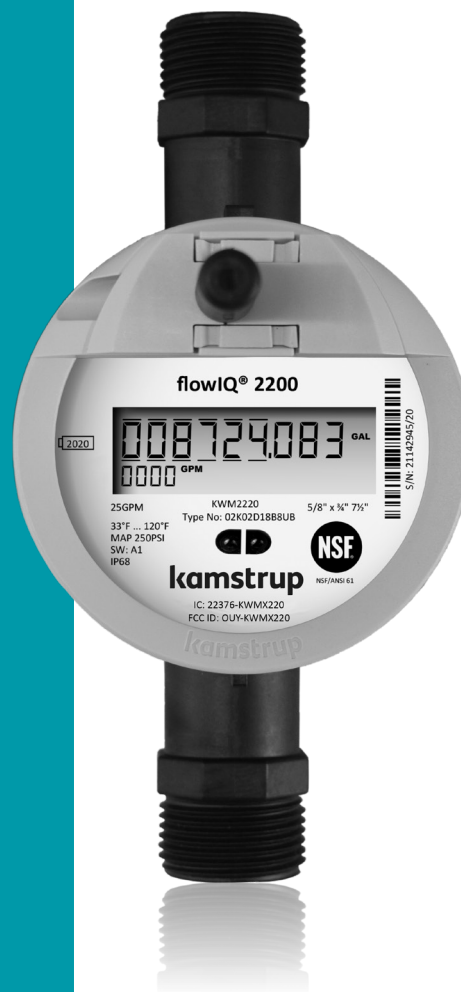


Data sheet

flowIQ® 2200

- Dual band radio
 - AMR (Walk-by/drive-by)
 - AMI (Fixed network)
- Ultrasonic measurement
- Sustainable measurement accuracy
- Temperature measurement
- IP68 Vacuum sealed construction
- Lead free and certified to NSF/ANSI 61
- Flow measurement in display
- Acoustic leak detection in service and distribution lines



Contents

Technical data	4
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Meter sizes	5
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Electronic ultrasonic cold water meter for measurement of cold water consumption in households, multi-unit buildings and industry.

Sustainable accuracy

Ultrasonic flow measurement guarantees sustainable accuracy and longevity. Ultrasonic flow measurement is based on the transit time method, and all measurements, references, readings, calculations and data communication are controlled by an advanced, specially designed electronic circuit. Thus, the meter includes no moving parts, which makes flowIQ® 2200 less sensitive to wear and tear and impurities in the water.

Construction

The meter is hermetically closed and vacuum-sealed to prevent humidity from reaching the electronics and avoid condensation between the glass and display. The meter is IP68 (submersible) type tested and suitable for installation in meter pits.

Installation

flowIQ® 2200 is easy to install in all operating environments, horizontally as well as vertically, independent of piping and installation conditions. Consumption data can be read visually from the display, using an optical eye, and remotely read, either by 912.5, 915 or 918.5 MHz (AMR) and 450-470 MHz (AMI) band RF signal, built into the meter.

Specific features

flowIQ® 2200 measures the water and environment temperatures and it includes acoustic leak detection, securing that water loss is discovered quickly.

The unique combination of all the flowIQ® 2200 features reduces current operating costs to measure water usage and minimizes unexpected expenses in connection with possible leakage.

Environmentally friendly

The meter has been approved according to Drinking Water Standards in multiple countries, and it is certified to NSF/ANSI 61. The meter housing and measuring part are made of the high performance thermoplastic material polyphenylene sulfide (PPS) with 40 % fiberglass, which is free from lead and other heavy metals. The environmental report, Carbon Footprint, documents the meter's high reusability and low environmental impact, including recycling of materials.

Hygiene

To protect the health of the consumers Kamstrup has a hygienic manufacturing process of the water meters. Kamstrup has a highly automated manufacturing process, and only uses materials which are approved for drinking water. Furthermore the products gets disinfected before dispatch. The hygiene is being controlled by external accredited laboratories and by frequent audits.

General description

flowIQ® 2200 is a hermetically sealed water meter intended for measurement of cold water consumption in residential and multi-unit buildings.

flowIQ® 2200 employ the ultrasonic measurement principle, based on Kamstrup's experience since 1991, with the initial development and production of static ultrasonic meters.

