

# *Ultrasonic Flowmeter*

## **Type E-ST Operation Manual**



### Notice

Thank you for choosing Model E-ST

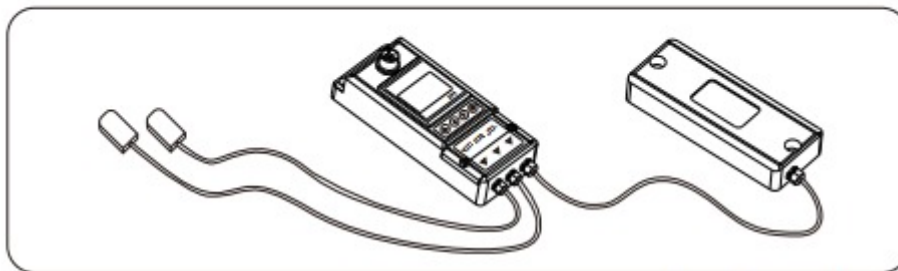
This instruction manual contains the important using and operation information of the flow meter. Please read carefully the reference manual before operation to make your flow meter exert the best performance.

If you make a mistake there will be affected the meter's working and reduce the meter's life or cause some malfunctions.

### Product component

Inspection should be made before installing the Flow meter. Check to see if the spare parts are in accordance with the packing list. Make sure that there is no potential damage to the enclosure due to a loose screw or loose wire, which occurred during transportation.

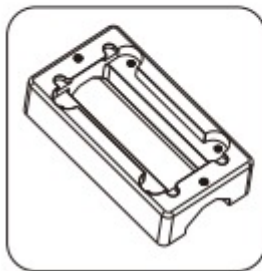
Any questions, please contact your representative as soon as possible.



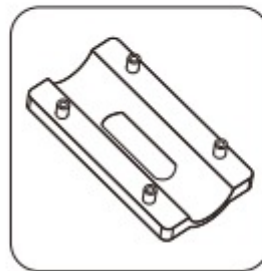
Temperature  
Sensor

E-ST Unit

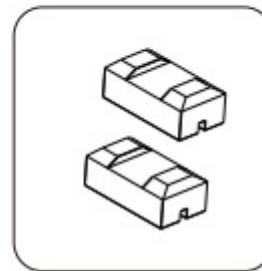
Flow Transducer



Upper bracket



Base bracket



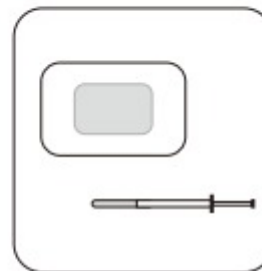
Temp. mount



Connecting cables



Instruction manual

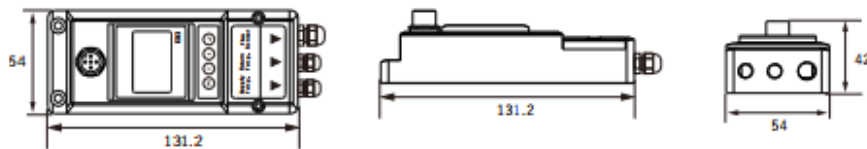


Coupling agent  
High temp. silicone

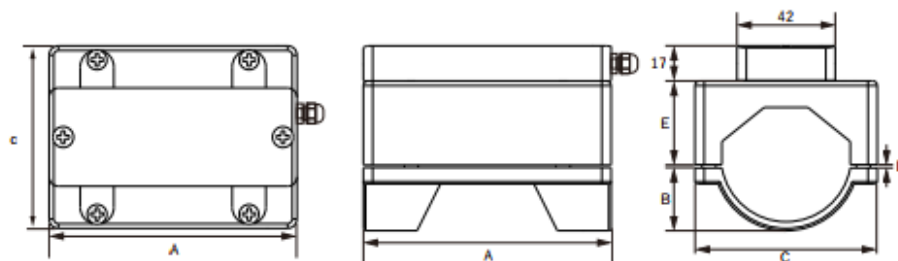
## Dimensions

Model	A (mm)	B (mm)	C (mm)	D (mm)	
				min	max
DN15	25	10	58	1/Φ18	7.5/Φ22.3
DN20	25	15	58	1/Φ25	4/Φ28
DN25	28.5	18.5	58	1/Φ32	4/Φ35
DN32	29.5	24	68	1/Φ38	9/Φ45
DN40	36	27	78	1/Φ48	7/Φ54
DN50	41	32	91	1.5/Φ58	8.5/Φ64
DN65	46.5	40	105	1/Φ65	7/Φ74
DN80	51.5	43	119	1/Φ76	13/Φ86

