DIFFERENTIAL PRESSURE CONTROLS



■ Introduction

FSD series differential pressure controls (oil pressure control) protect the refrigeration compressor and other machineries. In refrigeration system, lubrication system must be kept in a certain oil pressure in order to get well lubrication for every part. If the oil pressure is too low, compressors will happen “Cylinder sticking” for losing oil in normal running or starting, even destroy bearing pad of the compressor.

The differential pressure control receives the signal of discharge pressure from lubricating oil pump and suction pressure from compressor. And it maintains the two pressures in a certain differential range. When the differential is lower than the setting one, the switch automatically cuts the compressor circuit off to stop running.

FSD series differential pressure controllers can be used not only in refrigeration systems using Freon refrigerants but also in R717 refrigeration systems.

■ Technical Parameters

- Ambient temperature: -20~+65°C
- Medium temperature: -20~+120°C
- Applicable medium: R22、R407C、R134a、R404A、non-corrosive copper alloy fluids and gases and oils with a viscosity less than 2 degrees Engen
- Protection level: IP20

■ Electrical rating

Rated current \ Rated voltage		A.C.110	A.C.220
Non-induced current		22	16
Induced current	Full load current	24	16
	Instantaneous current	144	96

■ Characteristic

FSD35T series is equipped with a periodic thermal relay, which has two independent circuits: a safety circuit and a working circuit. If the compressor starts without an oil pressure differential (the difference between the oil pump pressure and the suction pressure), or if the differential oil pressure is lower than the set value during operation, the thermal relay in the safety circuit works. After the set time, it will disconnect the working circuit, causing the compressor to stop. When the differential oil pressure exceeds the set pressure differential value , the safety circuit will disconnect the thermal relay. After the thermal relay cools down, pressing the manual reset button ,the working circuit will reconnect , and the compressor will resume operation.

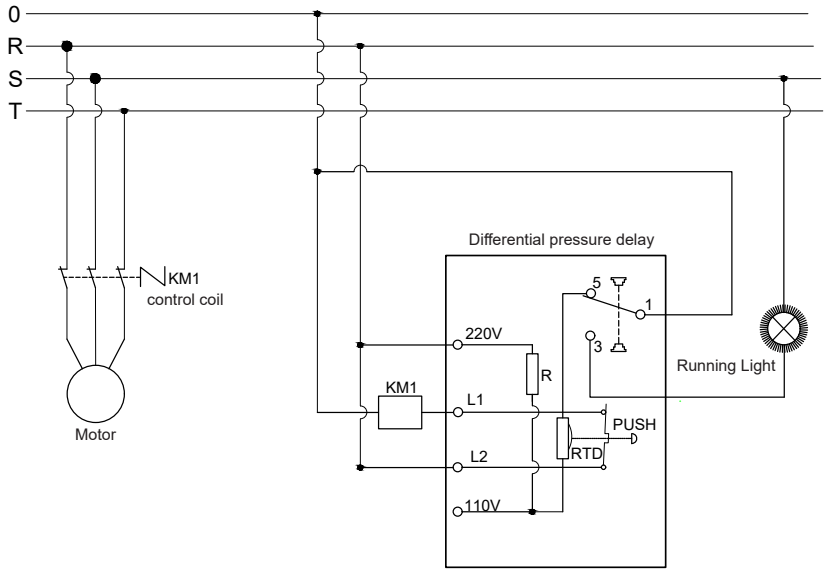
The pressure differential controller only operates based on the differential pressure , between the two directions and the pressure acting on the bellows. Instead of acting according to the individual absolute pressure on the two bellows. It does not operate based on the absolute pressure in each of the bellows individually.

