Description

BTU meters are used for the measurement of heat energy and water flow in heating/cooling systems. This unit is small and stable, it is built to provide long term accuracy with no maintenance. The ultrasonic flow sensor means there are no moving parts to wear out and the head loss is low. The metal fitting and temperature sensors can be delivered to the site separately for installation by the plumbers, then the electronics can be snapped in on site with only a screw driver. If parts do get damaged it is a simple matter to swap out the electronics without opening up the pipework.

The unit supports Bacnet & Modbus protocal simultaneously, and the pipe is avaliable in DN20, DN25, DN32, DN40, DN50, DN65, DN80, DN100
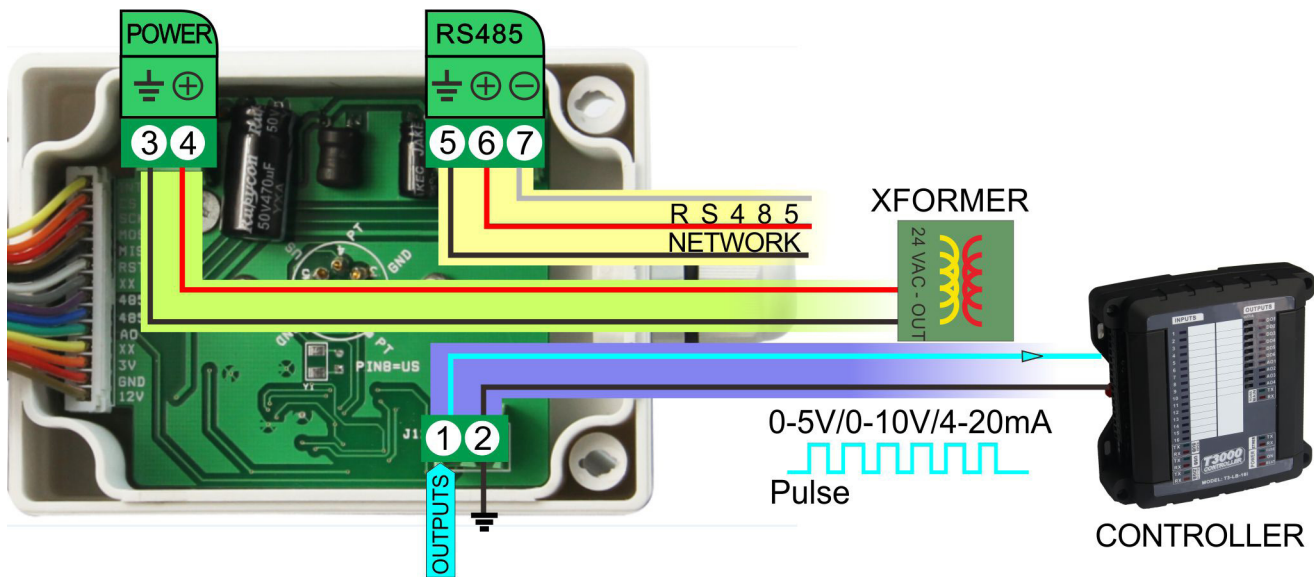
Specifications

| Function	Parameters
Output	analog output 0-5V, 0-10V, 4-20mA
	5V pulse mode
	RS485 output
Temperature sensor	sensor type: PT1000*2 range: -200~300°C accuracy: Class B ±0.3C
Ultrasonic sensor	Operating temperature: 0 ~ 105C Maximum pressure: 2.5KP PSI
Power supply	15 - 24VAC/DC
Baudrate	9600, 19200
Network	Modbus RS485, Bacnet is a free option on request

