Australian Government
Department of Industry, Innovation and Science

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 14/3/23

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that an approval for use for trade has been granted in respect of the instruments herein described.

Kamstrup Model flowIQ® 2102 water meter

submitted by Kamstrup A/S
Industrivej 28
8660 Stilling Skanderborg
DENMARK

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

This approval has been granted with reference to document NMI R 49-1 Water Meters Intended for the Metering of Cold Potable Water and Hot Water*, Part 1 Metrological and Technical Requirements*, dated September 2015.

This approval becomes subject to review on 01/05/25, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variant 1 approved – certificate issued	28/04/14
1	Variant 2 approved – certificate issued	27/05/15
2	Pattern & variant 1 updated, variant 3 approved – certificate issued	8/09/16
3	Pattern and variants 1 to 3 reviewed, variant 4 approved – certificate issued	09/04/20

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 14/3/23' and only by persons authorised by the submittor.

It is the submittor's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the National Measurement Institute (NMI) and with the relevant Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the National Measurement Act and may result in cancellation or withdrawal of the approval, in accordance with document NMI P 106.

Signed by a person authorised by the Chief Metrologist to exercise their powers under Regulation 60 of the *National Measurement Regulations 1999*.

Darryl Hines
Manager
Policy and Regulatory Services

TECHNICAL SCHEDULE No 14/3/23

1. Description of Pattern approved on 28/04/14

A Kamstrup model flowIQ® 2102 water meter used to measure cold potable water supplies for trade.

The pattern carries the type number '02A70C0L8AC'.

1.1 Field of Operation

The field of operation of the measuring system using the DN20 sized Kamstrup model flowIQ® 2102 water meter is determined by the following characteristics:

Minimum flow rate, Q_1:	0.016 m^3/h
Transition flow rate, Q_2:	0.026 m^3/h
Maximum continuous flow rate, Q_3:	4.0 m^3/h
Overload flow rate, Q_4:	5.0 m^3/h
Flow rate ratio, Q_3/Q_1:	250
Maximum admissible temperature:	50 °C
Temperature class:	T50
Maximum admissible pressure:	1600 kPa
Pressure loss class:	Δp 40
Accuracy class:	2
Flow profile sensitivity class:	U0/D0
Electromagnetic class:	E1 (residential, commercial & light industrial); E2 (industrial)
Environmental class:	B or O (indoors or outdoors)
Orientation:	All positions
Flow Direction:	Forward only
Power supply:	Lithium battery (3.65 V DC nominal) (non-replaceable)

1.2 Features/Functions

The pattern (Figures 1) consists of an ultrasonic flow sensor and an indicating flow converter (calculator/indicator) and has features/functions as listed below:

Connection type:	Threaded end connections type standard G1B.
Display:	A digital, electronic, liquid crystal display allowing for a maximum indication range of 99,999.999 m^3 in 0.001 m^3 increments. The meter may be placed into a verification mode allowing for a resolution of 0.000001 m^3.
Communications:	Wireless 923 MHz output and an optical port
Materials:	Polyphenylene suphide (PPS) composite material
Meter length:	130 mm

1.3 Conditions

1.3.1 Installation Conditions:

No flow straightener or flow conditioner is required.

The flow profile sensitivity class is U0/D0 (Accuracy Class 2).

The meter may also be fitted with a strainer (optional).

1.3.2 Water Quality

The meter is approved for use for the metering of cold potable water supplies.

1.4 Software Version

The pattern is approved for use with Kamstrup version xxxx0B01 (K1) software.

1.5 Verification Provision

Provision is made for the application of a verification mark.

1.6 Sealing Provision

Provision is made for the instrument to be sealed by the application of one or more tamper-evident mechanical seals as shown in Figure 2.

