B METERS
metering solutions

EN

# HYDRODIGIT-S1

Digital single jet smart meter

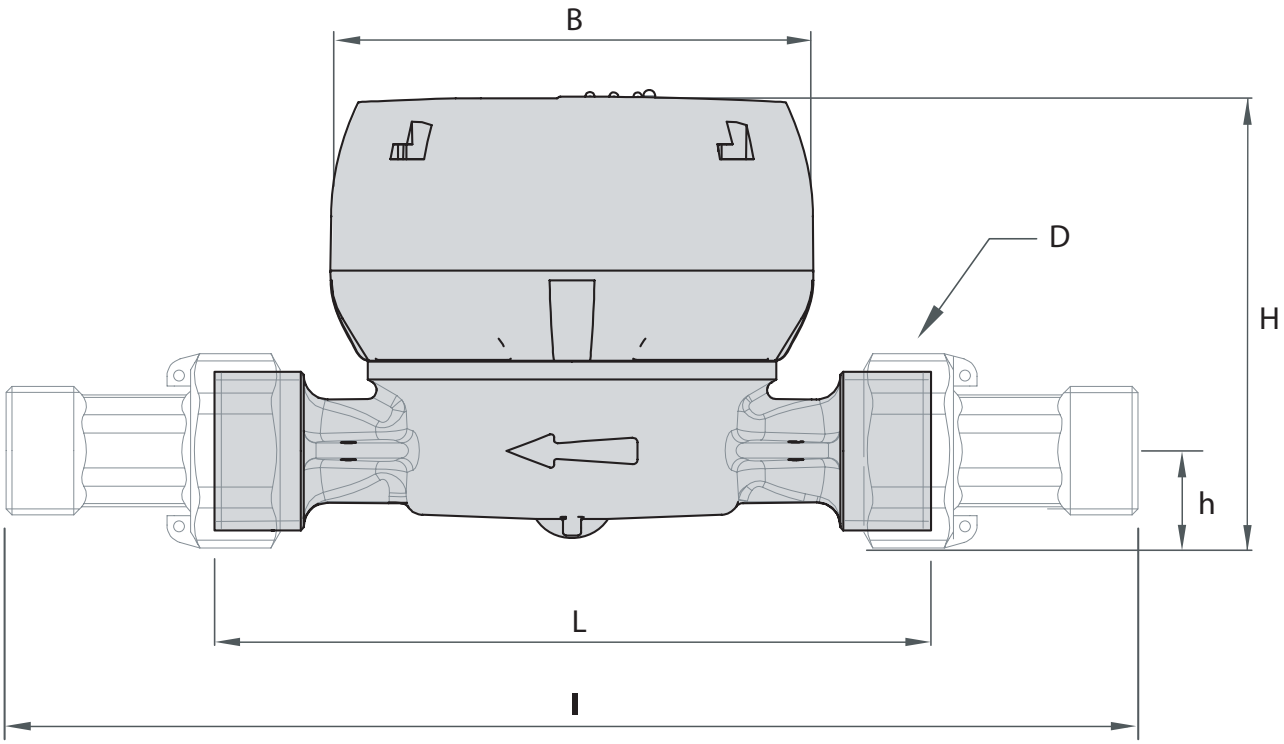
## OPERATING INSTRUCTIONS

# INDEX

# CONTENT

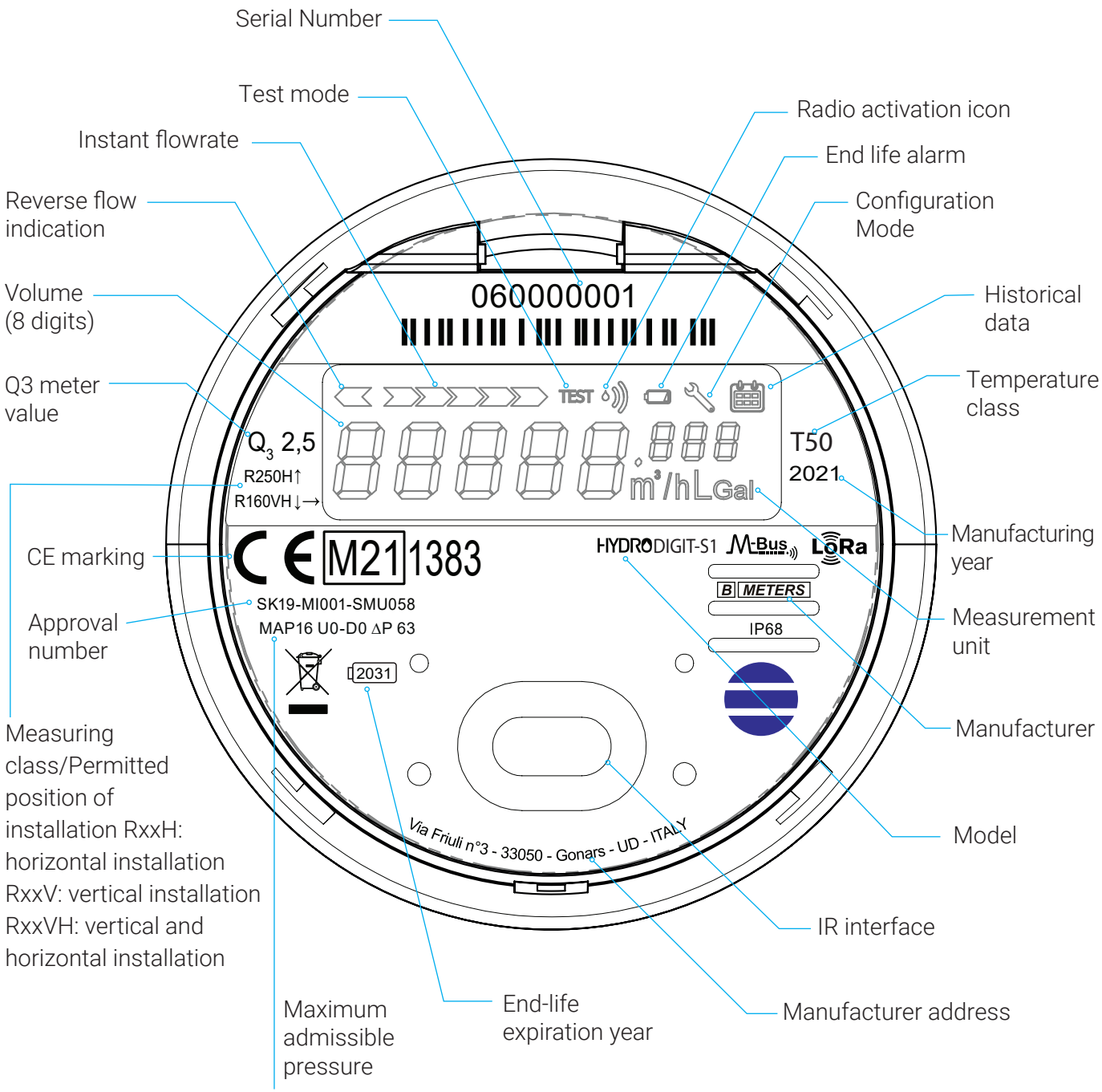
## DESIGN

According ISO4064




| Size | mm<br>in | 15<br>(1/2”) | 15<br>(1/2”) | 20<br>(3/4”) |
|---|---|---|---|---|
| L | mm | 80 | 110 | 130 |
| B | mm | 85 | 85 | 85 |
| l | mm | 160 | 190 | 228 |
| D Threading | in | 3/4” | 3/4” | 1” |
| H | mm | 73 | 73 | 73 |
| h | mm | 18 | 18 | 18 |

