kamstrup

Data sheet

flowIQ® 2200 & flowIQ® 3200 – KWM3231

- Acoustic leakage detection in service connections for all meter variants – both flowIQ® 2200 & flowIQ® 3200
- Meter sizes from 1" to 2"
- Meters both in composite or stainless steel
- Nominal flow from 2.5 m³/h up to 16.0 m³/h
- Approved with dynamic range up to R1000
- Pinpoint accuracy
- Integrated communication
  - Wireless M-Bus C1/C2, T1
  - linkIQ®
- External antenna option
- Intelligent info codes assist you with your operations, asset management and customer service
- Water and ambient temperature measurement
- Up to 16 years of battery life time
- Designed for operation in submerged environments

Contents

Taking smart metering to the next level

Our flowIQ® meters raises the bar for what you can expect from a static ultrasonic water meter. The flowIQ® meters consists of several variants, all specifically named with a prefix e.g. KWM3231, which is the meter in question for this data sheet.

The KWM3231 meter series comes with a composite electronic housing combined with a composite or metal body for all meter sizes.

flowIQ® 2200 composite & metal thread meter 1" to 1¼"
flowIQ® 3200 composite & metal thread meter 1½" to 2"

Founded on our more than 25 years of experience, the meter provides modern water utilities with the knowledge needed to make informed and reasoned decisions to prioritize the daily efforts.

The meter support Integrated Acoustic Leakage detection (called ALD) on all meter sizes. Having been in operation, now for only few years, this feature has already proved its worth significantly and contributed considerably to the elimination of non-revenue water.

Thanks to the low minimum cut-off flow the meters measure even the smallest consumption.

The meter has no built-in moving parts and is therefore less sensitive to impurities in the water and also to wear and tear, which ensures increased longevity and better performance compared to traditional mechanical meters.

The KWM3231 meter series is supplied by two A-cell batteries, that, depending on the installation and radio configuration, has a lifetime of up to 16 years.

Other key features include intelligent alarms and info codes, water- and ambient temperature measurements, as well as consumption profiles. All of this ensures fair and accurate billing, improves the data quality and help to reduce the non-revenue water.

Sizes	1"	1¼"	1½"	2"
flowIQ® 2200				
flowIQ® 3200				

= *Stainless steel*

= *Composite*

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 are continuously testing disinfection effectiveness through frequent audits both internally and by external accredited laboratories.

Approved meter data

MID classifications according to MID 2014/32/EU, based on OIML R 49/ISO 4064

Approval:

flowIQ® 2200 - KWM3231	DK-0200-MI001-047
flowIQ® 3200 - KWM3231	DK-0200-MI001-047
Mechanical environment	Class M1
Electromagnetic environment: flowIQ® 2200/flowIQ® 3200 - KWM3231	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)
Water temperature, cold water	0.1...30 °C (T30) or 0.1...50 °C (T50)
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)
Meter types:	
- Composite	Q_3 = 4.0, 6.3, 10.0 and 16.0 m³/h
- Stainless steel	Q_3 = 2.5, 4.0, 6.3, 10.0 and 16.0 m³/h
Radio communication	RE-D (Radio Equipment Directive)
Drinking water approvals	(All parts are suitable for drinking water)

Technical data

Electrical data

Battery:	3.65 VDC lithium - 2 x A-cell
Battery lifetime:	Up to 16 years – depending on selected data package and ambient installation temperature
EMC data:	Fulfils MID class: E1 and E2
MID approved electronic operating temperature range:	-25...55 °C

Mechanical data

Metrological class:	2
Ambient class:	Fulfils OIML R 49 class B and O (building/outdoor)
Ambient temperature:	2...55 °C
Protection class:	IP68
Impact energy levels:	IK08 according to IEC62262
Storage temp. empty sensor: (dry meter)	-25...60 °C (< 40 °C for a prolonged storage time) Specially for APET packaging: A packaged water meter must not be stored at temperatures > 40 °C for periods exceeding 24 hours
Pressure stage:	PN16
Connection:	Thread EN/ISO 228-1

