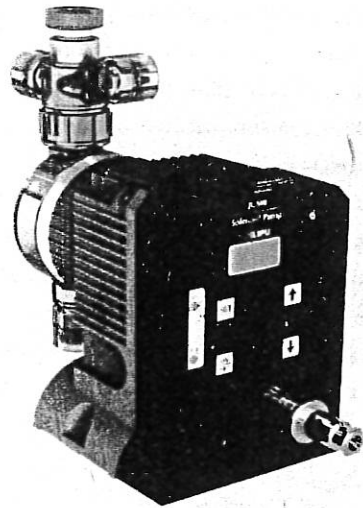


**JCMA Series
Solenoid Dosing Pump**

OPERATION MANUAL



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We are really honored that you choose our JCMMA Solenoid Diaphragm Metering Pumps.
Make sure that you read this manual before installation.

1. Product Summarize

JCMMA pumps are used widely in the fields like medicine industry, chemical industry, atomic energy; petroleum, electric power, environmental protection, food industry, papermaking and many other important national economy industries, especially popular in the technical process which require for dosing various kinds of corrosive chemicals with high accurate measurement. The biggest advantage is that you can get the function of controlling the flow rate by remote signal with the cheapest price, which create conditions for automatic proportioning process. The other advantages are high accurate, complete functions, stable, excellent performance, simple structure and easy to operate.

2. Safety Precaution

When using the pump, precautions as below need to be followed:

⚠ When operating the solenoid pumps, protective clothing, masks, goggles and gloves need to be worn. Depend on which kind of liquids being transferred, extra precautions may be needed to avoid the harmness from the chemical.

⚠ Make sure the wet parts of your solenoid pumps are suitable for the chemical being used. Each pump was tested strictly before sold. Check with your chemical supplier and Atlipu's corrosion-resistant material table to verify your pump's compatibility. You can also contact with your local distributor to get more details.

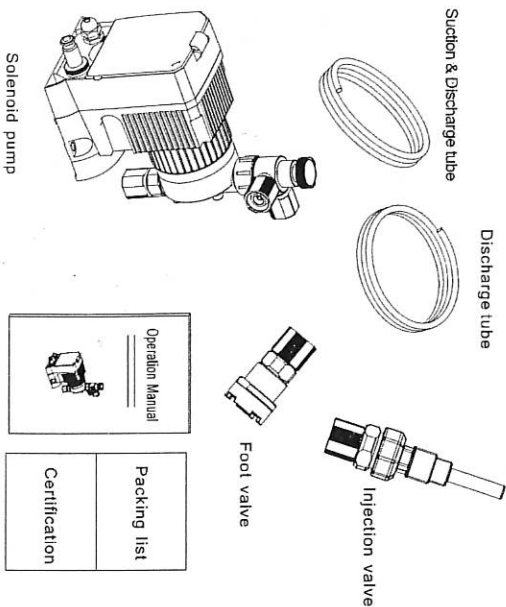
⚠ The size of suction/discharge end of the soft/hard tube cannot be reduced. The suction tube and the air-releasing tube are clear PVC, and the discharge end is net-textured PVC, and they are not exchangeable. Before connecting the tube, cut one end of the tube neatly, and sink that end in 80°C water for 2-3min(if necessary) to soften the tube, then it would be easier to connect with the pump and valves. Make sure the tube is plugged to the bottom of the connector, after that fasten tightly by a tube cap.

All the connectors can be fastened by hands. Rotate the connectors for extra 1/8-1/4 round after the connector touched the seal ring. Too much rotation or using a pipe pliers would cause damages for seal rings or pump head screws. Seal the suction/discharge pipeline with seal rings or O-rings, Do NOT use Teflon tapes!

⚠ If sucking chemicals from a low level or injecting chemicals into a low-pressure/non-pressure system, a back pressure anti-siphon device (back pressure valve) must be installed to avoid over pumping or siphon. (Contact with your local distributor to get more detailed information)

3. Unpacking

The package should have some or all of following items. If the pump or the accessories have any kind of damage, please contact the distributors.



4. Installation

Install solenoid pumps nearby the solution tank and power supply, leave enough space for the convenience of regular maintaining, and the environmental temperature should be under 50°C when operating. Should avoid the solenoid pump direct expose to the sun, if be caught in the rain, sunshade should be installed.

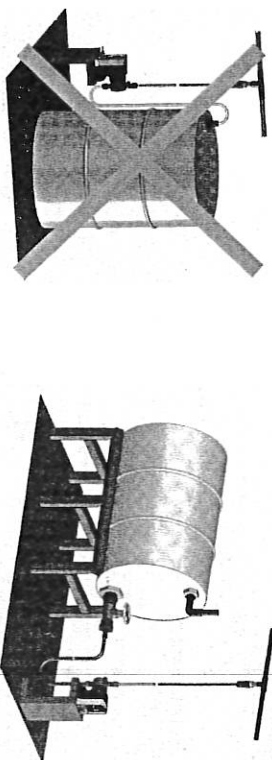
4.1 Pump Fixation

There are two ways for the fixation.

