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CRL-H(L) Household-Use Ultrasonic Heat (Cold) Meter

Installation & User Guide



Huizhong Instrumentation Co., Ltd.

Dear Users and Friends,

Thanks for your choice of our company's ultrasonic flow measuring meters. Huizhong Instrumentation Co., Ltd. is currently China's R&D and manufacture base of series ultrasonic heat meters, water meters and flowmeters and related systems. It is also a new and hi-tech and software enterprise of Hebei province.

In 2008, the company participated in the «research of the flow sensor and system for industrial process control system» -the 863 program assigned by the Ministry of Science and Technology. The research-derived achievements are constructive to the independent R&D and industrialization of advanced sensors in China.

Incessant technical innovation lays a solid foundation which enables the company's products to maintain all along technologically a leading position and win the acclaim of numerous users both at home and abroad for their leading technology and superior quality. Among them, the series ultrasonic flowmeters and water meters have been sold in batch quantities to Europe, African, North American and South Asian countries and regions, the products are well accepted by users.

Huizhong Instrumentation Co., Ltd. innovate the ultrasonic flow measuring technology and energy management and control systems service capabilities to satisfy the needs of users with world-class products and services and make contributions to the development of global water and energy conservation course.

Quality Assurance

The following are product's Standards and Certificates:

- China Metrology Certification Hebei Province No.: 00000240
- Designed and manufactured in conformity to the standard CJ 128-2007 «Heat Meter» -a Chinese trade standard set for Urban construction sector.
- The ex-factory calibration is made in conformity to the P.R.C calibration regulations as specified in «Heat Meter» JJG 225-2001.
- GB/T 19001-2008/ ISO 9001:2008 Standard
- GB/T 24001-2004/ ISO 14001:2004 Standard
- CE Certificate

Important Tips:

- Please do read this Installation & User Guide carefully prior to the use of meter.

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- Please keep this instruction manual for reference whenever necessary.
- Please operate the meter strictly in accordance with the instructions. Huizhong bears no responsibility for any consequence resulted from user's failure to follow the directives.
- All the diagrams shown in this instruction manual are illustrated instructions for operation, and do not serve as a basis for meter inspection. If there is any data that is inconsistent with the meter for use, pls. take the meter actually used as the criterion, or consult with our company.
- The meter has been calibrated strictly before delivery. Huizhong company bears no responsibility for any damage resulted from arbitrary disassembly of meter by user.
- When the symbol "ERR" or "⏏" comes to display, please refer to the List of Common Troubles for remedy. Otherwise, meter-measured data may get lost.
- If the meter does not work properly or it needs repair and maintenance, contact us or our authorized agency.



Warning: Please proceed with your meter's installation and operation strictly in accordance with the instructions to avoid the loss of your interests.

Version No. Ver 1.00

Safety Warning:

Please proceed with following precautions and use the meter correctly for avoiding economic loss, personal injury and death!



- 1** The meter is a precision device and must be operated by specialized personnel.
-
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- 2** Battery-related points for special attention:

- The battery is non-rechargeable. Never short circuit or refit it without permission.
- Never allow battery to get overheated or soldered up.
- Keep battery away from flame or water.
- Protect battery against strong physical impact.
- The battery has undergone special treatment. Never use any battery of the same size for replacement.
- When battery power is low, replace it in time. Otherwise, meter-measured data may get lost. The battery must be replaced by trained personnel or by Huizhong, if the meter is sent back to our company by user.
- The replaced battery should have its electronic contacts insulated using adhesive tape for avoiding fire or explosion hazard caused by their contact with other metallic objects or battery.
- The used battery should be treated for environmental protection or sent to Huizhong for unified recovery and treatment.
- If the battery is found to have leakage, color change, deformation, or flare up or send forth a peculiar smell, remove it immediately and avoid skin burn while doing so.
- Never allow the battery's leakage to contact your eyes, skin or clothes. This may cause, in severe cases, loss of sight and skin injury.
- In case of contact of your eyes, skin or clothes with battery leakage, lose no time to wash them with plenty of fresh water(Do

not try to rub your affected part) and immediately seek medical advice.



