

Data sheet

flowIQ® 4200

- » RF
- » Encoded Output

- Ultrasonic measurement
- Sustainable measurement accuracy
- Flow measurement in display
- Multiple radio options available
- Fire service approved
- IP68 Vacuum sealed construction
- Lead free and certified to NSF/ANSI/CAN 61
- Replaceable battery
- Coated split flanges in cast iron



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Electronic ultrasonic cold water meter for measurement of cold water consumption in multi-unit buildings, commercial applications 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® 4200 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) and is suitable for installation in meter pits.

Installation

flowIQ® 4200 is easy to install horizontally as well as vertically, independent of piping and installation conditions.

Consumption data can be read visually from the display, using an optical IR interface head, or remotely read, by various integrated communication protocols.

Specific features

flowIQ® 4200 measures the environmental temperatures.

The battery package is replaceable without decommissioning the meter, allowing for easy and convenient asset management.

flowIQ® 4200 utilizes split flanges allowing for flexible installation options.

Environmentally friendly

The meter has been approved according to Drinking Water Standards and is certified to NSF/ANSI/CAN 61. The meter housing is made of stainless steel 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 also has a highly automated manufacturing process and only uses materials approved for drinking water. The hygiene is being controlled by external accredited laboratories and by frequent audits.

General description

flowIQ® 4200 is a hermetically sealed water meter intended for measurement of cold water consumption in multi-unit buildings, commercial applications and industry.

flowIQ® 4200 employs the ultrasonic measurement principle, based on Kamstrup's experience since 1991, with the initial development and production of static ultrasonic meters.

One of flowIQ® 4200's many advantages is the fact that it has no wearing parts, which ensures a high and stable accuracy throughout its lifetime. flowIQ® 4200 complies with all the AWWA C715-18 and CN1044 fire service guideline for Ultrasonic Water Meters.

In the flowIQ® 4200 series a composite housing is mounted on a stainless steel meter body with coated split flanges in cast iron. The electronics are fully protected against internal and external penetration of water.

The meter is suitable for mounting in pump stations or wellheads, as it will also function in fully submerged conditions.

flowIQ® 4200 measures the water consumption electronically as a volume, using two pairs of ultrasonic signals. Through four 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 delayed. 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® 4200 is powered by a double D-cell internal lithium battery which can provide up to 20 years operating life depending on usage and configuration.

flowIQ® 4200 is available with a choice of two integrated data communication options:

- 912.5, 915 or 918.5 MHz – RF
- 450-470 MHz - RF
- Encoded Output

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® 4200 can and must only be opened by Kamstrup A/S – or by Kamstrup instructed personnel in regard to battery replacement.

Technical data

Electrical data

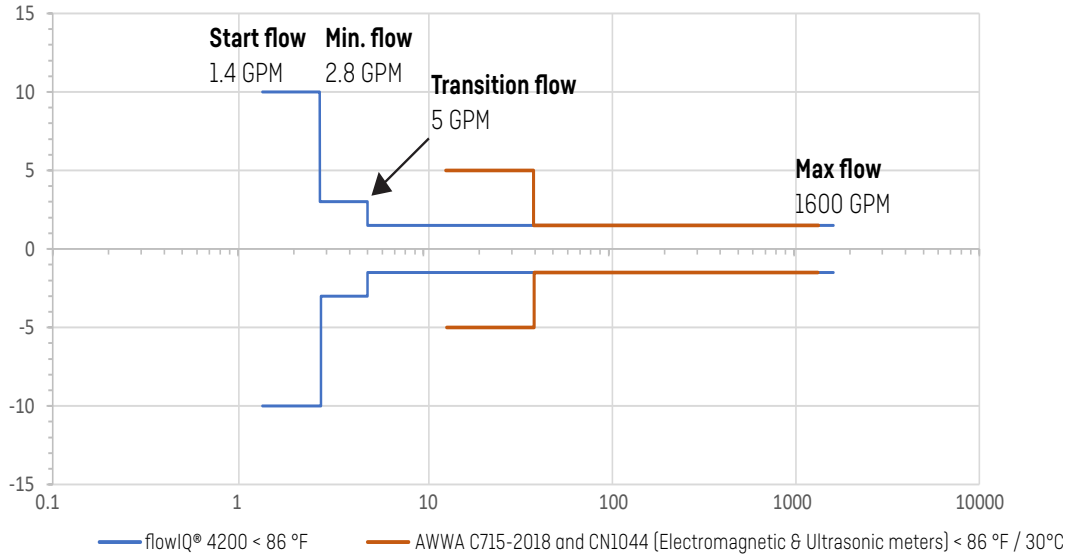
Battery 2 x D-cell batteries, 3.6V. The battery warranty does not apply at meter temperatures above $t_{BAT} > 95\text{ °F} / 35\text{ °C}$