A. Full Tube Suction under the tank (Ideal method): the chemical can flow to the pump entrance automatically, and improve the sucking performance.

B. Auto-Suction: when the liquid's density is similar to water or the viscosity is less than 100mP·s, the pump lift will be less than 1.5m. (For higher density/ viscosity liquids, pump entrance should better have positive pressure.) Note: The suction valve and discharge valve should be installed vertically after fixed the pump.

4.1.1 The solenoid pump and the tank are fastened on the same base, this is the best method as the suction pipe filled in liquid, which can make quick diversion. When the pump pumps in a low pressure system or a non-pressure system, a back pressure/anti-siphon device must be installed to avoid over pumping or siphon. We suggest that the method of full tube suction under the tank should be used for all high density/ viscosity liquids.



Wrong

Correct

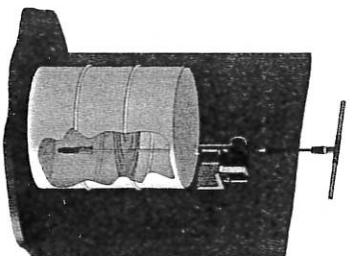
4.1.2 Bracket set can be used for solenoid pumps (Optional), and it can be installed above the tank. This method can be used when you need replacing the tank easily.

4.1.3 Auto-Suction: Fixed on the tank

Solenoid pump can be installed on the tank which has a moulding of fixed base.

4.1.4 Auto-Suction: Fixate on the Bracket

Solenoid pump can be installed on the bracket which would keep the pump lift less than 1.5m, and the fasteners will fix the solenoid pumps on the bracket solidly.



4.2. Piping

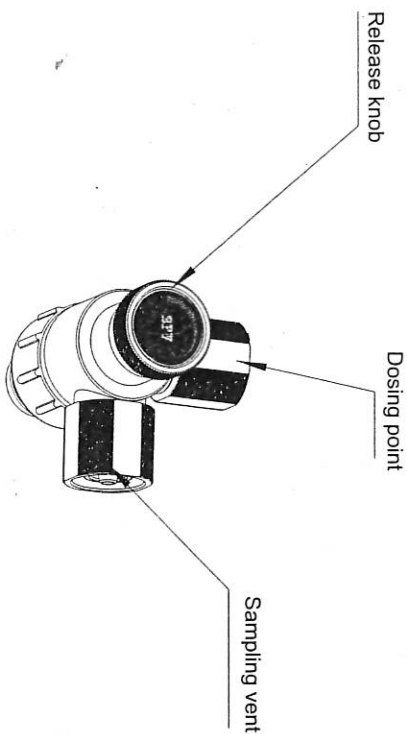
a. Before the installation, all the pipes are needed to be cut neatly.

b. Don't use combination pliers or pipe pliers to fasten screw caps/connectors. Features of Multi-Function Valves:

a. Manual Pipeline Pressure Release: turn on the pressure release knob and the liquid in the outlet pipeline would flow back to the tank.

b. Air Release: When the pump is operating, if there is the air in the pipeline, the pump's accuracy would be influenced, so the air should be released. Turn on the pressure release knob and the liquid in the outlet pipeline would flow back to the tank.

c. Sampling.



Multi-function valve

4.3 Installation of Foot Valve/ Suction pipe End

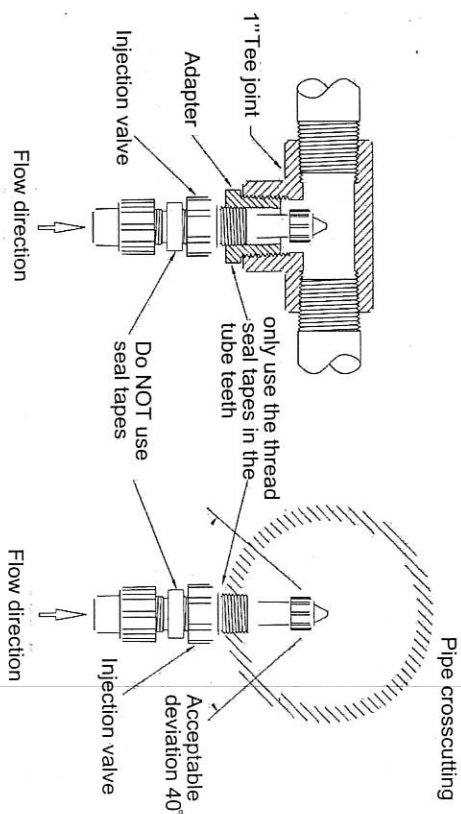
For the application of self-suction, the foot valve can be used as a non-return valve to keep the liquid in the pipe when the pump is off. The foot valve is designed for submerging in the tank, and it has to be installed vertically on the bottom. If there are sediments on the bottom, there should be a 50mm gap between the valve and the bottom.

4.3.1 Install the foot valve in the suction end of the pipe.

4.3.2 Put the foot valve and the pipe into the tank. Make sure the valve is vertical, and the gap between the valve and the tank bottom is 50mm. Connect the other end of the pipe with the suction end of the pump head (the bottom end of the pump head).

