Ultrimis

Ultrasonic water meter
DN15-DN50

Ultrimis, a state-of-the-art ultrasonic water meter with the latest patented design features the W-Sonic Technology, a unique metering method. The W-Sonic Technology enables meter readings in the R800 range with the starting flow already from 0.75 l/h.
The water meter is designed and manufactured to the highest quality standards. The water meter is rated at IP68 and with a high resistance to hydraulic shock and magnetic interference. The measurement chamber is designed to provide the water meter with insensitivity to hydraulic shock. The ultrasonic measurement technology of the water meter is completely impervious to interference from magnetic fields.

APPLICATION

Water supply systems with the maximum cold water temperature of 50°C and the maximum hot water temperature of 70°C, requiring reliable water consumption metering and reliable data communication methods, including remote meter reading over NFC, WM-Bus or LoRaWAN. The water meter can be installed in any orientation and does not require upstream and downstream sections of straight piping.

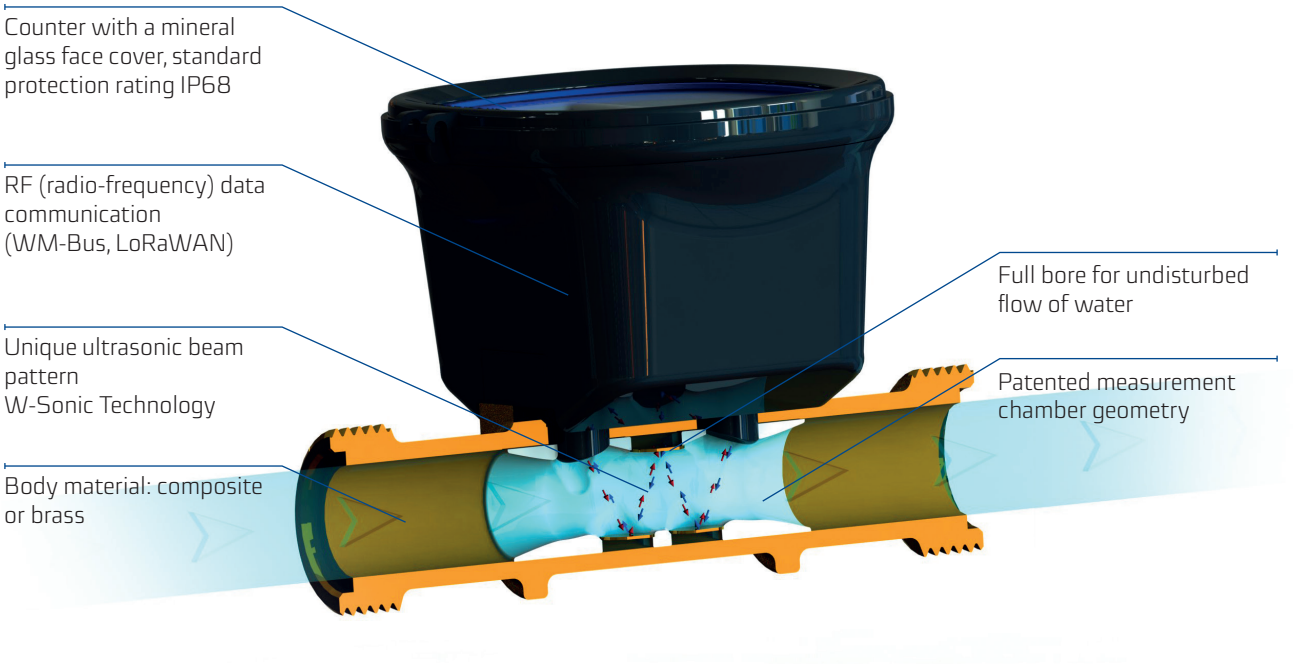
water&heat

DVGW CERT
DW-4715CU0111

LoRaWAN CERTIFIED

SONIC TECHNOLOGY

Ultrimis



ADVANTAGES

Provides savings

- High-precision measurement **improves efficiency** of water use: the water meter can detect all leaks in the supply system
- **No moving** parts for a high resistance to fouling: cost-free inspection and maintenance
- No upstream or downstream **straight sections** of piping required
- **Compact size** for easy installation in confined spaces
- Robust design and **minimum electrical power demand** for a stable, long-term operation
- A wide **measurement range** with immunity to electrical conductivity of metered water (as required for electromagnetic water meter systems)
- Extremely **low pressure loss** (and low resistance to flow)

