

RC82 Series ultrasonic heat meter

DN15-DN40 Installation instructions



1 Product introduction

1.1 Features

- Internal high capacity 3.6V lithium battery, External optional AC220V or DC24V power supply mode;
- Can be mounted on supply pipeline or on return pipeline, and can be mounted in either horizontal or vertical direction, Can be installed at any angle;
- DN15-DN25 is installed without the straight pipe;
- Compatible with CJ/T 188, MODBUS RTU 、EN13757、BACnet communication protocol;
- Having optical interface, RS485, M-Bus, wM-Bus, pulse input and output, (4 ~ 20) mA, Bacnet 、GPRS communication mode
- The product conforms to Chinese CMC certification, in line with Chinese CJ128-2007 and the European EN1434 standard, compatible with the German Heating Association Measurement NOWA protocol.
- The modular design, support thread and flange two connections.

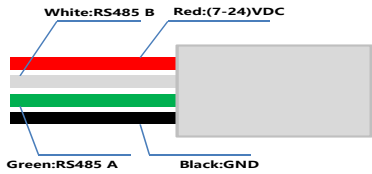
1.2 Communication interface

M-Bus Communication
M-Bus communication module is the heat meter and the external equipment (M-Bus collector) for data transmission interface. Multiple heat meters can be connected to the same collector at the same time.
M-Bus bus is a non polarity connection;
Baud rate is 600 ~ 9600bps;
Must use the cross-sectional area of not less than 0.75 mm2 shielded twisted pair, and a single bus distance of not more than 1500 meters

wM-Bus Communication
Wireless M-Bus protocol supporting EN 13757-4 mode T1 and C1.
Operating in the ISM frequency band of 868MHz;
Output power is up to 14 dBm;
Comply with OMS standards.

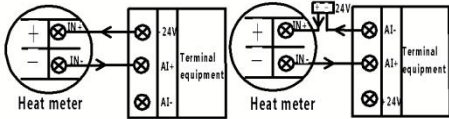
BACnet Communication
BACnet Application Specific Controller, MS/TP master.
External communication interface is the same as the RS485.
Baud rate:9600, 19200, 38400, 57600, 76800.
External DC (7 ~ 24) V or AC220V power supplyis required

RS485 Communication
RS485 bus must use the cross-sectional area of not less than mm2 4*0.75 shielded twisted pair.
Single battery powered products using the RS485 interface requires an external DC (7 ~ 24) V power supply for the RS485 interface to provide the power supply.
RS485 bus polarity distinction: red = power supply, white =B, green =A, black =GND (the red power line is not connected when dual power supply, only the remaining three lines can be).



Dual power supply
Heat meter with dual power supply module can use external AC220V or DC(7~24) V and built-in 3.6V lithium battery power supply.
When the external power supply power failure, automatically switch to the built-in lithium battery power supply, but when the built-in battery powered, RS485 communication module stop working.
DC7~24V uses 2 core lines: red =DC(7~24)V, white =GND.

4 ~ 20mA output
4mA means no flow, 20mA represents the maximum flow.
First one: 24V power supply terminal confession, Second way: the use of an external 24V power supply



Pulse input and output
Green is Pulse output Red is Pulse input1 Blue is GND Yellow is Pulse input 2

GPRS Communication
GPRS: four frequency 850/900/1800/1900MHz; meet 2/2+ GSM standard
Default network protocol: UDP
The default baud rate: 2400, even parity, 8 data bits, 1 stop bit
Battery power supply: DC3.6V, default configuration: 6Ah; communication frequency: 3000

1.3 Technical parameters and characteristics

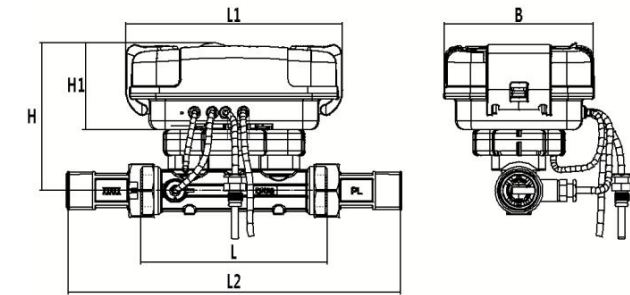
1.3.1 Survey

Application	Heating metering / cold and heat metering
Accuracy grade	2 grade
Protection level	IP65
Heat consumption calculation	Start from 0.25K
Temperature range	(4~95) °C or (4~130) °C optional
Range of temperature difference	(3~60) K ((2~100) K optional)
Ambient temperature	Class A (5~55) C or class B (-25~55) C optional
Power supply	3.6V lithium battery (220VAC、DC(7~24)V optional)
Battery working time	≥10 years
Installation method	Arbitrary angle
Hot (cold) carrier	Water full of measured pipe
Temperature sensor	Pt1000 platinum resistance (Pt500, Pt100 optional)
Maximum working pressure	1.6MPa (2.5MPa optional)
Maximum flow reading (m³)	999999.99
Maximum heat reading (kWh)	99999999

