

PW-02

Multifunction Intelligent Pump Control

Operation and Installation Instruction

Three Phase AC380V One Controller For Two Pumps

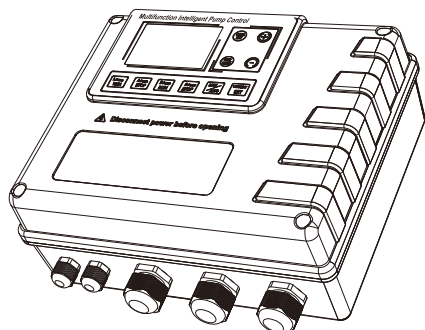
Attention: Please read this instruction carefully before using and keep it for future reference.



WARNING

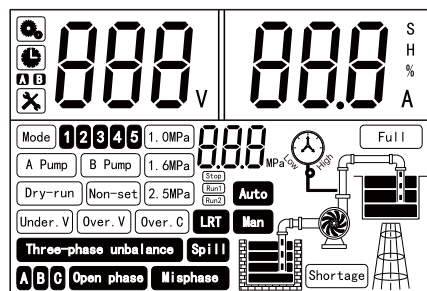
- Please read the instructions and keep it properly before installing and using.
- The controller must be installed by professionals familiar with Low-voltage electric technology.
- The power supply must be disconnected during installation wiring disassembly and maintenance.
- It is strictly forbidden to touch the live element with your hand when power on.
- The controller must be reliably grounded before energized.

1 : Product Introduction



length, width and height
Size: 302×267×129(mm)

LCD screen display diagram



Application area:

Protect and control the deep well pump/submersible pump/sewage pump/pipe booster pump/multistage pump/centrifugal pump and so on, for the underground sewage, tall building water supply.

Main features:

Manually and automatically work with open phase,locked-rotor, over-current, dry-run, under-pressure and over-pressure protection; automatic control of liquid level and pressure can be realized; it not only realize to set the double pump rotation start time, but also realize double pump working at the same time. in the automatic mode for single pump working, after the single pump fails, another pump can automatically switch jobs.

Technical data:

Rated Output Power:0.75-4Kw 5.5-7.5Kw 11Kw 15Kw

Working Voltage:AC380V/50Hz/60Hz

Locked-rotor Protection Time:<1s

Dry-running Protection Time:10s Or 3mins Or 5mins

Recovery Time From Dry-running:30mins

Distance For Signal Transmit:≤200M

Protection Degree:IP54

Over Current Actuating Time:(Inverse-time characteristic-the current bigger, acting time shorter)

Open Phase Protection Time:<2s

Recovery Time From Under/Over Voltage:5mins

Under Or Over Voltage Protection Time:<5s

Under Voltage Protection:304V

Over Voltage Protection:437V

Recovery Time From Over Current:30mins

Overload Multiple (Times)	1.3	1.5	2	3	5
Protection time	30s	15s	5s	3s	1s

7 : Basic Using Way

1. After installation and setting the current, Press" MAN/AUTO "button, switch to " MAN/AUTO " mode.
2. Switch to "MAN" model. Press button or button to Start the pump. And button or button to stop the pump.
3. Switch to "AUTO" mode, the controller will start or stop the pumps according to the liquid or pressure automatically.

8 : Packing List

Packing list	SPARE PARTS	QTY. (PCS)	Warm tip for selecting modes installation: Much thunder or Sludge area, please select float switch control mode. Please short circuit signal line ① ② ③ port, when they are not working. Because the cable for deep well submersible pump is long, please select the bigger power controller. Pressure sensor data:DC5V supply/0.5-4.5V voltage signal output.
	Cement nail	3	
	Inflatable plastic tubes	3	
	Self-tapping screw	3	
	Liquid-level probe (SELECT)	3	
	Pressure sensor (SELECT)	1	
Sensor signal line (SELECT)	1		
Manual	1		

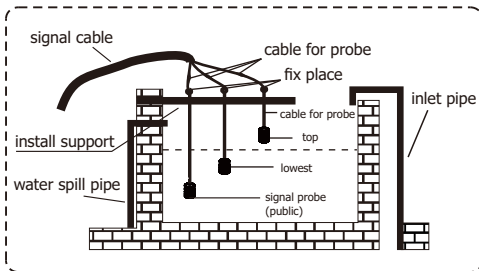
● Pressure gauge pointer low Flash	It means the pressure in pipe is too low.
● Pressure gauge pointer high Flash	It means the pressure in pipe is too high.