## DEVICE DIAL


Serial Number
Test mode
Instant flowrate
Reverse flow indication
Volume (8 digits)
Q3 meter value
CE marking
Approval number
Measuring class/Permitted position of installation RxxH: horizontal installation RxxV: vertical installation RxxVH: vertical and horizontal installation
Maximum admissible pressure
End-life expiration year
Manufacturer address
IR interface
Model
Manufacturer
Measurement unit
Manufacturing year
Temperature class
Historical data
Configuration Mode
End life alarm
Radio activation icon
060000001
TEST
Q3 2,5
R250H↑
R160VH↓→
m³/h L Gal
T50
2021
M21 1383
SK19-MI001-SMU058
MAP16 U0-D0 ΔP 63
2031
HYDRODIGIT-S1
M-Bus
LoRa
B METERS
IP68
Via Friuli n°3 - 33050 - Gonars - UD - ITALY

## FUNCTIONALITY

The water meter **HYDRODIGIT** is a single jet water meter with digital display and inductive rotation detection, anti-magnetic.
It is available for both cold and hot water.

## VERSIONS

The device is available in four versions:
• Wireless MBUS  compatible
• Wireless MBUS  v4 (COMBO, output configuration Wireless MBUS  v4 only)
• LoRaWAN (COMBO, output configuration LoRaWAN only)
• LoRaWAN + Wireless MBUS  v4 (COMBO, output configuration LoraWAN + Wireless MBUS  v4)

## PACKAGING CONTENT

• Hydrodigit water meter
• Connection gaskets*
• Connectors*
• Seal*

*if ordered with the meter

## ENVIRONMENTAL CONDITIONS

• Storage: from -20°C to +70°C
• Operating: from +1°C to +55°C
• The storage period must not exceed 1 year
• The water meters are precision devices and must be protected from shocks and vibration

## SAFETY INSTRUCTIONS

Warning: this symbol highlights the instructions to be strictly followed for the correct functioning of the smart water meter.

Danger: Items marked with this symbol contain information that must be followed carefully to avoid dangerous situations.

Notes: the notes indicated by this symbol contain suggestions to keep in mind when using the smart water meter.

**Read all the instructions carefully before proceeding with the installation! Failure to comply with one or more procedures contained in the manual can be dangerous and cause damage to things and people.**
**It is recommended to comply with all applicable safety and accident prevention laws.**

| | |
|---|---|
| | Follow nationwide regulations regarding water measurement. |
| | Follow the technical requirements relating to the installation of electrical equipment. |
| | The instrument complies with the requirements of the European Council Directive 2014/30/EU on electromagnetic compatibility, the Directive 2014/35/EU on electrical safety and the RED Directive 2014/53/EU. |
| | The warranty and correct functioning are void if the identification plate and seals applied to the instrument are removed or damaged. |
| | It is forbidden to transport instruments with an active radio interface by air. |
| | To clean the instrument externally, use a soft cloth moistened with water. Do not wash with high pressure jets or immerse the device in water. Avoid contact with oils and solvent. Do not use alcohol or detergents. |
| | Remove the instrument from the packaging only at the time of installation to protect it from damage and dirt. |
| | If multiple instruments are installed in a unit, the installation conditions must be the same for all instruments in order to ensure the most equitable billing of consumption possible. |
| | Carefully observe the instructions in the data sheet, instruction manual, application notes and lid. Failure to comply with the operating conditions may lead to situations of danger and forfeiture of all claims for liability for defects as well as liability based on any warranty.<br>For more information visit www.bmeters.com. |
| | Dispose of replaced instruments and defective components in accordance with the environmental regulations in force. |

