



Australian Government  
Department of Industry,  
Science and Resources

## National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

# Certificate of Approval

## NMI 14/3/1

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 Model 20 mm V100 Water Meter

submitted by Elster Metering Pty Ltd  
55 Northcorp Blvd  
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 for Cold Potable Water and Hot Water, Part 1 Metrological and technical requirements*, dated September 2015.

This 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 & 2 approved – interim certificate issued	7/12/01
1	Pattern & variants 1 & 2 approved – certificate issued	4/02/02
2	Variant 3 approved – interim certificate issued	17/02/03
3	Pattern & variants 1 & 2 updated – variant 3 approved – certificate issued	8/04/03
4	Pattern & variants 1 to 3 reviewed – notification of change issued	26/04/07

DOCUMENT HISTORY

Rev	Reason/Details	Date
5	Variant 4 approved – certificate issued	10/09/07
6	Variants 5 to 7 approved – interim certificate issued	8/03/10
7	Variants 5 to 7 approved & pattern amended – variant 8 approved – certificate issued	13/08/10
8	Test Procedure replaced – notification of change issued	1/09/10
9	Pattern & variants 1 to 8 reviewed & updated – certificate issued	20/09/12
10	Variants 1 to 8 consolidated into new variants 1 to 5 – additional series (V110 & V210) added – variant 2 (V110 series) provisionally approved – certificate issued	10/10/13
11	Pattern & variant 1 amended (Field of Operation, Table 1 & Figure 2, etc.) – certificate issued	21/08/15
12	Pattern updated, Variants 2 to 4 amended, Variant 6 approved – certificate issued	16/03/18
13	Pattern amended (editorial correction) – certificate issued	25/11/24

CONDITIONS OF APPROVAL

**General**

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI (or NSC) 14/3/1' and only by persons authorised by the submitter.

It is the submitter'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 14/3/1

**1. Description of Pattern**

**approved on 7/12/01  
amended on 25/11/24**

An Elster model 20 mm V100 class 2 positive displacement meter (Figures 1 & 2) used to measure water for potable supply for trade. May also be known as a model PSM-LT.

**1.1 Field of Operation**

The field of operation of the Elster model 20 mm V100 is determined by the following characteristics:

Minimum flow rate, $Q_1$ :	0.020 kL/h
Transitional flow rate, $Q_2$ :	0.032 kL/h
Maximum continuous flow rate, $Q_3$ :	4.0 kL/h
Overload flow rate, $Q_4$ :	5.0 kL/h
Flow rate ratio, $Q_3/Q_1$ :	200
Maximum admissible temperature:	30°C
Limiting condition (water temperature):	50°C
Maximum admissible pressure:	1600 kPa
Pressure loss class:	$\Delta p$ 63
Accuracy class:	2
Flow profile sensitivity class:	U0/D0
Electromagnetic class:	E1 (residential, commercial, light industrial)
Environmental class:	O (outdoor)
Orientation:	All positions

**1.2 Features/Functions**

A positive displacement piston-type class 2 water meter of a size which is normally connected to a 20 mm pipe and is approved for metering domestic supplies and has features/functions as listed below:

- Threaded-end connections as normally used in QLD, VIC, TAS, WA and NT.
- A mechanical digital indicator having a series of eight aligned digits giving a maximum display of 99999.999 kL in 1 L increments.
- Meter length: 154 mm
- Provision for pulse output of 5 litres per pulse

### 1.3 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:

Manufacturer's name or mark	.....
Serial number	.....
Pattern approval number	NMI (or NSC) 14/3/1
Numerical value of maximum continuous flow rate, $Q_3$	.....
Flow rate ratio, $Q_3/Q_1$	.....
Unit of measurement	kL
Maximum admissible pressure	1600 kPa
Maximum pressure loss <sup>(1)</sup>	63 kPa or $\Delta p$ 63
Orientation <sup>(2)</sup>	.....
Flow profile sensitivity	U0/D0
Direction of flow	→ or similar
Accuracy class <sup>(3)</sup>	2

<sup>(1)</sup> Optional for Class  $\Delta p$  63

<sup>(2)</sup> Optional for meters approved in all orientations

<sup>(3)</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	E1
Environmental class	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

### 1.4 Verification Provision

Provision is made for the application of a verification mark.