Convenient in operation

- Standard **IP68**-rated hermetically sealed body
- **No risk of physical wear** of the measurement chamber components during continuous operation, even at high flow rates
- MAP - **16 bar**
- Body material - **brass** or **composite**
- **Resistant** to strong **magnetic fields**
- Resistant to **hydraulic shock**
- Highly resistant to overload flow rate - Q_4

Measurement accuracy

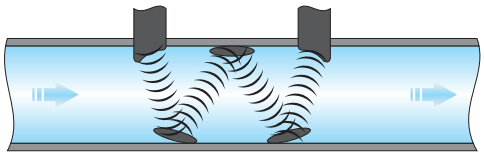
- Optimized measurement range: up to **R800** in every operating orientation (**H**, **V**, and **H/V**)
- Starting flow already from **0.75 l/h**
- **Stable** measurement system performance by insensitivity to fouling
- Back flow **measurement** enabled by a symmetrical structure and the applied measurement algorithms

Environmentally friendly

- Extremely **low power usage** when in operation
- Very low lithium content: **Li < 1.5 g**
- Maximum design battery life of 16 years (depending on the configuration and environmental conditions)
- Low energy output at the water supply side (the unit pressure drop across the water meter is **0.17 bar** at DN40 for Q_3)
- A measurement range up to R800 is also available for the water meter installation length **L = 80 mm**
- **Very low weight**: low costs of transport
- Low carbon footprint

Innovative

The Ultrimis water meter features a unique measurement system: it emits an ultrasonic beam across the measurement chamber, which results in steady indications and errors in the whole measurement range. This is the W-Sonic Technology which includes distinctive characteristics:



SONIC TECHNOLOGY

- With its unique ultrasonic beam pattern, the Ultrimis can be much more compact than other ultrasonic metering systems
- The full-bore design does not entrap any fouling or solids
- Insensitive to measurement bias from water contamination
- Sophisticated control algorithms of the ultrasonic beam system provide compensation for component ageing
- Requires no filters or check valves

REGULATORY AND STANDARD COMPLIANCE

- Directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments
- Polish Act of 13 April 2016 on conformity assessment and market control systems
- EN-ISO 4064-1 to 5:2014(E) – Water meters for cold potable water and hot water
- OIML R49:2013 – Water meters for cold potable water and hot water
- EC Type Test Certificate TCM 142/16-5405 for cold and hot water applications
- Classification of climate and environmental requirements – Class B (EN-ISO 4064:2014)
- Classification of environmental and mechanical requirements – Class M1 (Directive 2014/32/EU of 26 February 2014)
- Classification of environmental and electromagnetic requirements – Class E1, E2 (EN-ISO 4064:2014; Directive 2014/32/EU of 26 February 2014)s
- PZH (NIH) approval (all materials of the Ultrimis ultrasonic water meter have the appropriate Hygiene Approvals for contact with potable water)
- Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC
- WELMEC 7.2 edition 5
- WRAS certified
- KIWA U certified
- DVGW certified
- IP68 body proof testing
- OMS compliant - DVGW certified
- LoRaWAN Specification Version V1.0.4 compliance certificate

UL2,5-01
DN15, L80
DN15, L110

UL4-01
DN20, L130
DN20, L105

UL2,5
DN15, L80
DN15, L110
DN15, L115
DN15, L165

UL4
DN20, L130
DN20, L105
DN20, L115
DN20, L190

Communication

- Water meter data reading over NFC (Near Field Communication)
- RF (radio-frequency) reading of indications compatible with WM-Bus
- RF indication reading for walk-by and drive-by reading systems and stationary reading systems without any reconfiguration required
- Secondary verification at any suitable location with the Testbox module and a dedicated application

NFC CONFIGURATION

The Ultrimis water meters feature standard NFC data communication which enables configuration of the operating mode, reading of actual parameter values of the instrument and downloading the historical indications of statuses and errors (even at a low battery voltage or meter failure).

Developed specifically for the Ultrimis water meter, the data communication interface includes a dedicated SPIDAP application and the Testbox module. The data communication interface enables re-verification by secondary verification operators SPIDAP.

