

PRESSURE MANAGEMENT VALVE IOM



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Chapter 1 Introduction

1.1 Introduction

The intelligent valve controller can realize the pressure management of pipe network with hydraulic control valve and special pilot. The advantages of pressure management: reduce water leakage, prolong the service life of pipeline, reduce the investment and maintenance cost of pipe network. The product can communicate with cloud platform in the world through 4G, 3G and GPRS, and support cloud platform and mobile app to configure and query devices. The PMV is shown in Figure 1



Figure 1 PMV

The controller consists of three important parts: Control Box (PMCX), Solenoid Box (PMAX) and Battery Box (PMBX). Control Box (PMCX): pressure, flow, water level and other information acquisition and data transmission part. Solenoid Box (PMAX): solenoid valve part as execution. Battery Box (PMBX): Battery pack, the communication power supply part of the controller.

The product can be divided into Standard Version (STD) and professional version (pro) according to function. According to the application situation, it can be divided into Chinese Version (CN) and English Version (EN). The specific name and model are as follows.

Model Code of Chinese Version:

Control Box-Standard-Chinese	PMCX-STD-CN
Solenoid Box-Standard-Chinese	PMAX-STD-CN
Battery Box-Standard-Chinese	PMBX-STD-CN
Control Box-Professional-Chinese	PMCX-PRO-CN

Model Code of English Version:

Control Box-Standard-English	PMCX-STD-EN
Solenoid Box-Standard-English	PMAX-STD-EN
Battery Box-Standard-English	PMBX-STD-EN
Control Box-Professional-English	PMCX-PRO-EN

**SIM card is excluded

Chapter 2 Installation and wiring for controller

2.1 SIM card assembling

(1) Use an internal hexagon screw driver to open the fixing screw of the Control Box (PMCX), open the back cover (handle with care, pay attention to the battery connection cable). The inclined end of the SIM card should face down, and the contact surface of the SIM card should face the circuit board. Put the SIM card into the SIM card holder, push it down gently, and hear the "tick" sound of the self-propelled SIM card holder. As shown in Figure 2



Figure 2 SIM Card assembling

(2) When the equipment is disassembled and reassembling, check whether the sealing ring is in right place and cannot fall off; the battery connecting wire in the shell should be placed properly to avoid damaging the sealing ring; when installing the internal hexagon screws of the back cover and the shell, use a torque wrench to control the first pre tightening torque (1n * m) and the second pre tightening torque (2.5n * m) to tighten the screws evenly, at least two times. The bolts are shown in Figure 3.



Figure 3 Bolts on PMCX

2.2 Wiring for standard type

Connect wiring as shown in Figure 4. Only when the equipment is installed correctly can it be used normally. The equipment shall be installed perpendicular to the ground.

(1) LTE antenna with magnet, installed to the ANT.LTE on PMCX. Please tighten it; and install it perpendicular to the ground with bracket.

(2) Bluetooth antenna, installed to the ANT.BT on PMCX. Please tighten it;

(3) 2-core connecting wire, connecting the BAT.BOX1 on PMCX and battery pack CTL.BOX ;

(4) 8-core connecting wire, connecting the SV.BOX on PMCX and CTL.BOX on PMAX;

(5) The red hose with quick coupling is connected to the inlet P. of the PMCX and the plug in of the valve inlet;

(6) The green hose with quick coupling is connected to the outlet P. of the PMCX and plug in of the valve outlet;

(7), red hose, connecting sv1 inlet of PMAX and plug in of the valve inlet

(8), blue hose, connecting sv1 outlet of PMAX and pilot valve (with blue mark);

(9) White hose connecting SV2 inlet of PMAX and pilot valve;

(10) Black hose is installed to SV2 outlet of PMAX; (other color hose can be used for water outlet);



Fig.4 Wring

2.3 Wiring for Professional Version

(1), The Professional version of the PMCX is to add the interface of flow meter and water level detector on the basis of the standard version;

Flow meter interface (flow): red line corresponding to 24 V output; white line, 4-20mA input; green line, passive pulse input; black line, system ground GND. Level: red line, 24 V output; white line, 4-20mA input; green line, system ground GND; black line, suspended (reserved).

(2) In order to ensure the safe and reliable operation of the product, please read the following contents carefully.

The core wires to be connected in the cable shall be connected one by one according to the requirements, and the wrong connection is not allowed, so as to prevent damage to the equipment or external equipment. For the connected core wire, the joint part of the wire shall be wrapped tightly with electrical tape and wrapped tightly. The binding length shall be no less than 2 cm on both sides of the joint as shown in Fig 5.



