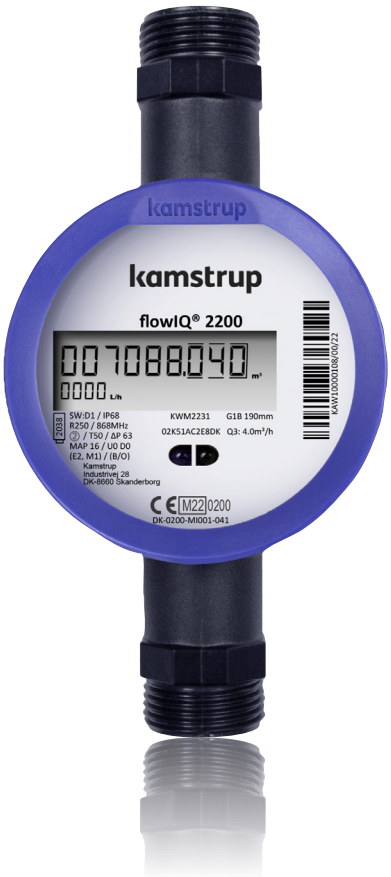
kamstrup

Data sheet

flowIQ® 2200

India –KWM2231

- Acoustic leakage detection in service connections
- Nominal flow from 2.5 m^3/h up to 4 m^3/h
- Approved with dynamic range up to R1600
- Pinpoint accuracy
- Integrated communication
  - Wireless M-Bus C1 - 865.5MHz
- Intelligent info codes assist you with your operations, asset management and customer service
- Water and ambient temperature measurement
- Up to 16 years of battery lifetime
- Designed for operation in submerged environments



Contents

Taking smart metering to the next level

flowIQ® 2200 raises the bar for what you can expect from a static ultrasonic water meter.

Founded on our more than 25 years of experience, the meter provides modern water utilities with the knowledge needed to make informed decisions and prioritize daily efforts.

flowIQ® 2200 introduces integrated acoustic leakage detection. Acting like a fine-meshed network of noise loggers, the meter monitors the surrounding pipes and detects noise patterns and acoustic changes that indicate potential leaks.

Thanks to the low minimum cut-off flow down to 2 L/hour for the smallest meter size, flowIQ® 2200 measures even the smallest consumption.

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.

The meter is powered by 2 x A-cell batteries, giving the meter a lifetime of up to 16 years.

Other key features include intelligent alarms and info codes, water and ambient temperature measurements, as well as consumption profiles.

All of this ensures fair and accurate billing, improves the data quality and helps to reduce the non-revenue water.

Hygiene
Security and hygiene are high-priority areas within both development and production.

Our water meters are approved for use with drinking water and are disinfected to ensure that only water meters of the highest quality leave our production facilities.

Platform overview

flowIQ® 2200 (KWM2231).

Composite meter powered by 2 A-cell batteries.

Approved meter data

MID classifications according to MID 2014/32/EU, based on OIML R 49/ISO 4064

Approval	flowIQ® 2200 - KWM2231: DK-0200-MI001-041
Mechanical environment	Class M1
Electromagnetic environment	Class E2

OIML R 49 designations

Accuracy class	2
Sensitivity class	U0/D0
Ambient class	Fulfils OIML R 49 class B and O (building/outdoor)
Water temperature, cold water	0.1...30 °C (T30) or 0.1...50 °C (T50)
Ambient temperature range	5...55 °C, condensing humidity (Mounted indoors in utility rooms and outdoors in meter pits – mounting in direct prolonged sunlight must be avoided)
Meter types	Composite (KWM2231) Q_3 = 2.5 m³/h and 4.0 m³/h
Radio communication	RED (Radio Equipment Directive)
Drinking water approvals	All parts are suitable for drinking water

Technical data

Electrical data

Battery	3.65 VDC lithium - 2 x A-cell
Battery lifetime	Up to 16 years - depending on selected data package and ambient temperature
EMC data	Fulfils MID class: E1 and E2 MID approved electronic operating
MID approved electronic operating temperature range	-25...55 °C

