

# IUWS

## Ultrasonic apartment / domestic water meter for cold water

The IUWS ultrasonic water meter guarantees reliable recording of the meter data for individual consumption billing in the residential or domestic water sector.

The IUWS is equipped with a 9-digit LCD display. The integrated radio interface is preset at the factory to wireless M-Bus (OMS) or LoRaWAN®. If required, this can also be changed at a later date.

All variants are approved for any installation and are therefore also available in the usual lengths for riser and down-pipe installation. A head-down mounting is also possible. All materials, which are used in the drinking water section, comply with the required standards, guidelines and the current German drinking water approval (other country specific drinking water approvals on request).



### Performance characteristics at a glance

- Switchable radio technology
- Highest precision and reliability even in case of low flow rates
- Protection class IP68
- Insensitive to deposits and particles
- No straight inlet or outlet needed (U0/D0) according to OIML R49 and DIN EN ISO 4064
- Electronic, battery powered LCD register with NFC interface
- Smart Metering functions
- Alarm and statistic functions
- Galvanically separated NFC interface
- Battery life up to 15 years (depending on configuration and environmental conditions)
- Approved in accordance with MID (2014/32/EU)
- OMS certification for BSI-compliant smart meter gateway connection
- Plug and play detection of radio technology via NDC radio module
- Configuration-App

### Applications

- For consumption measuring of drinking water and unpolluted service water up to 50 °C

### AMR options

- Integrated wM-Bus or LoRaWAN® radio interface
- NFC interface (=Near Field Data Capture) for connecting an external NDC module and for device configuration

### Readout options of the measuring device via the NFC interface (Near Field Communication)

- Measuring instrument ID (serial number)
- Current (balanced) consumption display or Total volume in case of an overflow
- Date / Time
- Firmware version
- Up to 15 previous month's values
- Temperature
- Key date / Key date volume
- Forward flow volume / Return flow volume
- Alarms or error messages
- Battery end

Technical data							
Permanent Flowrate	Q <sub>3</sub>	m <sup>3</sup> /h	1.6	1.6	2.5	2.5	2.5
Attainable measuring range	Q <sub>3</sub> /Q <sub>1</sub>	R	315	315	500	500	315
Standard measuring range <sup>1</sup>	Q <sub>3</sub> /Q <sub>1</sub>	R	250	250	250	250	250
Overload Flowrate	Q <sub>4</sub>	m <sup>3</sup> /h	2.00	2.00	3.13	3.13	3.13
Minimum flowrate <sup>2</sup>	Q <sub>1</sub>	l/h	6.40	6.40	10.00	10.00	10.00
Transitional Flowrate <sup>2</sup>	Q <sub>2</sub>	l/h	10.24	10.24	16.00	16.00	16.00
Lower measuring limit	-	l/h	2.0	2.0	2.0	2.0	2.0
Upper measuring limit	-	m <sup>3</sup> /h	5.7	5.7	5.7	5.7	5.7
Display range	min	l	1	1	1	1	1
	max	m <sup>3</sup>	999,999.999	999,999.999	999,999.999	999,999.999	999,999.999
Temperature range	-	°C	0.1 - 50	0.1 - 50	0.1 - 50	0.1 - 50	0.1 - 50
Operating pressure	MAP	bar	0.3 - 16	0.3 - 16	0.3 - 16	0.3 - 16	0.3 - 16
Pressure loss class at Q <sub>3</sub>	Δp	bar	0.1	0.1	0.25	0.25	0.25
Mechanical environmental condition	-	-	M1	M1	M1	M1	M1
Elektromagnetic ambient class	-	-	E1	E1	E1	E1	E1
Climatic ambient conditions <sup>3</sup>	-	°C	5 - 55	5 - 55	5 - 55	5 - 55	5 - 55
Flow profile sensitivity	-	-	U0/D0	U0/D0	U0/D0	U0/D0	U0/D0