One of flowIQ® 2200's many advantages is the fact that it has no wearing parts, which ensures a high and stable accuracy throughout its lifetime. flowIQ® 2200 complies with all the AWWA C715-18 guideline for Ultrasonic Water Meters.

flowIQ® 2200 measures the water consumption electronically, as a volume, using a pair of ultrasonic signals. Through two ultrasonic transducers, an ultrasonic signal is sent with and against the flow direction. A transducer serves both as a 'speaker' when transmitting and as a 'microphone' when a signal is received. The ultrasonic signal traveling with the flow will be the first to reach the opposite transducer, while the signal running against the flow will be received a little later. The time difference, between the two signals, can be converted into flow velocity, and thereby also into a volume. The measuring principle is a proven, long-term stable and accurate measuring principle.

In addition to volume reading, an indication of current flow and a number of other information codes are displayed. All registers are saved daily in the meter data logger (EEPROM) and are kept for 460 days. Furthermore, monthly data for the latest 36 months, hourly data for the latest 100 days and 50 info code events are saved.

flowIQ® 2200 is powered by an internal lithium battery which can provide up to 20 years operating life.

flowIQ® 2200 is available with a choice of two integrated data communication options and can be operated in either frequency configuration:

- 912.5, 915 or 918.5 MHz – Wireless Radio version (RF) for Wireless M-Bus – US localization of European standard for remote reading of meters EN 13757-4
- 450-470 MHz is used in AMI (Fixed network)

The meter is fitted with an optical eye which makes it possible to read saved consumption data and info codes, stored in the meter's data logger. Using an optical reading head, it is also possible to change the meter configuration e.g. data packages. flowIQ® 2200 can and must only be opened by Kamstrup A/S. If the meter has been opened and the sealing has thus been broken, the meter is no longer valid for billing purposes and the warranty is void.

Technical data

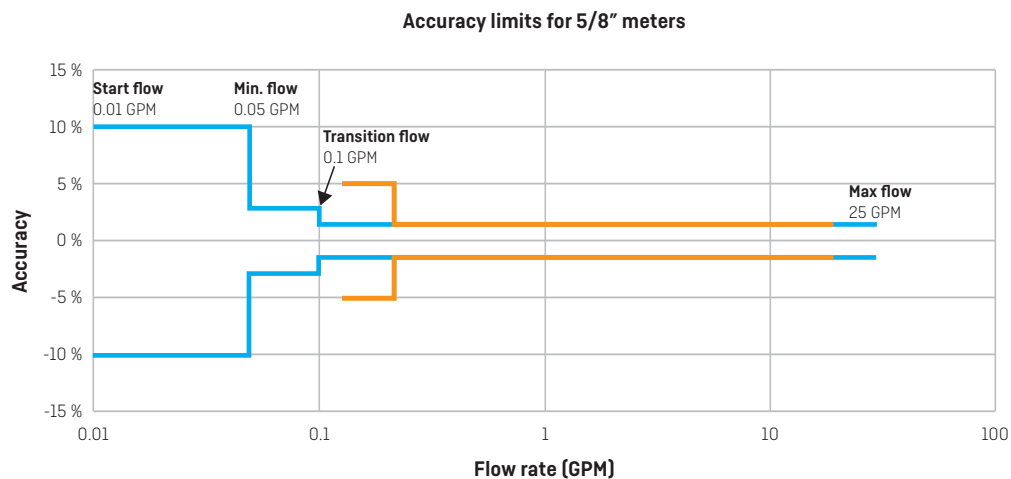
Electrical data

Battery D-Cell battery, 3.6V, 17Ah. The battery warranty does not apply at meter temperatures above $t_{BAT} > 95\text{ °F} / 35\text{ °C}$

Mechanical data

Protection class IP68-rated (waterproof/submersible)
 Mechanical environment Class M1 (Measuring Instruments Directive classification)
 Ambient/meter temperature
 - flowIQ® 2200, composite 35... 130 °F / 1.5... 55 °C
 - flowIQ® 2200, metal 35... 130 °F / 1.5... 55 °C
 Water temperature
 - flowIQ® 2200, composite 33... 120 °F / 0.5... 50 °C
 - flowIQ® 2200, metal 33... 120 °F / 0.5... 50 °C
 Storage temp. empty sensor -10... 140 °F / -20...60 °C
 Maximum operating pressure 250 PSI (17 bar)