Mechanical data

Metrological class	2
Ambient class	Fulfils OIML R 49 class B and O (building/outdoor)
Ambient temperature	2...55 °C
Protection class	IP68
Impact energy levels	IK08 according to IEC62262
Storage temp. empty sensor (dry meter)	-25...60 °C (< 40 °C for a prolonged storage time) A packaged water meter must not be stored at temperatures > 40 °C for periods exceeding 24 hours (This applies especially for APET packaging)
Pressure stage	PN16
Connection	Thread EN/ISO 228-1

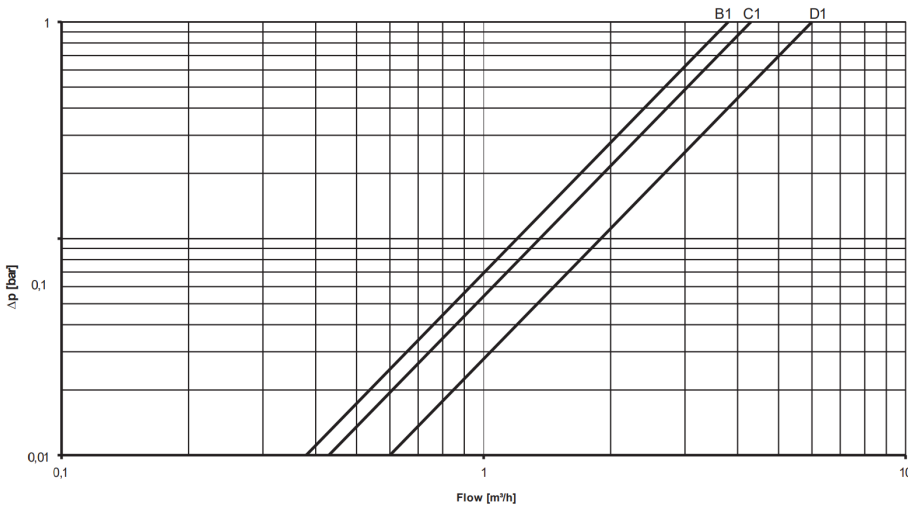
Materials

Wetted parts

Meter flow parts, composite	PPS with 40% fibreglass reinforcement
Measuring pipe	PSU
Reflector base	PPS
Reflectors	Stainless steel, W.no. 1.4401 and 1.4404 (316/316L)
O-ring/gasket	EPDM
Strainer	PPO or PES

Pressure loss

Δp flowIQ® 2200 (KWM2231)



Meter variant	Graph	Q_3 [m³/h]	Nom. diameter	kv	Q @ 0.63 bar [m³/h]
KWM2231	B1	2.5	¾" (DN15)	3.8	3.0
KWM2231	C1	2.5	1" (DN20)	4.3	3.4
KWM2231	D1	4.0	1" (DN20)	6	4.8

Meter sizes

flowIQ® 2200 composite (KWM2231) is available in these combinations:

Meter type	Nom. flow Q_3 [m^3/h]	Min. flow Q_1 [L/h]	Max flow Q_4 [m^3/h]	Min. cutoff [L/h]	Q at Δp 1 bar [m^3/h]	Pressure loss Δp at Q_3 [bar]	Dynamic range	Connection on meter and length [mm]
1B	2.5	10	3.1	1.5	4.6	0.17	250	G¾B 110
2B	2.5	10	3.1	1.5	4.6	0.17	250	G1B 130
2C	4.0	16	5.0	2.0	8.5	0.4	250	G1B 130

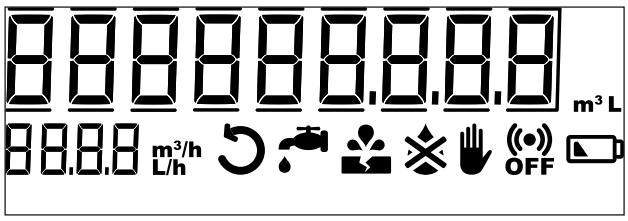
Measurements occurs in the range from 'Min. cutoff' to 'Max cutoff' – however, the accuracy is only guaranteed in the range from Q_1 to Q_4. Max cut-off is an indicative flow value, which depends on the hydraulic conditions.

Display and Info codes

The large display of flowIQ® 2200, showing totalized volume, flow rate and intuitive info codes, makes it easy for end users to understand their own consumption data.

flowIQ® 2200 includes a large number of intelligent info codes and alarms. An info code indicates a special condition in the meter. If the info code is available in the display, the related symbol is displayed when it has been activated.