■ Type & Data

Model	Adjust range MPa	Switch differential MPa	Max.working pressure MPa	The delay time of the thermal time circuit breaker Sec.	Test pressure MPa
FSD1.5C	0.05 ~ 0.15	≤0.03	1.3		1.7
FSD2C	0.05 ~ 0.20	≤0.05	1.3		1.7
FSD35C	0.05 ~ 0.35	≤0.05	1.3		1.7
FSD45C	0.02 ~ 0.45	≤0.03	1.3		1.7
FSD1.5CHM	Fixed 0.15	≤0.04	3.0		3.3
FSD2.5CHM	Fixed 0.25	≤0.04	3.0		3.3
FSD35CH	0.10 ~ 0.60	≤0.06	3.0		3.3
FSD35T	0.05 ~ 0.35	≤0.05	1.3	30/60/90/120	1.7
FSD35TH	0.1 ~ 0.6	≤0.06	3.0	30/60/90/120	3.3

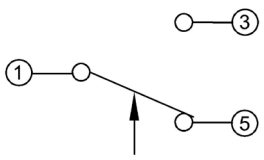
■ Contact function

● FSD–T SERIES



1	Heating timing circuit	Common Terminal (N)	
110V		110V power terminal (L)	
220V		220V power terminal (L)	
1	Differential pressure setting switch circuit	Common Terminal (N)	
5		NC contact –offs when differential pressure decreases	
3		NO contact –on when differential pressure decreases	
L1	Motor control circuit	Control coil contact	Or Switching output
L2		Control coil power terminal	

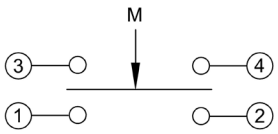
● FSD-C SERIES



Contactnumber	Function
1	Common connector
3	Closed when the differential pressure rises
5	Closing when the pressure difference drops

Direction of action when arrow pressure

● FSD-CHM SERIES



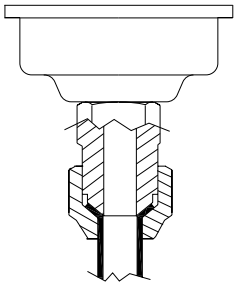
Contactnumber	Function
1–2	Closing when the pressure difference drops
3–4	Closed when the differential pressure rises
M	Manual reset action direction

■ Connection form

● Standard threaded joint

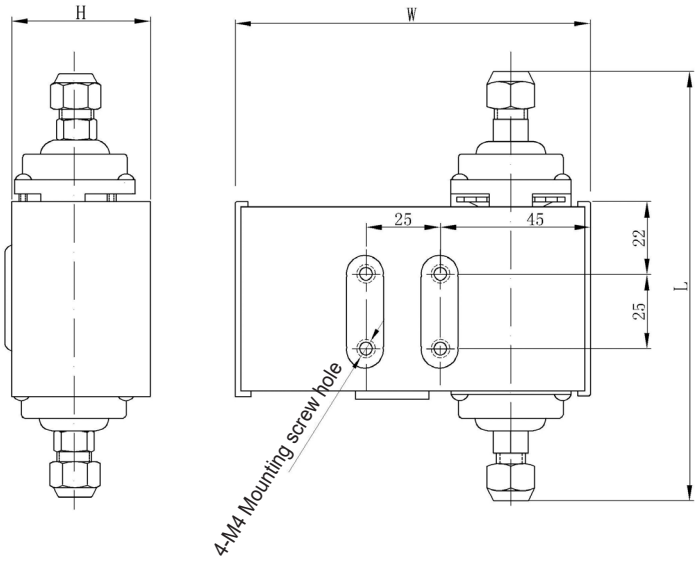
1, American thread 7/16-20UNF, 1/4" flare tube, model suffix plus E

