Australian Government
Department of Industry, Innovation and Science

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 14/3/43

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.

UAB Axioma Qalcosonic W1 Ultrasonic Water Meter

submitted by AMS Water Metering Pty Ltd
Unit 20, 51 Kalman Drive
Boronia VIC 3155

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 01/06/24, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variants 1 to 3 approved – certificate issued	17/05/19

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 14/3/43' 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
Pattern Approval, Policy and Licensing Section

TECHNICAL SCHEDULE No 14/3/43

1. Description of Pattern approved on 17/05/19

A DN20 sized UAB Axioma Metering Qalcosonic W1 Ultrasonic Water Meter used to measure cold potable and hot water supplies for trade.

1.1 Field of Operation

The field of operation of the measuring system using the DN20 Qalcosonic W1 Ultrasonic Water Meter is determined by the following characteristics:

Minimum flow rate, Q_1	0.005 m^3/h
Transition flow rate, Q_2	0.008 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:	800
Temperature Class:	T30
Maximum admissible temperature:	30 °C
Maximum admissible pressure:	1600 kPa
Pressure loss class:	Δp 63
Accuracy class:	2
Flow profile sensitivity class:	U0/D0
Electromagnetic class:	E1 & E2 (industrial)
Environmental class:	B & O (indoor & outdoor)
Orientation:	All positions
Flow Direction:	Forward only
Power supply:	3.6 V non-replaceable battery

1.2 Features/Functions

The pattern (Figure 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 (G1”)
Display:	A digital, electronic, liquid crystal display allowing for a maximum indication range of 999,999.999 m^3 in 0.001 m^3 increments. The display may be placed into verification mode allowing a minimum resolution of 0.000001 m^3.

Communications: Pulse and Mbus output is available via optical interface via means of a clamp-on module.

An internal radio module provides configurable wireless communications at the following frequencies:

- 868 MHz;
- 433 MHz; or
- 915 MHz;

Using the following protocols:

- W-M-Bus (T1/S1/C1);
- SIGFOX; or
- LORA WAN.

Materials: Polymer material

Meter length: 105 mm

Software version: 1.01

1.3 Conditions

1.3.1 Installation Conditions

No flow straightener or flow conditioner is required.

For Accuracy Class 2, the flow profile sensitivity class is U0/D0.

1.3.2 Water Quality

The meter is approved for use in the metering of cold potable and hot water supplies

1.4 Software Version

The pattern is approved for use with software versions:

- SW: 1.01

1.5 Verification Provision

Provision is made for the application of a verification mark.

1.6 Sealing Provision

The upper and lower parts of the meter casing are fitted such that any unauthorised attempt to physically access the casing is impossible without damaging the meter. When the upper casing is opened, a safety button is activated and an error code appears on the meter display. For sealing the meter after installation, there are holes provided in the meter body.

The meter is sealed against unauthorised changes to electronic parameters.

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 2):

Manufacturer's name or mark	...
Serial number	...
Pattern approval number	NMI 14/3/43
Numerical value of maximum continuous flow rate, Q_3	...
Flow rate ratio, Q_3/Q_1	...
Unit of measurement	m^3
Temperature class (1)	T30
Maximum admissible pressure (2)	1600 kPa
Maximum pressure loss (3)	63 kPa or Δp 63
Orientation (4)	…
Flow profile sensitive class (5)	U0/D0
Direction of flow	→ or similar
Accuracy class (6)	2

(1) Optional for Class T30

(2) Optional for meters with MAP of 1400 kPa or 600 kPa for DN ≥ 500

(3) Optional for Class Δp63

(4) Optional for meters approved for all orientations

(5) Optional for 0U/0D 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 17/05/19

The UAB Axioma Metering Qalcosonic W1 Ultrasonic Water Meter is approved with a range of different flowrates and associated characteristics as specified in Table 2 below. The Pattern is shown in **Bold** for completeness.

Table 2 Meter flowrates and related information (DN20)

Meter size	**DN20**						
Minimum flowrate Q_1 (m^3/h)	0.020	0.016	0.0127	0.010	0.008	0.0063	**0.005**
Transitional flowrate Q_2 (m^3/h)	0.032	0.026	0.020	0.016	0.013	0.010	**0.008**
Maximum continuous flowrate Q_3 (m^3/h)	**4.0**						
Overload flowrate Q_4 (m^3/h)	**5.0**						
Ratio Q_3/Q_1	200	250	315	400	500	630	**800**
Meter Lengths (mm)	**105**, 110, 130 or 190						
Temperature class	**T30**, T50, T70 or T90						
Pressure loss class	Δp 40 or **Δp 63**						

3. Description of Variant 2 approved on 17/05/19

The UAB Axioma Metering Qalcosonic W1 Ultrasonic Water Meter is approved as a DN15 sized meter with flowrates and associated characteristics as specified in Table 3 below.

Table 3 Meter flowrates and related information - DN15

Meter size	**DN15**				
Minimum flowrate Q_1 (m^3/h)	0.013	0.010	0.008	0.0063	0.005
Transitional flowrate Q_2 (m^3/h)	0.020	0.016	0.013	0.010	0.008
Maximum continuous flowrate Q_3 (m^3/h)	2.5				
Overload flowrate Q_4 (m^3/h)	3.125				
Ratio Q_3/Q_1	200	250	315	400	500
Meter Lengths (mm)	80, 105, 110, 165, 170				
Temperature class	T30, T50, T70, T90				
Pressure loss class	Δp 25, Δp 40, Δp 63				
Connection	Threaded end connection (G 3/4”)				

4. Description of Variant 3 approved on 17/05/19

The UAB Axioma Metering Qalcosonic W1 Ultrasonic Water Meter is approved as a DN15 sized meter with alternative flowrates and associated characteristics as specified in Table 4 below.

Table 4 Meter flowrates and related information - DN15

Meter size	**DN15**		
Minimum flowrate Q_1 (m^3/h)	0.008	0.0064	0.005
Transitional flowrate Q_2 (m^3/h)	0.0128	0.010	0.008
Maximum continuous flowrate Q_3 (m^3/h)	1.6		
Overload flowrate Q_4 (m^3/h)	2.0		
Ratio Q_3/Q_1	200	250	315
Meter Lengths (mm)	80, 105, 110, 165, 170		
Temperature class	T30, T50, T70, T90		
Pressure loss class	Δp 25, Δp 40, Δp 63		
Connection	Threaded end connection (G 3/4”)		

TEST PROCEDURE No 14/3/43

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 14/3/43 – 1

UAB Axioma Metering Qalcosonic W1 Ultrasonic Water Meter

FIGURE 14/3/43 – 2

Example of required markings

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