kamstrup

Data sheet

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flowIQ® 2200

- Acoustic leakage detection in service connections for meter sizes up to 10 m³/h
- Approved with dynamic range up to R1600
- Pinpoint accuracy
- Integrated communication
  - Wireless M-Bus C1, T1
  - linkIQ®
- Wired interface for:
  - Communication with flowIQ® Gateway
  - Configuration of volume pulses
- Intelligent info codes assist you with your operations, asset management and customer service
- Temperature measurement
- Up to 20 years of battery life time (depending on the selected data package and ambient installation temperature)

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 utilites with the knowledge needed to make informed decisions and prioritise daily efforts.

flowIQ® 2200 introduces integrated acoustic leakage detection. Acting like a fine-meshed network of noise loggers, the meters monitor the surrounding pipes and detect noise patterns and acoustic changes that indicate potential leaks (not available for warm water meters).

Thanks to the low minimum cut-off flow down to 0.9 l/hour for some of the smallest meter sizes, 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. Battery life time can be as high as 20 years for meters equipped with a D-cell battery depending on the selected data package and ambient installation temperature.

This ensures increased longevity and better performance compared to traditional mechanical meters.

Other key features include intelligent alarms and info codes as well as a configurable log to match your data needs.

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

flowIQ® 2200 is available in different versions to suit most of the needs from water utilites.

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, dried and packed in airtight packaging so that they are not subject to environmental influences before their application. Moreover, we continuously test for disinfection effectiveness through frequent audits both internally and by external accredited laboratories.

All these steps are carried out to ensure that only water meters of the highest quality leave our production facilities.

Platform overview

flowIQ® 2200 composite (KWM2210)

flowIQ® 2200 composite (KWM2230) with wired interface

flowIQ® 2200 metal body (KWM3230) 2-part metal body with wired intreface

Some meter sizes come in a warm-water version

Approved meter data

MID classifications

Approval:

flowIQ® 2200 - KWM2210	DK-0200-MI001-022
flowIQ® 2200 - KWMx230	DK-0200-MI001-038
Mechanical environment	Class M1

Electromagnetic environment:

flowIQ® 2200 - KWM2210	Class E1 and E2
flowIQ® 2200 - KWM2230, KWM3230	Class E2

OIML R49 designations

Accuracy class	2
Sensitivity class	U0/D0
Ambient class	Fulfils OIML R49 class B and O (building/outdoor)
Medium temperature, cold water	0.1...30 °C (T30) or 0.1...50 °C (T50)
Medium temperature, warm water	0.1...70 °C (T70) (selected meter sizes only)
Meter types	
Composite (KWM2210)	Q_3 = 1.6 m³/h, 2.5 m³/h and 4.0 m³/h
Composite (KWM2230)	Q_3 = 1.6 m³/h, 2.5 m³/h and 4.0 m³/h
2-part metal body (KWM3230)	Q_3 = 2.5 m³/h, 4.0 m³/h, 6.3 m³/h and 10.0 m³/h
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)
Drinking water approvals	KIWA (all parts are suitable for drinking water)

Material

Wetted parts

Meter flow parts, composite	PPS with 40 % fibreglass reinforcement
Meter flow parts, brass	DZR brass - CW511L (dezincification resistant)
Measuring pipe	PPS with 40 % fibreglass and PSU
Reflectors	Stainless steel
Strainer	PES
O-ring	EPDM

Technical data

**Electrical data**

|	
Battery	3.65 VDC lithium C- or D-cell
Battery lifetime:	
C-cell (KWM2210)	Up to 16 years depending on selected data package and ambient installation temperature
D-cell (KWM2230, KWM3230)	Up to 20 years depending on selected data package and ambient installation temperature
EMC data	Fulfils MID class:
	- E1 and E2
Ambient operation temperature	-10...55 °C (note: frozen water will damage the meter)