Mechanical data

Protection class IP68-rated (waterproof/submersible)
 Mechanical environment Class 1 (Measuring Instruments Directive classification)
 Maximum operating pressure Round flange mounted, 275 PSI
 Ambient/meter temperature 35... 130 °F / 0.5... 55 °C
 Water temperature 33... 120 °F / 0.5... 50 °C
 Storage temp. empty sensor -10... 140 °F / -20... 60 °C
 Upstream/Downstream U0/D0
 Pipe Length Req. U0/D0

KWM4220 6" 1600 GPM

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/CAN 61
 Complies to part 15 of the FCC rules, ISED, AWWA C715-18 and with CN1044

Material

Wetted parts

Flow part, flanged	Stainless Steel 316L
O-ring/gasket	EPDM
Transducer pocket	PPS with fiberglass

Non-wetted parts

Split flanges	Cast iron, EN-GJS-500-7C-black-FBE coating
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External meter parts

Meter housing	Polyphenylene sulfide (PPS) – 40 % fiberglass
Cover	Glass
Top ring (sealing)	Polycarbonate (gray)

Meter sizes

flowIQ® 4200 is available in sizes shown in the table below:

XX = Communication module ZZ = Country code

Type number	Meter size	Start flow (S)	Min. flow	Transition flow ¹⁾	Max flow	Sat. flow rate	Pressure loss SMOC ³⁾	Connection on meter	Lay length	Split flanges weight	Total weight
	Inches										
02-E-XX-G-1-FR-8ZZ ²⁾	6"	1.4/ 318	2.8/ 635	5/ 1.136	1600/ 317.97	1960/ 445.16	2.66/ 0.183	6"	11.8'/ 299.7	31/ 14.1	60/ 27.2
02-E-XX-G-1-GA-8ZZ ²⁾	8"	1.7/ 386	4/ 908	7/ 1.590	2800/ 635.95	3920/ 890.33	3.9/ 0.268	8"	13.8'/ 350.5	42/ 19.1	86/ 39.0
02-E-XX-G-1-GJ-8ZZ	10"	2/ 454	5/ 1136	8/ 1.817	4500/ 1022.06	6300/ 1430.89	4.2/ 0.289	10"	17.7'/ 450	64/ 29.0	134/ 60.8
02-E-XX-G-1-GS-8ZZ	12"	2.3/ 522	6/ 1363	10/ 2.271	5500/ 1249.19	7700/ 1748.86	2.8/ 0.193	12"	19.7'/ 500	84/ 38.1	185/ 83.9