### 1.5 Sealing Provision

Instruments shall include one or more devices which can be sealed (Figure 2) so as to prevent dismantling or modification of the instrument without damaging the device(s). Figures 1 to 3 & 5 show typical methods for the V100/V110 series meters.

**2. Description of Variant 1** **approved on 10/10/13**

The Elster V100 series of class 2 water meters having the features/functions as listed below:

- A model V100 15 mm meter as specified in Table 1 (Figure 3)
- Threaded-end connections as normally used in NSW and ACT (ball seat)
- Threaded-end connections as normally used in SA (1¼" BSP) and meter length of 140 mm
- BSP threaded-end connections
- A mechanical digital indicator having a series of eight (8) aligned digits giving a maximum display of 9999.9999 kL in 0.1 L increments
- An alternative mechanical digital indicator incorporating the maximum displays of 99999.999 kL in 1 L increments and/or 9999.9999 kL in 0.1 L increments with contrasting scale markings and magnification of the first element. The indicator also includes changes to the gear assembly
- Provision for a pulse output of 0.5 or 5 litres per pulse
- Having single, dual (Figures 1 to 4) or no check valves
- The meter sizes and flowrates as specified in Table 1:

TABLE 1 – Specifications for V100 series meters

Meter size	DN15		DN20
Nominal diameter (mm)	15	15	20
Meter length (mm)	134	134	140 or 154
Maximum continuous flowrate Q3 (kL/h)	2.5	4.0	4.0
Ratio Q3/Q1	200 or 250	200, 250, 315 or 400	200, 250, 315 or 400

**3. Description of Variant 2** **approved on 10/10/13**

The Elster V110 series of class 2 water meters (Figure 5) having the same technical characteristics as the V100 series with the following differences:

- BSP and threaded end connections as for the V100 series
- Having single, dual or no check valves
- The meter body made of polymer material (Figure 5)
- The threaded-end connections are made of the same polymer or of brass
- Meter sizes and flowrates as specified in Table 2

TABLE 2 – Meter sizes and flowrates for V110 series meters

Meter size	DN15	DN20
Nominal diameter (mm)	15	20
Meter length (mm)	115	154, 165 or 199
Maximum continuous flowrate Q3 (kL/h)	2.5	4.0
Ratio Q3/Q1	200 or 250	200, 250, 315 or 400

**4. Description of Variant 3** **approved on 10/10/13**

The Elster V200 series of class 2 water meters (Figure 6 to 9) having the same technical characteristics as the DN 15 or DN20 V100 series with the following differences:

- Certain shroud designs and mechanical indicator layouts with either seven (7) or eight (8) aligned digits and either one (1) or two (2) sub-wheels (Figures 6, 8 and 9)
- An alternative shroud design with an electronic indicator (Figures 7 and 9) incorporating an encoder, pulse or AMR interface utilised by radio modules, with a maximum display of 999999.99999 kL
- A model V200P with the meter body made of polymer material (Figure 8)
- The threaded-end connections are made of brass
- Provision for e-sens inductive pulse output of 1 or 10 litres per pulse or AMR-AMI transmitter

Meters are factory-assembled to be tamper-proof therefore additional sealing is not required.

**5. Description of Variant 4** **approved on 10/10/13**

The Elster V210 concentric series of class 2 water meters having the same technical characteristics as the DN15 or DN20 V100 series with the following differences:

- A concentric meter design with a G1½ threaded-end connection (Figure 10)
- The same alternative shroud and indicator designs as for the V200 series
- A model V210P with the meter body made of polymer material (Figure 11).

Meters are factory-assembled to be tamper-proof therefore additional sealing is not required.

**6. Description of Variant 5** **approved on 10/10/13**

The Elster M160 manifold series of class 2 water meters (Figures 12 and 13) having the same technical characteristics as the V100 series with the following differences:

- A manifold meter design (including concentric meter body and manifold)
- Provision for pulse output of inductive 1 pulse per litre or full reading encoder
- The same alternative shroud and indicator designs as for the V200 series

The indicator and shroud are factory-assembled to be tamper-proof however the meter body requires sealing (Figures 12 and 13).