**Dimensions and weights:**

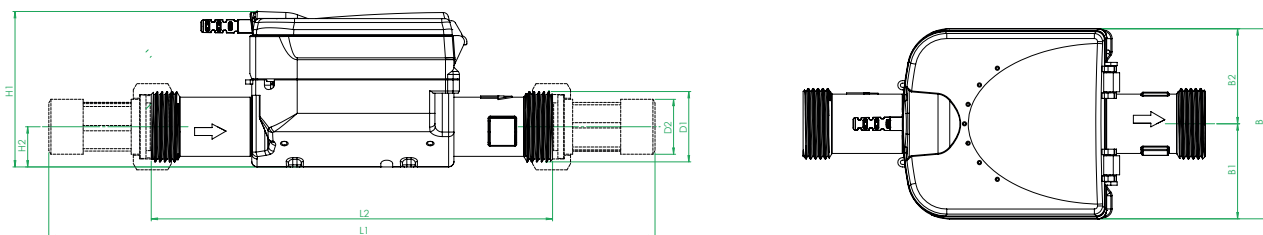
Nominal diameter	DN	mm	15	15	15	15	20
		inch	1/2"	1/2"	1/2"	1/2"	3/4"
Overall length without connectors <sup>1</sup>	L2	mm	110/115	145/165/ 170/190	110/115	145/165/ 170/190	130/160/ 165/190
Overall length with connectors approx.	L1	mm	190/195	225/245/ 250/270	190/195	225/245/ 250/270	226/256/ 261/286
Thread meter G x B	D1	inch	3/4"	3/4"	3/4"	3/4"	1"
Thread connector R x	D2	inch	1/2"	1/2"	1/2"	1/2"	3/4"
Width	B	mm	98.00	98.00	98.00	98.00	98.00
Width	B1	mm	53.00	53.00	53.00	53.00	53.00
Width	B2	mm	45.00	45.00	45.00	45.00	45.00
Height (total)	H1	mm	80.00	80.00	80.00	80.00	80.00
Height	H2	mm	25.30	25.30	25.30	25.30	25.30
Weight approx.	-	kg	0.80/0.81	0.90/0.85/ 0.86/0.90	0.80/0.81	0.90/0.85/ 0.86/0.90	0.80/0.84 0.85/0.90

<sup>1</sup> Other measuring ranges and overall lengths on request

<sup>2</sup> The data refer to the standard measuring range

<sup>3</sup> Condensation possible

Attention: not all versions are available in all markets



**Technical data**

Permanent Flowrate	Q <sub>3</sub>	m <sup>3</sup> /h	4	4	4	6.3	10
Attainable measuring range	Q <sub>3</sub> /Q <sub>1</sub>	R	400	500	315	500	800
Standard measuring range <sup>1</sup>	Q <sub>3</sub> /Q <sub>1</sub>	R	250	250	250	250	250
Overload Flowrate	Q <sub>4</sub>	m <sup>3</sup> /h	5.00	5.00	5.00	7.88	12.50
Minimum flowrate <sup>2</sup>	Q <sub>1</sub>	l/h	16.00	16.00	16.00	25.20	40.00
Transitional Flowrate <sup>2</sup>	Q <sub>2</sub>	l/h	25.60	25.60	25.60	40.32	64.00
Lower measuring limit	-	l/h	5.1	3.2	3.2	5.1	5.1
Upper measuring limit	-	m <sup>3</sup> /h	5.7	8.0	8.0	13.8	13.8
Display range	min	l	1	1	1	1	1
	max	m <sup>3</sup>	999,999.999	999,999.999	999,999.999	999,999.999	999,999.999
Temperature range	-	°C	0.1 - 50	0.1 - 50	0.1 - 50	0.1 - 50	0.1 - 50
Operating pressure	MAP	bar	0.3 - 16	0.3 - 16	0.3 - 16	0.3 - 16	0.3 - 16
Pressure loss class at Q <sub>3</sub>	Δp	bar	0.4	0.25	0.16	0.16	0.25
Mechanical environmental condition	-	-	M1	M1	M1	M1	M1
Elektromagnetic ambient class	-	-	E1	E1	E1	E1	E1
Climatic ambient conditions <sup>3</sup>	-	°C	5 - 55	5 - 55	5 - 55	5 - 55	5 - 55
Flow profile sensitivity	-	-	U0/D0	U0/D0	U0/D0	U0/D0	U0/D0