Accuracy



Note: At flows between 'Start flow' and 'Maximum flow' measurement occurs – however the accuracy is only guaranteed in the range from minimum flow to maximum flow

Approved meter data

Certified to NSF/ANSI 61
 Complies to part 15 of the FCC rules, ISED and with AWWA C715-18

Material

Wetted parts (composite model)

Meter housing and flow part Polyphenylene sulfide (PPS) with fiberglass [40 %] reinforcement, PSU, extenders made from PA12
 Reflectors Stainless steel 316

Wetted parts (2-part body)

Flow part, threaded Stainless Steel 316L
 O-ring/gasket EPDM
 Measuring tube PPS with fiberglass
 Reflectors Stainless steel

External meter parts

Top ring (sealing) Polycarbonate (gray)

Meter sizes

flowIQ® 2200 is available in these sizes:

Type number	Meter size	Start flow ¹⁾ [S]	Min. flow ¹⁾ [L/h]	Transition flow	Max flow	Sat. flow rate	Pressure loss SMOC	Connection on meter	Lay length	Strainer	Temp. measurement of water
RF version	Inches	[GPM]/ [L/h]	[GPM]/ [L/h]	[GPM]/ [L/h]	[GPM]/ [m³/h]	[GPM]/ [m³/h]	[PSI]/ [bar]	NPSM thread	[Inches] /[mm]		
02-K-02-D-1-8A-8UB	½" x ½"	0.01/ 2.27	0.05/ 11.4	0.1/ 22.7	25/ 5.68	35/ 7.95	6.2/ 0.43	¾"	7½"/ 190	Yes	Yes
02-K-02-D-1-8B-8UB	¾" x ¾"	0.01/ 2.27	0.05/ 11.4	0.1/ 22.7	25/ 5.68	35/ 7.95	7.7/ 0.53	1"	7½"/ 190	Yes	Yes
02-K-02-D-1-8R-8UB	¾" x ¾"	0.01/ 2.27	0.05/ 11.4	0.1/ 22.7	25/ 5.68	35/ 7.95	7.7/ 0.53	1"	5.1"/ 130	Yes	Yes
02-K-02-D-1-8C-8UB	¾"	0.015/ 3.4	0.05/ 11.4	0.1/ 22.7	32/ 7.27	45/ 10.22	9.0/ 0.62	1"	7½" or 9"/ 229	Yes	Yes
02-L-02-D-1-8B-8UB	¾" x ¾"	0.015/ 3.4	0.10/ 0.023	0.15/ 34.1	25/ 5.68	35/ 7.95	3.8/ 0.26	1"	7½"/ 190	No	Yes
02-L-02-D-1-8N-8UB	¾"	0.025/ 5.68	0.10/ 22.8	0.15/ 34.1	35/ 7.95	49/ 11.13	3.9/ 0.27	1"	7½"/ 190	No	Yes
02-L-02-D-1-8L-8UB	¾"	0.03/ 6.8	0.10/ 22.8	0.15/ 34.1	35/ 7.95	49/ 11.13	3.9/ 0.27	1"	9"/ 229	No	Yes
02-L-02-D-1-8D-8UB	1"	0.04/ 9.1	0.25/ 56.8	0.4/ 90.8	55/ 12.49	77/ 17.49	3.1/ 0.21	1½"	10½"/ 273	No	Yes

