



WATER METERING SOLUTIONS

kwhiq

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Meet the new IQ02w1LW/S Serial IOT Ultrasonic Water Meter for residential use

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



IQ02w1LW/S IOT Ultrasonic Water Meter

The IQ02w1LW/S serial water meter uses ultrasonic measurement technology for pinpoint accuracy, it has no moving parts, meaning there is no worn parts. The meter is characterized by excellent long-term stability with consistent performance, accuracy does not degrade over time.

The system is a cutting edge fixed automatic meter reading system which integrates seamlessly with the latest IOT AMR/AMI technologies such as Sigfox, LoraWAN, NB-IoT, etc., which is helpful for realization of wireless data transmission for both 'Drive-by' and 'WAN network' solutions.

IQ02w1LW/S 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.

Main features

Security

- › AES128-GCM
- › Physical security
- › Opening cover detection

Reliability

- › Mechanical sealing
- › IP 68 water-proof enclosure protection
- › ISO 4064
- › Environment Class B/O
- › Leakage detection
- › No moving parts. Wear-free ultrasonic technology
- › Detect air in pipe

Accuracy

- › Wide rangeability up to R400
- › Low start flow 1L/h

Smart communications

- › Dual mode with LAN/WAN
- › IOT technology with LoraWAN / Sigfox
- › Prepaid or post pay
- › Events and alarms
- › Data reading by immediately, hourly, daily
- › Valve management remotely (Optional)
- › Pay As you Go by WAN or NFC locally (Optional)

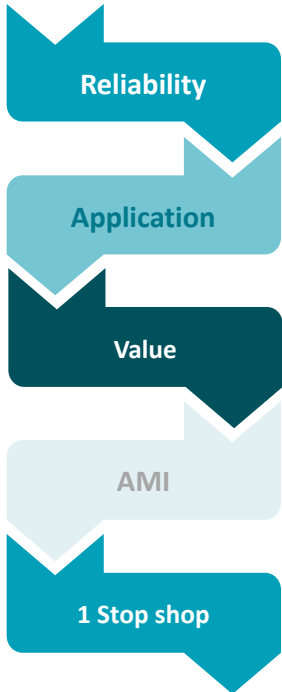
Key Features

- › 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.

User interface

- › Display indication LCD, 9-digit
- › Units DN 15 - DN 25 Flow and volume (m3 + 3 digits)

Our solution offering



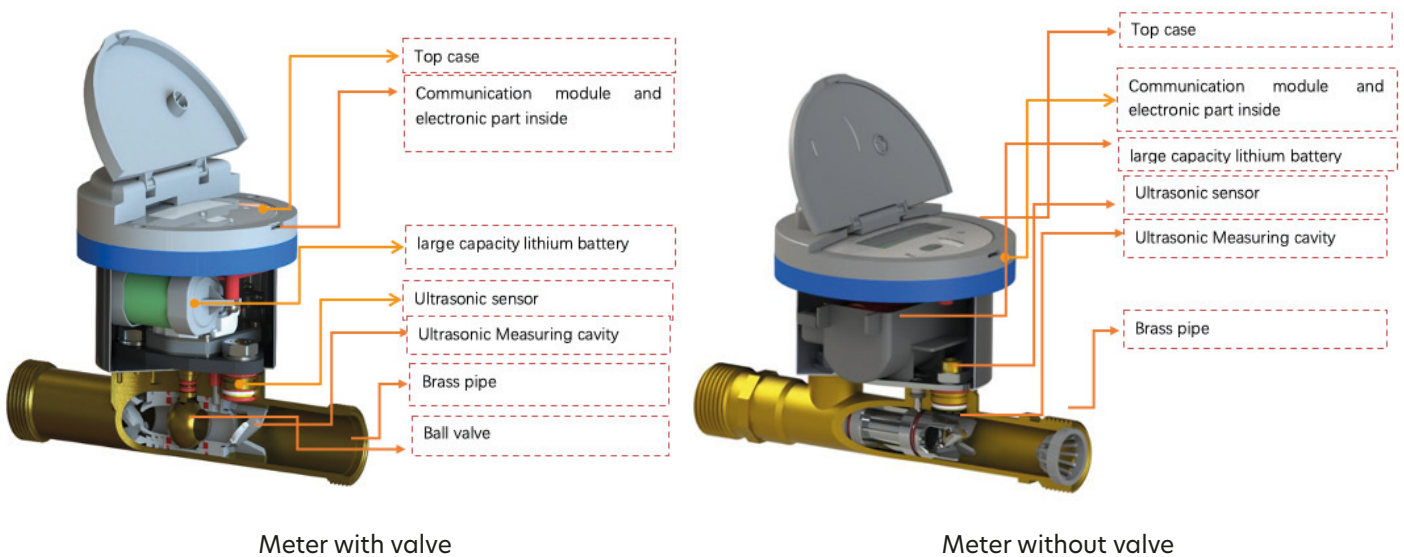
With the use of Brass material our KWHIQ IQ02w1IW/S water meter series are designed to endure a lifetime of at least 10 years. It can withstand high temperatures up to T50 and is not sensitive to scale and sand.

