Electromagnetic flowmeter converter
User 's Manual

L-mag H series
（ Heat & Cold Metering Function ）
V1.0.0

2025-11-20

Catalogue

L-magH Electromagnetic Flowmeter Heat&Cold Metering Converter User's Manual

1 Converter wiring

1.1 Characteristics of connecting wires and cables

1.1.1 Flow signal line

When the heat meter is used with the sensor, for the condition that the electrical conductivity of the measured fluid is greater than 50 μS/cm, the flow signal transmission cable can adopt the PVC-sheathed metal mesh shielded signal cable of model RVVPB2*0.12*280 mm^2. The maximum usable length shall not exceed 100 m. The signal cable is supplied with the sensor as standard.

The converter provides equipotential excitation shield signal output voltage to reduce the influence of distributed capacitance transmitted by cable on flow signal measurement. When the measured conductivity is less than or long-distance transmission, double-core double-shielded signal cable with equipotential shielding can be used. For example, STT3200 special cable or BTS triple shielded signal cable.

1.1.2 Excitation current line

Two-core insulated rubber flexible cable can be used for excitation current line, and the recommended model is RVVPB2*0.12*250 mm^2. The length of excitation current line is consistent with the length of signal cable. When STT3200 special cable is used, excitation cable and signal cable are combined into one.

1.2 Terminal wiring and marking

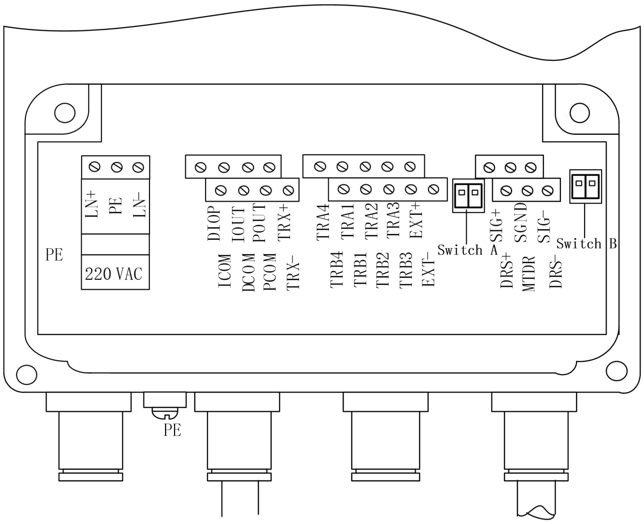


Fig. 1.2.1 Wiring terminal diagram of 220V power supply

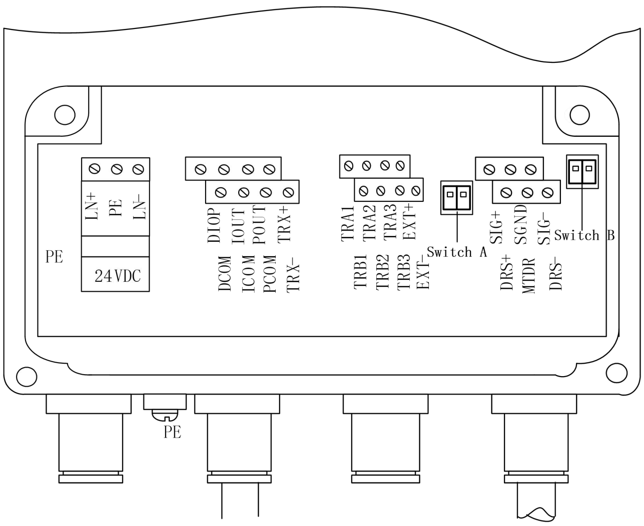


Fig. 1.2.2 Wiring terminal diagram of 24V power supply

The terminals are marked as follows

Table 1.2 Terminals function

TRA1	Input temperature: input	TRA2	Input temperature: input
TRA3	Input temperature: input	TRB1	Output temperature: input
TRB2	Output temperature: input	TRB3	Output temperature: input
TRA4	Reserve	TRB4	Reserve
SIG +	Signal 1	SGND	Signal ground
SIG-	Signal 2	DRS +	Excitation shielding positive

DRS-	Excitation shielding negative	MTDR	Excitation shielding ground
EXT +	Excitation current positive output	EXT-	Excitation current negative output
POUT	Pulse/Frequency positive output	PCOM	Pulse/Frequency output ground
IOUT	Current positive output	ICOM	Current output ground
TRX-	Communication input(RS485- B)	TRX+	Communication input(RS485- A)
LN-	220VAC(24VDC+) Power	LN+	220VAC(24VDC-) Power
Switch A	Thermal Resistor Selection	Switch B	Communication terminal resistor
DCOM/DIOP	Reserve		

Note: Switch A is the selection switch for PT1000 and PT100 platinum resistance thermometers. The default setting at the factory is PT1000, with both switches 1 and 2 toggled to OFF. If the user adopts a PT100 platinum resistance thermometer, both switches 1 and 2 must be toggled to ON. The resistance selection must be used in conjunction with parameter settings; refer to Chapter 2.4 “Temper.param” for details.

Switch B is for the communication terminating resistor. Toggle both switches 1 and 2 to ON to connect the 120Ω communication terminating resistor (standard configuration). Toggle both switches 1 and 2 to OFF to disconnect the communication terminating resistor. The terminating resistor is only used for the converter at the farthest end in long-distance communication; converters at other positions should not be connected to it.

1.3 Connection requirements

The grounding terminal of the converter housing shall be grounded with a grounding copper wire not less than $1.6mm^2$. The grounding resistance from the converter housing to the ground should be less than 10 Ω.

First Φ 20 copper pipe, cut into 1700 mm long (can be lengthened as needed) to make a ground nail buried 1500 mm (note: when embedding the ground nail, sprinkle a layer of wood charcoal on the tip of the ground nail, and then pour salt water);

Next, weld $4mm^2$ copper wire on the ground stud, and finally connect the ground wire to the sensor flange, grounding ring, and pipe flange, as shown in Figure 1.3.

Note: stainless steel is required for fixing ground wire screw, spring washer and flat washer.

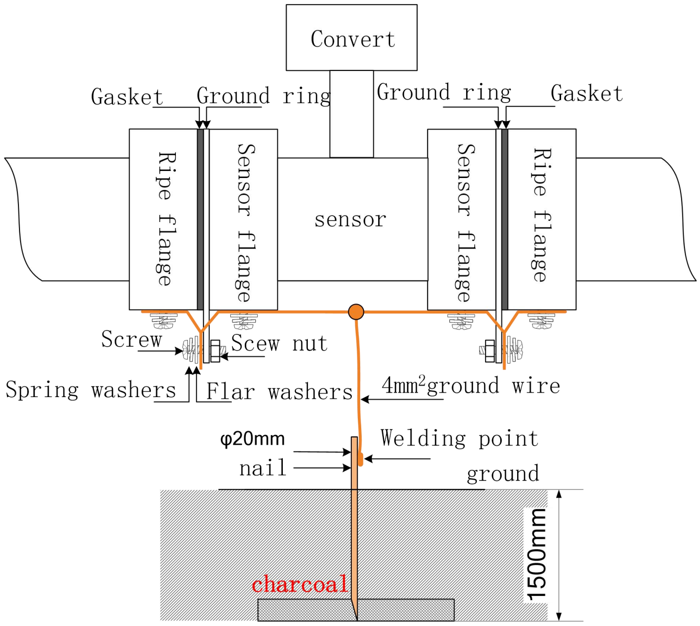


Fig.1.3.1 Grounding

1.4 Output and power cable

All output and power cables shall be prepared by the user according to the actual situation. However, please pay attention to meet the requirements of load current.

Frequency, pulse alarm output external power supply and load are shown in Figure 1.4.1-Figure 1.4.4. When using inductive load, the freewheeling diode should be added as shown in the figure.

