MULTICAL® 21 & flowIQ® 2200

kamstrup

Raising the bar for residential water meters

- Ultrasonic precision from the very first drop
- Superior stability in the entire dynamic range
- Innovative acoustic leak detection
- Flexible remote reading including NB-IoT

Building on quality and innovation

Building on more than 30 years of experience, a solution from Kamstrup represents the next generation of smart metering. Our water meters are based on proven technology and provide modern water utilities with the data-based knowledge they need to bill consumers fairly, optimise operations, reduce non-revenue water and prioritise their efforts.

MULTICAL® 21

flowIQ® 2200

flowIQ® 2200

flowIQ® 2200 NB-IoT

Precision at the core

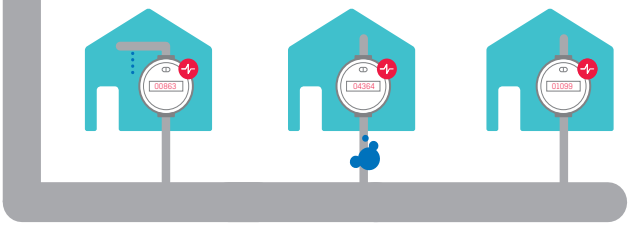
Thanks to an industry-leading accuracy and optimised low start flow, our meters measure even the smallest consumption. The meters are highly stable throughout the entire dynamic range with a very low error margin – and as static meters with no moving parts, they maintain a high and stable accuracy throughout the entire lifetime.

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

Cutting-edge leak detection *before* the meter

Non-revenue water remains one of the water industry's main challenges and locating leaks on service connections or distribution mains can feel like finding a needle in a haystack. But, what if your meters could detect the leaks you cannot see?

With the integrated acoustic leak detection offered by flowIQ® 2200, they can do just that.



Use your meters to detect leaks

Now, you can let your smart meters work for you to help locate leaks. Acting as a fine-meshed network of noise loggers, the meters monitor noise patterns in the distribution lines and service connections to detect possible leaks.

With detailed knowledge of where to find possible leaks, you will be able to prioritise daily efforts and large investments to when and where they will have the biggest impact. And with a faster and more efficient leak detection, you can reduce your cost per identified leak and find the low-hanging fruits for reducing your water loss.

Flexible remote reading – now also through NB-IoT

All our residential water meters come with integrated communication that allows for safe and easy remote reading via drive-by or network through various communication technologies such as Wireless M-Bus, linkIQ® and NB-IoT - without any add-on devices.

This means that you can say goodbye to manual meter readings and estimated calculations. You can significantly decrease your data collection time and avoid time-consuming follow-ups on lacking or imprecise readings.

The integrated NB-IoT option will, as a key complementary element to the linkIQ® system, improve the device deployment flexibility such as at the black spot of a fixed network or areas with less meter density. Hence, with the Kamstrup linkIQ®/NB-IoT hybrid concept, the dependency on radio infrastructure and the total cost of ownership of an AMI system will be reduced significantly.

NB-IoT, as an official member of the 5G family, shall assist your smooth evolution to massive IoT in the coming decades.

Data for more than billing

Our residential meters offer more than the data needed to conduct a fair and accurate billing. Multiple intelligent alarms and info codes let you detect irregularities such as leaks and bursts or other events like tampering attempts, reverse flows and more.

The meters offer a variety of different data packages and options for configuring the log ensuring that you get the data you need to optimise your operations.

Info codes and intelligent alarms

- Dry
- Reverse
- Leak
- Burst
- Tamper
- Radio off
- Low battery*
- Low temperature*
- High temperature*
- Max flow exceeded *
- No consumption*