Dimensions
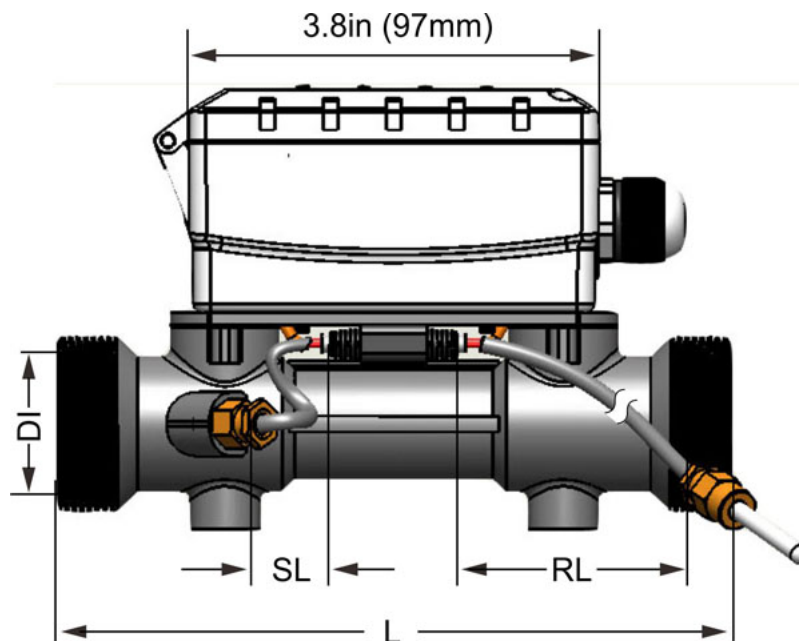
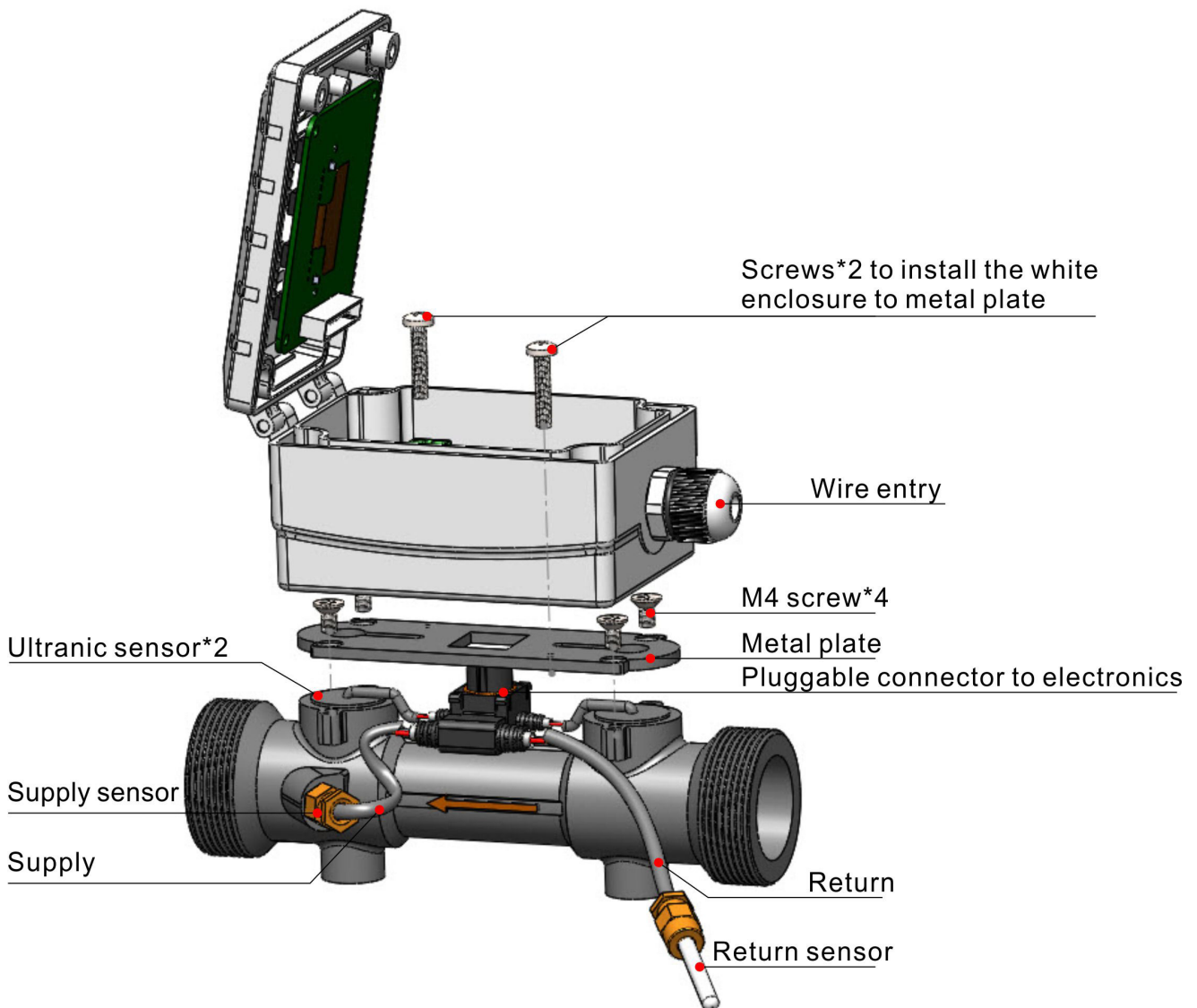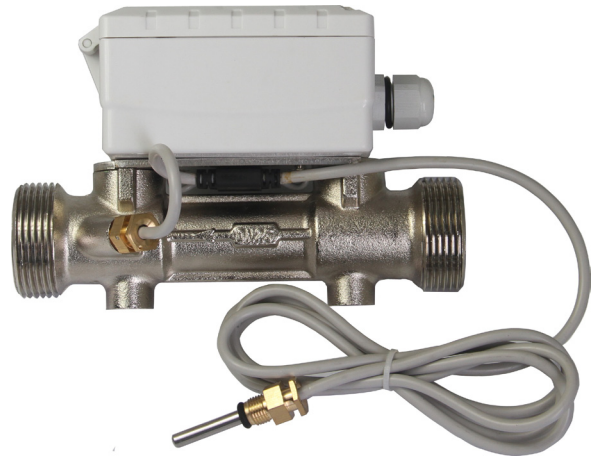| DN mm	Overall length (L: mm)	Temp supply jacket length (SL: mm)	Temp return jacket length (RL: mm)	Pipe diameter (DI: mm)
20	130	35	200	22
25	160	40	200	27
32	180	50	200	33
40	200	70	200	42

