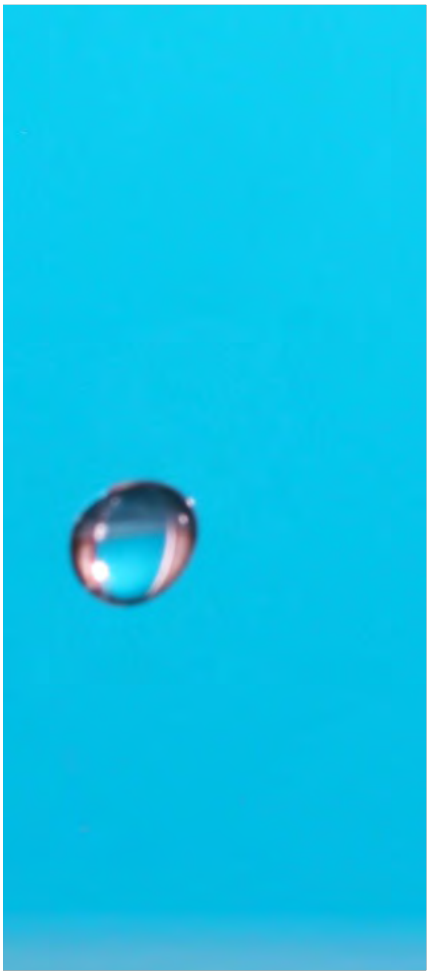
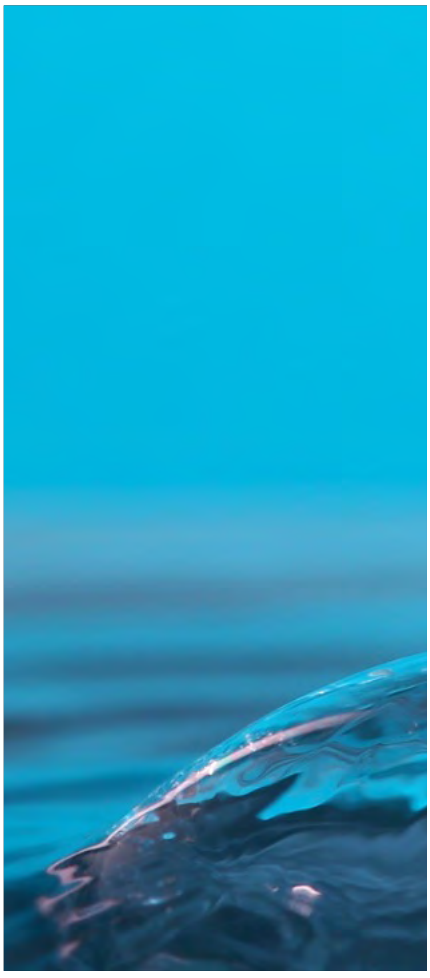
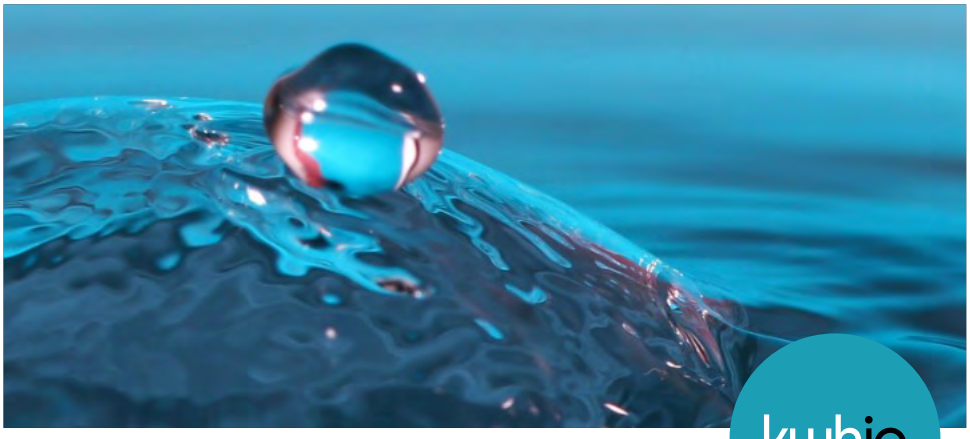
kwhiq
Energy Information Technology



WATER METERING SOLUTIONS





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Meet the new IQ408 Serial IOT Ultrasonic Water Meter

We provide Energy Information Technology with comprehensive monitoring, security and control functionality. Our modular approach let you choose your preferred communication technology.

