

EU-Type Examination Certificate

Measuring Instrument Directive

Certificate number: DK-0200-MI001-039

Issued by FORCE Certification A/S, Denmark
EU-notified body number 0200

In accordance with Annex II Module B of the Directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to the making available on the market of measuring instruments (MID).

Issued to: **Kamstrup A/S**
Industrivej 28, Stilling
DK-8660 Skanderborg

Type of instrument: Water meter

Type designation: KWM3230

Valid until: 2031-03-18

Number of pages: 15, including appendix

Date of issue: 2024-09-23

Version: 20
This version of DK-0200-MI001-039 is issued due to changes to the meter.
The previous certificate is withdrawn.

Approved by



Michael Møller Nielsen
Certification Manager

Processed by



Lars Poder
Examiner

The conformity markings may only be affixed to the above type approved equipment. The manufacturer's Declaration of Conformity may only be issued and the notified body identification number may only be affixed on the instrument when the production/product assessment module (D or F) of the Directive is fully complied with and controlled by a written inspection agreement with a notified body.
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FORCE Certification references: TASK no.: 124-30956.02 and ID no.: 0200-MID-18083-1

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Appendix to EU-Type Examination Certificate Measuring Instrument Directive Number: **DK-0200-MI001-039**

Issued by FORCE Certification A/S, Denmark
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Revision	Issue date	Changes
DK-0200-MI001-039	2021-03-18	Original certificate
DK-0200-MI001-039 ver 1	2021-05-25	New SW version added
DK-0200-MI001-039 ver 2	2021-06-14	New SW version added, component for temperature measurement added
DK-0200-MI001-039 ver 3	2021-08-20	Minor editorial changes on page 6
DK-0200-MI001-039 ver 4	2021-10-07	New SW versions added
DK-0200-MI001-039 ver 5	2021-10-26	New SW version added, new communication module added
DK-0200-MI001-039 ver 6	2022-01-18	New SW versions added, new communication modules added
DK-0200-MI001-039 ver 7	2022-02-03	New SW version added
DK-0200-MI001-039 ver 8	2022-02-23	New SW version added
DK-0200-MI001-039 ver 9	2022-03-30	New SW version added
DK-0200-MI001-039 ver 10	2022-05-17	New communication modules 65 and 91 added
DK-0200-MI001-039 ver 11	2022-07-15	New SW version added
DK-0200-MI001-039 ver 12	2022-08-17	New SW version added
DK-0200-MI001-039 ver 13	2023-02-02	New SW versions added, new communication modules 31 and 32 added
DK-0200-MI001-039 ver 14	2023-03-23	Stainless steel and PPS composite added as new materials for the meter housings
DK-0200-MI001-039 ver 15	2023-08-03	Editorial change on page 6
DK-0200-MI001-039 ver 16	2023-09-19	New SW version added
DK-0200-MI001-039 ver 17	2023-12-15	New SW version added
DK-0200-MI001-039 ver 18	2024-06-06	New SW version H1 added
DK-0200-MI001-039 ver 19	2024-09-19	New SW versions E1C1 and E1D1 added
DK-0200-MI001-039 ver 20	2024-09-23	New SW version D1F1 added

Applied standards and documents:

OIML R 49:2013
ISO 4064:2014
WELMEC Guide 7.2:2021

The instruments/measuring systems shall correspond with the following specifications:

Type designation:

KWM3230 Water meter

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Description:

KWM3230 is an integrated and hermetically sealed static water meter based on the ultrasonic measuring principle. The meter house is moulded composite material, mounted on a measuring tube made of hot forged brass, stainless steel or PPS composite. The volume measurements are made by means of bidirectional ultrasonic technique according to the transit time method. KWM3230 has a display indicating the registered volume, measuring unit, error codes and more. Furthermore, an optical eye is located on the front, whereby data reading of data loggers and configuration of the meter, can be made for service and diagnostic purposes.

The meter has a wired connection on top of the meter, hidden behind a blind cover. Behind the blind cover, the meter has 3 pins for the wire connection. This would not cause any problems even on submerged water meters.

The blind cover only protects the pins from mechanical impact and is not a seal of the connection.