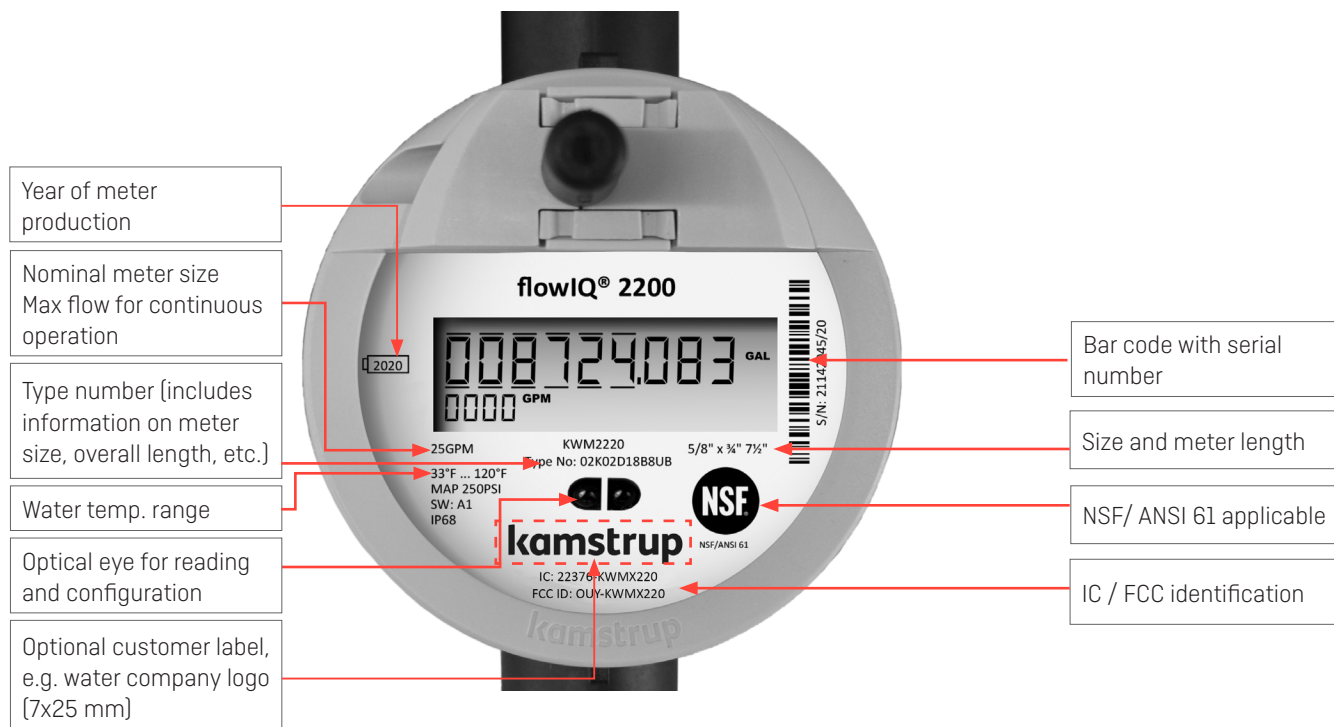
Note! 02-K-02-D-1-8C-8UB can be ordered with a 1½" extension and washer (installed by the customer) to fit 7½" or 9" lay lengths.

Note! Flow specifications only apply at temperatures below 86 °F / 30 °C

¹⁾ At flows between 'Start flow' and 'Maximum flow' measurement occurs – however the accuracy is only guaranteed in the range from minimum flow to maximum flow.

Meter face details

Meter information in permanent laser engraved text.



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

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.

Temperature monitoring

flowIQ® 2200 measures water and ambient temperatures respectively.

Information on temperatures above or below the configured temperature in the meter will warn the utility on potential frost damages or quality issues.

The measurements can be used to monitor the installation and to give an indication of the quality of the water.

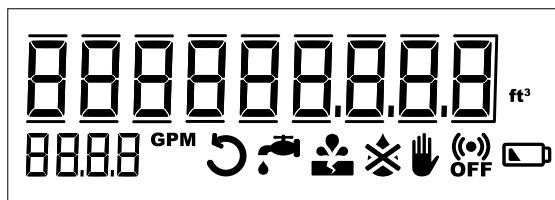
Consumption above max flow

The meter logs information on consumption above max flow. This information can be used to indicate if the meter size for a given installation is correct.

Consumption histogram

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

Display and info codes



The large display with totalized volume, flow rate and intuitive info codes on flowIQ® 2200 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 operations optimization, customer information, water loss and tampering. The info codes in the display have the following meaning and function:

Info code	Meaning
	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.
	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 on the first time water runs through the meter.
	RADIO OFF lights permanently. The radio is switched off permanently. Can be activated via METERTOOL.
	The symbol appears when the expected capacity left is 6 months or less.

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.

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	2400 hours
Operating hours	✓	✓	✓	✓
Info codes incl. hour counter	✓	✓	✓	✓
Volume	✓	✓	✓	✓
Volume reverse	✓	✓	✓	✓
Volume net	✓	✓	✓	✓
Acoustic Noise Value Day			✓	
Flow max incl. date	✓	✓		
Flow min incl. date	✓	✓		
Flow max day incl. Timestamp			✓	
Flow min day 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, 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.