Mechanical data

Metrological class	2
Ambient class	Fulfils OIML R49 class B and O (building/outdoor)
Ambient temperature	2...55 °C
Protection class	IP68
Impact energy levels	
(KWM2230,3230)	IK07 according to IEC62262
Storage temp. empty sensor	-25...60 °C
Pressure stage	PN16
Connection	Thread EN/ISO 228-1

Pressure loss

Δp flowIQ® 2200 (KWM2210 and 2230)
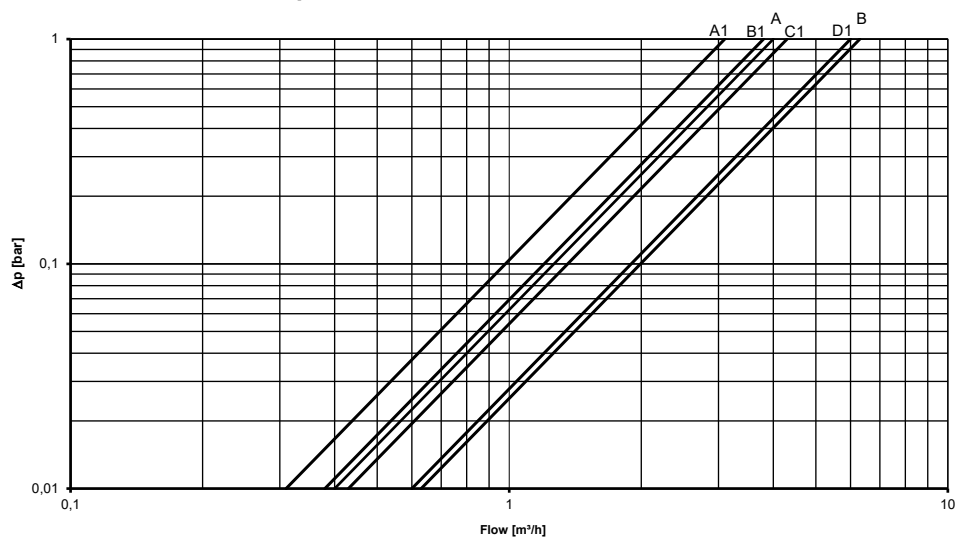
Δp flowIQ® 2200 (KWM3230)
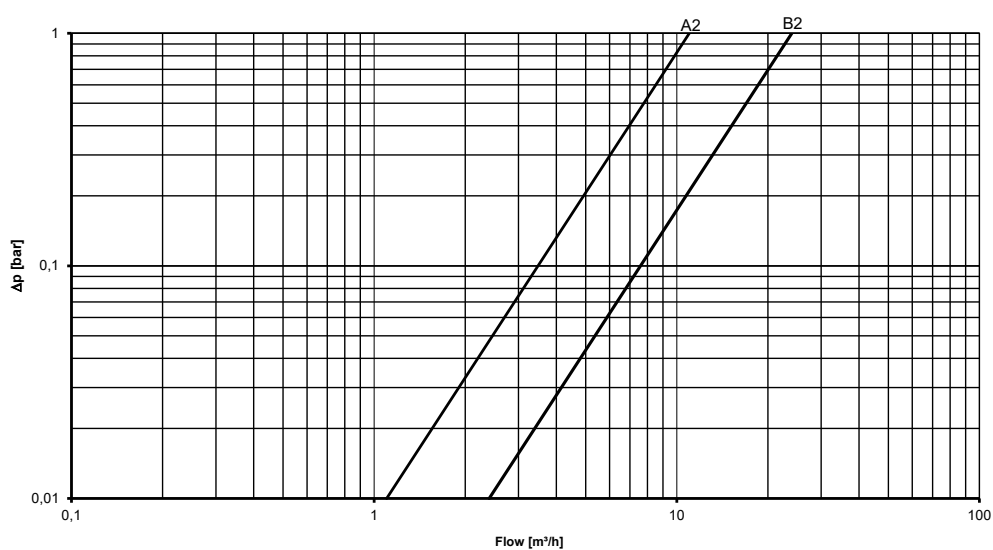
Meter variant	Graph	Q₃ [m³/h]			Nom. diameter [mm]	kv	Q @ 0.63 bar [m³/h]
KWM2210	A	1.6	2.5		DN15/20	4	3.2
KWM2210	B	4.0			DN20	6.3	5
KWM2230	A1	1.6			DN15	3.1	2.5
KWM2230	B1	2.5			DN15	3.8	3.0
KWM2230	C1	2.5			DN20	4.3	3.4
KWM2230	D1	4.0			DN20	6	4.8
KWM3230	A2	2.5	4.0	6.3	DN20	11	8.7
KWM3230	B2	4.0	6.3	10.0	DN25	24	19