- 3** Don't alter the length of any cable. Otherwise, meter performance is affected.
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- 4** Keep any cable or wire away from heat. If not, the insulation layer of cable may be damaged due to deformation of cable under heat, which can lead to fire hazard or electric shock accident.
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- 5** Handle the meter carefully for avoiding skin injury caused by contact with any bare threads.
-
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- 6** The wireless remote data reading system operates in GPRS or GSM communication mode. Please observe the local relevant laws or regulations.
-
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- 7** Try as much as possible not to use the meter under acid environment or at places with heavy salt fog as the use of the meter under such an environment may accelerate.
-
-



- 8** The meter is a precise device and must be protected against dropping or impact.
-
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- 9** Protect meter's display panel against long-term exposure to direct sunshine.
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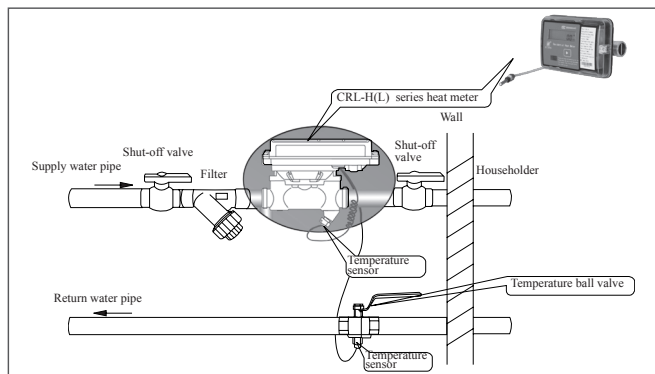
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1. Introduction

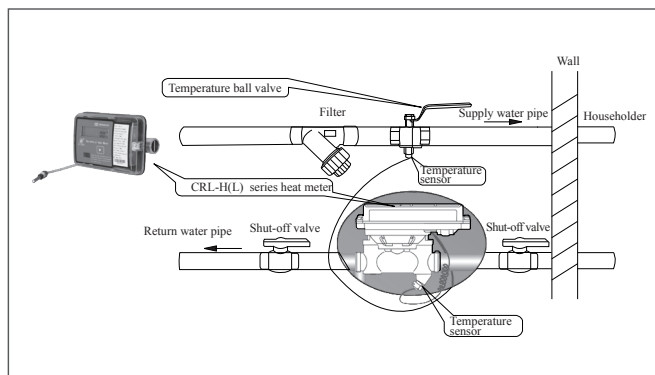
- The meter is provided with ultrasonic flow transducers and paired temperature sensors which can measure the supply water flowrate and the difference of temperatures between supply water and return water, and then measure and display the heat quantity either released or absorbed by the water flowing through a heat exchange system. Capable of executing measurement-calculating-display integrated function. The meter is working with micro-power consumption technology, and the lifetime of battery is over 10 years. A flowrate as low as $0.015\text{m}^3/\text{h}$ can be precisely measured, as well as the meter enjoys the merits of being compacted in size and high in stability and anti-interference capability. Thanks to the application of ultrasonic measuring technology, it is possible to mount the meter at any angles without being affected in measuring accuracy. Moreover, the pressure loss of pipe flow can be reduced to a minimum.
- The meter is widely used in houses, buildings, district heating station, central air-conditioning and related systems and so on.
- The meter is in compliance with the standard CJ 128-2007 «Heat Meter» -a Chinese trade standard set for Urban construction sector.
- Ex-factory calibration of the meter is made in accordance with P.R.C calibration regulations as specified in «Heat Meter» JJG 225-2001.

2. Installation Instruction

Water supply pipe installation



Return water pipe installation



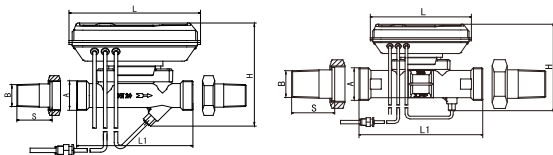
Installation Diagram of CRL-H(L) Series Heat Meter