If the 'condition' is not active, the sign is turned off. The info codes provide you with the exact knowledge you need to target your efforts within operation optimization, customer information, water loss and tampering.



Display and Info codes

The info codes in the display have the following meaning and function:

Info icon	Condition
	The water in the meter has not been stagnant for more than one continuous hour during the last 24 hours. This can be a sign of a leakage downstream the meter such as a leaky faucet, toilet cistern or pipe leakage.
	The water consumption has been consistently high for half an hour, which indicates a pipe burst downstream of the meter.
	Attempt at fraud. The meter is no longer valid for billing.
	The meter is not filled with water. In this case, nothing will be measured.
	The water flows through the meter in the wrong direction.
	RADIO OFF flashes. The meter is still in transport mode with the built-in radio transmitter turned off. The transmitter turns on automatically when the first liter of water has run through the meter.
	RADIO OFF lights continuously. The radio is switched off permanently. Can be activated via METERTOOL or DataTool.
	The symbol appears when the expected capacity left is 6 months (or when the voltage drops below a specific voltage).

 Switch off automatically when the conditions that activated them no longer exist.

 Disappears when the water has been stagnant for one hour.

 Disappears when the consumption falls to normal level.

 Disappears when the water is no longer flowing in the wrong direction.

 Disappears when the meter is filled with water.

Core features

Water meters placed throughout the network make it possible to gather information that can be of vital importance for an effective water supply, asset management and improved customer service.

Acoustic Leakage Detection
The flowIQ® 2200 water meter introduces integrated Acoustic Leakage Detection that allows you to monitor your service connections for possible leaks. Like a fine-meshed network of noise loggers, all your meters monitor the noise in the distribution lines and service connections to detect possible leaks.

In other words, you can let your meters work for you instead of installing separate noise loggers all around your supply area.

Current flow display
Besides the consumed volume, flowIQ® 2200 also shows the current flow in the display. The flow display has been designed with user experience in mind, where it can be advantageous, for example during installation, to be able to see the current consumption. In this context, it is important to stress that the metrological approval of the water meter is related to the volume reading only. Due to the meter's update time, the flow display, in case of rapidly increasing/decreasing flow, may turn out to be slower than the real flow and not a one-to-one correlation between the flow display and the volume growth. In general, one would expect the flow display to stabilize after about half a minute of constant flow and thereafter to be consistent with volume growth.

Temperature monitoring
flowIQ® 2200 measures water and ambient temperatures, respectively. Information on temperatures above or below configurable values in the meter will warn the utility about any potential high and low temperature issues.

The measurements can be used to monitor the installation and to give an indication if something is unusual.

Consumption above legal flow range
The meter logs information on consumption above the legal flow range. This information can be used to indicate if the meter size of a given installation is correct.

Consumption profile
The meter tracks consumption in different flow intervals for further analysis of the consumption patterns of the specific installation.

No consumption
If no consumption has been measured for a long period of time in a household installation, an info code will inform the utility as this indicates that there might be a problem with the installation.

Data registers

The water meter has a permanent memory in which the values of various data loggers are saved.
The loggers can be read via the meter's optical eye.

The following registers are logged:

Description	Yearly logger	Monthly logger	Daily logger	Hourly logger
Logger depth	20 years	36 months	460 days	1440 hours
Operating hours	✓	✓	✓	✓
Info codes incl. hour counter	✓	✓	✓	✓
Volume	✓	✓	✓	✓
Volume reverse	✓	✓	✓	✓
Acoustic noise value day			✓	
Flow max incl. date	✓	✓		
Flow min. incl. date	✓	✓		
Flow max incl. timestamp			✓	
Flow min. incl. timestamp			✓	
Water temp. max	✓	✓	✓	
Water temp. min.	✓	✓	✓	
Water temp. avg.	✓	✓	✓	
Ambient temp. max	✓	✓	✓	
Ambient temp. min.	✓	✓	✓	
Ambient temp. avg.	✓	✓	✓	

Every time the information code changes, the date and info codes are logged. Thus, it is possible to data read the latest 50 changes of the information code as well as the date the change was made. Reading is only possible via the optical IR interface.

Integrated communication

The meter supports Wireless M-Bus communication.

