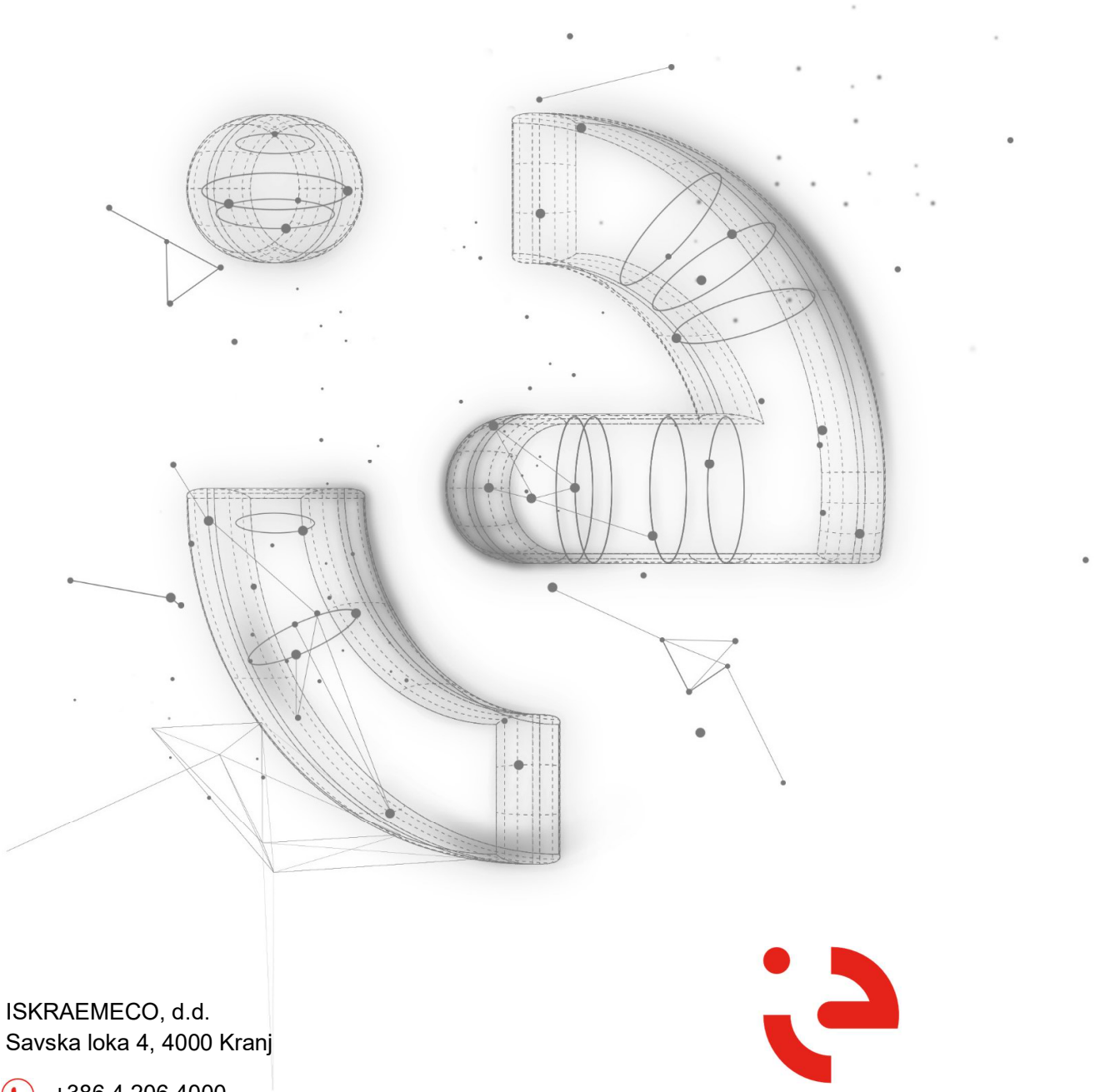
ISKRASONIC™ IS
Residential water meter

User manual



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BY ELSEWEDY ELECTRIC

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i. Device variants covered by this document

ISKRASONIC™ IS

- Ultrasonic Residential Water Meter DN15 to DN40

SMART RESIDNETIAL WATER METER

- with modular communication

ii. About

This document describes ISKRASONIC™ IS residential ultrasonic water meter, its usage, installation, and maintenance. It presents the purpose of the meter, its construction, the way of deriving the metering and communication functionalities. The document is intended for technically qualified personnel at water supply companies, responsible for system planning and system operation.

