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 Co. Ltd.
137 Thorndon Quay
Pipitea, Wellington, 6011
New Zealand

**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 | Pattern amended (software), Variants 2 & 3 approved – certificate issued | 23/04/25 |
| | | |

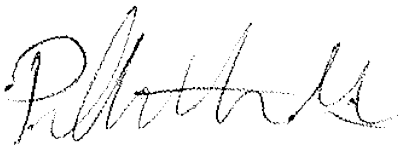
CONDITIONS OF APPROVAL

## 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 23/04/25**

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 23/04/25

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 23/04/25

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 ~