Meter sizes

flowIQ® 2200 composite (KWM2210) is available in different combinations of length and nominal flow Q$_3$.

Meter type	Nom. flow Q$_3$ [m³/h]	Min. flow Q$_1$ [l/h]	Max flow Q$_4$ [m³/h]	Min. cutoff [l/h]	Max cutoff [m³/h]	Pressure loss Δp at Q$_3$ [bar]	Dynamic range	Connection on meter*
1A, 1E	1.6	10	2.0	2	4.6	0.17	250	G¾B
1B, 1D	2.5	10	3.1	2	4.6	0.17	250	G¾B
2A, 2B, 2D	2.5	10	3.1	2	4.6	0.17	250	G1B
2C, 2E	4.0	16	5.0	3.2	8.5	0.4	250	G1B

*) See the section "Ordering details" for information about length.

flowIQ® 2200 composite (KWM2230) is available in different combinations of length, nominal flow Q$_3$ and dynamic range.

Meter type	Nom. flow Q$_3$ [m³/h]	Min. flow Q$_1$ [l/h]	Max flow Q$_4$ [m³/h]	Min. cutoff [l/h]	Max cutoff [m³/h]	Pressure loss Δp at Q$_3$ [bar]	Dynamic range	Connection on meter and length [mm]
1A	1.6	10	2.0	0.9	2.8	0.27	160	G¾B 110
2A	2.5	15.6	3.1	0.9	4.4	0.44	160	G¾B 105
2D	2.5	15.6	3.1	0.9	4.4	0.35	160	G1B 190
1A	1.6	4	2.0	0.9	2.8	0.27	400	G¾B 110
1B	2.5	6.3	3.1	0.9	4.4	0.44	400	G¾B 110
2A	2.5	6.3	3.1	0.9	4.4	0.35	400	G1B 105
2B	2.5	6.3	3.1	0.9	4.4	0.35	400	G1B 130
2C	4.0	10	5.0	1.5	7	0.44	400	G1B 130
2D	2.5	6.3	3.1	0.9	4.4	0.35	400	G1B 190
2E	4.0	10	5.0	1.5	7	0.44	400	G1B 190

flowIQ® 2200 metal (KWM3230) is available in different combinations of length, nominal flow Q$_3$ and dynamic range.

Meter type	Nom. flow Q$_3$ [m³/h]	Min. flow Q$_1$ [l/h]	Max flow Q$_4$ [m³/h]	Min. cutoff [l/h]	Max cutoff [m³/h]	Pressure loss Δp at Q$_3$ [bar]	Dynamic range	Connection on meter and length [mm]
2D	2.5	25	3.1	3	4.4	0.05	100	G1B 190
2D	2.5	15.6	3.1	3	4.4	0.05	160	G1B 190
3C	4.0	25	5	5	7	0.03	160	G1¼B 260
3D	6.3	40	7.8	5	11	0.07	160	G1¼B 260
3E	10	63	12.5	5	17.5	0.17	160	G1¼B 260
2E	4.0	16	5	5	7	0.13	250	G1B 190
3D	6.3	25.2	7.8	5	11	0.07	250	G1¼B 260
2J	6.3	15.8	7.8	5	11	0.33	400	G1B 190
3E	10	25	12.5	5	17.5	0.17	400	G1¼B 260

See the section "Ordering details" for combination possibilities.