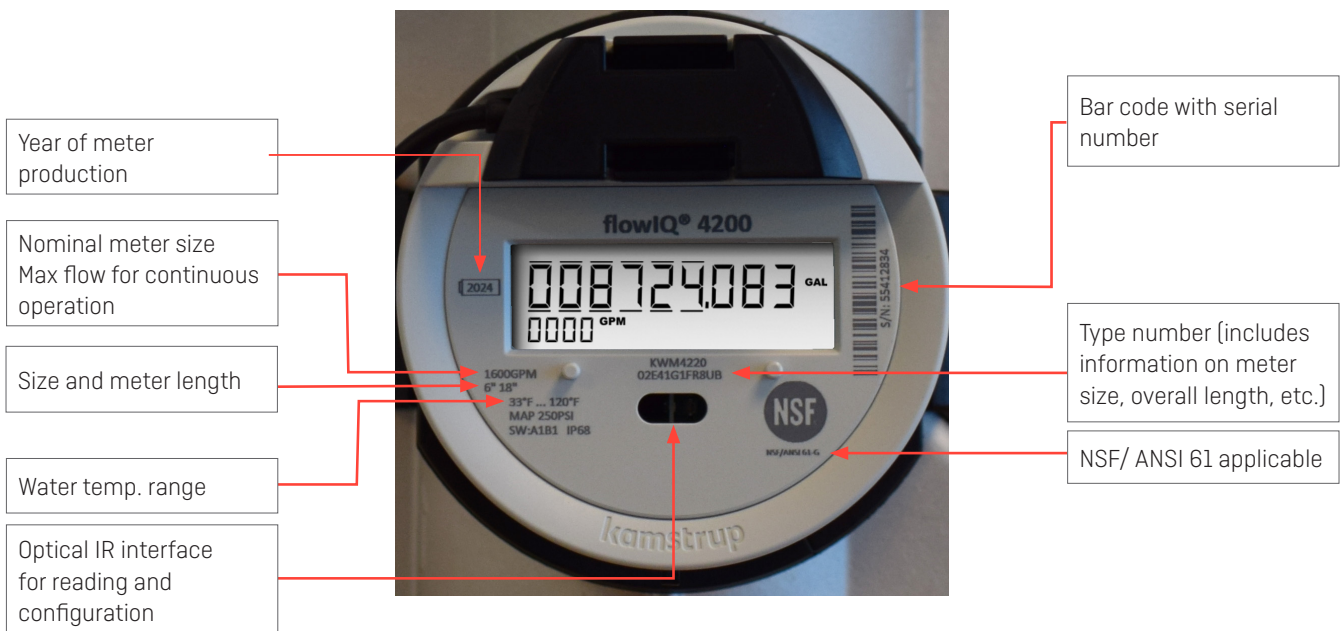
¹⁾ At flows between 'Start flow' and 'Maximum flow' measurement occurs – however the accuracy is only guaranteed in the range from minimum flow to maximum flow.

²⁾ Spool piece is available for this meter size. Lay length 6" with spool piece = 18"/457mm; lay length 8" with spool piece = 20"/508mm.

³⁾ SMOC = Safety Maximum Operating Capacity [pressure].

Meter face details

Meter information in permanent laser engraved text.



Core features

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

Temperature monitoring

flowIQ® 4200 measures ambient temperatures.

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.

No consumption

If no consumption has been measured for a long period of time the meter will inform the utility, as this indicates a potential 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 only related to the volume reading. Due to the meter's update time, the flow display, in case of rapidly increasing/decreasing flow, may turn out to be slower than the real flow and not a one-to-one correlation between the flow display and the volume growth.

In general, one would expect the flow display to stabilize after about half a minute of constant flow and thereafter to be consistent with volume growth.

Meter modes

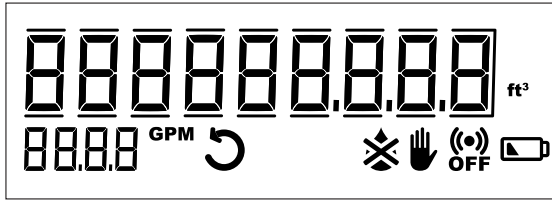
KWM4220:	Normal mode	Verification mode
Flow measurement and flow display update	1 s	0.125 s
Volume integration and volume display update	8 s	1 s

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.

Display and info codes



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

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	Condition
	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.

- Switch off automatically when the condition that activated them no longer exists.
- Disappears when the water no longer flows in the wrong direction.
- Disappears when the meter is filled with water.

**RADIO OFF is not available for Encoded Output meters*

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 IR interface.