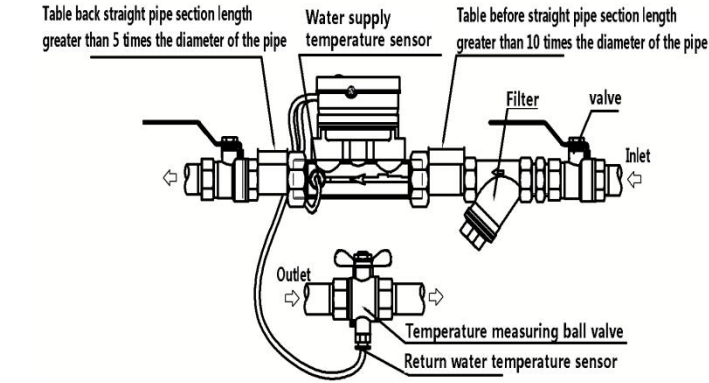
1.3.2 Technical parameter

Common flow q _p (m³/h)	0.6	0.6	0.6	1.5	1.5	1.5
DN (mm)	15	20	20	15	20	20
L (mm)	110	130	190	110	130	190
L2 (mm)	204	234	294	204	234	294
L1 (mm)	150	150	150	150	150	150
H (mm)	105	108	108	105	108	108
H1 (mm)	60	60	60	60	60	60
B (mm)	105	105	105	105	105	105
Table screw thread A (inch)	G ³ / ₄ B	G1B	G1B	G ³ / ₄ B	G1B	G1B
Live connecting thread B (inch)	R ¹ / ₂	R ³ / ₄	R ³ / ₄	R ¹ / ₂	R ³ / ₄	R ³ / ₄
Pressure loss (kPa/q _p)	14	14	14	18	7	7
Range ratio (q _p : q _i)	100:1 or 50:1 optional			250:1 or 100:1 or 50:1 optional		
Pulse output equivalent (kWh)	0.1	0.2	0.2	0.1	0.2	0.2
Pulse output equivalent (L)	1	1	1	1	1	1

Common flow q _p (m3/h)	2.5	2.5	3.5	6	6	10
DN (mm)	20	20	25	25	32	40
L (mm)	130	190	160	260	180	200
L2 (mm)	234	294	280	380	300	328
L1 (mm)	150	150	150	150	150	150
H (mm)	108	108	111	111	114	118
H1 (mm)	60	60	60	60	60	60
B (mm)	105	105	105	105	105	105
Table screw thread A (inch)	G1B	G1B	G1 ¹ / ₄ B	G1 ¹ / ₄ B	G1 ¹ / ₂ B	G2B
Live connecting thread B (inch)	R ³ / ₄	R ³ / ₄	R1	R1	R1 ¹ / ₄	R1 ¹ / ₂
Pressure loss (kPa/q _p)	17	17	15	20	13	11
Range ratio (q _p : q _i)	250:1 or 100:1 or 50:1 optional					
Pulse output equivalent (kWh)	0.2	0.2	0.25	0.25	0.5	0.5
Pulse output equivalent (L)	1	1	1	1	2	2



2 Guide for typical installation and maintenance



2.1 In order to ensure safety, before installation, please carefully read and master the following points:

- In use, the working conditions are to be followed by the identification of the parameters, otherwise it may lead to the danger, the company does not assume warranty obligations.
- Where there is explosive, flammable substances in the place of construction, must take effective preventive measures according to professional protection regulations.
- The installation, is strictly prohibited to touch the mouth to avoid finger cut or crush.
- To be strictly installed in toxic gases, and stimulate or corrosive liquids or dust places.
- Confirm when installing that there is no danger of injury to the human body by the surrounding environment. Confirm when installing.
- It is only allowed trained personnel to installate and removal of.
- It is only allowed to install and remove flow meter when the equipment is not under pressure.
- The flow meter is not provided with a lightning protection measures, when building cabling , the lightning protection measures should be used.