Our customers world-wide use not only our meters and services but also our software solutions for the application of monitoring & measuring residential water supply, monitor leakage and improve NRW level.

With our extensive experience in water metering in the Gulf region our value proposition is to provide for a '1 stop shop' for maintenance free equipment, software integration and project management to protect your revenues.

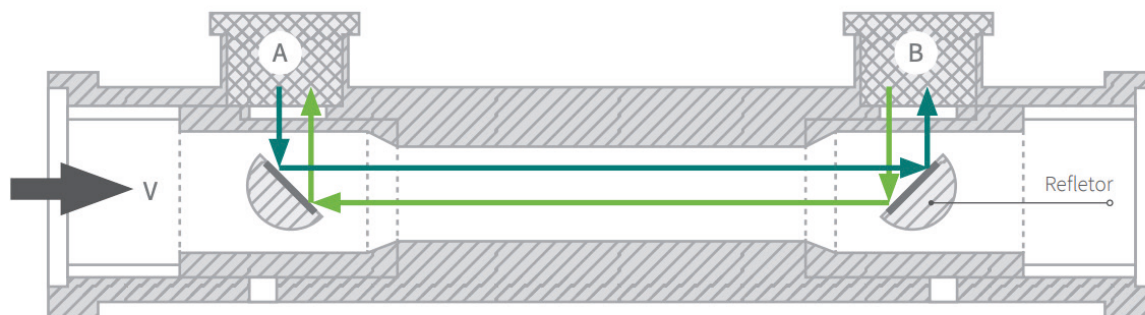
KWHIQ's water metering solution offers AMR/AMI systems (both Cloud based as On premise) as well as an integrated billing system or integration API's with a billings system of your choice. The system is a cutting edge fixed automatic meter reading system which integrates seamlessly with the latest IOT AMR/AMI technologies such as Sigfox, LoraWAN, LTE-M, NB-IoT, etc. It is a unified platform for meter reading and data management and in addition, it works seamlessly with KWHIQ's billing software to make data exchange easy, fast and reliable. KWHIQ Middle East is your '1-stop-shop' for water metering

Meter structure



Operating principle

The IQ02w1LW/S 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 IQ02w1LW/S 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!

Technical specifications

Flow parameters

Nominal Diameter	DN	mm	15	20	25
Connection Thread			G $\frac{3}{4}$ B	G $\frac{1}{2}$ B	G $\frac{1}{4}$ B
Flow Rate Range	Q3/Q1		R400/250	R400/250	R400/250
Overload Flow Rate	Q4	m ³ /h	3.125	5	7.875
Permanent Flow Rate	Q3	m ³ /h	2.5	4	6.3
Demarcation Flow Rate	Q2	l/h	16	25.6	40.32
Minimum Flow Rate	Q1	l/h	6.25	10	15.75
Starting Flow	\	l/h	1	1.5	2.5
Nominal Pressure	MAP	bar	16		
Permanent Temperature	MAT	°C	T50		
Pressure Loss Class	Δp	bar	<0.63		
Metrological Class	\	\	Class 2		
Environmental Class	\	\	Class B/O		
Relative Humidity	\	\	10% ~ 95%		
Enclosure Protection	\	\	IP68		
Valve Life (optional)			>5000 open/close		
Valve Structure(optional)			Inside valve		
Electromagnetic Compatibility Level			E1/E2		

General Performance

Water temperature range	0.1 °C to 50 °C
Ambient operating temperature	0.1 °C to 70 °C
Ambient storage temperature	-20 °C to 70 °C
Nominal pressure	PN bar 16
Power Supply	19Ah 3.6 VDC lithium-batteries
Communication	Optical, NB-IoT / LoraWAN / Sigfox
Data storage	Events and consumption values
Measurement	Class 2, R250/R400, DN15/20/25
IP protection	IP68