Note:

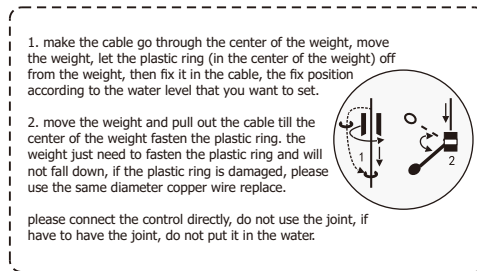
- When light of **A PUMP** or **B PUMP** is always on, it means the corresponding pump is in working condition; when the light off, it means the pump is stopped. Flashing indicates the state of fault shutdown, and the corresponding fault information flashes as well.
- When single pump or double pump is working, the total current of single pump or double pump can be displayed, and **A**, **B** or **A B** can be displayed alternately on the screen.

6 : liquid-level Probe/Float Switch Installation

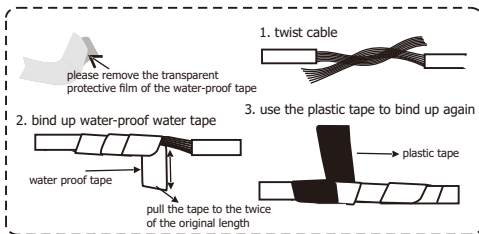
Liquid-level probe installation



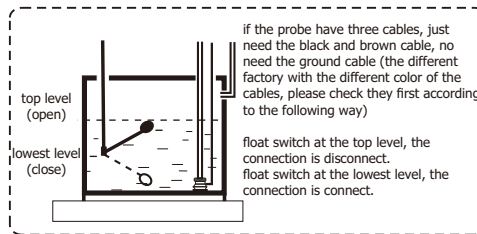
Float switch installation



Bind up the joint



Position installation



Warning: if the cable of float switch have joint, never immersed it into water.

2 : Precautions For Product Installation

Warning: Connect the cable for power or motor, at first must make sure cut off the controller input power!

The controller used for regular work environment, please avoid install in below condition.

MECHANICAL SHOCK	THE CORROSIVE GAS OR LIQUID	VERY COLD OR HOT, THE CONTROL USED FOR TEMPERATURE RANGE: -25°C-55°C
SALT FOG	RAINING	FLAMMABLE ITEMS

Matters need attention:

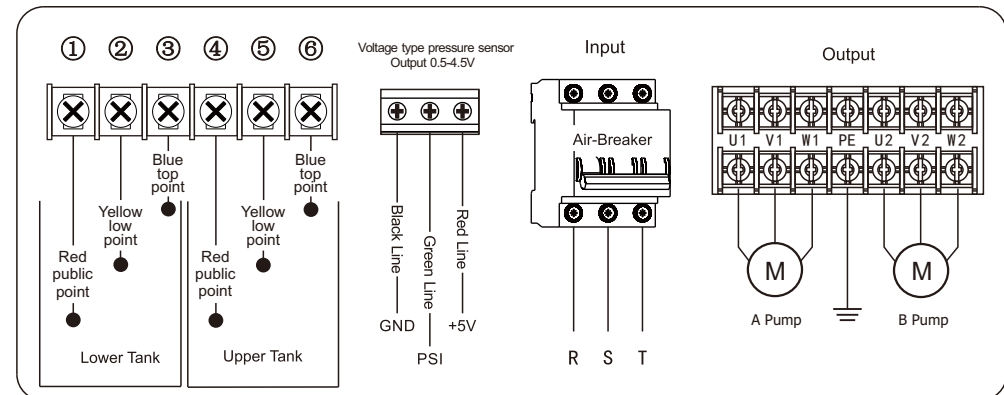
- The controller can't use for medical treatment or something system will cause big damage when it broken down. In the most biggest legal bounds, the manufacture don't afford the loss caused by controller.
- This controller itself don't have any parts that user could maintenance by themselves, it must be finished by the people who have the technical knowledge.
- Must use four-core round cable connect this controller, power and pump. To ensure safety, ground cable must be connected correctly.