The cover is mounted from factory and must be removed before installing the cable. It can be re-moved without use of any tools.

KWM3230 is power supplied from an internal lithium D-cell battery providing long battery life, even with high performance communication. A separate pulse interface can be used for converting the data telegram into volume pulses during calibration of the meter.

Technical documentation:

Reference number:

- 124-30956.02
- 124-30956.01
- 121-24450.19
- 121-24450.18
- 121-24450.17
- 121-24450.16
- 121-24450.15
- 121-24450.14
- 121-24450.13
- 121-24450.12
- 121-24450.11
- 121-24450.10
- 121-24450.09
- 121-24450.08
- 121-24450.07
- 121-24450.06
- 121-24450.05
- 121-24450.04
- 121-24450.03
- 121-24450.02
- 121-24450.01

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Technical data for hot forged brass meters

Flow designations

Meter size 1" x 190mm

Q ₁ Minimum flow rate [l/h]	6.3		
Q ₂ Transitional flow rate [l/h]	10		
Q ₃ Permanent flow rate [m ³ /h]	2.5	4	6.3
Q ₄ Overload flow rate [m ³ /h]	3.1	5	7.9
Dynamic range Q ₃ /Q ₁	400 ¹⁾	630 ²⁾	1000 ³⁾

Meter size 1¼" x 260mm

Q ₁ Minimum flow rate [l/h]	10		
Q ₂ Transitional flow rate [l/h]	16		
Q ₃ Permanent flow rate [m ³ /h]	4	6.3	10
Q ₄ Overload flow rate [m ³ /h]	5	7.9	12.5
Dynamic range Q ₃ /Q ₁	400 ¹⁾	630 ²⁾	1000 ³⁾

Meter size 1½" x 260mm

Q ₁ Minimum flow rate [l/h]	16		
Q ₂ Transitional flow rate [l/h]	25.6		
Q ₃ Permanent flow rate [m ³ /h]	6.3	10	16
Q ₄ Overload flow rate [m ³ /h]	7.9	12.5	20
Dynamic range Q ₃ /Q ₁	400 ¹⁾	630 ²⁾	1000 ³⁾

Meter size 2" x 300mm

Q ₁ Minimum flow rate [l/h]	25		
Q ₂ Transitional flow rate [l/h]	40		
Q ₃ Permanent flow rate [m ³ /h]	10	16	25
Q ₄ Overload flow rate [m ³ /h]	12.5	20	31.3
Dynamic range Q ₃ /Q ₁	400 ¹⁾	630 ²⁾	1000 ³⁾

1) The meter can also be used for dynamics ranges: R315, R250, R200, R160, R125, R100

2) The meter can also be used for dynamics ranges: R500, R400, R315, R250, R200, R160, R125, R100

3) The meter can also be used for dynamics ranges: R800, R630, R500, R400, R315, R250, R200, R160, R125, R100

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Technical data for stainless steel meters
Flow designations

Meter size 1" x 190mm

Q ₁ Minimum flow rate [l/h]	6.3		
Q ₂ Transitional flow rate [l/h]	10		
Q ₃ Permanent flow rate [m ³ /h]	2.5	4	6.3
Q ₄ Overload flow rate [m ³ /h]	3.1	5	7.9
Dynamic range Q ₃ /Q ₁	400 ¹⁾	630 ²⁾	1000 ³⁾

Meter size 1¼" x 175mm

Q ₁ Minimum flow rate [l/h]	10	
Q ₂ Transitional flow rate [l/h]	16	
Q ₃ Permanent flow rate [m ³ /h]	4	6.3
Q ₄ Overload flow rate [m ³ /h]	5	7.9
Dynamic range Q ₃ /Q ₁	400 ¹⁾	630 ²⁾

Meter size 1½" x 260mm

Q ₁ Minimum flow rate [l/h]	10		
Q ₂ Transitional flow rate [l/h]	16		
Q ₃ Permanent flow rate [m ³ /h]	4	6.3	10
Q ₄ Overload flow rate [m ³ /h]	5	7.9	12.5
Dynamic range Q ₃ /Q ₁	400 ¹⁾	630 ²⁾	1000 ³⁾

