Australian Government
Department of Industry, Science and Resources

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 14/3/75

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 Metering Qalcosonic W1 DN20 Water Meter

submitted by ARTHUR D. RILEY AND COMPANY PTY LTD
Level 17, 383 Kent Street
SYDNEY NSW 2000

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 May 2022.

This approval is subject to review at the decision of the Chief Metrologist in accordance with the conditions specified in the document NMI P 106.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & Variant 1 approved – certificate issued	22/11/24
1	Change of submittor, Pattern amended (software), Variants 2 & 3 approved – certificate issued	02/05/25

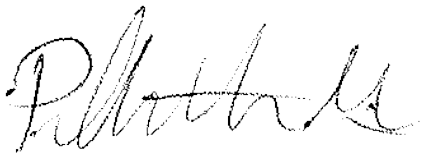
CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 14/3/75' 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*.



Phillip Mitchell
A/g Manager
Policy and Regulatory Services

TECHNICAL SCHEDULE No 14/3/75

1. Description of Pattern

approved on 22/11/24
amended on 02/05/25

A DN20 sized UAB Axioma Metering Qalcosonic W1 model water meter (utilising the 'B Design' meter body) used to measure cold potable water and hot water supplies for trade.

1.1 Field of Operation

The field of operation of the measuring system using the DN20 sized 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 m^3/h
Overload flow rate, Q_4:	5 m^3/h
Flow rate ratio, Q_3/Q_1:	800
Temperature class:	T30
Maximum admissible temperature:	50 °C
Maximum admissible pressure:	1600 kPa
Pressure loss class:	Δp 63
Accuracy class:	2
Flow profile sensitivity class:	U0/D0 (see 1.3.1)
Electromagnetic class:	E2
Environmental class:	B & O
Orientation:	All positions
Flow direction:	Forward
Power supply:	Non-replaceable battery (3.6 V)

1.2 Features/Functions

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

Connection type:	Threaded
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(1):	Pulse output and optional RF or NB-IoT communication module (using wMBus, LoRa WAN or CoAP protocols) for data transmission
Materials:	Meter body: Plastic
	Note: The meter incorporates a 'B Design' clear plastic meter body (Figure 2)
Meter length:	105 mm
Non-return device:	Optional dual check valve

(1) The pattern and variants may be fitted and/or configured with the communication options listed in this certificate. However, the primary indication of volume displayed by the indicating device of the meter is the approved indication of volume.

1.3 Conditions

1.3.1 Installation Conditions

No flow straightener or flow conditioner is required.

The flow profile sensitivity class is U0/D0.

1.3.2 Water Quality

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

1.4 Software Version

The meter is approved with the following software versions:

- 4.01 (physically marked, applicable to meters with LoRa functionality)
- 4.01.03 (CRC checksum '8205FC3', applicable to DN15-DN32 sizes with NB-IoT functionality)
- 4.01.04 (CRC checksum '4CE18891', applicable to DN40-DN50 sizes with NB-IoT functionality)

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 display. For sealing the meter after installation, there are holes provided in the meter body. The meter is sealed against unauthorised changes to electrical 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 1):

Manufacturer's name or mark	...
Serial number	...
Pattern approval number	NMI 14/3/75
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, T50, T70, T90 or T30/70
Maximum admissible pressure (2)	1600 kPa
Pressure loss class (3)	63 kPa or Δp 63
Orientation (4)	…
Flow profile sensitive class (5)	…
Direction of flow	→ or similar
Accuracy class (6)	2

(1) Optional for temperature class T30 meters

(2) Optional for meters with MAP = 1400 kPa

(3) Optional for pressure loss class Δp 63

(4) Optional for meters approved for all orientations

(5) Optional for U0/D0 class meters

(6) Optional for accuracy 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	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 22/11/24

The pattern is approved with a range of different sizes, flowrates and associated characteristics as specified in Tables 1-10 below. In Table 3, the pattern is shown in **bold** for completeness.