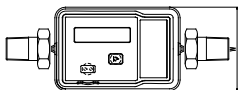
3. Technical Parameters

Item	Parameter					
	DN15	DN20		DN25	DN32	DN40
Nominal Diameter(mm)	DN15	DN20		DN25	DN32	DN40
Dynamic Range	100	100		100	100	100
Permanent Flow Rate, Q3 (m³/h)	1.5	1.5	2.5	3.5	6	10
Min. Flow Rate, Q1 (m³/h)	0.015	0.015	0.025	0.035	0.06	0.1
Max. Flow Rate (m³/h)	3.0	3.0	5.0	7.0	12	20
Temperature Range (°C)	4~95					
Temperature Difference (K)	3~70(Min.value of ex-factory is 0.2)					
Min. Temperature Pair Error (°C)	± 0.1					
Max. Admissible Working Pressure (MPa)	1.6					
Accuracy	Class 2					
Type of Temperature Sensor	Pt1000, DIN/IEC751B					
Protection Class	IP66/IP68, default: IP66 (Pls. specify IP68 on ordering)					
Power Supply	Battery-powered with a service life more than 10 years					
Ambient Class	Class A/B					
Display and Content	LC 8-digit+prompting characters					
	Cumulative heat quantity: (kW·h or MJ) (Display Range:0~9999999.9), Thermal power (kW), Instantaneous flowrate (m³ /h), Cumulative flowrate(m³), Supply water temperature(°C), Return water temperature (°C), Temperature Difference (K), Total operating time(h) Date: Y/M/D, Clock: h/m/s					

Display resolution		Heat quantity: 0.1kW-h or 1MJ, Cumulative flowrate: 0.001 m ³ ; Temperature: 0.01 ℃ ; Temperature difference: 0.01K
Communication Mode	Photoelectric	2400bps, CJ/T188 Protocol
	M-BUS/ RS-485	Baudrate: 2400bps, 4800bps, 9600bps(Selectable), Default: 2400bps, Transmission distance:≤1200m; Protocols: CJ/T 188, Huizhong, Modbus (Selectable), Default: CJ/T 188
Data Storage(EEPROM)		Heat quantity, Cumulative flowrate and corresponding time and the Max. thermal power of the current month stored by month. Latest 24 month's data can be stored.
Storage Temperature		-25 ℃ ~+55 ℃
Pressure Loss at Permanent flow rate (MPa)		≤0.025
Cable Length of Temperature Sensor (m)		1.3 (The supply water temperature sensor shall be installed on the flow transducer before delivery)
Mounting position of meter		On supply water pipe (Pls.specify on return pipe when ordering)

4. Overall Dimensions (Unit: mm)





DN15 ~ DN25



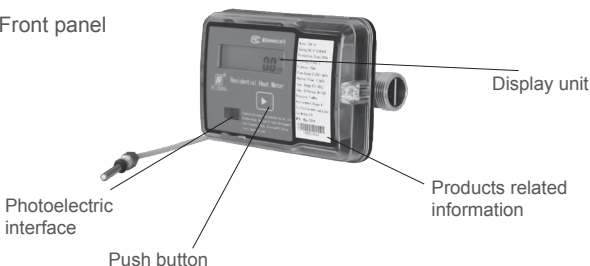
DN32 ~ DN40

Nominal Diameter	DN15	DN20	DN25	DN32	DN40
A: Meter mounted without connecting fittings	G $\frac{3}{4}$ B	G1B	G1 $\frac{1}{4}$ B	G1 $\frac{1}{2}$ B	G2B
B: Meter mounted with connecting fittings	R $\frac{1}{2}$ B	R $\frac{3}{4}$ B	R1B	R1 $\frac{1}{4}$ B	R1 $\frac{1}{2}$ B
L1 (mm)	147	147	147	147	147
H (mm)	110	130	160	180	200
K (mm)	114	116	119	127	135
W (mm)	94	94	94	94	94
Length of connecting fittings	45	51	59	60	62

Fig. 4-1 Overall Dimensions of CRL-H


5. Operating Instructions

■ Front panel



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This is the master screen display of CRL-H heat meter.