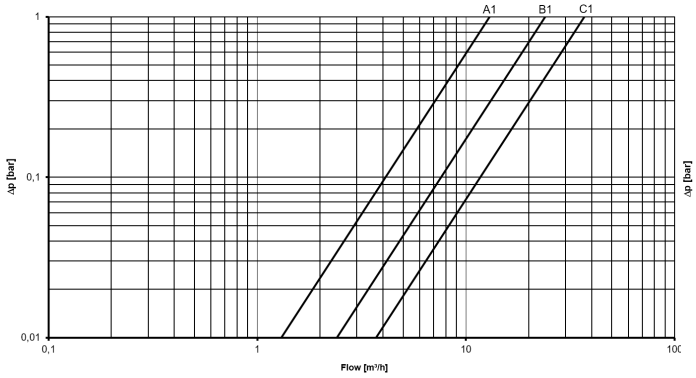
Materials

Wetted parts

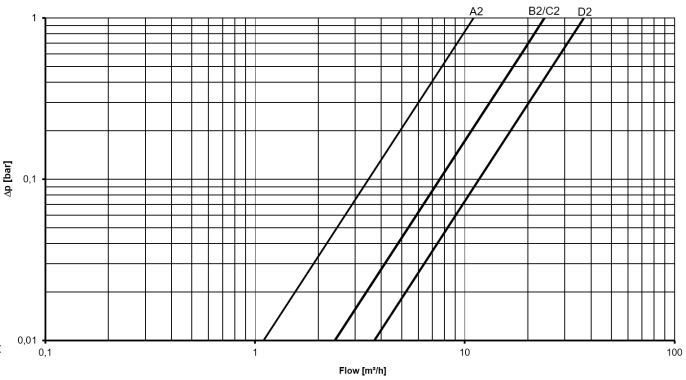
Meter flow parts, composite	PPS with 40 % fibreglass reinforcement
Meter flow parts, metal	Stainless steel, W.no. 1.4408
Measuring pipe	PPS with fibreglass (40 %) reinforcement
Reflectors	Stainless steel, W.no. 1.4401 and 1.4404 (316/316L)
O-ring/gasket, composite	EPDM
O-ring/gasket, stainless steel	Tesnit® BA-KTW-G
Strainer	PES and PPO
By-pass blocker, composite	PPS with 40 % fibreglass
Attachment ring	Stainless steel
Housing connection O-ring	EPDM

Pressure loss

Δp flowIQ® 2200 & 3200 (KWM3231)
Composite meter body



Δp flowIQ® 2200 & 3200 (KWM3231)
Stainless steel meter body



Meter variant Composite	Graph	Q_3 [m³/h]	Nom. diameter	kv	Q @ 0.63 bar [m³/h]
KWM3231	A1	4.0 / 6.3 / 10.0	1¼" (DN25)	13.0	10.3
	B1	6.3 / 10.0	1½" (DN32)	24.0	19.0
	C1	10.0 / 16.0	2" (DN40)	37.0	29.4

Meter variant Stainless steel	Graph	Q_3 [m³/h]	Nom. diameter	kv	Q @ 0.63 bar [m³/h]
KWM3231	A2	2.5	1" (DN20)	11.0	8.7
	B2	4.0 / 6.3 / 10.0	1¼" (DN25)	24.0	19.0
	C2	6.3 / 10.0	1½" (DN32)	24.0	19.0
	D2	10.0 / 16.0	2" (DN40)	37.0	29.4

Meter sizes

KWM3231 is available in these combinations with a stainless steel body:

Meter type	Nom. flow Q_3 [m³/h]	Min. flow Q_1 [L/h]	Max flow Q_4 [m³/h]	Min. cutoff [L/h]	Q at Δp 1 bar [m³/h]	Pressure loss Δp at Q_3 [bar]	Dynamic range	Connection on meter and length [mm]
2D	2.5	15.6	3.1	3.0	11.0	0.05	160	G1B 190
3C	4.0	25.0	5.0	5.0	24.0	0.03	160	G1¼B 260
3D	6.3	25.2	7.9	5.0	24.0	0.07	250	G1¼B 260
3E	10.0	40.0	12.5	5.0	24.0	0.17	250	G1¼B 260
3M	6.3	39.4	7.9	5.0	24.0	0.07	160	G1½B 260
3N	10.0	40.0	12.5	5.0	24.0	0.17	250	G1½B 260
4A	10.0	62.5	12.5	8.0	37.0	0.07	160	G2B 300
4B	16.0	64.0	20.0	8.0	37.0	0.19	250	G2B 300

KWM3231 is available in these variants with a composite body:

Meter type	Nom. flow Q_3 [m³/h]	Min. flow Q_1 [L/h]	Max flow Q_4 [m³/h]	Min. cutoff [L/h]	Q at Δp 1 bar [m³/h]	Pressure loss Δp at Q_3 [bar]	Dynamic range	Connection on meter and length [mm]
3C	4.0	25.0	5.0	3.0	13.0	0.09	160	G1¼B 260
3D	6.3	25.2	7.9	3.0	13.0	0.23	250	G1¼B 260
3E	10.0	40.0	12.5	3.0	13.0	0.57	250	G1¼B 260
3M	6.3	39.4	7.9	5.0	24.0	0.07	160	G1½B 260
3N	10.0	40.0	12.5	5.0	24.0	0.17	250	G1½B 260
4A	10.0	62.5	12.5	8.0	37.0	0.07	160	G2B 300
4B	16.0	64.0	20.0	8.0	37.0	0.19	250	G2B 300

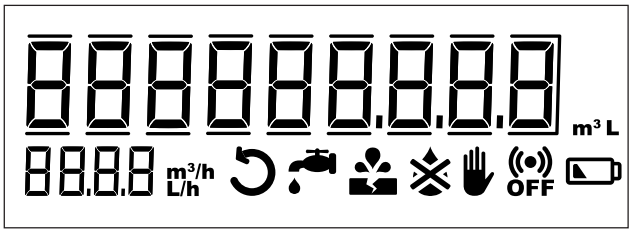
See the section 'Ordering details' for combination possibilities.

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. Max cut-off is an indicative flow value, which depends on the hydraulic conditions.

Display and info codes

The large display of flowIQ® 2200 & flowIQ® 3200 showing totalized volume, flow rate and intuitive info codes makes it easy for end users to understand their own consumption data.

flowIQ® 2200 & flowIQ® 3200 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 optimization, customer information, water loss and tampering.



Display and info codes

The info codes in the display have the following meaning and function:

Info icon	Condition
	The water in the meter has not been stagnant for more than one continuous hour during the last 24 hours. This can be a sign of a leakage downstream the meter such as a leaky faucet, toilet cistern or pipe leakage.
	The water consumption has been consistently high for half an hour, which indicates a pipe burst downstream of the meter.
	Attempt at 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.
	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 amount 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).

 Switch off automatically when the conditions that activated them no longer exist.

 Disappears when the water has been stagnant for more than one hour.

 Disappears when the consumption falls to normal level.

 Disappears when the water is no longer flowing in the wrong direction.

 Disappears when the meter is filled with water.

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.

Acoustic Leakage Detection
The KWM3231 water meter introduces integrated Acoustic Leakage Detection on all meter sizes, 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.

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

Core functions

Current flow display
Besides the consumed volume, KWM3231 series 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 stabilize after about half a minute of constant flow and thereafter to be consistent with volume growth.

Temperature monitoring
The KWM3231 series measures water- and ambient temperatures, respectively. 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 long period of time in a household installation, an info code 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
Operating hours	✓	✓	✓	✓
Info codes incl. hour counter	✓	✓	✓	✓
Volume	✓	✓	✓	✓
Volume reverse	✓	✓	✓	✓
Volume net (only for RR003)	✓	✓	✓	✓
Acoustic noise value day			✓	
Flow max incl. date	✓	✓		
Flow min. incl. date	✓	✓		
Flow max incl. timestamp			✓	
Flow min. 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, 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 the hourly and daily log is possible with the READy Converter and the READy App.