** Only available for flowIQ® 2200*

Product comparison

Feature	MULTICAL® 21/ flowIQ® 2101	flowIQ® 2200	flowIQ® 2200 w/NB-IoT
Acoustic leak detection	-	✓	✓
Flow rate shown in display	-	✓	✓
Consumption profile	-	✓	✓
Hourly log	-	✓	✓
Remote reading	• Wireless M-Bus • Wired M-Bus • Sigfox • Pulse Adapter • GEO Display	• Wireless M-Bus • linkIQ® • Pulse output • flowIQ® Gateway	• NB-IoT
Intelligent alarms	• Leak • Burst • Tamper • Dry • Reverse flow	• Leak • Burst • Tamper • Dry • Reverse flow • Low battery • Low temperature • High temperature • No consumption • Max flow exceeded ($Q > Q_4$)	• Leak • Burst • Tamper • Dry • Reverse flow • Low battery • Low temperature • High temperature • No consumption • Max flow exceeded ($Q > Q_4$) • Daily (hourly values) • Real-time priority alarms
Display update	32 s update	Down to 4 s update	Down to 4 s update
Water ingress protection	IP68	IP68	IP68
Sizes	1.6 - 4.0 m^3/h	1.6 - 10 m^3/h / DN15-DN25	1.6 - 10 m^3/h / DN15-DN25
Start flow	2 l/hour	Down to 0.9 l/hour	Down to 0.9 l/hour
Battery lifetime	Up to 16 years	Up to 20 years	Up to 15 years (at ECL0)
Clip-on antenna	-	-	✓
SIM			3FF non-exchangeable
Frequency bands			B1/B2/B3/B4/B5/B8/B12/ B13/B17/B18/B19/B20/B25/ B26/B28/B66
Telecommunication compliance			3GPP Rel-14

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Kamstrup A/S
Industrivej 28, Stilling
DK-8660 Skanderborg
T: +45 89 93 10 00
info@kamstrup.com
kamstrup.com

flowIQ® 3200

kamstrup

District and commercial water meter

- Ultrasonic precision for up to 20 years
- Pinpoint accuracy across flow range
- Minimized water loss with district meter data
- Accurate billing of large consumers

Beating water loss and maximizing revenue with technology

The flowIQ® 3200 water meter enables you to establish district metering areas in your network. This is an effective way to monitor water loss and get a better overview across the distribution network, especially when used in combination with our District Analyser analytics software.

Every single drop counts when it comes to accurate billing. Our flowIQ® 3200 water meter measures consumption in commercial installations with pinpoint accuracy over its entire lifetime. This ensures fair billing for your customers and secures revenue for investing back into your network.

Quality and innovation at the core

Building on more than 30 years of experience, our water meters are based on proven technology and provide water utilities with the data they need to reduce non-revenue water, bill consumers fairly and operate efficiently. Our automated production process includes thorough testing in our accredited lab and ensures consistently high-quality, hygienic and accurately calibrated meters with industry-low failure rates.

Ultrasonic precision

Thanks to an industry-leading accuracy and an ultra-low start flow, our meters measure even the smallest consumption. The meters are highly stable throughout the entire flow range with a very low error margin. Tamper-proof with no moving parts, the flowIQ® 3200 meter is less subject to wear and tear and this ensures a high and stable accuracy during its lifetime of up to 20 years.

Easy remote reading

The flowIQ® 3200 meter comes with integrated communication for safe and easy remote reading. The flexible connectivity options include Wireless M-Bus, linkIQ® and a range of accessories for combining network and drive-by reading, depending on your data needs. You can also expand the range of connectivity options by adding a flowIQ® Gateway for transfer of data to your control systems.

Reduced water loss

Reduce non-revenue water and consequential damages from leaks and pipe bursts. Intelligent alarms quickly notify you of irregularities in the network such as leaks, tampering attempts or reverse flows. For easy calculation of water balances and visualisation of the water loss per district, use your meters in combination with our monitoring tool District Analyser.

Feature	flowIQ® 3200
Flow rate in display	✓
Consumption profile	✓
Hourly log	✓
Remote reading	Support for: • Wireless M-Bus • linkIQ® • Pulse output • flowIQ® Gateway
Intelligent alarms	• Leak • Burst • Tamper • Dry • Reverse flow • Low battery • Low temperature • High temperature • No consumption • Max flow exceeded ($Q > Q_4$)
Display update	20 s
Water ingress protection	IP68
Size	6.3 - 160 m^3/h / DN32-DN100
Start flow	5 l/hour
Battery lifetime	Up to 20 years
MID approval	R1000
Materials	Stainless steel, glassfibre-reinforced composite
Can be delivered with extended product warranty	✓
Can be delivered with sample testing of meter accuracy	✓

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Kamstrup Asia Pacific Sdn Bhd
Unit 801, Level 8, Uptown 2
2, Jalan SS21/37
Damansara Uptown
47400 Petaling Jaya
Selangor, Malaysia
T: +6012-3822 230
apacinfo@kamstrup.com
kamstrup.com

