

Ultrasonic apartment and residential water meter IUWS B.One

Product description

- Ultrasonic apartment / residential water meter type IUWS B.One for cold water up to 50 °C.
- With ex-works integrated wM-Bus (OMS certified version available) or LoRaWAN® radio interface.
- There is also the option of connecting an external radio module (NDC wM-Bus or NDC LoRaWAN®) to the NDC interface of the meter. In this case, the internal radio interface is automatically deactivated.

Intended use

For the consumption measurement of cold and clean drinking water or service water up to 50 °C.

Scope of delivery

- Ultrasonic water meter type IUWS B.One with ex-works integrated wM-Bus or LoRaWAN® radio interface
- Installation instruction, Declaration of Conformity

Remark

This installation manual is intended for qualified specialists only. In order to ensure a proper flow measurement, the measuring device must be completely filled with water at all times.

NDC modules may be retrofitted to the installation point of the measuring instrument if required. Retrofitting should only be carried out by qualified specialists. It is recommended to secure the modules against unauthorised removal with a user safeguard.

Notes on labeling

MAP = Maximum operating pressure (bar)

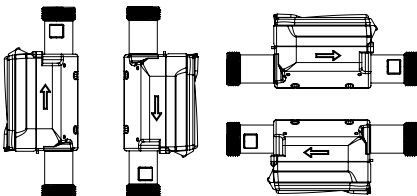
T = Maximum operating temperature (°C)

Q_3 = Permanent flowrate (m³/h)

Δp = Pressure loss class (KPa)

Permissible installation positions

The IUWS B.One series is intended for "any" installation position (even overhead).



Activating of the measuring device

Upon delivery, the display of the measuring device is in "sleep mode". The display is activated ten seconds after the measuring device has been filled with water. For this purpose, the pipeline or measuring device must be completely vented or filled with water. Optional options for activation: use of the MSS software + MinoConnect Set USB NFC or by means of the B.One Device Manager app. The measuring device can be retrofitted with the following NDC modules:

NDC wM-Bus, NDC LoRaWAN®, NDC 'universal' (= NDC module adopts the radio scenario seted in the meter)

General information

- Water meters are precision devices.
- Protect against shock and vibration.
- Store in a frost-free, cool and dry location.
- Electronic water meters contain lithium batteries. Storage at temperatures down to -10 °C is safe, provided the device has not yet been activated. A storage temperature of over 35 °C should not be exceeded for more than 4 weeks (ideally +15 °C). Long-term storage in extreme cold or heat outside this temperature range can damage the battery or greatly reduce its capacity.
- Suitable measures must be taken to ensure that any contamination or damage is excluded during transport to the installation location.
- If this measuring device is used in an EU country, it is subject to a metrological test of the respective EU member state.
- The IUWS B.One series has been approved with a flow sensitivity class U0/D0 (no inlet outlet section required). However, to achieve the best measurement results, we recommend observing national regulations and recognised rules of technology.
- For the IUW series at least 3xDN are recommended as a straight inlet section. Ideally, at least 2xDN should be available as the outlet section.
- The pipe cross-section should not be reduced or extended directly in front of or behind the measuring device.
- Connection seals must not protrude into the pipe cross-section.
- Valves or other flow regulators should be installed behind of the measuring device if possible.

