OIML Member State Denmark	**OIML Certificate No.** R49/2013-A-DK2-22.01 Revision 1

OIML CERTIFICATE ISSUED UNDER SCHEME A

OIML Issuing Authority

Name: FORCE Certification A/S
Address: Park Allé 345, 2605 Brøndby Denmark
Person responsible: Lars Poder

Applicant

Name: Kamstrup A/S
Address: Industrivej 28, 8660 Skanderborg, Denmark

Manufacturer

Name: Kamstrup A/S
Address: Industrivej 28, 8660 Skanderborg, Denmark

Identification of the certified type *(the detailed characteristics will be defined in the additional pages)*

Ultrasonic water meter, type KWM2231

Designation of the module *(if applicable)*

-

This OIML Certificate attests the conformity of the above identified type (represented by the sample(s) identified in the OIML type evaluation report) with the requirements of the following Recommendation of the International Organization of Legal Metrology (OIML):

OIML R 49, Edition (year): 2013

For accuracy class (if applicable): 2

FORCE Certification A/S · Park Alle 345, 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 www.forcecertification.com
Mail: info@forcecertification.com
Task no.: 125-22596.51 and ID no.: FC-OIML-12684-1

OIML Certificate No.
R49/2013-A-DK2-22.01 Revision 1

This OIML Certificate relates only to metrological and technical characteristics of the type of measuring instrument covered by the relevant OIML Recommendation identified above.

This OIML Certificate does not bestow any form of legal international approval.

The conformity was established by the results of tests and examinations provided in the associated reports:

- OIML type evaluation report no. 121-30138 issued by FORCE Technology on 6 April 2022
- Test report no. 122-23234-1 issued by FORCE Technology on 18 March 2022

The technical documentation relating to the identified type is contained in documentation file:

Task no. 121-30138, 122-24673 and 125-22596

OIML Certificate History

Revision No.	Date	Description of the modification
Revision 0	21 April 2022	Original certificate
Revision 1	10 April 2026	New meter variant Q3=4m3/h, G1B x 105 mm added

Identification, signature and stamp
The OIML Issuing Authority

Date: 10. April 2026

Michael Møller Nielsen
Certification manager

Important note: Apart from the mention of the Certificate's reference number and the name of the OIML Member State in which the Certificate is issued, partial quotation of the Certificate and of the associated OIML type evaluation report(s) is not permitted, although either may be reproduced in full.

FORCE Certification A/S · Park Alle 345, 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 www.forcecertification.com
Mail: info@forcecertification.com

Measuring system description

KWM2231 is a family of integrated and hermetically sealed static water meters based on the ultrasonic measuring principle ranging from 1.6 m^3/h to 4.0 m^3/h. The meter body is made of PPS composite material. The volume measurements are made by means of bidirectional ultrasonic technique according to the transit time method.

KWM2231 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.

KWM2231 is power supplied from internal lithium batteries (2 x A-cell) 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.

Inscriptions

The water meters type KWM2231 shall be clearly and indelibly marked with the following information:

- 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)
- Software version (e.g.: SW: D1)
- Meter replacement year
- Direction of flow by means of an arrow shown on both sides of the body

FORCE Certification A/S · Park Alle 345, 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 www.forcecertification.com
Mail: info@forcecertification.com

Technical and metrological characteristics

Meter dimensions

Meter with Q_3	Overall meter length [mm]	Meter connection	Diameter [DN]
4.0 [m^3/h]	105, 130, 190	G1B	20
2.5 [m^3/h]	105, 130, 190	G1B	20
2.5 [m^3/h]	110, 165, 170	G¾B	15
1.6 [m^3/h]	110, 165, 170	G¾B	15

Flow designation for T50

Meters with Q_3 = 4.0 m^3/h:

Dynamic range Q_3/Q_1	1600	1000	800	630	500	400	315
Q_1 Minimum flow rate [l/h]	2.5	4	5	6.3	8	10	12.7
Q_2 Transitional flow rate [l/h]	4	6.4	8	10.2	12.8	16	20.3
Q_3 Permanent flow rate [m^3/h]	4.0						
Q_4 Overload flow rate [m^3/h]	5.0						

Dynamic range Q_3/Q_1	250	200	160	125	100
Q_1 Minimum flow rate [l/h]	16	20	25	32	40
Q_2 Transitional flow rate [l/h]	25.6	32	40	51.2	64
Q_3 Permanent flow rate [m^3/h]	4.0				
Q_4 Overload flow rate [m^3/h]	5.0				

Meters with Q_3 = 2.5 m^3/h:

Dynamic range Q_3/Q_1	1600	1000	800	630	500	400	315
Q_1 Minimum flow rate [l/h]	1.6	2.5	3.1	4	5	6.3	7.9
Q_2 Transitional flow rate [l/h]	2.5	4	5	6.3	8	10	12.7
Q_3 Permanent flow rate [m^3/h]	2.5						
Q_4 Overload flow rate [m^3/h]	3.125						

