



Australian Government  
Department of Industry,  
Science and Resources

## National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

# Certificate of Approval

## NMI 14/3/3

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.

ACTARIS Model CT5 Water Meter

submitted by Itron Australasia Pty Limited  
8 Rosberg Road  
Wingfield SA 5013

**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 & variants 1 to 6 approved – interim certificate issued	19/07/02
1	Pattern & variants 1 to 6 approved – certificate issued	1/11/02
2	Pattern & variants 1 to 6 reviewed – variant 5 amended – notification of change issued	13/08/07
3	Variant 7 approved – interim certificate issued	29/01/09
4	Variant 7 approved – certificate issued	21/07/09
5	Variant 8 approved – certificate issued	27/10/11

Rev	Reason/Details	Date
6	Pattern & variants 1 to 8 reviewed & updated – submittor name updated – certificate issued	21/03/13
7	Pattern & variants 1 to 8 reviewed – certificate issued	19/07/18
8	Variant 9 approved – certificate issued	23/10/19
9	Variant 10 approved – certificate issued	08/12/23

## CONDITIONS OF APPROVAL

### General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI (or NSC) 14/3/3' 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 14/3/3

**1. Description of Pattern**

**approved on 19/07/02**

An ACTARIS model CT5 positive displacement water meter used to measure cold potable water supplies for trade.

May also be known as an Itron model CT5 water meter.

**1.1 Field of Operation**

The field of operation of the ACTARIS model CT5 water meter is determined by the following characteristics:

Minimum flow rate, Q <sub>1</sub>	0.020 kL/h
Transition flow rate, Q <sub>2</sub>	0.032 kL/h
Maximum continuous flow rate, Q <sub>3</sub> :	4.0 kL/h
Overload flow rate, Q <sub>4</sub>	5.0 kL/h
Flow rate ratio, Q <sub>3</sub> /Q <sub>1</sub> :	200
Maximum admissible temperature:	30 °C
Limiting condition (water temperature):	50 °C
Maximum admissible pressure:	1400 kPa
Pressure loss class:	Δp 63
Accuracy class:	2
Flow profile sensitivity class:	U0/D0
Electromagnetic class:	NA
Environmental class:	NA
Orientation:	All positions
Flow Direction:	Forward only
Power supply:	NA

## 1.2 Features and Functions

The pattern (Figure 1) consists of positive displacement piston-type water meter incorporating a mechanical indicating device, of a size which is normally connected to 20 mm pipe, and has features/functions as listed below:

Connection type:	Threaded end connections as normally used in SA (1¼ BSP).
Display:	A mechanical digital indicator having a series of eight aligned digits giving a maximum display of 99999.999 kL in 1 L increments (Figure 2)
Materials:	Meter body: brass Indicating device: Composite material
Meter length:	140 mm
Non-return device:	Single check valve
Software version:	NA

## 1.3 Conditions

### 1.3.1 Installation Conditions:

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

### 1.3.2 Water Quality

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

## 1.4 Software Version

Not applicable.

## 1.5 Verification Provision

Provision is made for the application of a verification mark.

## 1.6 Sealing Provision

The pattern incorporates a cover (made of composite material) clamped over the indicating device, such that attempts to mechanically access the meter will result in evidence of tampering.

## 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 14/3/3
Numerical value of maximum continuous flow rate, $Q_3$	...
Flow rate ratio, $Q_3/Q_1$	...
Unit of measurement	kL
Maximum admissible pressure <sup>(1)</sup>	1400 kPa
Maximum pressure loss <sup>(2)</sup>	63 kPa or $\Delta p$ 63
Maximum admissible temperature <sup>(3)</sup>	T30
Orientation <sup>(4)</sup>	...
Flow profile sensitive class <sup>(5)</sup>	U0/D0
Direction of flow	→ or similar
Accuracy class <sup>(6)</sup>	2