2, Metric thread M12×1.25, Φ6 flare tube



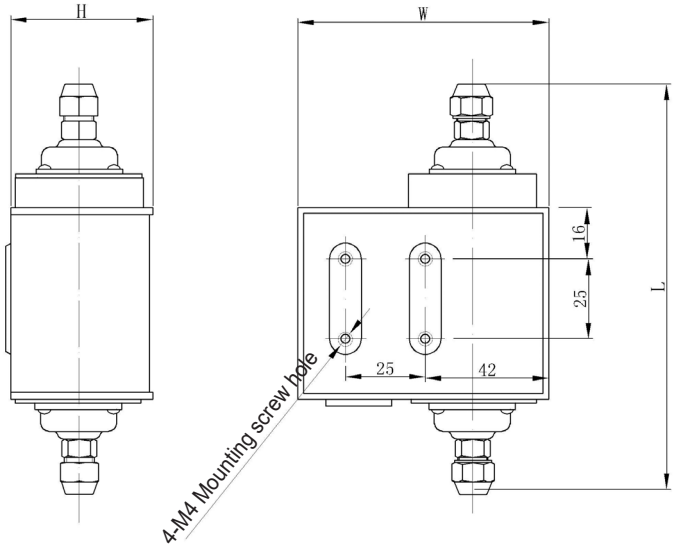
■ Dimensions

● FSD-T SERIES



SERIES	L	W	H
FSD–T	154	116	46
FSD–TH	140	116	46
FSD–C	154	68	46
FSD–CH	140	68	46

● FSD-C SERIES





■ Introduction

FP74E pressure differential controller is equipped with two highly sensitive bellows pressure sensing elements, which are positioned face-to-face. When the pressure at either end of these elements changes, it triggers the switch mechanism to control equipment such as motor drivers or valve actuators. The switch mechanism provides a SPDT (Single Pole Double Throw) non-rapid action (floating) operation. A movable common contact will either make contact with one of the two fixed contacts or remain between the two fixed contacts.

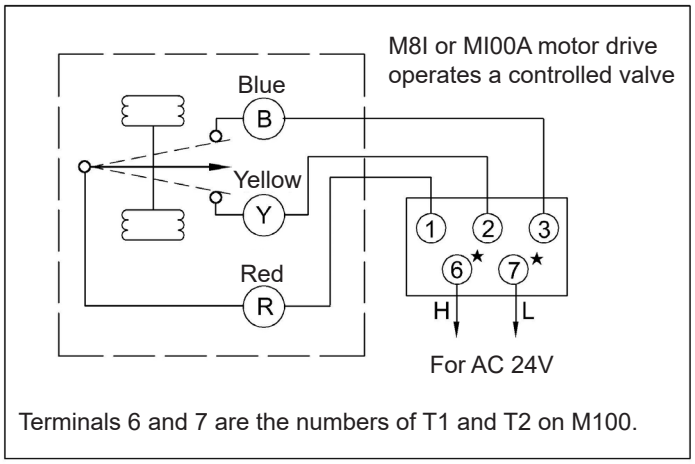
FP74E differential pressure control is usually used in the water system of central conditioning. It controls the pressure difference between water supply pipe and return pipe.According to the differential pressure, the movement of floating-point will connect the contact plate to open or close the operating valve of motor drive.

One typical application is to mount the valve on the by-pass line near the system's water pump. When the pressure differential between the system's feeding and return pipes is over the setpoint of the controller, the valve turns up and more water will flow through the by-pass valve and hereby reduces the pressure differential between feeding and return pipes. On the opposite, the pressure differential will increase between these two pipes of the water system.

■ Technical Parameters

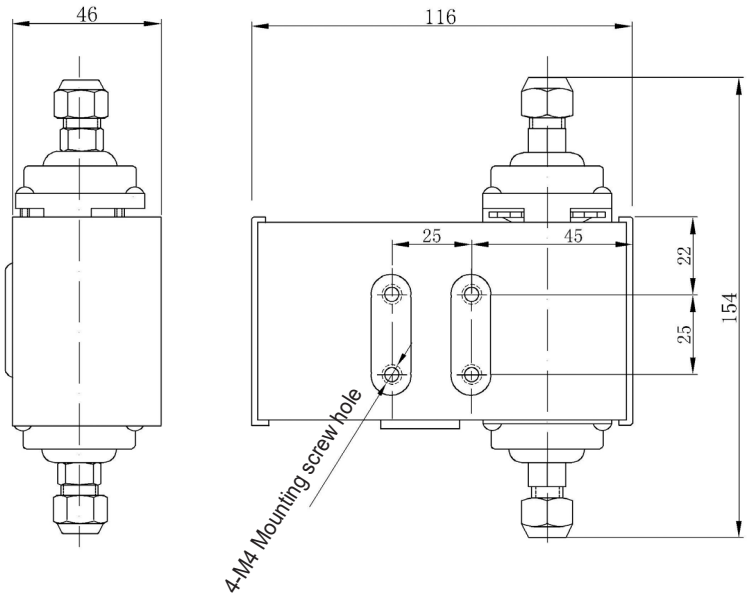
- Ambient temperature: -20~+65°C
- Medium temperature: -20~+120°C
- Maximum working pressure: 1.0MPa
- test pressure: 1.7MPa
- Differential pressure adjustment range: 0.05~0.40MPa
- Switching difference: 0.014MPa
- Applicable medium: Non-corrosion water
- Protection level: IP20