Dynamic range Q_3/Q_1	250	200	160	125	100
Q_1 Minimum flow rate [l/h]	10	12.5	15.6	20	25
Q_2 Transitional flow rate [l/h]	16	20	25	32	40
Q_3 Permanent flow rate [m^3/h]	2.5				
Q_4 Overload flow rate [m^3/h]	3.125				

FORCE Certification A/S · Park Alle 345, 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 www.forcecertification.com
Mail: info@forcecertification.com

Flow designation for T50 continued

Meters with Q_3 = 1.6 m^3/h and measuring path 30261219:

Dynamic range Q_3/Q_1	1600	1000	800	630	500	400	315
Q_1 Minimum flow rate [l/h]	1	1.6	2	2.6	3.2	4	5.1
Q_2 Transitional flow rate [l/h]	1.6	2.6	3.2	4	5.1	6.4	8.1
Q_3 Permanent flow rate [m^3/h]	1.6						
Q_4 Overload flow rate [m^3/h]	2.0						

Dynamic range Q_3/Q_1	250	200	160	125	100
Q_1 Minimum flow rate [l/h]	6.4	8	10	12.8	16
Q_2 Transitional flow rate [l/h]	10.2	12.8	16	20.5	25.6
Q_3 Permanent flow rate [m^3/h]	1.6				
Q_4 Overload flow rate [m^3/h]	2.0				

Meters with Q_3 = 1.6 m^3/h and measuring path 30261143:

Dynamic range Q_3/Q_1	1000	800	630	500	400	315
Q_1 Minimum flow rate [l/h]	1.6	2	2.6	3.2	4	5.1
Q_2 Transitional flow rate [l/h]	2.6	3.2	4	5.1	6.4	8.1
Q_3 Permanent flow rate [m^3/h]	1.6					
Q_4 Overload flow rate [m^3/h]	2.0					

Dynamic range Q_3/Q_1	250	200	160	125	100
Q_1 Minimum flow rate [l/h]	6.4	8	10	12.8	16
Q_2 Transitional flow rate [l/h]	10.2	12.8	16	20.5	25.6
Q_3 Permanent flow rate [m^3/h]	1.6				
Q_4 Overload flow rate [m^3/h]	2.0				

Flow designation for T70

Meters with Q_3 = 4.0 m^3/h:

Dynamic range Q_3/Q_1	400	315	250	200	160	125	100
Q_1 Minimum flow rate [l/h]	10	12.7	16	20	25	32	40
Q_2 Transitional flow rate [l/h]	16	20.3	25.6	32	40	51.2	64
Q_3 Permanent flow rate [m^3/h]	4.0						
Q_4 Overload flow rate [m^3/h]	5.0						

FORCE Certification A/S · Park Alle 345, 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 www.forcecertification.com
Mail: info@forcecertification.com

Flow designation for T70 continued

Meters with Q_3 = 2.5 m^3/h:

Dynamic range Q_3/Q_1	400	315	250	200	160	125	100
Q_1 Minimum flow rate [l/h]	6.3	7.9	10	12.5	15.6	20	25
Q_2 Transitional flow rate [l/h]	10	12.7	16	20	25	32	40
Q_3 Permanent flow rate [m^3/h]	2.5						
Q_4 Overload flow rate [m^3/h]	3.125						

Meters with Q_3 = 1.6 m^3/h and measuring path 30261219:

Dynamic range Q_3/Q_1	400	315	250	200	160	125	100
Q_1 Minimum flow rate [l/h]	4	5.1	6.4	8	10	12.8	16
Q_2 Transitional flow rate [l/h]	6.4	8.1	10.2	12.8	16	20.5	25.6
Q_3 Permanent flow rate [m^3/h]	1.6						
Q_4 Overload flow rate [m^3/h]	2.0						

Meters with Q_3 = 1.6 m^3/h and measuring path 30261143:

Dynamic range Q_3/Q_1	250	200	160	125	100
Q_1 Minimum flow rate [l/h]	6.4	8	10	12.8	16
Q_2 Transitional flow rate [l/h]	10.2	12.8	16	20.5	25.6
Q_3 Permanent flow rate [m^3/h]	1.6				
Q_4 Overload flow rate [m^3/h]	2.0				

FORCE Certification A/S · Park Alle 345, 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 www.forcecertification.com
Mail: info@forcecertification.com