<sup>(1)</sup> Optional for meters with MAP = 1400 kPa

<sup>(2)</sup> Optional for class  $\Delta p$  63

<sup>(3)</sup> Optional for T30 meters

<sup>(4)</sup> Optional for meters approved for all orientations

<sup>(5)</sup> Optional for U0/D0 class meters

<sup>(6)</sup> 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	NA
Environmental class	NA
For meters with an external power supply	NA
For battery powered meters	NA

**2. Description of Variant 1** **approved on 19/07/02**

An ACTARIS (or Itron) model TD8 positive displacement meter (Figure 3) which is the same as the pattern (model CT5) except for the following:

**Features and functions**

Display: A mechanical digital indicator having a series of eight aligned digits giving a maximum display of 9999.9999 kL in 0.1 L increments (Figure 4)

Communications: Provision for a pulse output of 0.1 litre per pulse.

**Sealing Provision**

The ACTARIS model TD8 has a copper pin inserted through the body of the meter and the screw-on cover over the indicator (register); the pin is then sealed (Figure 5) to prevent removal of the cover.

**3. Description of Variant 2** **approved on 19/07/02**

The pattern and variants may be fitted with threaded end connections as normally used in QLD, VIC, TAS, WA and NT.

**4. Description of Variant 3** **approved on 19/07/02**

The pattern and variants may be fitted with threaded end connections as normally used in NSW and ACT (ball seat).

**5. Description of Variant 4** **approved on 19/07/02**

The pattern and variants may be fitted with dual check valves.

**6. Description of Variant 5** **approved on 19/07/02**

The pattern and variants may be fitted with various meter lengths as specified in Table 1.

**7. Description of Variant 6** **approved on 19/07/02**

The pattern and variants may be fitted with a manifold configuration (Figure 6).

**8. Description of Variant 7** **approved on 29/01/09**

The pattern and variants may be fitted with the indicator housing (known as type TVM) made of copper and glass (Figure 7) instead of composite material (known as type TSN).

**9. Description of Variant 8**

**approved on 27/10/11**

The pattern and variants may incorporate modifications to the measuring chamber, with the flowrates and associated characteristics as specified in Table 1. The pattern is shown in **bold** for completeness.

**Table 1 Meter flowrates and associated characteristics**

<b>Meter size</b>	<b>DN20</b>			
Minimum flowrate Q <sub>1</sub> (kL/h)	<b>0.020</b>	0.016	0.013	0.010
Transitional flowrate Q <sub>2</sub> (kL/h)	<b>0.032</b>	0.026	0.020	0.016
Maximum continuous flowrate Q <sub>3</sub> (kL/h)	<b>4.0</b>	4.0	4.0	4.0
Overload flowrate Q <sub>4</sub> (kL/h)	<b>5.0</b>	5.0	5.0	5.0
Ratio Q <sub>3</sub> /Q <sub>1</sub>	<b>200</b>	250	315	400
Meter Length (mm)	<b>140</b> or 154			
Maximum admissible pressure (kPa)	<b>1400</b> or 1600			
Verification scale interval (kL)	<b>0.001</b> or 0.0001			

Instruments may be known as ACTARIS model CT5, ACTARIS model TD8, Itron model TD8 or Itron model P50.

**10. Description of Variant 9**

**approved on 23/10/19**

The pattern and variants may incorporate an alternative meter body as shown in Figure 8.

**11. Description of Variant 10**

**approved on 08/12/23**

The pattern and variants are approved with low-lead brass as an alternative material for the meter body.

## TEST PROCEDURE No 14/3/3

Water meters tested for verification shall comply with the Certificate of Approval, Technical Schedule, and the maximum permissible errors for verifications at the operating conditions in effect at the time of verification. Maximum permissible errors for the 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*.