Meter size 1½" x 260mm

Q ₁ Minimum flow rate [l/h]	16		
Q ₂ Transitional flow rate [l/h]	25.6		
Q ₃ Permanent flow rate [m ³ /h]	6.3	10	16
Q ₄ Overload flow rate [m ³ /h]	7.9	12.5	20
Dynamic range Q ₃ /Q ₁	400 ¹⁾	630 ²⁾	1000 ³⁾

Meter size 2" x 300mm

Q ₁ Minimum flow rate [l/h]	25		
Q ₂ Transitional flow rate [l/h]	40		
Q ₃ Permanent flow rate [m ³ /h]	10	16	25
Q ₄ Overload flow rate [m ³ /h]	12.5	20	31.3
Dynamic range Q ₃ /Q ₁	400 ¹⁾	630 ²⁾	1000 ³⁾

1) The meter can also be used for dynamics ranges: R315, R250, R200, R160, R125, R100

2) The meter can also be used for dynamics ranges: R500, R400, R315, R250, R200, R160, R125, R100

3) The meter can also be used for dynamics ranges: R800, R630, R500, R400, R315, R250, R200, R160, R125, R100

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Technical data for stainless steel meters continued
Flow designations

Meter size DN50 x 270mm

Q ₁ Minimum flow rate [l/h]	40		
Q ₂ Transitional flow rate [l/h]	64		
Q ₃ Permanent flow rate [m ³ /h]	16	25	40
Q ₄ Overload flow rate [m ³ /h]	20	31.3	50
Dynamic range Q ₃ /Q ₁	400 ¹⁾	630 ²⁾	1000 ³⁾

Meter size DN65 x 300mm

Q ₁ Minimum flow rate [l/h]	40	
Q ₂ Transitional flow rate [l/h]	64	
Q ₃ Permanent flow rate [m ³ /h]	25	40
Q ₄ Overload flow rate [m ³ /h]	31.3	50
Dynamic range Q ₃ /Q ₁	630 ²⁾	1000 ³⁾

Meter size DN80 x 300mm

Q ₁ Minimum flow rate [l/h]	63	
Q ₂ Transitional flow rate [l/h]	101	
Q ₃ Permanent flow rate [m ³ /h]	40	63
Q ₄ Overload flow rate [m ³ /h]	50	78.8
Dynamic range Q ₃ /Q ₁	630 ²⁾	1000 ³⁾

Meter size DN100 x 250mm

Q ₁ Minimum flow rate [l/h]	160		
Q ₂ Transitional flow rate [l/h]	256		
Q ₃ Permanent flow rate [m ³ /h]	63	100	160
Q ₄ Overload flow rate [m ³ /h]	78.8	125	200
Dynamic range Q ₃ /Q ₁	400 ¹⁾	630 ²⁾	1000 ³⁾

Meter size DN100 x 360mm

Q ₁ Minimum flow rate [l/h]	160		
Q ₂ Transitional flow rate [l/h]	256		
Q ₃ Permanent flow rate [m ³ /h]	63	100	160
Q ₄ Overload flow rate [m ³ /h]	78.8	125	200
Dynamic range Q ₃ /Q ₁	400 ¹⁾	630 ²⁾	1000 ³⁾

1) The meter can also be used for dynamics ranges: R315, R250, R200, R160, R125, R100

2) The meter can also be used for dynamics ranges: R500, R400, R315, R250, R200, R160, R125, R100

3) The meter can also be used for dynamics ranges: R800, R630, R500, R400, R315, R250, R200, R160, R125, R100

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Technical data for PPS meters

Flow designations

Meter size 1¼" x 260mm

Q ₁ Minimum flow rate [l/h]	6.3		
Q ₂ Transitional flow rate [l/h]	10		
Q ₃ Permanent flow rate [m ³ /h]	2.5	4	6.3
Q ₄ Overload flow rate [m ³ /h]	3.1	5	7.9
Dynamic range Q ₃ /Q ₁	400 ¹⁾	630 ²⁾	1000 ³⁾

