

Data sheet

flowIQ® 2200

- Acoustic leakage detection in service connections for meter sizes up to 10 m³/h
- Approved with dynamic range up to R1000
- Pinpoint accuracy
- Integrated communication
 - Wireless M-Bus C1, T1
 - linkIQ®
- Wired interface for:
 - Communication to 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 selected data package and ambient installation temperature)



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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 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 min. 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 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 utilities.

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 interface



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) $Q_3 = 1.6 \text{ m}^3/\text{h}$, $2.5 \text{ m}^3/\text{h}$ and $4.0 \text{ m}^3/\text{h}$

Composite (KWM2230) $Q_3 = 1.6 \text{ m}^3/\text{h}$, $2.5 \text{ m}^3/\text{h}$ and $4.0 \text{ m}^3/\text{h}$

2-part metal body (KWM3230) $Q_3 = 2.5 \text{ m}^3/\text{h}$, $4.0 \text{ m}^3/\text{h}$, $6.3 \text{ m}^3/\text{h}$ and $10.0 \text{ m}^3/\text{h}$

Ambient temperature range 5...55 °C, condensing humidity
(indoors mounted 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, W.no. 1.4401 and 1.4404 [316/316L]

Strainer PES

O-ring EPDM

Technical data

Electrical data

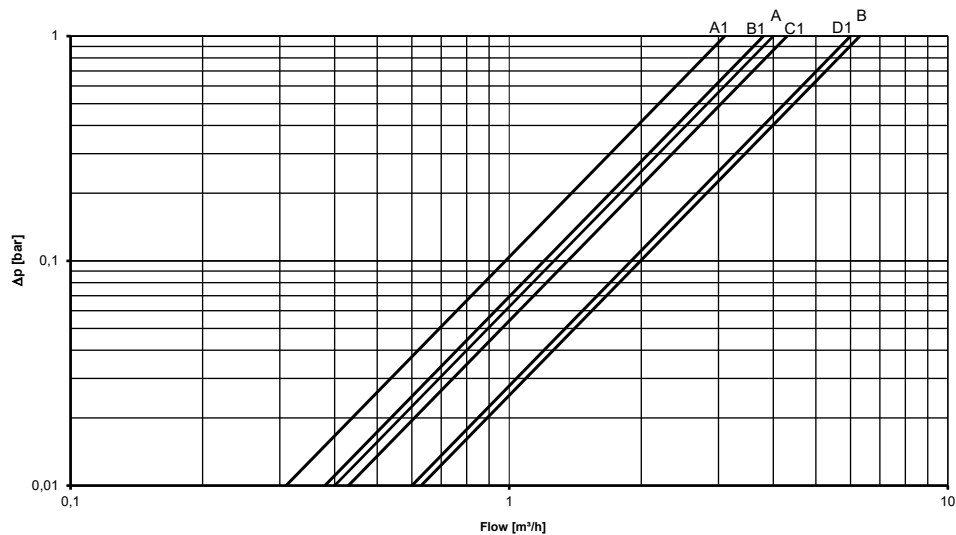
Battery	3.65 VDC lithium C or D-cell
Battery lifetime:	
C-cell [KWM2210]	Up to 16 years depending on selected data package and ambient installation temperature
D-cell [KWM2230, KWM3230]	Up to 20 years depending on selected data package and ambient installation temperature
EMC data	Fulfils MID class: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

