kamstrup

Data sheet

flowIQ® 2101

Concentric water meter

- Pinpoint accuracy
- Temperature measurement
- Low start flow
- Long life
- Easy to read
- Environment-friendly
- GDPR ready

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Smart concentric water meter – hermetically sealed, intended for measurement of cold-water consumption in residential, multi-unit buildings and commercial applications

This meter is the first of its kind, being a concentric meter that applies ultrasonic measurement principle.

Pinpoint accuracy
Ultrasonic flow measurement guarantees pinpoint measuring accuracy. The meter has no built-in moving parts and is therefore less sensitive to impurities in the water and to wear and tear. This ensures increased longevity and better performance compared to traditional mechanical meters.

Communication
Integrated data communication 868 MHz Wireless Radio version (RF) for Wireless M-Bus. Using an optical reading head, with USB connection, the optical eye at the meter front, in addition, allows the meter to be configured.

Temperatures
The meter measures both water and ambient temperatures, and saves all registers daily in the meter data logger.

Low start flow
The meter has a low-flow cut-off in only 3.2 l/h which provides accurate measurement also at low water flows.

Long life

The meter is powered by 2 lithium batteries, which provide longevity up to 16 years lifetime.

Easy to read
The meter is fitted with an easily readable LCD-display where measuring units like consumption volume and flow rate, besides several information codes are shown. The codes are shown as pictograms indicating a special condition in the meter.

Environment-friendly
This water meter has of course been approved for drinking Water. Housing and flow parts are made of the synthetic materials PPS and PPO, which means that the meter does not contain lead or other heavy metals.

General description
The meter is a hermetically closed concentric water meter intended for the registration of cold water consumption. It is constructed as a vacuum chamber of molded watertight composite material. Thus, the electronics are fully protected against penetration of water. The meter is intended for installation in boundary boxes, which are frequently filled with water

The water meter has been subject to a very comprehensive set of type tests according to the Measuring Instruments Directive (MID) (performed in accordance with the international OIML R49 recommendations), in order to ensure a long-term stable, accurate and reliable meter.

The meter can and must only be opened by Kamstrup A/S.

If the meter has been opened and the seals have thus been broken, the meter is no longer valid for billing purposes. Furthermore, the factory guarantee no longer applies.

The large and clear display has been specially designed to obtain long life and sharp contrast in a wide temperature range. The accumulated water consumption is displayed by the meter in cubic metres (m^3) with 9 digits and up to three decimals, i.e. the resolution has been extended to 1 liter only.

Characteristics in short:
- Type tests in acc. with MID and the international OIML R49 recommendations
- Integrated data communication 868 MHz – Wireless Radio version (RF) for Wireless M-Bus
- Low start flow (low-flow cut-off) in only 3.2 l/h
- Consumption shown in cubic meters (m^3) with 9 digits and up to three decimals
- Resolution extended to 1 litre only
- Iinternally powered by 2 lithium batteries, which provide longevity
- Up to 16 years lifetime

Approved meter data

The water meter has been approved for the European markets according to the Measurement Instruments Directive MID2014/32EU, based on OIML R49* with 'FORCE Certification' as notified body.

*OIML: 'International Organization of Legal Metrology'

CE marking according to MID	CE M18 0200	
Designations according to MID classifications MID Cert.	OIML R49-2013	
	B-Module:	DK-0200-MI001-021
	D-Module:	DK-0200-MIQA-001
Low Voltage Directive	Mechanical: M1	
Ambient class	B/O (Buildings/out-doors)	
Radio/Communication	RE-D (Radio Equipment Directive)	
Hygienic/Drinking Water	GB: WRAS	

Material

Wetted parts

Meter housing and pipe	PPS with 40 % fibreglass, PPO and PSU
Reflectors	Stainless steel, W.no. 1.4401/1.4404
Cover	Glass
Top ring	Polycarbonate (dyed)

Technical data

Mechanical data

Water temperature	Cold water, 0.1...30 °C (T30)
Climatic environment	5...55 °C, condensing humidity (mounted indoors in utility rooms and outdoors in meter pits)
Storage temperature	-25...60 °C (Empty meter)
Accuracy class	2
Protection class	IP68
Orientation requirements	None

Electrical data

Battery	3.65 VDC, lithium, 2 A-cells
Battery lifetime	Up to 16 years at tBAT < 30 °C Up to 8 years at tBAT < 55 °C
EMC data (OIML)	Fulfils MID class E1 and E2

Meter sizes

flowIQ® 2101/KWM2170 is available as listed below.