| | |
|---|---|
| ⚠ | Do not damage the device casing. In case of impact with external objects, the device can be irreparably damaged and lose the IP65 or IP68 degree of protection. Install in areas protected against impact. In case of breakage of the protective casing, contact customer support. |
| → | The water meter is not suitable for central heating and cooling systems. The water meter is suitable for drinking water only. |
| ⚠ | Pay attention to sharp or edgy protrusions in threads, flanges and measuring tubes. In this regard, it is recommended to wear protective gloves. |
| → | After installing the water meter, perform a leakage test on the system. |
| → | Install or disassemble the meter only after depressurizing the system. |
| → | The meter does not have protection against lightning. |
| ⚠ | Do not expose the instrument to sunlight and other heat sources. Do not throw in the fire. |
| ⚠ | The device must be used in a way that minimizes the potential for human contact during normal operation. In order to avoid the possibility of exceeding the RF exposure limits, human proximity to receivers with an integrated antenna should not be less than 20 cm (8 inches) during normal operation. |
| → | Keep out of the reach of children. |
| → | The device does not require special protection against electrical interference; however, electromagnetic interference must be avoided. |
| → | If transmission network interfaces are used, especially when cables are routed outside the building, use increased protection against electrical interference. |
| ⚠ | If there is a possibility of frosting, empty the system and, if necessary, remove the meter. |
| → | Rinse the pipes thoroughly before installing the meter. |
| → | The meter must be installed with the direction of the arrow (visible on the lower part of the device) matching the flow direction. |
| → | Avoid collecting air in the meter during the installation process. |
| → | The meter must not be subjected to mechanical strain when installed in the pipeline. |
| → | Install the meter in order to be protected from all impurities and contamination. |
| → | Remove the old gaskets and clean the sealing surfaces. |
| → | Grease sealing surfaces (use acid-free, potable water approved grease). |
| → | The device may only be installed in frost-free areas. |

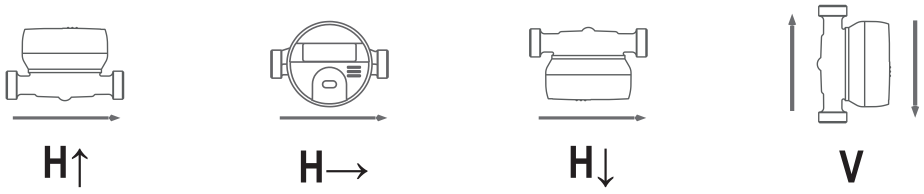
| | |
|---|---|
| → | Fit only the supplied seals (seals must not obstruct the pipeline). The seals supplied must be fit for purpose and comply with local guidelines and directives. No liability is accepted for consequential damages resulting from the use of third party seals, such as corrosion of sealing surfaces and threads. |
| → | Clamp the meter fittings on both sides at the same time by hand and then tighten in opposite directions using a suitable tool. |
| → | Slowly fill the piping with water after the installation is complete. |
| → | The meter must be protected against pressure shocks in the pipeline. |

The table below displays the troubleshooting procedures:

| Problem | Cause | Solution |
|---|---|---|
| Display off | The batteries may be damaged or discharged. | Report to the after-sales service |
| Damaged casing | Possible external impact or fall to the ground | Report to the after-sales service |
| Lower case body separated from electronic unit | Tampering by third parties or strong external impacts | Report to the after-sales service |
| Open and visible electronic unit | Tampering by third parties or strong external impacts | Report to the after-sales service |
| Consumption is not accounted | Tampering by third parties, strong external impacts or damage to the flow detection sensor | Report to the after-sales service |
| No radio transmission | Failure to pass 5 liters or the batteries may be damaged or discharged. | Report to the after-sales service |
| Error '_ _ _ _L Err' on the display | Possible leaks in the water network / system / taps. | Check for leaks in the water supply / system / tap |
| Error '_ _ _ _O Err' on the display | Range higher than Q4 for 10 consecutive minutes. | Check the water supply and the installation of the meter |
| Error '_ _ _ _I Err' on the display | Continuous reverse flow greater than 20 liters | Check the water supply and the installation of the meter |

## INSTALLATION REQUIREMENTS

All the versions of the water meter can be installed both horizontally and vertically. For a better performance it is preferable, however, the horizontal installation, with the turbine axis perpendicular to the ground and the reading mechanism facing upwards.