IQ408 Serial IOT Ultrasonic Water Meter

IQ408 serial water meter is with ultrasonic measurement technology for pinpoint accuracy, it has no moving parts, meaning there is no worn parts. Excellent long-term stability with consistent performance, accuracy does not degrade over time.
Adopting dual network wireless radio frequency technology, such as LoraWan and wMbus, which is helpful for realization of wireless data transmission for both 'Drive-by' and 'WAN network' solution.

IQ408 meter can be used to realize remote measurement and storage, such as remote valve control and remote monitor the status of the meter, automatically detect the battery status, operation status and other information, leakage detection, overflow alarm and so on.

It can support prepayment and post pay mode. It has the advantages of simple operation and convenient maintenance.

1 applications

- Revenue metering
- Residential submetering
- Commercial buildings
- Leakage detection
- AMR / AMI and billing
- Drive-by metering

2 mainfeatures

2.1 Key Features

- Residential potable water consumption metering.
- Temperature compensation for cold water meter is up to 50°C
- More than 10 years' battery life
- Bi-directional flow measurement
- Low starting flow
- Suitable for horizontal/ vertical installation
- Durable, proven BRASS sensor body. Solves the challenges in harsh environments
- Advanced sensor design. provides precise signal, robust performance, and is not impacted by water impurity
- Excellent long-term stability with consistent performance. Accuracy does not degrade over time
- Maintenance-free
- Low pressure drop
- Tamper-proof design.
- Remote Valve control
- LoRaWAN communication to DCU for AMI application
- Wmbus communication for local communication while LoraWan network fail.
- As soon as the consumption credit has expired, the electromagnetic valve will close automatically without remote intervention(optional).
- Support to switch mode between prepaid and postpaid payment.

2.2 Reliability

- Mechanical sealing
- IP 68 water-proof
- ISO 4064
- Environment Class O
- Leakage detection
- No moving parts. Wear-free ultrasonic technology
- Detect air in pipe
- Temperature detection in the pipe

2.3 Smartness & Safety

- 90 days hourly frozen data record
- Data Logger with 360 daily totals and 12 monthly totals
- Remote valve control system
- Not affected by the external magnetic field
- Alarms for abnormal events
- Compatible with AMR/AMI and Billing solutions
- Large LCD, 9 digits display
- Low voltage battery alarm.
- STS compliance.
- Valve stuck alarm (optional)
- Top-up by mobile phone or computer
- Can measure forward flow and reversal flow