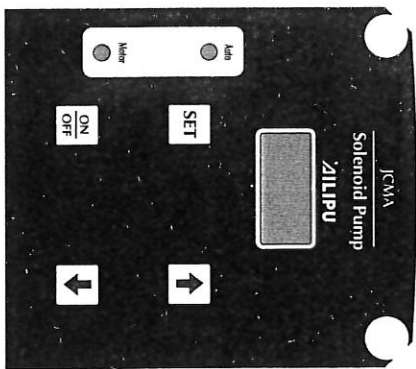
4.4 Installation of the Injection Valve

Injection Valve can prevent inverse flow, and it should be installed at pump outlet to the end of the dosing pipe. PTFE tapes can be used for pipe threads sealing. During the installation, make sure that its position should be entered vertically from the bottom of that pipe (see drawing belows), and a 4° deviation is acceptable (see the diagram). Then cut a tube with a suitable length. Connect one end of the tube with the injection valve and another end with the valve/connector (upper one) of the discharge end of the pump head. Make sure that the tube is not bent or get to any heat source or sharp surface.



Typical Injection Valve Installation

5. Operation



SWITCH BUTTON «SET» :

When the pump stop working, this key is used for switching between internal manual control mode & external remote control mode, save & exist setting.

POWER BUTTON (ON/OFF) :

For turn on/off the pump.

Indicator: ① Power Indicator: A. ON is for the pump has power; OFF is for the pump has no power.

B. When the pump is operating: ON when connecting; OFF when resetting

② Internal/External Mode Indicator: OFF when the mode is internal; ON when the mode is external

Power input: AC220V power input interface. Frequency 50-60HZ power input interface.

Speed Adjusting 《▲》 《▼》 : Adjust the number of stroke per minute in the internal mode with manual control mode. Max: 360 stroke/min.; Min: 0 stroke/min.

Signal Input: Functions include ① 4-20mA signal input ② Remote start/stop the pump

③ Liquid level detection ④ Impulse input ⑤ Impulse output

Remark: Users can choose ①, OR, ④ and ⑤.

5.1 Startup and Adjustment

When the suction is less than 1.5m, the pump can fill liquid automatically.

5.1.1 Startup and Quick Suction.

Read this entire section before operation, the purpose is to quickly release the air in inlet pipe and pump cavity.

After all safety precautions are completed, make sure the pump is installed firmly, and the pipelines are fastened, you can turn on the pump to start liquid suction.

- Power up the solenoid pump
- When the pump is running, set the speed at 100%.
- Turn the pressure-release knob of the multi function valve 1-2 rounds counterclockwise.
- See if the suction pipe has lead liquid from the tank throughout pipe
- A small amount of solution should start to discharge from the return pipe of the Multi function valve, then tighten pressure release knob clockwise and turnoff the pump.
- Now the liquid-guiding process is finished.

▲ If the pump can't do self-suction, remove the multi function valve off the pump head. Remove the non-return valve (one-way valve) and fill liquid in that mounting hole till the diaphragm chamber of pump head is full. Put the non-return valve back and repeat the liquid-guiding process.

5.2 Output Adjustment

Speed Adjustment: press ↑ to change the diaphragm operating frequency per minute to change the flow rate of the pump.

5.3 Output Flow Adjustment

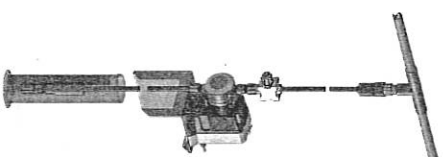
After the pump head is filled, the output flow must be adjusted. Follow this formula to calculate the output flow of the pump:

Output capacity = max output × frequency %

5.4 Calibration

When the approximate flow is set, the pump should be calibrated. Adjust the frequency to reach the actual flow rate.

5.4.1 Calibration under internal manual mode:



- Check whether the pump head is filled or not; check the installation of the discharge pipeline and non-return valve; check whether the discharge pressure (should be equal or close to work conditions), fluid viscosity, and suction head meet the requirement.
- Put the foot valve into a container which has scales with capacity is over 1000ml. If without scale, please put the container on the electronic scale.
- Power on the pump and set the mode to internal control mode (see 6.5 for details), then empty the air in the pump head and the suction tube.
- Power off the pump, and fill the container with liquid to an initial liquid calibration.
- Keep the pump running for at least 1 min. The longer this time is, the better the calibration will be.
- Turn off the pump after running the set time. Base on the liquid level change, you can calculate the pump output per hour.
- If the output is too big or too small, you can adjust the frequency to change the output

5.4.2 Calibration under external remote mode:

- The external remote signal has two modes: ① 4-20mA signal input; ② Impulse input
- Setting required output (per hour) under manual control mode (see 6.4.1 for details) to get the frequency percentage.
- In external remote mode, change 4-20mA current signal or impulse signal to meet the frequency percentage on the screen. (see 6.5 for details)

5.5 Control Mode

A.JCMA-S

Manual Control JICMA-S

A: Panel Operation

- Manual Flow Rate Percentage Setting: Press ▲ or ▼ to set; the setting will be auto-saved in 15 seconds to EEPROM.
- A.C. Voltage Sampling Regulating: Press SET and ▼ at the same time when the pump is not running, the LED screen will show "H22". Then set the AC voltage to standard AC220V and wait for 5 seconds, press SET, and the LED screen will show "L11". Then set the AC voltage to standard AC110V and wait for 5 seconds, and press SET to finish the regulating. The setting will be auto-saved to EEPROM.