Radio package options

Optional RF output

Some of the data sent via a high-power antenna and integrated 912.5, 915 or 918.5 MHz band RF is optional. It is possible to select one of the data packages with content illustrated in the figure below.

The choices are determined by means of the selected YYYY-value when ordering a water meter – shown to the right in the figures.

Data collection	Data profile	Volume	Reverse volume	Water temperature	Ambient temperature	Max. flow	Acoustic noise	YYYY value
Walk-by drive-by		Actual + monthly		Min. daily	Min. daily		Actual	01004
					Max. daily			01005
Fixed network	Daily*	Daily	Daily	Min. & max daily	Min. & max daily	Daily	Daily	51505
	3 hours	Hourly						51506
	1 hour	Hourly						52506

*The package is transmitted every 3 hours.

State of the art meter reading system (READY)

Standardized and open communication

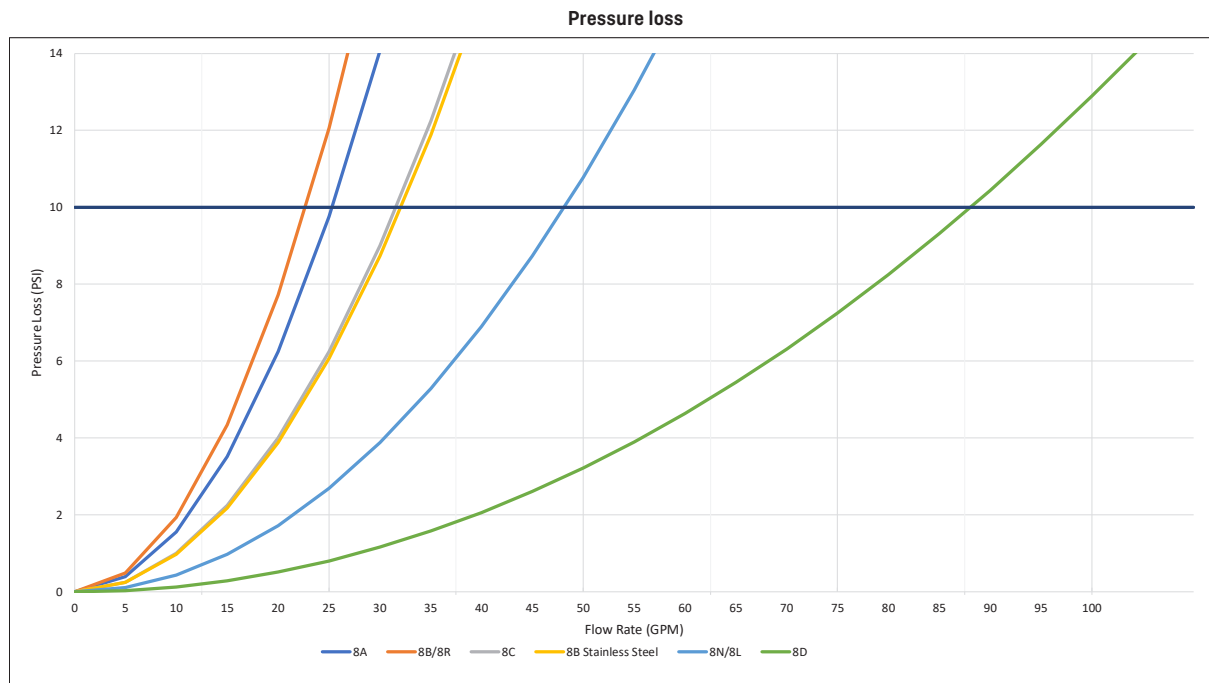
902-928 MHz band RF is an open standard, following EN13757-4:2010, which means that while the flowIQ® 2200 can be configured with or without encryption of the transmitted signal, encryption is required in the United States.

Encryption protects personal data against unauthorized monitoring. Furthermore, the encryption file provides easy access to import meter data for reading programs.

Pressure loss

According to AWWA C715-18 Type I guideline the maximum pressure loss must not exceed 10 PSI (0.69 bar) at SMOC.

The following graph shows pressure loss with respect to flow rate:



Ordering details

Start your order by stating the type number of the selected model of flowIQ® 2200. The type number includes information on meter type - meter version, size, lay length, service connection and time zone.