1.7 Descriptive Markings and Notices

Instruments are marked with the following data, either grouped or distributed on the casing, the indicating device dial or an identification plate (Figure 1):

Manufacturer's name or mark	...
Serial number	...
Pattern approval number	NMI 14/3/23
Numerical value of maximum continuous flow rate, Q_3	...
Flow rate ratio, Q_3/Q_1	...
Unit of measurement	m^3
Maximum admissible pressure (1)	1600 kPa
Maximum pressure loss (2)	40 kPa or Δp 40
Maximum admissible temperature (3)	T50
Orientation (4)	…
Flow profile sensitive class (5)	U0/D0
Direction of flow	→ or similar
Accuracy class (6)	2

(1) Optional for meters with MAP = 1400 kPa

(2) Optional for class Δp 63

(3) Optional for T30 meters

(4) Optional for meters approved for all orientations

(5) Optional for U0/D0 class meters

(6) Optional for class 2 meters

For instruments that incorporate electronic devices, the following information can either be physically marked on the instrument or provided electronically via the indicating device or similar means:

Electromagnetic class	E1 or E2
Environmental class	B or O
For meters with an external power supply	the voltage and frequency
For battery powered meters	a replacement date or similar indication of expected battery life

2. Description of Variant 1 approved on 28/04/14

The Pattern and Variants are approved with a range of different sizes, flowrates and associated characteristics as specified in Table 1 below. The Pattern is shown in **Bold** for completeness.

Table 1 Meter sizes, flowrates and related information

Meter size	**DN15**	**DN15**	**DN20**	**DN20**
Minimum flowrate Q_1 (m^3/h)	0.006	0.010	0.020	**0.016**
Transitional flowrate Q_2 (m^3/h)	0.010	0.016	0.032	**0.026**
Maximum continuous flowrate Q_3 (m^3/h)	1.6	2.5	4.0	**4.0**
Overload flowrate Q_4 (m^3/h)	2.0	3.125	5.0	**5.0**
Ratio Q_3/Q_1	250	250	200	**250**
Type Number	02A70C0D8AC		**02A70C0L8AC**	
Meter Length (mm)	110, **130**, 154, 165, 190 or 200			
Flow Profile Sensitivity Class	**U0/D0**			
Maximum admissible pressure	**1600 kPa**			
Pressure Loss Class	**Δp 40**			
Verification scale interval (m^3)	**0.000001**			

3. Description of Variant 2 approved on 27/05/15

The Pattern and Variants are approved with the alternative features and functions:

Communications: An updated radio transmitter – indicated by type number '02A**8**0C0L8AC' or '02A**8**0C0D8AC' marked on the indicating device (Figure 3).

Software: A new software version (Q1) – indicated by 'SW:Q1' marked on the indicating device (Figure 3).

4. Description of Variant 3 approved on 08/09/16

The Pattern and Variants are approved with the alternative temperature classes of T70 or T30/T70 (Figure 4).

5. Description of Variant 4 approved on 09/04/20

The Pattern and Variants are approved with the model designation flowIQ® 2101 (Figure 5) and incorporate a wired M-Bus connection, replacing the radio transmitter. The flowIQ® 2101 is approved as:

Electromagnetic class: E1 (residential, commercial & light industrial)

Environmental class: B or C (indoor or outdoor)

The flowIQ® 2101 is approved with the alternative software version SW: F1.

The type numbers for the flowIQ® 2101 are dependent on the technical characteristic of the meter and are listed in Table 2.

Table 2 Type number for the flowIQ® 2101

Type number	Meter Size	Q_3 (m^3/h)	Q_3/Q_1	Temperature Class
021-30-C0D-8XX	DN15	2.5	250	T50
021-30-C0D-7XX	DN15	2.5	250	T70
021-30-C0L-8XX	DN20	4.0	250	T50
021-30-C0L-7XX	DN20	4.0	250	T70

TEST PROCEDURE No 14/3/23

Water meters tested for initial verification shall comply with the Certificate of Approval, Technical Schedule, and the maximum permissible errors for initial and subsequent verifications at the operating conditions in effect at the time of verification. Maximum permissible errors for the initial and subsequent verification of water meters are given in the *National Trade Measurement Regulations 2009* (Cth).