The manufacturer reserves the right to change technical data without prior notice. You can request the latest information and versions of this manual from your local dealer.

CAUTION: The manufacturer assumes no responsibility if the instructions and procedures described in this manual are not followed!

NOTE: This user manual is intended for qualified personnel and therefore does not contain any basic working steps. The installation guide and this user manual must be read and under-stood in full before the unit is installed or commissioned. Please keep this manual for future reference!

iii. Reference documents

- Iskraemeco's general terms and condition
- ISKRASONIC™ IS EU-type certificate (MID)
- Communication modules data sheet

iv. Versioning

Date	Version	Update
15.3.2023	V1.00	The first version of the document.

v. Definitions, Acronyms and Abbreviations

Abbreviation	Explanation
ANSI	American National Standards Institute
ISO	International Organization for Standardization
BSI	British Standards Institution

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INDEX OF TABLES

1. SAFETY INFORMATION

1.1. Intended use

This guide is intended for trained specialized personnel. For this reason, no basic working steps are included.

1.2. Notes on safety rules and symbols

WARNING: indicates an action or measure, if performed incorrectly, can cause potentially life-threatening injuries and lead to a high safety risk. Always follow the instructions and proceed with caution.

CAUTION: indicates an action or measure, if performed incorrectly, can cause minor injuries and/or incorrect operation or destruction of the device. Always follow the instructions.

NOTE: indicates an action or measure which, if performed incorrectly, may have an indirect effect on the operation of the device.

COMMENT: indicates an action or measure which, if performed incorrectly, may have an indirect effect on the operation of the device.

REFERENCE: refers to other documents. If available.

1.3. Safety rules and precautions

The manufacturer assumes no responsibility if the following safety instructions and precautions are disregarded:

- Installation, operation, maintenance and decommissioning of this device may only be carried out by trained personnel, by qualified specialist personnel who have been instructed by the manufacturer, operator, or owner. The specialist must have read and understood all these operating instructions contained therein.
- The specified classifications for mechanical loads (e.g., pressure, temperature, etc.) must be observed. Protection class (IP) etc.) must not be exceeded.
- Only operate the system under the specified ambient conditions and installation positions.
- The local labour and safety laws and regulations must be observed.

1.4. Handling, transport, and storage

CAUTION

When sending measuring instruments with integrated radio communication by air, deactivate the radio before shipping. The shipping must be carried out according to the specific safety regulations for devices for devices with lithium batteries.

- The product can be stored in a dry place at temperatures between -20 °C and +70 °C (also during transport). The storage duration should not exceed 1 year.
- Water meters are precision devices and must be protected against impact and vibration.
- The meter can be damaged by frost.
- Meter shall not be exposed to direct sunlight.

CAUTION

The meter shall not be stored more than 4 weeks at temperatures higher than 35°C/95°F.

NOTE

Longer storage at high temperatures can lead to a considerable loss of autonomy.

2. STANDARDS AND REFERENCES

STANDARD	TITLE
ISO 4064	Water meters for cold potable water and hot water
OIML R49	Water meters intended for metering of cold potable water and hot water

Table 1: Standards and references

3. SCOPE OF SUPPLIES AND ACCESSORIES

The scope of delivery is described on the delivery note. Please check all components and delivered parts immediately after receipt of the goods. Transport damage must be reported immediately.

QUANTITY	DESCRIPTION OF ITEMS	IMAGE
1X	ISKRASONIC™ IS	
1X per batch	Installation guide	
1X par batch	Declaration of conformity	

Table 2: The scope of delivery

4. PRODUCT DESCRIPTION

The Iskrasonic IS ultrasonic water meter is a new type of instrument which calculates water flow by using the principle of ultrasonic time difference.

The instrument has a good ability to detect small flow and is beneficial to users' rational use and saving water resources.

When the ultrasonic water meter is used, it does not produce mechanical friction, wear, clogging, accurate measurement, good reliability, long service life, basically maintenance-free and has the characteristics of small size, good stability, low power consumption and strong anti-interference ability.

Product characteristics: Built-in 3.6V lithium battery power supply.

COMMENT

The meters are supplied with one internal battery. An external power supply is not supported.

Support horizontal and vertical installation methods to meet the needs of different users.

Support using the touch key function to switch the LCD screen menu to view the information under different menus.

Supports infrared communication modes to read the water meter instantaneous flow data, cumulative flow data and current time.(the other data or parameters are forbidden to read or set once the meter is out of factory).