- If necessary, the measuring device should be protected by a filter, so that no foreign particles, such as stones or sand, are flushed into the measuring device and cause damage.
- The measuring device must be protected against pressure surges in the pipe network.
- The measuring device may only be installed in a frost-proof location and the ambient temperature must not exceed +55 °C.
- The measuring device should be installed, where possible, at the deepest point of the pipe installation so that air bubbles are not able to form in the measuring device and the pipe is always completely filled.
- The medium temperature must not exceed the permissible 50 °C (T50).
- When using lubricants / assembly pastes e.g. for the seals, it must be ensured that these are suitable for contact with drinking water.
- If there is a risk of frost, shut off the system and empty it completely (including the measuring device!), removing the measuring device if necessary.
- Close the valves upstream and downstream of the measuring device and relieve the pressure at the installation point.
- Dismantle existing measuring device or adapter piece.
- Old seals must be removed immediately after dismantling the existing measuring device or adapter piece. The corresponding sealing surfaces must be cleaned and checked for damage.
- Check before starting installation:
 - that all sealing surfaces are plane and free of damages such as notches, grooves or similar.
 - all information on the dial/register cap/type plate must be readable.
 - the measuring device is suitable in design, size, temperature range and pressure rating for the installation site.
- Only use new and flawless sealing material.
- It must be ensured that the flow direction of the measuring device matches that of the pipe.
- Screw on the swivel nuts by hand and tighten with a suitable tool. Make sure that the seals are seated correctly.
- It must be ensured that the meter is installed in a tensionless state in the pipe. In the case of an installation that is not tensionless, the housing of the measuring device can be damaged and water may escape.
- To prevent damage to the measuring instrument caused by pressure surges after installation, the pipe must be filled slowly after installation.
- The measuring instrument must be easily accessible at all times after installation to guarantee that the key data and the conformity/metrology mark can be read at all times.
- Check all sealing points for leaks after installation.
- We recommend securing the connection points against unauthorised disassembly with a user safeguard. It should not be possible to remove or loosen the guard without visibly damaging it.

Safety instructions

- **Note!** The device is equipped with a permanently installed lithium battery, which must not be recharged. This type of battery is classified as dangerous goods (Hazardous goods class 9). The applicable transport regulations must be observed! Data sheets, safety data sheets and test reports of the batteries are available on request. Please also note the following general information on handling batteries.
- **Warning!** The device contains a non-rechargeable lithium battery. Attempting to charge the battery will damage the device and cause injury.
- **Attention!** Under no circumstances may the device be disposed of with normal household waste. Please consult our separate disposal regulations in this manual.

General information on handling lithium batteries or devices with lithium batteries

Attention! The following must be observed when handling lithium batteries and devices with lithium batteries:

- store protected from moisture
- do not heat or throw into fire to avoid explosion
- do not short circuit
- do not open or damage
- do not charge
- do not store within reach of children

Installation manual

- Read the installation instructions carefully right up to the end before beginning installation.
- Prior to installing the measuring device, the pipe system is to be carefully flushed.

Note on short overall lengths

Use a screwdriver/metal rod (Ø max. 5.2mm) or similar tool to hold the short overall lengths (110mm – 145mm) when tightening the screw connections.



Segment test / Firmware version:

The segment test will be carried out every 5 minutes. If required, the segment test can be called up via the menu level using a smartphone with activated NFC function. The firmware version can also be read out via NFC interface if required and is displayed in the NFC tag.

Consumption value:

- DN15 to DN50, 9-digit, with 3 digits after the decimal place
- The number of decimal places may vary depending on the unit, in the case of m³, 3 decimal places are shown.
- Leading zeros (pre-decimal positions) of the consumption display are not displayed at the start (display 0.000 or 0.00). These are increased after reaching the respective volume.
- In the event of an overrun, all leading zeros are displayed in the consumption display (display 0.000).
- The actual consumption is fully recorded in the internal memory and can be retrieved via the NFC interface.
- Unit of consumption display: m³ (for the Gal and CF display units, as well as the x10 or x100 factors, this involves factory-preset programmable country-specific units / factors).

Attention! If the upper measuring limit is exceeded, the flow rate display is deactivated and FOR = Flow Out of Range is displayed.

While the flow rate is exceeded, the consumption progress is not registered. The last overload message is stored in the error memory as undersized detection.

Data logger

The unit has an extensive data logger.

The data logger is read out using the Android app B.One Device Manager. The file format can be selected as PDF or CSV.

Status information / Smart functions / Alarms

The IUW / IUWS B.One meter series has smart functions. This means that the meter can detect certain conditions and display warnings or device status information. The warnings or device status information can be sent by radio, but can also be shown on the display.

The following smart functions with associated numeration can be shown on the display:

Leakage	SF01	Burst	SF06
ReverseInstallation	SF02	Dry	SF07
BatteryWarning	SF03	Frost	SF08
Oversized	SF04	Backflow	SF09
Undersized	SF05	NoConsumption	SF10

The SFxx system info text is automatically deleted from the main view after 7 days.