**7. Description of Variant 6** **approved on 16/03/18**

The Elster V200 series water meters (V200, V200P, V210 and V210P) and the Elster M160 manifold series water meters may include:

- An alternative Mechanical Indicator Version 3 (Figure 14); or
- An alternative Electronic Indicator Version 2 (Figure 15).

## TEST PROCEDURE No 14/3/1

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.

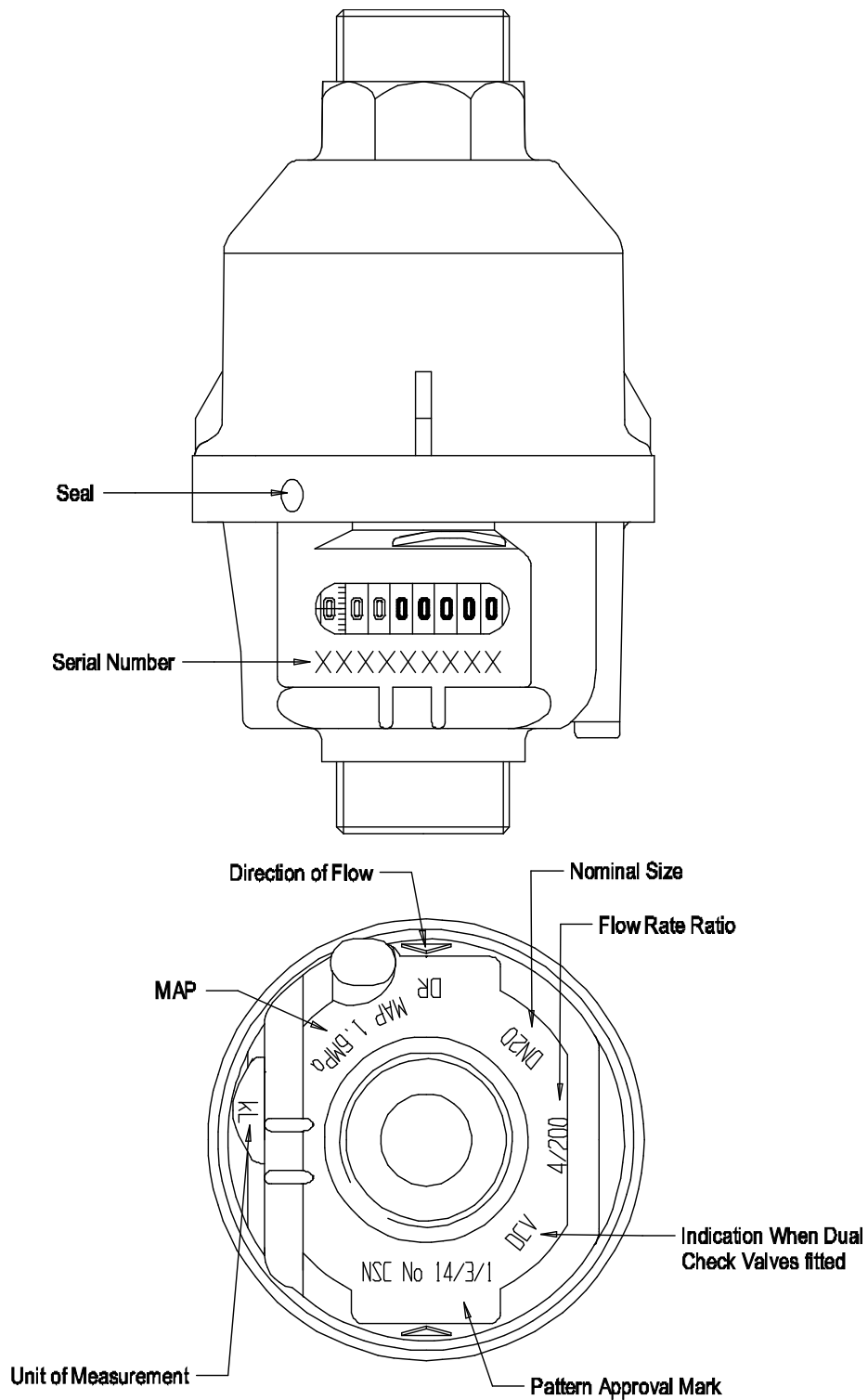
FIGURE 14/3/1 – 1



Elster Model V100 20 mm Water Meter (the pattern)  