3 : Installation Settings And Wiring

(NOTE: Liquid level signal port can not connect any power supply)

Warning: Pipe for signal line, suggest using PVC plastic pipe not metal pipe.

terminals wiring diagram

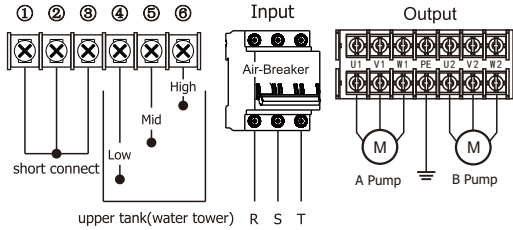


(1) Installation diagram & Setting work mode

Mode 1: Double Level Supply Water

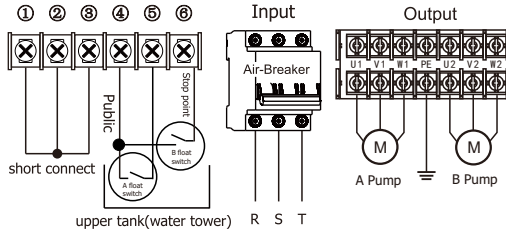
Step 1: Controller correct wiring diagram

① Pumping the water to the upper tank(sensor)control (no need the sensor in lower tank)



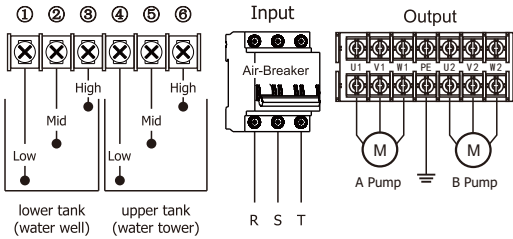
When the water level is below the yellow low point, two pumps both work.
When the water level is in mid(between the yellow low point and the blue top point),the main pump works.
When the water lever is above the blue top point, two pumps both stop.

② Pumping the water to the upper tank(float switch) control(no need the sensor in lower tank)



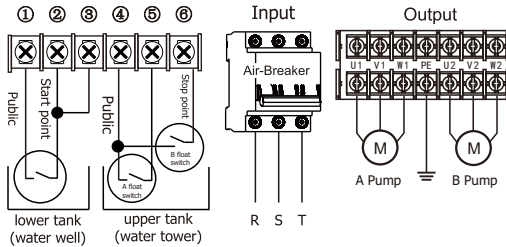
When float switches in the upper water tank all drop, two pumps both work.
When float switches in the upper water tank all raise, two pumps both stop.
When float switch A raises and float switch B drops, the main pump works.

③ Pumping the water to the upper tank(sensor)control



When the water level is below the yellow low point, two pumps both work.
When the water level is in mid(between the yellow low point and the blue top point),the main pump works.
When the water lever is above the blue top point, two pumps both stop.

④ Pumping the water to the upper tank(float switch) control

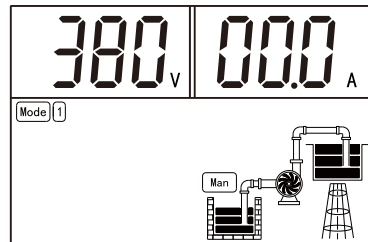


When float switches in the upper water tank all drop, two pumps both work.
When float switches in the upper water tank all raise, two pumps both stop.
When float switch A raises and float switch B drops, the main pump works.

Step 2: Setting work mode

NOTE Under shutdown state, make sure the controller in manual mode.

Press **PARA SET** and hold it, meantime click **(+)** to select **Mode 1** . as shown right:



F07: Single pump start pressure set (only for mode 5)

The pressure sensor range is 0-1.0MPa, starting pressure can be adjusted from 0.1-0.6Mpa;
The pressure sensor range is 0-1.6MPa, starting pressure can be adjusted from 0.1-1.0Mpa;
The pressure sensor range is 0-2.5MPa, starting pressure can be adjusted from 0.1-1.5Mpa.

F08: Double pump start pressure set (only for mode 5)

The pressure sensor range is 0-1.0MPa, starting pressure can be adjusted from 0.05-0.55Mpa;
The pressure sensor range is 0-1.6MPa, starting pressure can be adjusted from 0.05-0.95Mpa;
The pressure sensor range is 0-2.5MPa, starting pressure can be adjusted from 0.05-1.45Mpa.