Wiring Diagram

There are eight pins on the board, two ultrasonic pins, two temperature pins, and four GND pins.

The output can be configured 1 of 4 ways: 0-5V, 0-10V, 4-20mA, and pulse.
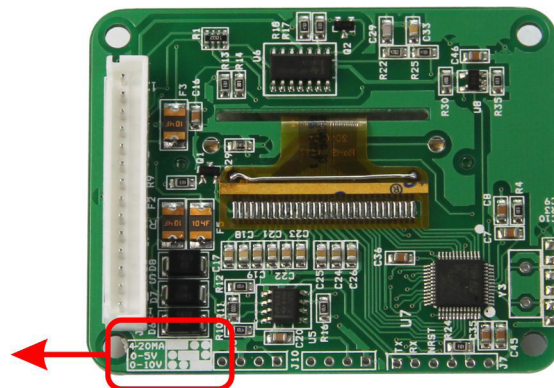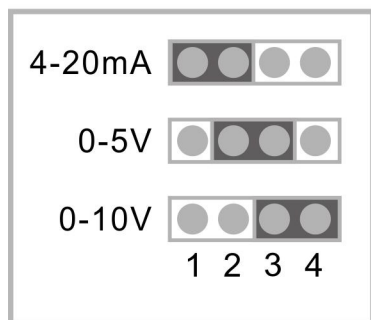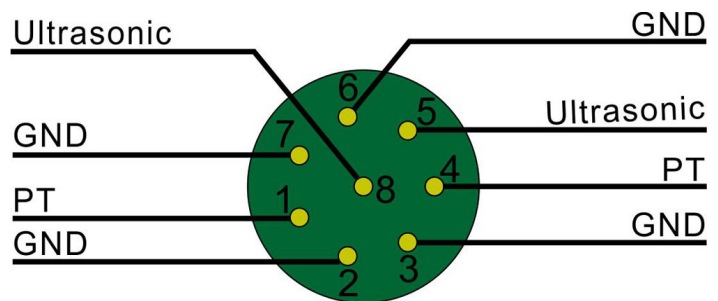
Highlights

