

EU-Type Examination Certificate

Measuring Instrument Directive

Certificate number: DK-0200-MI001-040

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: KWM4230

Valid until: 2032-06-30

Number of pages: 10, including appendix

Date of issue: 2024-09-23

Version: 8
This new version of DK-0200-MI001-040 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The previous certificate is withdrawn.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.
This EU-type examination certificate may not be reproduced except in full, without written permission by FORCE Certification A/S.

FORCE Certification references: TASK no.: 124-30959.02 and ID no.: 0200-MID-18084-1

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Appendix to EU-Type Examination Certificate Measuring Instrument Directive Number: **DK-0200-MI001-040**

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Revision	Issue date	Changes
DK-0200-MI001-040	2022-06-30	Original certificate
DK-0200-MI001-040 ver 1	2022-10-05	Changed location of transducers in the meter housing, new dynamic range Q3/Q1=1000 added
DK-0200-MI001-040 ver 2	2023-02-02	New SW versions added, new communication modules 31 and 32 added
DK-0200-MI001-040 ver 3	2023-06-27	Minor editorial change on page 1
DK-0200-MI001-040 ver 4	2023-09-19	New SW version added
DK-0200-MI001-040 ver 5	2023-12-15	New SW version added
DK-0200-MI001-040 ver 6	2024-05-23	New SW version H1 added
DK-0200-MI001-040 ver 7	2024-09-19	New SW versions E1A1 and E1B1 added
DK-0200-MI001-040 ver 8	2024-09-23	New SW version D1C1 added

Applied standards and documents:

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

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

Type designation:

KWM4230 Water meter

Description:

KWM4230 is an integrated and hermetically sealed static water meter based on the ultrasonic measuring principle. The meter body is made of a composite housing combined with a body fully made of stainless steel and equipped with black coated split flanges made in cast iron.

The volume measurements are made by means of bidirectional ultrasonic technique according to the transit time method. KWM4230 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.

KWM4230 is powered by 2 x D-cell-batteries with possibility for replaceable batteries. It is 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.

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Technical documentation:

Reference numbers:

- 124-30959.02
- 124-30959.01
- 122-28125.07
- 122-28125.06
- 122-28125.05
- 122-28125.04
- 122-28125.03
- 122-28125.02
- 122-28125.01

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Technical data

Flow designation

Meter size DN125, length 250 mm

Q ₁ Minimum flow rate [l/h]	160
Q ₂ Transitional flow rate [l/h]	256
Q ₃ Permanent flow rate [m ³ /h]	160
Q ₄ Overload flow rate [m ³ /h]	200
Dynamic range Q ₃ /Q ₁	1000, 800, 630, 500, 400, 315, 250, 200, 160, 125, 100

Meter size DN150, length 300 mm

Q ₁ Minimum flow rate [l/h]	250
Q ₂ Transitional flow rate [l/h]	400
Q ₃ Permanent flow rate [m ³ /h]	250
Q ₄ Overload flow rate [m ³ /h]	312
Dynamic range Q ₃ /Q ₁	1000, 800, 630, 500, 400, 315, 250, 200, 160, 125, 100

Meter size DN200, length 350 mm

Q ₁ Minimum flow rate [l/h]	400
Q ₂ Transitional flow rate [l/h]	640
Q ₃ Permanent flow rate [m ³ /h]	400
Q ₄ Overload flow rate [m ³ /h]	500
Dynamic range Q ₃ /Q ₁	1000, 800, 630, 500, 400, 315, 250, 200, 160, 125, 100

Meter size DN250, length 450 mm

Q ₁ Minimum flow rate [l/h]	630
Q ₂ Transitional flow rate [l/h]	1008
Q ₃ Permanent flow rate [m ³ /h]	630
Q ₄ Overload flow rate [m ³ /h]	787
Dynamic range Q ₃ /Q ₁	1000, 800, 630, 500, 400, 315, 250, 200, 160, 125, 100

Meter size DN300, length 500 mm

Q ₁ Minimum flow rate [l/h]	1000
Q ₂ Transitional flow rate [l/h]	1600
Q ₃ Permanent flow rate [m ³ /h]	1000
Q ₄ Overload flow rate [m ³ /h]	1250
Dynamic range Q ₃ /Q ₁	1000, 800, 630, 500, 400, 315, 250, 200, 160, 125, 100

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Other designations

Instrument type:	Complete water meter
Temperature class:	T30 (0.1 – 30 °C) Also tested T50 according to OIML R 49:2013
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:	None up to R400 Above R400 only in horizontal position
Protection class:	IP68
Power supply:	3.65 VDC lithium battery (2xD-cell)
Battery lifetime:	Up to 20 years

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Communication

Communication modules:

Module designation	Module description
02E-31	Wired M-Bus Wireless M-Bus C1/T1 OMS linkIQ®
02E-32	Wired M-Bus Radio disabled
02E-60	Wireless M-Bus C1/T1 OMS linkIQ® Without plug
02E-65	Wireless M-Bus/linkIQ® Serial communication + Ext. power
02E-71	LoRaWAN
02E-72	LoRaWAN/Sigfox
02E-81	NB-IoT
02E-82	NB-IoT 1.5
02E-91	Serial communication + Ext. power