Kamstrup A/S
Industrivej 28, Stilling
DK-8660 Skanderborg
T: +45 89 93 10 00
info@kamstrup.com
kamstrup.com

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Data sheet

flowIQ® 4200

- Nominal flow from 160 m^3/h to 1000 m^3/h
- Approved with dynamic range up to R1000
- Connection from DN125 to DN300
- Pinpoint accuracy
- Wired interface for flowIQ® Gateway
- External power supply from the gateway
- Ambient temperature measurement
- Replaceable battery
- Designed for operation in submerged environments
- Coated split flanges in cast iron
- Volume measurements every second

Contents

Intelligent district meters

flowIQ® 4200 is intented for measuring potable water in distribution networks and covers a series of water meters with integrated, hermetically sealed electronics. A wired interface connection for serial communication is built-in on the front of the meter, which enables connection to flowIQ® Gateway. flowIQ® 4200 can also be externally power supplied from the Gateway.

flowIQ® 4200 is a stainless steel meter that comes with four ultrasonic sensors. The meter is powered by 2xD-cell batteries. Meter sizes are available from DN125 to DN300. The meter is delivered with seperate coated split flanges in cast iron.

flowIQ® 4200 is suitable for measurement in commercial premises and industrial environments. The meters are suitable for mounting in pump stations or well heads and are fully protected against internal or external penetration of water.

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

Our water meters are approved for use with drinking water.

Approved meter data

MID classifications

Approval for meter sizes DN125-DN300	DK-0200-MI001-040
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)
Medium temperature, cold water	0.1...50 °C (T50)
Meter types	Q_3 = 160, 250, 400, 630 and 1000 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)
Radio communication	RE-D (Radio Equipment Directive)
Drinking water approvals	KIWA, KTW-BWGL (all parts are suitable for drinking water)

Material

Wetted parts

Meter flow part	Stainless steel, W.no. 1.4408 (316)
Transducer pocket	PPS
O-ring/gasket	EPDM

Non-wetted parts

Flange	Cast iron, EN-GJS-500-7C, black FBE coating

Technical data

Electrical data

Battery	2 x 3.65 VDC lithium D-cell (replaceable)
Battery lifetime	Up to 20 years depending on selected data package and ambient installation temperature (without external power supply)

Mechanical data

Metrological class	2
Protection class	IP68
Storage temp. empty sensor	-25...60 °C (< 40 °C for a prolonged storage time)
Impact energy levels	IK08 according to IEC62262
Pressure stage	PN16 all sizes
Connection	Split flange, EN 1092-1

Meter sizes

flowIQ® 4200 is available in different combinations of length, dynamic range and nominal flow Q_3.

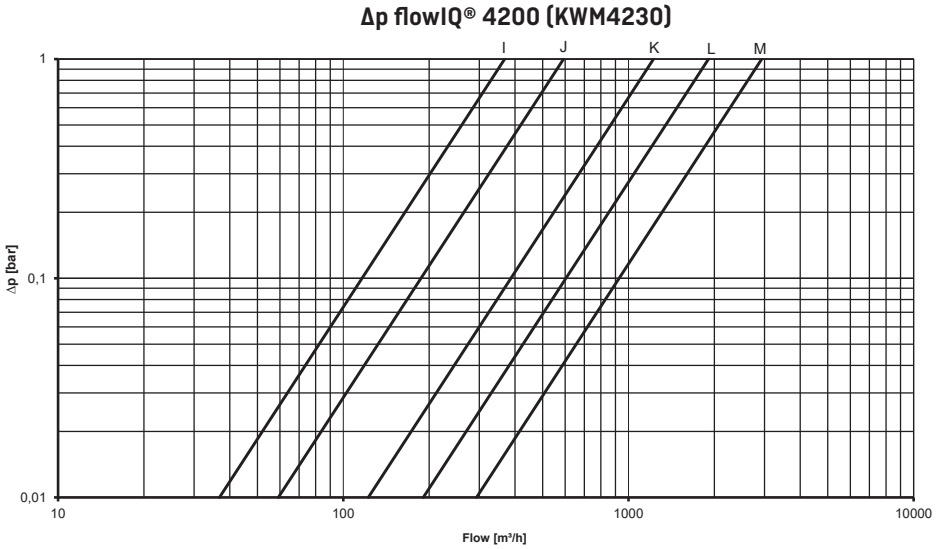
Meter type	Connection on meter	Nom. flow Q_3 [m³/h]	Min. flow Q_1 [l/h]	Max flow Q_4 [m³/h]	Min. cutoff [l/h]	Max cutoff [m³/h]	Pressure loss Δp at Q_3 [bar]	Dynamic range	Split flanges weight kg	Total weight kg
AH	DN125	160	640	200	70	280	0.19	250	9.5	19
AR	DN150	250	1000	312.5	250	438	0.18	250	14	27
BA	DN200	400	1600	500	300	700	0.11	250	19	39
BJ	DN250	630	2520	787	600	1100	0.11	250	29	61
BS	DN300	1000	4000	1250	1000	1750	0.12	250	38	84