The following exceptions apply for accuracy class 2 meters:

- The working water temperature range for verification is dependent on the temperature class of the meter as follows:
  - T30, T50:  $20\text{ °C} \pm 10\text{ °C}$ ;
  - T70 to T180:  $20\text{ °C} \pm 10\text{ °C}$  and  $50\text{ °C} \pm 10\text{ °C}$ ;
  - T30/70 to T30/180:  $50\text{ °C} \pm 10\text{ °C}$ .
- Where a meter is tested with a working water temperature greater than 30 °C, the maximum permissible errors shall be:
  - $\pm 5\%$  within the flowrate range  $Q_1 \leq Q < Q_2$ ; and
  - $\pm 3\%$  within the flowrate range  $Q_2 \leq Q \leq Q_4$ .

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

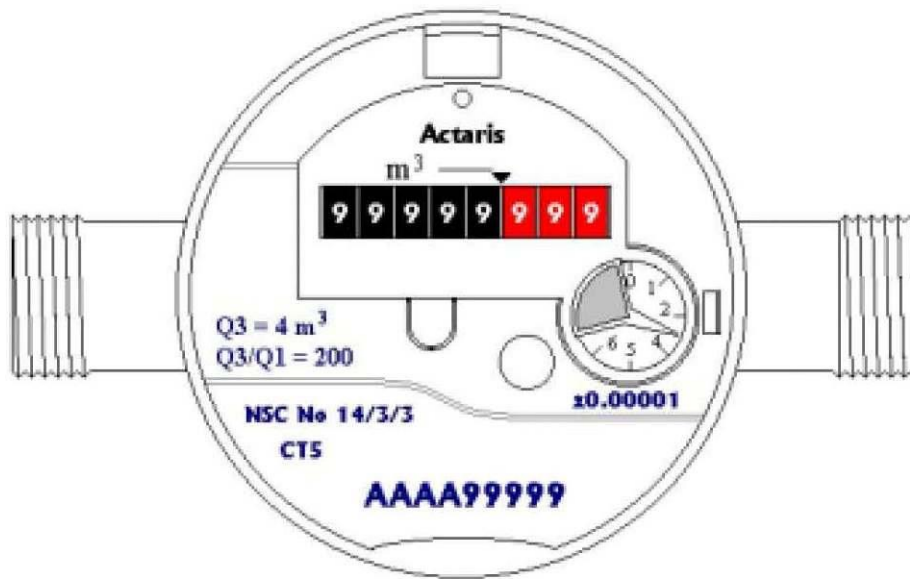


FIGURE 14/3/3 – 1

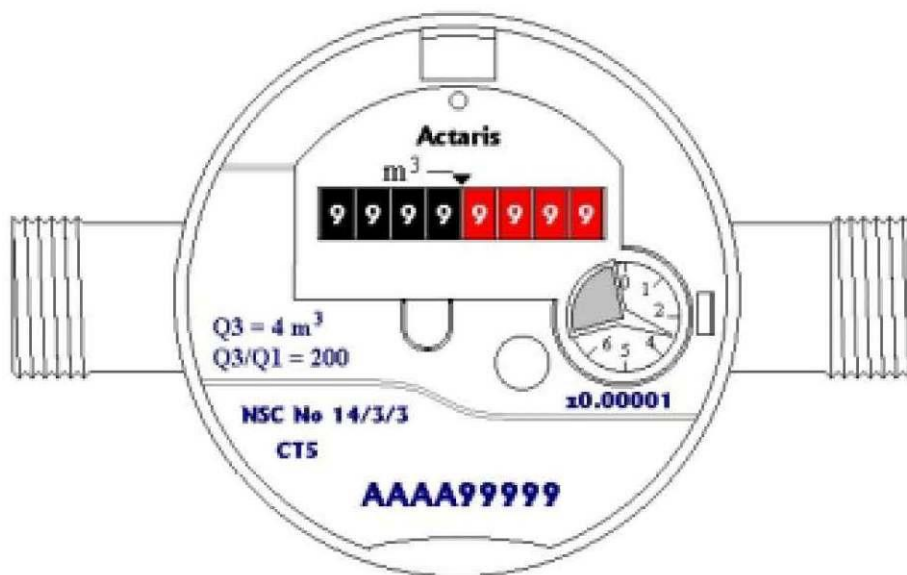


ACTARIS Model CT5 Water Meter – The Pattern

FIGURE 14/3/3 – 2



(a) 99999.999 Display ("5:3 register")