F09: Pump A total working time query

F10: Pump B total working time query

5 : Trouble-Shooting

LCD screen shows	Reasons and solutions
● Dry-run Flash and ringing once per minute	It means pump Dry-running or no-load, wait for 30 minutes, then start again.
● Over. C Flash and ringing once per minute	It means current is too high, check whether the impeller or the motor shaft wind with something. Or after 30 minutes, start again.
● Under. V Flash and ringing once per minute	It means the voltage is too low. Restart every 5 minutes, after the voltage be regular and it will work.
● Over. V Flash and ringing once per minute	It means the voltage is too high. Restart every 5 minutes, after the voltage be regular and it will work.
● LRT Flash with alarm	It means current is too high. check whether the impeller or motor shaft stuck. Must cut off the power, after check and maintain pump then connect power.
● Open phase Flash with alarm	Must cut off power. Check input and output voltage, the motor coil and cable, then power on.
● (Non-set) Flash all the time	It means non-set or the previous set current already be eliminated, please set the current again.
● Show Shortage	It means the lower tank or well without water.
● Show Full	It means the top tank full of water.
● Shortage Or Full flash	Sensor cables are connected inversely or the cable to LDC was broken down.

5. After the parameters are set, press **A PUMP STOP** or **B PUMP STOP** to save and return to the main interface, or the controller will automatically save and return to the main interface after waiting for 15 seconds without pressing any key.

Note:

1. If shift-working time is 0, it means turn off the shift-working function.
2. when accumulating the operational time of shift-working for pump A and pump B, there must be only one pump working and the working time should be more than 1 minute. Otherwise, the time can't be counted in total.

4 : Parameter Code Description

F00: Setting percentage of Dry-running current

The current lower than setting current, the pump will stop.
Current can be selected 70% or 80% or 85% of rated current

F01: Setting Dry-running protection current

The system checked the current lower than **F00** data, Before stopping pump, the pump is still running for some time.

Setting delay time can be selected 10s or 3mins or 5mins

F02: Set rated current of pump A

The power range of pump is 0.75-7.5kw, please set 1-30A;
The power range of pump is 11-15kw, please set 1-40A.

F03: Set rated current of pump B

The power range of pump is 0.75-7.5kw, please set 1-30A;
The power range of pump is 11-15kw, please set 1-40A.

F04: Double pump alternate working time setting

Selecting 0-99hours

F05: Pressure sensor's range setting

State: setting the range of pressure sensor (only for mode 5)
There are three ranges could be chose: 0-1.0MPa, 0-1.6MPa, 0-2.5MPa.

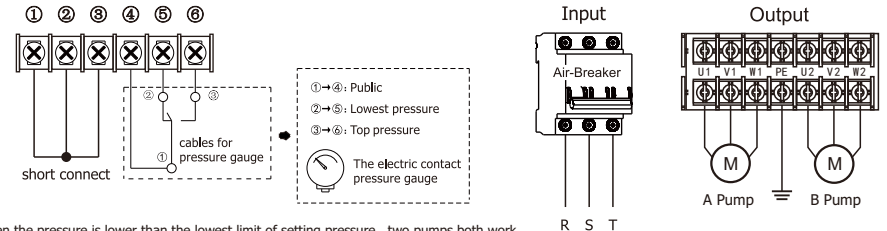
F06: Setting stopping pressure (only for mode 5)

The pressure sensor range is 0-1.0MPa, stop pressure can be adjusted from 0.15-0.95Mpa;
The pressure sensor range is 0-1.6MPa, stop pressure can be adjusted from 0.15-1.55Mpa;
The pressure sensor range is 0-2.5MPa, stop pressure can be adjusted from 0.15-2.45Mpa.

Mode 2: The Electric Contact Pressure Gauge

Step 1: Controller correct wiring diagram

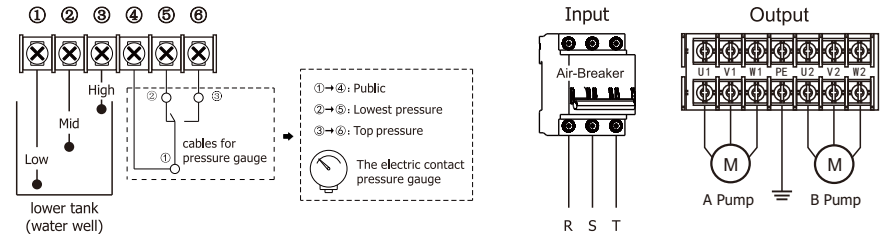
- ① Pumping the water to the pipe control (no need sensor in the lower tank)



When the pressure is lower than the lowest limit of setting pressure , two pumps both work.
When the pressure is higher than the top limit of the set pressure, two pumps both stop.
When the pressure is between the top limit and lowest limit of the setting pressure, main pump works.