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	✓	✓	✓	✓
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			✓	
Ambient temp. Max Year	✓			
Ambient temp. Min. Year	✓			
Ambient temp. Avg. Year	✓			
Ambient temp. Max Month		✓		
Ambient temp. Min. Month		✓		
Ambient temp. Avg. Month		✓		
Ambient temp. Max Day			✓	
Ambient temp. Min. Day			✓	
Ambient temp. Avg. Day			✓	

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.

Integrated communication

The meter supports a variety of different communication options depending on meter type. All radio supported meters can be used with Kamstrup's external antenna. Transmission properties and data packages are defined in the configuration number YY-ZZZ. These can be changed with METERTOOL, MeterToolX or READyApp through the optical IR interface or with a READy Converter.*

**Depending on communication protocol.*

RF

Kamstrup RF is based on Wireless M-Bus which is a mature and proven technology for remote reading of smart meters. Wireless M-Bus provides a robust, simple and secure reading of meters and requires a low initial investment, but is flexible enough to be expanded whenever desired. Wireless M-Bus is based on an European standard (EN 13757-4) applicable to devices for reading consumption of water, electricity, or energy. The data encryption consists of a 128-bit AES counter mode encryption. Both AMR 912.5, 915 and 918.5 MHz and AMI 450-470 MHz are available.

For additional information about the Kamstrup RF communication module, please refer to FILE100003480.

Encoded Output

The Sensus Encoded Output and TouchRead are implemented based on Sensus specification UI-1203 and UI1204. Encoded Output is compatible with several 3rd party RF network systems. Kamstrup Encoded Output supports Sensus Encoded Output systems and Sensus TouchRead systems. In addition, Neptune ProRead, Neptune E-coder systems and others are supported.

For additional information about the Encoded Output communication module, please refer to FILE100003729.

State of the art meter reading system (READY)

Standardized and open communication

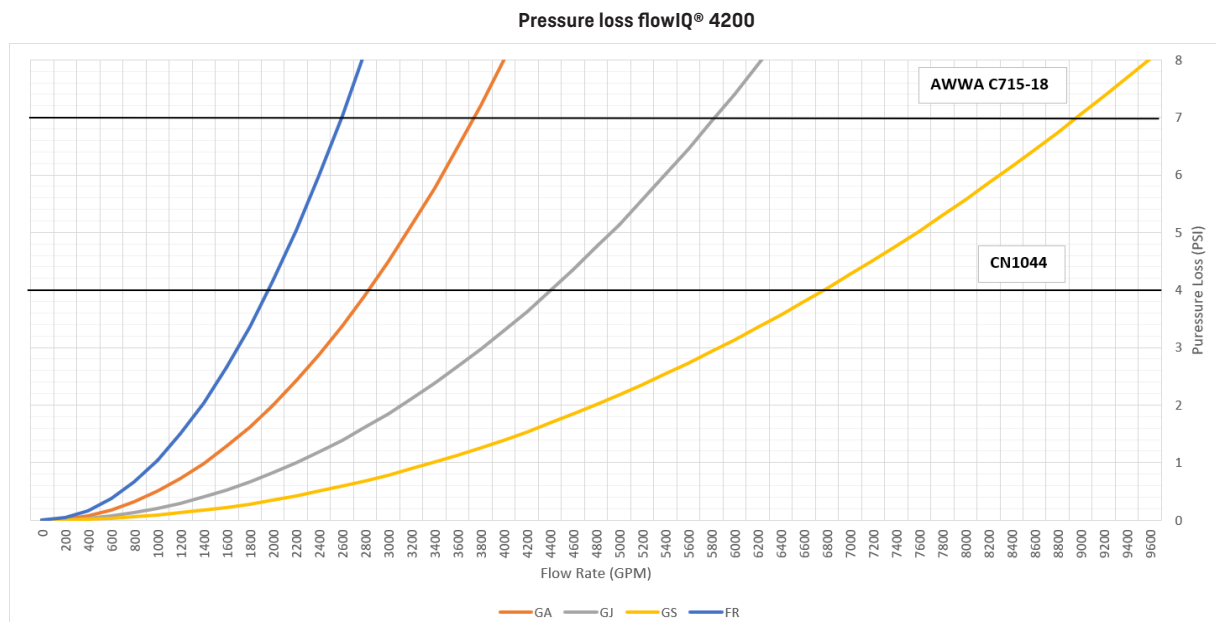
902-928 MHz band RF is an open standard, following EN13757-4:2010, which means that while the flowIQ® 4200 can be configured with or without encryption of the transmitted signal, encryption is required in the United States.