– Including Sealing



FIGURE 14/3/1 – 2



Elster Model V100 20 mm Water Meter  
– Including Sealing

FIGURE 14/3/1 – 3



Elster Model 15 mm V100 15 mm Water Meter (variant 1)  
– Including Sealing

FIGURE 14/3/1 – 4



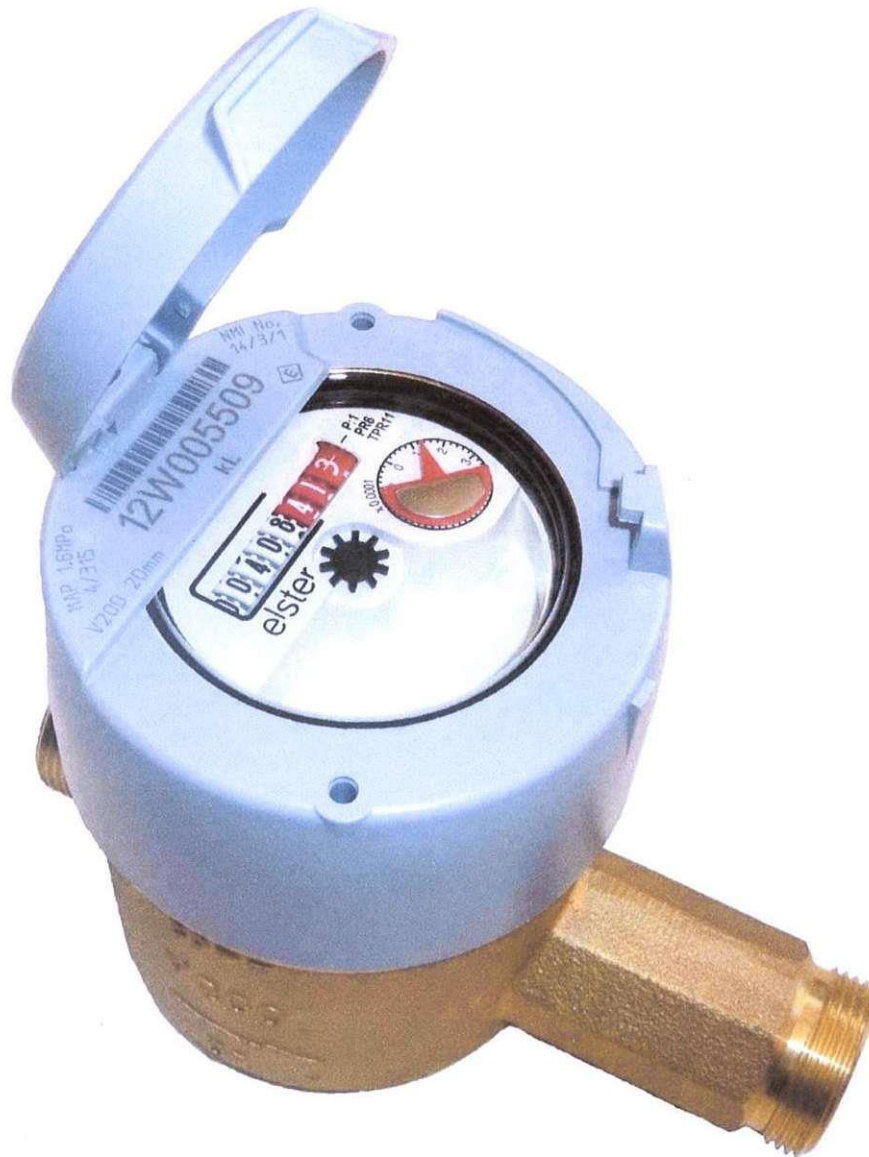
Elster Model V100 20 mm Water Meter With Dual Check Valves (variant 1)

FIGURE 14/3/1 – 5



Elster Model V110 Water Meter With Polymer Body (variant 2)  
– Including Sealing

FIGURE 14/3/1 – 6



Elster Model V200 20 mm Water Meter With Mechanical Indicator (variant 3)