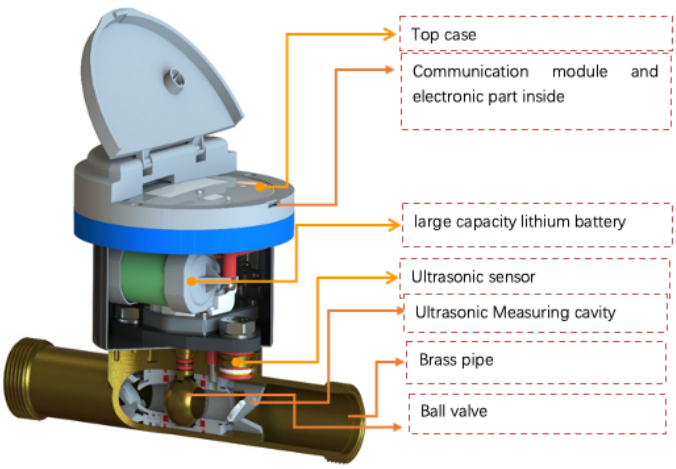
2.4 Main feature

- The technical specifications of the IQ408 meet the standards for residential utility metering with Class C performance, operational temperature from 0.1°C to 50°C and safety temperature up to 85°C, as well as nominal pressure of 1.6MPa.
- IQ408 offers the most advanced water flow measurement by using state-of-the-art ultrasonic technology. The flow sensor does not have any moving parts, which provides a robust and accurate meter with no maintenance required.
- IQ408 Residential Ultrasonic Water Meter is specially designed for domestic water metering applications where conventional water meters fail due to harsh environment, solids in water, performance degradation, magnetic vandalization or are incapable of leakage detection.
- The wide dynamic range allows flow rates up to double the rating, thereby ensuring high operation security. The large LCD can display the total flow, leakage alarm, reverse flow, and more. The meter also has a remote readout which could be configured as Encoder or RF wireless.
- IQ408 Residential Ultrasonic Water Meter stands out among its competitors due to its robust performance, advanced sensor design, tamper-proof features, multiple AMR / AMI options and capability to detect very low flowrates. It works reliably even when the water has particles and the environment is harsh, such as the case in Middle East and Africa. Residential installations can profit from the advantage of the wear-free water flow measurement, including precision, operation security and long service life.

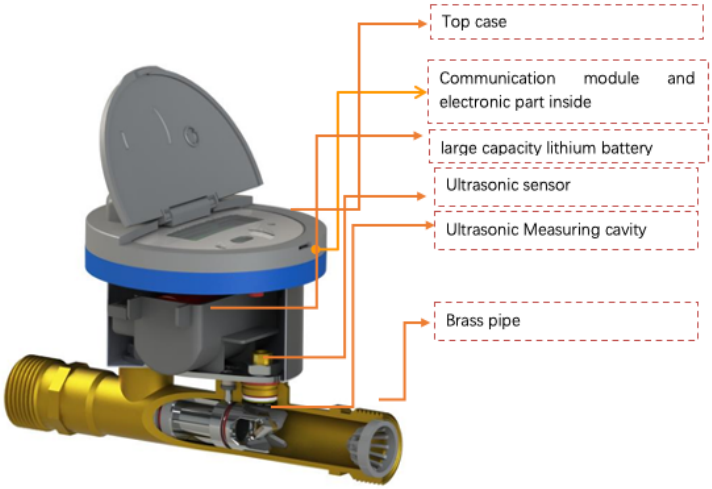
- ISO 4064 2014
- ETSI 300220-1
- EN 301489-1
- EN 60950-1
- ISO / IEC 9798

3 meterstructure

3.1 Meter with valve



3.2 Meter without valve



4 operatingprinciple

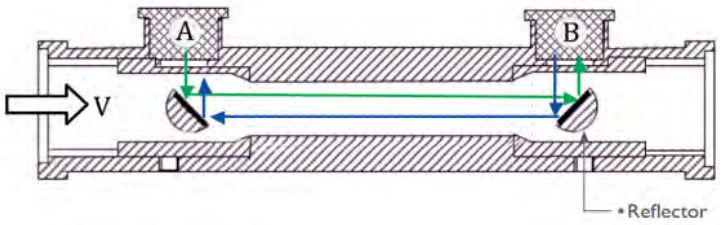
The IQ408 water meter consists of a flow sensor and an integrator. The flow sensor is a flow-cell made from brass (figure below.) Two ultrasonic transducers, A and B are firmly mounted on the flow-cell at optimal positions, with two reflectors inside of the flow tube. The ultrasonic signal generated by one transducer is directed toward the flow direction by the reflector below it. When the ultrasonic signal reaches the other reflector. it is redirected to the transducer above it. Therefore, each transducer can receive the signal sent from the other transducer.

An integrator (or calculator) controls the two ultrasonic transducers to transmit and receive signal in an orderly fashion to conduct precise flow measurement. Specifically, the integrator operates the two transducers to simultaneously transmit a pulse of ultrasonic energy into the water flow. The pulse signal travels along the flow and reaches the other transducer under the guidance of the two reflectors. Due to the flow direction, the downstream pulse (from A to B) travels faster than the upstream pulse (from B to A). The travel time (or transit-time) difference of the two pulses is directly proportional to flow or volume velocity. Therefore, the flow rate can be derived from the transit-time difference accordingly.