# OPERATION

**Note: the following display pictures are given as example.**

## DISPLAY


## DELIVERY STATUS

The factory setting is the energy saving mode. In this mode the radio transmission function is not yet activated, in order to save battery power during shipping and stock. However, the device can account the consumption and send, if any, errors (e.g. reverse flow for incorrect installation).

## OPERATING MODE – RADIO ACTIVATION

Once the water meter is installed, the radio transmission activates automatically after +/- 5 liters of water passed through the device (LoRaWAN: starts sending Join requests – wM-BUS: radio is activated).
The display changes and the flow direction/level appear if the flow rate is detected.

## RADIO PARAMETERS

### Wireless MBUS compatible

As soon as radio operation mode is activated, the meter sends a radio telegram according to Wireless MBUS T1 mode (unidirectional transmission).

Preconfigured Radio parameters (AMR Mode):
- Transmission frequency: every 200 seconds (current values).
- Transmission intervals: every day, from 0 to 24 h.
- Encryption: disabled (default).
- No historical data.
- Transmitted data: volume, actual date and time, reverse flow, alarms.

It is possible to change the configuration parameters into Walk-By mode with an USB to IR interface (B METERS mod. UC-Cable) and the B Metering software.

Walk-By mode parameters:
• Transmission frequency: every 60 seconds (current values).
• Transmission interval: every day from 6 to 20.
• Encryption: enabled/disabled.
• Historical Data (12 months).
• Transmitted data: volume, actual date and time, reverse flow, alarms, leakage alarm date, fraud alarm date (Qmax overflow or Backward flow detection).

## Wireless MBUS v4 (COMBO, output configuration Wireless MBUS only)

As soon as radio operation mode is activated, the meter sends a radio telegram according to Wireless MBUS v4, T1 mode (unidirectional and synchronous transmission).

Preconfigured Radio parameters (AMR and synchronous Mode OMSv4 compliant):
• Transmission frequency: every 200 seconds (current values).
• Transmission interval: every day, from 0 to 24 h.
• Encryption: disabled (default).
• No historical data.
• Transmitted data: volume, actual date and time, reverse flow, alarms.

It is possible to change the configuration parameters into Walk-By mode with an USB to IR interface (B METERS mod. UC-Cable) and the B Metering software:

• Transmission frequency: configurable (minimum 60 seconds).
• Transmission interval: from Monday to Sunday, maximum 12 hours per day (time span can be selected freely).
Possibility to select a 24-hours time span with the following mandatory conditions:
→ Transmission frequency: > 300 seconds (synchronous)
→ Historical data disabled.
• Encryption: enabled/disabled.
• Historical data (12 months).
• Transmitted data (depends on the selected parameters): volume, date and time, reverse flow, alarms, leakage alarm date, fraud alarm date (Qmax overflow or backward flow detection).

## LoRaWAN (COMBO, output configuration LoraWAN only)

As soon as radio operation mode is activated, the meter sends join requests to the Network Server where it has been provisioned, according to LoRaWAN transmission standard.
During this process, the radio icon on the display will blink every second. If the procedure is successful, the icon will remain active and stable, otherwise it will turn off.

Preconfigured radio parameters:
• Transmission frequency: every 12 hours (current values).
• Transmission interval: 7/7d, 0/24h.
• Transmitted data: volume, reverse flow, diameter, medium, alarms

It is possible to change the configuration parameters into Walk-By mode with an USB to IR interface (B METERS mod. UC-Cable) and the B Metering software:
• Transmission frequency: every 6 hours (current values)
• Temperature data sending
• Transmitted data: volume, reverse flow, diameter, medium, alarms, temperature (if enabled)
• ABP mode and relative keys

### LoRaWAN + Wireless MBUS v4 (COMBO, output configuration LoraWAN + Wireless MBUS OMSv4)

As soon as radio operation mode is activated, the meter sends join requests to the Network Server where it has been provisioned, according to LoRaWAN transmission standard. Moreover, it enables the transmission based on the Wireless M-BUS v4 mode T1 (unidirectional but asynchronous transmission) standard.
During this process, the radio icon on the display will blink every second. If the procedure is successful, the icon will remain active and stable, otherwise it will turn off.