(b) 9999.9999 Display ("4:4 register")

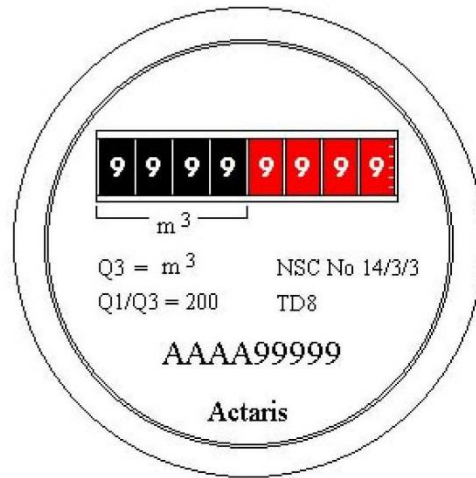
ACTARIS Model CT5 Water Meter Alternate Displays – The Pattern

FIGURE 14/3/3 – 3



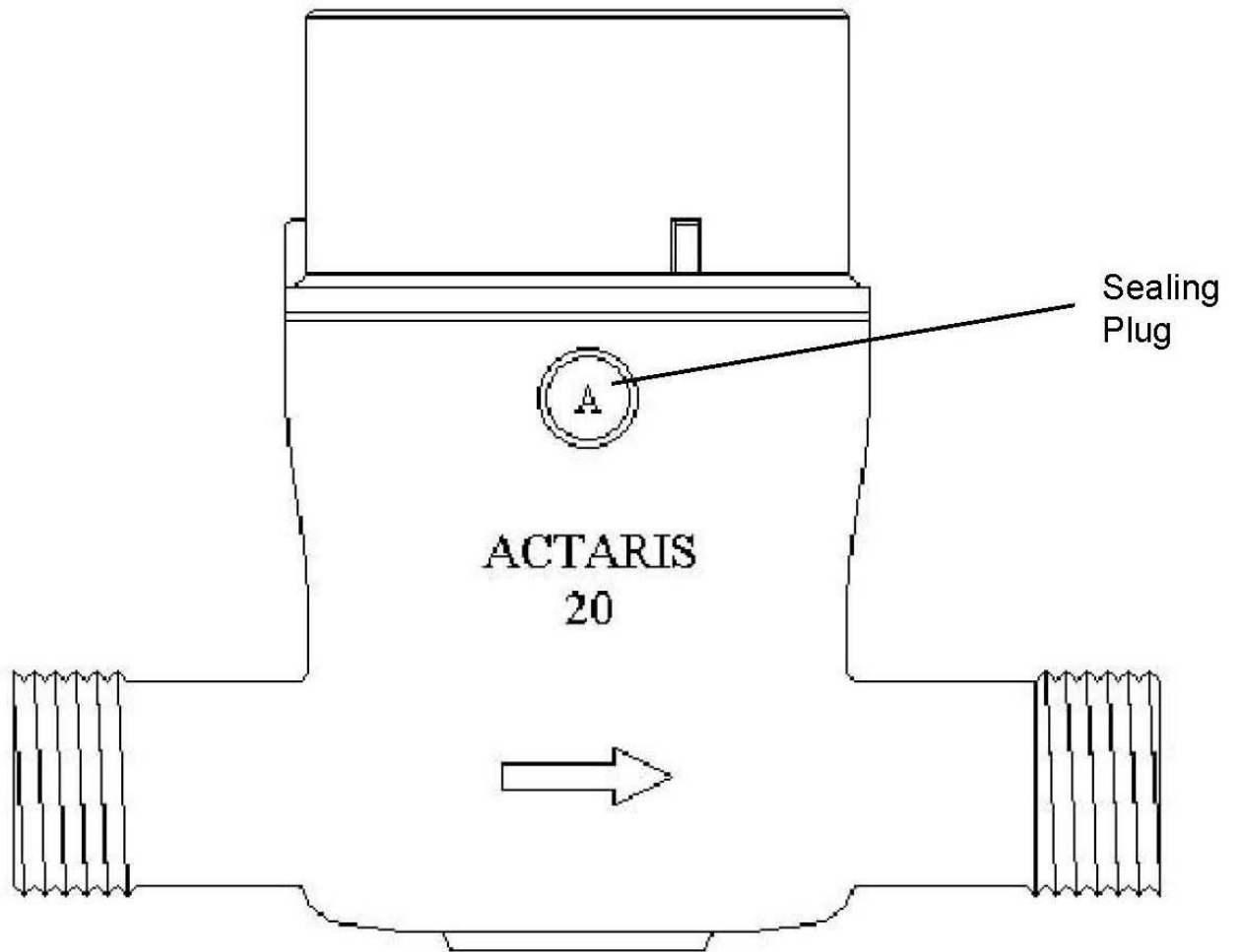
ACTARIS Model TD8 Water Meter – Variant 1