1.4.1 Pulse output wiring(1)

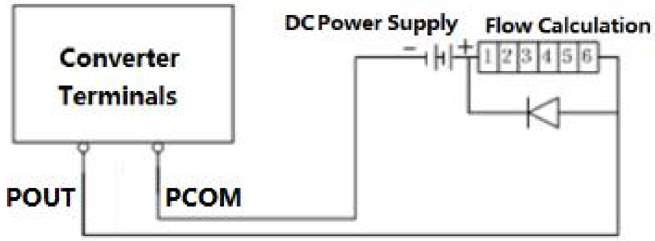


Fig1.4.1 External power supply connected electronic counter

1.4.2 Pulse output wiring(2)

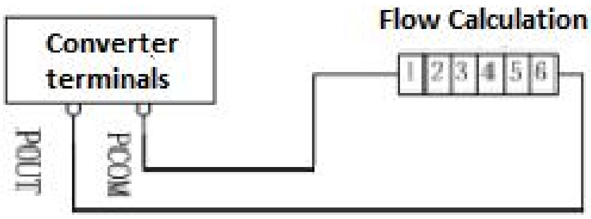


Fig1.4.2 Alarm output connection

1.4.3 Current output wiring:

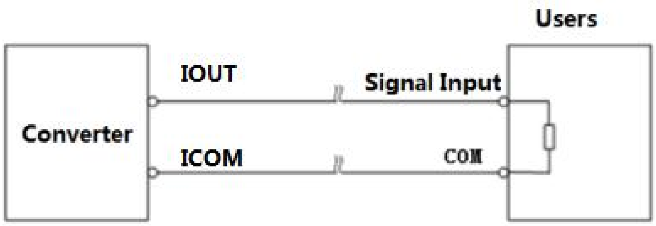


Fig1.4.3 4-20mA Internal power supply connection

1.4.4 Connection mode of OC door in the table

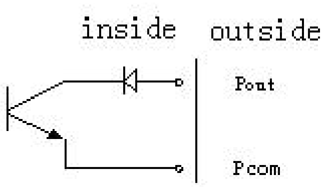


Fig1.4.4 Connection mode of OC door in the table

2 Introduction to instrument parameters

<u>Note：To align with the parameters displayed in the converter, some words are abbreviated. Users can use the parameter function by referring to the meter display and parameter description.</u>

2.1 Flow Paramet.

2.1.1 Operat. mode

The L-magH electromagnetic flow heat meter has three operating modes: heat meter mode, cold meter mode, and cold-heat mode.

Heat meter mode: Only calculates heat quantity. Heat quantity is denoted by the symbol “H”;

Cold meter mode: Only calculates cold quantity. Cold quantity is denoted by the symbol “C” or “R” (symbols may vary with different software versions; please refer to the actual product);

Cold-heat mode: Calculates both cold and heat quantities, with automatic switching based on inlet and outlet temperatures. This is the default mode of the meter at factory shipment;

2.1.2 Snsr size

The diameter range of the supporting sensor of the L-magH electromagnetic flowmeter converter: 10-2000 mm.

10,15,20,25,32,40,50,65,80,100,125,150,200,250,300,350,400,450,500,600,700,800,900,1000,1200,1400,1600,1800,2000.

2.1.3 Flow Unit

Select the flow rate display unit in the parameters. The meter's available flow rate display units are: L/s, L/min, L/h, m^3/s, m^3/min, m^3/h. Users can select an appropriate flow rate unit according to their application requirements.

2.1.3 Heat Unit & Cold Unit

The meter offers four optional heat quantity display units: MJ, GJ, kWh, MWh, all of which are based on the hour as the time unit.

2.1.5 Flow Rspns

This parameter means filtering time, long measurement damping time can improve the stability of instrument flow display and output signal, and is suitable for the measurement of total cumulative pulsating flow. Short measurement damping time is characterized by fast measurement response speed, which is suitable for production process control. The measurement damping time can be set by selection.

2.1.6 Flow Direct

If the user thinks that the fluid direction during commissioning is inconsistent with the design, the user does not need to change the excitation line or signal line connection method, but can change the flow direction setting parameters.

2.1.7 Flow Zero

During point correction, ensure that the sensor tube is filled with fluid and that the fluid is still. The flow zero point is expressed by the flow rate, and the unit is mm/s. The converter flow zero correction is shown as follows:

ZR = ± 0 0 0 0 0
± 0 0 0 0

Upward small word display: ZR represents the zero measurement value of the instrument;

Downward large word display: correction value of flow rate zero point;

When ZR is not displayed as “0”, the correction value should be adjusted to make ZR=0. Note: If the downstream correction value is changed and ZR value increases, the positive and negative signs of the downstream value need to be changed so that ZR can be corrected to zero.

The corrected value of flow zero is the matching constant value of the sensor, which should be recorded in the sensor record sheet and the sensor label. When recording, the zero point value of the sensor is the flow rate value in mm/s, and its sign is opposite to the sign of the corrected value.

2.1.8 Flow Cutoff

"Flow cutoff " is expressed in flow. This parameter is allowed to be used in conjunction with signal cutting. When this parameter is set to 0, the small signal removal function does not work.

2.1.9 Tempe.Cutoff

When the temperature difference between the inlet and outlet is lower than this parameter setting, the converter will not calculate heat or cold capacity.

2.1.10 Total Unit

The heat meter display has 9 digits, and the maximum allowable count value is 999999999.

The unit of use is L(liter), m^3(cubic meter).

The flow accumulation equivalent is：

0.00001L, 0.0001L, 0.001L, 0.010L, 0.100L, 1.000L

0.00001m^3, 0.0001m^3, 0.001m^3, 0.010m^3, 0.100m^3, 1.000m^3

2.1.11 HeatTotUnit &ColdTotUnit

The heat meter display has 9 digits, and the maximum allowable count value is 999999999.

The unit of use is MJ, GJ, KWh, MWh.

The heat/cold accumulation equivalent is：

0.0001MJ, 0.001MJ, 0.010MJ, 0.100MJ, 1.000MJ

0.0001GJ, 0.001GJ, 0.010GJ, 0.100GJ, 1.000GJ

0.0001KWh, 0.001KWh, 0.010KWh, 0.100KWh, 1.000KWh

0.0001MWh, 0.001MWh, 0.010MWh, 0.100MWh, 1.000MWh

2.1.2 REV Flow Ena

The heat meter is equipped with a reverse flow prohibition function.

When the parameter is set to "DISANLE", if the fluid flows in reverse, the converter will not calculate heat or cold capacity and will have no output, with only the flow rate displayed.

When the parameter is set to "ENABLE", the converter will perform normal metering as long as the fluid flows, and the heat meter will operate normally.

In principle, heat or cold capacity should not be calculated for reverse flow, so this parameter is set to "DISANLE" by default at the factory.

2.2 Output Param

2.2.1 Current Mode

The L-magH heat meter offers six current output modes: "Flow output", "Heat Output", "Cold output", "Heat Cold output", "Status output", and "Flow Direction".

Flow Output: Current is output as a percentage of the instantaneous flow rate, with the percentage display showing the flow rate percentage.

Heat Output: Current is output as a percentage of the instantaneous heat, with the percentage display showing the heat percentage.

Cold Output: Current is output as a percentage of the instantaneous cold, with the percentage display showing the cold percentage.

Heat Cold Output: Current is output as a percentage of the instantaneous cold or heat, with the percentage display showing the corresponding percentage.

Status Output: Current output indicates cold or heat -20mA for cold and 4mA for heat.

Flow Direction: Current output indicates the flow direction -20mA for reverse flow and 4mA for forward flow.

2.2.2 Flow Range & Heat Range & Cold Range

"Flow Range"refers to determining the upper limit flow rate, with the lower limit flow rate of the meter automatically set to "0".

Therefore, the meter range setting defines the meter's range, and also establishes the corresponding relationships between the meter's percentage display, current/frequency outputs and the flow rate (the same applies to cold and heat):

Meter percentage display value = (Flow rate / Flow range) * 100%

Meter current output value = (Flow rate / Flow range) * Current range + Current zero point

Meter frequency output value = (Flow rate / Flow range) * Full-scale frequency value

2.2.3 Data Output

The L-magH heat meter provides seventeen pulse output modes:

Flow Frequency, Flow Pulse Lt, Flow Pulse m3, Heat Pulse MJ,Heat Pulse GJ, Heat Pulse KWh, Heat Pulse MWh, Cold Pulse MJ, Cold Pulse GJ, Cold Pulse KWh, Cold Pulse MWh, Cold Heat P MJ,Cold Heat P GJ, Cold Heat P KWh, Cold Heat P MWh, WorkStatus Mark, Flow direction.

Frequency Output Mode: The frequency output is a continuous square wave, with the frequency value corresponding to the flow rate percentage (see Section 2.2.2 for details).

Pulse Output Mode: The pulse output is a train of rectangular wave pulses. Each pulse represents a flow equivalent passing through the pipeline, and the pulse equivalent is set by combining “Data Output” and “Pulse Factor” parameter below. This mode is mostly used for total accumulation and is generally connected to integrating instruments.

Heat/Cold Status Output: When the pulse output indicates the heat/cooling status, a low level represents heat and a high level represents cooling capacity.

Flow Direction Output: When the pulse output indicates the flow direction, a low level represents forward flow and a high level represents reverse flow.

2.2.4 FrequencyMax

The L-magH heat meter frequency output corresponding to flow rate percentage (not applicable to heat or cold), with a selectable range of 1-5000. The calculation formula is as follows:

Meter frequency output value = (Flow rate / Flow range)* Full-scale frequency value

2.2.5 Pulse Factor

“Pulse Factor” is the pulse equivalent, with a range of 0.001-59.999. It is used in conjunction with “Data Output” and “Pulse Width”.

2.2.6 Pulse Width

Pulse output is effective at low level, pulse width: 0.5-999.9ms

Corresponding table of pulse width - maximum output pulse number

No.	**Pulse Width**（ms）	Maximum number of output pulses per hour（p/h）
1	0.5	3600000
2	1	1800000
3	5	360000
4	10	180000
5	50	36000
6	100	18000
7	200	9000
8	500	3600
9	999.9	

2.3 Sensor Param

2.3.1 Sensor Fact

“Sensor Fact”: the calibration coefficient of the whole electromagnetic flowmeter. The coefficient is obtained from the real label and stamped on the sensor label. The user must put this coefficient in the L-magH converter parameter table.