Preconfigured radio parameters (**LoRaWAN**):
• Transmission frequency: every 12 hours (current values).
• Transmission interval: 7/7d, 0/24h.
• Transmitted data: volume, reverse flow, diameter, medium, alarms

Preconfigured radio parameters (**wM-Bus**):
• Transmission frequency: every 60 seconds (asynchronous).
• Transmission interval: from Monday to Friday, from 8 to 18 h.
• Encryption: disabled
• Historical data (12 months)
• Transmitted data volume, date and time, reverse flow, alarms, leakage alarm date, fraud alarm date (Qmax overflow or backward flow detection).

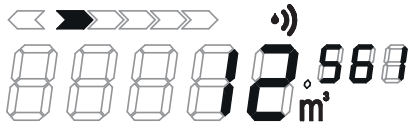
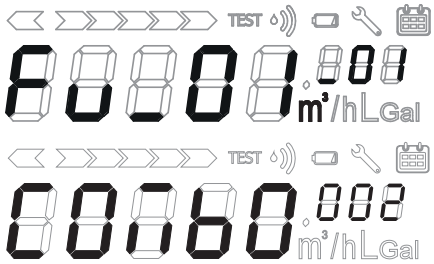
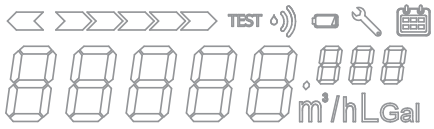
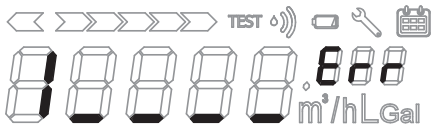
It is possible to change the configuration parameters into Walk-By mode with an USB to IR interface (B METERS mod. UC-Cable) and the B Metering software:

**LoRaWAN**:
• Transmission frequency: every 6 hours (current data)
• Temperature data sending
• Transmitted data: volume, backward flow, diameter, medium, alarms, temperature (if enabled)
• ABP mode and relative keys

**wM-Bus**:

- Transmission frequency: configurable (minimum 60 seconds).
- Transmission interval: from Monday to Sunday, maximum 12 hours per day (time span can be selected freely).
  Possibility to select a 24-hours time span with the following mandatory conditions:
  → Transmission frequency: > 300 seconds (synchronous)
  → Historical data disabled.
- Encryption: enabled/disabled.
- Historical data (12 months).
- Transmitted data (depends on the selected parameters): volume, date and time, reverse flow, alarms, leakage alarm date, fraud alarm date (Qmax overflow or backward flow detection).

## DEVICE DISPLAY LOOP

| Device display | Display time | Example description |
|---|---|---|
|  | 10 seconds | Consumption: 12,561 m³<br>Flow: present<br>Radio: activated |
|  | 2 seconds | Firmware version Fu_01_01<br>(In the “COMBO” version, “Combo 002” will be displayed) |
|  | 2 seconds | Display test “ALL ON” |
|  | 2 seconds | Display test “ALL OFF” |
|  | 2 seconds | Error message |

## ERROR MESSAGE

If an error occurs, an error message is displayed. The error message will be integrated into the device display loop for 2 seconds.