1) The meter can also be used for dynamics ranges: R315, R250, R200, R160, R125, R100

2) The meter can also be used for dynamics ranges: R500, R400, R315, R250, R200, R160, R125, R100

3) The meter can also be used for dynamics ranges: R800, R630, R500, R400, R315, R250, R200, R160, R125, R100

PPS meters are only approved for cold water T50

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Other designations

Instrument type:	Complete water meter
Temperature class:	T30 (0.1 – 30 °C) Also tested T50 and T70 according to OIML R 49:2013 T70 is tested with a dynamic range of R400 1½" x 260 mm PPS is only approved for T50
Pressure stage:	PN6, PN10 and PN16
Accuracy class:	2
Electromagnetic environment class:	E1 and E2
Mechanical environment class:	M1, Class B and O (building and outdoors)
Climatic class:	-25 °C – 55 °C, condensing
Sensitivity to irregularity upstream velocity field classes:	U0
Sensitivity to irregularity downstream velocity field classes:	D0
Orientation requirements:	Horizontal, vertical or at an intermediate angle
Protection class:	IP68
Power supply:	3.65 VDC lithium battery
Battery lifetime:	Up to 20 years

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Communication

Communication modules:

Module designation	Module description
02B/L/N-31	Wired M-Bus Wireless M-Bus C1/T1 OMS linkIQ®
02B/L/N-32	Wired M-Bus Radio disabled
02B/L/N-60	Wireless M-Bus C1/T1 OMS linkIQ® without plug
02B/L/N-63	Serial communication for flowIQ® Gateway. Metal – cold
02B/L/N-64	Serial communication for flowIQ® Gateway. Metal – hot
02B/L/N-65	Wireless M-Bus/linkIQ® Serial communication + Ext. Power
02B/L/N-71	LoRaWAN
02B/L/N-72	LoRaWAN/Sigfox
02B/L/N-81	NB-IoT
02B/L/N-82	NB-IoT 1.5
02B/L/N-91	Serial communication + Ext. Power

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Approved software versions

Module description	Version no.	Checksum for metrological part of the SW		Description
		Calculator software	ASIC software	
Wireless M-Bus C1/T1 OMS linkIQ® and Wired output	A1A1	086D (Hex)	2202 (Hex)	N
	B1B1	CB73 (Hex)	50A6 (Hex)	N
	E1B1	004F (Hex)	50A6 (Hex)	N
	E1C1	004F (Hex)	76B2 (Hex)	N
	B1D1	CB73 (Hex)	9018 (Hex)	N
	E1D1	004F (Hex)	9018 (Hex)	N
	F1D1	46FB (Hex)	9018 (Hex)	N
	F1E1	46FB (Hex)	A47B911A (Hex) 2759561498 (Dec)	N
	G1D1	504A4821 (Hex) 1347045409 (Dec)	9018 (Hex)	N
	G1E1	504A4821 (Hex) 1347045409 (Dec)	A47B911A (Hex) 2759561498 (Dec)	N
	G1F1	504A4821 (Hex) 1347045409 (Dec)	E557488A (Hex) 3847702666 (Dec)	N
	H1F1	A7B7AC40 (Hex) 2813832256 (Dec)	E557488A (Hex) 3847702666 (Dec)	N
LoRaWAN	D1D1	1887EB74 (Hex) 411560820 (Dec)	9018 (Hex)	N
	D1E1	1887EB74 (Hex) 411560820 (Dec)	A47B911A (Hex) 2759561498 (Dec)	N
	E1D1	7BB41719 (Hex) 2075399961 (Dec)	9018 (Hex)	N
	E1E1	7BB41719 (Hex) 2075399961 (Dec)	A47B911A (Hex) 2759561498 (Dec)	N
	E1F1	7BB41719 (Hex) 2075399961 (Dec)	E557488A (Hex) 3847702666 (Dec)	N
LoRaWAN/Sigfox	D1D1	68CA1DCB (Hex) 1758076363 (Dec)	9018 (Hex)	N
	D1E1	68CA1DCB (Hex) 1758076363 (Dec)	A47B911A (Hex) 2759561498 (Dec)	N
	E1D1	781E6F6B (Hex) 2015260523 (Dec)	9018 (Hex)	N
	E1E1	781E6F6B (Hex) 2015260523 (Dec)	A47B911A (Hex) 2759561498 (Dec)	N
	E1F1	781E6F6B (Hex) 2015260523 (Dec)	E557488A (Hex) 3847702666 (Dec)	N
	F1E1	ACFD0693 (Hex) 2902263443 (Dec)	A47B911A (Hex) 2759561498 (Dec)	N
	F1F1	ACFD0693 (Hex) 2902263443 (Dec)	E557488A (Hex) 3847702666 (Dec)	N
	G1E1	C0B9 C1FD (Hex) 3233399293 (Dec)	A47B911A (Hex) 2759561498 (Dec)	N
	G1F1	C0B9 C1FD (Hex) 3233399293 (Dec)	E557488A (Hex) 3847702666 (Dec)	N