Measurement occurs at flows between 'Min. cutoff' and 'Max cutoff', but accuracy is not guaranteed.
Max cut-off is an indicative flow value, which depends on the hydraulic conditions.

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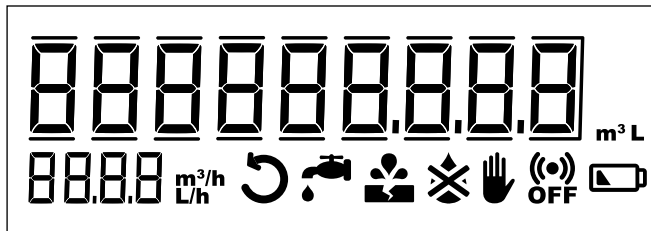
The large display of flowIQ® 2200 showing totalized volume, flow rate and intuitive info codes makes it easy for end users to understand their own consumption data.

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 on when it has been activated. If the 'condition' is not active, the sign is off. The info codes provide you with the exact knowledge you need to target your efforts within operation optimisation, customer information, water loss and tampering. The info codes in the display have the following meaning and function:

Info code	Meaning
🚰	The water in the meter has not been stagnant for one continuous hour during the latest 24 hours. This can be a sign of a leaky faucet or toilet cistern or indicate a leakage after the meter.
💥	The water consumption has been consistently high for half an hour, which indicates a pipe burst downstream of the meter.
✋	Attempt of fraud. The meter is no longer valid for billing.
✳	The meter is dry. In this case, nothing will be measured.
↺	The water flows through the meter in the wrong direction.
((•)) OFF	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.
((•)) OFF	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).

The info codes 🚰, 💥, ✳ and ↺ switch off automatically when the conditions that activated them no longer exist. In other words, 🚰 disappears when the water has been stagnant for one hour, 💥 disappears when the consumption falls to normal level, ↺ disappears when the water no longer flows in the wrong direction, and ✳ disappears when the meter is filled with water.

Sensor information

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 (not available for warm water meters)
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 – 24/7.

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

Temperature monitoring
flowIQ® 2200 measures water and ambient temperatures, respectively (water temperature only up to 4.0 m³).

Information on temperatures above or below configurable values in the meter will warn the utility about any potentiel 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, the meter 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 (KWM2210) 2400 hours (KWM2230 & 3230)
Operating hours	✓	✓	✓	✓
Info codes incl. hour counter	✓	✓	✓	✓
Volume	✓	✓	✓	✓
Volume reverse	✓	✓	✓	✓
Volume net	✓	✓	✓	✓
Acoustic noise value day			✓	
Flow max year incl. date	✓			
Flow min. year incl. date	✓			
Flow max month incl. date		✓		
Flow min. month incl. date		✓		
Flow max day incl. timestamp			✓	
Flow min. day incl. timestamp			✓	
Water temp. max year	✓			
Water temp. min. year	✓			
Water temp. avg. year	✓			
Ambient temp. max year	✓			
Ambient temp. min. year	✓			
Ambient temp. avg. year	✓			
Water temp. max month		✓		
Water temp. min. month		✓		
Water temp. avg. month		✓		
Ambient temp. max month		✓		
Ambient temp. min. month		✓		
Ambient temp. avg. month		✓		
Water temp. max day			✓	
Water temp. min. day			✓	
Water temp. avg. day			✓	
Ambient temp. max day			✓	
Ambient temp. min. day			✓	
Ambient temp. avg. day			✓	

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 eye.

Integrated communication

The meter is delivered with integrated radio communication and supports both Wireless M-Bus and Kamstrup linkIQ®.

For both linkIQ® and Wireless M-Bus, you can select different transmission properties and data packages. Wireless M-Bus is available with the C1 or T1 protocol and various reading intervals.

Wireless M-Bus
A Wireless M-Bus data package is transmitted every 16 seconds ('drive-by') or 96 seconds ('fixed network').

When sending a data package every 16 seconds, the package is kept short and compressed to achieve a long battery life.