Cumulative heat quantity, kW.h
Initiating  for cyclic display of the following information

Cumulative heat quantity, MJ

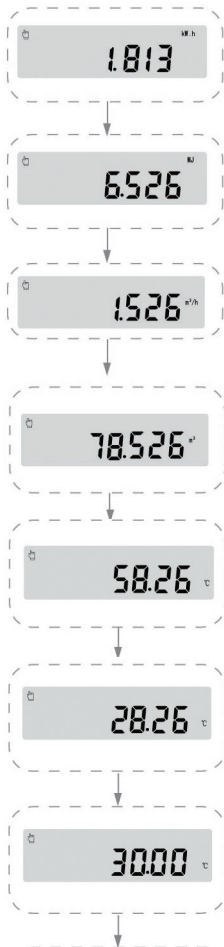
Instantaneous flowrate, m³/h

Cumulative flowrate, m³

Supply water temperature, °C

Return water temperature, °C

Temperature difference, °C



Thermal power, kW



Cumulative effective running time, h



Year/Month/Date



Hour/Minute/Second



Software Version



Alternation between all on and all off



Note:

- With the symbol “ERR” displays on the screen, each screen display stays for 3 minutes, and then the meter returns to master screen display if no pressing of the button is made.
 - With no symbol “ERR” displays on the screen, each screen display stays for 3 minutes, and then self-closing automatically, if no pressing of the button is made.
-

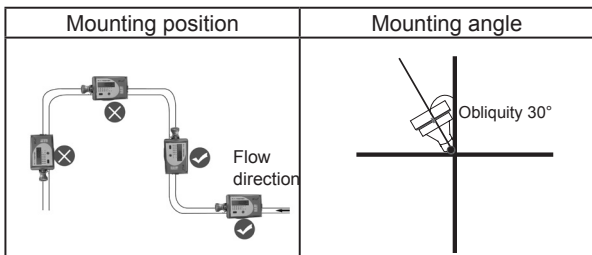
6. Installation and Connection

Requirements on mounting and connection

- The meter is not for outdoor use. Never expose it to the sun and rain.
- The meter must be fitted at such a place as specified by professional design.
It is not allowed to arbitrarily change its mounting position.
- For ensuring the precision of the meter, it is not allowed to change the length of the temperature sensor cable.
- The replacement of battery should be made by professional personnel.

Mounting position of meter:

- (1) The measuring point should be preferably selected on an upright pipewith either upward or inclined upward flow, or possibly on a horizontal pipe. Avoid, as much as possibly, the use of a transducer on a pipe with downward or inclined downward flow, as the pipe may not be fully filled with fluid in this case.
- (2) Never mount a transducer at the highest point of a pipe, because abnormalities in measurement may occur in this case due to accumulation of air bubbles at this point of the pipe.
- (3) Instrument panel should remain horizontal when transducer is mounted on a horizontal pipe. If instrument panel needs to tilt in exceptional cases, the obliquity should be less than 30°.

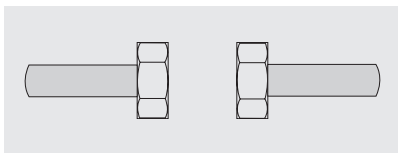


▲ Mounting Procedure

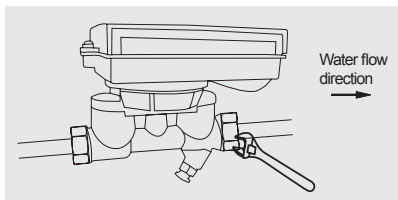
Method A: Mounting without use of connecting piece

I Mounting of meter

- (1) Cut the supply water pipe apart at the meter mounting place to provide the required mounting space



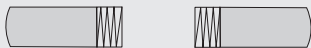
- (2) Align concentrically the meter and pipe and then screw the pipe union onto the meter's thread connection with a spanner to complete the meter mounting



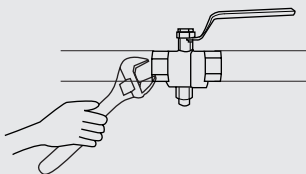
1. The connection should be tightly sealed for avoiding leakage!
2. The arrow "→" marked on the bottom of the meter should point to the same direction as that of the water flow!