2.2 Installation notes:

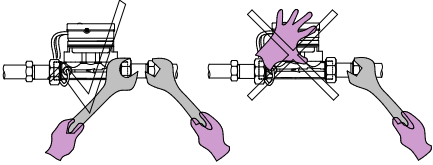
- alve installation before and after heat meter and filter, easy for heat meter maintenance and filter cleaning.
- Please notice valve opening sequence: open slowly valve before heat meter in inlet water side firstly, then open valve after heat meter outlet water side. Finally open valve in back water pipeline, to protect heat meter due to sand, stone etc. impurity which inside of pipeline of lower of heat meter flowing back to meter body.
- Notice: opening valve action should be slowly, to prevent water hammer effect during opening valve quickly, then damage heat meter and components.
- During heat meter running, try to avoid valve closing completely in pipeline, to prevent heat meter freezing without heat water flowing in pipeline for long time.
- If heat meter installation outdoor, should have protection measurement, to prevent damage incidentally and human destruction.
- Before heat meter installation, should clean pipeline and keep enough straight pipe in inlet and outlet. Inlet straight pipe length before heat meter is not less than 10 times of pipe diameter length, outlet straight pipe length after heat meter is not less than 5 times of pipe diameter length. Installation at the confluence between two back water pipeline, should have 10 times pipe diameter of straight pipe between heat meter and joint(like T joint), to ensure water temperature mixture averagely in two pipes.
- Water in heat system should be cleaning, demineralization and no dirt to ensure the running of heat meter smoothly, no block and damage. If flowing rate reduction significantly in the moment in heat exchanger system working normally, it means more dirt inside of filter and narrows pipeline, so flowing rate reduction. Should clean filter timely and change filter net in necessary.
- Heat meter is belonging to measuring instrument, must calibrate regularly according to national standards and change battery in necessary during calibration.
- Heat meter is belonging to accurate instrument, put up and down gently and carefully, forbidden to press and hit calculator and temperature sensor etc. key components. Forbidden to lift calculator and temperature sensor' s connection wire and other vulnerable parts.
- Forbidden to close high temperature heat source, like electric welding, to avoid instrument damage and influence use.
- Flow sensor had flow direction request, water flowing direction should be same with flowing sensor arrow direction.

2.3 Wiring requirements

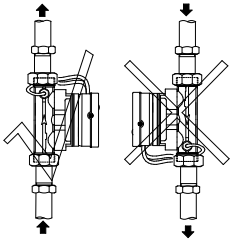
- All data line matched with product is not allowed to be truncated or replaced.
- The bus must adopt multi strand shielded twisted pair wire,diameter is not less than 0.75 mm².
- Prohibite laying signal lines and power lines in the same slot, in order to avoid strong signal interference.
- The RS485 bus must be reliable grounding point.
- The RS485 bus network generally use the hand structure wiring, avoid star connection and irregular branch connection. The star structure will produce a reflection signal, which will affect the RS485 communication

2.4 Several common error installation methods

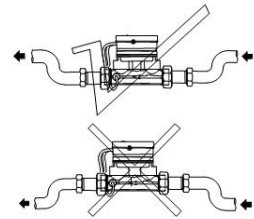
- When installation , Screw the nut with a wrench, do not use hand holding a plastic box body and then use the wrench to tighten the nut, because the box body is made of plastic, avoid the damage.



- When the flow meter vertical installation , it must be installed in the straight pipe, which water flow upward , if installed in the pipeline which water downward in the pipeline , because the water cannot fill pipe, it will affect the measurement accuracy, even beyond measure.

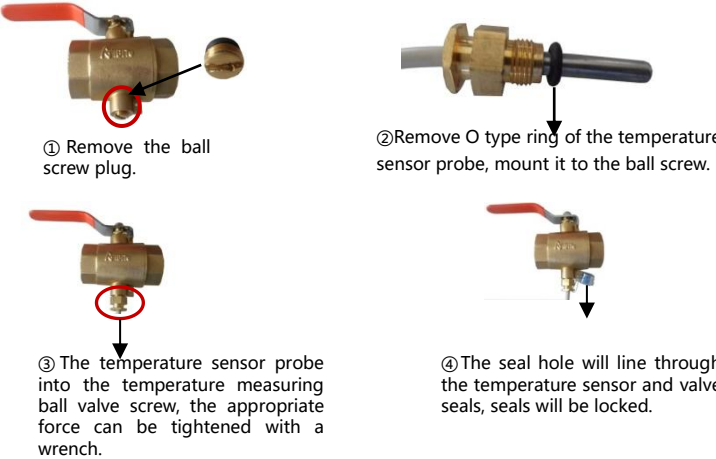


- Please install the flow meter in the lowest tube while installed in the "U" type, Because the pipes are likely to gather the air at the highest point, causing flow metering or inaccurate measurement.