Fig. 5

Chapter 3 - Mobile APP

3. APP

Use the magnet at bottom of LTE antenna to touch the PMCX surface with a lightning logo, then you will hear a "beep". Turn on the mobile Bluetooth and click the Bluetooth logo in the APP to connect valve controller.

Chapter 4 Troubleshooting

4. Troubleshooting

- 1. Device offline
- A. Check the platform settings, such as whether the equipment address is correct;
- B. Check whether the device address, IP address and port number are set correctly;
- C. Check whether the sampling interval, saving interval and sending interval are set correctly;
- D. Check whether the SIM is installed and shut down;
- E. Check whether the equipment antenna is installed correctly;
- F. Check whether the connecting wire between the main controller and the battery box is installed correctly;
- 2. Pressure control failure
- A. Check whether the pressure before and after the valve is normal and whether the connecting wire is installed correctly;
- B. Check whether the connecting wires of the main controller and the auxiliary controller are installed correctly;
- C. Check whether the red, blue and white plastic hose is installed correctly;
- D. Observe whether there is water seepage at each interface;

Chapter 5 Commissioning

a) Needle Valve Function

The installation diagram of valve and equipment is shown in Figure 6.

5-1 is the needle valve that controls the speed of the main valve (1), and the preset value is to close to the bottom and reverse one and a half turns.

5-2 is the pilot valve (5) booster needle valve, which can adjust the pressure of each pressurization. The default is to turn off to the bottom and reverse one and a half times.

5-3 is the pilot valve (5) pressure reducing needle valve, which can adjust the pressure of each decompression. The default is to turn off to the bottom and reverse one turn.





b) Commissioning

During the first commissioning, since there is no water in the pilot valve (5), the following steps must be carried out:

(1) Turn the black plastic cover on the top of the pilot valve (5).

(2) Loosen the nut on the top of the pilot valve, and use a slotted screwdriver to adjust the screw on the top of the smart 3 pilot valve until the back pressure of the main valve reaches any set value (2 bar is assumed here).

(3) Open the mobile phone app, connect the device with Bluetooth, select the pressure after the fixed valve, and set it to be greater than the value set in (2) + 0.5bar, for example, 2 + 0.5 = 2.5bar.

(4) When the controller adjusts the pressure behind the valve to 2.5 bar, use a slotted screwdriver to loosen the screw on the top of the pilot valve, lock the nut, and lock the black plastic cover.

(5) At this time, you can start to use all the functions in the app.

c) Valve Parameter Setting

Dimension compensation parameter: this parameter is used to adjust according to the valve diameter and field conditions. Generally speaking, the value of dn50-100 is set as 1, the value of DN 150-200 is set as 4, the value of dn250-300 is set as 6, the value of d350-450 is set as 10, and the value of dn500-600 is set as 13. If it is found that valve commissioning often fails to converge to the set value \pm 0.1, this parameter can be appropriately increased.

Needle valve setting: if it is found that the pressure regulating range of each solenoid valve action is too large, the opening of 2-2 and 2-3 needle valves can be appropriately reduced. The most ideal pressure regulating range is that the solenoid valve acts once, and the pressure behind the valve changes between 0.04-0.08bar.

Chapter 6. Emergency

d) Emergency

When the valve controller fails, mechanical adjustment can be used to achieve the following effects: closing the valve, fully opening the valve or using it as a normal mechanical pressure reducing valve. The treatment steps are as follows:

(1) Close the valve.

Pull out the hose connected to the 2-2, 2-3 needle valve, so that the hose is no longer connected to the control box and pilot valve, and then close the 3-2 ball valve between the pilot valve outlet and the main valve outlet, the valve will automatically close.

(2) Fully open the valve.

Pull out the hose connected to the 2-2, 2-3 needle valve, and open the black plastic cover on the 2-1 needle valve. There is a screw and a small nut inside. Loosen the nut to the end, and turn the screw clockwise to the end to close the needle valve.

Remove the black plastic cover on the top of (5) pilot valve. There is a screw and a small nut inside. Loosen the nut to the bottom and turn the screw down clockwise to the end, then the valve can be fully opened.

(3) Mechanical decompression

Pull out the hose connected to 2-2, 2-3 needle valve, and remove the black plastic cover on the top of (5) pilot valve. There is a screw and a small nut in it. Loosen the nut to the end, and turn the screw down clockwise to the required pressure at the valve outlet. After adjustment, the small nut can be locked to complete the mechanical decompression.