Transmission properties and data packages are defined in the ordering process in the configuration number named YY-ZZZ. However, these properties can be changed after installation with METERTOOL through the optical IR interface.

The meter can be used with Kamstrup's external antenna.

Wireless M-Bus
Wireless M-Bus is an unlicensed European frequency standard protocol. Kamstrup water meters are utilizing the C1-mode. Kamstrup Wireless M-Bus is transmitting every 16 seconds (drive-by).

Encryption for Wireless M-Bus is done in accordance with AES 128 standard.

Ordering details

An order is initiated by stating the type number of the selected model of flowIQ® 2200.

The type number includes information on meter type, meter size, meter length, battery supply, country code, etc.

Subsequently, the meter configuration, which determines customer-specific requirements, is selected.

Finally, required accessories, if any, in the form of gaskets, different extension pipes, check valve and standard couplings are selected.

Accessories are enclosed separately to be mounted by the installer.

flowIQ® 2200		**KWM2231-**	☐☐	☐	☐☐	☐	☐	☐☐	☐	☐☐
Meter generation										
Second generation			02							
Mechanical design										
Composite PPS				K						
Communication module										
Wireless M-Bus C1 868,5 MHz					12					
Power supply										
2 x A-cell						A				
Dynamic range										
250							C			
Meter size										
¾" 110 mm, 2.5 m³/h	DN15							1B		
1" 130 mm, 2.5 m³/h	DN20							2B		
1" 130 mm, 4.0 m³/h	DN20							2C		
Meter type										
Cold-water meter									8	
Country code										IN

The country code is used for:

- Language and approval on type label
- Temperature class for the water meter, cold water (T30 and T50)

Configuration

	DDD	JJ	LLL	MMMM	N	P	S	U	RR	CCC	V	T	YY	ZZZ
	□□□	□□	□□□	□□□□	□	□	□	□	□□	□□□	□	□	□□	□□□
Display views														
KWM2231	804													
GMT offset – time zone														
GMT+5		68												
GMT+6		72												
GMT+7		76												
Target date														
1st of the month														
Max values – average over time (1...120 min.)														
2 minutes			002											
Customer label														
Options are defined in order system				MMMM										
Leakage message limit														
Flow continuously > 0.25 % of Q_3/nom. flow					2									
Flow continuously > 0.5 % of Q_3/nom. flow (default)					3									
Flow continuously > 1.0 % of Q_3/nom. flow					4									
Flow continuously > 2.0 % of Q_3/nom. flow					5									
OFF					9									
Pipe burst limit														
OFF						0								
Flow > 5 % of Q_3/nom. flow for 30 minutes						1								
Flow > 10 % of Q_3/nom. flow for 30 minutes						2								
Flow > 20 % of Q_3/nom. flow for 30 minutes (default)						3								
Ambient temperature low limit														
Ambient temp. < 2 °C (default)							2							
OFF							0							
Ambient temperature high limit														
Ambient temp. > 35 °C (default)								3						
Ambient temp. > 45 °C								6						
OFF								0						
Data logger profile														
KWM2231									17					
Display resolution (alphanumeric) – decimal markings (options defined by meter size*)														
000000.000 m³ – 0000 L/h										010				
0000000.00 m³ – 0000 L/h										020				
00000000.0 m³ – 0000 L/h										030				
000000000 m³ – 0000 L/h										040				
please see FILE100004388 for available CCC-codes in relation to meter flow size														

To be continued on the next page...

Configuration

	DDD □□□	JJ □□	LLL □□□	MMMM □□□□	N □	P □	S □	U □	RR □□	CCC □□□	V □	T □	YY □□	ZZZ □□□
Continued from previous page														
Temperature units of measure														
Celsius (default)											0			
Encryption level														
Encryption with separately forwarded key (default)												3		
Transmission behaviour														
Please refer to FILE100001317													YY	
Data packages														
Please refer to FILE100001317														ZZZ

Unless otherwise stated in the order, Kamstrup supplies this configuration:

Leak	N = 3
Burst	P = 3
Ambient temp. low	S = 2
Ambient temp. high	U = 3
Temperature units	V = 0 (Celsius)
Encryption level	T = 3

Accessories

See "Accessories list for Water Meters" on www.kamstrup.com.

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