Note: most pressure gauge already marked the number of the connect cable, the normal Corresponding relations between pressure gauge①、②、③ to the controller ④、⑤、⑥

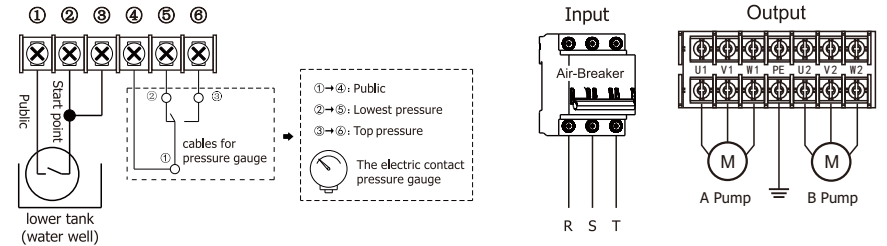
- ② Pumping the water to the pipe (liquid-level probe) control



When the pressure is lower than the lowest limit of setting pressure , two pumps both work.
When the pressure is higher than the top limit of the set pressure, two pumps both stop.
When the pressure is between the top limit and lowest limit of the setting pressure, main pump works.

Note: most pressure gauge already marked the number of the connect cable, the normal Corresponding relations between pressure gauge①、②、③ to the controller ④、⑤、⑥

- ③ Pumping the water to the pipe (float switch) control



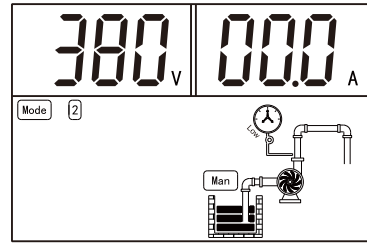
When the pressure is lower than the lowest limit of setting pressure , two pumps both work.
When the pressure is higher than the top limit of the set pressure, two pumps both stop.
When the pressure is between the top limit and lowest limit of the setting pressure, main pump works.

Note: most pressure gauge already marked the number of the connect cable, the normal Corresponding relations between pressure gauge①、②、③ to the controller ④、⑤、⑥

Step 2: Setting work mode

NOTE Under shutdown state, make sure the controller in manual mode.

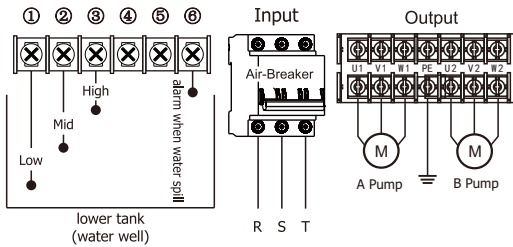
Press **PARA SET** and hold it, meantime click **+** to select **Mode 2** . as shown right:



Mode 4: Overflow Drainage Alarm

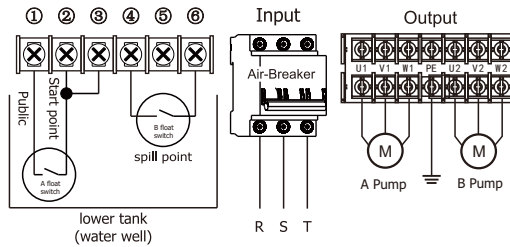
Step 1: Controller correct wiring diagram

① Alarm when water spill, then drain off the water (liquid-level probe) control



When the water level is below the yellow low point, two pumps both stop.
When the water level is between the yellow low point and the overflow-alarming-point, main pump works.
When the water level is above the overflow-alarming-point, two pumps both work and alarm with sound.

② Alarm when water spill, then drain off the water (float switch) control

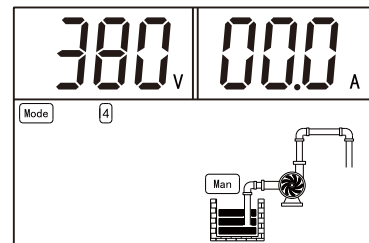


When Float switch A drops, two pumps both stop.
When Float switch A raises, but Float switch B drops, main pump works.
When Float switch A and Float switch B both raises, two pumps both start and alarm with sound.