Communication

Optical	Port baud rate 9600 bps
wMBUS	868/915/923, EN13757, Open Metering Standard, optional
Sigfox	RC1/2/4, SigFox IOT network, optional
LoRaWAN	868/915/923Mhz, 16dbm, LoRaWAN network, optional
NBIOT	B3/B5/B8/B20/B28
Antenna	Dual Band (Embedded Structure type)

Events & alarms

Overflow detection	>1.2 Qmax	10 seconds
Leakage detection	>5L/hour	24 hour
Opening cover detection	Detected	1 second
Absence of water detection	Detected	1 minute
Low battery detection	<18%	3 seconds
Valve malfunctioning detection	Detected	1 minute
Water return detection	Detected	1 minute
meter reverse detection	Detected	3 days
Meter stop detection	Detected	10 days

Electrical characteristics

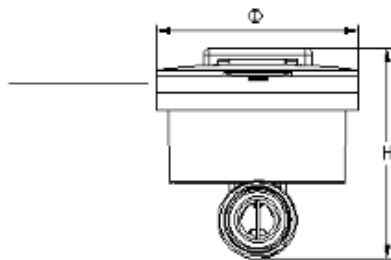
Power Supply	3.6	V
Quiescent current	<50	uA
Battery capacity	19Ah, Lithium, D size	Ah
ESD protection	2	kV
Magnetic influence	Insensitive	/

NFC interface (optional)

Frequency	13.56	MHz
Static current	<1uA	uA
Active current	<10mA	mA
NFC card supported	ISO/IEC 14443 Type A	/
Operation distance	>50mm	mm

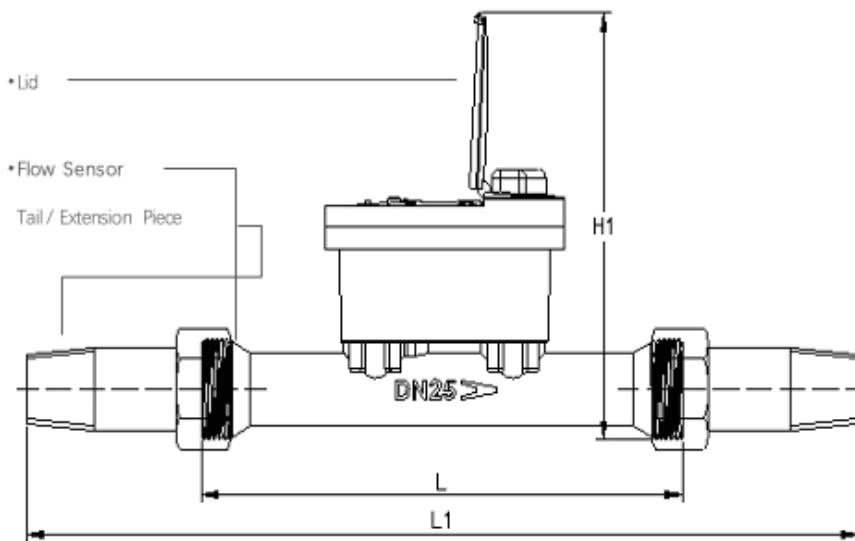
Mechanical Parameters

DN mm	Dimensions					Thread
	L mm	L1 mm	H mm	H1 mm	Φ mm	
15	110/165	206/261	102	167	110	G3/4
20	190/195	296/301	107	172	110	G1
25	225/260	347/382	112	177	110	G1 1/4
32	230/260	356/386	121	186	110	G1 1/2
40	245/300	376/431	132	197	110	G2

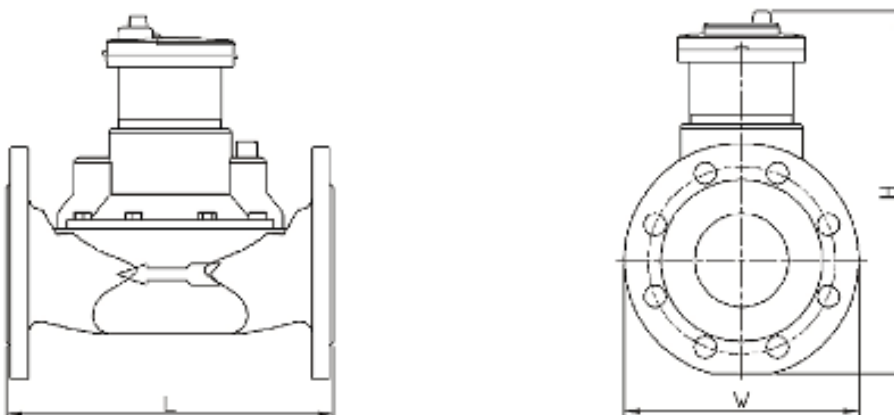


Notes

- › L is flow sensor length. L1 is the total length of flow sensor plus extension pieces.
- › 1m³/h is about 4.4GPM.