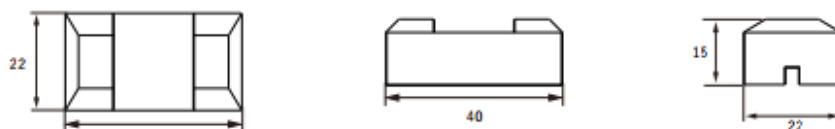
### E-ST Unit dimensions



### Flow transducer dimensions



### Temp. sensor dimensions

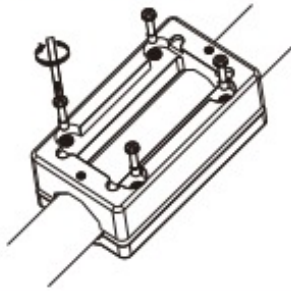


## E-ST Installation and connect

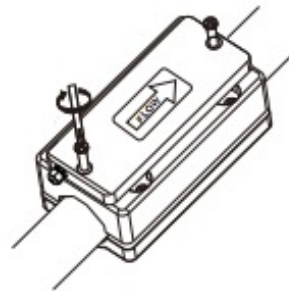
E-ST need to install flow sensor and temperature sensor, clean the pipeline before installation.

Make sure no dirt, paint, or other stains on the surface of the tube. Then put the bottom parts on the side of the pipe.

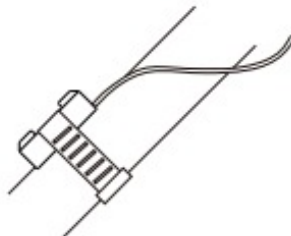
**Step1:** Align the bracket to the pipe position; Install screw on top part of the bracket, the bottom part of the bracket will automatically connect with the top part. Tighten the four M4 screws.



**Step2:** Take the cover off the Flow Transducer. put it into Upper bracket, and tighten two M4 screws.



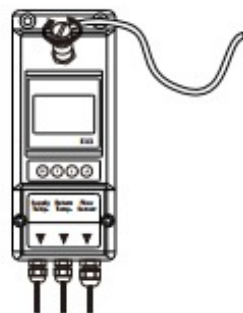
**Step3:** Install inlet and outlet temperature sensor. Fix it mount to the pipe and then use high temp. silicon grease on the pipe contact surface, load temperature sensor and tighten screw.



**Step4:** Fix the E-ST, where it is easy to observe and where power is available.



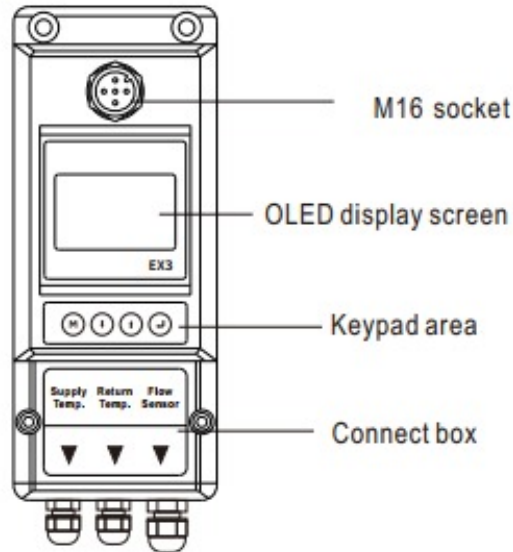
**Step5:** Take out the cable and screw the end of the plug into the socket. It can be easily plugged into the socket in the right direction and then rotated in. Finally connected to the DC power supply, the Energy meter began to measure.



brown +24VDC  
black GND  
blue RS485 A  
white RS485 B

When E-ST is installed, the Energy meter is wired.  
Connect the DC power and RS485 output.

## Panel function



## Powering on

As soon as E-ST Energy meter is switched on, the self-diagnosis program will start to run.

SQ 88	12:30:29
Eq 135.28	GJ/H
EH 335.66	GJ
EC 35487.53	GJ

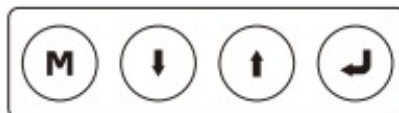
## Signal Quality (SQ value)

Q value is short for Signal Quality. It indicates the level of the signal detected. Q value is indicated by numbers from 0~99 represents the minimum signal detected while 99 represent the maximum.