Step 2: Setting work mode

NOTE Under shutdown state, make sure the controller in manual mode.

Press **PARA SET** and hold it, meantime click **+** to select **Mode 4** . as shown right:



Mode 5: Pressure Sensor Control

Step 1: Controller correct wiring diagram

3. Click or long press **+** to increase value of current, and **-** to decrease value of current.

The range of the current should be 1A-30A when the power is 0.75-7.5kw. The range of the current should be 1A-40A when the power is 11-15kw.

4. Press **QUERY CONFIRM** to save the current setting.

5. After the parameters are set, press **A PUMP STOP** or **B PUMP STOP** to save and return to the main interface, or the controller will automatically save and return to the main interface after waiting for 15 seconds without pressing any key.

Eliminate the previous set current:

1. Press the button **MAN/AUTO** to switch the mode to manual condition. The LCD screen shows "Man"

2. Long press the button **A PUMP STOP** for 5 seconds until hearing the sound of "bi", and the LCD screen shows "A" "UNADJUSTED". It means the former current setting is cleared and pump A could be re-adjusted now.

3. Long press the button **B PUMP STOP** for 5 seconds until hearing the sound of "bi", and the LCD screen shows "B" "UNADJUSTED". It means the former current setting is cleared and pump B could be re-adjusted now.

4. Long press button **PARA SET** and **QUERY CONFIRM** for more than 3 seconds and then the pump back to the factory default setting.

Note: The controller is a direct start type, the current of the pump starts to be large, and the impact on the power grid is large. All the double pumps are stepped on by 6 seconds.

Double Pump shift-working time setting:

1. Press the button **MAN/AUTO** to switch the model to manual condition. The LCD screen shows "MAN"

2. Long press **+** and **-** more than 3 seconds to enter the interface **PARA SET**, press the button **PARA SET** when it shows **F04** on the LCD screen.

3. Increase working time by click or long press the button **+** and decrease working time by click or long press the button **-**

(Time setting range:0-99 hours)

4. Press the button **QUERY CONFIRM** to save the setting.

(2) Current setting and eliminate




Must set current when first time use the pump.

NOTE Please eliminate the previous set current in the controller when maintenance or change new pump, and then set the current for the new pump again!




One key current setting:

NOTE One key current setting can only be used to display **A** **B** **Non-set** on the LCD screen.





Pump A Setting:

1. Press the button  to switch the mode to manual condition. The LCD screen shows "Man"
2. Press the button  and the pump starts, "the impeller" mark on the LCD screen is running. Check whether the current value, forward and back of the water pump and the flow rate is normal.
3. Press the button , count 6 seconds and the pump stops automatically when there is a sound "bi". After all above steps finished, the current of pump A is debugging completed.

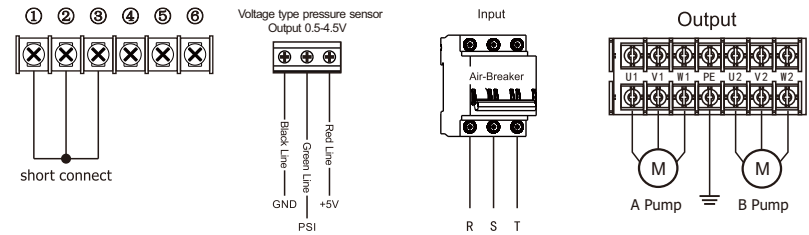
Pump B Setting:

1. Press the button  to switch the mode to manual condition. The LCD screen shows "Man"
2. Press the button  and the pump starts, "the impeller" mark on the LCD screen is running. Check whether the current value, forward and back of the water pump and the flow rate is normal.
3. Press the button , count 6 seconds and the pump stops automatically when there is a sound "bi". After all above steps finished, the current of pump B is debugging completed.