Subsequently the meter configuration, which determines customer-specific requirements such as number of digits in display etc., is selected. The configuration is completed during programming of the final meter.

Accessories are enclosed separately to be mounted by the installer.

Meter type - flowIQ® 2200

Type	□□	□	□□	□	□	□□	□	□□
Meter generation								
Second generation	02							
Mechanical design								
Composite, PPS		K						
Stainless steel		L						
Communication								
AMI, dual-band capable, [2-way]			02					
Power supply								
D-cell				D				
Dynamic range								
AWWA C715-18					1			
Meter size								
5/8" x 1/2" [25GPM]; 3/4" NPSM; 7 1/2"						8A		
5/8" x 3/4" [25GPM]; 1" NPSM; 7 1/2"						8B		
5/8" x 3/4" [25 GPM]; 1" NPSM; 5.1"						8R		
3/4" [32GPM]; 1" NPSM; 7 1/2" or 9"; includes 1 1/2" extension						8C		
3/4" [35GPM]; 1" NPSM; 7 1/2"						8N		
3/4" [35GPM]; 1" NPSM; 9"						8L		
1" [55GPM]; 1 1/4" NPSM; 10 3/4"						8D		
Meter type								
Cold water							8	
Country code								
North America, FCC and NSF approved								UB
Canada, ISED and NSF approved								CA

Kamstrup delivers 3 mm EDPM rubber gaskets, which can be ordered with all flowIQ® composite meters.

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

Configuration - flowIQ® 2200

Config	DDD □□□	JJ □□	LLL □□□	MMMM □□□□	N □	P □	S □	U □	RR □□	CCC □□□	V □	T □	YY □□	ZZZ □□□
Display views ¹⁾														
Standard	810													
GMT offset (time zone)														
USA Eastern (GMT-5)		28												
USA Central (GMT-6)		24												
USA Mountain (GMT-7)		20												
USA Pacific (GMT-8)		16												
Target date (handled as order data)														
Max values averaged over time (1..120 min.)														
2 minutes			002											
Customer label														
Alphanumeric (2060-MMMM)				0000										
Leakage message limit														
OFF					0									
Flow continuously > 0.25% of max flow					2									
Flow continuously > 0.5% of max flow					3									
Flow continuously > 1.0% of max flow					4									
Flow continuously > 2.0% of max flow					5									
Pipe burst limit														
OFF					0									
Flow > 5 % of max flow for 30 minutes					1									
Flow > 10 % of max flow for 30 minutes					2									
Flow > 20 % of max flow for 30 minutes					3									
Ambient Temperature low limit														
OFF						0								
Ambient temperature < 3 °C / 37 °F						3								
Ambient temperature < 6 °C / 43 °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														
Standard (default)								04						
To be continued on next page...														

Configuration - flowIQ® 2200

Config	DDD	JJ	LLL	MMMM	N	P	S	U	RR	CCC	V	T	YY	ZZZ
...	□□□	□□	□□□	□□□□	□	□	□	□	□□	□□□	□	□	□□	□□□
...continued from previous page														
Display resolution (alphanumeric)														
0000000.00 USgal - 0.01 GPM - Billing in 1,000s (recommended for residential meters)										220				
000000000 ft³ - 0000 GPM - Billing in 1,000s (recommended for district meters)										154				
For additional options please refer to FILE100002712														
Temperature units of measure														
Fahrenheit											1			
Celsius											0			
Encryption level														
Encryption with separately forwarded key												3		
System														
AMR													01	
AMI													51	
AMI, no battery warranty ²⁾													52	
Data packages - AMR														
Actual: Vol., AcousticNoise. Monthly: Vol., Daily: Min. water temp. ³⁾ , Min. ambient temp.														[01]-004
Actual: Vol., AcousticNoise. Monthly: Vol., Daily: Min. water temp. ³⁾ , Max ambient temp.														[01]-005
Data packages - AMI														
Default, Daily - Vol., reverse vol., Min. water temp. ³⁾ , Min. ambient temp., Max flow, AcousticNoise, Max Ambient temp., Max Water Temp.														[51]-505
Default, 3 hour - Vol., reverse vol., Min. water temp. ³⁾ , Min. ambient temp., Max flow, AcousticNoise, Max Ambient temp., Max Water Temp.														[51]-506
Default, 1 hour - Vol., reverse vol., Min. water temp. ³⁾ , Min. ambient temp., Max flow, AcousticNoise, Max Ambient temp., Max Water Temp.														[52]-506

