Australian Government
Department of Industry, Innovation and Science

National Measurement Institute

Certificate of Approval

NMI 14/3/36

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.

Euromag Model MUT 2200 EL Water Meter

submitted by Bermad Water Technologies
7 Inglewood Drive
Thomastown VIC 3074

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

This approval becomes subject to review on 1/12/21, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variants 1 to 3 approved – certificate issued	07/11/16

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number ‘NMI 14/3/36’ 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.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificates No S1/0/A or No S1/0B.

Signed by a person authorised by the Chief Metrologist to exercise their powers under Regulation 60 of the *National Measurement Regulations 1999*.

Dr A Rawlinson

TECHNICAL SCHEDULE No 14/3/36

1. Description of Pattern approved on 07/11/16

A DN40 sized Euromag model MUT 2200 EL water meter used to measure non-potable water supplies for trade.

1.1 Field of Operation

The field of operation of the measuring system using the DN40 sized Euromag MUT 2200 EL model water meter is determined by the following characteristics:

Minimum flow rate, Q_1	0.79 m^3/h
Maximum continuous flow rate, Q_3	25 m^3/h
Overload flow rate, Q_4	31.25 m^3/h
Flow rate ratio, Q_3/Q_1	31.5
Maximum admissible temperature:	50 °C
Maximum admissible pressure:	1600 kPa
Pressure loss class:	Δp10
Accuracy class:	2.5
Flow profile sensitivity class:	UX/DX – see table 1
Electromagnetic class:	E1 & E2 (industrial)
Environmental class:	B & O (indoor & outdoor)
Orientation:	Horizontal only
Flow Direction:	Forward only
Power supply:	Battery 12/24 V
Software versions:	Firmware Version 3.49

1.2 Features/Functions

The pattern (Figures 1 & 2) consists of a MUT2200 EL model electromagnetic flow sensor and a MC608B model indicating flow converter (calculator/indicator) and has features/functions as listed below:

Connection type:	Flanged
Display:	A digital, electronic, liquid crystal display allowing for a maximum indication range of 99,999,999 m^3 in 0.0001 m^3 increments
Communications:	MODBUS RTU interface
Materials:	Flow sensor: Epoxy coated stainless steel
	Flow converter: Polymer material
Meter length:	200 mm
Power Supply:	12/24 V battery
Orientation:	Horizontal only
Flow direction:	Forward only

1.3 Conditions

1.3.1 Installation conditions:

No flow straightener or flow conditioner is required.

Table 1 minimum pipe lengths required by flow disturbance type

Disturbance Type (*)	Minimum upstream pipe length	Minimum downstream pipe length
1	10	5
2	10	5
3	4	5

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

No flow straightener or flow conditioner is required.

1.3.2 Water quality:

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

The meter was not tested for the effect of water quality; however some pattern approval testing was performed with a non-potable water of an unspecified nature.

1.4 Software Versions

The pattern is approved for use with firmware version 3.49.

1.5 Verification Provision

Provision is made for the application of a verification mark.

1.6 Sealing Provision

The flow sensor is epoxy sealed stainless steel such that any attempt to access metrologically significant components is made evident. The connection between the flow sensor and flow converter via stainless steel bolts. These bolts are sealed via the application of an epoxy resin. The flow converter is sealed by tamper protection stickers (Figure 3) which provide evidence of the casing being unscrewed and accessed. The physical connection between the flow converter and the flow sensor (Figure 4) is also to be sealed in an appropriate manner.

Unauthorised electric access to the flow converter is prevented via the use of passwords.

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 (Figures 5 & 6):

Manufacturer's name or mark	...
Serial number	...
Pattern approval number	NMI 14/3/36
Numerical value of maximum continuous flow rate, Q_3	...
Flow rate ratio, Q_3/Q_1	...
Unit of measurement	m^3
Maximum admissible pressure	1600 kPa
Maximum pressure loss	10 kPa or ΔP10
Direction of flow	→ or similar
Accuracy class	2.5

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 and/or E2
Environmental class	B and/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 07/11/16

A Euromag model MUT 2200 EL water meter, except with the dimensions and specifications as listed in Tables 2a to 2c below. The pattern is repeated in **bold** for completeness.

Table 2a Meter sizes, flowrates and related information

Meter size	**DN40**	**DN50**	**DN65**	**DN80**	**DN100**
Minimum flowrate Q1 (m^3/h)	**0.79**	0.96	1.6	2.88	4.48
Maximum continuous flowrate Q3 (m^3/h)	**25**	48	80	144	224
Overload flowrate Q4 (m^3/h)	**31.25**	60	100	180	280
Ratio Q3/Q1	**31.5**	50	50	50	50
Nominal diameter (mm)	**40**	50	65	80	100
Meter Length	**200**	200	200	200	250
Verification scale interval (m^3)	**0.0001**	0.0001	0.0001	0.0001	0.0001

Table 2b Meter sizes, flowrates and related information

Meter size	**DN125**	**DN150**	**DN200**	**DN250**	**DN300**
Minimum flowrate Q1 (m^3/h)	5.6	6.4	12.8	19.2	20
Maximum continuous flowrate Q3 (m^3/h)	280	320	640	960	1260
Overload flowrate Q4 (m^3/h)	350	400	800	1200	1575
Ratio Q_3/Q1	50	50	50	50	63
Nominal diameter (mm)	125	150	200	250	300
Meter Length	250	300	350	450	500
Verification scale interval (m^3)	0.001	0.001	0.001	0.001	0.001

Table 2c Meter sizes, flowrates and related information

Meter size	DN350	DN400
Minimum flowrate Q_1 (m^3/h)	48	64
Maximum continuous flowrate Q3 (m^3/h)	2400	3200
Overload flowrate Q4 (m^3/h)	3000	4000
Ratio Q3/Q1	50	50
Nominal diameter (mm)	350	400
Meter Length	550	600
Verification scale interval (m^3)	0.001	0.001

3. Description of Variant 2 approved on 07/11/16

A Euromag MUT 2500 EL, with the same technical characteristics as the pattern except with specifications as listed in Table 3a below.

Table 3a Meter sizes, flowrates and related information

Meter size	DN450	DN500	DN550	DN600
Minimum flowrate Q1 (m^3/h)	72	72	72	72
Maximum continuous flowrate Q3 (m^3/h)	3600	3600	3600	3600
Overload flowrate Q4 (m^3/h)	4500	4500	4500	4500
Ratio Q3/Q1	50	50	50	50
Nominal diameter (mm)	450	500	550	600
Meter Length	450	500	550	600
Verification scale interval (m^3)	0.001	0.001	0.001	0.001

4. Description of Variant 3 approved on 07/11/16

The pattern may incorporate an alternative MC608R model indicating flow converter. This flow converter includes rechargeable batteries. Batteries are recharged via connection to a solar panel.

TEST PROCEDURE No 14/3/36

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 14/3/36 – 1

A Euromag MUT2200 EL Electromagnetic Flow Sensor and
an MC608B Model Indicating Flow Converter

FIGURE 14/3/36 – 2

Indicating Device

FIGURE 14/3/36 – 3

Typical Sealing of Flow Converter

FIGURE 14/3/36 – 4

Connection Between Flow Converter and Flow Sensor To Be Sealed

FIGURE 14/3/36 – 5

NMI 14/3/XX	Accuracy class: 2.5
Orientation: H	Maximum loss 10kPa
Q3: 320m³h	Q3/Q1: 50

Markings and Inscriptions

FIGURE 14/3/36 – 6

Other Markings and Inscriptions

~ End of Document ~