The meter is available with 3 different communication modes, NB-IoT, WMBus OMS or LoRaWAN.

4.1. Interfaces and dimensions

4.1.1. Interfaces

The meter is equipped with the following communication interface:

IR Communication parameter	Value
Carrier Frequency	38 kHz
Infrared Wavelength	940 nm
Baud rate	2400 BPS
Verification	Dual Verification
Data bits	8 bits
Stop bit	1 bit
Parity	Even

Table 3: Infrared Communication Parameters

LoRaWAN	
Working frequency	868Mhz
Transmitting power	14dBm
Receiving sensitivity	-137dBm
RF data rate	0.24 to 5 kbps
Modulation	LoRa
Covered distance	2500m (Unobstructed)
Report data content	Cumulative flow of traffic, reverse accumulation of flow, status

Table 4: LoRaWAN interface data

Wireless M-Bus	
Working frequency	868Mhz
Transmitting power	14dBm
Receiving sensitivity	-137dBm
RF data rate	0.24 to 5 kbps
Modulation	LoRa
Covered distance	2500m (Unobstructed)
Report data content	Cumulative flow of traffic, reverse accumulation of flow, status

Table 5:Wireless M-Bus interface data

NB-IoT	
NB Band	B3/B5/B8/B20/B28
Transmitting power	>18dBm
Receiving sensitivity	-115dBm
Network protocol characteristics	UDP/TCP/CoAP/LwM2M
Data encryption	AES-128
Data transmission characteristics	20kbps – 25kbps (down), 13kbps – 15kbps (up)
Operating mode	Timely activation
NB the average power consumption during activation	28mA

Table 6: NB-IoT interface data

4.1.2. Dimensions

4.1.2.1. DN15~DN20

Nominal Diameter (DN)	Overall Length L (mm)	Counter Length L1 (mm)	Counter Length L2 (mm)	Counter Width W (mm)	Total Height H (mm)	Total Height H1 (mm)	Overall Height H2 (mm)	Connec-tion Thread M
15	110/165	90	104	90	148	78	97	G3/4
20	130/195	93	104	90	150	80	99	G1

Table 7: DN15~DN20 Dimensions

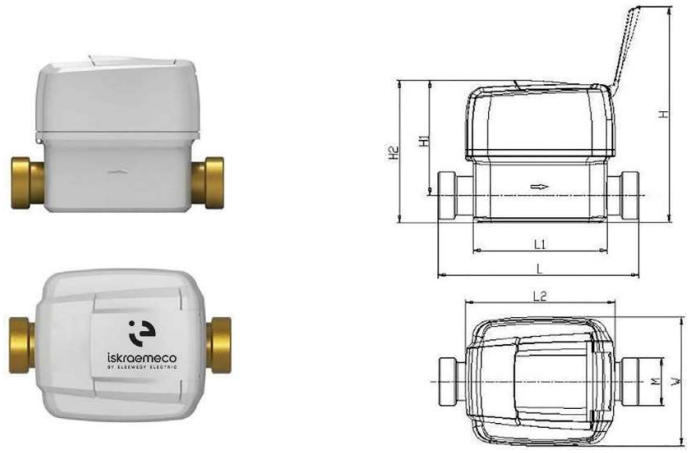


Figure 1: DN15~DN20 Dimensions

4.1.2.2. DN25 ~DN40

Nominal Diameter (DN)	Overall Length L (mm)	Counter Length L1 (mm)	Counter Width W (mm)	Total Height H (mm)	Total Height H1 (mm)	Overall Height H2 (mm)	Connection Thread M
25	260	135	90	221	83	115	G1¼
32	260	135	90	221	85	115	G1½
40	300	135	90	225	88	117	G2