Measurements occur in the range from 'Min. cutoff' to 'Max cutoff' – however, the accuracy is only guaranteed in the range from Q_1 to Q_4. The maximum cut-off flow above Q_4 depends on the hydraulic conditions.

Meter type	Connection on meter	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[1)]	Split flanges weight kg	Total weight kg
AH	DN125	160	254	200	70	280	0.19	630	9.5	19
AR	DN150	250	397	312.5	250	438	0.18	630	14	27
BA	DN200	400	635	500	300	700	0.11	630	19	39
BJ	DN250	630	1000	787	600	1100	0.11	630	29	61
BS	DN300	1000	1587	1250	1000	1750	0.12	630	38	84

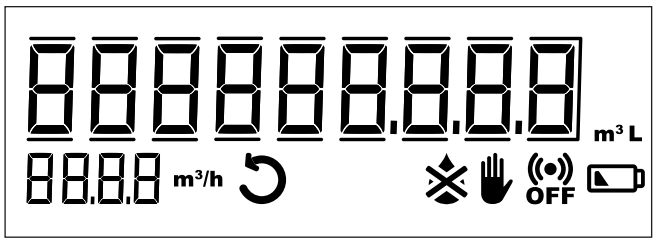
[1)] *Only for selected markets. For dynamic range 630 the meter MUST only be installed horisontally.*

Pressure loss



Graph	Q_3 [m^3/h]	Meter type	Dimension [mm]	kv	Q @ 0.63 bar [m^3/h]
I	160	AH	250 mm, DN125	368	292
J	250	AR	300 mm, DN150	592	470
K	400	BA	350 mm, DN200	1224	972
L	630	BJ	450 mm, DN250	1908	1515
M	1000	BS	500 mm, DN300	2933	1855

Display and info codes



The large display of flowIQ® 4200 shows totalized volume, flow rate and symbols for the info codes.

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.

Info code	Meaning
	Attempt of 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.
	This symbol appears when the expected battery lifetime left is 6 months.
	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 water start running through the meter.
	RADIO OFF lights continuously. The radio is switched off permanently. Can be activated via METERTOOL or DataTool.

Core functions

Temperature monitoring
flowIQ® 4200 measures ambient temperatures.

An info code is activated if the temperature is above or below configurable values.

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.

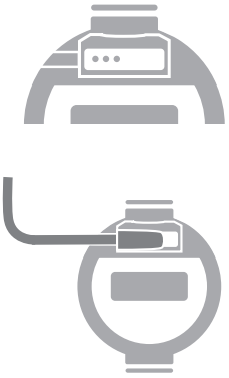
Consumption profile
The meter tracks consumption in different flow intervals for further analysis of the consumption patterns of the specific installation.

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

Current flow display
Besides the consumed volume, flowIQ® 4200 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 stabilise after about half a minute of constant flow and thereafter to be consistent with volume growth.

Wired interface

- flowIQ® 4200 has a 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 a serial communication to connect to flowIQ® Gateway.
- The gateway synchronizes with the meter every 20 seconds. It is possible to reconfigure the meter with METERTOOL to set the meter in fast transmission which increases the synchronization to every 4 seconds.



Caution

- The wired interface does not support pulse output configuration (it is not possible for the wired interface to send out volume pulses).
- Fast transmission will reduce the battery lifetime with approximately 50 %.