The data logger supported by NFC enables modification of the interval and range of data logging.
The data logging interval can be configured from 12 minutes to 45 days. One of the 10 predefined data acquisition sets can also be selected.
Depending on the data acquisition set selected, up to 800 unique records can be stored. The data acquired can drive histograms to evaluate whether the water meter has been specified correctly for its actual application.

UL6,3
DN25, L260
DN25, L165

UL10 - DN32, L260
UL16 - DN40, L300

UL25 - DN50, L200
UL25 - DN50, L270
UL25 - DN50, L300

RF READING

The water meter has an integrated RF data communication module for easy and efficient remote data reading in walk-by, drive-by and stationary reading systems.

The WM-Bus data connectivity enables reading of the following data:

- Water meter indications (from a logged month of choice and at the time of reading)
- Reverse volume (at the time of the reading)
- Events/alarms (from a logged month of choice, the current month, and at the time of reading), including:
  - Reverse flow
  - Low flow
  - High flow
  - No water
  - Low battery
  - Tampering detected
  - Temperature limit violation
  - Zero flow

Wireless M-Bus + LoRaWAN

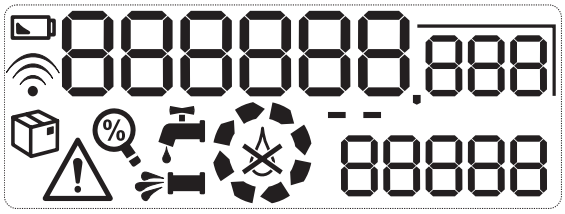
The Ultrimis LoRaWAN + WM-Bus water meter versions are intended for stationary reading systems. They facilitate default data communication over LoRaWAN with a long range and a low power consumption. If there is no LoRaWAN service, the water meter automatically switches over to WM-Bus communication. One of the following data communication methods can also be configured for permanent use:

- LoRaWAN only
- WM-Bus only
- Hybrid – LoRaWAN is default; if there is no LoRaWAN service, WM-Bus is automatically switched to.

The LoRaWAN communication is divided into two areas:

- Standard data communication, each with an RF data frame output every 7 hours and holding the data from the previous 14 hours
- Emergency data communication is triggered instantly when a predefined event emerges.

LCD DISPLAY FUNCTIONS



Water meter indication in m^3

Water meter indication in dm^3

Actual flow (water meter primed with water)
Software version number and CRC* (no water detected)

Low battery

RF transmission on

Shipping mode
Shipping mode disabled when the minimum flow rate detected is:
5L at DN15; 8L at DN20; 12.6L at DN25; 20L at DN32; 32L at DN40;
50L at DN50; or disabled on command via NFC

Tampering detected

Test mode

Back flow
Alarm triggered after > 45 s of back flow time
The flow direction indicator is animated clockwise.

Water meter leak
Alarm trigger: flow > 0.3 x Q_2 for 240 min

Water main leak (bypass flow)
Alarm trigger: flow > Q_4 for 30 s

Animated water flow direction indicator
The flow direction indicator is animated clockwise.

No water
Alarm triggered after 30 s

Metering online

Zero flow
Alarm triggered after > 8 s of zero flow
The flow direction indicator is steady.

EVENTS NOT INDICATED ON THE LCD

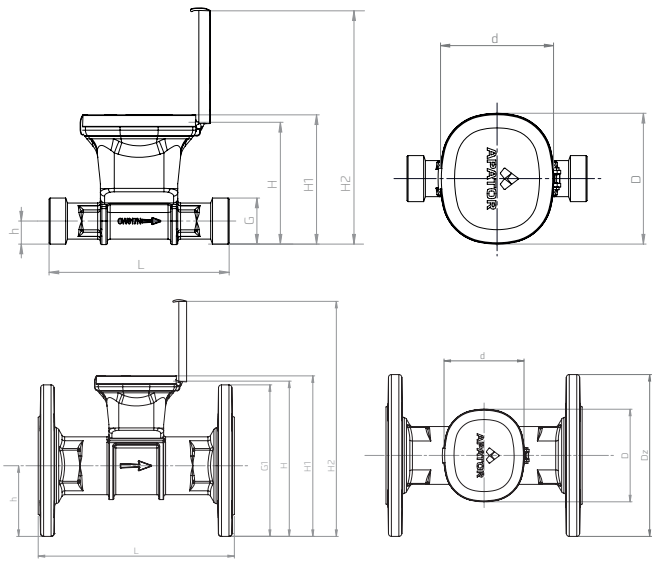
Overtemperature
Switchover
for T50: <2°C or >50°C
for T70: <2°C or >70°C

*) CRC: a control checksum value which verifies if the software source code is correct.

