kamstrup

Data sheet

flowIQ® 3200

- Nominal flow from 6.3 m^3/h up to 100 m^3/h
- Approved with dynamic range up to R1000
- Pinpoint accuracy
- Integrated communication
  - Wireless M-Bus C1, T1
  - linkIQ®
- Wired interface for selected modules:
  - Communication with flowIQ® Gateway
  - Configuration of volume pulses
- External antenna option
- Intelligent info codes assist you with your operations, asset management and customer service
- Water and ambient temperature measurement
- Up to 20 years of battery life time
- Designed for operation in submerged environments

Contents

District meters for various and smart solutions

flowIQ® 3200 covers a series of integrated, hermetically sealed water meters with integrated radio communication.

The flowIQ® 3200 series is, for all sizes, a composite housing unit combined with a metal body. Battery life time can be as high as 20 years.

flowIQ® 3200 is suitable for measurement in multi-unit apartments and commercial premises. The meter is suitable for mounting in pump stations or well heads and is fully protected against internal or external penetration of water.

The wireless interface enables the opportunity to utilize the external pit antenna option.

The wired connection can be used for connecting with flowIQ® Gateway or to be reprogrammed with different pulse output options.

flowIQ® Gateway can be used as a remote display and/or with additional communication options - see documentation for flowIQ® Gateway.

Other key features include intelligent alarms and info codes, water and ambient temperature measurements, 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 non-revenue water.

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. 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.

Approved meter data

MID classifications	
Approval	DK-0200-MI001-039
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...30 °C (T30) or 0.1...50 °C (T50)
Medium temperature, warm water	0.1...70 °C (T70)
Meter types	Q_3 = 6.3 10.0 16 25 40 63 and 100 m^3/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, ACS, KTW-BWGL (except DN100) (all parts are suitable for drinking water)