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 guideline Type II) the maximum pressure loss must not exceed 7 PSI (0.48 bar) at SMOC for water meters. According to CN1044 the maximum pressure loss must not exceed 4 PSI (0.27 bar) at SMOC for Fire Service water meters.

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



The pressure loss graph is indicative, please see document no.: FILE100000198 for more information about pressure loss.

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 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® 4200

Type	□□	□	□□	□	□	□□	□	□□
Meter generation								
Second generation	02							
Mechanical design								
Stainless steel with iron split flanges		E						
Communication								
RF			02					
Encoded Output			41					
Power supply								
Double D-cell				G				
Dynamic range								
AWWA C715-18					1			
Meter size								
6" x 11.8" [1600 GPM]							FR	
8" x 13.8" [2800 GPM]							GA	
10" x 17.7" [4500 GPM]							GJ	
12" x 19.7" [5500 GPM]							GS	
Meter type								
Cold water								8
Country code								
North America, FCC and NSF approved								UB
Canada, ISED and NSF approved								CA
FM fire service approved								FM

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

Configuration

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														
Customer label blank				5000										
Leakage message limit														
OFF						9								
Pipe burst limit														
OFF							0							
Ambient Temperature low limit														
OFF								0						
Ambient temperature < 2 °C / 36 °F								2						
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 / 113 °F									6					
Data logger profile														
Standard (default)										04				
Standard Encoded Output										15				
<i>To be continued on next page...</i>														

Configuration

Config	DDD	JJ	LLL	MMMM	N	P	S	U	RR	CCC	V	T	YY	ZZZ
	□□□	□□	□□□	□□□□	□	□	□	□	□□	□□□	□	□	□□	□□□
<i>...continued from previous page</i>														
Display resolution (alphanumeric)														
000000000 ft³ - 0000 GPM - Billing in 1,000s										154				
0000000000 Usgal - 0000 GPM - Billing in 10s (recommended for district meters)										224				
<i>For additional options please refer to FILE100002712</i>														
Temperature units of measure														
Fahrenheit											1			
Celsius											0			
Encryption level														
Encryption with separately forwarded key												3		
No encryption (applicable for Encoded meters)												0		
Communication														
For communication protocols please refer to the specific module data sheets														

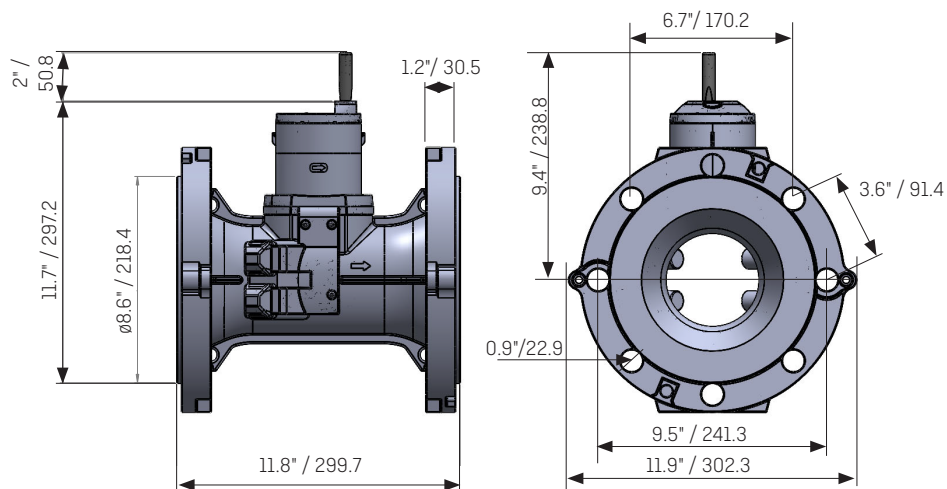
	DDD	JJ	LLL	MMMM	N	P	S	U	RR	CCC	V	T	YY	ZZZ
Unless otherwise stated in the order, Kamstrup supplies the following:	810	□□	002	5000	9	0	3	3	RR	224	1	3	YY	ZZZ