The structure of the external valve

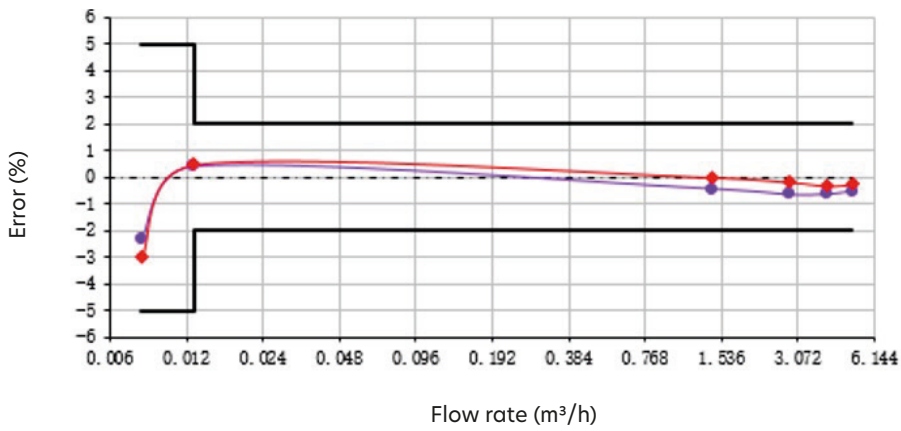


Connection of meter and external valve

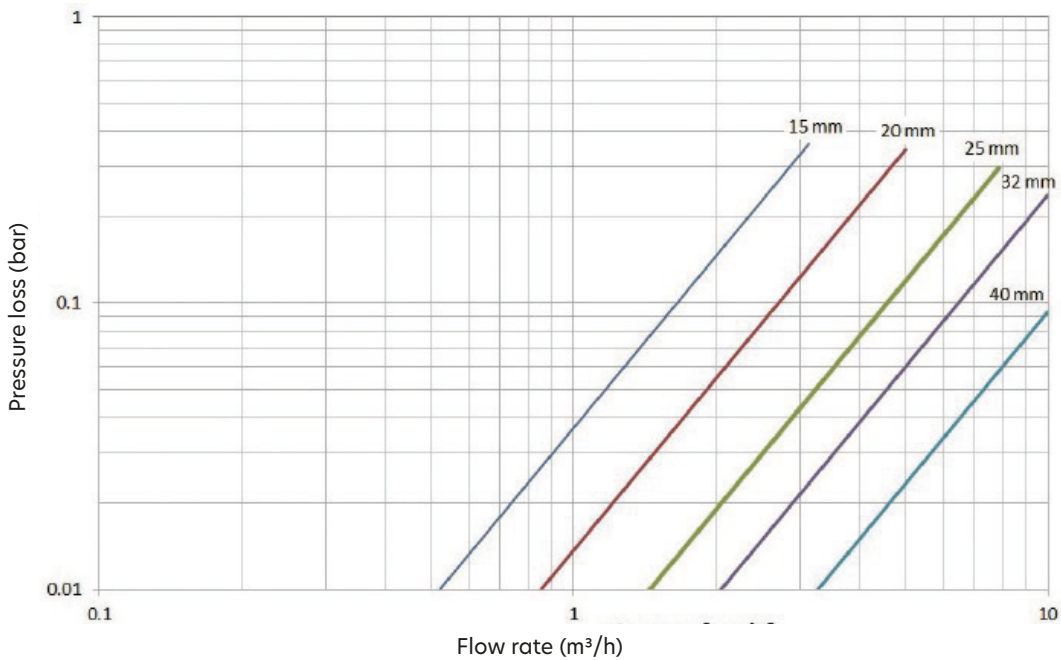
If the valve and meter are independently placed it is easy to replace one of the parts. The water meter can control the valve through either RS-485 or LoraWAN.



Error Curve



Pressure loss



Contact information



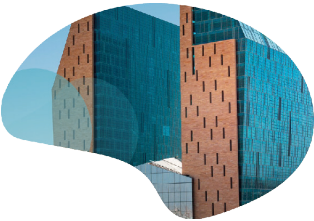
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