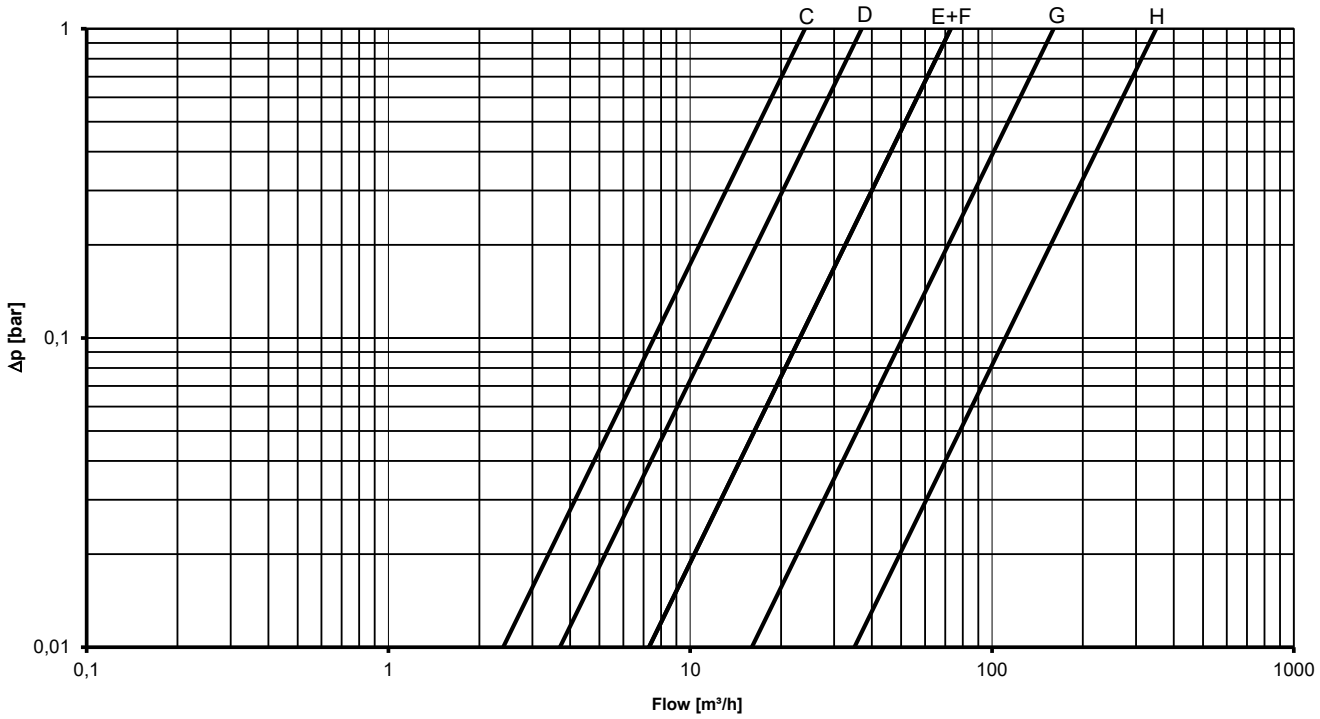
Material

Wetted parts	
Meter flow parts, composite	PPS with 40 % fibreglass reinforcement
Meter flow parts, steel	Stainless steel, W.no. 1.4408 (316)
Measuring pipe	PPS with fibreglass (40 %) reinforcement For DN100 PPO
Reflectors	Stainless steel, W.no. 1.4401 and 1.4404 (316/316L)
O-ring/gasket	EPDM
Strainer	PES

Technical data

Electrical data	
Battery	3.65 VDC lithium D-cell
Battery lifetime	Up to 20 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)
Protection class	IP68
Impact energy levels	IK08 according to IEC62262 / IK07 for wired interface
Storage temp. empty sensor	-25...60 °C
Pressure stage	PN16 all sizes
Connection	Thread EN/ISO 228-1 Flange EN 1092-1 PN16

Pressure loss



Graph	Q_3 [m³/h]	Nom. diameter	kv	Q @ 0.63 bar [m³/h]
C	6.3 10	1½" (DN32)	24	19
D	10 16	2" (DN40)	37	29
E	16 25	DN50	73	58
F	25 40 63	DN65	73	58
G	40 63	DN80	160	127
H	100	DN100	350	278

Meter sizes

flowIQ® 3200 is available in these combinations of length, dynamic range and nominal flow Q_3.

Meter type	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	Connection on meter
3M	6.3	40	7.8	5	11	0.07	160	1½" (DN32)
3N	10	40	12.5	5	17.5	0.17	250	1½" (DN32)
4A	10	40	12.5	8	17.5	0.07	160	2" (DN40)
4B	16	100	20	8	28	0.19	160	2" (DN40)
4B	16	64	20	8	28	0.19	250	2" (DN40)
4J	16	100	20	20	28	0.05	160	DN50
4K	25	156	31	20	44	0.12	160	DN50
4K	25	100	31	20	44	0.12	250	DN50
4T	25	156	31	20	44	0.12	160	DN65
4U	40	160	50	20	70	0.30	250	DN65
5A	40	250	50	30	70	0.06	160	DN80
5B	63	252	79	30	110	0.16	250	DN80
AA	63	393	79	50	110	0.03	160	DN100 (250 mm)
AB	100	400	125	50	175	0.08	250	DN100 (250 mm)
AE	63	393	79	50	110	0.03	160	DN100
AF	100	400	125	50	175	0.08	250	DN100

Measurements occurs 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.

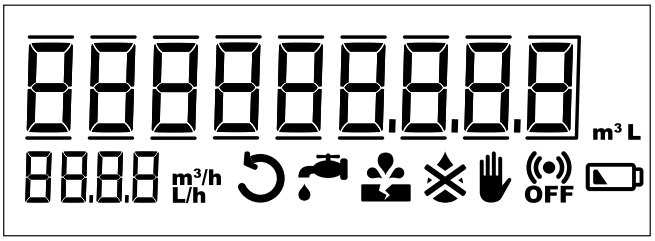
flowIQ® 3200 available with warm water.

Meter type	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	Connection on meter
4A	10	40	12.5	8	17.5	0.07	160	2" (DN40)
4J	16	100	20	20	28	0.05	160	DN50
4T	25	156	31	20	44	0.12	160	DN65
5A	40	250	50	30	70	0.06	160	DN80
AE	63	393	79	50	110	0.03	160	DN100

Display and info codes

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

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 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 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 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).

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

 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.

 Disappears when the meter is filled with water.

Core features

Temperature monitoring
flowIQ® 3200 measures water and ambient temperatures, respectively.

Information on temperatures above or below configurable values in the meter will warn the utility about any potentiel 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, the meter 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	2400 hours
Operating hours	✓	✓	✓	✓
Info codes incl. hour counter	✓	✓	✓	✓
Volume	✓	✓	✓	✓
Volume reverse	✓	✓	✓	✓
Volume net	✓	✓	✓	✓
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 is only possible via the optical IR interface.

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

Transmission properties and data packages are defined in the configuration number YY-ZZZ. These can be changed with METERTOOL and through the optical IR interface.

