmly connected, open all the control valves on the inlet and outlet lines, you can start priming the pump head.

- Connect the power.
- When the pump is running, slowly increase the pulse frequency.
- Suction tubing should begin to fill with solution from the tank.
- A small amount of solution will begin to discharge out the discharge valve.
- The pump is now primed.

The pump has a self-priming function (except for special conditions). If the pump does not self-prime, remove the discharge check valves, pour water or solution into the pump port until the head is filled. Install back the

discharge check valve(see check valve assembly), and re-start the prime steps.

4.2 Setting

The start and stop of the pump are controlled by the STOP/START button ②.

The stroke frequency is set by the Increase button ③ and Decrese Button ④. The display shows the frequency in percentage. The range is from 0-100%.

4.3 Signal Function Setting (for JLM-P only）

4.3.1 Display

(1)Shutdown state-> Display “P”.

(2) Running state -> Different display according to the mode.

[1] Manual mode: Displays the flow rate in percentage.

[2] Pulse multiplication, pulse division mode: Display pulse count.

[3] 4-20mA mode ： Display 4-20mA corresponds to the percentage.

(3) In the setting state -> display function code and the corresponding parameter value.

4.3.2 Button Operation

(1) Shutdown Sate：

[1] Click on the switch button [STOP / START], can be boot [Note: remote control mode does not work].

[2]Long press the switch button [STOP / START] 3 seconds to enter the setup mode.

In the setting mode, press the switch key [STOP / START] 3 seconds to exit the setting mode.

If there is no operation after 10 seconds, it automatically exits the setting mode.

[3] In Set the mode, click the switch button [STOP / START] toggle the function code, click "Increase key", "Decrese key" to adjust the parameters.

(2) Running State：

[1] Click on the [STOP / START]button can be shut down [Note: except for remote control mode].

[2] In manual mode, click "Increase key" and "Decrese key" to adjust the flow in percentage.

4.3.3 Parameter

(1) Parameter List

FC	Parameter Values
0	Percentage (0-100)
1	Pulse counts per minute (0-180)
2	**Running Mode** 0: Manual 1:Pulse Multiplication 2:Pulse Division 3: 4-20mA
3	Pulse Count Base (1-255)
4	**Remote Control** 0: Remote Off 1:Remote On

(2) Parameter Adjustment in Setting Mode

[0] Percentage: Click "Increase" or "Decrese" button to adjust the percentage plus 1 or minus 1, long press "Increase" or "Decrese" button to adjust percentage plus 10 or minus 10. Maximum 100, minimum 0.

[1] The number of pulses per minute: click "Increase" or "Decrese" button to adjust the number of pulses per minute plus 1 or minus 1, long press "Increase" or "Decrese" button to adjust the number of pulses per minute plus 10 or minus 10. Maximum 180, minimum 0.

[2] In running mode: Click "Increase" or "Decrese" button to adjust the running mode [0: Manual Mode 1: Pulse Multiplication Mode 2: Pulse Division Mode 3: 4-20mA Mode]

[3] Press the "Increase" or "Decrese" button to adjust the pulse base plus 1 or minus 1, long press "Increase" or "Decrese" button to adjust the pulse base plus 10 or minus 10. Maximum 255, minimum 1.

[4] Remote control: Click "Increase" or "Decrese" button to adjust the remote control [0: Remote Control Off 1: Remote Control On]

4.3.4 Wiring

[1] Power：Single phase 220V/110V

Note: Depending on the voltage requirements on the nameplate. Wrong connection will damage the device. The pump requires grounding connection.

[2] Signal line: Red - remote control;

Black - zero line;

Yellow——Pulse;

White——4—20mA.