2.3.2 Field Type

The L-magH heat meter offers two excitation frequency options: 1/10 power frequency (“Type 1”) and 1/12 power frequency (“Type 2”).

Sensors with small calibers have low inductance in the excitation system and should select 1/10 power frequency. Sensors with large calibers have high inductance in the excitation system, so users should choose 1/12 power frequency. During use, first select Excitation “Type 1”; if the meter’s flow rate zero point is too high, switch to “Type 2” in sequence.

※ Note: The meter must operate in the same excitation mode as it was calibrated in.

2.3.3 Snsr Code 1 & Snsr Code 2

These parameters is used to record the sensor's code.

2.3.4 Sensor Post.

If the flow sensor of the heat meter is installed at the inlet of the heating pipeline, please select “Flow Inlet”; if the flow sensor of the heat meter is installed at the outlet of the heating pipeline, please select “Flow Outlet”. It should be noted that if this parameter does not correspond to the actual installation, calculation errors will occur.

2.4 Temper.param

2.4.1 Heat Start T & Cold Start T

The temperature limit for the meter's measurement of heat and cold is such that when the temperature is lower than the set temperature, the meter does not calculate the heat or cooling capacity.

2.4.2 Pres. Range

The L-magH heat meter complies with the Industry Standard for Urban Construction of the People’s Republic of China CJ128—2007, and is set with two pressure options (0.6MPa and 1.6MPa) for user convenience.

2.4.3 TempA Zero & TempA Range & TempB Zero & TempB Range

The L-magH electromagnetic heat meter adopts the three-wire bridge connection method for Pt1000 and Pt100 thermal resistors. For specific calibration methods, refer to Appendix 3.

2.4.4 RTD type

The L-magH heat meter is equipped with a selection function for Pt1000 and Pt100 thermal resistors.

This parameter needs to be used in conjunction with Switch A (see chapter 1 “**Terminals function**”). If the user intends to use Pt1000 thermal resistors for the temperature measurement section, select “Pt1000” for this parameter and set switches 1 and 2 of Switch A to “OFF”. If the user intends to use Pt100 thermal resistors for the temperature measurement section, select “Pt100” for this parameter and set switches 1 and 2 of Switch A to “ON”.

By default, the temperature measurement section uses Pt1000 thermal resistors at the factory, with switches 1 and 2 of Switch A set to “OFF”.

※ **Note: The temperature measurement must be used in the same thermal resistor mode as it was calibrated in.**

2.4.5 Ent.T.Calic & Out.T.Calic

When there is a deviation between the measured temperature value and the theoretical temperature value, calibration can be performed by adjusting the temperature correction parameter to make the temperature data more consistent with the actual temperature value. The setting method for the outlet temperature correction(“Ent.T.Calic”) is the same as that for the inlet temperature correction(“Out.T.Calic”), and reference can be made to the following formula (taking “Ent.T.Calic” as an example):

Inlet Temperature Correction = Measured Temperature Value /Theoretical Temperature Value.

2.5 Alarm Parame

2.5.1 Mtsnsr Ena

The L-magH heat meter is equipped with an empty pipe detection function without the need for additional electrodes.

If the user enables empty pipe alarm, the meter can detect an empty pipe status when the fluid in the pipeline is below the measuring electrodes. After detecting the empty pipe status, the meter’s analog output and digital output are set to zero signal, and the meter’s flow rate display is also zero.

2.5.2 MtsnsrTrip

The empty pipe alarm setting has been modified for scenarios where the pipeline is fully filled with fluid (regardless of whether there is flow rate), making it more user-friendly.

For the empty pipe alarm threshold parameter, the upper display shows the measured conductivity ratio, and the lower display is for setting the empty pipe alarm threshold. When setting the empty pipe alarm threshold, it can be configured based on the measured conductivity ratio, and setting it to 3 to 5 times the measured conductivity ratio is sufficient.

During an alarm, “MT” will be displayed on the meter’s measurement screen.

2.5.3 Sys Alm Ena

Select “ENABLE” to activate the excitation alarm function; select “DISABLE” to deactivate it. During an alarm, “SY” will be displayed on the meter's measurement screen.

2.5.4 MtsnsrZero

When the field full pipe value is large, the user can correct the empty pipe zero point. When correcting the null point of the empty tube, ensure that the sensor tube is filled with fluid. The null point correction of the empty tube is shown as follows：

MZ = 0 0 0 1 5
+ 0 0 0 0

Up line display: MZ represents the measured value of zero point of instrument air pipe;

Down line display: ATC zero correction value;

First, according to the measured conductivity MT value, adjust the correction value to make MZ=5-10 (note: if the downward correction value is increased, the MZ value will decrease).

2.5.5 MtsnsrRange

When the MT value of empty tube conductivity measured by the instrument is small, the user can correct the empty tube range. During empty tube range correction, ensure that there is no fluid in the sensor tube, and the empty tube range correction display is as follows:

MR = 0 0 1 0 7
1 .0 0 0 0

Upstream display: MR represents the measured value of instrument air pipe range;

Downward display: ATC range correction value;

Increase the downlink correction value, and the MR value will increase; decrease the downlink correction value, and the MR value will decrease. The user can adjust the MR to the appropriate value according to the actual needs (it is recommended to adjust it to about MR=500), so the measured conductivity value of empty pipe is basically the actual corrected MR value.

2.6 Linearizati

The linear correction parameters include nine parameters in total, namely: “LineCrcEna”,“LinearyCRC1”,“LinearyFact1”,“LinearyCRC2”,“LinearyFact2”,“LinearyCRC3”,“LinearyFact3”, “LinearyCRC2”and “LinearyFact 4”.

For detailed descriptions, refer to Appendix 1.

2.7 Communicati

2.7.1 Comm Addres

Refers to the communication address of this table during data communication. The optional range: address 01-250, address 0 reserved.

2.7.2 Baud Rate

Selection range of instrument communication baud rate:
300,600,1200,2400,4800,9600,19200,38400.

2.7.3 Commun.Mode

The standard configuration of the instrument is the standard MODBUS communication 8-bit no-parity mode, and users can select the 8-bit odd-parity and 8-bit even-parity modes according to their needs.

2.8 Date paramet

The time parameters include six time - setting parameters: “”, “”, “”, “”, “”, and “”. These parameters are used for power - off timing and the clock setting of monthly cumulative total.

2.9 Factory Adj

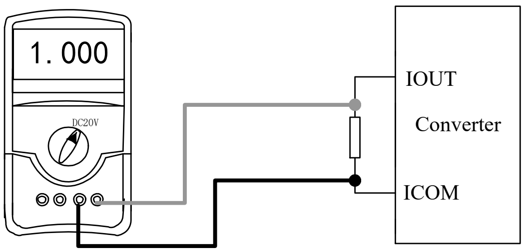
2.9.1 Meter Fact

This coefficient is a special coefficient of the converter manufacturer. The converter manufacturer uses this coefficient to normalize the measurement circuit system of the electromagnetic converter to ensure that the interchangeability among all electromagnetic converters reaches 0.1%.

2.9.2 AnalogZero & Anlg Range

(1)Instrument calibration preparation

The instrument shall be started and operated for 15 minutes to achieve thermal stability inside the instrument. Prepare 0.1% level ammeter, or 250 Ω resistance and 0.1% voltmeter, and connect them according to the following figure.



(2)Analog Zero CRC

Set the converter to the parameter setting state, select the "Analog Zero CRC" item, enter, set the standard signal source to the "0" position, adjust the correction factor value, so that the ammeter just indicates 4mA (± 0.004mA).

(3)Analog Range CRC

Select "Analog Range CRC", enter, set the standard signal source to the full range, adjust the converter correction factor, and make the ammeter exactly indicate 20mA (± 0.004mA).

After adjusting the "0" point and the full range value of the current, the current function of the converter can ensure the accuracy. The current output linearity of the converter is within 0.1%.

2.9.3 Clr Sum Key

Users can set this password using the second - level password, and then set this password again when clearing the total amount.

2.9.4 MeterCode1 & MeterCode2

The converter code records the factory time and serial number of the converter.

2.9.5 Password 1

Users can access with the Level 5 password and modify this password.

2.9.6 Language

The L-magH heat meter supports two languages (Chinese and English), allowing users to select the operating language independently.

2.10 Test paramet

2.10.1 Heat Test

The meter's heat measurement function includes a test mode, which can be used for on-site inspection by customers to verify whether the mainboard hardware functions normally.

When this parameter is set to “ENABLE”, the converter will display the flow rate, inlet temperature, and outlet temperature according to the set values, and calculate the flow rate and heat based on these set values.

When the parameter is set to “DISABLE”, the converter will perform normal measurements.

2.10.2 TempA Value

Used to set the test inlet temperature.

2.10.3 TempB Value

Used to set the test outlet temperature.