3. Max. Strokes Setting: Press SET, ▲ and ▼, when the pump is not working, and the screen will show the last setting of maximum stroke times. You can reset by pressing ▲ or ▼, and press SET to finish setting, Auto-saved to EEPROM and exit setting.
 4. Check AC Voltage: Press SET and ON/OFF, when the pump is not working, and the screen will show current AC Voltage (only show, cannot be set). Press set to exit.
 5. Operating Time indication: Press SET, ▲, ▼ and ON/OFF the four buttons together at the same time, the screen will show the time based on "DAY" (means 24 hours), when you press the SET again, the screen will show the time based on HOUR, and press SET the third time to exit.
- B: JQMA-QYH (Current Control Panel)**
- a: Panel Operation**
1. Manual Flow Rate Percentage Setting: Press ▲ or ▼ to set the percentage flow; the setting will be automatic-saved after 15 seconds into EEPROM.
 2. Manual/Automatic Switching: Press SET for 3 seconds to switch, and the setting will be automatic-saved after 15 seconds into EEPROM.
 3. Electric Current Sampling calibration: Press SET and ▲ together at the same time when the pump is not working, the LED screen will show "H20". Then input standard 20mA electricity and wait for 5 seconds, press SET, and the LED screen will show "L4". Then input standard 4mA and wait for 5s, and press SET to finish the calibration. The setting will be automatic-saved into EEPROM.
 4. A.C. Voltage Sampling Calibration: Press SET and ▼ together at the same time when the pump is not working, the LED screen will show "H22". Then set the AC voltage to standard AC220V and wait for 5s, press SET, the LED screen will show "L11". Then set the AC voltage to standard AC110V and wait for 5s, and press SET to finish the calibration. The setting will be automatically saved into EEPROM.
 5. Max. Strokes Setting: Press SET, ▲ and ▼ together at the same time, when the pump is not working, the screen will show the last setting of max stroke times. You can reset by pressing ▲ or ▼, and press SET to finish setting, Auto-save to EEPROM and exit.
 6. Indicate AC Voltage: Press SET and ON/OFF together at the same time, when the pump is not working, and the LED screen will show current AC Voltage (only show, can not be set). Press set to exit.
 7. Indicate Operating Time: Press SET, ▲, ▼ and ON/OFF total four buttons together at the same time, the LED screen will show the time based on DAY (means 24 hours), when you press the SET again, the screen will show the time based on HOUR, and press SET the third time to exit.
- b: Function**
1. Remote On/Off Control
 2. Liquid level Alarm. If the liquid level is lower than the height of liquid level detector which is set by the user, the pump will shut down automatically. At the same time, **FE0** will be shown on

thescreen. Elimination Method: Dosing chemical till the liquid level is higher than the height of liquid level detector, the pump will turn on automatically, and the **FE0** symbol will disappear automatically.

3. 4-20 mA Remote Control. When the remote input signal is 4mA, the pump output frequency is 0%, and when the remote input signal is 20mA, the pump output frequency will be 100%.

Remark: 4-20mA signal input is directly proportional to percentage on the screen. Specific calculation as follows:

$$\left[\frac{\text{Input Signal value}-4}{16} \right] \times 100\% = \text{screen display percentage}$$

For Example:

$$\text{Input 12mA signal: } \left[\frac{(12-4)}{16} \right] \times 100\% = 50\%$$

$$\text{Input 8mA signal: } \left[\frac{(8-4)}{16} \right] \times 100\% = 25\%$$

C: JQMA-QYCF (Pulse Control Panel)