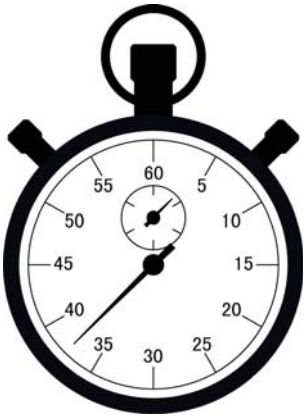
4.4 Calibration

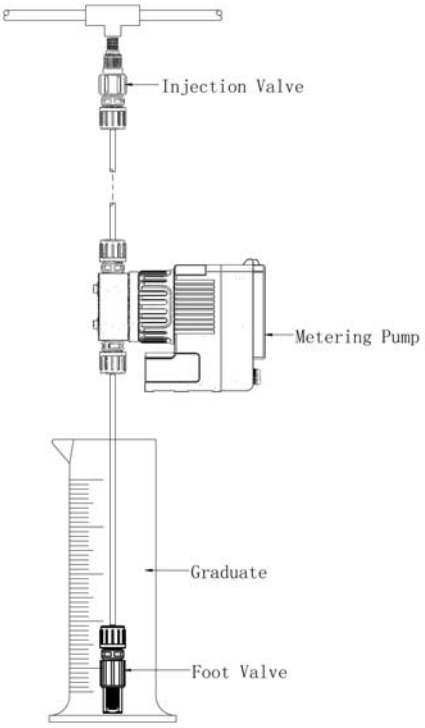
Once the installation is complete, the approximate output of the pump is determined and the pump is calibrated to adjust the actual output flow.

Make sure the pump is primed, and the discharge tubing and injection valve is installed as they would be in normal service（including factors such as working pressure, solution viscosity, and suction lift）

- Place the foot valve in a graduated container with a volume of 1000ml or more.
- Start the pump, until all the air in the exhausted from the suction line and head.
- Stop the pump. Refill the graduated container to a level starting point.
- Using a stopwatch or timer, turn the pump on for a measured amount of time(120 strokes minimum). The longer the time period, the more confident you can be of the results.
- Stop the pump. Record the time and the volume of the discharge medium, calculate the flow rate.

➢ If the output is too low or too great, increase or decrease the speed accordingly.





5 Maintenance and Repair

Caution

➢ Electrical maintenance must be carried out by qualified electricians.

➢ Before servicing, unplug the power plug or disconnect

the power. Cut off its power if there is a relay. Make sure that the pump's power supply is not turned on during maintenance.

- The drainage pipe should be decompression before maintenance. Discharge and wash the pump head cavity. Use of corrosive liquid is prohibited .
- If the metered medium is a hazardous or unknown liquid, check the performance parameters of the metered liquid before servicing. The pump head should be emptied and cleaned.

5.1 Maintenance

Metering pump maintenance, should strictly check the following:

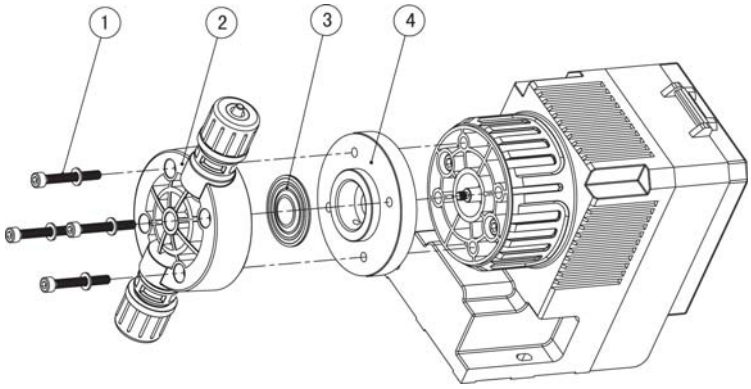
- Pump head bolts (connection is firm).
- Discharge tubing(connection is firm).
- Pump head and suction check valve(connection is firm).
- The drain hole on the diaphragm base (drip indicates

that the diaphragm may be damaged).

5.2 Diaphragm Replacement

⚠Must wear protective clothing, face shield, safety glasses and gloves in the process of replacement. See also other protective measures on the Material Safety Data Sheet provided by the material supplier.

JLM metering pump is designed for trouble free operation, but in order to make the pump in the best working condition, the elastic parts must be maintained daily. It is recommended to replace parts such as diaphragm, check valves, sealing rings, springs every year according to the actual situation.