**Dimensions and weights:**

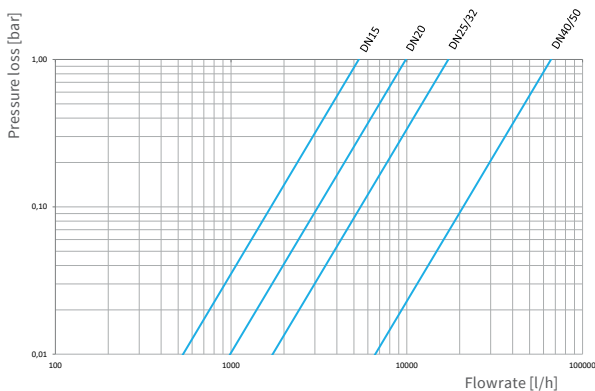
Nominal diameter	DN	mm	20	20	25	25	25
		inch	3/4"	3/4"	1"	1"	1"
Overall length without connectors <sup>1</sup>	L2	mm	105	130/160/ 165/190	175	150/260	175
Overall length with connectors approx.	L1	mm	201	226/256/ 261/286	293	268/378	293
Thread meter G x B	D1	inch	1"	1"	1 1/4"	1 1/4"	1 1/4"
Thread connector R x	D2	inch	3/4"	3/4"	1"	1"	1"
Width	B	mm	98.00	98.00	98.20	98.20	98.20
Width	B1	mm	53.00	53.00	56.00	56.00	56.00
Width	B2	mm	45.00	45.00	42.20	42.20	42.20
Height (total)	H1	mm	80.00	80.00	80.00	80.00	80.00
Height	H2	mm	25.30	25.30	22.70	22.70	22.70
Weight approx.	-	kg	0.75	0.80/0.84/ 0.85/0.90	0.87	1.0/1.30	0.87

<sup>1</sup> Other measuring ranges and overall lengths on request

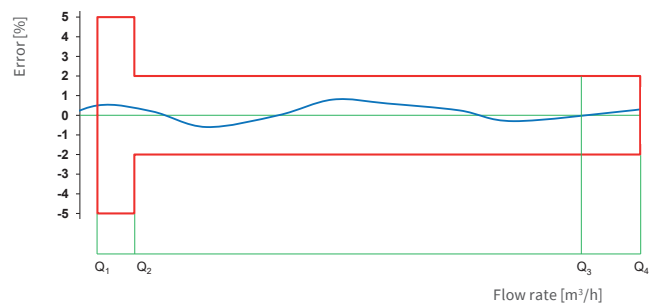
<sup>2</sup> The data refer to the standard measuring range

<sup>3</sup> Condensation possible

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Typical pressure loss curve



Typical error curve

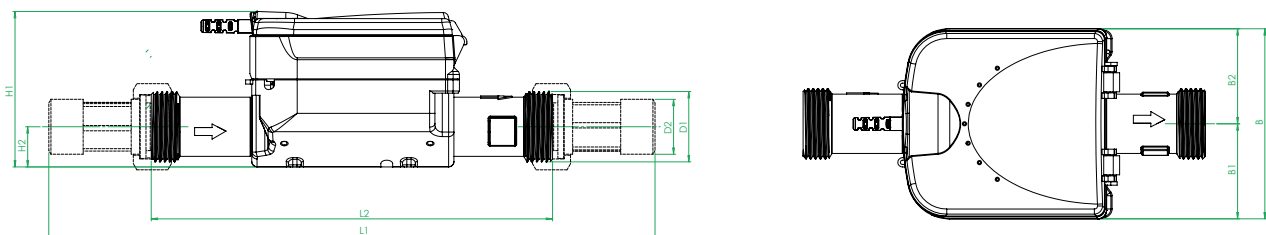
**Technical data**

Permanent Flowrate	Q <sub>3</sub>	m <sup>3</sup> /h	10	10	16	25
Attainable measuring range	Q <sub>3</sub> /Q <sub>1</sub>	R	800	800	500	800
Standard measuring range <sup>1</sup>	Q <sub>3</sub> /Q <sub>1</sub>	R	250	250	250	250
Overload Flowrate	Q <sub>4</sub>	m <sup>3</sup> /h	12.50	12.50	20.00	31.25
Minimum flowrate <sup>2</sup>	Q <sub>1</sub>	l/h	40.00	40.00	64.00	100.00
Transitional Flowrate <sup>2</sup>	Q <sub>2</sub>	l/h	64.00	64.00	102.40	160.00
Lower measuring limit	-	l/h	5.1	5.1	13.0	20.0
Upper measuring limit	-	m <sup>3</sup> /h	13.8	13.8	27.3	34.5
Display range	min	l	1	1	1	1
	max	m <sup>3</sup>	999,999.999	999,999.999	999,999.999	999,999.999
Temperature range	-	°C	0.1 - 50	0.1 - 50	0.1 - 50	0.1 - 50
Operating pressure	MAP	bar	0.3 - 16	0.3 - 16	0.3 - 16	0.3 - 16
Pressure loss class at Q <sub>3</sub>	Δp	bar	0.25	0.25	0.1	0.25
Mechanical environmental condition	-	-	M1	M1	M1	M1
Elektromagnetic ambient class	-	-	E1	E1	E1	E1
Climatic ambient conditions <sup>3</sup>	-	°C	5 - 55	5 - 55	5 - 55	5 - 55
Flow profile sensitivity	-	-	U0/D0	U0/D0	U0/D0	U0/D0