Normally, the transducer position should be adjusted repeatedly and coupling compound should be checked frequently until the signal quality detected is as strong as possible.

## Keypad Functions

Follow these guidelines when using the Flow meter keypad:



Ⓜ Setting or display mode, when it is setting mode, that can return to the previous menu, ↓ and ↑ scroll up and down to select the menu, when press ↓ move to next digit, press ↑ and the numbers scroll from 0 to 9, you can select the number. Press ↵ to confirm.




## Window descriptions

### Display Menu

- When the power on, the meter will display Velocity/Net Totalize.


SQ 88	12:30:29
Eq 135.28	GJ/H
EH 335.66	GJ
EC 35487.53	GJ

Display signal quality (SQ), time, heat power (Eq), heat totalizer (EH), cold totalizer (EC)

- Press  will display T1, T2, delta T, press  will return to previous menu.


19-06-22	12:30:29
T1 11.38	C
T2 5.55	C
DT 5.832	K

Display date, time, outlet temp. (T1), inlet temp. (T2), Delta temp. (DT)

- Press  will display Eq, EH, press  will return to previous menu.

SQ 88	12:30:29
<b>12.933</b>	GJ/H
EH 354.53	GJ

Display signal quality (SQ), time, Heat power (GJ/h), Heat totalizer (EH)

- Press  will display Eq, EC, press  will return to previous menu.



SQ 88	12:30:29
<b>95.651</b>	GJ/H
EC 354.53	GJ

Display signal quality (SQ), time, heat power (Eq), cold totalizer (EC)

- Press  will display Flow rate, Net totalizer, press  will return to previous menu.

SQ 88	12:30:29
<b>11.651</b>	m3/h
Net 354.53	m3

Display signal quality (SQ), time, flow rate, Net totalizer

- Press  will display the Unit runtime, press  will return to previous menu.

Runtime	23 h
EHM 5.543	Kwh
ECM 7.248	Kwh
ETM 9.539	m3

Display Unit runtime, monthly heat totalizer (EHM), monthly energy totalizer (ECM), monthly flow totalizer (ETM)

## Setup Menu



Press  will display Setup menu.

Setup menu  
0.Pipe parameter  
1.System setting  
2.Calibration



The following options are available (by  or  buttons)





- 0. Pipe parameter
- 1. System setting
- 2. Calibration
- 3. Output setting
- 4. Energy setting
- 5. History Data

## Setup Menu – Pipe parameter



Press , Select 0.Pipe parameter, then  display:

Pipe parameter  
0.Outer diameter  
1.Wall thickness  
2.Material



The following options are available (by  or  buttons)










- 0. Outer diameter
- 1. Wall thickness
- 2. Material: Move  or  can option PVC, Carbon steel, Steel, Copper pipe.
- 3. Fluid type: Move  or  can option Water, Sea Water, Oil...etc.

## Setup Menu – System setting

Press , Select 1.System setting, then  display:

System setting  
0.System Unit  
1.Flow rate unit  
2.Total unit

The following options are available (by  or  buttons)

- 0. System unit : Move  or  can option Metric, English.
- 1. Flow rate unit : Move  or  can option m<sup>3</sup>/h, LPM, GPM.
- 2. Total unit : Move  or  can m<sup>3</sup>, L, GAL.
- 3. Totalize RESET : All parameters are reset, Press , move  or  arrow to select "YES" or "NO". After "YES" is selected.

#### 4. Time set

```
yy-mm-dd hh:mm
19-06-20 12:30
```

Generally, it is unnecessary to modify date time as the system is provided with a highly reliable perpetual calendar chip.

#### 5. System lock

System lock System unlocked	System lock ENT to lock	ENT key word 0000	System lock System locked OK
System lock System locked	System lock ENT to unlock	ENT key word 0000	System lock System unlocked OK


Once the system is locked, any modifications to the system are prohibited, but the parameter is readable. "Unlock" using your designated password. The password is composed of 1 to 4 numbers.



#### 6. System INFO

System INFO Engery meter SN:E0001356 V1.02	Manual Totalizer ENT To Start	Manual Totalizar ENT To Stop 1.239 m3/h SQ 88 1.056L	Manual Totalizer ENT TO Restart 1.239 m3/h SQ 88 1.056L
---	----------------------------------	---	--

System INFO: Display serial number (SN) of the meter. This SN is the only one assigned to each flow meter ready to leave the factory.

The factory uses it for files setup and for management by the user.