- Depressurize, drain, and remove the discharge tubing from pump .
- Place the bottom valve in water or other neutral solution. Start the pump and rinse the pump head. When the pump head is rinsed, remove the bottom valve from the liquid and continue running the pump to allow the air to enter until the pump head has no water or a neutral solution. (If the liquid can not be pumped due to diaphragm rupture, remove the four bolts ① on the pump head, and immerse the pump head in water or other neutral solution.
- Stop the pump and disconnect the power, unscrew the bolts①.
- Pull the pump head② and the bolts ① from the pump body.
- Turning the diaphragm③ counter-clockwise, and remove it.
- Turning a new diaphragm③ on to the driving shaft. Check the screw condition.
- Turning out the diaphragm③ again.
- Install the diaphragm base④ on the pump body(the

drain hole must be down).

- Turning the diaphragm③ clockwise to the driving shaft until tightened.
- Install pump head② back to the pump body(Take care of the check valves direction).
- Diagonally tighten the bolts①.
- After 24 hours operation, recheck the screws and tighten if necessary.

5.3 Check Valves Replacement

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

Refer to the pump head section 7 in this manual.

- Depressurize and disconnect the discharge line from the pump head.
- Place the bottom valve in water or other neutral solution. Start the pump and rinse the check valves. When the check valves are rinsed, remove the bottom valve from the liquid and continue running the pump to allow the air to

enter until the discharge valve has no water or a neutral solution.

- Disassemble the discharge check valve, and place each part in correct order.
- Disconnect the suction tubing from the suction valve.
- Disassemble the suction check valve, and place each part in correct order.
- Check the ball valve, seat, seal wear, if necessary, to be replaced.
- Reinstall the check valve components (reverse position of disassembly).
- Reconnect to the pump head and the piping system.

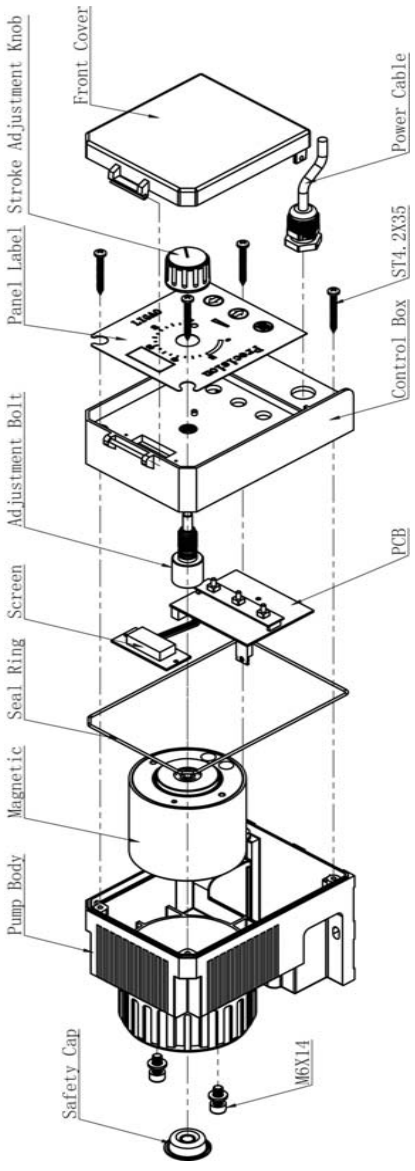
6 Troubleshooting

Problem	Possible Cause	Solution
Pump Not Start	Power supply fault.	Check the power.
	Fuse blown.	Eliminate overload, replace the fuse.
	Power circuit.	Find the location of the circuit and handle it.
	Wiring error.	Check the wiring diagram.
	Pipeline or pump cavity blockage.	Check the pipe, pump cavity, and check valves, clean the dirt.
	Wrong setting.	Check the setting.
No Output	Pump not run.	Check power and setting.
	Solution tank is empty.	Fill the solution tank.
	Pipeline block.	Clean the pipeline.
	Shut-Off valve closed.	Open the valves.
	The ball check valve is blocked by particles.	Check and flush the check valves.
	Air in the pump cavity.	Release the air.
	Cavitation	Increase the suction pressure, reduce the suction lift.
	Priming problem.	Repriming and check the leakage.