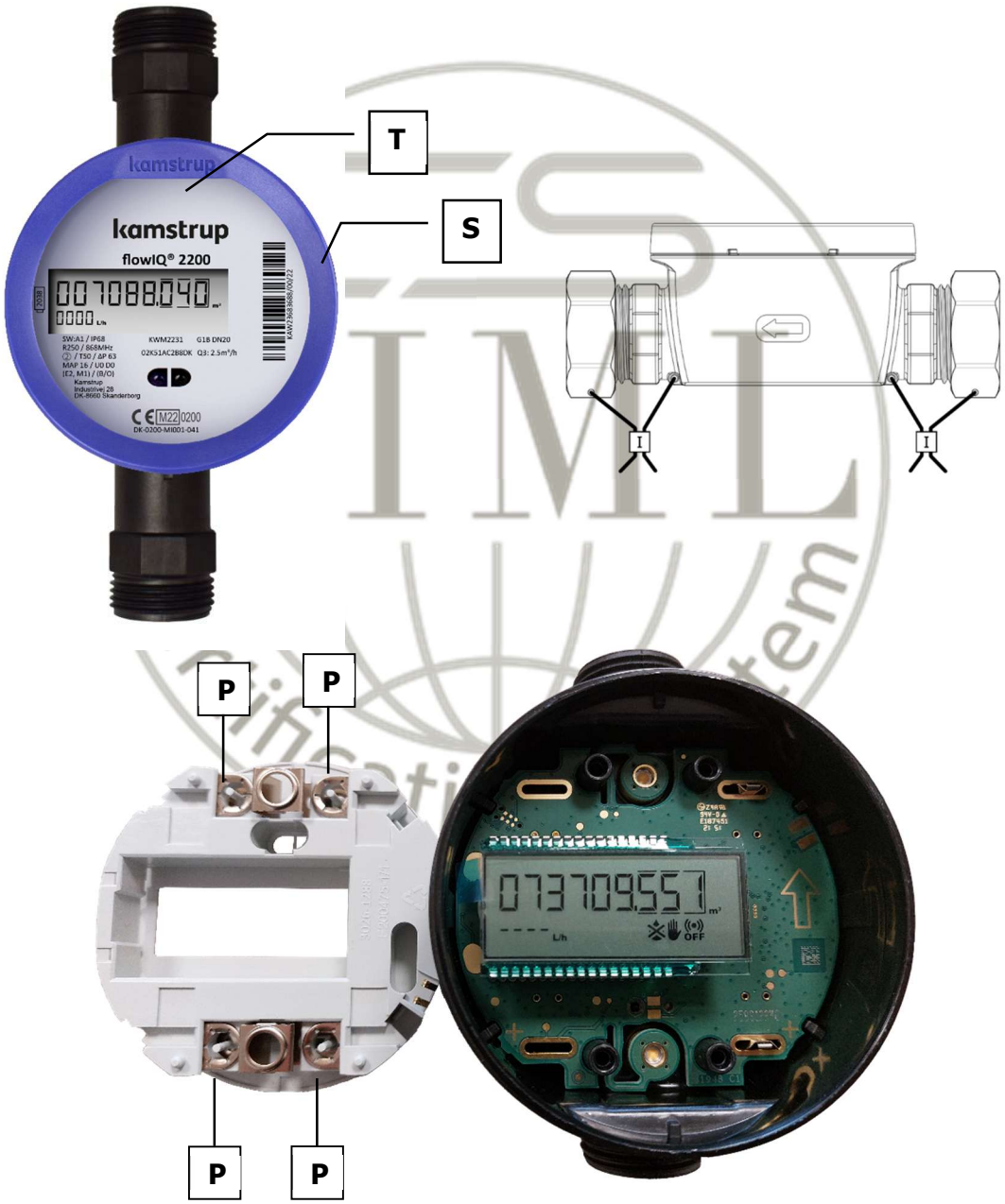
Other characteristics:

Instrument type:	Complete water meter
Temperature class:	T50 (0.1…50 °C) @ R=1600 and R=1000 T70 (0.1…70 °C) @ R=400 and R=250
Water pressure class:	MAP 16
Accuracy class:	2
Electromagnetic environment class:	E1 and E2
Mechanical environment class:	M1, Class B and O (building and outdoors)
Ambient temperature range:	-25 °C – 55 °C
Sensitivity to irregularity upstream velocity field classes:	U0
Sensitivity to irregularity downstream velocity field classes:	D0
Protection class:	IP68
Orientation requirements:	Horizontal, vertical or at an intermediate angle
Power supply:	3.65 VDC lithium battery (2 x A-cell)
Battery lifetime:	Up to 16 years

FORCE Certification A/S · Park Alle 345, 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 www.forcecertification.com
Mail: info@forcecertification.com

Security measures:

S	Security seal (void sealing ring)
T	Type label (Behind the front glass)
I	Installation seals (Wire and seals)
P	Security seals (Snap points for sealing)



FORCE Certification A/S · Park Alle 345, 2605 Brøndby Tel+45 43 25 01 77 Fax +45 43 25 00 10 www.forcecertification.com
Mail: info@forcecertification.com