| Error | Type | Descrizione | Activation | Troubleshooting | Reset | Radio telegram |
|---|---|---|---|---|---|---|
| I_ _ _ _ Err | Backflow | Reverse flow detected, a flow in opposite direction is detected. | The error activates after continuous reverse flow higher than 20 liters. | Check water network and the meter installation. | Reset the alarm via LoRa downlink (**if in LoRa version**) or directly on field with IR interface and B Metering software. | The payload contains the status of the alarm and the date of the alarm activation. After resetting it the status is updated and the date will be removed from the radio payload. |
| _O_ _ _ Err | Overflow | Water meters was used in an improper condition, flow rate exceeded the operating conditions. Manufacturer warranty expires. | The error activates after the meter operates at a flow rate higher than Q4 for 10 minutes continuously. | Check water network parameters. | Reset the alarm via LoRa downlink (**if in LoRa version**) or directly on field with IR interface and B Metering software. | The payload contains the status of the alarm and the date of the alarm activation. After resetting it the status is updated and the date will be removed from the radio payload. |
| _ _B_ _ Err | Burst | High consumption in a short term is detected. This is probably linked to a pipeline failure/break. | If the flow rate of the meter stays continuously over Q3 for 30 minutes the alarm is set. | Check water network. | The alarm automatically resets when the flow rate decreases below 0,5*Q3 | The payload contains the status of the alarm and the date of the alarm activation. After the alarm resets, the date changes to the date of deactivation. |
| _ _ _R_ Err | Reverse installation | The meter starts flowing in the opposite direction. This is probably due to a wrong installation. | During first installation only, if the absolute counter (forward counter - reverse counter) is equal to 0 and a reverse flow (>8 Liters) is detected, the alarm turns on. | Check water meter installation. | Automatically resets when flow is on the correct direction. | The payload contains the status of the alarm and when flow direction turns to the correct one the status updates. |
| _ _ _ _L Err | Leakage | A continuous flow for a long time is detected. This is probably linked to a leakage in the water network. | The meter detects a continuous flow of >0.5*Q1 for 12 hours. | Check water network\system\ taps against leakages. | Resets automatically when a flow interruption happens. | The payload contains the status of the alarm and the date of the alarm activation. After the alarm reset the date changes to the date of deactivation. |

## BATTERY AND REPLACEMENT PROCEDURES

The water meter constantly monitors the battery status (maximum duration: 10 years) and reports the upcoming discharge via LoRaWAN or WM-BUS radio, by displaying the icon .
The notification occurs one year before the total discharge.

→ For the replacement, contact the manufacturer.
The instrument is equipped with a non-rechargeable battery, which can be dangerous if used improperly. To reduce the risks, the following precautions must be observed:

| | |
|---|---|
| ⚠ | Do not recharge or replace the battery; |
| ⚠ | Do not open, puncture or damage the batteries; |
| ⚠ | Do not short-circuit the battery; |
| ⚠ | Do not expose the battery to temperatures above 85° C; |
| ⚠ | Do not insert into ovens, crush or cut: these actions could cause an explosion or leakage of flammable gases or liquids; |
| ⚠ | Do not use naked flames near the device; |
| ⚠ | Do not put in contact with water; |
| ⚠ | Do not expose the battery to an extremely low pressure environment which could cause an explosion or a leak of gases or flammable liquids; |
| ⚠ | Always dispose of batteries in compliance with current regulations; |
| ⚠ | Always use original spare parts authorized by the manufacturer. |

## INFORMATION FOR CORRECT DISPOSAL OF THE PRODUCT

This product falls into the scope of the Directive 2012/19/EU concerning the management of Waste Electrical and Electronic Equipment (WEEE). This product shall not be disposing into the domestic waste as it is made of different materials that must be recycled at the appropriate facilities. Inquire through the municipal authority regarding the location of the ecological platforms to receive the product for disposal and its subsequent correct recycling.
The product is not potentially dangerous for human health and the environment, but if abandoned in the environment can have negative impact on the environment.
The crossed-out wheeled dustbin symbol, on the label on the product, indicates the compliance of this product with the regulations regarding Waste Electrical and Electronic Equipment.
Abandonment in the environment or illegal disposal of the product is punishable by law.