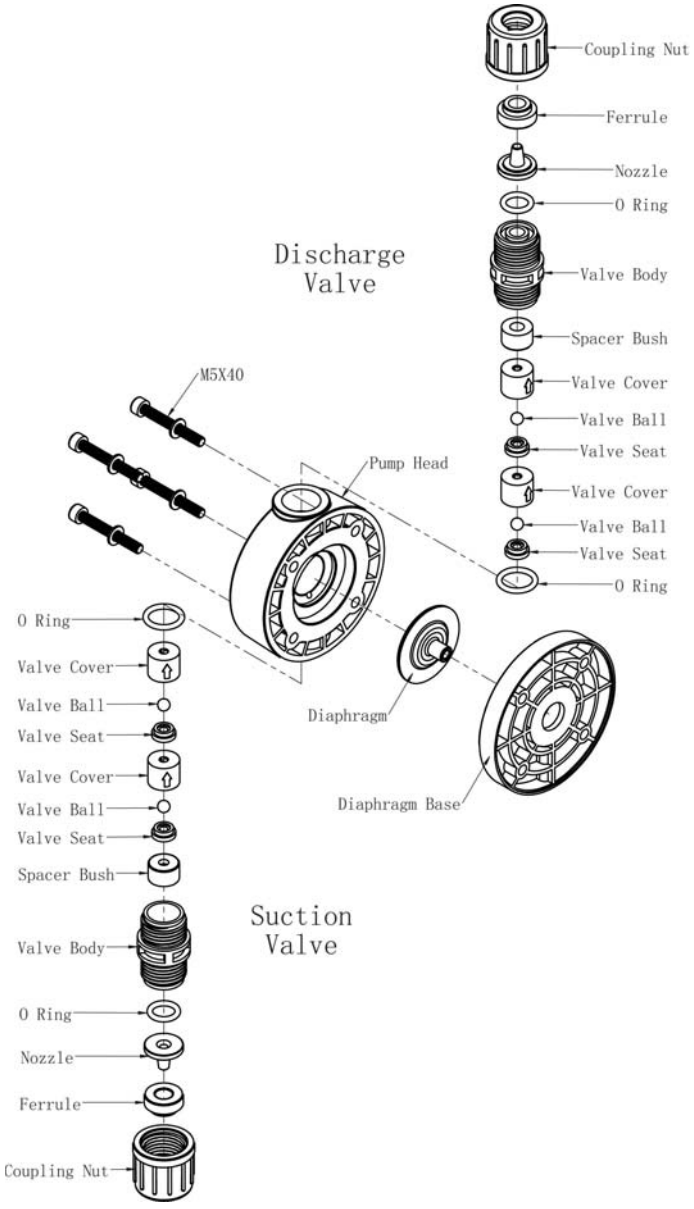
	Strainer block.	Clean or change the strainer.
Low Output	Check valves wear or with particles.	Clean or change the check valves.
	Wrong calibration.	Evaluate and correct it.
	Solution viscosity too high.	Diluting the viscosity or increase the pipe size.
	Medium cavitation.	Increase the suction pressure, reduce the suction lift.
Output Gradual Descend	Check valve leakage	Clean or change it.
	Suction tubing leakage.	Find out the leakage point and handle it.
	Strainer block.	Clean or change the strainer.
	Medium change.	Check the viscosity
	Tank air vent hole is blocked.	Dredge vent hole.
Flow Unstable	Suction tubing leakage.	Find out the leakage point and handle it.
	Cavitation.	Increase the suction pressure, reduce the suction lift.
	Check valve block.	Clean or change it.