Type number	Nom. flow Q_3 [m^3/h]	Min. flow Q_1 [l/h]	Max. flow Q_4 [m^3/h]	Dynamic range Q_3/Q_1	Min. cutoff [l/h]	Max. cutoff* [m^3/h]	Pressure loss Δp at Q_3 [bar]	Connection on meter	Non-return valve [mm]	Strainer
02-D-19-A-C-7A-8-GB	2.5	10	3.125	250	3.2	4.6	0.34	G1½B	No	Yes

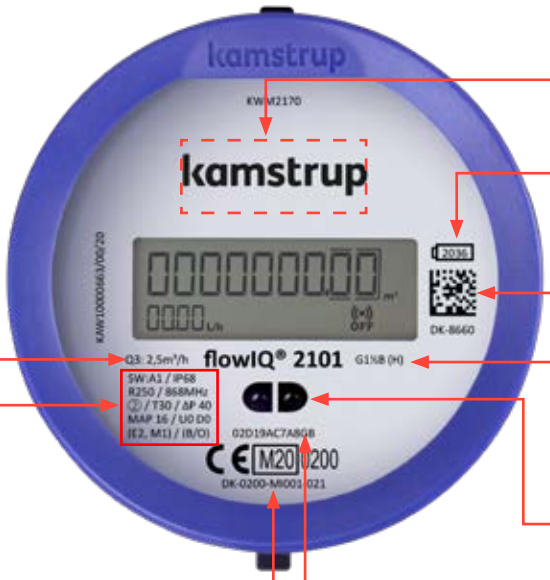
**At flows above 'Maximum cut-off' measurement continues corresponding to a constant flow at this value.*

According to OIML R49 maximum pressure loss at Q_3 must not exceed 0.063 MPa (0.63 bar).

At Q_4 this results in a pressure loss of max 0.1 MPa (1 bar).

Meter details

The meter face plate contains permanent laser engraved information on type number, serial number, temperature range, maximum admissible pressure (MAP), production year, rated flow, IP rating and approvals.



Flow size

SW	Software version
IP68	Dust and water protection class
R250	Dynamic range
868 MHz	Frequency
②	Accuracy class 2
T30	Max water temp.
ΔP 40	Max pressure loss
MAP16	Max admissible pressure
U0 D0	Required straight length of pipe on inlet and outlet
E2, M1	Environmental classes
B/O	Installation allowed in buildings and outside (not in direct sunlight)

Optional customer label
Water company logo, serial no., etc. (15x38 mm)

Year when battery life expires

QR code/datamatrix with serial number
Extended availability and production year (not part of bar code)

Connection on meter
Orientation horizontal

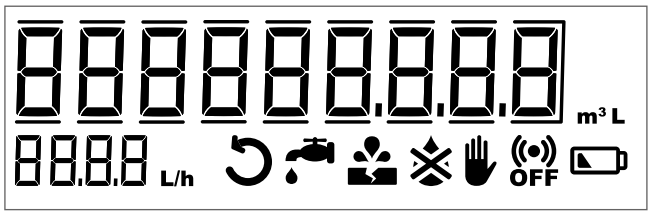
Optical eye – for reading and configuration

Type number

MID identification

Display and info codes

- The meter is fitted with an easily readable LCD-display:
- 9 digits – for volume measurement
- 4 digits – for flow measurement (bottom left corner)
- Measuring units – for volume and flow
- Pictograms – showing meter information or warnings
- Lines above and below every digit to highlight decimals



The value shown in the display, and thereby the measured quantity, can be maximum 999,999.999. If that were to happen, that the meter reaches the max point, the display will roll over and the meter continues counting from 000,000.000.

Pressure loss

According to OIML R49 maximum pressure loss must not exceed 0.63 bar (0.063 MPa) in the range Q_1 - Q_3.