At 96-second intervals, a longer and intelligent radio package with built-in 'repair coding' is sent – the battery life is still valid since the transmission interval is increased.

16- or 96-second intervals must be chosen when ordering and can be reprogrammed by METERTOOL or DataTool.

linkIQ® communication
linkIQ® is a Wireless M-Bus protocol which contains hourly data and is designed for a very high data performance in a fixed network supported by Kamstrup's READy Concentrator 1M.

This increases the range of the data collection devices, meaning that only a few sites are needed.

With Kamstrup's new READy Concentrator 1M, linkIQ® can be used in an existing Wireless M-Bus network and will perform with a higher range.

linkIQ® transmits on the 868 MHz band at 25 mW.

On flowIQ® 2200, it is not possible to change the choice of communication module XX, see "Communication" under "Ordering details".

However, protocol and data package (YY-ZZZ) can be changed subsequently with METERTOOL.

For communication options, see document 5512-2521 at products.kamstrup.com.

Wired interface

flowIQ® 2200 (KWMx230) has built-in wired interface on the front of the meter, through the front glass. The construction does not compromise the IP68 approval.

The wired interface is programmed to serial communication (default from factory) to connect to flowIQ® Gateway.

flowIQ® Gateway is a modular and upgradeable device which allows multiple communication and power options (for details, see the flowIQ® Gateway data sheet – 58101825).

The wired interface can be reprogrammed to send out volume pulses with different pulse values and pulse lengths.

The pulse configuration can be changed with MeterToolX/ METERTOOL and an USB read-out head.

Volume output (l/imp.)	1
	10
	100
	1000

It is also possible to program the meter to "KM Pulse" which gives pulse values that depend on the actual meter size, according to pulse standards for water meters.

Consult the table to the right for the KM pulse configurations.

Pulse length option	
(KM) Kamstrup meter pulse	3.9 msec
l/imp: 1, 10, 100, 1000	10 msec
	32 msec
	100 msec
	250 msec
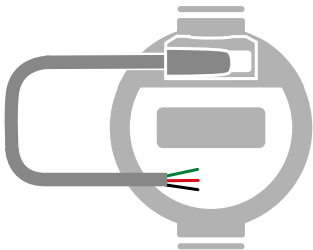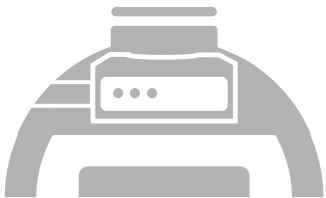
On the cable connected to the wired interface, the pulse output is between the black and the red wire.

Kamstrup Pulse (KM)	
Q_3 (m³/h)	Meter factor (Imp./l)
1.6	100
2.5	60
4.0	50
6.3	25
10	15
16	10
25	6
40	5
63	2.5
100	1.5

Wired interface

Solution overview for wired interface

SCADA system

Water meter ···· Pulse ···· SCADA system

flowIQ® Gateway

Water meter ···· Serial ···· flowIQ® Gateway (Remote reading)