2.10.4 Speed Value

Used to set the test flow rate value.

2.11 Total parame

2.11.1 TotalWordLo & TotalWordHi

The high and low total setting can modify the cumulative flow total value, mainly used for instrument maintenance and replacement. Users can access with the Level 2 password to adjust the cumulative flow, which generally shall not exceed the maximum value of the counter (999999999).

2.11.2 HeatTotalLo&HeatTotalHi& ColdTotalLo & ColdTotalHi

The setting method is the same as “TotalWordLo” and “TotalWordHi”.

3 Instrument display and operation

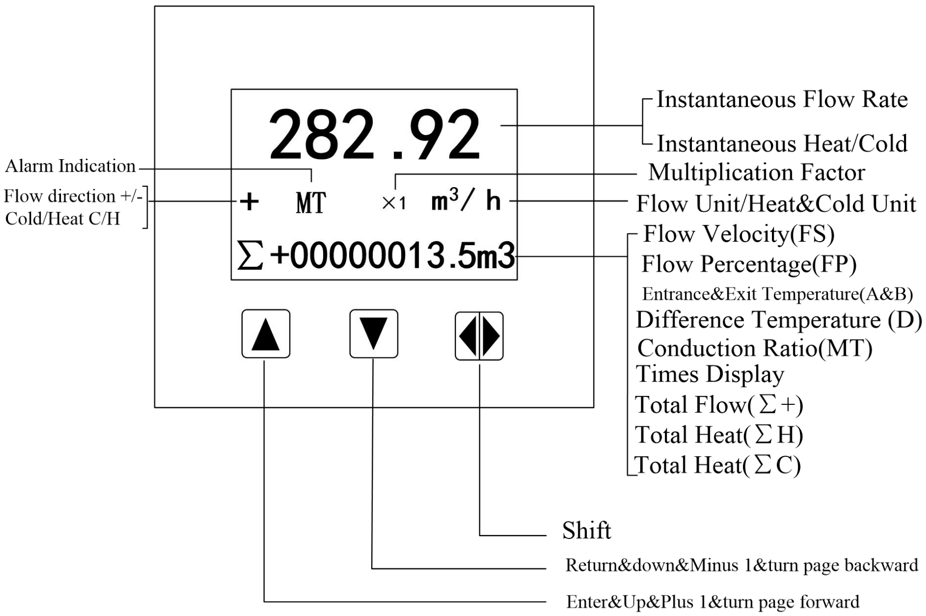


Fig.3.1 Interface display and keyboard definition

When the converter is powered on, it automatically enters the measurement state. In the automatic measurement state, the converter automatically completes each measurement function and displays the corresponding measurement data.

In the parameter setting state, users can complete the instrument parameter settings using the three panel keys.

3.1 Key function and remote control function

3.1.1 Key function in automatic measurement state

- Up: Conversion between instantaneous heat (cold) energy and instantaneous flow rate; heat energy is denoted by the symbol “H”, and cooling energy is denoted by “C” or “R” (the symbol varies by software version, subject to the actual product).
- Down: Cycle to select the content displayed in the lower line of the screen.
- Shift: Press the shift key, and the instrument will enter the instrument function selection screen.
- Up+Down: Dim the LCD contrast.
- Up+Shift: Brighten the LCD contrast.

3.1.2 Functions of keys in parameter setting state

- Down: Subtract 1 from the number at the cursor and turn the page forward;
- Up: Add 1 from the number at the cursor and turn the page backward;
- Press the shift key to move the cursor below the up - key, then press the up - key to enter the sub - menu.
- Press the shift key to move the cursor below the down - key, then press the down - key to return to the previous menu.

3.2 Parameter Setting Functions and Function Key Operations

To set or modify instrument parameters, the instrument must be switched from the measurement state to the parameter setting state. In the measurement state, press “Shift” once to enter the function selection screen “Parameters Set.” .

Then press “Shift” again to move the cursor below the “Up”, and press “Up” once to enter the password input state (“00000”). After entering the password, press “Shift” to move the cursor below “Up” and press “Up” once to access the main operation selection menu, as shown in the figure below:

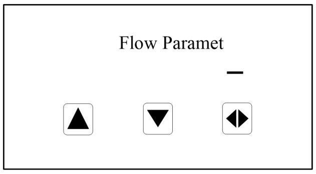


Fig.3.2a

To change the main menu, simply press “Up”. To access the sub-menu and modify its parameters from the main menu, move the cursor below “Up” and press “Up” — the instrument will then enter the sub-menu of the current main menu, as shown in the figure below:

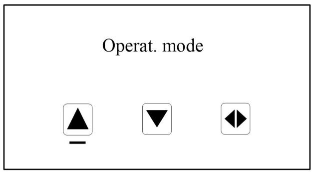


Fig.3.2b

To enter the sub-menu, move the cursor below the menu item. Press “Up”or “Down” to modify the parameters, and press “Shift” to exit after completion.

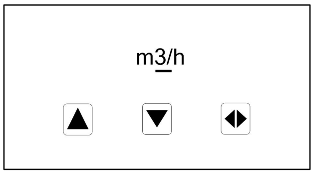


Fig.3.2c

3.3 Function Selection Screen

Press “Shift” once to enter the function selection screen, and then press the "Enter" key to make a selection. There are a total of five functions available for selection on this screen.

No.	function	explain
1	Parameters Set.	Enter the parameter setting screen
2	Clr Total Reco.	Clear the total amount of the instrument
3	MON Total Reco.	View thirty-two month accumulated value
4	Power Down Rec.	view thirty-two power - off records
5	Verificat. Sel.	choose the instrument mode
6	Fact Modif Rec.	Reserve

3.3.1 Parameter Set.

Press "Shift" once ,the LCD displays "Parameters Set.". After entering the instrument password, press "Shift" to move the cursor under "Enter" , then press "Enter" once to enter the parameter setting state.

3.3.2 Clr Total Reco.

Press "Shift" once, the LCD display "Parameters Set.", then press "Up" to page to "Clr Total Reco.". Enter the total reset password (this password must first be set by the user in chapter 2.9.3 "Clr Sum Key", press "Shift" to move the cursor under "Enter", and press "Enter" once. When the total reset password automatically changes to "00000", the instrument's reset function is completed, and the total amount inside the instrument becomes 0.

Remarks:

"Clr Sum Key" + 0: Clears the cumulative flow total value;

"Clr Sum Key" + 1: Reserved;

"Clr Sum Key" + 2: Clears the cumulative heat total value;

"Clr Sum Key" + 3: Clears the cumulative cooling total value;

"Clr Sum Key" + 4: Reserved;

"Clr Sum Key" + 5: Clears monthly records and power-off records;

"Clr Sum Key" + 6: Clears all the above data;

3.3.3 MON Total Reco.

The instrument include consistent power clock and the clock can work more than five years. If the " Heat Month Total"&"Power Down Reco."function will be used, the instrument need to ensure the clock worked normally.

The instrument need to calibrate the value of "Year,Month,Day,hour,Minute,Second".

The user need to supply enough power of battery.(Change the battery every five years.)

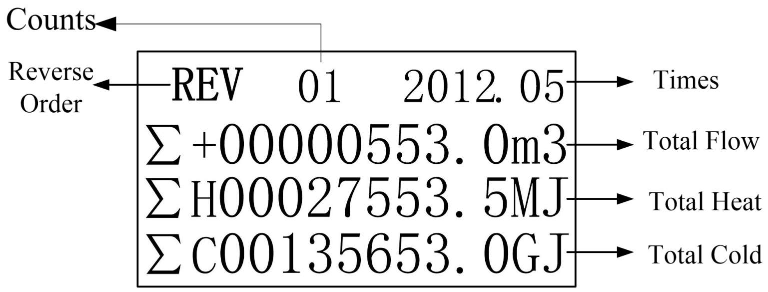


Fig.3.2.1 month total

The "Heat Month Total" function can record thirty-two items of data at most.If the data items is more than thirty-two,new data will cover the original ones.

3.3.4 Power Down Rec.

The function's method is the same as "MON Total Reco.".

It can record up to 32 power-off logs and a maximum of9999 power-off times.

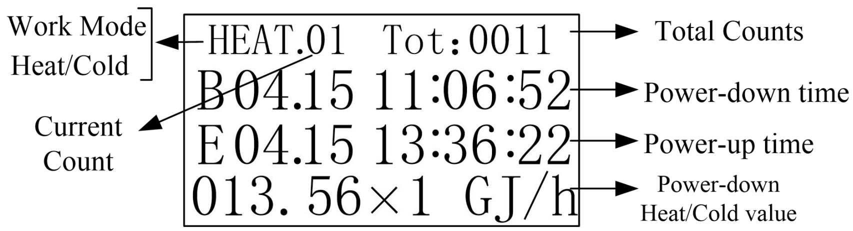


Fig.3.3.2 Power down record

3.3.5 Verificat. Sel.

According to the Requirements of Heat Meter Verification Regulation JJG225-201,in addition to the normal measurement mode, the electromagnetic flow meter (heat meter) shall be equipped with a calibration mode.