In the case of an active LoRaWAN® communication scenario, a related radio packet is sent via LoRaWAN® each time a smart meter function triggers a warning. If the wM-Bus scenario is active, the device status information (e.g. device error, battery warning) is sent in the header of the radio telegram.

Disposal

This device contains a non-removable and non-rechargeable lithium battery. Batteries contain substances, which could harm the environment and might endanger human health if not disposed of properly. To reduce the disposal quantity so as unavoidable pollutants from electrical and electronic equipment in waste, old equipment should be reused prior or materials recycled or reused as another form. This is only possible if old equipment, batteries, other accessories and packaging of the products are returned to the manufacturer or handed in at recycling centres. Our business processes tend to make provisions for us or specialist companies authorised by us to collect and properly dispose of used equipment, including batteries, other accessories and packaging materials, after it has been replaced or at the end of its service life. Insofar as no other contractual arrangement has been made in this respect, your local or municipal authority or the local waste disposal company can give you information relating the collection points for your used equipments. ZENNER will always ensure correct disposal.

Attention

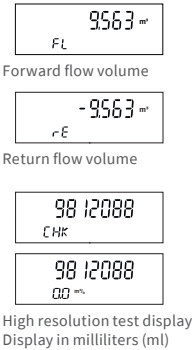
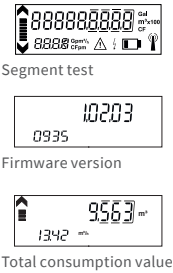
Do not dispose of the devices with domestic waste. In this way, you will help to protect natural resources and to promote the sustainable reuse of material resources.



For any question, please contact info@zenner.com

The latest information on this product and the current version of these instructions can be found at www.zenner.com

Menu display

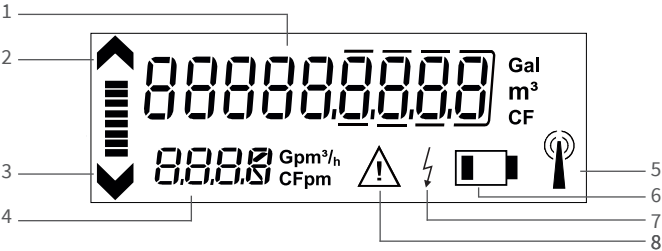


With an NFC-enabled end device (smartphone or tablet) and the B.One Device Manager app installed on it, the following (non-editable) menu displays can be called up. Bring the NFC device close to the NFC interface and remove it again. With each new contact, the next display appears. After the last display, the display returns back to the main display at the next contact.

Segment test / Firmware version:

The segment test will be carried out every 5 minutes and after then the firmware version is displayed. After then the display returns to the main display. The segment test and firmware version can be also queried via the menu level.

Display description



- Consumption with unit m³:
 - for nominal diameters DN15-DN50: 6 digits before/3 after the decimal point
 - for DN50-DN125: 6 digits before/3 after the decimal point
 - for DN150-DN300: 7 digits before/2 after the decimal point
- Flow direction display in forward flow direction
- Flow direction display in return flow direction
- 4-digit flow rate display, unit in m³/h;
with automatic point shifting;
the flow rate display is updated every 2 seconds
- Data transfer display: Symbols for displaying the join status with LoRaWAN® or the wireless M-Bus radio status.
- Battery lifetime display: Symbol is activated 15 months prior to fully discharged battery.
- External power supply: Symbol is activated briefly once an NDC communication module is switched on via the NFC interface
- Indication of alarm or error messages (those are saved in the data logger and can be read out via the NFC interface)

Data transfer display

Status of the radio symbol in the LCD display	IUWS B.One with integrated LoRaWAN® interface (Communication Scenario 2xx)	IUWS B.One with integrated wM-Bus interface (Communication Scenario 3xx)	IUWS B.One with attached external NDC radio module
No symbol	Radio off	The status of the symbol (visible or not visible) does not initially provide any information about the operating mode of the device	Radio off or NDC radio module not yet discovered
	Radio on, but not yet joined to LoRa network or LoRa network join failed	<N/A>	(only in case of LoRa) radio on, but not yet joined to LoRa network or LoRa network join failed
	LoRa network join request was sent, accept not yet received	wM-Bus packet is being transmitted	<N/A>
	LoRa network joined	<N/A>	LoRa network joined