2.5 Temperature sensor installation guide:

Each table has two temperature sensors, supply water supply temperature sensor with a red label, return water temperature sensor with a blue label. The water supply temperature sensor or the water return temperature sensor is fixed on the flow sensor according to the ordering requirement before the factory, and only the other temperature sensor is installed at the time of installation:



3 Description of the state of the content of hazardous substances in products

Component name	Toxic or hazardous substances or elements					
	leadPb	mercury Hg	Cadmium Cd	Six valence chromium Cr (VI)	Multi bromine PBB	Two phenyl ether PBDE
complete machine	○	○	○	○	○	○
○: It indicates that the content of the toxic and hazardous substances in all homogeneous materials of this part shall not exceed the limits set by the SJ/T11363-2006 standard. ×: It indicates that the content of the toxic and hazardous substances in a homogeneous material in at least one part of the component exceeds the requirements specified in the SJ/T11363-2006 standard. Note: 1. This table shows that our products may contain these substances, but the information may be updated with the development of technology. 2.The explanatory power of part definition in this table belongs to our company. 3. According to the EU waste electrical and electronic recycling directive 2002/96/EC (WEEE),if you need to scrap the product, you can return to my company, by my company to do scrap processing, but also can be returned to the company to have the quality of recycling. Not allowed to be discarded with other living garbage						

4 Warranty commitment

- (1) Free warranty: since the day you buy (in a formal purchase invoice date), to ensure that the seal is intact, the product quality problems as a result of the fault or not normal, the company responsible for the repair or replacement free of charge, but do not bear the cost of door-to-door service.
- (2) Exempt from warranty obligations: in order to protect the legitimate rights and interests of the protection, to avoid unnecessary losses, the following conditions caused by the failure, abnormal work or damage, our company does not assume warranty obligations, the need to pay maintenance.
 - a. When the product is beyond the warranty period;
 - b. Product damage due to the use of errors, self disassembly, improper maintenance and other reasons;
 - c. To open the seal products;
 - d. Accident factors (handling, collision, etc.) or man-made damage marks;
 - e. Other such as natural disasters, such as force majeure (such as earthquake, fire, etc.) caused by damage.
- (3) After sales service: Failure in normal use , please contact the supplier or the company's after-sales service department, in order to provide you with services in a timely manner.
- (4) About battery: the normal depletion period of the battery is 10 years, it is recommended purchasing and replacing before the expiration. In order to avoid the impact of the battery on the measurement accuracy of the product.

Important statement: the company's products in the design has the greatest ability to ensure the reliability of the measurement data, but can not guarantee that all products are not a problem. the loss of products measurement data caused by fault or other causes, the company will try our best to recover, but do not take responsibility for the measurement of data loss caused by the loss of users on a regular basis measurement data read and save.

Packing list

Name	Model	Number	Remarks
Ultrasonic water meter	RC82	1	*
Instructions		1	

* Expressed as the main component

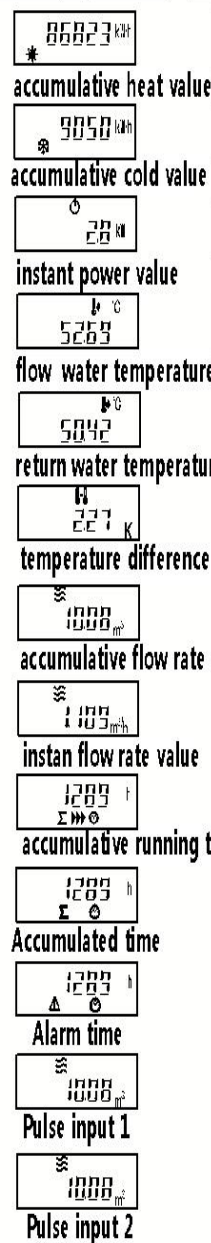
5 Liquid crystal display

The user can switch the liquid crystal display interface by the button:

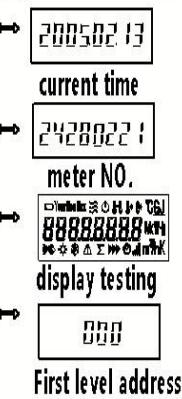
- A1 menu is the basic measurement data display. A2 menu is reference data, such as the date, the factory number, the first level address, etc...A3 menu is the first 24 months of the monthly cumulative heat, flow value. A5 menu is maximum statistics.
- Short press the button will be in the same menu scroll the contents of the display.
- A1 menu instantaneous flow term, long press the button, enter the A4 menu calculator state; the cumulative flow term, long press the button, can withdraw from the calculator state.
- A1 menu items, long press the button to enter the A4 menu flow of verification state;the cumulative flow, long press the button, can exit the verification status.
- A1 menu power, long press the button for 3 seconds, enter the A5 menu maximum value statistics menu.

Note: "the total amount of cold" only in the hot and cold (heating, cooling) dual purpose heat meter display

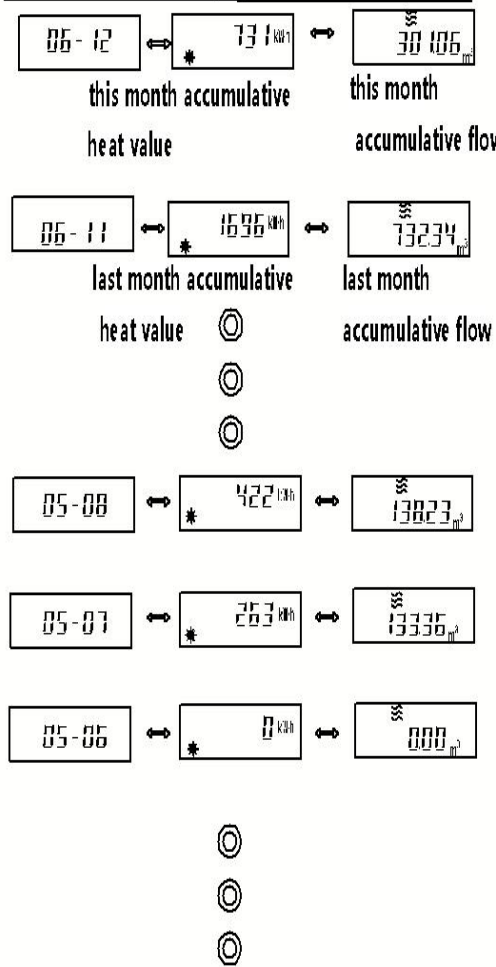
main display menu A1



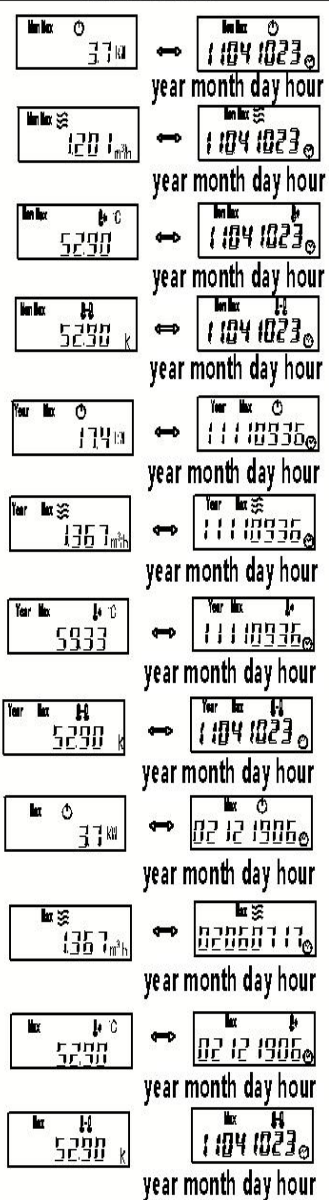
main display menu A2



main display menu A3



display menu A5



Error Codes	Fault information	Prompt service
err0__	incorrection flow direction or wrong installation	Checking the flow or mounting direction;correction if necessary
err_1__	negative temperature difference	Check the installation position of the sensor; replace it if necessary
err_2__	Open circuit in flow temperature sensor	Repair or replacement by professionals
err_3__	Short circuit in flow temperature sensor	Repair or replacement by professionals
err__4_	Open circuit in return temperature sensor	Repair or replacement by professionals
err__5_	Short circuit in return temperature sensor	Repair or replacement by professionals
err__6	Air tube	Pipes do not have water or water discontent
	Battery power shortage	Need to replace the battery by professional personnel