1.Instrument Calibration Mode choice:

Press "Shift" once to display "Parameters Set.", then press "Up" to page to "Verificat. Sel.". Press "Up" to select the mode("**Verification**" or "**Measure**"), and press "Shift" to exit to the main interface after selection.

2. "Verification":

- Cold unit and heat unit are fixedly displayed as kWh/h;
- Total cold unit and total heat unit are fixedly displayed as 0.001kWh;
- Minimum temperature display is 0.01℃;
- Cumulative flow units for different calibers:
  DN10 - DN25: 0.00001m^3;
  DN32 - DN100: 0.0001m^3;
  DN＞100: 0.001m^3;

3. “Measure”:

Display and calculation are performed according to the units set in the parameters, with a minimum temperature display of 0.1℃.

Note: The instrument will automatically switch to the normal “Measure” after working in “Verification” for 6 hours.

4 Product performance and index

4.1 Basic function

- Low-frequency square wave excitation, excitation frequency: 1/10 power frequency, 1/12 power frequency;
- The excitation current is 125 mA ,187 mA, and 250 mA;
- Empty tube measurement function without additional electrode, continuous measurement, constant value alarm;
- Flow rate measurement range: 0.1 - 15 m/s, flow rate resolution: 0.5 mm/s;
- AC high-frequency switching power supply, voltage range: 85VAC - 250VAC;
- DC 24V switching power supply, voltage application range: 20VDC - 36VDC;
- Type of thermal resistance: PT1000, PT100;
- Temperature measurement range: 0°C to +150°C;
- Network function: MODBUS(Standard),HART(optional);
- English display mode (other languages can be customized);
- There are three internal totalizer totals, which can be recorded separately: forward total, cold total and heat total.

4.2 Normal operating conditions

- Ambient Temperature Ranges: Split type –10-+50℃;
- Relative Humidity: 5%-90%;
- Power Supply: AC 85-250V,50Hz/60Hz.
  DC 20-36V.
- Dissipation Power: <20W（ After connecting sensor）

4.3 Type of connection to sensor

- Square shell split type: Wall-mounted square shell, and the converter is connected to the sensor cable.
- Square shell integrated type: The shell is directly connected to the sensor flange.

4.4 Request of relative sensor

Sensitivity of the sensor signal: When the flow velocity is 1 m/s, the sensor outputs 150μV to 200μV.

Resistance of sensor exciting coil:

250mA exciting current:50 -60Ω;

187mA exciting current:60 -80Ω;

125mA exciting current:100 - 120Ω;

4.5 Measuring accuracy of the whole machine

VS：setting measurement range（m/s）（m/s）

Diameter mm	Range m/s	Accuracy
3-20	≤0.3	±0.25%FS
	0.3-1	±1.0%R
	1-15	±0.5%R
25-600	0.1-0.3	±0.25%FS
	0.3-1	±0.5%R
	1-15	±0.3%R
700-3000	≤0.3	±0.25%FS
	0.3-1	±1.0%R
	1-15	±0.5%R
%FS：for relative ranges; %R：for relative value of measurement.		

4.6 Digital frequency output

Frequency output range：1-5000Hz;

Output electrical isolation： Photoelectric isolation.. Isolation voltage:> 1000VDC;

Frequency output drive：FET output，Maximum withstand voltage36VDC，Maximum load current250mA.

4.7 Analog current output

Load resistance： 0-750Ω.

Basic error：0.1%±10μA.

4.8 Digital communication port and protocol

RS485 Interface: Modbus protocol, RTU format;

Eectrical isolation: 1000V;

4.9 Electrical isolation

Insulated voltage between simulated input and simulated output should be higher than 500V;

Insulated voltage between simulated input and alarm power supply should be higher than 500V;

Insulated voltage between simulated input and AC power supply should be higher than 500V;

Insulated voltage between simulated output and AC power supply should be higher than 500V;

Insulated voltage between simulated output and earth should be higher than 500V;

Insulated voltage between pulse output and AC power supply should be higher than 500V;

Insulated voltage between pulse output and earth should be higher than 500V;

Insulated voltage between alarm output and AC power supply should be higher than 500V;

Insulated voltage between alarm output and earth should be higher than 500V;

4.10 Digital & Analog output and Calculate

Digital output means frequency output and pulse output, and both of them use the same output point, so user can choose only one type of them but not both.

4.10.1 Frequency Output

Frequency output range is 0-5000HZ, and corresponding the percent of flux.

Meter frequency output value = (Flow rate / Flow range)* Full-scale frequency value

The up limit of frequency output can be adjusted. It can be chosen from 0-5000HZ, and also can be chosen low frequency: such as 0-1000HZ or 0-5000HZ.

Frequency output mode general can be used in control application, because it responses the percent flux. Users can choose pulse output when the equipment is applied to count.

4.10.2 The connection of digital output

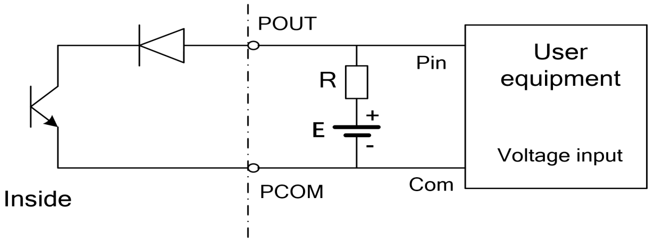
Digital output and alarm output have two connected points: digital output connected point, digital ground point, and symbol as follows:

POUT ----- digital output point;

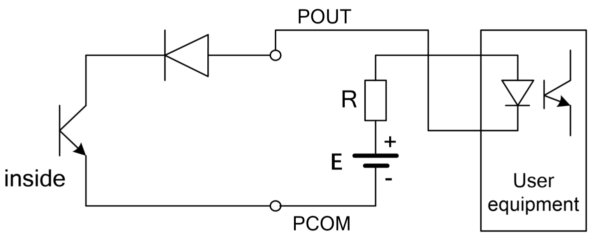
PCOM ----- digital ground point;

POUT is collector plough output, user may refer to next circuit to connect.

4.10.3 The connection of digital voltage output

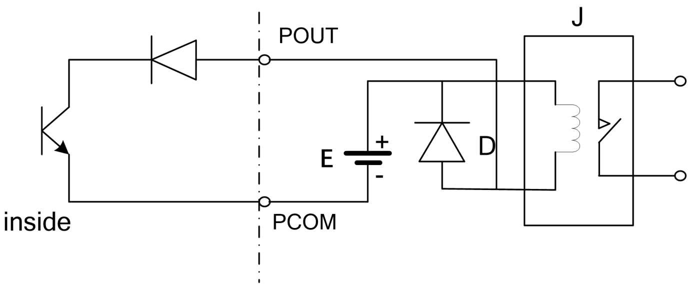


4.10.4 Digital output is connected to optocoupler (such as PLC)



Generally, the user optocoupler needs about 10mA current, so E/R=about 10mA. E=5-24V。

4.10.5 Digital output connect relay



Generally, the required E of intermediate relay is 12V or 24V. D is a freewheeling diode, which is currently used in most intermediate relays. If the intermediate relay itself does not contain this diode, the user should connect it externally.

Table of digital output parameter:

POUT

Parameter	Test condition	Mini	Typical	Max	Unit
working voltage	IC=100 mA	5	24	36	V
Working current	Vol≤1.4V	0	300	350	mA
working frequency	IC=100mA Vcc=24V	0	5000	7500	Hz
High level	IC=100mA	Vcc	Vcc	Vcc	V
Low level	IC=100mA	0.9	1.0	1.4	V

4.11 Analog output

Analog output refers to 4-20mA signal system.

The analog current output is internally powered by 24V, which can drive 750 Ω load resistance.

Analog current output corresponds to the percentage flow of flow, namely:

$$I_0=\frac{\text{Measure value}}{\text{Full scale value}} * \text{the scale of current} + \text{the zero point of current}$$

For 4-20mA signal system, the current zero point is 4mA.

Therefore, in order to improve the resolution of the output analog current, users should properly select the range of the flowmeter.

When the flowmeter leaves the factory, the manufacturer has calibrated the parameters of analog output. Generally, no user adjustment is required. If the user needs to calibrate the analog output under abnormal conditions, the following operation procedures can be followed.

※ Note: After the L_MagH heat meter and sensor are connected to the fluid pipeline (whether for calibration or use), the following work should be carried out first:

- Firmly connect the pipelines before and after the sensor with copper wires.
- Ensure the sensor is properly grounded.
- Make sure the fluid in the pipeline is stationary when adjusting the instrument zero point.
- Ensure the stable formation of the oxide film on the sensor electrodes (continuous contact between electrodes and fluid for 48 hours is sufficient).