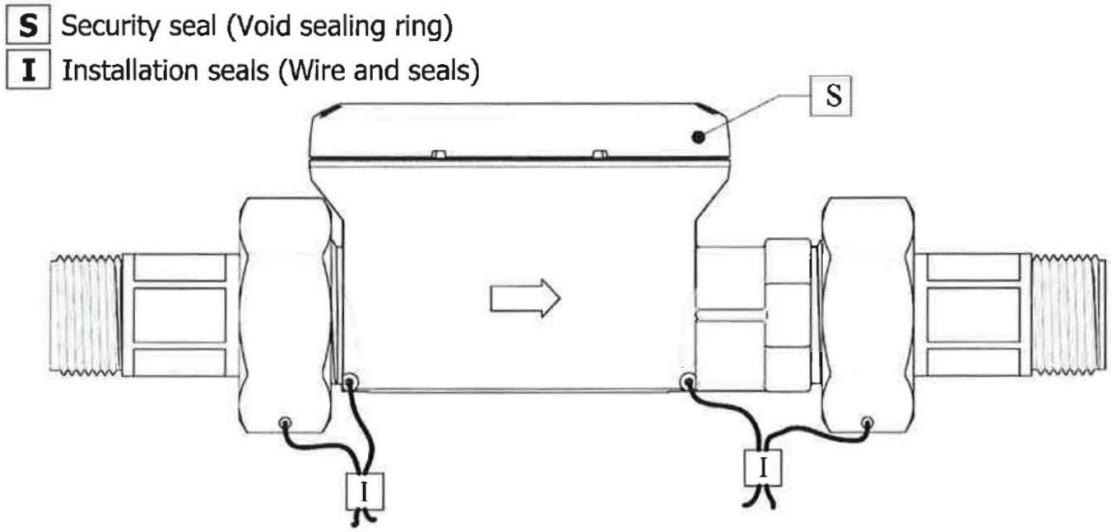
Water meters shall be verified in accordance with NITP 14 *National Instrument Test Procedures for Utility Meters*.

NOTE: NMI reserves the right to vary this procedure. Any such variation shall be notified in writing by NMI.

FIGURE 14/3/23 – 1

Kamstrup Model flowIQ® 2102 water meter (The Pattern)

FIGURE 14/3/23 – 2

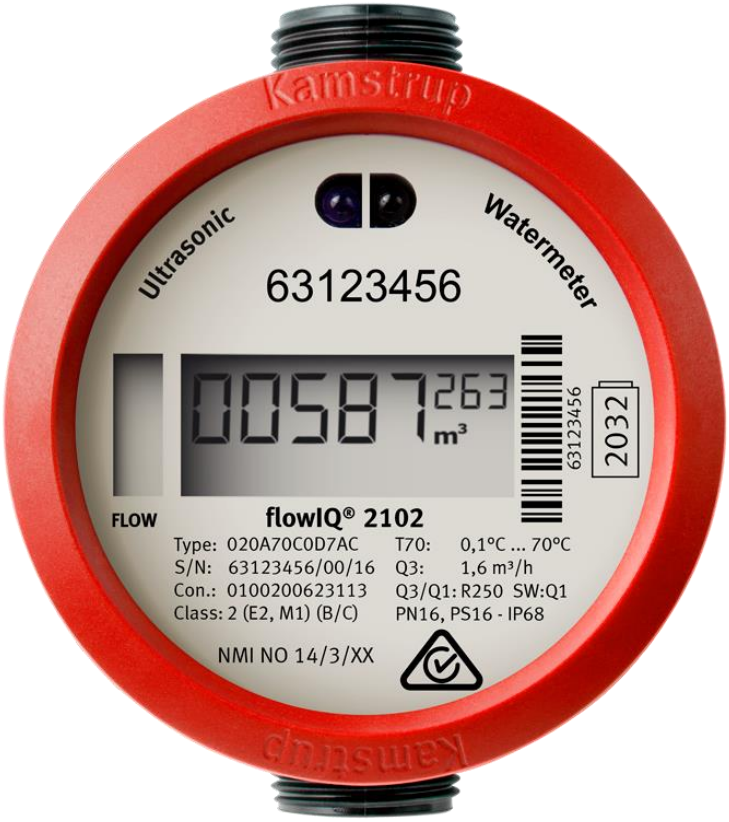


Typical Sealing Arrangements

FIGURE 14/3/23 – 3

Kamstrup Model flowIQ® 2102 water meters (Variant 2)

FIGURE 14/3/23 – 4



Kamstrup Model flowIQ® 2102 water meter, Temperature Class T70 (Variant 3)

FIGURE 14/3/23 – 5

Kamstrup Model flowIQ® 2101 water meter, wired M-Bus connection (Variant 4)

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