Table 8: DN25~DN40 Dimensions

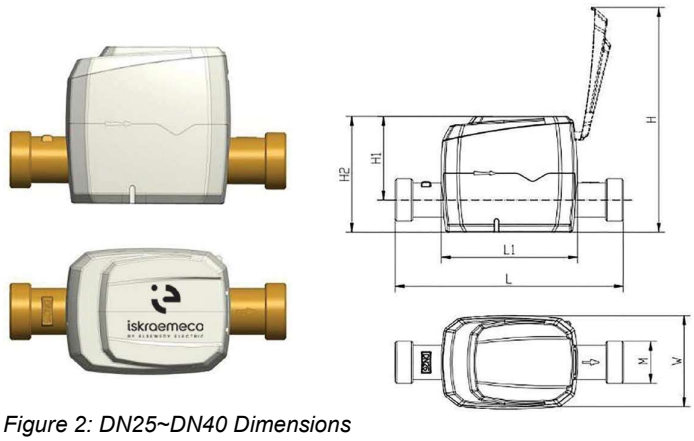


Figure 2: DN25~DN40 Dimensions

4.2. Nameplate

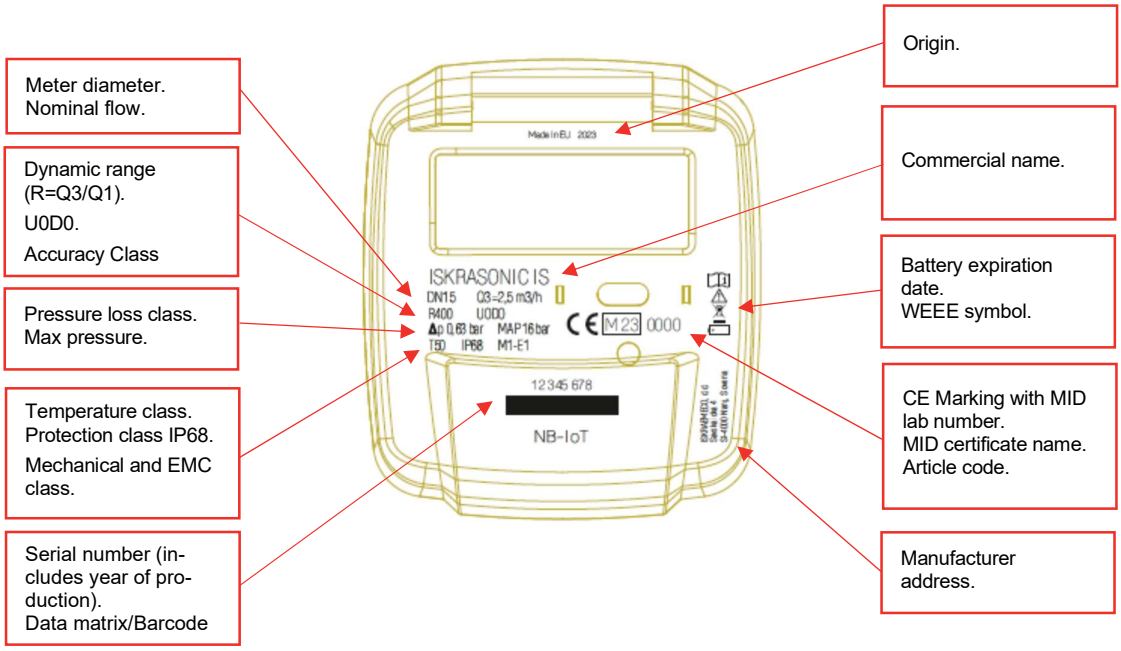


Figure 3: Nameplate

4.3. Display / Symbols

The data generated by the meter can be viewed in the display loop which includes system information (e.g. Net volume, Forward volume, Flow rate, Events, Alarms...).

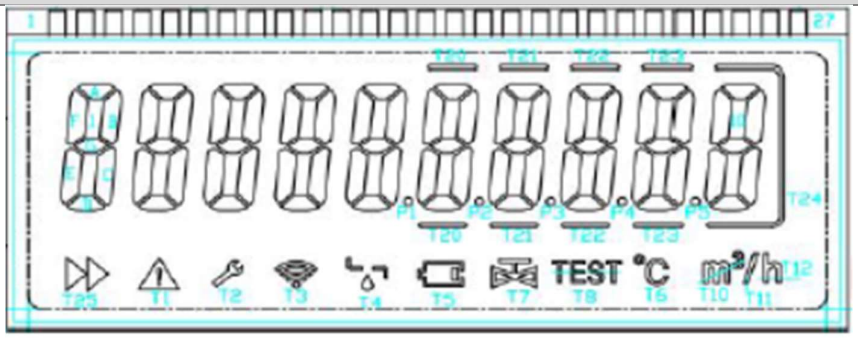
Meanings of special symbols	
Display position of special symbols	
Icon code	Description
T1	Warning: No water in the pipe – reverse flow – temperature out of range
T2	Fault: wireless communication fault, measuring chip breakdown
T3	Wireless communication active (note1)
T4	Flow rate too low (>Q1)
T5	Battery low power
T6	Temperature: Celsius
T7	Valve closed (note 2)
T8	Verification mode
T10	Volume unit: cubic meter
T11, T12	Volume unit: per hour
T20-T24	Decimal places
T25	Indicate reverse cumulative flow
Note: these symbols require the corresponding function to be turned on when the meter leaves the factory. These symbols are reserved on some products.	