Mechanical data

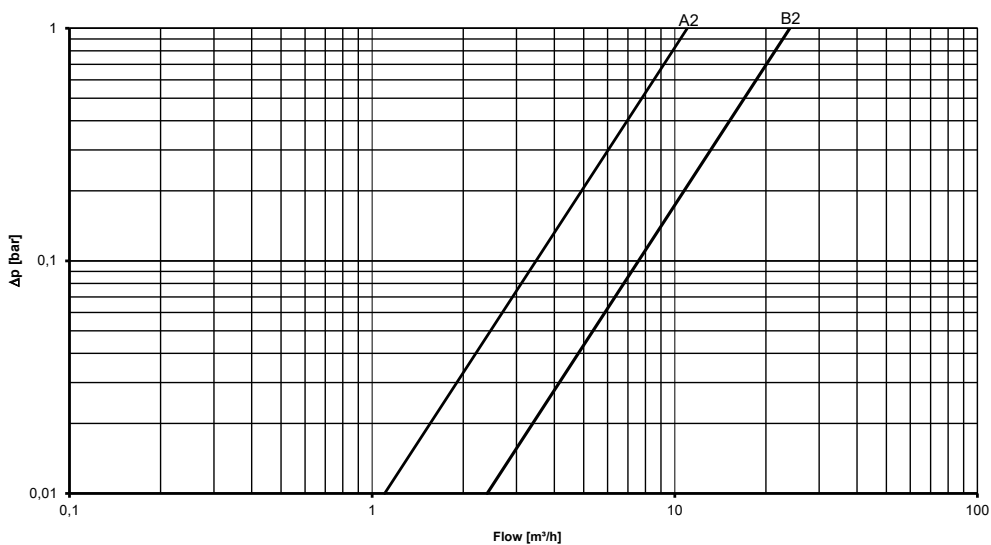
Metrological class	2
Ambient class	Fulfils OIML R49 class B and O (building/outdoor)
Ambient temperature	2...55 °C
Protection class	IP68
Impact energy levels [KWM2230,3230]	IK07 according to IEC62262
Storage temp. empty sensor	-25...60 °C
Pressure stage	PN16
Connection	Thread EN/ISO 228-1

Pressure loss

Δp flowIQ® 2200 (KWM2210 and 2230)



Δp flowIQ® 2200 (KWM3230)



Meter variant	Graph	Q ₃ [m ³ /h]	Nom. diameter [mm]	kv	Q @ 0.63 bar [m ³ /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 [m ³ /h]	Min. flow Q_1 [l/h]	Max flow Q_4 [m ³ /h]	Min. cutoff [l/h]	Max cutoff [m ³ /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 [m ³ /h]	Min. flow Q_1 [l/h]	Max flow Q_4 [m ³ /h]	Min. cutoff [l/h]	Max cutoff [m ³ /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.

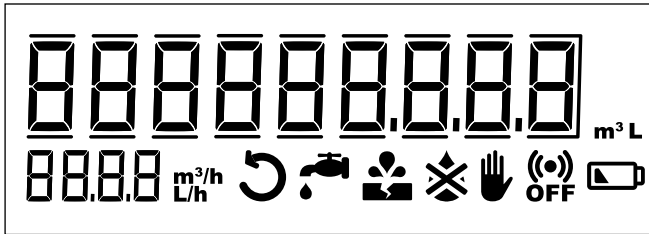
Meter type	Nom. flow Q_3 [m ³ /h]	Min. flow Q_1 [l/h]	Max flow Q_4 [m ³ /h]	Min. cutoff [l/h]	Max cutoff [m ³ /h]	Pressure loss Δp at Q_3 [bar]	Dynamic range	Connection on meter and length [mm]
2D	2.5	25	3.1	3	4.4	0.05	100	G1B 190
2D	2.5	15.6	3.1	3	4.4	0.05	160	G1B 190
3C	4.0	25	5	5	7	0.03	160	G1¼B 260
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 with 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.
	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).

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 leak 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 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 longer period of time in a household installation, the meter will inform the utility, since 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 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.

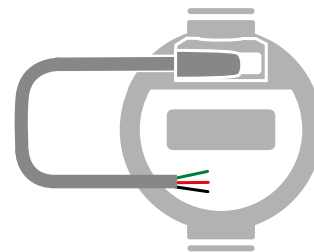
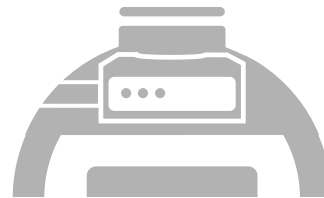
The pulse configuration can be changed with MeterToolX/METERTOOL and an USB reading head.