Wireless M-Bus
Wireless M-Bus is an unlicensed European frequency standard protocol. Kamstrup water meters are utilizing the C1-mode and also support 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.

linkIQ® communication
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" and can communicate on the 868 MHz band, which has 8 channel changes and re-transmission of previously transmitted data. Besides the linkIQ® transmission the meter can also send a small Wireless M-Bus data package for fallback drive-by readings.

NB-IoT
NB-IoT (Narrow Band Internet of Things) is an emerging communication technology offered by almost all main mobile operators (telcos) in the world. Unlike 2G, 3G and 4G, which are designed for high-speed communications at the expense of high power consumption, NB-IoT supports low data rate communications, but in return offers superior power efficiency and this feature makes battery operation possible.

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

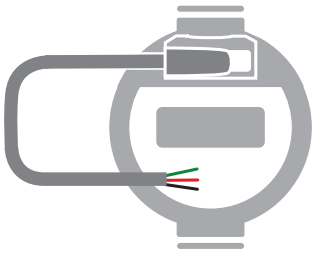
Note: Integrated radio communication is always active, independent of utilization of the wired interface.

Wired interface

flowIQ® 3200 can be ordered with 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 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 on Kamstrup.com).



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

The wired interface can be reprogrammed to send out volume pulses.

Note: Reprogramming with METERTOOL is always necessary.

Serial/KMP options (l/imp)
Disabled
1
10
100
1000
(Q_3=1.6 m³) 100 imp/l*
Serial KMP

* Depending on meter size from below table.

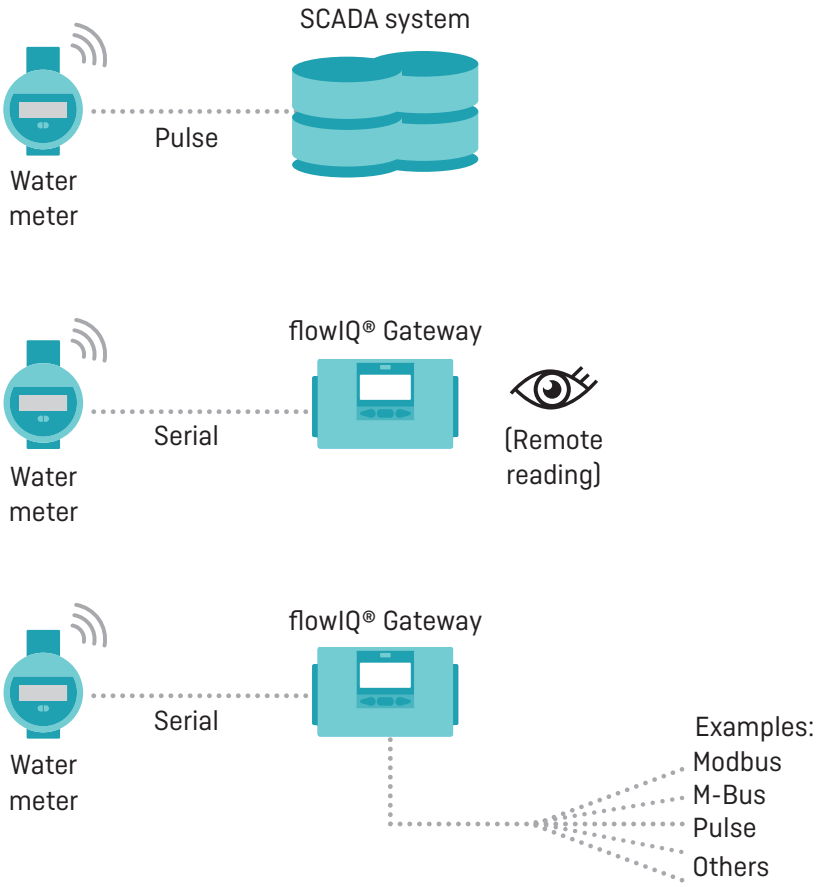
(KM) Kamstrup meter pulse (meter size dependent)	
Q_3 (m³/h)	Meter factor (imp/l)
1.6	100
2.5	60
4.0	50
6.3	25
10	15
16	10
25	6
40	5
63	2.5
100	1.5

The pulse length is linked to the output pulse configuration and can be programmed to settings shown in the table below.

Pulse length option	
3.9 ms	Recommended for Kamstrup meter pulses
10 ms	
32 ms	
100 ms	
250 ms	

Wired interface

Solution overview for wired interface



Pit antenna options

In installation scenarios where better radio signals are needed, external antennas are available for all flowIQ® 3200 meters without wired interface, defined by the module choice in the type number, see ordering details.