**Dimensions and weights:**

Nominal diameter	DN	mm	25	32	40	50
		inch	1"	1 1/4"	1 1/2"	2"
Overall length without connectors <sup>1</sup>	L2	mm	150/260	260	150/200/300	300
Overall length with connectors approx.	L1	mm	268/378	384	278/328/428	444
Thread meter G x B	D1	inch	1 1/4"	1 1/2"	2"	2 1/2"
Thread connector R x	D2	inch	1"	1 1/4"	1 1/2"	2"
Width	B	mm	98.20	98.20	116.40	116.40
Width	B1	mm	56.00	56.00	63.80	63.80
Width	B2	mm	42.20	42.20	52.60	52.60
Height (total)	H1	mm	80.00	81.20	93.20	101.00
Height	H2	mm	22.70	23.90	29.80	37.60
Weight approx.	-	kg	1.0/1.30	1.40	1.30/1.50/1.90	2.30

<sup>1</sup> Other measuring ranges and overall lengths on request  
<sup>2</sup> The data refer to the standard measuring range  
<sup>3</sup> Condensation possible  
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Dimensions

**Technical data**

Permanent Flowrate	Q <sub>3</sub>	m <sup>3</sup> /h	16	25
Attainable measuring range	Q <sub>3</sub> /Q <sub>1</sub>	R	500	800
Standard measuring range <sup>1</sup>	Q <sub>3</sub> /Q <sub>1</sub>	R	250	250
Overload Flowrate	Q <sub>4</sub>	m <sup>3</sup> /h	20.00	31.25
Minimum flowrate <sup>2</sup>	Q <sub>1</sub>	l/h	64.00	100.00
Transitional Flowrate <sup>2</sup>	Q <sub>2</sub>	l/h	102.40	160.00
Lower measuring limit	-	l/h	13.0	20.0
Upper measuring limit	-	m <sup>3</sup> /h	27.3	34.5
Display range	min	l	1	1
	max	m <sup>3</sup>	999,999.999	999,999.999
Temperature range	-	°C	0.1 - 50	0.1 - 50
Operating pressure	MAP	bar	0.3 - 16	0.3 - 16
Pressure loss class at Q <sub>3</sub>	Δp	bar	0.1	0.25
Mechanical environmental condition	-	-	M1	M1
Elektromagnetic ambient class	-	-	E1	E1
Climatic ambient conditions <sup>3</sup>	-	°C	5 - 55	5 - 55
Flow profile sensitivity	-	-	U0/D0	U0/D0

**Dimensions and weights:**

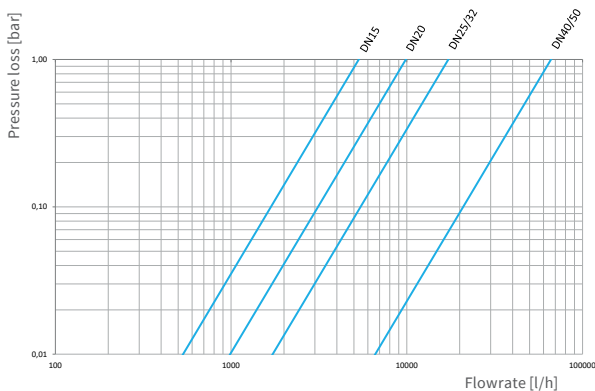
Nominal diameter	DN	mm	40	50
		inch	1 1/2"	2"
Overall length without connectors <sup>1</sup>	L2	mm	270 FL 4	270 FL 4
Overall length with connectors approx.	L1	mm	-	-
Thread meter G x B	D1	inch	-	-
Thread connector R x	D2	inch	-	-
Width	B	mm	124.80	128
Width	B1	mm	63.80	64
Width	B2	mm	61.00	64
Height (total)	H1	mm	125.70	128.7
Height	H2	mm	61	64
Weight approx.	-	kg	4.65	5.7
Flange diameter			150	165
Bolt circle diameter			110	125
Number of bolts			4	4
Bolt size			M16	M16
Bolt diameter			19	19