¹⁾ Volume and software version are always a part of display views

²⁾ Only for data package 506

³⁾ Min. water temperature will not indicate potential frost damage

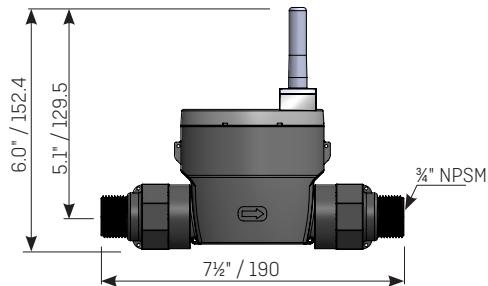
	DDD	JJ	LLL	MMMM	N	P	S	U	RR	CCC	V	T	YY	ZZZ
Unless otherwise stated in the order, Kamstrup supplies the following:	810	□□	002	0000	4	3	3	3	04	220	1	3	01	004

Note: JJ (timezone) and target date are not predefined and has to be chosen in the ordering system.

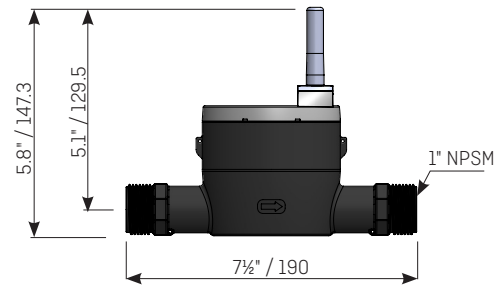
Dimensional sketches – flowIQ® 2200

NOTE! Same threads for in- and outlet.

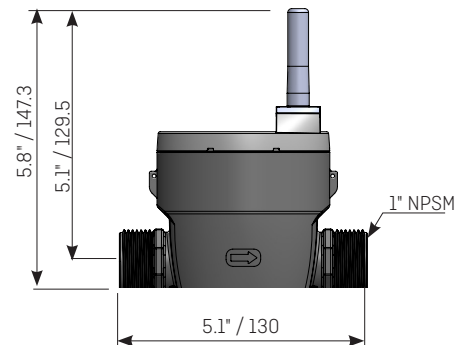
Type: 8A – Size: 25 GPM $\frac{5}{8}$ " x $\frac{1}{2}$ " x $7\frac{1}{2}$ "



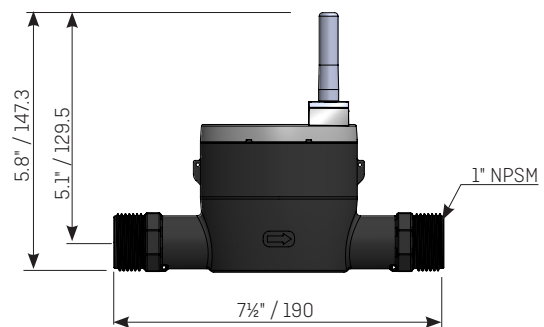
Type: 8B – Size: 25 GPM $\frac{5}{8}$ " x $\frac{3}{4}$ " x $7\frac{1}{2}$ "



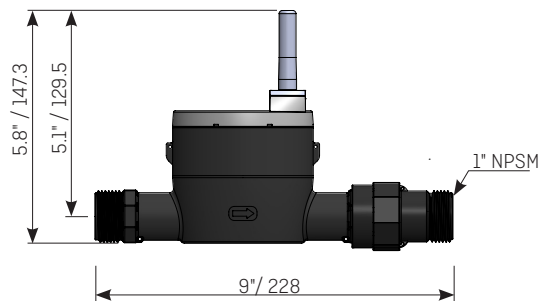
Type: 8R – Size: 25 GPM $\frac{5}{8}$ " x $\frac{3}{4}$ " x 5.1 "