Meters without wired interface is the meter with XX communication module 60:

For flowIQ® 3200, KWM3230, the following antenna option is available:

– Pit antenna II 2.0 meters 6697926

Ordering details

An order is initiated by stating the type number of the selected model of 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® 3200	**KWM3230-**	☐☐	☐	☐☐	☐	☐☐	☐☐	☐	☐☐
Meter generation									
Second generation		02							
Mechanical design									
2-part body, st. steel 1.4408 housing			L						
Communication module									
linkIQ® – Wireless M-Bus, for antenna connection (no wired output) composite/metal – cold/warm (warm only for selected meter sizes)				60					
Wireless M-Bus C1/T1, linkIQ®, 868 MHz, metal - Cold (wired output) [1]				63					
Wireless M-Bus C1/T1, linkIQ®, 868 MHz, metal - Warm (wired output) [1]				64					
NB-IoT [2] [3]				XX					
Power supply									
D-cell					D				
Dynamic range (for selected sizes)									
R160						B			
R250						C			
Meter size - thread									
1½" 260 mm, 6.3 m³/h (DN32)							3M		
1½" 260 mm, 10 m³/h (DN32)							3N		
2" 300 mm, 10 m³/h (DN40) [4]							4A		
2" 300 mm, 16 m³/h (DN40)							4B		
Meter size - flange									
DN50 270 mm, 16 m³/h [4]							4J		
DN50 270 mm, 25 m³/h							4K		
DN65 300 mm, 25 m³/h [4]							4T		
DN65 300 mm, 40 m³/h							4U		
DN80 300 mm, 40 m³/h [4]							5A		
DN80 300 mm, 63 m³/h							5B		
DN100 250 mm, 63 m³/h [4]							AA		
DN100 250 mm, 100 m³/h							AB		
DN100 360 mm, 63 m³/h [4]							AE		
DN100 360 mm, 100 m³/h							AF		
Meter type									
Warm-water meter								7	
Cold-water meter								8	
Country code									XX

[1] Wired interface default settings: Serial communication

[2] Only for specific collaborator

[3] Not available for warm-water meters

[3] Also available as a warm-water meter

The country code is used for:

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

Configuration

KWM3230	DDD	JJ	LLL	MMMM	N	P	S	U	RR	CCC	V	T	YY	ZZZ
	□□□	□□	□□□	□□□□	□	□	□	□	□□	□□□	□	□	□□	□□□
Display views														
KWM3230	804													
GMT offset – time zone														
(GMT+1)		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 *				MMMM										
**) Meters with wired interface have limited options for customer label. Contact Kamstrup for more information.*														
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 of nom. flow for 30 minutes						1								
Flow > 10 % of Q_3 of nom. flow for 30 minutes						2								
Flow > 20 % of Q_3 of nom. flow for 30 minutes (default)						3								
Ambient temperature low limit														
Ambient temp. < 3 °C (default)							3							
Ambient temp. < 6 °C							6							
OFF							0							
Ambient temperature high limit														
Ambient temp. > 35 °C (default)								3						
Ambient temp. > 45 °C								6						
OFF								0						
Data logger profile														
Standard (for KWM3230)									05					
Display resolution (alphanumeric) – decimal markings (options defined by meter size)														
0000000.01 m³ – 0000 L/h										020				
000000.001 m³ – 000.0 m³/h										051				
000000.001 m³ – 00.00 m³/h										052				
0000000.01 m³ – 000.0 m³/h										061				
0000000.01 m³ – 00.00 m³/h										062				
00000000.1 m³ – 000.0 m³/h										071				
00000000.1 m³ – 00.00 m³/h										072				
000000001 m³ – 000.0 m³/h										081				
000000001 m³ – 00.00 m³/h										082				

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														
Celcius (default)											0			
Encryption level														
Encryption with separately forwarded key (default)												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 'Communicaton Modules and Data Packages Overview' here: FILE100002508_EN.

Accessories

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

See FILE100002499_EN "Accessories list for Water Meters".

Related hardware for separate ordering

Cable for wired interface	1.5 m 5000-491.CP (open end) 7.5 m 5000-493.CP (open end)
flowIQ® Gateway no.	603xWxxxxxxxxx
Holder for optical IR interface for flowIQ® 3200	65-61-354.CP
Lid:	
flowIQ® 3200 w/o wired interface	66-99-644.CP
flowIQ® 3200 w/wired interface	66-99-645.CP

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".

For more datagram options, see FILE100002508_EN "Communication Modules and Data Packages Overview".

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