Table 9: Display & Symbols

4.4. Events

If the product fails, please refer to this troubleshooting guide first. If this troubleshooting guide cannot solve the problem, please contact the manufacturer for maintenance.

Icon	Description	Status of Icon	Meaning Reasons	Measuring is running or not
	Fault Information	Display when a fault occurs, no display means no fault.	Measuring chip go broken	Measuring is not running
			Communication fault	Measuring is running
	Warning Information	Display when a warning occurs, no display means no warning.	Water meter is a reverse set	Measuring is running
			No water in the pipe	Measuring is running
	Low flow rate information	Display when the flow rate is too low (<Q1)	Flow rate exceeds minimum	Measuring is running
	Battey low power	Display when the battery is low	Battery is low power	Measuring is running

Table 10: Error messages

5. INSTALLATION

NOTE: The meter must be installed in compliance with the requirements of ISO 4064 and the EC Type Examination Certificate. Medium: Water without additives.

REFERENCE: Detailed instructions can be found in the enclosed "Installation guide", which are enclosed with every package of the product.

- If a risk of frost exists, empty the system and, if necessary, remove the meter.
- Thoroughly flush out the pipes before installing the meter.
- The meter must be installed so that the direction of the arrow on the meter housing corresponds to the direction of flow.
- Avoid the collection of air bubbles in the meter during the installation process.
- ISKRASONIC™ IS is approved according to EMC class E2. We recommend installing the meter sufficiently far away from possible sources of an electric field.
- Calming sections before and after the meter are not necessary.
- The meter must not be under any mechanical stress when installed in the pipeline.
- The meter must be fitted so that is protected against all outside impurities and contamination.
- Remove old seals and clean sealing faces.
- Thinly grease sealing faces (use acid-free, potable-water approved grease).
- Only fit the newly supplied seals (the seals should not intrude into the pipeline).
- Site-provided seals must be suitable for the purpose and comply with the local guidelines and directives. No liability is accepted for consequential damage resulting from the use of third-party seals such as corrosion to sealing surfaces and threads.
- Simultaneously manually screw home the meter fittings on both sides and then tighten in opposing directions using a suitable tool (mini- mum torque 30 Nm, maximum torque 50 Nm).
- The meter is suitable for water temperatures from 0.1 °C to 50 °C.
- Slowly fill the pipeline with water on completion of the installation.
- The meter must always be filled full with water.
- The meter must be protected against pressure shocks in the pipeline.
- The meter may only be installed in frost-free areas.

6. INSTALLATION GUIDE

- Choosing the calibre of the water meter should be based on the calibre of the pipeline and the flow rate equal to or less than the common flow rate of the water meter.
- Water meter installation should pay attention to the arrow direction on the side of the instrument pipeline is the same as the water flow. The newly installed pipeline must wash the stones, sediment, linen and other debris in the pipeline before installing the water meter, so as to avoid water meter failure.
- In order to facilitate disassembly and maintenance, valves should be installed on the upstream and downstream of water meters, and the inlet and outlet of water meters should have straight pipe sections of the same diameter. Generally, straight pipe sections of more than 10D should be retained in front of the meter, and straight pipe sections of more than 5D should be retained behind the table.
- It is suggested to install a filter in the upstream of the water meter in order to prevent the impurities mixed into the pipeline from damaging the water meter.
- The upstream and downstream straight pipe sections should be coaxially installed. Sealing gaskets should not be protruded into the pipe to avoid inaccurate measurement.
- When the water meter is used for a long time, impurities/rust in the pipeline will block the filter screen or enter the meter, which will increase the error of the water meter or affect its normal operation. Therefore, it is necessary to clean the water meter every other time and recalibrate it quickly or slowly, but it is not allowed to disassemble and assemble it by itself.
- When not in use, if the water meter has a small fluctuation, it is caused by the unstable flow pressure in the pipeline or other reasons.