Table 1 – DN15 meter sizes, flowrates and related information

Minimum flowrate Q_1 (m^3/h)	0.02	0.010	0.0064	0.005	0.004
Transitional flowrate Q_2 (m^3/h)	0.032	0.016	0.01	0.008	0.0064
Maximum continuous flowrate Q_3 (m^3/h)	1.6	1.6	1.6	1.6	1.6
Overload flowrate Q_4 (m^3/h)	2	2	2	2	2
Ratio Q_3/Q_1	80	160	250	315	400
Temperature class	T30, T50, T70, T90 or T30/70				
Meter Length (mm)	80, 105, 110, 115, 165 or 170				

Table 2 – DN15 meter sizes, flowrates and related information

Minimum flowrate Q_1 (m^3/h)	0.031	0.016	0.01	0.0062	0.0031
Transitional flowrate Q_2 (m^3/h)	0.05	0.025	0.016	0.01	0.005
Maximum continuous flowrate Q_3 (m^3/h)	2.5	2.5	2.5	2.5	2.5
Overload flowrate Q_4 (m^3/h)	3.125	3.125	3.125	3.125	3.125
Ratio Q_3/Q_1	80	160	250	400	800
Temperature class	T30, T50, T70, T90 or T30/70				T30
Meter Length (mm)	80, 105, 110, 115, 165 or 170				

Table 3 – DN20 meter sizes, flowrates and related information

Minimum flowrate Q_1 (m^3/h)	0.016	0.01	**0.005**
Transitional flowrate Q_2 (m^3/h)	0.026	0.016	**0.008**
Maximum continuous flowrate Q_3 (m^3/h)	4	4	**4**
Overload flowrate Q_4 (m^3/h)	5	5	**5**
Ratio Q_3/Q_1	250	400	**800**
Temperature class	**T30**, T50, T70, T90 or T30/70		
Meter length	**105**, 110, 130, 165 or 190		

Table 4 – DN25 meter sizes, flowrates and related information

Minimum flowrate Q_1 (m^3/h)	0.079	0.040	0.252	0.016
Transitional flowrate Q_2 (m^3/h)	0.126	0.063	0.040	0.026
Maximum continuous flowrate Q_3 (m^3/h)	6.3	6.3	6.3	6.3
Overload flowrate Q_4 (m^3/h)	7.875	7.875	7.875	7.875
Ratio Q_3/Q_1	80	160	250	400
Temperature class	T30, T50, T70, T90 or T30/70			
Meter Length (mm)	260			
Orientation	H and/or V			

Table 5 – DN25 meter sizes, flowrates and related information

Minimum flowrate Q_1 (m^3/h)	0.125	0.0625	0.04	0.025
Transitional flowrate Q_2 (m^3/h)	0.2	0.100	0.064	0.04
Maximum continuous flowrate Q_3 (m^3/h)	10	10	10	10
Overload flowrate Q_4 (m^3/h)	12.5	12.5	12.5	12.5
Ratio Q_3/Q_1	80	160	250	400
Temperature class	T30, T50, T70, T90 or T30/70			
Meter Length (mm)	260			
Orientation	H and/or V			

Table 6 – DN32 meter sizes, flowrates and related information

Minimum flowrate Q_1 (m^3/h)	0.079	0.040	0.0252	0.016
Transitional flowrate Q_2 (m^3/h)	0.126	0.063	0.04	0.026
Maximum continuous flowrate Q_3 (m^3/h)	6.3	6.3	6.3	6.3
Overload flowrate Q_4 (m^3/h)	7.875	7.875	7.875	7.875
Ratio Q_3/Q_1	80	160	250	400
Temperature class	T30, T50, T70, T90 or T30/70			
Meter Length (mm)	260			
Orientation	H and/or V			

Table 7 – DN32 meter sizes, flowrates and related information

Minimum flowrate Q_1 (m^3/h)	0.125	0.0625	0.025
Transitional flowrate Q_2 (m^3/h)	0.2	0.100	0.04
Maximum continuous flowrate Q_3 (m^3/h)	10	10	10
Overload flowrate Q_4 (m^3/h)	12.5	12.5	12.5
Ratio Q_3/Q_1	80	160	400
Temperature class	T30, T50, T70, T90 or T30/70		
Meter Length (mm)	260		
Orientation	H and/or V		