<sup>1</sup> Other measuring ranges and overall lengths on request

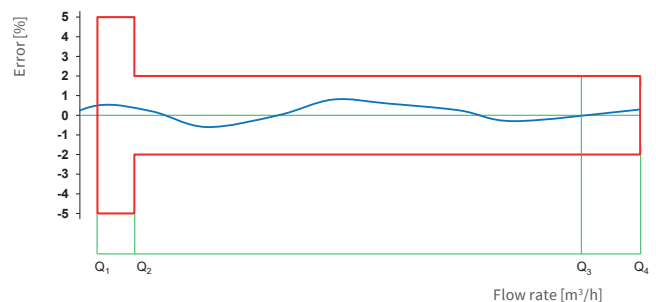
<sup>2</sup> The data refer to the standard measuring range

<sup>3</sup> Condensation possible

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Typical pressure loss curve



Typical error curve

## IUWS / Technical data LoRaWAN® radio interface

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)
Transmission interval	depending on the respective meter configuration, e.g. every day; 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 associated ZENNER opto head, MinoConnect and the MSS configuration software - via the NFC interface using the Android app ZENNER Device Manager Basic

### LoRaWAN® radio telegram

Protocol contents general	Interval
Serial number (DevEUI)	once when logging into the LoRaWAN® network
Device-specific information (firmware version, LoRaWAN®-version, device type)	six-monthly
Changes of status (manipulation, battery warning,...)	event-driven

### Scenario 201 (monthly)

Protocol content	Interval
Monthly value (previous month) [liter], status information, actual date and time	monthly (beginning)
Monthly value (previous month) [liter], mid-month value, actual date and time	monthly (middle)
Due date value and date [01.01.]	every year on due date

### Scenario 202 (daily)

Protocol content	Interval
Daily values (previous day) [liter]	daily
Status information, actual date and time	monthly
Due date value and date [01.01.]	every year on due date

### Scenario 203 (every 3 hours)

Protocol content	Interval
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)

Protocol content	Interval
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

## IUWS / Technical data wireless M-Bus-radio module

Technical data wireless M-Bus-radio module	
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	<ul style="list-style-type: none"> <li>- automatically after the meter has been filled with water (&gt; 10s);</li> <li>- via the NFC interface using the associated ZENNER opto head, MinoConnect and the MSS configuration software</li> <li>- via the NFC interface using the Android app ZENNER Device Manager Basic</li> </ul>

### wireless M-Bus radio telegram

#### Possible sending scenarios and related telegram content

Scenario No.:	312	313	318*	319* (OMS)	321	324* (OMS)	329 (OMS)
Frequency (MHz)	868	868	868	868	868	868	868
Transmission interval	120 s	20 s	300 s	432 s	20 s	20 s	20s
Radio pause	---	---	---	---	---	---	---

Telegram content							
Current value			x	x	x	x	x
Current date	x	x					
Actual date and time					x	x	x
Daily value (00:00 h)	x	x					
Due date value	x	x			x	x	
Due date	---	---	---	---	---	---	---
Date of previous month	x						x
Monthly value of the previous month	x	x			x	x	x
Monthly value -2	x						x
Monthly value -3	x						x
Monthly value -4	x						x
Monthly value -5	x						x
Monthly value -6	x						x
Monthly value -7	x						x
Monthly value -8	x						x
Monthly value -9	x						x
Monthly value -10	x						x
Monthly value -11	x						x
Monthly value -1	x						x
Monthly value -13							
Monthly value -14							
Monthly value -15							
Status information	x	x	x	x	x	x	x
wM-Bus mode	C1	C1	C1	C1	C1	C1	C1
Encryption mode	5	5	7	7	5	7	5

\* Suitable for connection to an SMGW (Smart Meter Gateway)

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