5 Installation dimension drawing and meter images

5.1 Installation dimension drawing

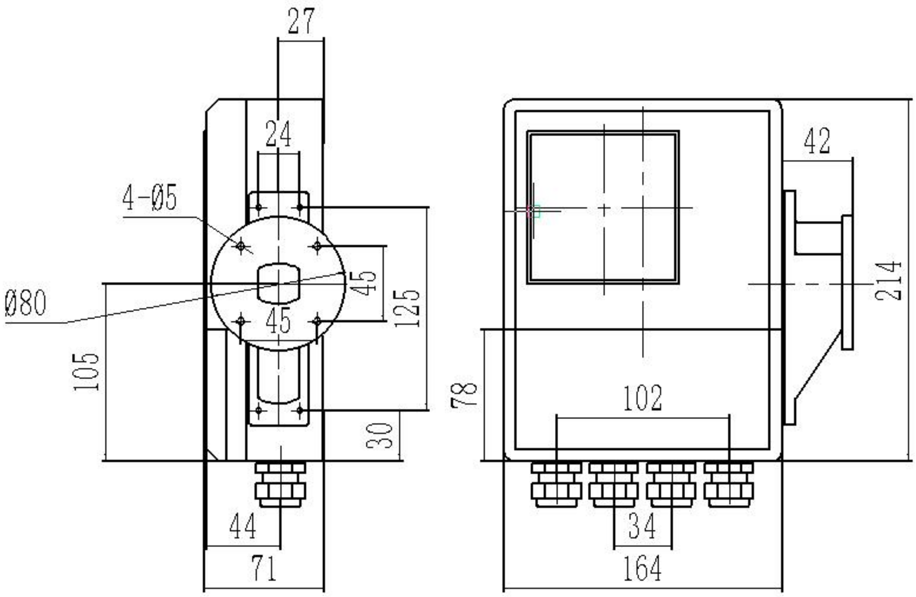


Fig.5a The dimension of integrated square shell

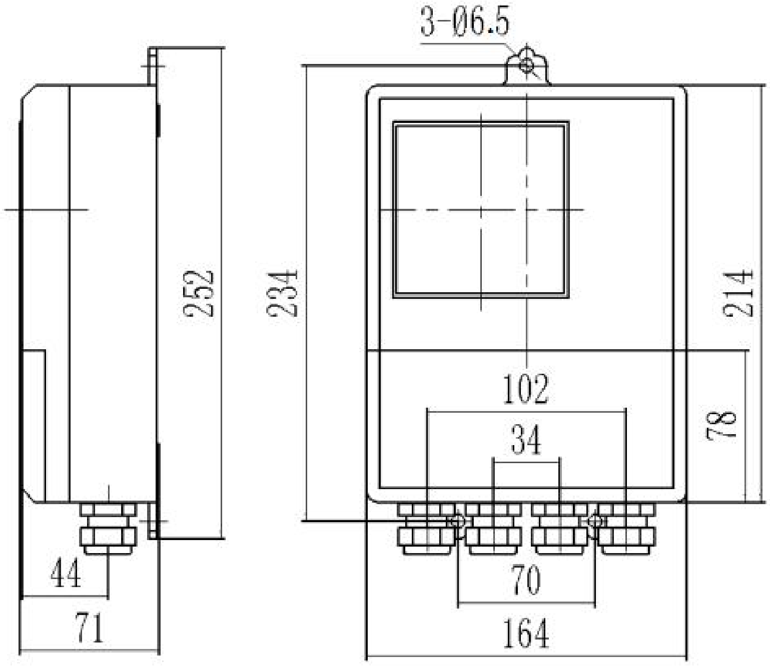


Fig.5b The dimension of split square shell

5.2 Meter images

Fig.5.2 Meter images

6 Alarm Information

The printed circuit board (PCB) of the L_MagH electromagnetic heat meter adopts surface mount technology (SMT) and is non-repairable for users. Therefore, users must not open the converter housing.

The three-key intelligent converter of the L_MagH electromagnetic heat meter is equipped with a self-diagnostic function. Except for power supply and hardware circuit faults, all faults occurring in general applications can be accurately indicated with alarm messages. These messages are displayed on the left side of the monitor as follows:

SY ---- System exciting alarm; MT --- Flow empty pipe alarm;

7 Trouble shooting

7.1 No display

- Check the power supply connection;
- Check the power fuse to see for OK;

7.2 System alarm

- Check if the exciting cables EX1 and EX2 did not connected;
- Check if the total resistance of sensor's exciting coil resistances less than 150Ω;
- If the first two checks are normal, the converter is faulty.

7.3 Empty pipe alarm(MT)

- Measure whether the fluid is filled with the sensor measuring tube;
- Short-circuit the converter signal wire (white core wire, red core wire, shield wire). At this time, if the "empty tube" prompt is canceled, it means that the converter is normal. It may be due to the low conductivity of the measured fluid or the wrong setting of the empty tube threshold and the empty tube range;
- Check whether the signal wiring is correct;
- Check whether the sensor electrode is normal:

Set the flow to zero, and observe that the conductivity ratio should be less than 100%;

When there is flow, measure the resistance of terminals SIG1 and SIG2 to SGND separately; the resistance should be less than 50 kΩ. (the measured value for the medium is water. It is better to measure with a pointer multimeter, and it can be seen that there is charging and discharging phenomenon in the measurement process).

When measuring the DC voltage between terminals DS1 and DS2 with a multimeter, the reading should be less than 1V. If not, it indicates that the sensor electrodes are contaminated and should be cleaned.

7.4 The measured flow is not accurate

- Measure whether the fluid is filled with the sensor measuring tube;
- Whether the signal line is connected normally;
- Check whether the sensor coefficient and sensor zero point are set according to the sensor label or factory calibration sheet;

8 Packing and storage

8.1 Packing

The electromagnetic converter is packaged in plastic bags and has a certain moisture-proof capability.

The accompanying documents include: one product certificate and one packing list.

8.2 Shipping and storage

In order to prevent the instrument from being damaged during operation, please keep the packaging state of the manufacturer before arriving at the installation site. During storage, the storage place shall be indoor with the following conditions, rain-proof, moisture-proof, low mechanical vibration and avoid impact; Temperature range: - 20-+60 ℃; The humidity shall not be greater than 80%.

Solemnly declare that this manual is suitable for our company's general software. In case of any difference between some contents and the actual converter, please refer to the physical object.

Appendix1 Description of nonlinear correction function

The non-linear correction function is, in principle, used for linear adjustment at low flow rates (below 0.5 m/s). This function is designed with 4-stage correction, consisting of 4 flow points and 4 correction coefficients. The flow rates corresponding to the correction points must satisfy: Correction Point 1 > Correction Point 2 > Correction Point 3 > Correction Point 4 > 0.

Correction calculations are performed on the original sensor flow coefficient curve. Therefore, the non-linear correction function should first be disabled to record the sensor coefficients. Then, enable the non-linear correction function, set the correction coefficients based on the recorded sensor non-linearity, and perform segmented correction. If the coefficients are set appropriately, re-calibration is not required.

In the formulas below, the original flow rate refers to the actually calibrated flow rate, and the corrected flow rate is called the adjusted flow rate. The correction formulas are as follows:

For the range: Correction Point 1 > Original Flow Rate ≥ Correction Point 2;Adjusted Flow Rate = Correction Coefficient 1 × Original Flow Rate;

For the range: Correction Point 2 > Original Flow Rate ≥ Correction Point 3;Adjusted Flow Rate = Correction Coefficient 2 × Original Flow Rate;

For the range: Correction Point 3 > Original Flow Rate ≥ Correction Point 4;Adjusted Flow Rate = Correction Coefficient 3 × Original Flow Rate;

For the range: Correction Point 4 > Original Flow Rate ≥ 0;Adjusted Flow Rate = Correction Coefficient 4 × Original Flow Rate;

Note: When setting the correction points, the following relationship must be maintained:Correction Point 1 > Correction Point 2 > Correction Point 3 > Correction Point 4 > 0

The midpoint value of the correction coefficient is 1.0000. A coefficient greater than 1 will increase the flow rate, while a coefficient less than 1 will decrease the flow rate.