■ Contact function



- When the differential pressure is reduced, the common point R and B contacts are turned on, the motor rotates clockwise, and the valve is closed.
- When the pressure difference increases, the common point R and Y contacts are turned on, the motor rotates counterclockwise, and the valve is closed.

■ Dimensions





■ Introduction

FSED35T electronic delay differential pressure control is a kind of oil pressure protection switch, It can be used to prevent refrigeration compressor from damage because of over-low lubricating oil pressure. It is a kind of highly sensitive automatic control and protection components. It uses electronic delay module for delay, delay time can be set arbitrarily according to demand, delay time is precise. When the oil differential pressure is less than the setpoint in the delay time, after the delay time is reached the switching circuit of the relay controls the disconnection of the output circuit, so that the compressor stop working and plays a role of safety protection.

■ Technical data

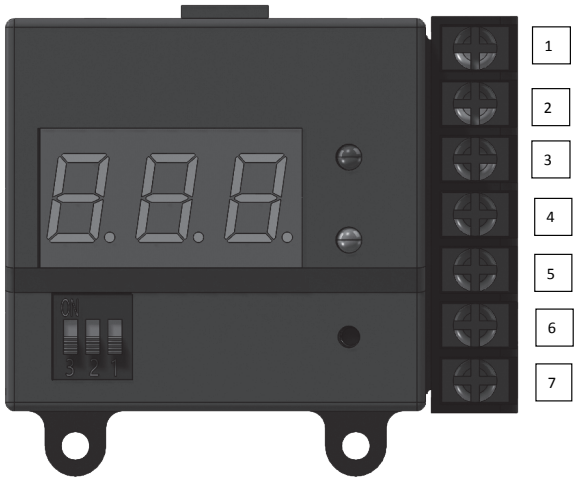
- Differential pressure adjust range：0.05 ~ 0.35MPa
- Max. working pressure：1.7MPa
- Delay time：30 Seconds、60 Seconds、90 Seconds
- Ambient temperature：-20 ~ +65℃
- Medium temperature: -20~+120°C
- Applicable medium：R134a、R22、R407C、R404a、Does not attack copper alloy fluids and gases and oils with a viscosity less than 2 degrees Engen
- Protection level: IP20

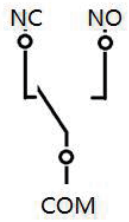
Model	Adjustment range	Switching difference	Factory set pressure difference	Maximum working pressure	Test pressure
FSED35T	0.05~0.35	⩽ 0.05	0.01	10	1.70
FSED35TH				3.30	3.30

■ Electrical rating

Rated current \ Rated voltage		A.C.110	A.C.220
Non-induced current		24	12
Induced current	Full load current	24	12
	Instantaneous current	144	72