II Mounting of return water temperature sensor

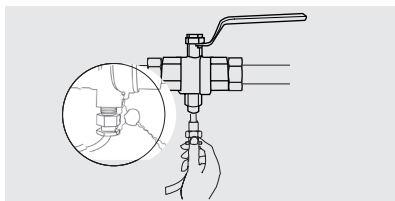
- (1) Cut the return water pipe apart to leave a space just sufficient to mount the valve



- (2) Align the valve with the pipe and then secure the former onto the return water pipe with a spanner



- (3) Mount the return-water temperature sensor onto the base of the valve at the corresponding place

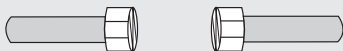


If there is water in the pipe, please turn down the valve firstly

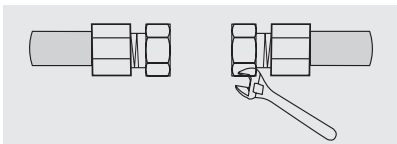
Method B: Mounting with use of connecting piece

I Mounting of meter

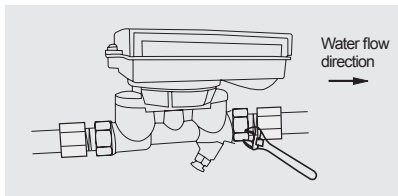
- (1) Cut the supply water pipe apart to provide the space for mounting the meter and connecting fittings



- (2) Secure the connecting fittings onto pipe ends



- (3) Align the meter with connecting fittings and then connect them together



1. The connection should be tightly sealed for avoiding leakage!
2. The arrow "→" marked on the bottom of the meter should point to the same direction as that of the water flow!

II Mounting of return water temperature sensor (Refer to Method A)

7. Battery Replacement

The meter is powered by a 3.6V lithium battery which has a service life of over 10 years at an ambient temperature of 0℃ ~35℃. When the symbol "🔋" is displayed, it indicates that the battery is low and needs to be replaced (by a professional person only). After battery replacement, the stored "Cumulative heat quantity", "Cumulative flowrate" and "Cumulative running time" will suffer no loss.

8. Verification


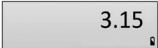
The meter applies to component test, total test and total combination test, when doing verification, please use the associated special tool – handheld infrared data reader. For the setting of verification mode and related parameters, refer to *Hand-held Infrared Data Reader Instruction Manual*.

9. Fault Remedy and After-sales Service

9.1 Correction of common troubles

In case of fault, first refer to the trouble remedy guide. If no ready solution can be found there, please contact Huizhong for remedy.

Table 9-1 List of Common troubles

Trouble	Cause	Remedial Measure
“ERR” keeps on display	<ol style="list-style-type: none"> 1. No water in pipe 2. Thick scale deposit on transducer surface 3. Faulty meter 	<ol style="list-style-type: none"> 1. Keep pipe full of flow 2. Remove 3. Contact Huizhong
“ERR” frequently on display	Excessive air bubbles or impurities in water or medium	Remove
Display of 	Low battery	Replace soon
Display of 	Battery too low in power with a voltage as low as 3.15 as indicated. Now, measurements are interrupted but view of stored data is possible	Battery must be replaced
Display of “88888888”	Faulty EEPROM	Contact Huizhong immediately for repair

9.2 After-sales service

Huizhong operates by adhering to the principle of “being user’s most trustworthy friend and providing users our quality products and timely first-rate after-sales service”. Our specific commitments are as follows:

- 1 After receiving user’s call, we promise to make a response within 2 hours.

- 2 We promise to repair any meter within one year after its date of delivery free of charge without asking for the costs of labor and components.
- 3 “Free repair” is only limited to the repair of the damaged main measuring unit and key functional components like transducers. Repair of damaged cables is outside the promised scope.
- 4 Repair of any meter beyond its guaranty period will be made on site, if required, with the travel expenses and cost of components covered by user.
- 5 The free repair provisions shall not cover any of the following damages:
 - Damage of meter due to purely artificial reasons, such as mechanical impact.
 - After-sales service rendered for the repair of any meter damage caused not by the failure of the meter itself, but for the shut-down or abnormal operation of system or user’s failure to operate the meter according to the instructions.
 - Damage of meter caused by force of majeure, such as thunder strike.
 - For the repair work done on site for the above mentioned reasons, the travel expenses and costs of components shall be covered by user.
- 6 If the user sends the meter’s core part or the entire meter back to Huizhong for repair, both parties shall respectively bear the transportation expenses and the costs of components for replacing damaged ones shall be borne by user.