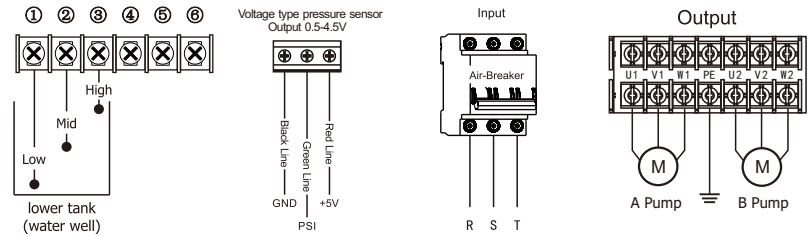
Manual current setting:

1. Press the button  to switch the mode to manual condition. The LCD screen shows "Man"
2. Press  and  at the same time more than 3 seconds to enter the parameter setting interface. when displays **F02**, press  to set pump A rated current and set pump B rated current when displays **F03**.

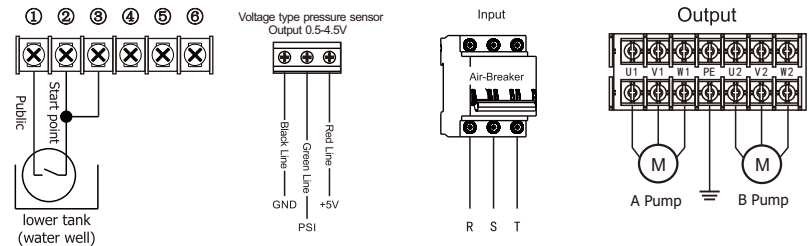
① Pressure sensor control (no need sensor in the lower tank)



② Pressure sensor (liquid-level probe) control

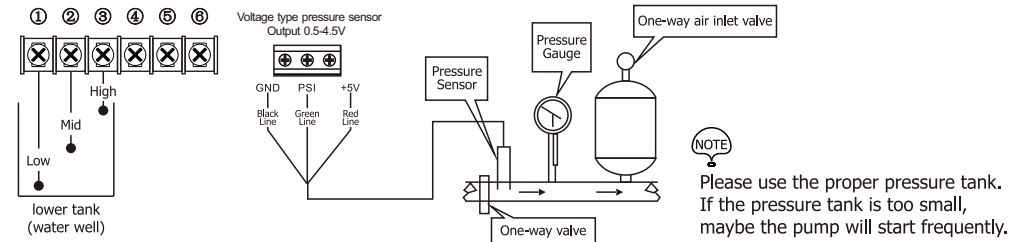


③ Pressure sensor (float switch) control



The starting pressure of single pump, starting pressure of double pumps and stopping pressure should be set for all the above three connection methods (Stopping pressure > single pump starting pressure > double pumps starting pressure)
 When the pressure in the pipe is less than the starting pressure of single pump, main pump works.
 When the pressure in the pipe is less than the starting pressure of double pumps, two pumps both work.
 When the pressure in the pipe is higher than the stopping pressure, two pumps both stop.
 When the pressure in the pipe is higher than the starting pressure of single pump, but less than the stopping pressure, main pump works.

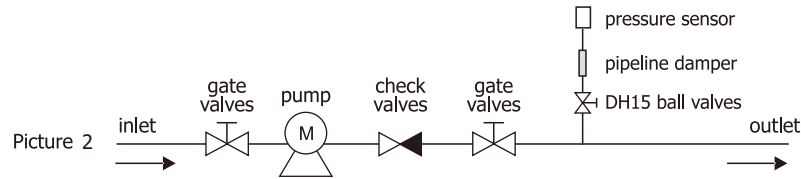
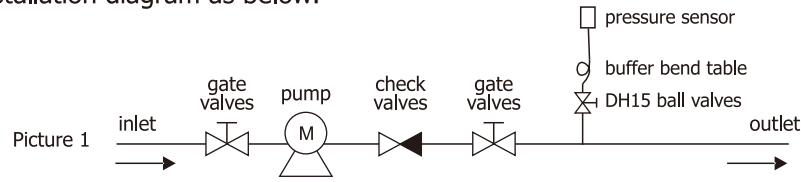
Pressure piping installation diagram



Requirement for installing pressure sensor:

1. Minimize mechanical vibration source;
2. Please install the DN15 ball valves before installing the pressure sensor. Then install the buffer bend table or pipeline damper to reduce the impact of water hammer on pressure sensor.