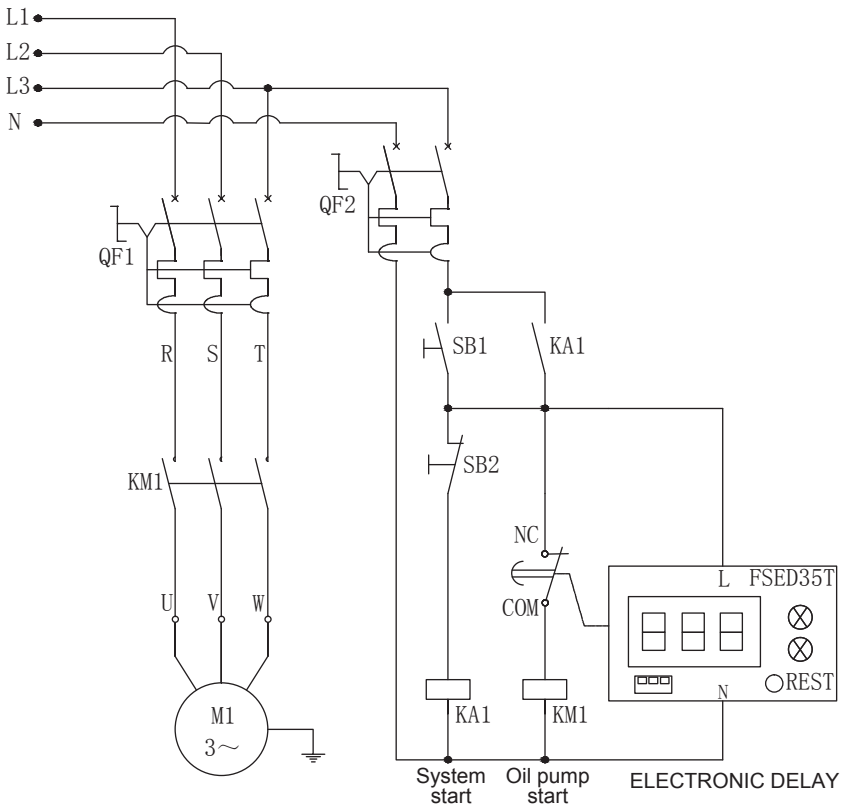
■ Contact function





1: Relay NC terminal
2: Relay COM terminal
3: Relay NO terminal
4: AC220V L input terminal L
5: AC220V N input terminal L
6: Spare
7: Spare