Integrated communication

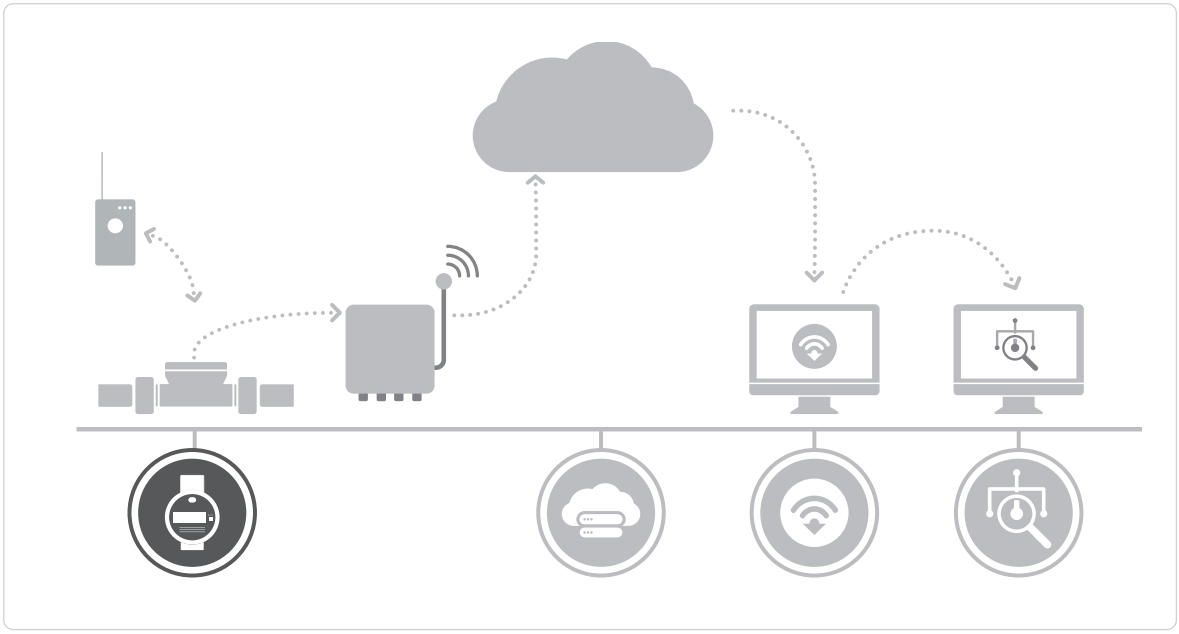
The KWM3231 series supports Wireless M-Bus and linkIQ® communication. All meters can be used with Kamstrup's external antenna. Transmission properties and data packages are defined in the configuration number YY-ZZZ. These can be changed with METERTOOL through the optical IR interface.

Wireless M-Bus

Wireless M-Bus is an unlicensed European frequency standard protocol. The KWM3231 water meter is utilizing the C1 or C2-mode while also supporting T1-BSI/OMS. Kamstrup Wireless M-Bus is transmitting every 16 seconds (drive-by) or every 96 seconds (fixed network).

Encryption for Wireless M-Bus is done in accordance with AES 128 standard.

Integrated communication



linkIQ®
linkIQ® is a Kamstrup developed communication protocol. The linkIQ® protocol ensures the potential for a future-proof, robust and competitive communication network. By utilizing the linkIQ® protocol, high data performance can be achieved. linkIQ® is a "multi- channel-protocol" that can communicate on the 868 MHz band, which has 8 channel changes and retransmission of previously transmitted data. Besides the linkIQ® transmission the meter can also send a small Wireless M-Bus C1 data package for fallback drive-by readings.

Two-ways communication
The KWM3231 can be configured with C2-mode which allows the hourly- or daily log to be read with the READy Converter and READy App, right by the curb. It is also possible to reconfigure the meter with the READy Converter at a distance.

For detailed information regarding all of the above and data packages, please contact Kamstrup.

Pit antenna options

In installation scenarios where better radio signals are needed, external antennas are available for all flowIQ® 2200 and flowIQ® 3200 meters.

- Pit antenna II 2.0 meters 6697926
- Coupler 30261304
- Coupler with SMA connection 6697927

Ordering details

An order is initiated by stating the type number of the selected model of flowIQ® 2200 or flowIQ® 3200.

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	**KWM3231-**	☐☐	☐	☐☐	☐	☐	☐☐	☐	☐☐
Meter generation									
Second generation		02							
Mechanical design									
Composite (PPS) body			N						
Stainless steel body			L						
Communication module									
Wireless M-Bus C1/C2/T1, linkIQ®, 868 MHz				52					
Power supply									
2 x A-cell					A				
Dynamic range (for selected sizes)									
R160						B			
R250						C			
Meter size									
1" 190 mm, 2.5 m³/h	Stainless steel body R160						2D		
1¼" 260 mm, 4 m³/h	Stainless steel & PPS body R160						3C		
1¼" 260 mm, 6.3 m³/h	Stainless steel & PPS body R250						3D		
1¼" 260 mm, 10 m³/h	Stainless steel & PPS body R250						3E		
Meter type									
Cold-water meter								8	
Country code									XX

The country code is used for:

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

Ordering details

flowIQ® 3200	**KWM3231-**	☐☐	☐	☐☐	☐	☐	☐☐	☐	☐☐
Meter generation									
Second generation		02							
Mechanical design									
Composite (PPS) body			N						
Stainless steel body			L						
Communication module									
Wireless M-Bus C1/C2/T1, linkIQ®, 868 MHz				52					
Power supply									
2 x A-cell					A				
Dynamic range (for selected sizes)									
R160						B			
R250						C			
Meter size									
1½" 260 mm, 6.3 m³/h	Stainless steel & PPS-body R160						3M		
1½" 260 mm, 10 m³/h	Stainless steel & PPS-body R250						3N		
2" 300 mm, 10 m³/h	Stainless steel & PPS-body R160						4A		
2" 300 mm, 16 m³/h	Stainless steel & PPS-body R250						4B		
Meter type									
Cold-water meter								8	
Country code									XX

The country code is used for:

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

Configuration

flowIQ® 2200 & flowIQ® 3200

KWM3231	DDD	JJ	LLL	MMMM	N	P	S	U	RR	CCC	V	T	YY	ZZZ
	□□□	□□	□□□	□□□□	□	□	□	□	□□	□□□	□	□	□□	□□□
Display views														
KWM3231	804													
GMT offset – time zone														
(GMT+1) default		52												
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 *(same options as for KWM2231)*				MMMM										
Leakage message limit														
Flow continuously > 0.25 % of Q_3/nom. flow					2									
Flow continuously > 0.5 % of Q_3/nom. flow (default)					3									
Flow continuously > 1.0 % of Q_3/nom. flow					4									
Flow continuously > 2.0 % of Q_3/nom. flow					5									
OFF					9									
Pipe burst limit														
OFF						0								
Flow > 5 % of Q_3/nom. flow for 30 minutes						1								
Flow > 10 % of Q_3/nom. flow for 30 minutes						2								
Flow > 20 % of Q_3/nom. flow for 30 minutes (default)						3								
Ambient temperature low limit														
Ambient temp. < 2 °C (default)							2							
OFF							0							
Ambient temperature high limit														
Ambient temp. > 35 °C (default)								3						
Ambient temp. > 45 °C								6						
OFF								0						
Data logger profile														
Standard & Acoustic Leakage Detection (default)									17					
Display resolution (alphanumeric) – decimal markings *(options defined by meter size)*														
000000.001 m³ – 0000 L/h	(2.5, 4.0, 6.3 m³/h)									010				
0000000.01 m³ – 0000 L/h	(2.5, 4.0, 6.3 m³/h)									020				
00000000.1 m³ – 0000 L/h	(2.5, 4.0, 6.3 m³/h)									030				
000000001 m³ – 0000 L/h	(2.5, 4.0, 6.3 m³/h)									040				
000000.001 m³ – 00.00 m³/h	(10.0, 16.0 m³/h)									052				
0000000.01 m³ – 000.0 m³/h	(10.0, 16.0 m³/h)									061				
0000000.01 m³ – 00.00 m³/h	(10.0, 16.0 m³/h)									062				
00000000.1 m³ – 00.00 m³/h	(10.0, 16.0 m³/h)									072				

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														
Celsius (default)											0			
Encryption level														
Encryption with separately forwarded key (default)												3		
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 = 2
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, please contact Kamstrup.

Accessories

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

Also see 'Accessories list for Water Meters', FILE100002499_EN.

Related hardware for separate ordering

Holder for optical IR interface: for flowIQ® 2200 & 3200	65-61-355
Lid: for flowIQ® 2200 & 3200	66-99-644
Pit antenna II 2.0 meters:	66-97-926
Pulse adapter:	66-99-051
Gaskets:	See table below

Gaskets for composite meters	Part number	Material	Meter sizes
1¼"	3130292	EPDM	3C, 3D
1½"	3130294		3M, 3N
2"	3130295		4A, 4B
Fiber gaskets for stainless steel meters	**Part number**	**Material**	**Meter sizes**
1"	3130252	Tesnit® BA-KTW-G	2D
1¼"	3130253		3C, 3D, 3E
1½"	3130142		3M, 3N
2"	3130254		4A, 4B

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_EN 'Hygiene Concept Kamstrup'.

Kamstrup A/S • FILE100004701_C_EN_11.2025

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