The electronics can be removed from the flow sensor body by removing two screws. This makes it easy to swap out electronics in the field without opening any pipe work. The two ultrasonic flow sensors and the temperature sensor are mounted in the body of the meter in direct contact with the fluid flow. In the slim chance that these sensors have to be replaced it is good practice to install a shutoff valve on the supply side so that the sensors can be removed.

Screws*2 to install the white enclosure to metal plate

Wire entry

M4 screw*4

Metal plate

Pluggable connector to electronics

Ultranic sensor*2

Supply sensor

Supply

Return

Return sensor

BTU METER

Pluggable connector to electronics

Upstream

Downstream

Ultrasonic Sensor(typ of 2)

Supply

Temp Sensor (typ of 2)
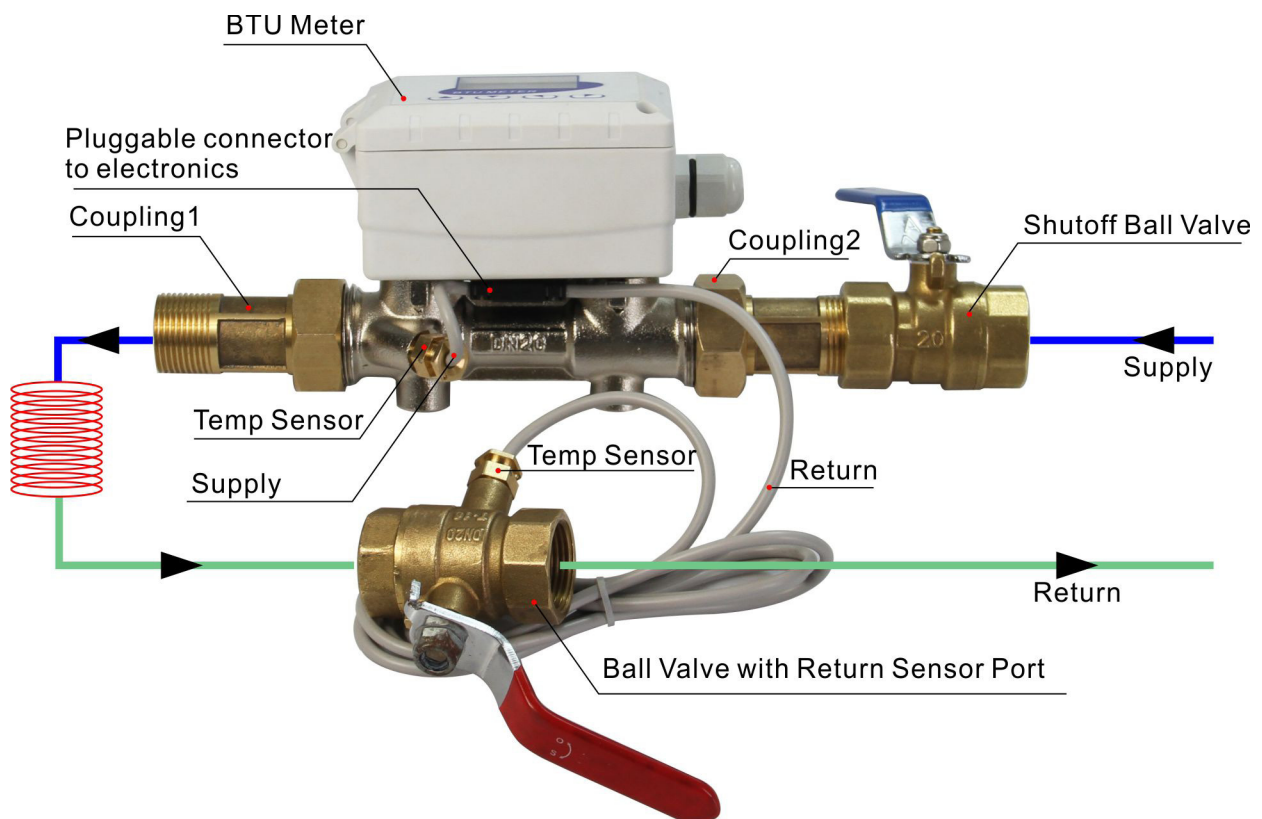
Return

Accessory

Ball valve with temp sensor port

Shut off ball valve

Coupling
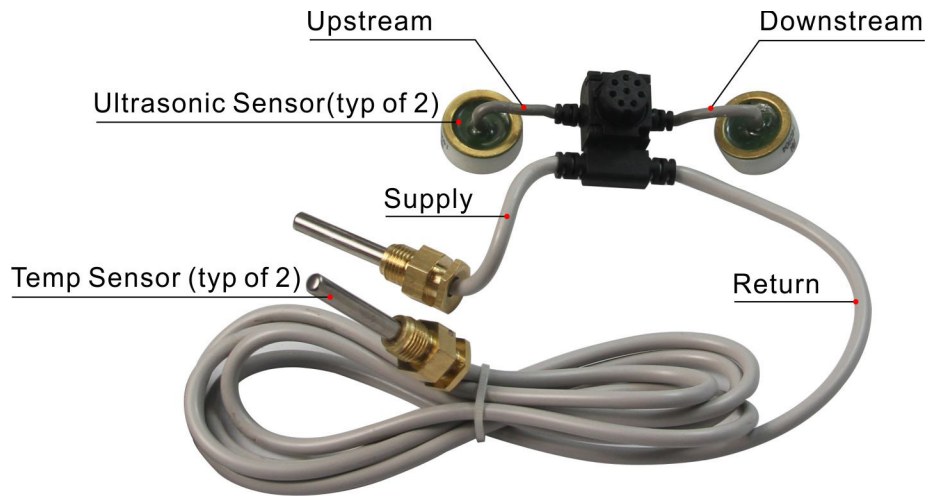
The BTU meter has BSP threads which will mate with the NPT threads found in the USA and Canada, however the seal is not as good as a NPT to NPT fit. For this reason, and also for easier maintenance of the building later on, it is recommended to install a BSP to NPT coupling on each side of the flow meter. These are available in the accessories section of this page.

