Australian Government
Department of Industry, Innovation and Science

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 14/3/52

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.

Elster Q4000 Electromagnetic model water meter

submitted by Elster Metering Pty Ltd
55 Northcorp Boulevard
Broadmeadows VIC 3047

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.

This approval becomes subject to review on 1/08/2025, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variants 1 to 3 approved – certificate issued	22/07/20

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 14/3/52' 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 14/3/52

1. Description of Pattern approved on 22/07/20

A DN50 sized Elster Q4000 Electromagnetic model water meter used to measure cold water supplies for trade.

1.1 Field of Operation

The field of operation of the measuring system using the DN50 sized Elster Q4000 Electromagnetic model water meter is determined by the following characteristics:

Minimum flow rate, Q_1:	0.20 m^3/h
Transition flow rate, Q_2:	0.32 m^3/h
Maximum continuous flow rate, Q_3:	63.0 m^3/h
Overload flow rate, Q_4:	78.75 m^3/h
Flow rate ratio, Q_3/Q_1:	315
Temperature class:	T30
Maximum admissible temperature:	30 °C
Limiting condition (water temperature):	50 °C
Maximum admissible pressure:	1600 kPa
Pressure loss class:	Δp 10
Accuracy class:	2
Flow profile sensitivity class:	U10/D2
Electromagnetic class:	E1 or E2 (industrial)
Environmental class:	B or O (indoor & outdoor)
Orientation:	Horizontal
Flow Direction:	Forward
Power supply:	Non-replaceable battery 3.6 V

1.2 Features/Functions

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

Connection type: Wafer type and flange adaptor (Figure 2)

Display: A digital, electronic, liquid crystal display allowing for a maximum indication range of 999,999 m^3 in 0.001 m^3 increments (Figure 3)

Materials: Flow sensor: Stainless steel

Flow converter: Polymer material

Meter length: 122 mm (meter only)

200 mm (including flange adaptor)

1.3 Conditions

1.3.1 Installation Conditions:

No flow straightener or flow conditioner is required.

For Accuracy Class 2, the flow profile sensitivity class is U10/D2.

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

Table 1 minimum pipe lengths required by flow disturbance type

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

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

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 Software Version

The pattern is approved for use with firmware versions:

- P 236-1.00.

1.5 Verification Provision

Provision is made for the application of a verification mark.

1.6 Sealing Provision

The register is secured by a one-way snap-on polymer shroud, which cannot be removed without damage. The inner liner, and flow sensors are secured by welded housing ends. Refer to Figure 4 for sealing details.

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 5):

Manufacturer's name or mark	...
Serial number	...
Pattern approval number	NMI 14/3/52
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
Maximum admissible pressure (2)	1600 kPa
Pressure loss class (3)	10 kPa or Δp 10
Orientation (4)	H
Flow profile sensitive class (5)	U10/D2
Direction of flow	→ or similar
Accuracy class (6)	2 or 2.5

(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

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 or 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 22/07/20

The Pattern and Variants are approved with Accuracy class 2.5 (in accordance with NMI M 10-1).

2. Description of Variant 2 approved on 22/07/20

The Pattern and Variants are approved with an alternative replaceable battery, with a model designation of Elster Q4000B Electromagnetic model water meter (Figure 6).

2. Description of Variant 3 approved on 22/07/20

The Pattern and Variants are approved with a range of different sizes, flowrates and associated characteristics as specified in Tables 2 and 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)	**0.20**	0.32	0.50	0.79
Transitional flowrate Q_2 (m^3/h) (*)	**0.32**	0.50	0.81	1.27
Maximum continuous flowrate Q_3 (m^3/h)	**63.00**	100.00	160.00	250.00
Overload flowrate Q_4 (m^3/h)	**78.75**	125.00	200.00	312.50
Ratio Q_3/Q_1	**315**, 250, 200, 160, 125 or 100			
Meter length (meter only) mm	**122**	122 or 142	142 or 162	162 or 182
Meter length (including flange adaptor) mm	**200**	200	200 or 225	250
Verification scale interval (m^3)	**0.001**			

(*) Accuracy class 2 only

Table 3 Meter sizes, flowrates and related information

Meter size	**DN125**	**DN150**	**DN200**
Minimum flowrate Q_1 (m^3/h)	1.27	2.00	3.17
Transitional flowrate Q_2 (m^3/h) (*)	2.03	3.20	5.08
Maximum continuous flowrate Q_3 (m^3/h)	400.00	630.00	1000.00
Overload flowrate Q_4 (m^3/h)	500.00	787.50	1250.00
Ratio Q_3/Q_1	315, 250, 200, 160, 125 or 100		
Meter length (meter only) mm	182 or 202	202 or 231	231 or 302
Meter length (including flange adaptor) mm	250	300	350
Verification scale interval (m^3)	0.01		

(*) Accuracy class 2 only

TEST PROCEDURE No 14/3/52

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*.

The following exceptions apply for accuracy class 2.5 meters:

- The maximum permissible errors shall be:
  ±2.5% within the flowrate range 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 14/3/52 – 1

Elster Q4000 Electromagnetic model water meter – The Pattern

FIGURE 14/3/52 – 2

The flange adaptor

FIGURE 14/3/52 – 3

Display for: DN50 - DN100 Meters

Display for: DN125 – DN200 Meters

The indicating device

FIGURE 14/3/52 – 4

Sealing provisions

FIGURE 14/3/52 – 5

Required markings

FIGURE 14/3/52 – 6

Elster Q4000B Electromagnetic model water meter – Variant 2

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