The IQ408 water meter has used advanced digital signal processing technology to precisely measure the transit-time of each ultrasonic pulse. A statistic algorithm is also used to counter interference which could come from solids or air bubbles in the water. The flow-cell is optimally designed according to latest technology, so that the multimode reflection in the flow tube is significantly attenuated. It allows a significant increase in signal strength and quality, thus, the robustness of the system. The flow rate calculation is based not only on transit-time difference and the geometry of the flow-cell, but also on fluid dynamics theory.

Only ultrasonic pulses are used to measure the flow which enables the meter to have no moving parts. Therefore, there is nothing to wear out or cause a reduction in accuracy.

In addition, the principle is based on the transit-time difference instead of transit-time, all the interfering factors, such as the temperature, pressure, solids concentration and water quality, are cancelled out. The end result is that the system is inherently robust!



5 technicalspecificatons

5.1 Basic parameters

Nominal Diameter	**DN**	**15**
Connection on meter		G¾B
Approved dynamic Ratio	Q3/Q1	R400
Minimum Flow Rate	Q1 (m³/h)	0.00625
Demarcation Flow Rate	Q2 (m³/h)	0.010
Permanent Flow Rate	Q3 (m³/h)	2.5
Overload Flow Rate	Q4 (m³/h)	4
Maximum Admissible Pressure	MAP(MPa)	1.6
Maximum Permanent Temperature	MAT	50°C
Minimum Permanent Temperature	\	0.1°C
Maximum Pressure Loss	Δp	<0.63
Metrological Class	\	Class 2
Environmental Class	\	Class B/O
Relative Humidity	\	10% ~ 100%
Enclosure Protection	\	IP68
Division	m³	0.001
Valve Life(optional)		>5000 open/close
Valve Structure(optional)		Inside valve
Electromagnetic Compatibility Level		E1/E2

Approvals

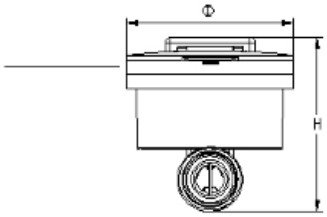
ISO 4064	MID B

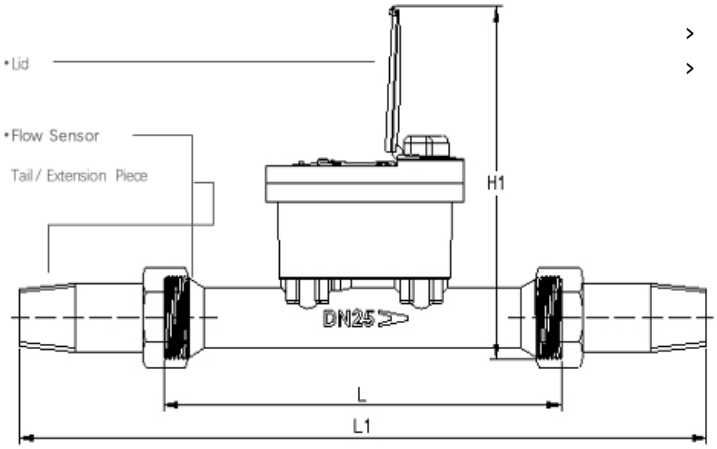
Electrical Data

Power supply	Battery, 3.6V, Lithium for 10 years
Replacement Interval	>10 years at tBAT(battery temp)<30°C (86°F) based on one remote reading per day.
Power Consumption	<0.1W
Backup Power Supply	Internal SuperCap
Communication Interface	LoRaWAN, EU868MHz, DLMS over LoRaWAN WMbus, 868MHz Mode 5,7,8,9, comply to EN 13757 Two communication methods can be switched automatically
CE approval	EN61326-1
Electromagnetic Class	E1/E2

5.2 Mechanical Parameters

Size	Dimensions					Maximum Pressure Loss (bar)	Pipe Joint (BSP)	
mm	L	L1	H	H1	Φ		Sensor	Ext. Piece
	mm	mm	mm	mm	mm			
15	110	200	126	174	108	0.63	G3/4B	R1/2