Appendix 2 Setting Parameters in Menu

Menu List

Code	Parameters	Set	Content	Password Level
1	**Flow Paramet**	**Select**		
1	Operat. mode	Select	Heat meter mode, Cold meter mode, Cold——Heat mode	2
2	Sensor size	Select	10-2000	2
3	Flow Unit	Select	L/h, L/m, L/s, m^3/h, m^3/m, m^3/s	2
4	Heat Unit	Select	GJ/h, MJ/h, KWh/h, MWh/h	2
5	Cold Unit	Select	GJ/h, MJ/h, KWh/h, MWh/h	2
6	Flow Rspns	Select	1-60S	2
7	Flow Direct	Select	FORWARD, REVERSE	2
8	Flow Zero	Set Count	0-±9999	2
9	Flow Cutoff	Set Count	According to flow	2
10	Tempe.Cutoff	Set Count	0-199.9	2
11	Total Unit	Select	0.00001L, 0.0001L, 0.001L 0.010L, 0.100L, 1.000L 0.00001m^3, 0.0001m^3, 0.001m^3 0.010m^3, 0.100m^3, 1.000m^3	2
12	HeatTotUnit	Select	0.0001MJ, 0.001MJ, 0.010MJ, 0.100MJ, 1.000MJ, 0.000 1GJ, 0.001GJ, 0.010GJ, 0.100GJ, 1.000GJ, 0.0001 KWh, 0.001 KWh, 0.010KWh, 0.100 KWh, 1.000 KWh , 0.0001 MWh,0.001 MWh,0.010 MWh, 0.100 MWh, 1.000 MWh	2
13	ColdTotUnit	Select	0.0001MJ, 0.001MJ, 0.010MJ, 0.100MJ, 1.000MJ, 0.000 1GJ, 0.001GJ, 0.010GJ, 0.100GJ, 1.000GJ, 0.0001 KWh, 0.001 KWh, 0.010KWh, 0.100 KWh, 1.000 KWh , 0.0001 MWh,0.001 MWh,0.010 MWh, 0.100 MWh, 1.000 MWh	2
14	REV Flow Ena	Select	ENABLE, DISABLE	2
2	**Output Param**			
1	Current Mode	Select	Flow output, Heat output, Cold output,Heat Cold output, Status output, Flow direction	2
2	Flow Range	Set Count	0-59999	2
3	Heat Range	Set Count	0-59999	2
4	Cold Range	Set Count	0-59999	2
5	Data Output	Select	Flow Frequency, Flow Pulse Lt Flow Pulse m3, Heat Pulse MJ Heat Pulse GJ, Heat Pulse KWh Heat Pulse MWh, Cold Pulse MJ	2

			Cold Pulse GJ, Cold Pulse KWh Cold Pulse MWh, Cold Heat P MJ Cold Heat P GJ, Cold Heat P KWh Cold Heat P MWh,WorkStatus Mark Flow direction	
6	FrequencyMax	Set Count	0-5999	2
7	Pulse Factor	Set Count	00.001- 59.999	2
8	Pulse Width	Set Count	0.5-999.9ms	2
3	**Sensor Param**			
1	Sensor Fact	Set Count	0.0000-5.9999	2
2	Field Type	Select	Type1, Type2	2
3	Snsr Code 1	Set Count	0-99999	2
4	Snsr Code 2	Set Count	0-99999	2
5	Sensor Post.	Select	Flow Inlet, Flow export	2
4	**Temper.param**			
1	Heat Start T	Set Count	0-199.9	2
2	Cold Start T	Set Count	0-199.9	2
3	Pres. Range	Select	0.6MP, 1.6MP	2
4	TempA Zero	Set Count	0-59999	2
5	TempA Range	Set Count	0-5.999	2
6	TempB Zero	Set Count	0-59999	2
7	TempB Range	Set Count	0-5.999	2
8	RTD type	Select	Pt1000, Pt100	2
9	Ent.T.Calic	Set Count	0.0000-1.9999	2
10	Out.T.Calic	Set Count	0.0000-1.9999	2
5	**Alarm Parame**			
1	Mtsnsr Ena	Select	ENABLE, DISABLE	2
2	MtsnsrTrip	Set Count	0-59999	2
3	Sys Alm Ena	Select	ENABLE, DISABLE	2
4	MtsnsrZero	Set Count	0-9999	2
5	MtsnsrRange	Set Count	0-5.9999	2
6	**Linearizati**			
1	Line Crc Ena	Select	ENABLE, DISABLE	2
2	Lineary CRC1	User Set	According to flow	2
3	LinearyFact 1	User Set	0.0000-1.9999	2
4	Lineary CRC2	User Set	According to flow	2
5	LinearyFact 2	User Set	0.0000-1.9999	2
6	Lineary CRC3	User Set	According to flow	2
7	LinearyFact 3	User Set	0.0000-1.9999	2
8	Lineary CRC4	User Set	According to flow	2
9	LinearyFact 4	User Set	0.0000-1.9999	2
7	**Communicati**			
1	Comm Addres	Set Count	0-250	2
2	Baud Rate	Select	300-38400	2
3	Commun.Mode	Select	No Parity,1 stop Odd Parity,1 St Even Parity,1 S. No Parity,2 stop Odd Parity,2 St	2

			Even Parity,2 stop	
8	**Date paramet**			
1	YEAR	Set Count	0-99	2
2	MONTH	Set Count	0-99	2
3	DAY	Set Count	0-99	2
4	HOUR	Set Count	0-99	2
5	MINUTE	Set Count	0-99	2
6	SECOND	Set Count	0-99	2
9	**Factory Adj**	Set Count		
1	Meter Fact	Set Count	0.0000-5.9999	2
2	AnalogZero	Set Count	0.0000-1.9999	2
3	Anlg Range	Set Count	0.0000-3.9999	2
4	Clr Sum Key	User Modify	0-99999	2
5	MeterCode1	Factory Set	0-99999	2
6	MeterCode2	Factory Set	0-99999	2
7	Password 1	User Modify	0-59999	2
8	Language	Select	Chinese, English	2
10	**Test paramet**			
1	Heat Test	Select	ENABLE, DISABLE	2
2	TempA Value	Set Count	0-199.9	2
3	TempB Value	Set Count	0-199.9	2
4	Speed Value	Set Count	0-19.999	2
11	**Total parame**			
1	TotalWordLo	User Modify	0-99999	2
2	TotalWordHi	User Modify	0-9999	2
3	HeatTotalLo	User Modify	0-99999	2
4	HeatTotalHi	User Modify	0-9999	2
5	ColdTotalLo	User Modify	0-99999	2
6	ColdTotalHi	User Modify	0-9999	2

Instrument parameters determine the instrument's operating status, calculation methods, output modes and conditions. Selecting and setting instrument parameters correctly enables the instrument to operate in optimal condition, achieving high measurement display accuracy and measurement output accuracy.

The instrument parameter setting function is protected by a 2-level password. Level 1 is the user password, and Level 2 is the manufacturer password. Users can reset the Level 1 password using the Level 2 password.

Users can view instrument parameters with either level of password. However, different levels of passwords are required if users intend to modify the instrument parameters.

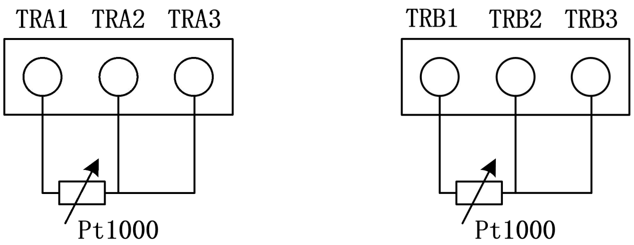
Level 1 password (factory default: 00521): View-only access.

Level 2 password (fixed value): Allows users to modify the instrument parameters listed above.

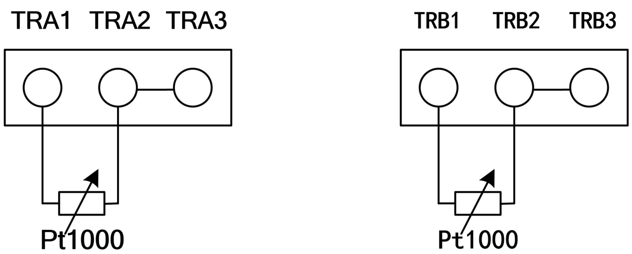
Appendix 3 Heat Measurement Instruction Manual and Connection Method

1.Temperature calibration method of Pt 1000 thermal resistance:

Pt1000 thermal resistance three-wire bridge connection method is applied in temperature measurement, wiring is as below:



Pt1000 thermal resistance two-wire bridge connection method is applied in temperature measurement, wiring is as below:



Current zero-point calibration and range calibration should be applied in thermal resistance measurement circuit. The converter has be calibrated in the factory and if calibration is still needed, follow the below steps:

A. use resistance box (connect according to three-wire bridge)

Step 1: Choose 1000Ω resistance.Users adjust zero-point value (generally around 32768) in “TempA Zero” and “TempB Zero” until the upper line of the LCD shows “0”.

Step 2: Choose 1535.8Ω resistance.Users adjust zero-point value (generally around 2.4) in “TempA Zero” and “TempB Zero” until the upper line of the

LCD shows “14000”.

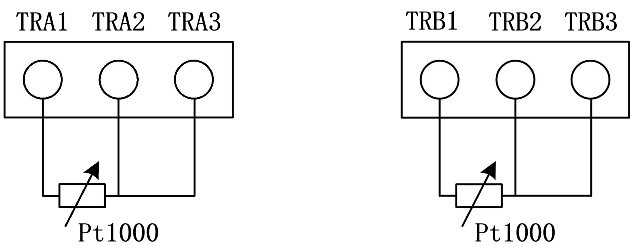
B.use black body furnace (connect according to three-wire bridge)

Step 1: Put thermal resistance ice water immersion, adjust zero-point value (generally around 32768) in “TempA Zero” and “TempB Zero” until the upper line of the LCD shows “±0”.