Approved software versions

Module description	Version no.	Checksum for metrological part of the SW		Description
		Calculator SW	ASIC SW	
Wireless M-Bus C1/T1 OMS linkIQ® and Wired output	G1A1	1347045409 (Dec) 504A 4821 (Hex)	3190831874 (Dec) BE30 3B02 (Hex)	N
	G1B1	1347045409 (Dec) 504A 4821 (Hex)	103948744 (Dec) 0632 21C8 (Hex)	N
	G1C1	1347045409 (Dec) 504A 4821 (Hex)	3580219804 (Dec) D565 D19C (Hex)	N
	H1C1	2813832256 (Dec) A7B7AC40 (Hex)	3580219804 (Dec) D565 D19C (Hex)	N
LoRaWAN	E1C1	2075399961 (Dec) 7BB4 1719 (Hex)	3580219804 (Dec) D565 D19C (Hex)	N
LoRaWAN/Sigfox	E1C1	2015260523 (Dec) 781E 6F6B (Hex)	3580219804 (Dec) D565 D19C (Hex)	N
	F1B1	2902263443 (Dec) ACFD 0693 (Hex)	103948744 (Dec) 0632 21C8 (Hex)	N
	F1C1	2902263443 (Dec) ACFD 0693 (Hex)	3580219804 (Dec) D565 D19C (Hex)	N
	G1B1	3233399293 (Dec) C0B9 C1FD (Hex)	103948744 (Dec) 0632 21C8 (Hex)	N
	G1C1	3233399293 (Dec) C0B9 C1FD (Hex)	3580219804 (Dec) D565 D19C (Hex)	N
NB-IoT	C1C1	1036213519 (Dec) 3DC3 5D0F (Hex)	3580219804 (Dec) D565 D19C (Hex)	N
	D1C1	2841696569 (Dec) A960 D939 (Hex)	3580219804 (Dec) D565 D19C (Hex)	N
NB-IoT 1.5	E1A1	2214904180 (Dec) 8404 C174 (Hex)	2952888127 (Dec) B001 7F3F (Hex)	L
	E1B1	2214904180 (Dec) 8404 C174 (Hex)	3641134837 (Dec) D907 4EF5	L
Wired M-Bus	G1B1	2769727099 (Dec) A516 AE7B (Hex)	103948744 (Dec) 0632 21C8 (Hex)	N
	G1C1	2769727099 (Dec) A516 AE7B (Hex)	3580219804 (Dec) D565 D19C (Hex)	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 and verification 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 high resolution display mode (000000,001 L)

- 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 KWM4230 water meter via the holder for optical IR interface 3026-909



Holder for optical IR

3026-909



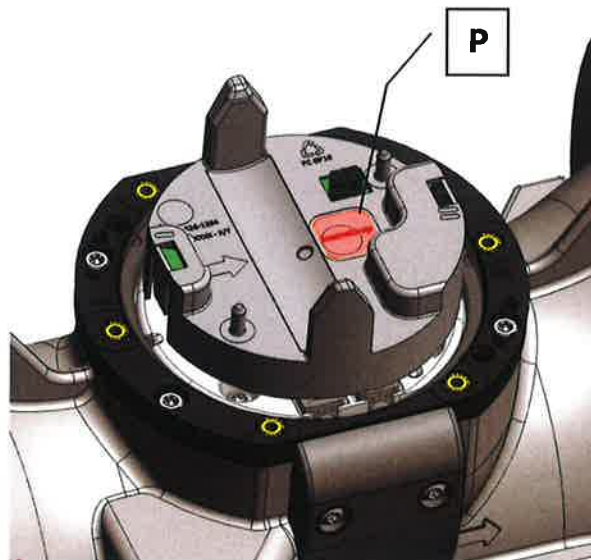
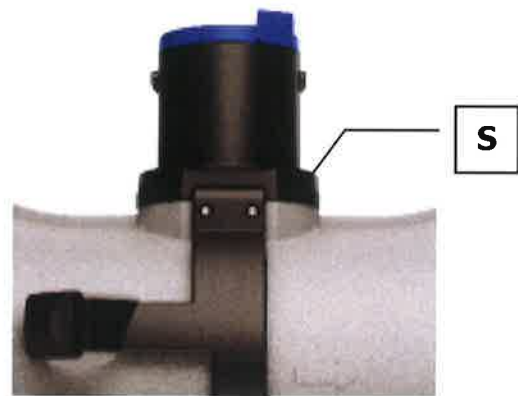
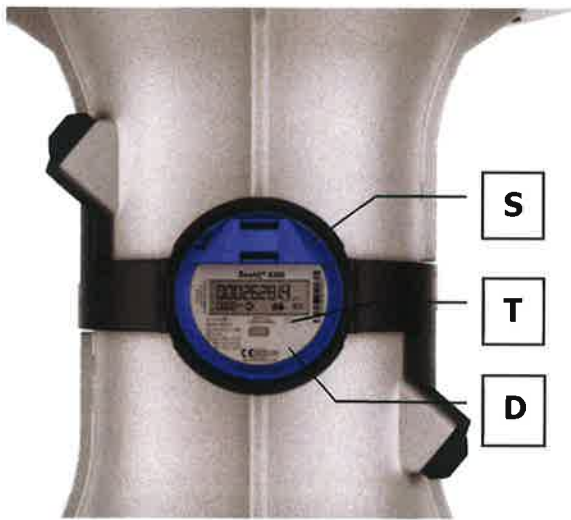
Pulse Interface

66-99-143

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Seals and markings

- D** Module D label engraved on a plaque under the sealing ring
- S** Security seal (Void sealing ring)
- T** Type label engraved on a plaque under the sealing ring
- P** Security seals (void label)



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Inscriptions

Front cover for KWM4230

- System designation
- Manufacturer designation or logo
- Manufacturer 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: H1C1)

Regulations regarding installation

KWM4230 water meter may be installed in all possible angles and positions with a dynamic range up to R400.

Above R400 and up to R1000 it may only be installed in a horizontal position.

¹ KWM4230 water meter may be labelled with a lower dynamic range than used under the verification procedure.

Photo of KWM2231

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