N: Non-legally Relevant Software Change

L: Legally Relevant Software Change

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Approved software versions continued

Module description	Version no.	Checksum for metrological part of the SW		Description
		Calculator SW	ASIC SW	
NB-IoT	B1D1	FD1CE794 (Hex) 4246529940 (Dec)	9018 (Hex)	N
	B1E1	FD1CE794 (Hex) 4246529940 (Dec)	A47B911A (Hex) 2759561498 (Dec)	N
	C1D1	3DC35DOF (Hex) 1036213519 (Dec)	9018 (Hex)	N
	C1E1	3DC35DOF (Hex) 1036213519 (Dec)	A47B911A (Hex) 2759561498 (Dec)	N
	C1F1	3DC35DOF (Hex) 1036213519 (Dec)	E557488A (Hex) 3847702666 (Dec)	N
	D1F1	A960D939 (Hex) 2841696569 (Dec)	E557488A (Hex) 3847702666 (Dec)	N
NB-IoT 1.5	E1C1	8404C174 (Hex) 2214904180 (Dec)	8895BB1F (Hex) 2291514143 (Dec)	L
	E1D1	8404C174 (Hex) 2214904180 (Dec)	A80F5D18 (Hex) 2819579160 (Dec)	L
Wired M-Bus	G1E1	A516AE7B (Hex) 2769727099 (Dec)	A47B911A (Hex) 2759561498 (Dec)	N
	G1F1	A516AE7B (Hex) 2769727099 (Dec)	E557488A (Hex) 3847702666 (Dec)	N

N: Non-legally Relevant Software Change

L: Legally Relevant Software Change

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Verification procedure

Errors: Maximum permissible errors according to the Directive 2014/32/EU of the European Parliament and Council of February 26, 2014 on measurement instruments (MID), Annex III (MI-001)

Procedure: The test points according to OIML R 49:2013
It is also possible to use water at a temperature of $20\text{ °C} \pm 10\text{ °C}$

Test points (flows): $Q_1 \leq Q \leq 1.1 Q_1$
 $Q_2 \leq Q \leq 1.1 Q_2$
 $0.9 Q_3 \leq Q \leq Q_3$

Test of water meter via display reading (Standing start/stop)

Preparation: Use the software Kamstrup LABTOOL and an optical head to set the meter in Verification mode



- Mount the water meter in the test rig
- Connect flow (start)
- Disconnect flow (stop)
- Read the LC-Display and compare the reading to the actual volume

Test of water meter via pulse interface (Flying start/stop)

Preparation: Connect a pulse interface type 66-99-143 to each water meter in the test rig and connect the volume pulse output to the pulse input on the test rig