FIGURE 14/3/3 – 4



ACTARIS Model TD8 Water Meter Display (“4:4 register”) – Variant 1

FIGURE 14/3/3 – 5



Sealing Provision for ACTARIS Model TD8 Water Meter) – Variant 1

FIGURE 14/3/3 – 6



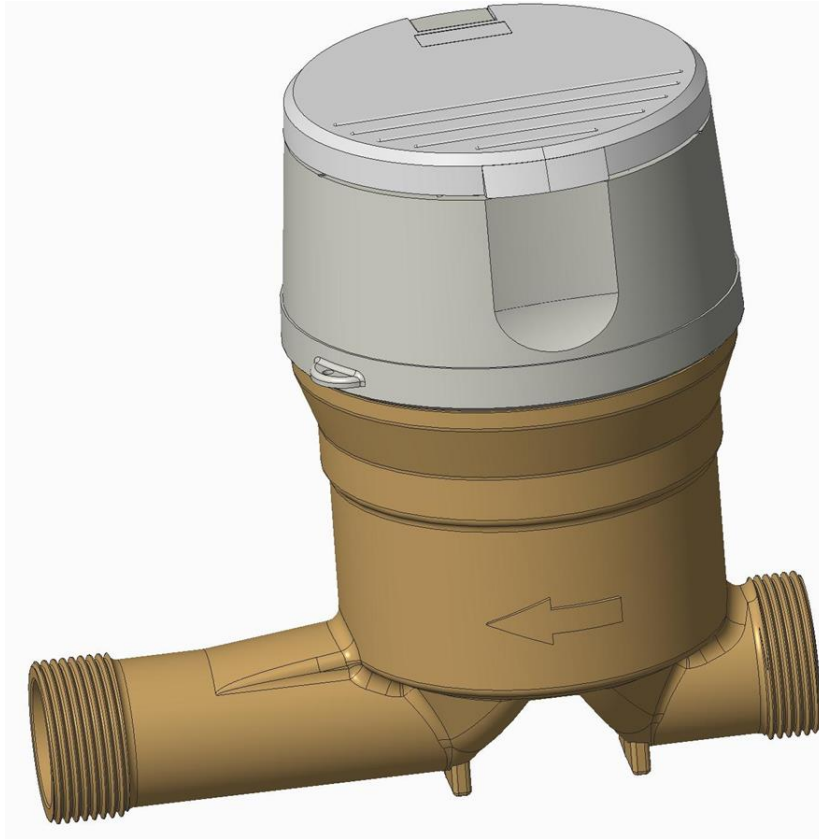
ACTARIS Model CT5 Water Meter With Manifold Configuration – Variant 6

FIGURE 14/3/3 – 7



ACTARIS Model CT5 Water Meter (Single Check Valve Version)  
With Type TVM Indicator Housing – Variant 7

FIGURE 14/3/3 – 8



ACTARIS Model CT5 Water Meter with alternative meter body – Variant 9

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