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

Dimensional sketches

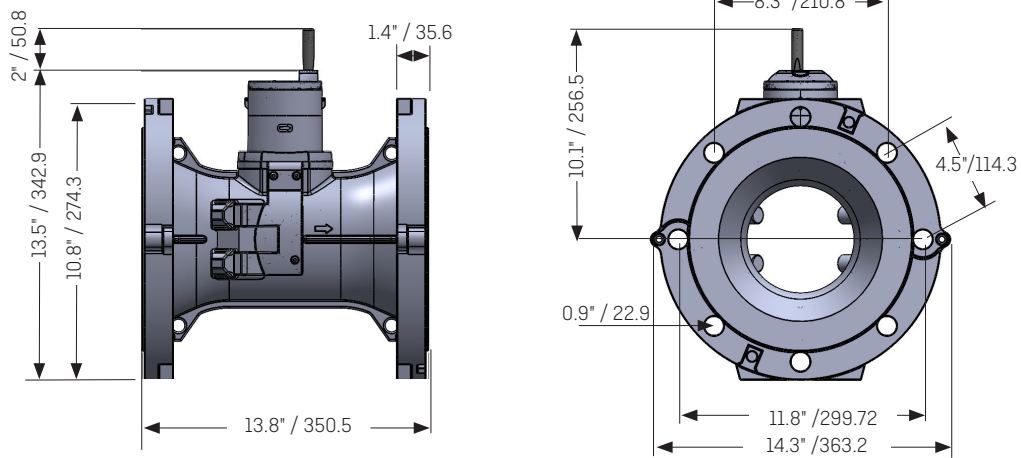
Type: FR Size: 1600 GPM 6" x 11.8"