Technical data LoRaWAN® radio interface

Operating frequency	868 MHz
Max. Transmission power	approx. 14 dBm, 25 mW
Duration of transmission telegrams	up to 1.5 s (depending on spreading factor)
Sending interval	dependent on the respective meter configuration, e.g. daily; optional: monthly or 8 telegrams with three hourly values each
Data transmission procedure	LoRaWAN® class A (bi-directional communication)
Encryption of radio protocols	yes
Error detection	CRC
Battery status monitoring	yes
CE conformity	according to directive 2014/53/EU (RED)
Activation of the radio interface	• automatically after the meter has been filled with water (>10s); • via the NFC interface using the corresponding ZENNER NFC coupler, MinoConnectUSB and the MSS configuration software • via the NFC interface using the Android app B.One Device Manager

LoRaWAN® radio interface

Protocol contents general	Interval
Serial number (DevEUI)	one-time upon registration in the LoRaWAN® network
Device-specific information (Firmware version, LoRaWAN version, device type)	six-monthly
Changes of status (manipulation, battery warning, ...)	event-driven

Scenario No.	Protocol content	Interval
Scenario 201 (monthly)	Monthly value (previous month) [liter], status information, actual date and time	monthly (beginning)
	Monthly value (previous month) [liter], mid-month value [liter], actual date and time	monthly (middle)
	Key value and Key date [01.01.]	annually on the key date
Scenario 202 (daily)	Daily value (previous day) [liter]	daily
	Status information, actual date and time	monthly
	Key value and Key date [01.01.]	annually on the key date
Scenario 203 (every 3 hours)	3-hour values [litre]	8 x per day
	Status information, actual date and time	monthly
	Device-specific information (Firmware version, LoRaWAN® version, device type)	six-monthly
	Device-specific information (manufacturer, fabrication number, VIF/VIFE)	once at join
Scenario 204 (hourly)	Hourly value [litre]	hourly
	Status information, actual date and time	monthly
	Device-specific information (Firmware version, LoRaWAN® version, device type)	six-monthly
	Device-specific information (manufacturer, fabrication number, VIF/VIFE)	once at join

Technical data wireless M-Bus interface

Operating frequency	868 MHz
Transmission power	approx. 14 dBm, 25 mW
Duration of transmission telegram	approx. 10-15 ms
Sending interval	Depending on meter configuration
Data transmission procedure	Wireless M-Bus (standard C1 mode)
Encryption of radio protocols	Depending on the meter configuration; Standard Security Profile A, Encryption Mode 5; Security profile B, mode 7 on request
Error detection CRC	CRC
Battery status monitoring	yes
CE conformity	according to directive 2014/53/EU (RED)
Activation of the radio interface	• automatically after the meter has been filled with water (>10s); • via the NFC interface using the corresponding ZENNER NFC coupler, MinoConnectUSB and the MSS configuration software • via the NFC interface using the Android app B.One Device Manager

The selection of possible wireless M-Bus

Scenario No.:	312	313	318*	319* (OMS)	321	324* (OMS)	329 (OMS)	342
Frequency (MHz)	868	868	868	868	868	868	868	868
Sending interval	120 s	20 s	300 s	432 s	20 s	20 s	20s	20s
Telegram content:								
Current value			✓	✓	✓	✓	✓	✓
Current date	✓	✓						
Actual date and time					✓	✓	✓	✓
Daily value (00:00 h)	✓	✓						
Key date values	✓	✓			✓	✓	✓	✓
Key date								
Date of previous month	✓						✓	✓
Monthly value of previous month	✓	✓			✓	✓	✓	✓
Another 11 previous month's value	✓						✓	✓
Status information	✓	✓	✓	✓	✓	✓	✓	✓
Medium temperature								✓
Ambient temperature								✓
wM-Bus mode	C1	C1	C1	C1	C1	C1	C1	C1
Encryption mode	5	5	7	7	5	7	5	5

* suitable for connection to an SMGW (Smart Meter Gateway)

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