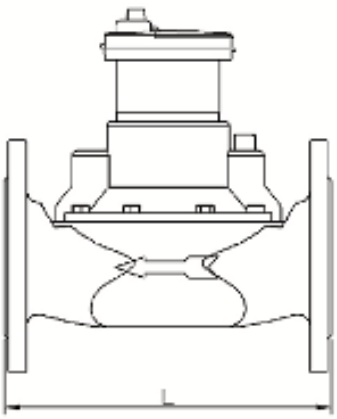


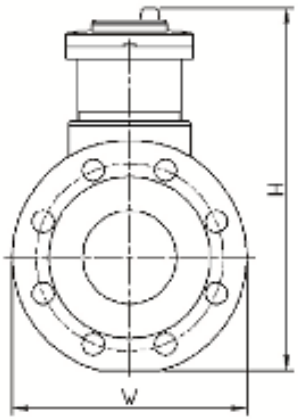
Notes

- L is flow sensor length. L1 is the total length of flow sensor plus extension pieces.
- Weight does not include extension piece. Weight may vary, please contact us for exact weight.
- 1m3/h is about 4.4GPM.
- Dimension H, Φ1 and Φ2 are for reference only. Please contact us for exact measure.

5.3 External valve

5.3.1 The structure of the external valve





Name	Size	Dimensions			Pressure Loss (bar)	Weight (kg)	Pipe Joint (BSP)	
	mm	L	H	W			Thread size	Thread type
		mm	mm	mm				
Valve-32	32	260	121	186	0.633	6.0	G1 1/4B	Internal thread
Valve-40	40	245	132	197	0.063	7.0	G1 1/2B	Internal thread

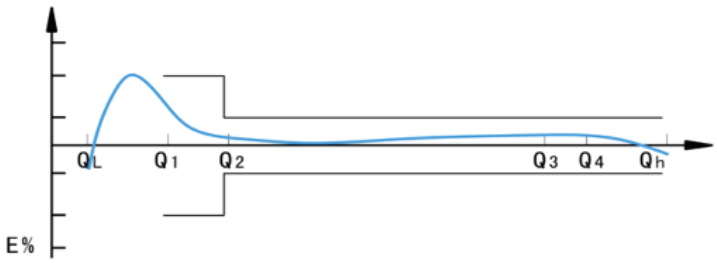
5.3.2 Technical Parameters

Nominal pressure	MAP	bar	MAP16(MAP10, MAP25)
Permanent temperature	MAT	°C	T50(T30)
Minimum permanent temperature	\	°C	0.1
Head Loss Class	Δp	bar	0.63
Environmental Class:	\	\	Class O
Relative Humidity	\	\	10% ~ 95%
Enclosure Protection	\	\	IP68

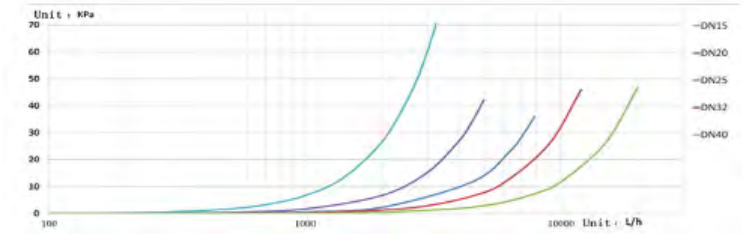
5.4 Connection of meter and external valve

If the valve and meter are independently placed it is easy to replace one of the parts. The water meter can control the valve through either RS-485 or LoraWAN.

5.5 Error Curve



5.6 Pressure loss



6 types&options

IQ408 - X - X - X - X - X - X
① ② ③ ④ ⑤ ⑥ ⑦

1. **Basic Module Number**
   MA40x Serial smart water meter
2. **Caliber (DN)**
   DN15-DN40
3. **Base Meter Material**
   B: Brass
   D: Ductile Cast Iron
   C: Composite
4. **AMI Technology**
   R: Lora
   S: SigFox
   Lw: LoRa WAN
   N: NB-IOT
   G: GPRS
   WM: Wireless Mbus
5. **Additional features**
   N: Normal
6. **Accessory**
   V: Valve (default)
   N: Without valve
7. **Pipe Joint**
   B: BSP (default)
   N: NPT

Contactinformation

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