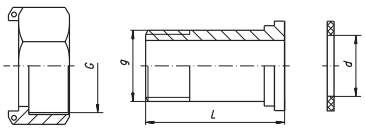
Table 1. Technical specifications

Specification				Ultrimis							
				UL2,5	UL2,5-01	UL4	UL4-01	UL6,3	UL10	UL16	UL25
Nominal diameter		DN	mm	15		20		25	32	40	50
Permanent flow rate		Q_3	m^3/h	2.5		4		6.3	10	16	25
Overload flow rate		Q_4	m^3/h	3.125		5		7.875	12.5	20	31.25
Transitional flow rate		Q_2	dm^3/h	16		25.6		40.32	64	102.4	160
Minimum flow rate		Q_1	dm^3/h	10		16		25.2	40	64	100
Starting flow		–	dm^3/h	0.75		1.2		1.89	3	4.8	12
Measurement range		R	Q_3/Q_1	R250 in standard*							
Range		–	Q_2/Q_1	1.6							
Temperature class (EN and OIML)		–	°C	T30, T50, T70				T30, T50			
Flow profile sensitivity class (EN)		–	–	U0, D0							
Counter indication range		–	m^3	999999							
Scale interval value		–	m^3	0.001							
Maximum permissible error in the range of $Q_2 \le Q \le Q_4$		ε	%	± 2 for cold water T ≤ 30ºC ± 3 for water T > 30ºC							
Maximum permissible error in the range of $Q_1 \le Q < Q_2$		ε	%	± 5							
Battery		–	–	2x integrated 3.6 V DC lithium AA batteries							
RF		–	–	868 MHz up to 25 mW E.R.P. EU868 MHz LoRa up to 25 mW E.R.P. 434 MHz up to 10 mW E.R.P.							
RF communication standard		–	–	OMS-compliant WM-Bus OMS-compliant WM-Bus + LoRaWAN							
Water pressure class	(EN)	–	bar	MAP16							
	(OIML)	–		0.3 to 16							
Pressure loss class at Q_3	(EN)	ΔP	bar	ΔP40 at T30, T50				ΔP40		ΔP40	
				ΔP25 at T70				–		–	
	(OIML)	–		0.4						0.25	
	manufacturer-specified	–		0.25		0.25		0.28	0.26	0.17	0.24
Installation orientation		–	–	H, V, H/V							
Reverse flow (manufacturer-specified)		–	–	Reverse flow metering by design							
Relative humidity		–	%	≤ 100							
IP rating		–	–	IP68							
Water meter body material				brass	composite	brass	composite	brass			
Connection end thread size		G	Inch	¾"; ⅞ -> ¾" **		1"		1 ¼"	1 ½"	2"	flanged ends****
		G1	mm	-							155
Water meter length		L	mm	80	110	80	105	130	105	165	260	300	200; 270; 300
				115	165	110	115	190	130	260			
Height		H	mm	83; 84***		83	88.5			95	102.5	111	158
		H1	mm	88			94			100	107	117	164
		H2	mm	163			169			175	182	192	240
		h	mm	14; 15***		14	17.5			21	25	30.5	72
Counter size		d	mm	87									
		D	mm	94.5									
Flange size		Dz	mm	-									165
Weight		–	kg	0.48	0.52	0.29	0.61	0.63	0.33	1.05	1.68	2.15	6.29; 6.75; 6.95
				0.53	0.6	0.31	0.66	0.77	0.34	1.39			

* Also available with: R400 & R800 for DN15-DN40 water meters; R400 & R500 for DN50 water meters
** Thread size ⅞ -> ¾" available for 115 mm long versions only
*** Applies to thread size ⅞ -> ¾"
**** Also available in a G2 ½ version