flowIQ® Gateway

Water meter ···· Serial ···· flowIQ® Gateway

Examples:
Modbus
M-Bus
Pulse
Others
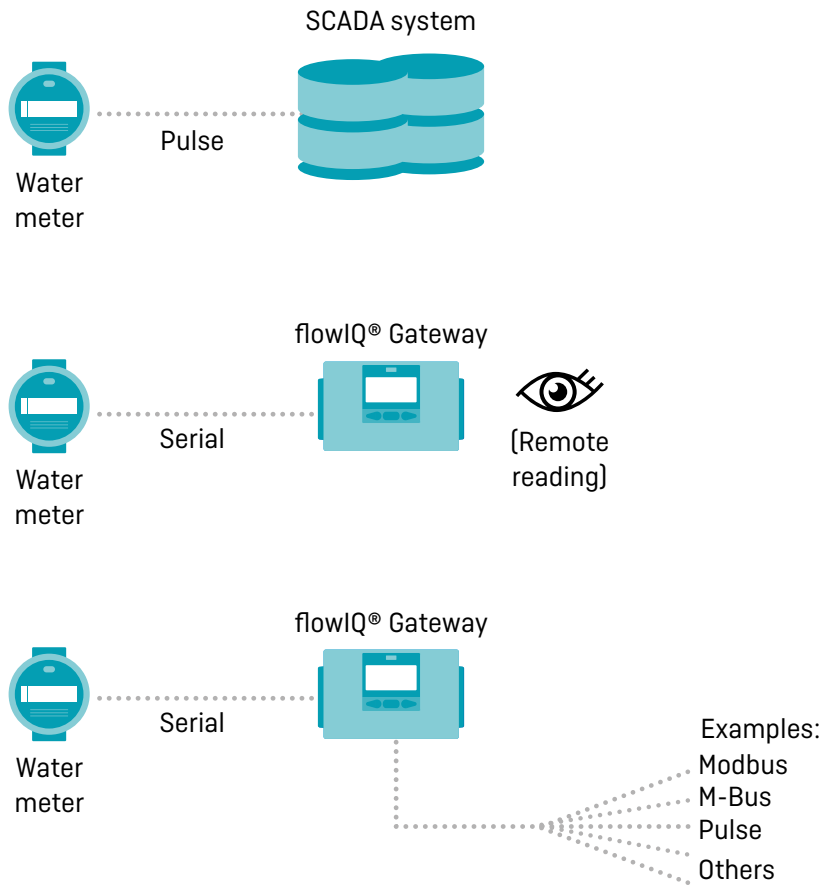
Ordering details

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 - KWM2210 (C-cell battery)	KWM2210-	☐☐	☐	☐☐	☐	☐☐	☐☐	☐	☐☐
Meter generation									
Second generation		02							
Mechanical design									
1-part PPS body			K						
Communication									
Wireless M-Bus 868 MHz				13					
Wireless M-Bus C1/T1, linkIQ®, 868 MHz				59					
Power supply									
C-cell					C				
Dynamic range (for selected sizes)									
100						A			
250						C			
Meter size									
¾" 110 mm, 1.6 m³/h							1A		
¾" 110 mm, 2.5 m³/h							1B		
¾" 170 mm, 1.6 m³/h							1E		
¾" 170 mm, 2.5 m³/h							1D		
1" 105 mm, 2.5 m³/h							2A		
1" 130 mm, 2.5 m³/h							2B		
1" 130 mm, 4.0 m³/h							2C		
1" 190 mm, 2.5 m³/h							2D		
1" 190 mm, 4.0 m³/h							2E		
Meter type									
Cold-water meter								8	
Country code									XX

The country code is used for:

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

Ordering details

flowIQ® 2200 - KWM2230 (D-cell battery and wired interface)

	KWM2230-	☐☐	☐	☐☐	☐	☐☐	☐☐	☐	☐☐
Meter generation									
Second generation		02							
Mechanical design									
1-part PPS body			K						
Communication									
Wireless M-Bus C1/T1, linkIQ®, 868 MHz PPS - Cold *				61					
Wireless M-Bus C1/T1, linkIQ®, 868 MHz PPS - Warm *				62					
) Wired interface default settings: Serial communication									
Power supply									
D-cell					D				
Dynamic range (for selected sizes)									
R160						B			
R400						E			
Meter size									
¾" 110 mm, 1.6 m³/h							1A		
¾" 110 mm, 2.5 m³/h							1B		
1" 105 mm, 2.5 m³/h							2A		
1" 130 mm, 2.5 m³/h							2B		
1" 130 mm, 4.0 m³/h							2C		
1" 190 mm, 2.5 m³/h							2D		
1" 190 mm, 4.0 m³/h							2E		
Meter type									
Warm-water meter								7	
Cold-water meter								8	
Country code									XX

Ordering details

flowIQ® 2200 - KWM3230 (D-cell battery, wired interface and 2-part metal body)