a: Panel Operation

1. Manual Flow Rate Percentage Setting: Press ▲ or ▼ to set; the setting will be automatically saved after 15 seconds into EEPROM.
2. Manual/Auto Switching: Press SET for 3s to switch between manual control mode to Automatic control mode, the setting will be automatically saved after 15s into EEPROM.
3. Setting multiplier and divisor: Press SET and ▲ together at the same time when the pump is not working, the LED screen will show the last setting result, it can be reset by ▲ and ▼ button. It means divisor if LED shows "÷", and it means multiplier if LED NOT shows "÷". Press SET to finish the setting. The setting will be auto-saved into EEPROM.
4. A.C. Voltage Sampling Calibration: Press SET and ▼ together at the same time when the pump is not working, the LED screen will show "H22". Then set the AC voltage to standard AC220V and wait for 5s, press SET, and the LED screen will show "L11". Then set the AC voltage to standard AC110V and wait for 5s, and press SET to finish the calibration. The setting will be auto-saved into EEPROM and exit. Can refer to step 6 shows the AC voltage to check whether the AC voltage calibration is correct;
5. Max. Strokes Setting: Press SET, ▲ and ▼ together at the same time, when the pump is not working, and the screen will show the last setting of max stroke times. You can change the setting by pressing ▲ or ▼, and press SET to finish setting, automatically saved and exit.
6. Check AC Voltage: Press SET and ON/OFF together at the same time, when the pump is not working, and the screen will show current AC Voltage (only display, cannot be set). Press set to exit.
7. Indication for Operating Time: Press SET, ▲, ▼ and ON/OFF total 4 buttons together at the same time, the screen will show the time based on DAY (means 24 hours), when you press the SET again and the screen will show the time based on HOUR, and press SET the third time to exit.

B: Functions:

1. Remote On/Off Control
2. Liquid level control. If the liquid level is lower than the height of liquid level detector which is set by the user, the pump will shut down automatically. At the same time, the E0 symbol will be shown on the screen. Elimination Method: Dosing liquid till the liquid level is higher than the height of liquid level detector, the pump will turn on automatically, and the E0 symbol will disappear automatically.
3. Impulse Signal Receiving: This pump can receive 5-24V impulse signal.
4. Impulse Signal Feedback: This pump will output one impulse signal for one stroke.

6. Spare Parts Replacement and Daily Maintenance

6.1 Diaphragm Replacement

The JGMA pumps are designed for flawless operation, but for the best functional condition, some spare parts (like diaphragms, seals, valve balls and injection valve springs) need to be changed regularly. ALLPU recommends that the users have to check those parts at least one time a year, based on the using circumstances. When the diaphragm is replaced, all the other ones need to be replaced as well.

How to replace a diaphragm:

1. After the pressure in the discharge pipe has been released, empty and take off the pipe. Put the bottom valve into water or neutral liquid tank. Then start the pump and flush the pump head, then pull the bottom valve out off the liquid and keep the pump running at the same time, till the pump head is filled with air. If the diaphragm is damaged and not functional, you must put on the gloves and remove the suction/discharge pipe carefully, remove the four screws, and put the pump head into water or neutral liquid.

2. After the pump stops running, grab the edge of the diaphragm and turn it counterclockwise, Loosen diaphragm and throw it away. Move the diaphragm plate away (behind the diaphragm), and make sure the diameter of bulge parts of the new diaphragm is same as the old one.

3. Put the diaphragm plate back and make sure the discharge hole is downward, and make sure the screw holes are aligned with the screw holes on the pump head.

4. Screw the new diaphragm clockwise till it touches the bottom. Please DO NOT scratch the surface of the new diaphragm.

5. Use 4 screws and gaskets to install the pump head back, and fasten the screws. After one week operating, the screws should be checked again, and fasten them if necessary.

6.2 How to replace O-rings and Valve Balls

⚠ The process of maintaining and replacing, protective clothing, masks, goggles and gloves need to be worn all along. Additional protective measures should be used according to the chemical suppliers.

1. After the pressure in the discharge pipe is released with caution, empty and take off the pipe.
2. Put the bottom valve into water or neutral liquid tank. Then start the pump and flush the pump head, and then pull the bottom valve out off the liquid and keep the pump running at the same time, till the pump head is filled with air. If the diaphragm is damaged and not functional, you must put on the gloves and remove the suction/discharge pipe carefully, remove the four screws, and put the pump head into water or neutral liquid.
3. Remove one pipe and the connector at a time carefully, and then replace the damaged O-ring and non-return valve. If necessary, use a small screwdriver go through the central hole of the non-return valve to open the valve. Remember the installation direction of the valve before remove it.
4. Install new non-return valves in each position, make sure the installation direction of the valves are correct.

6.3 How to replace the injection valve parts

⚠ The process of maintaining and replacing, protective clothing, masks, goggles and gloves need to be worn all along. Additional protective measures should be used according to the chemical suppliers

1. Isolate the injection valve and release the pipeline pressure, or release the liquid in the pipeline.
2. Release the pressure carefully and remove discharge pipeline.
3. Remove the pipe which is connected with the injection valve, and disassemble that valve and take out the damaged springs, valve seal, valve ball, and the o-ring.

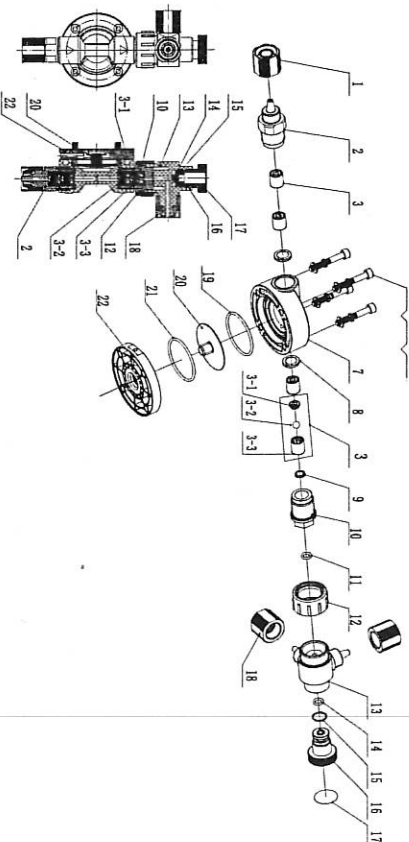
Note: Before disassembling that valve, you must remember the directions of each part.