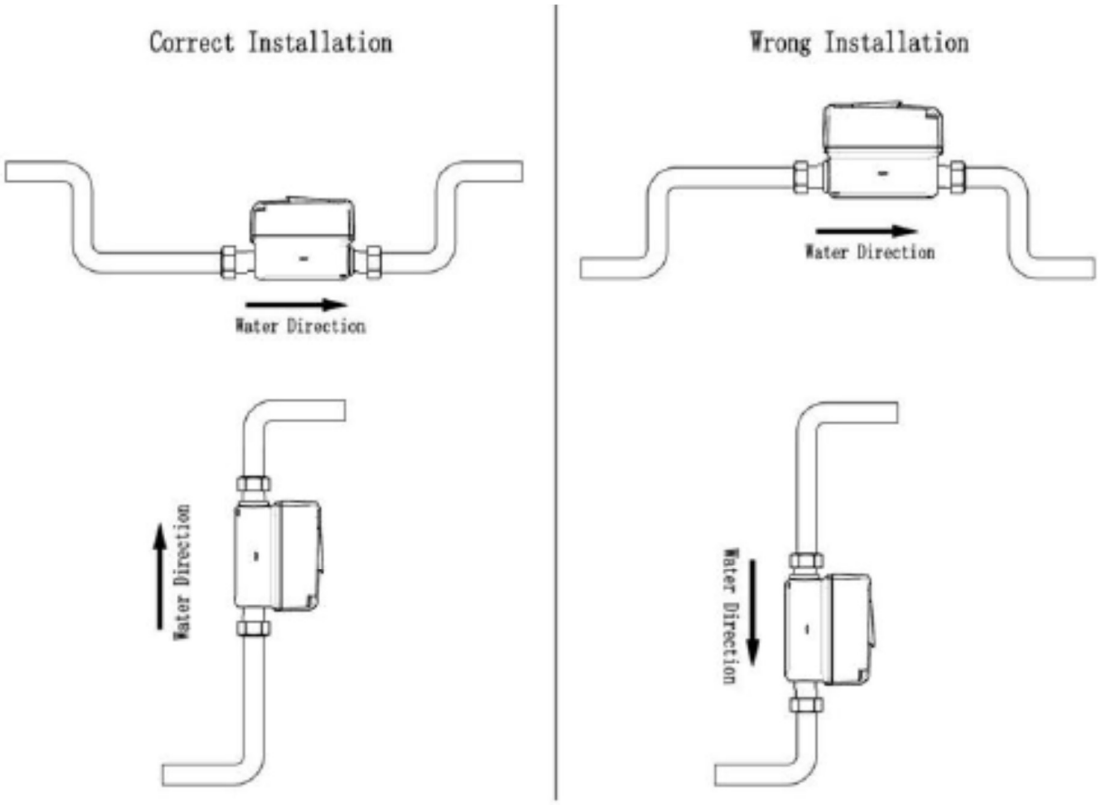


Figure 4: Installation orientation

7. CONFIGURATION

7.1. Key Method

Two possibilities exist and are identical in operation and function:

- Magnetic key: it refers to the key function triggered by the induction of the hall component of the meter to the magnetic substance. The position of magnetic key is shown in **Error! Reference source not found.** (Magnet induction zone).
- Touch key: it refers to the key function triggered when the finger touches the position of the key on the meter. The position of touch key is shown in **Error! Reference source not found.** (Touch key).