BTU Meter

Pluggable connector to electronics

Coupling1

Coupling2

Shutoff Ball Valve

Supply

Temp Sensor

Supply

Temp Sensor

Return

Return

Ball Valve with Return Sensor Port

Part Number Scheme

BVT - DN20

Code	Description
BVT	Ball Valve with Temp Sensor Port

Code	Ball Valve with Sensor Port Size
DN20	Brass body, DN20, NPT thread
DN25	Brass body, DN25, NPT thread
DN32	Brass body, DN32, NPT thread

CPL - DN20

Code	Description
CPL	Coupling

Code	Coupling Size
DN20	Fit DN20 BTU pipe
DN25	Fit DN25 BTU pipe
DN32	Fit DN32 BTU pipe

BV - DN20

Code	Description
BV	Shutoff Ball Valve

Code	Shotoff Ball Valve Size
DN20	Brass body, DN20, NPT thread
DN25	Brass body, DN25, NPT thread
DN32	Brass body, DN32, NPT thread
DN40	Brass body, DN40, NPT thread
DN50	Brass body, DN50, NPT thread

BTU - DN20

Code	Description
BTU	BTU Meter

Code	BTU Pipe Size
DN20	Brass body, 3/4" BSP thread
DN25	Brass body, 1" BSP thread
DN32	Brass body, 1 1/4" BSP thread
DN40	Brass body, 1 1/2" BSP thread
DN50	Brass body, 2" BSP thread
DN65	Brass body, 2 1/2" BSP thread
DN80	Brass body, 3", flange fitting
DN100	Brass body, 4", flange fitting