## TRANSLATION

For deliveries to countries in the European Economic Area, the operating instructions are to be translated into the appropriate language of user country.
Should there be any inconsistencies in the translated text, the original operating instructions (Italian) are to be consulted or the manufacturer should be contacted.

## TECHNICAL DATA

| Model | HYDRODIGIT |
|---|---|
| **Measuring class/Permitted installation** | R400H, R160V↓→<br>R250H, R160V↓→<br>R160H, R160V↓→<br>Depending on the order |
| **Flow detection technology** | Turbine reading by inductive system |
| **Temperature class** | T50 cold water, T30-90 hot water |
| **Display** | LCD, 8 digits + icons |
| **Protection class** | IP68* |
| **Local Interface** | Optical interface IR IEC 62056-21 |
| **Radio standard** | Depending on the version:<br>- Wireless MBUS EN 13757-4 compatible;<br>- COMBO - output configuration: Wireless MBUS EN 13757-4;<br>- COMBO - output configuration: LoRaWAN;<br>- COMBO - output configuration: LoRaWAN + Wireless MBUS EN 13757-4 ; |
| **Radio Frequency** | 868 MHz |
| **Radio range / radio power** | Wireless MBUS: 300 meters**<br>LoRaWAN: 5 Km** |
| **Battery life** | max 10 years*** |

*IP68: maximum 24 hours of continuous submersion at 1 m depth.
Note: in case of damage caused by involuntary impact, the meter must be replaced with a new one, to restore the protection class.
**Under optimal propagation conditions, the radio range depends on physical conditions (building constructions, climatic conditions, …) where propagation of the radio signal can therefore vary.
*** The battery life strongly depends on the working time window, set during the configuration process, and on the environmental conditions. Estimation of the battery life is given by the configuration software.

## DECLARATION OF CONFORMITY

### EU DECLARATION OF CONFORMIT

1. **Product type/model**: Water Meter – HYDRODIGIT
2. **Name and address of the manufacturer**:

   **B METERS SRL** Via del Friuli, 3 – 33050 GONARS (UDINE) ITALY
3. **This declaration of conformity is issued under the sole responsibility of the manufacturer.**
4. **Object of declaration:** **HYDRODIGIT**

   Vane-wheel single jet with electronic indicating device and radio transmitter
5. **Above mentioned object is in conformity with relevant EU harmonization legislation:**

   Directive No. 2014/32/EU
6. **Relevant harmonized standards or normative documents and references or other technical specifications or instructions used for the declaration:**

OIML R 49-1:2006
OIML R 49-2:2004
OIML R 49-1:2013
OIML R 49-2:2013

EN 14154-1:2005+A2:2011
EN 14154-2:2005+A2:2011
EN 14154-3:2005+A2:2011

EN ISO 4064-1:2017
EN ISO 4064-2:2017

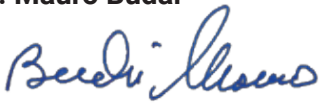
7. **Notified body**

| Name and number of NB | Performed | Issue the Certificate No. |
|---|---|---|
| Slovensky mtrologicky ustav, NB 178<br>Karloveska 63<br>84255 Bratislava 4<br>Slovenska Republika | EU type certification in accordance with Module B of Directive No. **2014/32/EU** | SK 19-MI001-SMU058 (rev. 3) |
| Czech Metrology Institute, NB 1383<br>Okruzni 31<br>638 00 Brno<br>Czech Republic | Certification of production, final product inspection and testing in accordance with Module D of Directive No. **2014/32/EU** | 0119-SJ-A011-08 |

8. **Another Information**

Signed by the General Manager:

**Mr. Mauro Budai**



On behalf of:

**B Meters Srl**

Place and date of declaration issue:

Gonars, Italy, 1st February 2022

## MANUFACTURER ADDRESS

**B METERS srl**
Via Friuli, 3 • Gonars 33050 (UD) • ITALY

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