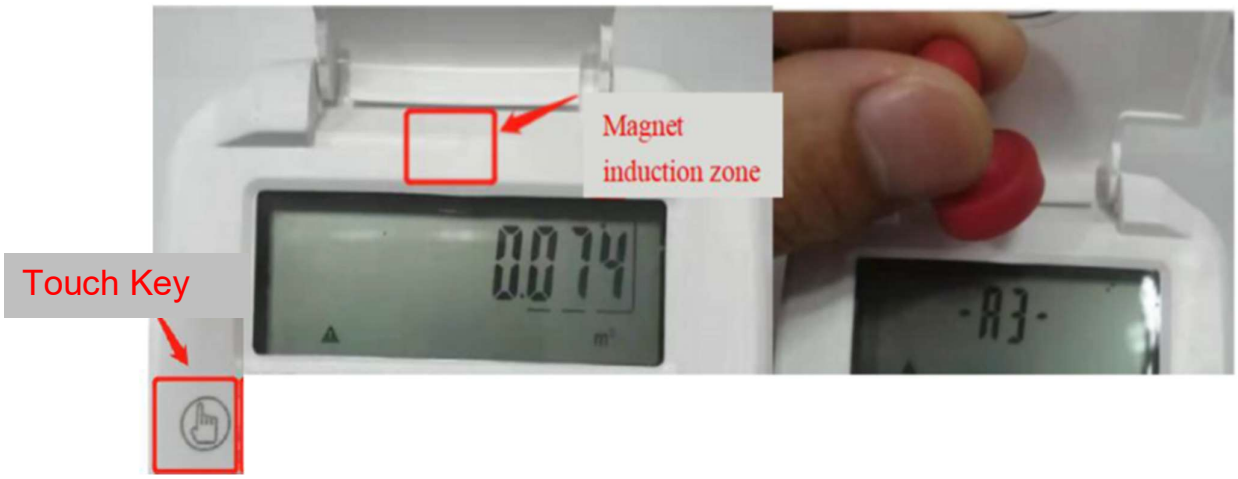


Figure 5: Configuration

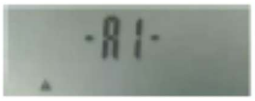
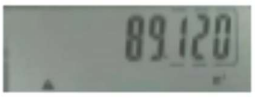
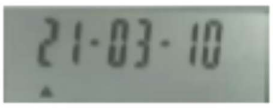
7.2. Key Functions

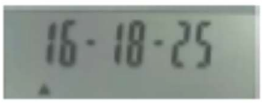
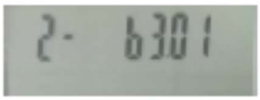
- Short-press key mode: it refers to the key function triggered when the magnet is close to the induction zone of the meter for more than 10 ms. Short-press key is mainly used to switch the secondary display menu of meter LCD.
- Long-press key mode: it refers to the key function triggered when the magnet is close to the induction zone of the meter for more than 2 s for the first time or generated every 1 s in the subsequent triggering process. Long-press key is mainly used to switch the primary display menu of meter LCD.
- Alternative key mode: it refers to the key function that will be triggered when the magnet is kept close to the induction zone for more than 1 minute after the long-press key is triggered. The abnormal key is used to prevent the key from being triggered continuously after the meter keeps in contact with magnetic objects or abnormal objects for a long time.

7.3. LCD Interface

7.3.1. LCD Menus

You can switch the LCD display interface of the meter through key functions, and the specific switching methods and the display contents of each interface are as follows:

LCD display content			
Menu number	**Display content**	**Description**	**Way to enter this menu**
A1		A1 Interface number	Long-press key
A1-1		Cumulative flow (m³)	Short-press key from A1
A1-2		Reverse cumulative flow	Short-press key from A1-1
A1-3		Instantaneous flow (m³/h)	Short-press key from A1-2
A1-4		Cumulative working hours (h)	Short-press key from A1-3
A2		A2 Interface number	Long-press key from A1/A1-1/A1-3
A2-1		Current date: MM-DD-YY	Short-press key from A2

A2-2		Current time: h-m-s	Short-press key from A2-1
A2-3		Nominal diameter: DN15	Short-press key from A2-2
A2-4		Program version number: b3.01	Short-press key from A2-3
A2-5		Meter address	Short-press key from A2-4
A2-6			Short-press key from A2-5
A2-7		Flow coefficient	Short-press key from A2-6
A2-8			Short-press key from A2-7
A2-9			Short-press key from A2-8
A2-10			Short-press key from A2-9
A2-11			Short-press key from A2-10
A2-12		Full display test	Short-press key from A2-11
A3		A3 Interface number	Long-press key from A2
A3-1		Warning mark	Short-press key from A3
A3-2		Fault mark	Short-press key from A3-1

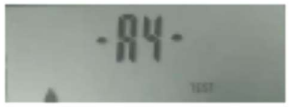
A4		A4 Interface number	Long key-press from A1-2
A4-1		Cumulative flow of verification state (m³)	Short-press key from A4
A4-2		Instantaneous flow of verification state (m³/h)	Short-press key from A4-1
A4-3		Time difference	Short-press key from A4-2
A4-4			Short-press key from A4-3
A4-5			Short-press key from A4-4
A4-6		Temperature	Short-press key from A4-5

Figure 6: LCD Display configuration

7.3.2. Verification Menu

If you need to verify the meter through the verification interface, you can switch the meter to the verification state through the following operations.

You can switch between different flow interfaces by pressing the button. There are three interfaces: cumulative flow, reverse cumulative flow, and instantaneous flow. See “Figure 9”

To access the verification interface, press and hold the button. From there, you can switch back to the cumulative flow interface by pressing the button twice.