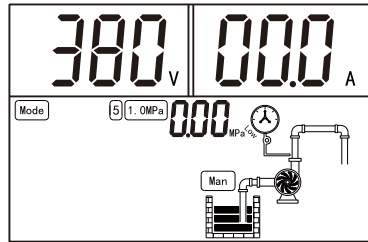
The installation diagram as below:



Step 2: Setting work mode

NOTE Under shutdown state, make sure the controller in manual mode.

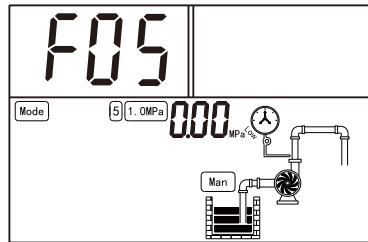
Press **PARA SET** and hold it, meantime click **+** to select **Mode 5**. as shown right:



Step3: The range of pressure sensor and pressure parameter setting

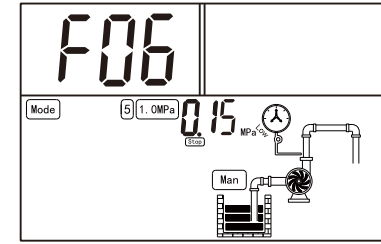
NOTE Under shutdown state, make sure the controller in manual mode, and set the work mode to mode 5.

- ① Selection of pressure sensor range: long press both **+** and **-** more than 3 seconds to enter the parameter set interface. after the screen show **F05**, press **PARA SET** enter. and press **+** or **-** to select the parameter value needed. final press **QUERY CONFIRM** to save the current setting. as shown right:



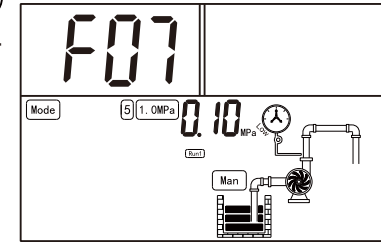
(The range of pressure sensor: 0-1.0MPa or 0-1.6MPa or 0-2.5MPa)

- ② Stop pressure set: press and hold both **+** and **-** more than 3 seconds to enter the parameter setting interface. after the screen show **F06**, press **PARA SET** enter. and click or long press **+** to increase value, and **-** to decrease. final press **QUERY CONFIRM** to save the current setting. as shown right:



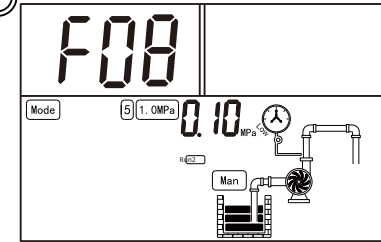
(The range of pressure sensor is 0-1.0Mpa, stopping pressure can be adjusted from 0.15-0.95MPa;
The range of pressure sensor is 0-1.6Mpa, stopping pressure can be adjusted from 0.15-1.55MPa;
The range of pressure sensor is 0-2.5Mpa, stopping pressure can be adjusted from 0.15-2.45MPa.)

- ③ Single pump start pressure set: press and hold both **+** and **-** more than 3 seconds to enter the parameter setting interface. after the screen show **F07**, press **PARA SET** enter. and click or long press **+** to increase value, and **-** to decrease. final press **QUERY CONFIRM** to save the current setting. as shown right:



(The range of pressure sensor is 0-1.0Mpa, starting pressure can be adjusted from 0.1-0.6MPa;
The range of pressure sensor is 0-1.6Mpa, starting pressure can be adjusted from 0.1-1.0MPa;
The range of pressure sensor is 0-2.5Mpa, starting pressure can be adjusted from 0.1-1.5MPa.)

- ④ Double pump start pressure set: press and hold both **+** and **-** more than 3 seconds to enter the parameter setting interface. after the screen show **F08**, press **PARA SET** enter. and click or long press **+** to increase value, and **-** to decrease. final press **QUERY CONFIRM** to save the current setting. as shown right:



(The range of pressure sensor is 0-1.0Mpa, starting pressure can be adjusted from 0.05-0.55MPa;
The range of pressure sensor is 0-1.6Mpa, starting pressure can be adjusted from 0.05-0.95MPa;
The range of pressure sensor is 0-2.5Mpa, starting pressure can be adjusted from 0.05-1.45MPa.)

- ⑤ After the parameters are set, press **A PUMP STOP** or **B PUMP STOP** to save and return to the main interface, or the controller will automatically save and return to the main interface after waiting for 15 seconds without pressing any key.