Item Weight	Unit (KG)
BVT-DN20	0.27
BVT-DN25	0.39
BVT-DN32	0.75
CPL-DN20	0.13
CPL-DN25	0.24
CPL-DN32	0.31
BV-DN20	0.26
BV-DN25	0.33
BV-DN32	0.53
BV-DN40	0.63
BV-DN50	1.09

Advanced Menu Items

The BTU meter has four buttons that are described below that make operating the unit simple. The 'menu' button is used to enter into the menu list and is also used to confrim a choice. The 'up' and 'down' buttons are used to cycle through the menu list and to adjust values. The 'back' button is to go back to a previous choice in the menu. Please refer to the Menu List section on the next page for an in depth example on operating the BTU meter unit.

(▲) back

(▼) Menu or confirm

(◀) increase value or select up

(▶) decrease value or select down

Display Normal State	Upstream Temp, Downstream Temp, Temp Diff, Flow Total, Heat Total, Flow Rate	
Menu List	Setting	Temp Unit: F, C
		Flow Unit: M^3, Cal, L
		Id: 1-254
		Reset: No/Yes
		Pipe: DN20, DN25, DN32, DN40,DN50
		Dis Time: 4
	Status	Signal:
		Flow Speed:
		Flow Total:
		Heat Total:
		Temp UP:
		Temp Down:
		Baudrate: 19200
		Protocol: MBUS
	About	Hardware: 04 Firmware: 150715

Installation Operation

1. Install pluggable connector with ultrasonic and temp sensor to pipe.
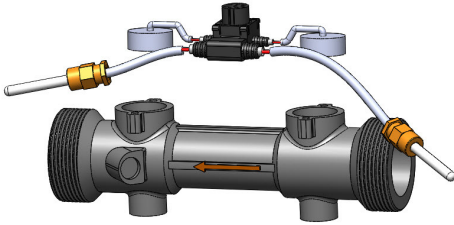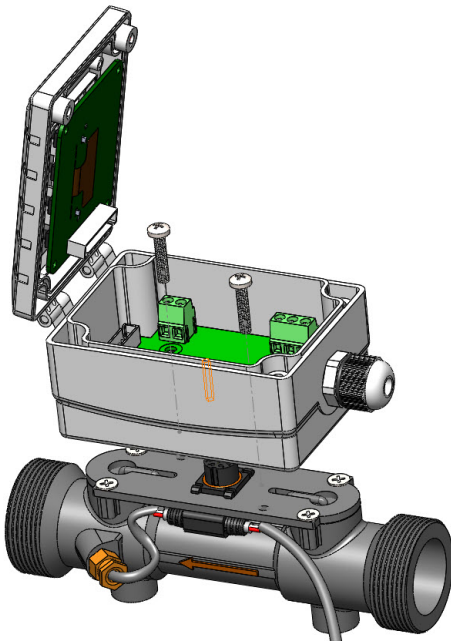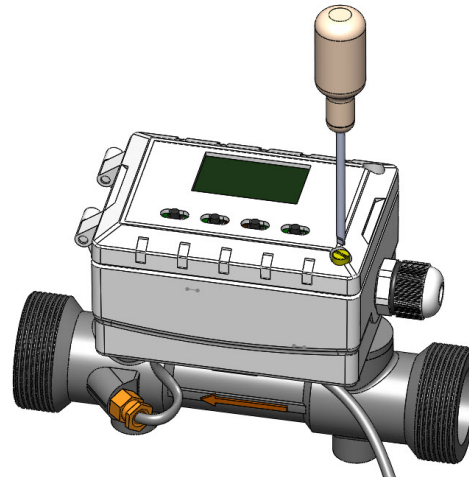