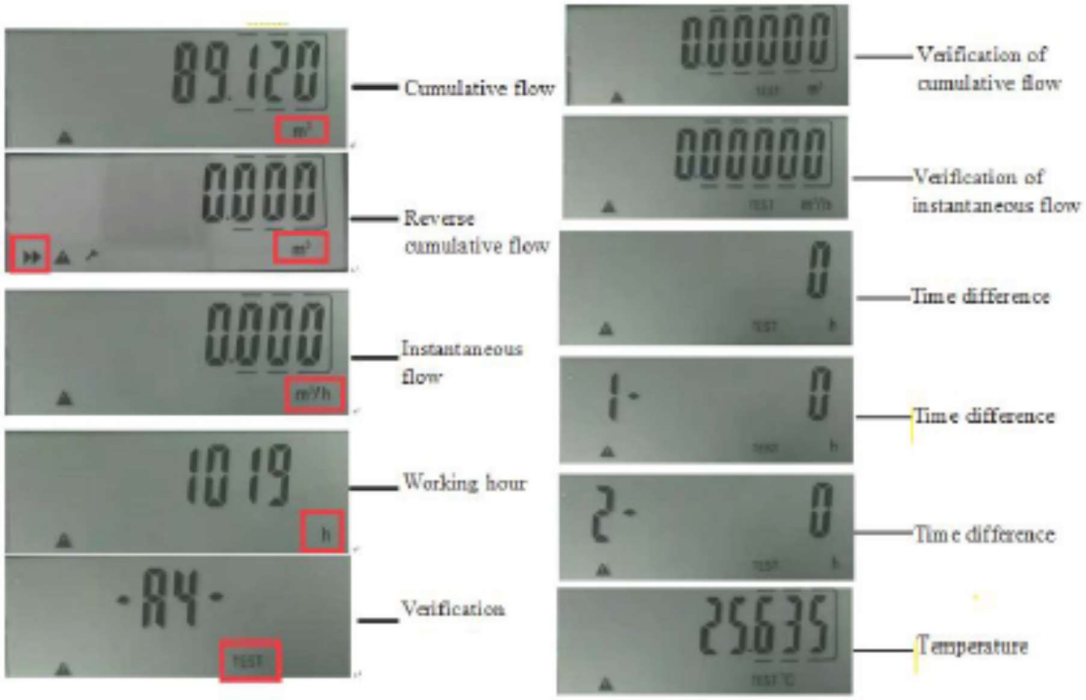


Figure 7: LCD Verification

8. TECHNICAL SPECIFICATIONS

Characteristics	UNIT	ISKRASONIC IS				
Nominal diameter DN	mm	15	20	25	32	40
Permanent flowrate Q3	m^3/h	2,5	4,0	6,3	10	16
Minimum flowrate Q1	m^3/h	0,0062	0,01	0,01575	0,025	0,040
Transitional flowrate Q2	m^3/h	0,01	0,016	0,0252	0,040	0,064
Overload flowrate Q4	m^3/h	3,125	5,0	7,875	12,5	20
Ratio Q3/Q1	R	400				
Ratio Q2/Q1	-	1,6				
Connection thread	inch	G¾	G1	G1¼	G1½	G2
Construction length L	mm	110	130	260	260	300
Installation orientation	-	horizontal, vertical (V/H)				
Water temperature range (temperature class)	°C	0,1 ~ 50 (T50)				
Maximum admissible pressure MAP	bar	16				
Pressure loss class Δp	bar	0,63				
Maximum permissible error in upper flowrates range Q2≤ Q ≤ Q4	%	>2 (at Θ ≤ 30°C) >3 (at Θ > 30°C)				
Maximum permissible error in lower flowrates range Q1	%	>5				
Indication range	m^3	99999,999				
Verification scale interval (resolution of the indicating device)	L	0,001				
Accuracy class	-	2				
Mechanical class	-	M1				
Climatic class	°C	- 25 ~ + 55				
Electromagnetic class	-	E1				
Climatic and mechanical environmental conditions (class) according to EN ISO 4064-1/OIML R 49-1	-	B/O				
Flow profile sensitivity class	-	U0 D0				
Battery	-	li-battery 3,6 V, lifetime 12 years				

Table 11: Technical specifications

9. MAINTENANCE

CAUTION

Do not clean it with solvents or abrasives as these may damage the plastic cover. If necessary, use a damp cloth or sponge.

10. DISPOSAL REGULATIONS

WARNING

The device must not be opened. The battery is permanently installed and cannot be changed.

WARNING

This device must not be disposed together with domestic waste. Please return it to the manufacturer for recycling.

11. CERTIFICATIONS AND REGULATIONS

Certificates and declarations of conformity are available at the request at supportwater@iskraemeco.com.

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