The pressure loss in a meter increases with the square of the flow, and can be stated as:

$Q=k_v \times \sqrt{\Delta p}$

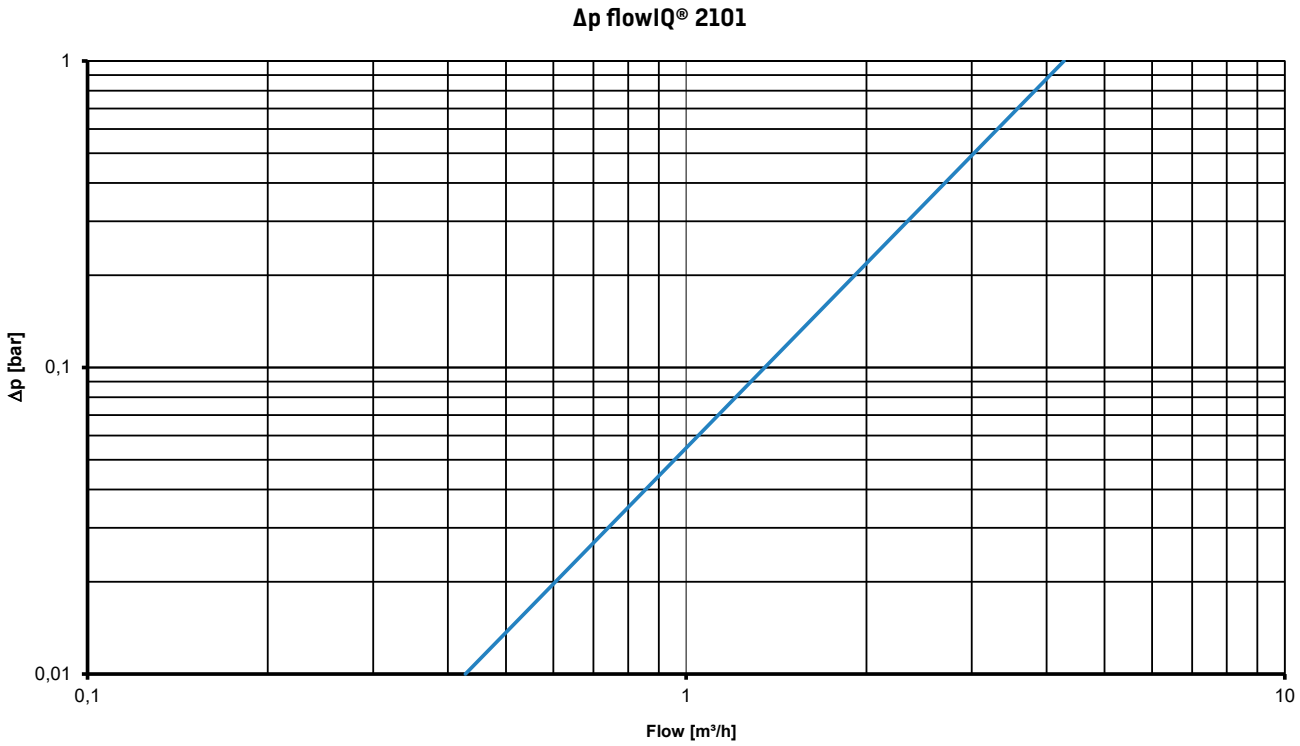
where:

Q = volume flow rate [m^3/h]

k_v = volume flow rate at 1 bar (0.1 MPa) pressure loss

Δp = pressure loss [bar]

Q_3 [m^3/h]	Nom. diameter [mm]	k_v	Q at 0.63 bar [m^3/h]
2,5	DN32	4.3	3.4



Communication

The water meters are available with integrated data communication Wireless Radio version (RF) for Wireless M-Bus.

Meter type	Frequency	Settings (Wirelss M-Bus)	Standard
Europe	868 MHz	Mode C1	EN 13757-4 European standard for remote reading of meters
Europe	868 MHz	Mode T1 OMS	EN 13757-4 European standard for remote reading of meters

Ordering details

The meter is available in versions for cold water. How type number structure is built:

Type	**02**	☐	☐☐	☐	☐	☐☐	☐	☐☐
Mechanical design								
Concentric		D						
Communication								
Wireless M-Bus 868 MHz			19					
Power supply								
2xA-cell				A				
Dynamic range								
250					C			
Meter size								
2.5 m³						7A		
Meter type								
Cold water							8	
Country code								
Europe (MID)								GB

All gaskets for mounting the meter are included.