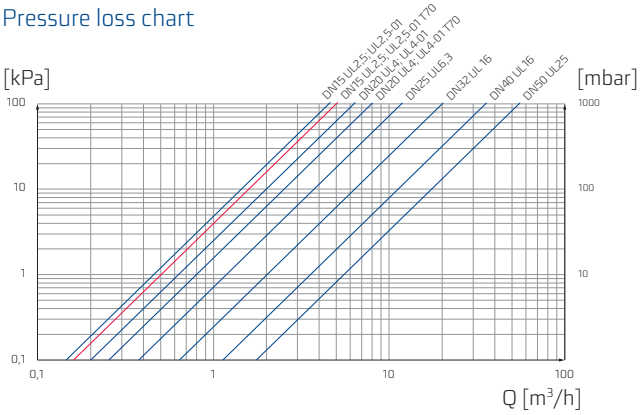
Connection fittings



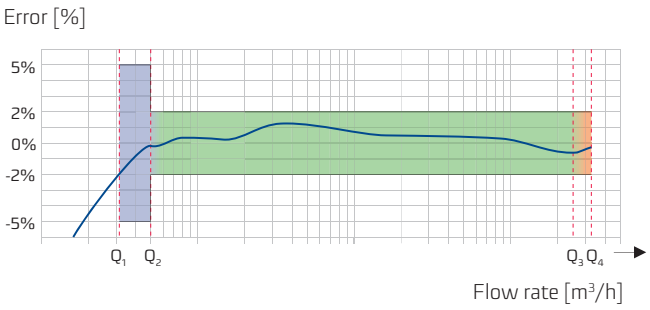
nut connection end gasket

DN	G	g	d	L
	inch	inch	mm	mm
15	¾"	½"	17	37.5
20	1"	¾"	23	45.6
25	1¼"	1"	29	46.5
32	1½"	1¼"	36	56
40	2"	1½"	43	66
50	2½"	2"	54	74.2

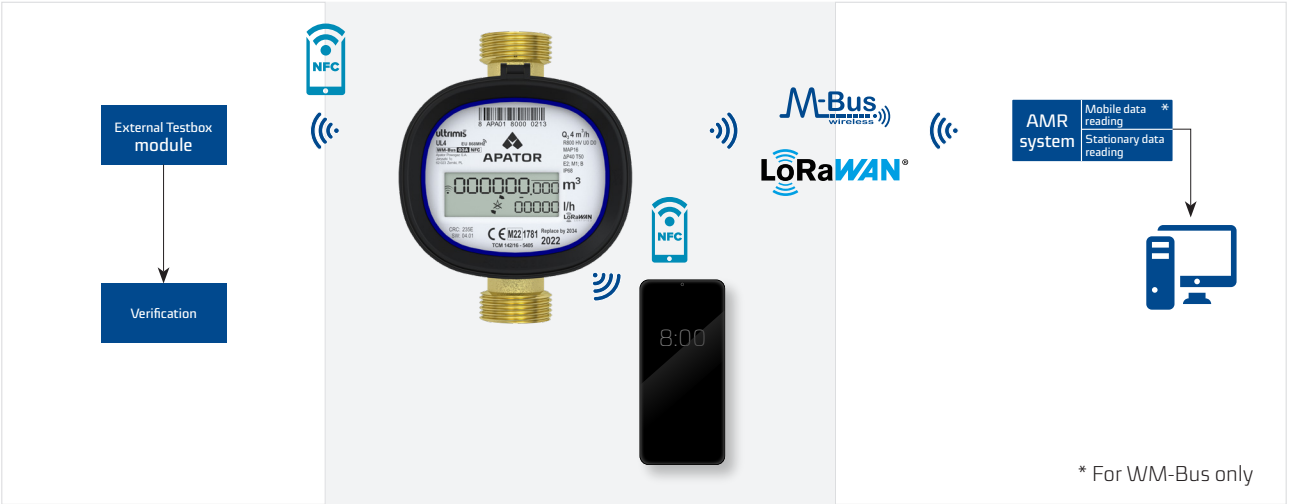
Pressure loss chart



Typical error chart



Installation, configuration and remote reading



Test

Data register reading configuration

Remote reading

Available options:

- Disposable clamps with snap-on seals made of plastic, with unique ID numbers
- Half unions with gaskets
- Water meter brackets
- Testbox
- Bluetooth to RF or USB converter

Apator Powogaz S.A.
Jaryszki 1c, 62-023 Żerniki, Poland
Office: sekretariat.powogaz@apator.com, tel. +48 61 84 18 101

Sales / Customer Service: tel.: +48 61 84 18 149
Customer Service Centre Support: handel.powogaz@apator.com
Export: export.powogaz@apator.com
Technical Support: support.powogaz@apator.com, tel. +48 61 8418 131, 134, 294
Warranty Claims: reklamacje.powogaz@apator.com