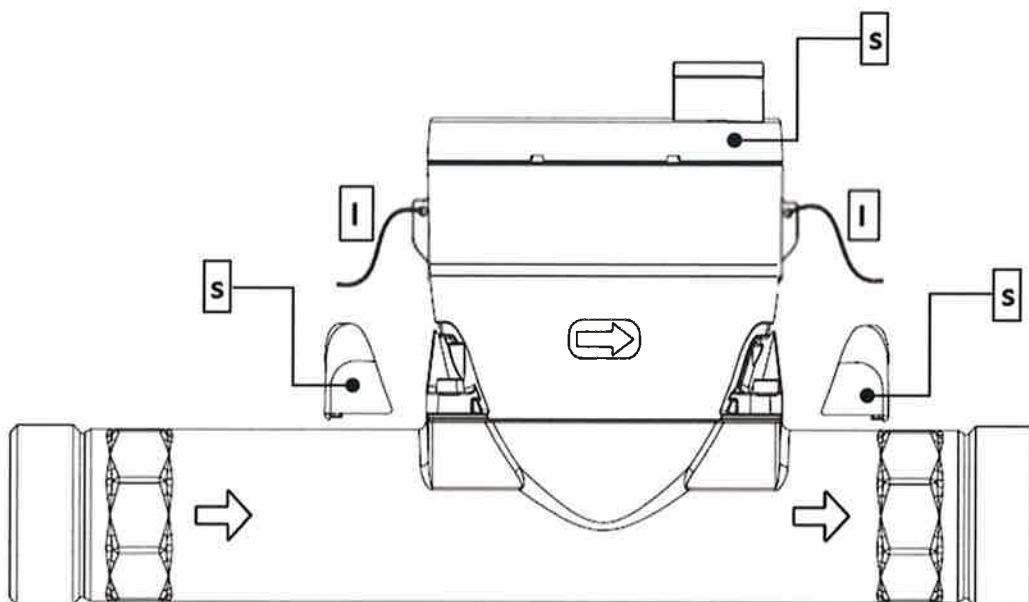
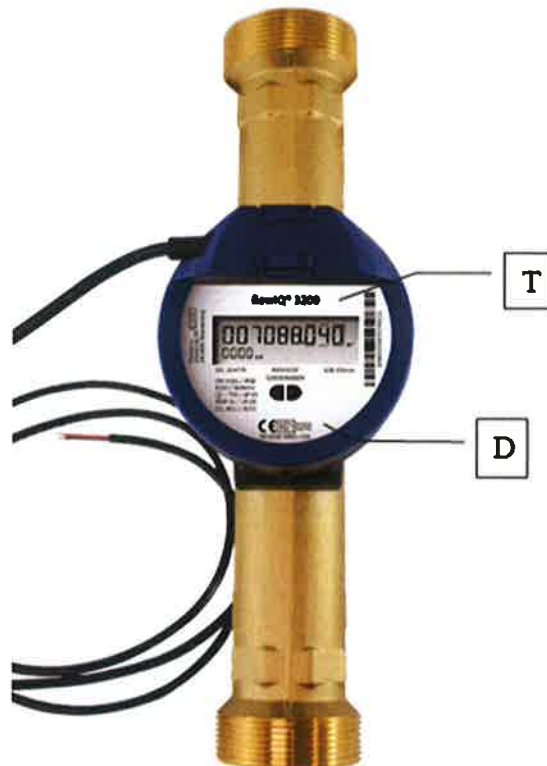
- Mount the water meter in the test rig
- Connect flow and wait for stabilisation of flow rate
- The measuring period is started and stopped
- Compare the EUT volume pulses to the master volume

Pulse Interface type 66-99-143 mounted on KWM3230 water meter via the optical support type 65-61-355.

	<p>Optical holder wireless</p>	<p>65-61-355</p>
	<p>Pulse interface</p>	<p>66-99-143</p>

Seals and markings

- D** Module D label (Behind the front glass)
- S** Security seal (Void sealing ring)
- T** Type label (Behind the front glass)
- I** Installation seals (Wire and seals)



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Inscriptions

Front cover for KWM3230

- System designation
- Manufacturer designation or logo
- Manufacturers postal address
- Type, production year and serial number
- Accuracy class
- Frequency
- Max pressure loss
- Mechanical and electromagnetic environment classes
- Climatic class
- Flow limits
- Sensitivity velocity field classes
- Temperature of medium
- Maximum working pressure (PN)
- Protection class
- Dynamic Range (Q3/Q1) ¹
- Software version (e.g.: SW: H1F1)

¹ KWM3230 water meter may be labelled with a lower dynamic range than used under the verification procedure.

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Photos of KWM3230