4. Install a new spring, a new valve seal, a new valve ball, and a new O-ring for the back-pressure valve. Make sure that the directions of the parts are correct.

7. Troubleshooting

Problem	Cause	Solution
The pump head can't self-irrigate.	1.The pump is off or no power.	1.Turn on the pump, or get power.
	2.The bottom valve is not vertical	2.Make the bottom valve stand vertically on the bottom.
	3.The suction increasing too high	3.The max suction is 1.5m. When processing high viscosity liquid, the pump should be installed in the irrigation-type.
	4.The suction tube is twisted	4.Straighten the suction tube with a straight set.
	5.The connector is screwed too tight.	5.The connector is screwed too tight, so the seal is deformed, and leak happens
	6.The suction tube has air in it.	6.The suction tube has to be as vertical as possible to avoid false irrigation
The pump head need re-irrigate	1.There is no liquid in the tank	1.Filling the tank with liquid, and re-irrigate the pump head
	2.The bottom valve is not vertical	2.Make the bottom valve stand vertically on the bottom.
	3.The suction increasing too high	3.The max suction is 1.5m. When processing high viscosity liquid, the pump should be installed in the irrigation -type.
	4.The suction tube is twisted	4.Straighten the tube with a straight set.
	5.The connector is screwed to tight	5.The connector is screwed too tight, so the seal is deformed, and leak happens
	6.The suction tube has air in it.	6.The suction tube has to be as vertical as possible to avoid false irrigation
	7.Air leaking in the suction end	7.Check whether the suction end have small holes or cracks and change it if necessary.
Tube leakage	1.The tube end is damaged	1. Cut the tube end off for 1inch (25mm), and re-install the tube.
	2.The connector is loose or cracked.	2.Replace the connector carefully if the old one is cracked, and don't use wrench. Once the connector makes a contact with the seal, turn the connector for another 1/8—1/4 round, and that's it.
	3.The seal is damaged	3. Replace the seal.
	4.The pump head is corrupted by the liquid.	4.Contact ALLIPU or local distributors for suitable material.
The output flow is too small, or the pump cannot work under pressure	1.The max discharge pressure is less than the input pressure.	1.Input pressure can be higher than the pump's max pressure.
	2.The seal is damaged	2. Replace the seal if damaged.
	3.The diaphragm is damaged.	3. Replace the diaphragm.
	4.The stroke length set is not suitable.	4.Check the zero /zero reset.
	5.The discharge tube is too long	5.If the discharge tube is too long, the rated pressure of the pump will be loss because of friction.
	6.The filter of the bottom valve is blocked.	6.Take out the filter when pumping high viscosity liquid.