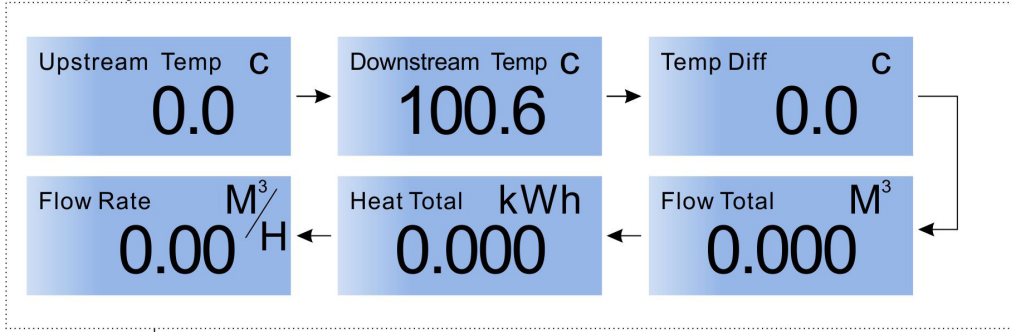2. Fasten the four M4 screws to install the plate to the pipe.
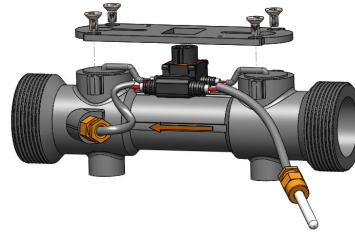
3. Put the white enclosure to the pipe to fit the female and male pins, fasten the 2 scews to install it.

3. Fasten the two capative screws to attach the cover.

Display Normal State

Upstream Temp ℃	Downstream Temp ℃	Temp Diff ℃
0.0	100.6	0.0

Flow Rate M³/H	Heat Total kWh	Flow Total M³
0.00	0.000	0.000

Menu List

1. Setting	1. Temp Unit: F	1. Temp Unit: F	1. Temp Unit: C
2. Status	2. Flow Unit: M³	2. Flow Unit: M³	2. Flow Unit: M³
3. About	3. Id: 254	3. Id: 254	3. Id: 254
	4. Reset: No		to confirm

5. Pipe: DN20
6. Dis Time: 4

1. Setting	1. Signal: 0.00
2. Status	2. FlowSpeed: 0.00
3. About	3. FlowTotal: 0.00
	4. HeatTotal: 0.00

5. TempUp: 0.0
6. TempDown: 100.6
7. Baudrate:19200
8. Protocol: MBUS

1. Setting	BTU METER
2. Status	Hardware: 04
3. About	Firmware: 150715

Modbus Register List

Address	Register Name	Register and Description
0 to 3	4	Serial Number 4 Bytes value
4	1	EPROM hardware Version Number
5	1	Firmware Version Number
6	1	Modbus device address
7	1	Product Model
10 to 12	Reserved	Reserved
14	Reserved	Reserved
15	1	"Baudrate Setting: 0 = 9600bps, 1 = 19200bps"
100	2	MODBUS_FLOW_SPEED
101	Reserved	Reserved
102	2	MODBUS_FLOW_TOTAL_HI
103	2	MODBUS_FLOW_TOTAL_LO
104	2	MODBUS_HEAT_TOTAL_HI
105	2	MODBUS_HEAT_TOTAL_LO
106	2	MODBUS_TEMP_UP
107	2	MODBUS_TEMP_DOWN
108	2	MODBUS_PIPE_TYPE
109	2	MODBUS_TEMP_UP_OFFSET
110	2	MODBUS_TEMP_DOWN_OFFSET
111~119	Reserved	Reserved
120	1	MODBUS_SIGNAL
121	1	MODBUS_PIPE_L
122	2	MODBUS_FLOW_RATE
123	1	MODBUS_DIS_TIME
124	1	MODBUS_PROTOCOL
125	1	MODBUS_OUTPUT
126	2	MODBUS_OUTPUT_RANGE
127	2	MODBUS_FLOW_RATE_MIN
128	2	MODBUS_FLOW_RATE_MAX
129	2	MODBUS_FLOW_VALUE_FOR_PULSE

Bacnet Register List