Australian Government
Department of Industry, Innovation and Science

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 14/3/44

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.

Arad WSTsb model water meter

submitted by Arad Ltd
Kibutz Dalia 19239
Israel

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 and NMI M 10-1 *Meters Intended for the Metering of Water in Full Flowing Pipes, Part 1 Metrological and Technical Requirements*, dated July 2010.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variant 1 provisionally approved – certificate issued	10/07/19
1	Pattern & variant 1 approved – certificate issued	02/04/20
2	Pattern amended (Installation Conditions) - certificate issued	06/08/20

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 14/3/44' and only by persons authorised by the submittor.

Instruments purporting to comply with this approval and currently marked with 'NMI P14/3/44' may be re-marked 'NMI 14/3/44' but 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 14/3/44

1. Description of Pattern **approved on 02/04/20**

amended on 06/08/20

A DN50 sized Arad WSTsb model water meter used to measure cold potable water supplies for trade.

1.1 Field of Operation

The field of operation of the measuring system using the DN50 Arad WSTsb model water meter is determined by the following characteristics:

Minimum flow rate, Q_1	0.63 m^3/h
Transition flow rate, Q_2	1.01 m^3/h
Maximum continuous flow rate, Q_3:	63.00 m^3/h
Overload flow rate, Q_4	78.75 m^3/h
Flow rate ratio, Q_3/Q_1:	100
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 (see Table 1)
Electromagnetic class:	E1 and E2
Environmental class:	O
Orientation:	Horizontal only
Flow Direction:	Forward only
Power supply:	NA

1.2 Features/Functions

The pattern (Figure 1) consists of a Woltman type mechanical water meter incorporating an impeller flow sensor and a mechanical indicating flow converter (calculator/indicator) and has features/functions as listed below:

Connection type: Flanged

Display: A mechanical display allowing for a maximum indication range of 9,999,999 m^3 in 0.0005 m^3 increments (Figure 2)

Materials: Meter body: Epoxy coated Cast iron and Ductile iron

Indicator housing: Polymer material

Meter length: 200 mm

1.3 Conditions

1.3.1 Installation Conditions:

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

For Accuracy Class 2.5, the installation conditions are specified in table 1.

Table 1 minimum pipe lengths (DN) required by flow disturbance type

Disturbance Type (*)	Minimum upstream pipe length	Minimum downstream pipe length
1	75	3
2	75	3
3	10	3

(*) For information on the different types of flow disturbances which are examined as part of pattern approval, refer to NMI M 10-2.

The meter incorporates flow conditioners at the inlet and outlet of the meter body.

1.3.2 Water Quality:

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

The meter is approved for use in the metering of non-potable water supplies of an unspecified nature.

1.4 Verification Provision

Provision is made for the application of a verification mark.

1.5 Sealing Provision

The meter is sealed using metal cable and plastic seals connecting the upper and lower part of the meter body to the indicator housing such that attempts to access metrologically significant components is made evident (Figure 3).

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 4):

Manufacturer's name or mark	Arad
Serial number – according to customer requirements	...
Pattern approval number	NMI 14/3/44
Numerical value of maximum continuous flow rate, Q_3	...
Flow rate ratio, Q_3/Q_1	...
Unit of measurement	m^3
Temperature class (1)	T50
Maximum admissible pressure (2)	1600 kPa
Maximum pressure loss (3)	40 kPa or Δp 40
Orientation (4)	H
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 Δp 63

(4) Optional for meters approved for all orientations

(5) Optional for U0/D0 meters

(6) Optional for class 2 meters

2. Description of Variant 1 approved on 02/04/20

The Arad WSTsb model water meter is approved with a range of different sizes (Figure 5), flowrates and associated characteristics as specified in Table 2 and Table 3 below. The Pattern is shown in **Bold** for completeness.

Table 2 Meter sizes, flowrates and related information

Meter size	DN50	DN65	DN80	DN100
Minimum flowrate Q_1 (m^3/h)	**0.63**	0.63	1.00	1.60
Transitional flowrate Q_2 (m^3/h)	**1.01**	1.01	1.60	2.56
Maximum continuous flowrate Q_3 (m^3/h)	**63**	63	100	160
Overload flowrate Q_4 (m^3/h)	**78.75**	78.75	125	200
Ratio Q_3/Q_1	**100**			
Meter length	**200** or 310	200	225, 230 or 413	250 or 483
Pressure loss class	**Δp 40**			
Verification scale interval (m^3)	**0.0005**			

Table 3 Meter sizes, flowrates and related information

Meter size	DN150	DN200	DN250	DN300
Minimum flowrate Q_1 (m^3/h)	2.50	12.60	20.00	20.00
Transitional flowrate Q_2 (m^3/h)	4.00	20.16	32.00	32.00
Maximum continuous flowrate Q_3 (m^3/h)	250	630	1000	1000
Overload flowrate Q_4 (m^3/h)	312.50	787.5	1250	1250
Ratio Q_3/Q_1	100	50		
Meter length	300 or 500	350 or 520	450	500
Pressure loss class	Δp 40			
Verification scale interval (m^3)	0.005		0.05	

TEST PROCEDURE No 14/3/44

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*.

For accuracy class 2.5 meters:

- The maximum permissible errors for initial verification shall be ±2.5% from Q_1 to Q_4.
- The flow rates specified for initial verification in NMI M 10-2 may replace the flow rates specified in NITP 14.

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

FIGURE 14/3/44 – 1

The Pattern

FIGURE 14/3/44 – 2

The indicating device

FIGURE 14/3/44 – 3

Sealing provisions

FIGURE 14/3/44 – 4

Required markings

FIGURE 14/3/44 – 5

DN300 sized Arad WSTsb model water meter – Variant 1

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