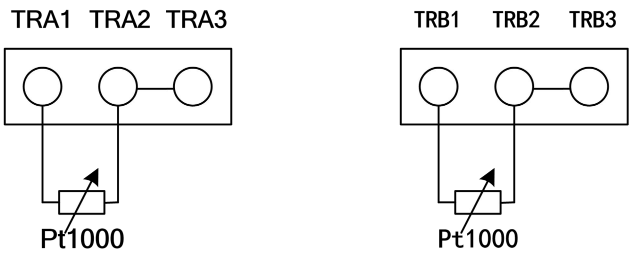
Step 2: Choose temperature 140℃ of black body furnace, put the thermal resistance into black body furnace, adjust zero-point value in “TempA Zero” and “TempB Zero” until the upper line of the LCD shows “14000”.

2.Temperature calibration method of Pt 100 thermal resistance:

Pt100 thermal resistance three-wire bridge connection method is applied in temperature measurement, wiring is as below:



Pt100 thermal resistance two-wire bridge connection method is applied in temperature measurement, wiring is as below:



Current zero-point calibration and range calibration should be applied in thermal resistance measurement circuit. The converter has be calibrated in the factory and if calibration is still needed, follow the below steps:

A. use resistance box (connect according to three-wire bridge)

Step 1: Choose 100Ω resistance.Users adjust zero-point value (generally, around 32768) in “TempA Zero” and “TempB Zero” until the upper line of the LCD shows “0”.

Step 2: Choose 153.58Ω resistance.Users adjust zero-point value (generally around 2.6) in “TempA Zero” and “TempB Zero” until the upper line of the LCD shows “14000”.

B.use black body furnace (connect according to three-wire bridge)

Step 1: Put thermal resistance ice water immersion, adjust zero-point value (generally around 32768) in “TempA Zero” and “TempB Zero” until the upper line of the LCD shows “±0”.

Step 2: Choose temperature 140℃ of black body furnace, put the thermal resistance into black body furnace, adjust zero-point value in “TempA Zero” and “TempB Zero” until the upper line of the LCD shows “14000”.

3. Heat calculation method

The heat calculation is done according to CJ128—2007.

Heat calculation:

When the water flows through the installed integrated heat meter or combined meter, the water signal is obtained based on the water flow and temperature from the sensor. The calculation is done based on the water signal and flow time to show the heat released or absorbed.

The format is:

$$Q = \int_{\tau 0}^{\tau 1} q_m \times \Delta h \times d\tau = \int_{\tau 0}^{\tau 1} \rho \times q_v \times \Delta h \times d\tau$$

Q - Heat released or absorbed (J);

qm – Water flow (kg/h);

qv - Water volume flow (m^3/h);

ρ – Water density (kg/m^3);

Δh - Enthalpy difference between entrance water temperature and outlet water temperature(J/kg);

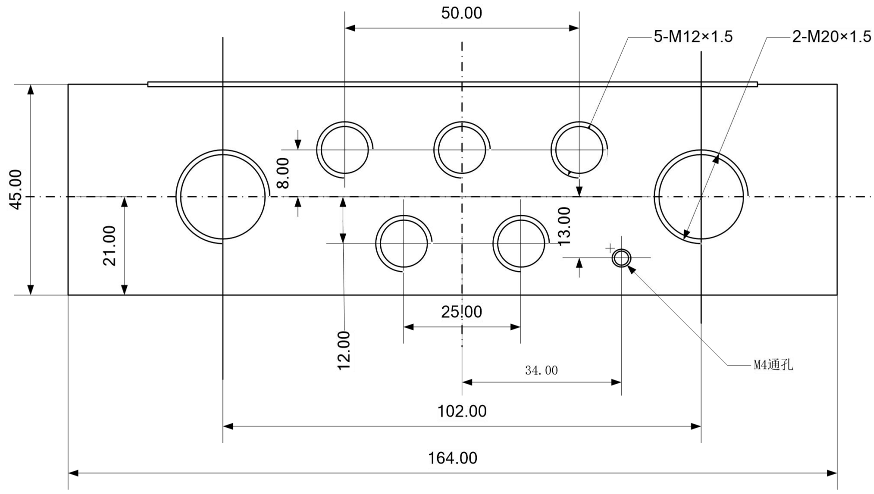
T – Time (h).

In the format, the destiny and enthalpy value is in compliance with the Annex A requirement of CJ128-2007. If the temperature is not integer, the calibration is needed.

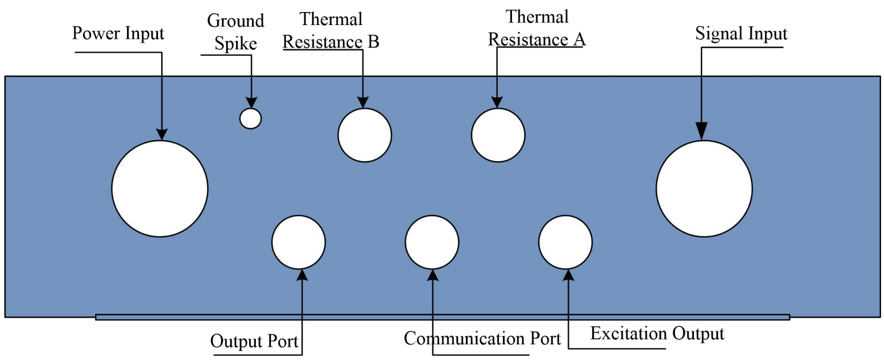
Remark: The measurement of the quantity of heat is calculated by using hot melting value of entrance and exit multiplying flow. So the calculated value relates to increment of one second of accumulative flow. That is to say, every time accumulative flow generates one increment, the quantity of heat should be calculated. So unit of accumulative flow should not be adjusted too much, avoiding that it takes long time to generate one accumulative flow increment. Accumulative flow is represented by 9 bits decimal numbers (999999999). Flow unit is 0.001 m^3, 0.01m^3, 0.1 m^3, 1 m^3.. The choice of flow unit should meet the demand that it won't overflow in 2-3 years.

Appendix 4 Definition of Inlet and Outlet Wire Holes for Heat Meter

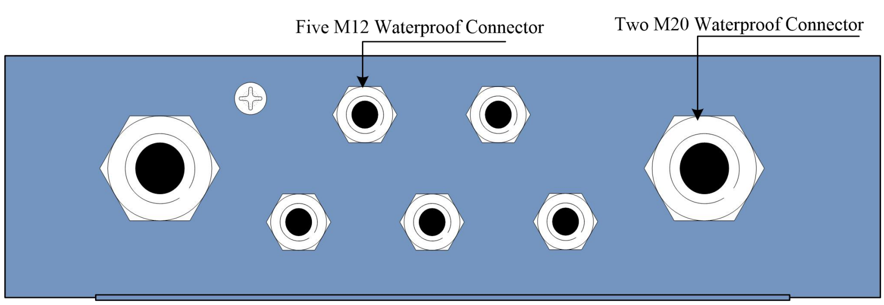
1. Bolt Size



2. Hole Definition



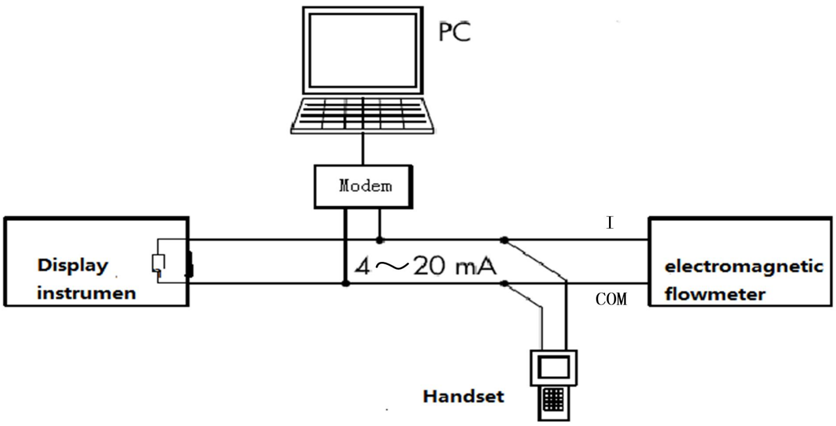
3. Bolt Installation



Appendix 5 HART Communication Function(Optional Functions)

Description 1 .HART Communication Bus Field Network Diagram

The characteristic of the HART communication bus is that it uses the 4-20mA signal line to transmit data signals, which saves on-site data communication lines and achieves data communication , making it very suitable for field applications. The field network composed of the HART communication bus is shown in the figure below.



Description 2 . Converter Setup Instructions

(1)The instrument can communicate using our company's handheld device, 375 handheld device, 475 handheld device;

(2)Set the instrument communication address to 64 and baud rate to 4800 when in use (this function is subject to the actual product);

(3)If the instrument communication method, address, and baud rate settings are incorrect, the handheld device will not be able to set parameters.

Description3 . Precautions for using HART communication function instrument

(1)The handheld device is connected in parallel across the load of the current output of the electromagnetic flowmeter without polarity;

(2)The resistance in the loop should be greater than 200Ω and less than 500Ω;

(3)The handheld device cannot be connected in series in the current loop.