Appendix 1: Pump Head Structure

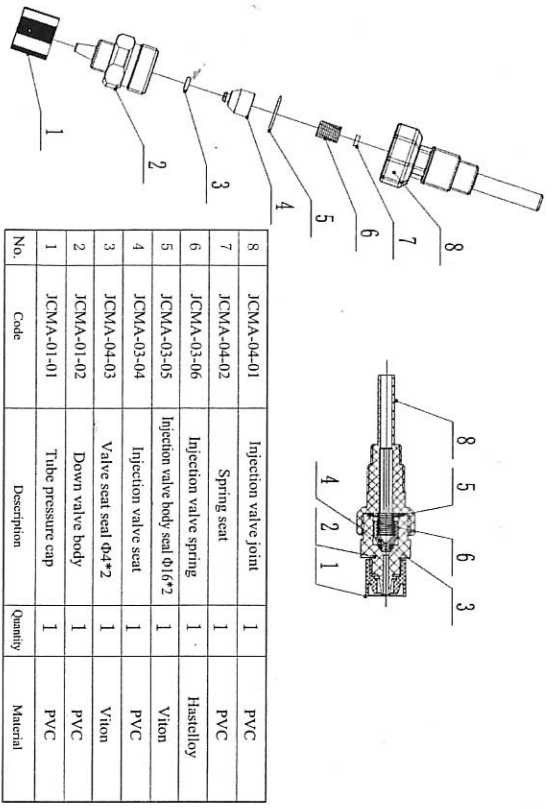


Appendix

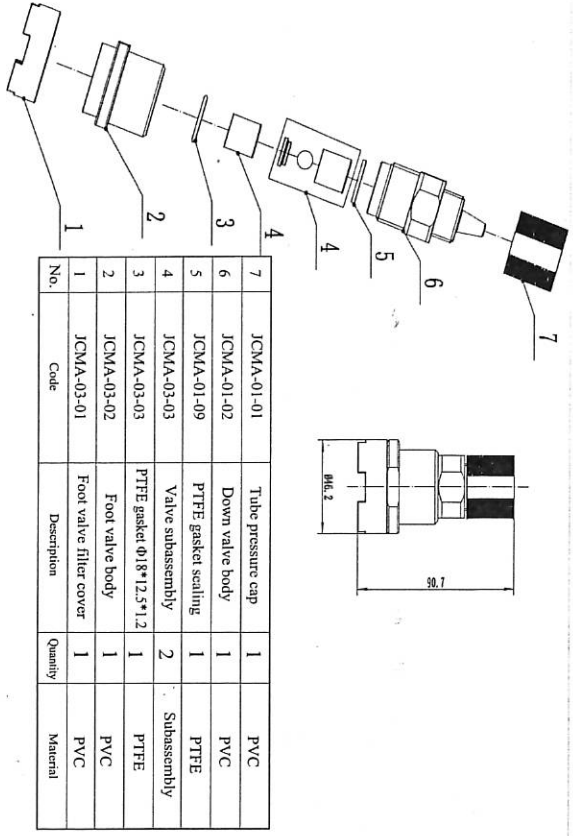
Pump Head Parts:

No.	Code	Description	Quantity	Material	No.	Code	Description	Quantity	Material
10	JCMA-01-10	Upper valve body	1	PVC					
9	JCMA-01-09	PTFE gasket sealing	1	PTFE	21	JCMA-01-22	Pump head Connecting base Two dimensions: 045/0936	1	PVC
3-3	JCAM40-06	Valve cover	4	PVC	21	JCMA-01-21	Connecting base O-Ring Two dimensions: 040/2.65/031 2.65	1	Viton
3-2	JCAM40-02	Valve ball 06.35	4	Ceramic	20	JCMA-01-20	Diaphragm Two dimensions: 045/06.46	1	PTFE
3-1	JCAM40-01	Valve seat	4	Viton	19	JCMA-01-19	Pump head O-Ring Two dimensions: 035/2.65/02.65	1	Viton
8	JCMA-01-08	PTFE gasket 018*12.5*1.2	2	PTFE	18	JCMA-01-18	Tube pressure cap	2	PVC
7	JCMA-01-07	Pump head Two dimensions: 039 and 045	1	PVC	17	JCMA-01-17	Multi-function valve Inble	1	PVC
6	JCMA-01-06	M5 flat gasket	4	304	16	JCMA-01-16	Hand wheel	1	PVC
5	JCMA-01-05	M5 spring washer	4	304	15	JCMA-01-15	O-Ring 010*2.5	1	Viton
4	JCMA-01-04	M5*50	4	304	14	JCMA-01-14	O-Ring 03.4*1.8	1	Viton
3	JCMA-01-03	Valve subassembly	4	Subassembly	13	JCMA-01-13	Multi-function valve body	1	PVC
2	JCMA-01-02	Drawn valve body	1	PVC	12	JCMA-01-12	Left-handed fixed cap	1	PVC
1	JCMA-01-01	Tube pressure cap	1	PVC	11	JCMA-01-11	O-Ring 06*1.8	1	Viton