7 Main Parts List

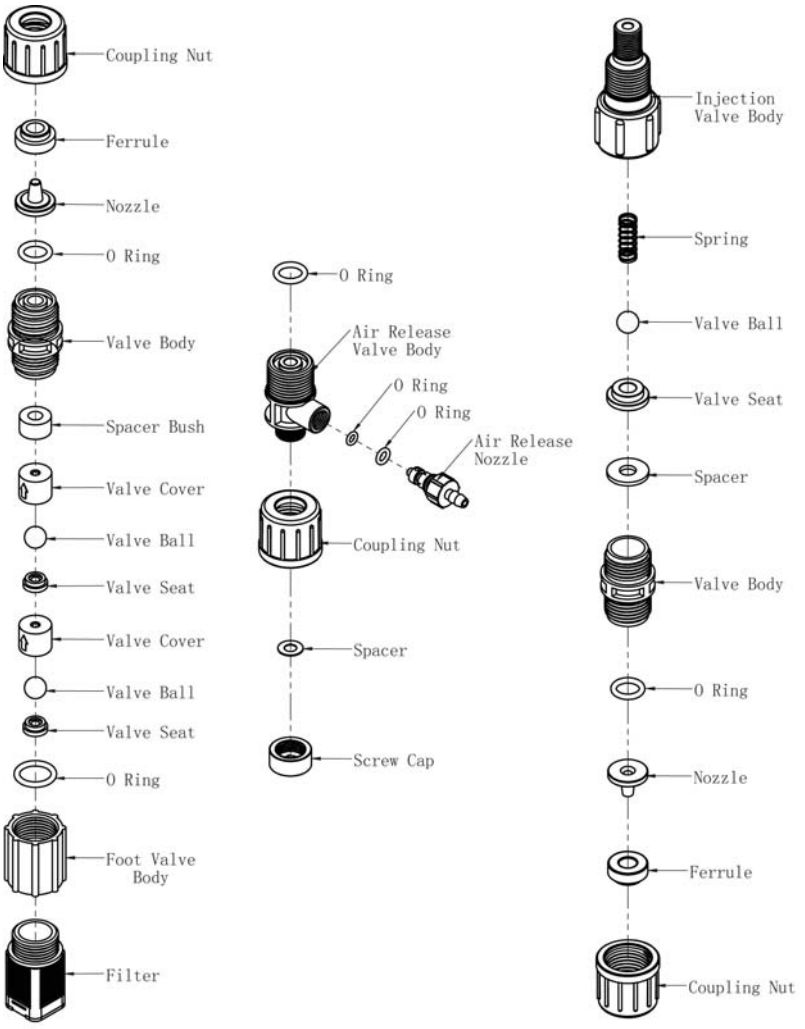
Pump Body



Pump Head


Coupling Nut
Ferrule
Nozzle
O Ring
Discharge Valve
Valve Body
Spacer Bush
Valve Cover
Valve Ball
Valve Seat
Valve Cover
Valve Ball
Valve Seat
O Ring
M5X40
Pump Head
O Ring
Valve Cover
Valve Ball
Valve Seat
Valve Cover
Valve Ball
Valve Seat
Spacer Bush
Diaphragm
Diaphragm Base
Suction Valve
Valve Body
O Ring
Nozzle
Ferrule
Coupling Nut

Valves



Foot Valve Air Release Valve Injection Valve

Appendix

Requirement on the Voltage Supply

Power supply in some areas is unstable. Excessive fluctuations in power supply affect the use of equipment, and even cause damage to the pump.

JLM solenoid metering pump power supply range is ± 10% of the rated voltage(for details, please refer to the relevant technical information).

For areas where the supply voltage fluctuates or the surge voltage exceeds the allowable range, please install an AC regulated power supply. Equipment loss due to over voltage of power supply, our company does not assume the responsibility of quality assurance.

Please read the manual carefully before use.

Zhejiang Ligao Pump Technology Co.,LTD

ADD：No.227 Huishu Road,Linhai, Zhejiang, China
TEL：0086-576-85289780
FAX：0086-576-85668297
WEBSITE: www.ligaopumps.com
E-MAIL：sales@ligaopumps.com

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