The features included in the type number cannot be changed, once the meter has been produced.

The country code is used for:

- Language and approval on type label
- Temperature class of water meter, cold water (T30)

Configuration

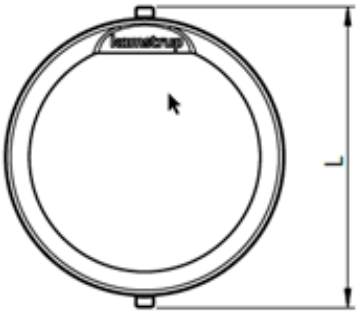
Config	DDD □□□	JJ □□	LLL □□□	MMMM □□□□	N □	P □	S □	U □	RR □□	CCC □□□	V □	T □	YY □□	ZZZ □□□
Display														
KWM2170	803													
GMT offset – time														
(GMT+ 0)		48												
Max val. average over time (1...120 min.)														
2 minutes (default)			002											
Customer label														
Alphanumeric (2060-XXXX)				0000										
Leakage message limit														
OFF					0									
Flow continuously > 0.1 % of Q_3					1									
Flow continuously > 0.25 % of Q_3					2									
Flow continuously > 0.5 % of Q_3					3									
Flow continuously > 1.0 % of Q_3					4									
Flow continuously > 2.0 % of Q_3					5									
Pipe burst limit														
OFF						0								
Flow > 5 % of Q_3 for 30 minutes						1								
Flow > 10 % of Q_3 for 30 minutes						2								
Flow > 20 % of Q_3 for 30 minutes						3								
Ambient temperature low limit														
OFF							0							
Ambient temperature < 3 °C / 37 °F							3							
Ambient temperature > 45 °C / 122 °F							6							
Ambient Temperature high limit														
OFF								0						
Ambient temperature > 35 °C / 95 °F								3						
Ambient temperature > 45 °C / 122 °F								6						
Data logger profile														
KWM2170									02					
Display resolution (alphanumeric)														
000000,000 m³ - 0000 l/h										010				
Temperature units of measure														
Celcius											0			
Encryption level														
No encryption												0		
Encryption with separately forwarded key												3		
System														
Drive-by – Wireless: - C1 Full, Drive-by (15 year lifetime)													01	
- T1 OMS Full, Drive-by (12 year lifetime)													07	
Fixed network: - C1 Full, Fixed													14	
Data packages														
(With system 01) Info codes, Volume V1, Target volume month, Target date, Actual flow, Max flow month, Min. amb. temp. month, Max amb. temp. month, Average amb. temp. day														100
(With system 14) Info codes, Volume V1, Target volume month, Target date, Actual flow, Min. amb. temp. month, Min. flow day, Max flow day, Min. water temp. day, Max water temp. day, Min. amb. temp. day														302
(With system 07) Info codes, Volume V1, V1 reverse, Target volume month, Target date, Actual flow, Max flow month, Min. flow month, Battery days left, Min. water temp. month, Max water temp. month, Min. amb. temp. month, Max amb. temp. month, Average amb. temp. day														400

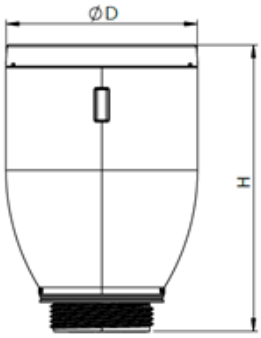
Unless otherwise stated in the order, Kamstrup supplies this configuration:	**DDD**	**JJ**	**LLL**	**MMMM**	**N**	**P**	**S**	**U**	**RR**	**CCC**	**V**	**T**	**YY**	**ZZZ**
	803	48	002	0000	3	3	3	3	10	010	0	3	YY	ZZZ

Note: *YYZZZ (data package) are not pre-defined and has to be chosen in the ordering system.*

Dimensioned sketches

Meter size [Q_3]	Length L [mm]	Height H [mm]	ØD [mm]	Weight [g]	Meter Connection
2.5	96	132.5	88.6	488	G1½B





Accessories

See Accessories for Water Meters: 58101270-GB.
For further information about READy, USB Meter Reader and Wireless M-Bus please see the technical description and the installation guide.
Information about Kamstrups hygiene concept can be found on products.kamstrup.com.

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