External power supply

flowIQ® 4200 can also be externally power-supplied from the wired interface from flowIQ® Gateway.

When an external power supply is connected, there is no power consumption from the meter's batteries.

Replaceable battery

flowIQ® 4200 has two built-in D-cell lithium batteries that supply the meter. When replacing the battery, Kamstrup's Battery replacement kit no: 66-99-821 must be utilized with the relevant replacement guide.

The battery replacement kit can ONLY be ordered through Kamstrup's product service. Otherwise the warranty is void. Kamstrup's product service will also help you with the training tutorial.

Ordering details

An order is initiated by stating the type number of the selected model of flowIQ® 4200.

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.

Accessories are enclosed separately to be mounted by the installation technician.

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

flowIQ® 4200 - KWM4230	**Meter type 02-**	☐	☐☐	☐	☐	☐☐	☐	☐☐
Mechanical design								
Stainless steel body with split flanges in cast iron		E						
Communication module								
Serial communication for gateway and external power supply			65					
Power supply								
2xD-cell				G				
Dynamic range								
R250					C			
R630[1]					G			
Meter size (stainless steel)								
DN125 (250 mm)	160 m³/h	(DN125-PN16)				AH		
DN150 (300 mm)	250 m³/h	(DN150-PN16)				AR		
DN200 (350 mm)	400 m³/h	(DN200-PN16)				BA		
DN250 (450 mm)	630 m³/h	(DN250-PN16)				BJ		
DN300 (500 mm)	1000 m³/h	(DN300-PN16)				BS		
Meter type								
Cold water							8	
Country code								XX

[1] *Only for selected markets*

The country code is used for:

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

Configuration

Config code	DDD	JJ	LLL	MMMM	N	P	S	U	RR	CCC	V	T	YY	ZZZ
	□□□	□□	□□□	□□□□	□	□	□	□	□□	□□□	□	□	□□	□□□
Display views														
KWM4230	804													
GMT offset – time zone														
(GMT-2)		40												
(GMT+1)		52												
(GMT+2)		56												
Target date (Handled as order data)														
1st of the month														
Max values – average over time (1...120 min.)														
Default 2 minutes			002											
Customer label														
Options are defined in order system*				MMMM										
**) Meters with wired interface have limited options for customer label. Contact Kamstrup for more information.*														
Leakage message limit														
Disabled					9									
Pipe burst limit														
Disabled						0								
Indicative ambient temperature - low limit														
Ambient/meter temp. < 3 °C (default)							3							
Ambient/meter temp. < 6 °C							6							
OFF							0							
Indicative ambient temperature - high limit														
Ambient/meter temp. > 35 °C (default)								3						
Ambient/meter temp. > 45 °C								6						
OFF								0						
Data logger profile														
Standard									05					
Display resolution (alphanumeric) – decimal markings (options defined by meter size)														
0000000.01 m³ – 0000 m³/h										060				
0000000.01 m³ – 000.0 m³/h										061				
00000000.1 m³ – 0000 m³/h										070				
00000000.1 m³ – 000.0 m³/h										071				
000000001 m³ – 0000 m³/h										080				
000000001 m³ – 000.0 m³/h										081				
Temperature units of measure														
Celsius											0			
Encryption level														
Encryption with separately forwarded key												3		
Transmission behaviour														
See note 1 below													YY	
Data packages														
See note 2 below														ZZZ

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

Ambient temp. low	S = 3
Ambient temp. high	U = 3
Temperature units	V = 0 (Celsius)
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 the relevant communication module data sheet.

Accessories

All of the below-mentioned documents can be found at kamstrup.com.
See "Accessories list for Water Meters": FILE100002499_EN.

Related hardware for separate ordering

Optical IR interface head w. USB	6699099
Holder for optical IR interface	3026909.CP
Lid for flowIQ® 4200 w/wired interface	6699645.CP
Flying lead cable 1.5 m	5000549
Flying lead cable 7.5 m	5000550
flowIQ Gateway no.	603-xWxxxx
Battery replacement kit	6699821

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 FILE100000816_A_EN "Hygiene Concept Kamstrup".
For datagram options, see the relevant communication module data sheet.

Kamstrup A/S
Industrivej 28, Stilling
DK-8660 Skanderborg
T: +45 89 93 10 00
info@kamstrup.com
kamstrup.com