NOTE! Same flanges for in- and outlet. / Dimensions: Inches/mm

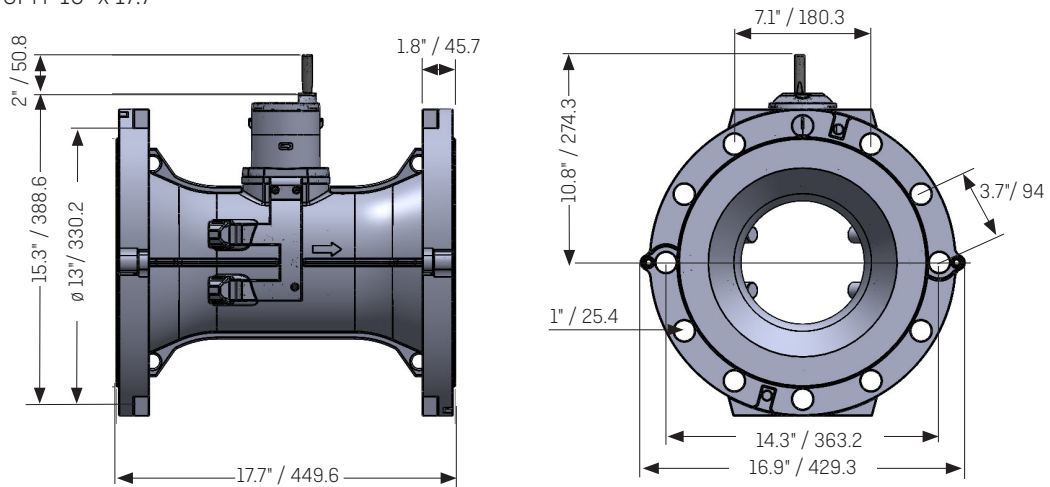


Dimensional sketches

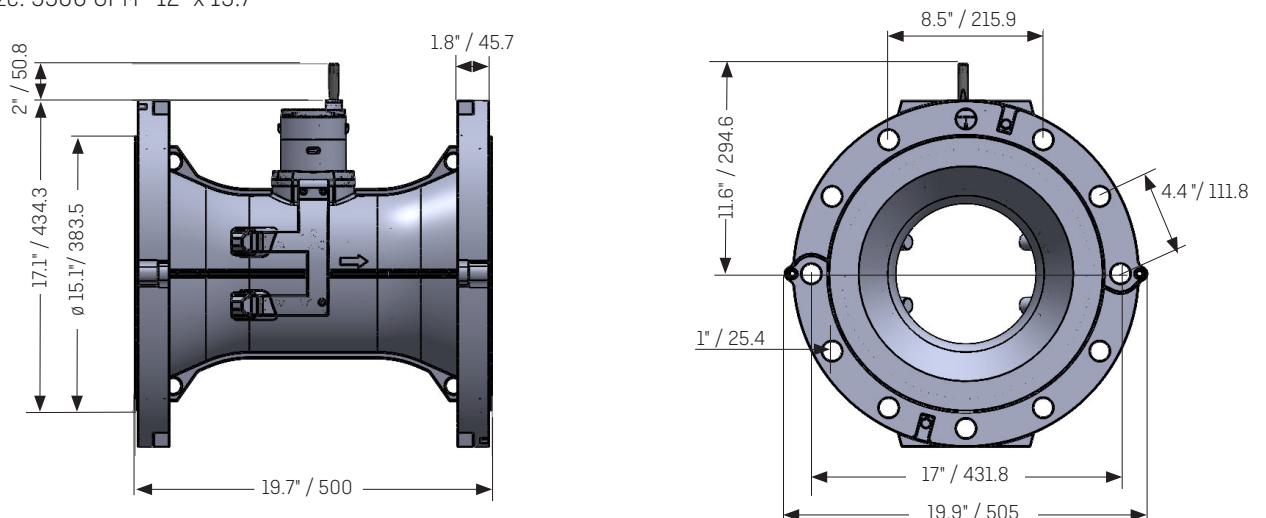
Type: GA Size: 2800 GPM 8" x 13.8"



Type: GJ Size: 4500 GPM 10" x 17.7"

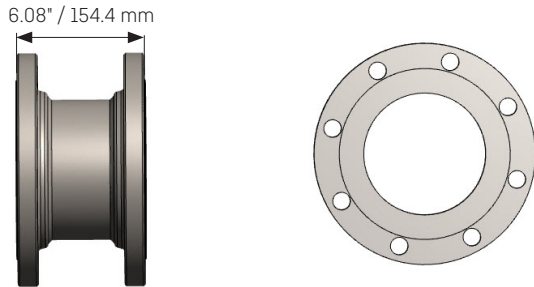


Type: GS Size: 5500 GPM 12" x 19.7"

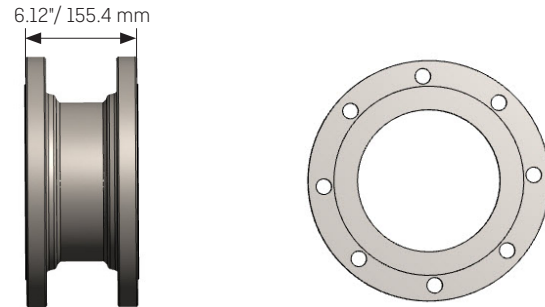


Dimensional sketches

Spool piece for 6" [FR]



Spool piece for 8" [GA]



Accessories

See Accessories for Water Meters on Kamstrup.com.

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

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