■ Contact function

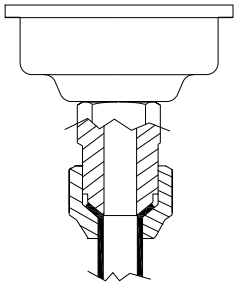


■ Connection form

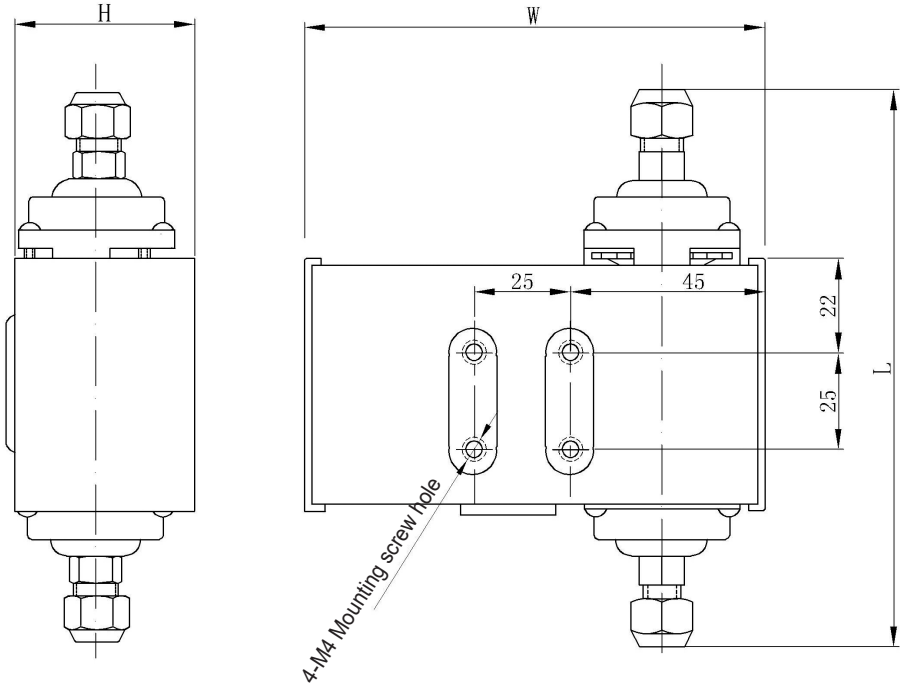
● Standard threaded joint

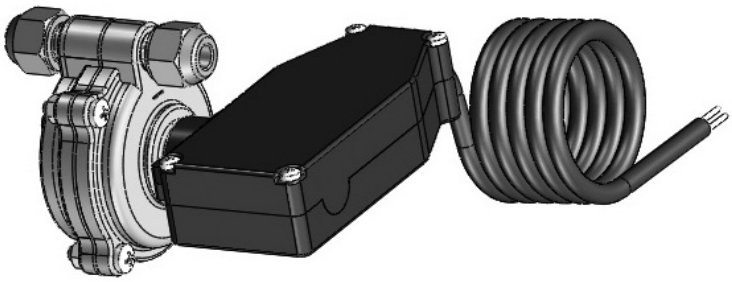
1, American thread 7/16-20UNF, 1/4" flare tube, model suffix plus E

2, Metric thread M12×1.25, Φ6 flare tube



■ Dimensions





■ Introduction

FSD-W seires micro differential pressure controls (Hereinafter referred to as the controller) are widly used in air cooling or water cooling units, such as plate heat exchanger,double-pipe heat interchanger, Shell and tube heat exchanger, etc. The controller monitor the statues of the water flow and the water pump and filter in order to insure the heat exchanger under regular work. The controller is a kind of automatic controller. It's working principle: installed on the water inlet and outlet of the heat exchanger to sensor the differential pressure of the water inlet and outlet. When heat exchanger with impurity, jams, the phenomenon such as ice, causing the inlet and outlet pressure difference increases, when the pressure difference larger than the set value, the controller disconnect circuit, so as to protect the heat exchanger. Controller can be installed in any heat exchanger pipe diameter, the tube diameter size did not demand, and is not affected by flow interference characteristics.

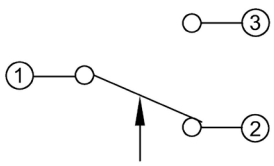
■ Technical Parameters

- Ambient temperature: -20~+65°C
- Medium temperature: -20~+70°C
- Maximum working pressure: 2.0MPa
- Test pressure: 2.3MPa
- Differential pressure adjustment range: 0.005~0.01MPa
- Switching difference: 0.005~0.01MPa
- Factory setting difference: 0.02MPa
- Applicable media: Does not attack copper alloy fluids and gases and oils with a viscosity less than 2 degrees Engen.
- Protection level: IP54

■ Electrical rating

Rated current \ Rated voltage		A.C.110	A.C.220
Non-induced current		24	12
Induced current	Full load current	24	12
	Instantaneous current	144	72