Set zero: Press  ; reset "Zero Point" which was set by the user.

Manual Totalizer: The manual totalize is a separate totalize. Press  to start, and press  to stop it. It is used for flow measurement and calculation.

#### 7. Display dir

```
Display dir
0.Normal
1.Inversion
```

Can choose the direction of display, convenient to observe the measurement data.



## Setup Menu – Calibration

Press **⏪**, Select 2.Calibration, and then **⏩** display:

```
Calibration
0.Scale factor
1.Set zero
2. Low flow cut
```

### 0. Scale factor

```
Scale factor
1.000
```

Refers to the ratio between "actual value" and "reading value". For example, when the measurement is 2.00, and it is indicated at 1.98 on the instrument, the scale factor reading is 2/1.98. This means that the best scale factor constant is 1.01.

1. Set zero: Press **⏩**; reset "Zero Point" which was set by the user.

```
Set zero
Ent To set zero
Reset zero
```

```
Set zero
Waiting...
SQ 88
Vel 0.035 m/s
```

2. Lowflow cut: Flow rate falls below the low flow cutoff value.

```
Low flow cut
0.030 m/s
```

The flow indication is driven to zero. This function can prevent the flow meter from reading flow after a pump as shut down but there is still liquid movement in the pipe, which will result in totalization error.

Generally, 0.03m/s is recommended to enter as the low flow cutoff point.

The low flow cutoff value has no relation to the measurement results once the velocity increases over the low flow cutoff value.

### 3. Manual zero

```
Manual Zero
0.000 m3/h
```

The seldom used calibration method is suitable for experienced operators to artificially input an offset superimposed on the measured value in order to obtain the true value when other calibration methods cannot be used well.

For example:

Actual measured value =250 m<sup>3</sup>/h

The offset valve =10 m<sup>3</sup>/h

Meter display =240 m<sup>3</sup>/h

In general, this value should be set: "0".

### Setup Menu – Output

Press **⏪** , Select 3.Output setting, and then **⏩** display:

Output setting  
0.RS485 Setup  
1.Alarm value

#### 0. RS485 setup

RS485 Setup  
0.Network addr  
1.RS485 Baudrate

The window used to set serial port. Its connection with the equipment of its serial port set of parameters must match.

Move **⏪** or **⏩** can option baud rate: 2400, 4800, 9600, 19200.

Data length fixed: 8 ;Stop bit for: 1.

Factory serial port parameters for the default "9600, 8, None, 1".

#### 1. Alarm value(Option)

Alarm value  
0.Low value  
1.High value

Enter the low alarm value; any of the measured flow, which is lower than the low value, will activate the alarm in the OCT hardware or relay output signal.

Enter the high alarm value; any of the measured flow, which is higher than the high value, will activate the alarm in the OCT hardware or relay output signal.

### Setup Menu – Energy setting

Press **⏪** , Select 4.Energy Setting, and then **⏩** display:

Energy setting  
0.Energy unit  
1.Temp. unit  
2.Flow position

The following options are available (by **⏪** or **⏩** buttons)

0.Energy unit: Move **⏪** or **⏩** can option: GJ, MBtu, KWh, MWh.

1. Temp unit: Move **⏪** or **⏩** can option: C or F

2. Flow position: Move **⏪** or **⏩** can option: Inlet, Outlet

3. DT sensitivity: Move **⏪** or **⏩** ,You can change the value

4. RTD Calib: Temperature sensor calibration

RTD Caliration  
0. T1 K factor  
1. T2 K factor

T1 K factor  
0.998

T2 K factor  
0.998

## Setup Menu – History Data

Press **⏏** , Select 5.History Data, and then **↵** display:

Date history
0.By Day
1.By Month
2.By Year

### 0. By Day

Display: Daily heat totalizer (EHD), Daily cold totalizer(ECD),  
Daily Flow totalizer (ETD)

Day	00-20-08-18
EHD	3.188
ECD	6.889 KWh
FTD	6.866 m3

### 1. By Month

Display: Monthly heat totalizer(EHM), Monthkt cold totalizer(ECM),  
Monthly Flow totalizer (ETM)

Month	00-20-08-18
EHM	9.188
ECM	9.889 KWh
FTM	9.866 m3

### 2. By Year

Display: Year heat totalizer(EHY), Year cold totalizer(ECY),  
Year Flow totalizer (ETY)

Year	00-20-08-18
EHY	88.196
ECY	96.889 KWh
FTY	89.866 m3