Table 8 – DN40 meter sizes, flowrates and related information

Minimum flowrate Q_1 (m^3/h)	0.125	0.0625	0.04
Transitional flowrate Q_2 (m^3/h)	0.2	0.100	0.064
Maximum continuous flowrate Q_3 (m^3/h)	10	10	10
Overload flowrate Q_4 (m^3/h)	12.5	12.5	12.5
Ratio Q_3/Q_1	80	160	250
Temperature class	T30, T50, T70, T90 or T30/70		
Meter Length (mm)	300		
Orientation	H and/or V		

Table 9 – DN40 meter sizes, flowrates and related information

Minimum flowrate Q_1 (m^3/h)	0.2	0.100	0.064	0.04
Transitional flowrate Q_2 (m^3/h)	0.32	0.160	0.102	0.064
Maximum continuous flowrate Q_3 (m^3/h)	16	16	16	16
Overload flowrate Q_4 (m^3/h)	20	20	20	20
Ratio Q_3/Q_1	80	160	250	400
Temperature class	T30, T50, T70, T90 or T30/70			
Meter Length (mm)	300			
Orientation	H and/or V			

Table 10 – DN40 meter sizes, flowrates and related information

Minimum flowrate Q_1 (m^3/h)	0.3125	0.156	0.1	0.0625
Transitional flowrate Q_2 (m^3/h)	0.5	0.250	0.16	0.1
Maximum continuous flowrate Q_3 (m^3/h)	25	25	25	25
Overload flowrate Q_4 (m^3/h)	31.25	31.25	31.25	31.25
Ratio Q_3/Q_1	80	160	250	400
Temperature class	T30, T50, T70, T90 or T30/70			
Meter Length (mm)	300			
Orientation	H and/or V			

3. Description of Variant 2 approved on 02/05/25

The pattern is approved with DN50 size, with the flowrates and associated characteristics as specified in Tables 11-13 below.

Table 11 – DN50 meter sizes, flowrates and related information

Minimum flowrate Q_1 (m^3/h)	0.200	0.100	0.064	0.040
Transitional flowrate Q_2 (m^3/h)	0.320	0.160	0.102	0.064
Maximum continuous flowrate Q_3 (m^3/h)	16	16	16	16
Overload flowrate Q_4 (m^3/h)	20	20	20	20
Ratio Q_3/Q_1	80	160	250	400
Temperature class	T30, T50, T70, T90 or T30/70			
Meter Length (mm)	300			
Connection type	Flanged			

Table 12 – DN50 meter sizes, flowrates and related information

Minimum flowrate Q_1 (m^3/h)	0.3125	0.156	0.100	0.0625	0.050	0.0312
Transitional flowrate Q_2 (m^3/h)	0.500	0.250	0.160	0.100	0.080	0.050
Maximum continuous flowrate Q_3 (m^3/h)	25	25	25	25	25	25
Overload flowrate Q_4 (m^3/h)	31.25	31.25	31.25	31.25	31.25	31.25
Ratio Q_3/Q_1	80	160	250	400	500	800
Temperature class	T30, T50, T70, T90 or T30/70					T30
Meter Length (mm)	300					
Connection type	Flanged					

Table 13 – DN50 meter sizes, flowrates and related information

Minimum flowrate Q_1 (m^3/h)	0.5	0.25	0.16	0.1	0.080	0.05
Transitional flowrate Q_2 (m^3/h)	0.8	0.4	0.256	0.16	0.128	0.08
Maximum continuous flowrate Q_3 (m^3/h)	40	40	40	40	40	40
Overload flowrate Q_4 (m^3/h)	50	50	50	50	50	50
Ratio Q_3/Q_1	80	160	250	400	500	800
Temperature class	T30, T50, T70, T90 or T30/70					T30
Meter Length (mm)	300					
Connection type	Flanged					

4. Description of Variant 3 approved on 02/05/25

The pattern and variants (DN15 and DN20 sizes) are approved with the alternative 'A Design' black plastic meter body (Figure 3).

TEST PROCEDURE No 14/3/75

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

Water meters shall be verified in accordance with the following national instrument test procedures:

- NITP 14.0 – Utility meters – general requirements
- NITP 14.3 – Utility meters – water meters

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

FIGURE 14/3/75 – 1

UAB Axioma Metering Qalcosonic W1 model DN20 Water Meter (the pattern) and example of required markings

FIGURE 14/3/75 – 2

'B Design' meter body

FIGURE 14/3/75 – 3

‘A Design’ meter body

~ End of Document ~