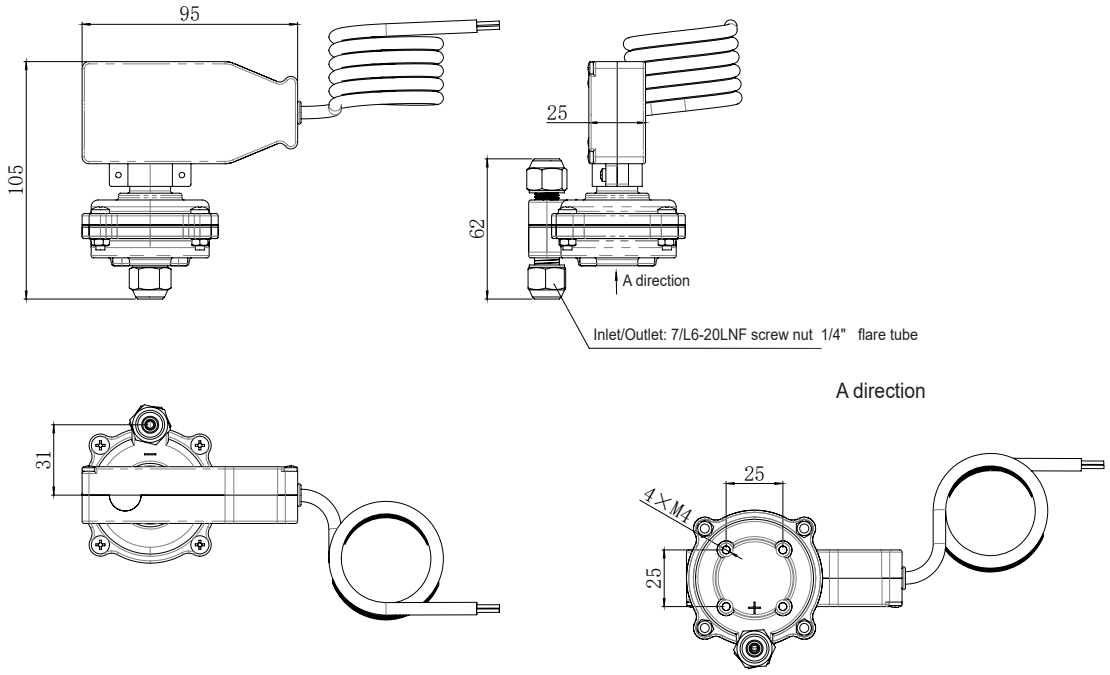
■ Contact function



Contact number	Function
1	Common connector
2	Closed when the differential pressure rises
3	Closing when the pressure difference drops

Direction of action when arrow pressure difference increases

■ Dimensions



■ Installation

1. The controller has two interfaces, high end and low end, the high pressure side has expressly identify, it should be connected with high pressure side (inlet) interface of the heat exchanger, the other end connect with the low pressure side of heat exchanger (water outlet) interface, the installation position of controller should be parallel or below the heat exchanger outlet ends, don't make a mistake, as diagram 1,2 shows.

2. The controller position of pressure is very important, in order to ensure the accuracy of the differential pressure measurement, the installation position should be near the inlet and outlet ends of heat exchanger.

3. Two attachments in the bag M4X5 cross slot round head screw and 2 pieces of Φ 4 washer fix the mounting plate on the body of the controller, and then according to the installation drawing, istall the controller in the right position.

4. Using two Φ 6x1 copper tube with bell mouth nut to connect the high pressure joint of the controller with the high pressure joint of the heat exchanger, low pressure joint of the controller with the low pressure joint of the heat exchanger.

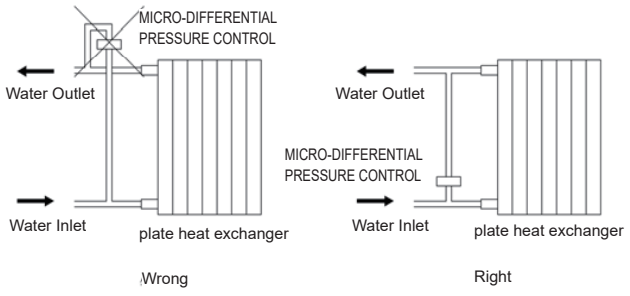


Diagram 1 Installed to plate heat exchanger

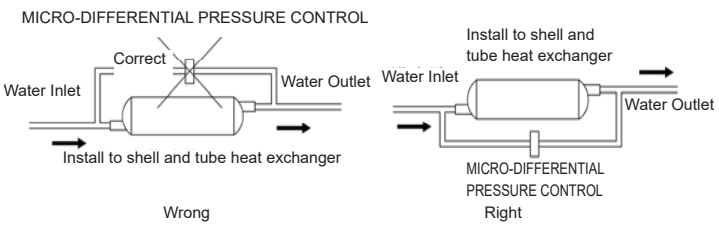


Diagram 2 Installed to shell and tube heat exchanger