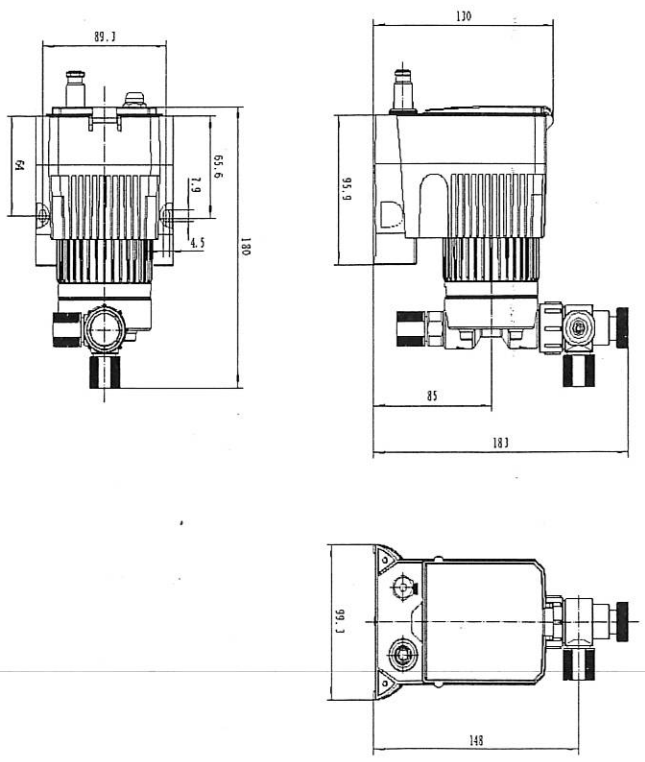
Appendix 2: Injection Valve Structure



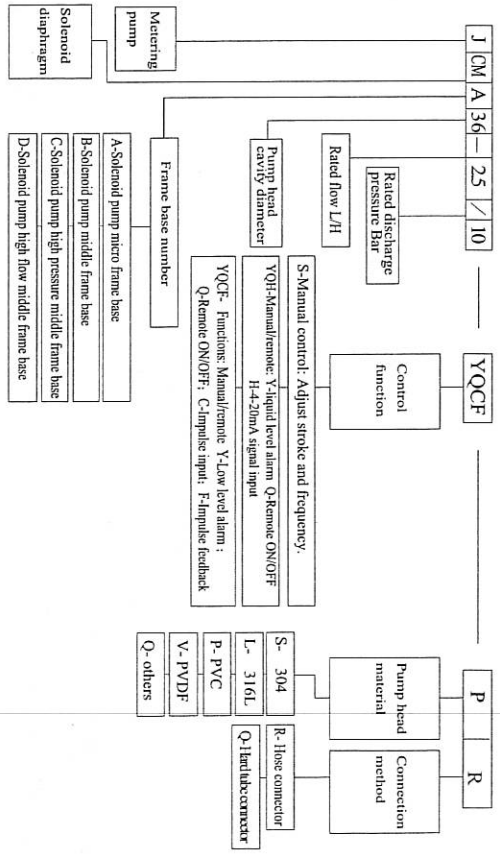
Appendix 3: Foot Valve Structure



Appendix 4: JCMA Outline Drawing



Appendix 5: JCM Coding



5.1.JCMA Function Table

JCMA			
No.	Function Category	Explanation	Coding and Explanation
1、	Manual	On the panel, Only ON/OFF and frequency adjust ment key can be used, The SET button means nothing.	JCMA-S S--Manual
2、	Manual/Remote	Functions :	Y--Liquid level alarm
		1.Liquid level alarm	Q--Remote ON/OFF
3、	Manual/Remote	2.Remote ON/OFF	H--4-20mA Input
		3.4--20mA Input	
		Functions:	Y--Liquid level alarm
		1.Liquid level alarm	Q--Remote ON/OFF
3、	Manual/Remote	2.Remote ON/OFF	C-- Impulse Input
		3. Pulse Input	F-- Impulse Feedback
		4. Pulse Feedback	

5.2.JCMA Models

JCMA36 Series					
Model	Max. Flow	Max. Pressure	Max. Pipe Dia. (mm)	Pipe Material	
JCMA36 - 2.5 / 10	2.5 L/H	10bar	In 4 ,Out 9.5	PVC	
JCMA36 - 1.5 /12	1.5 L/H	12bar	In 4 ,Out 9.5	PVC	
JCMA36 - 0.8/15	0.8L/H	15bar	In 4 ,Out 9.5	PVC	

JCMA45 Series

Model	Max. Flow	Max. Pressure	Inlet Pipe Dia. (mm)	Outlet Pipe Dia. (mm)	Pipe Material
JCMA45-15/1.5	15 L/H	1.5 bar	In 5.5 ,Out 9.5	In 4 ,Out 9.5	PVC
JCMA45-11/2	11 L/H	2 bar	In 5.5 ,Out 9.5	In 4 ,Out 9.5	PVC
JCMA45-7/3.5	7 L/H	3.5 bar	In 5.5 ,Out 9.5	In 4 ,Out 9.5	PVC
JCMA45-3.5/7	3.5 L/H	7 bar	In 5.5 ,Out 9.5	In 4 ,Out 9.5	PVC

Appendix 6: 5-Core Signal Interface

A: 4-20mA signal function interface definition

No.	Wiring Serial	Color	Signal	Explanation	Wiring Map
1	①+③-	Blue+ Grey -	Q - Remote ON/OFF	1. Passive contact signal	① BLUE ③ GREY ② YELLOW Remote ON/OFF Timing switch signal Level ON/OFF Power signal
2	②+③-	Yellow+ Grey-	Y-Liquid level ON/OFF	2. Grey wire is public wire	
3	④+⑤-	Red+Green-	H-4-20mA Receiving	If the positive and negative are mixed, the signal function is not working, but the pump won't be damaged.	④ RED ⑤ GREEN 4-20mA receiving current signal

B: Impulse signal receiving & feedback function interface pins definition:

No.	Wiring Serial	Color	Signal	Explanation	Wiring Map
1	①+③-	Blue+ Grey -	Q-Remote ON/OFF	1.Passive contact signal Grey wire is public wire	<p> BLUE+ → Remote ON/OFF GREY- → Timing switch signal YELLOW+ → Level ON/OFF RED+ → Impulse receiving RED- → Impulse feedback GREEN+ → Impulse signal GREEN- → Impulse signal </p>
2	②+③-	Yellow+Grey-	Y- Liquid level ON/OFF		
3	④+⑤-	Red+ Grey-	Impulse Receiving	1.Impulse Signal 2.Grey wire is public wire	
4	⑤+⑥-	Green+ Grey -	Impulse Feedback	3.The pump will output a impulse signal for each stroke	