	KWM3230-	▢▢	▢	▢▢	▢	▢▢	▢▢	▢	▢▢
Meter generation									
Second generation		02							
Mechanical design									
2-part brass body			B						
Communication									
Wireless M-Bus C1/T1, linkIQ®, 868 MHz metal - Cold *				63					
Wireless M-Bus C1/T1, linkIQ®, 868 MHz metal - Warm *				64					
*) Wired interface default settings: Serial communication									
Power supply									
D-cell					D				
Dynamic range									
R100 *(for selected meter sizes only)*						A			
R160 *(for selected meter sizes only)*						B			
R250 *(for selected meter sizes only)*						C			
Meter size									
1" 190 mm, 2.5 m³/h							2D		
1" 190 mm, 4.0 m³/h							2E		
1" 190 mm, 6.3 m³/h							2J		
1¼" 260 mm, 4.0 m³/h							3C		
1¼" 260 mm, 6.3 m³/h							3D		
1¼" 260 mm, 10 m³/h							3E		
Meter type									
Warm-water meter								7	
Cold-water meter								8	
Country code									XX

Configuration

KWM2210, KWM2230, KWM3230

	DDD	JJ	LLL	MMMM	N	P	S	U	RR	CCC	V	T	YY	ZZZ
Display views														
KWM2210	803													
KWM2230/3230	804													
GMT offset – time zone														
(GMT+1)		52												
(GMT+2) (only KWM2210)		56												
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/max flow					2									
Flow continuously > 0.5 % of Q_3/max flow					3									
Flow continuously > 1.0 % of Q_3/max flow					4									
Flow continuously > 2.0 % of Q_3/max flow					5									
OFF					0									
Pipe burst limit														
OFF						0								
Flow > 5 % of Q_3 of max flow for 30 minutes						1								
Flow > 10 % of Q_3 of max flow for 30 minutes						2								
Flow > 20 % of Q_3 of max flow for 30 minutes						3								
Ambient temperature low limit														
Ambient temp. < 3 °C							3							
Ambient temp. < 6 °C							6							
OFF							0							
Ambient temperature high limit														
Ambient temp. > 35 °C								3						
Ambient temp. > 45 °C								6						
OFF								0						
Data logger profile														
Standard & Accoustic Leakage Detection (for KWM2210)									03					
Standard & Accoustic Leakage Detection (for KWMx230)									05					
Display resolution (alphanumeric) – decimal markings (options defined by meter size)														
000000.001 m³ – 0000 l/h										010				
0000000.01 m³ – 0000 l/h										020				
00000000.1 m³ – 0000 l/h										030				
000000001 m³ – 0000 l/h										040				
0000000.01 m³ – 0000 m³										060				
00000000.1 m³ – 0000 m³										070				
000000001 m³ – 0000 m³										080				

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																							
Celcius																				0			
Encryption level																							
Encryption with separately forwarded key																					3		
Encryption with separate key, with encrypted access to logs																					4		
Transmission behaviour																							
See note 1) below																						YY	
Data packages																							
See note 2) below																							ZZZ

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

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

[1] *JJ (time zone), CCC (unit, display resolution and billing units) and YYZZZ (datagram) are not predefined and must be chosen in the ordering system.*

[2] *For an overview of datagrams, see 'Communicaton Modules and Data Packages Overview' here:* 5512-2521.

Accessories

All of the below-mentioned documents can be found on products.kamstrup.com.

See "Accessories list for Water Meters": 58101270-GB.

Related hardware for separate ordering

Cable for wired interface	1.5 m 5000-491.CP (open end)
	7.5 m 5000-493.CP (open end)
flowIQ® Gateway no.	603xWxxxxxxxxxx

For further information about READy, USB Meter Reader and Wireless M-Bus, please see the technical description and the installation guide.

For information about Kamstrup's hygiene concept, see 5518-319-GB "Hygiene Concept Kamstrup".

For more datagram options, see 5512-2521 "Communication Modules and Data Packages Overview".

flowIQ® 2200

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