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 on 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

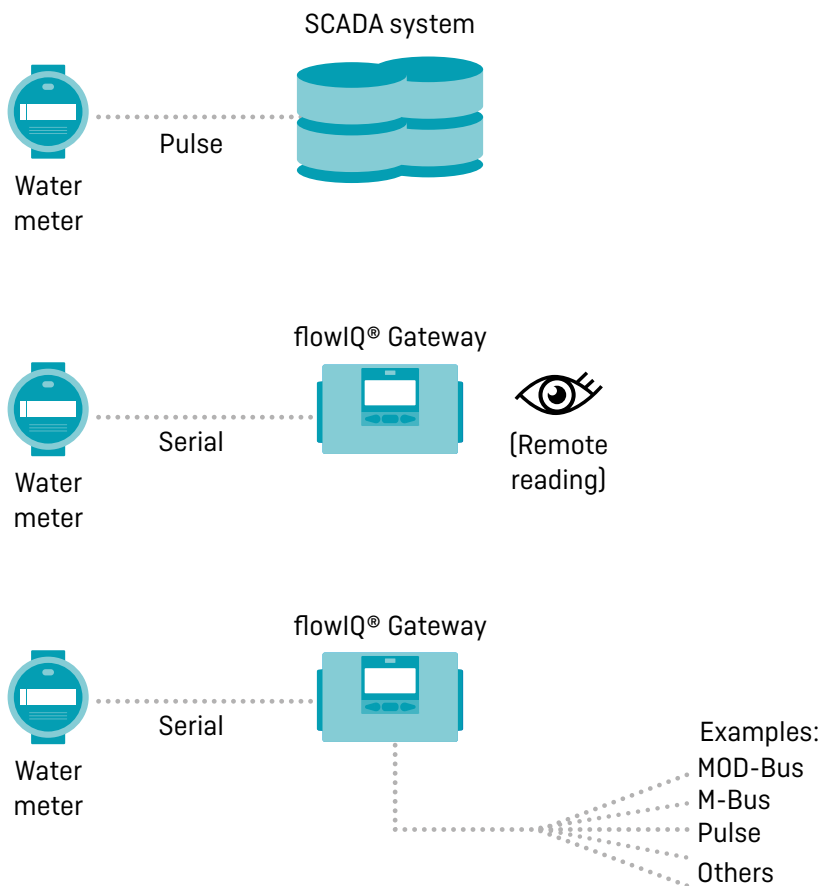


On the cable connected to the wired interface, the pulse output is between the black and the red wire.

Kamstrup Pulse (KM)	
Q ₃ (m ³ /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



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-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Meter generation											
Second generation		0	2								
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 (only for selected meter sizes)											A
R160 (only for selected meter sizes)											B
R250 (only for selected meter sizes)											C
Meter size											
1" 190 mm, 2.5 m ³ /h											2D
1" 190 mm, 4.0 m ³ /h											2E
1" 190 mm, 6.3 m ³ /h											2J
1¼" 260 mm, 4.0 m ³ /h											3C
1¼" 260 mm, 6.3 m ³ /h											3D
1¼" 260 mm, 10 m ³ /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														
1 st 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 Leak Detection (for KWM2210)														03
Standard & Accoustic Leak Detection (for KWMx230)														05
Display resolution (alphanumeric) – decimal markings (options defined by meter size)														
000000.001 m ³ – 0000 l/h														010
0000000.01 m ³ – 0000 l/h														020
00000000.1 m ³ – 0000 l/h														030
000000001 m ³ – 0000 l/h														040
0000000.01 m ³ – 0000 m ³														060
00000000.1 m ³ – 0000 m ³														070
000000001 m ³ – 0000 m ³														080
<i>To be continued on the next page...</i>														

Configuration

	DDD	JJ	LLL	MMMM	N	P	S	U	RR	CCC	V	T	YY	ZZZ
	□□□	□□	□□□	□□□□	□	□	□	□	□□	□□□	□	□	□□	□□□
<i>Continued from previous page</i>														
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 'Communication Modules and Data Packages Overview' here: [5512-2521](#).

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