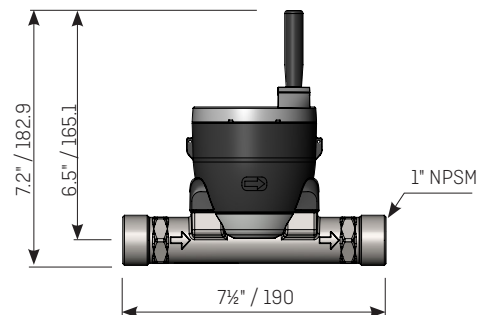
Type: 8C – Size: 32 GPM $\frac{3}{4}$ " x $\frac{3}{4}$ " x $7\frac{1}{2}$ "



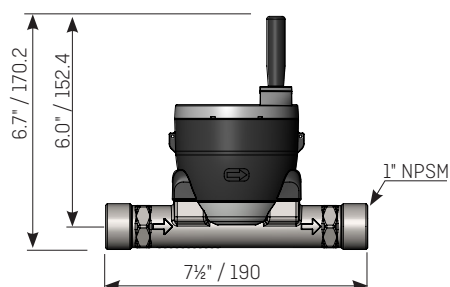
Type: 8C+ – Size: 32 GPM $\frac{3}{4}$ " x $\frac{3}{4}$ " x 9 "



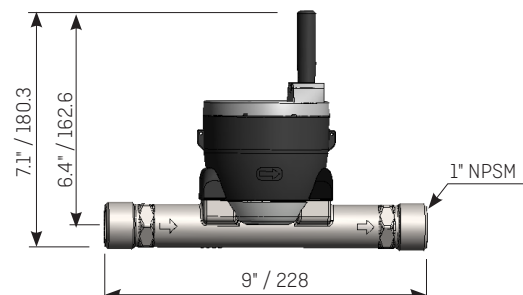
Type: 8B – Size: 25 GPM $\frac{5}{8}$ " x $\frac{3}{4}$ " x $7\frac{1}{2}$ "



Type: 8N – Size: 35 GPM $\frac{3}{4}$ " x 1 " x $7\frac{1}{2}$ "

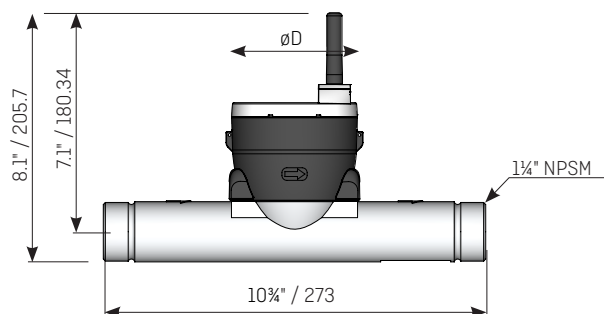


Type: 8L – Size: 35 GPM $\frac{3}{4}$ " x 1 " x 9 "



Dimensional sketches – flowIQ® 2200

Type: 8D – Size: 55 GPM 1" x 1¼" x 10¾"



*Dimensions: Inches / mm

Dimensions

Mechanical design	Meter type	Meter size GPM	NPSM thread	L	H	øD	Weight approx. [Lbs/Kg]
				[Inches /mm]			
PPS	8A	25	¾"	7½" / 190	6.0" / 152.4	3.6" / 91.4	1.07/ 0.49
PPS	8B	25	1"	7½" / 190	5.8" /147.3	3.6"	1.02/ 0.46
PPS	8R	25	1"	5.1" / 130	5.8" / 147.3	3.6"	1.02/ 0.46
PPS	8C	32	1"	7½" / 190	5.8" / 147.3	3.6"	1.02/ 0.46
PPS	8C+	32	1"	9" / 228	5.8" / 147.3	3.6"	1.11/ 0.50
Stainless steel	8B	25	1"	7½" / 190	7.2" / 182.9	3.6"	1.02/ 0.46
Stainless steel	8N	35	1"	7½" / 190	6.7" / 170.2	3.6"	2.2/ 1.0
Stainless steel	8L	35	1"	9" /228	7.1" / 180.3	3.6"	2.5/ 1.13
Stainless steel	8D	55	1¼"	10¾" / 273	8.1" / 205.7	3.6"	4.1/ 1.86

Accessories

See Accessories for Water Meters: [FILE100000644_US](#).

[Accessories are ordered separately in CPQ (Kamstrup ordering system) and will be delivered as single parts in the packaging.]

flowIQ® 2200

Kamstrup A/S • FILE1000000648_C_EN-US_09.2023

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