FIGURE 14/3/1 – 7



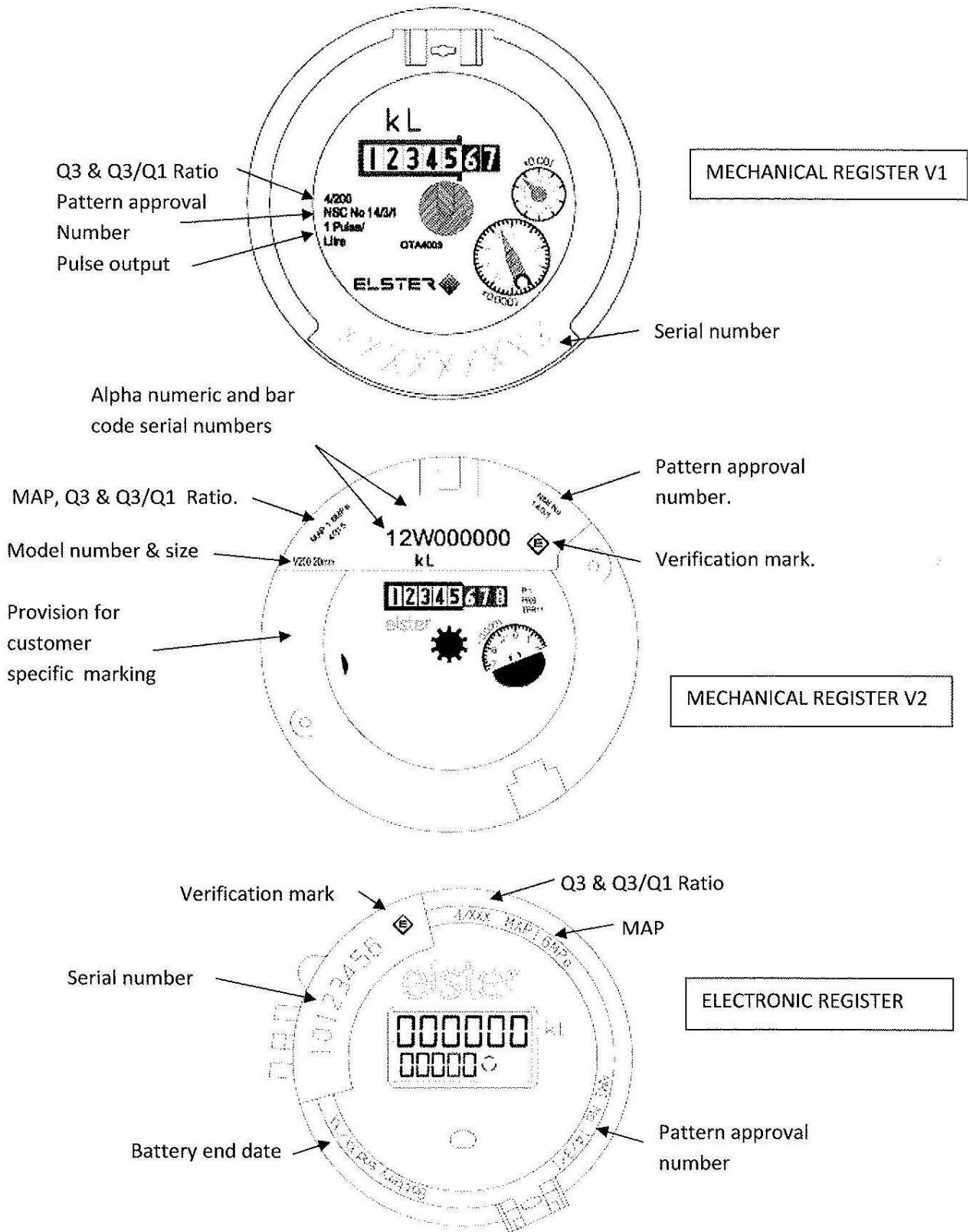
Elster Model V200 20 mm Water Meter With Electronic Indicator (variant 3)

FIGURE 14/3/1 – 8



Elster Model V200P 20 mm Water Meter With Polymer Body (variant 3)

FIGURE 14/3/1 – 9



Certain Mechanical and Electronic Indicator Layouts and Alternative Shroud Designs – Models V200, V200P, V210, V210P and M160 (variants 3 to 5)



FIGURE 14/3/1 – 10



Elster Model V210 20 mm Water Meter With Mechanical Indicator (variant 4)

FIGURE 14/3/1 – 11



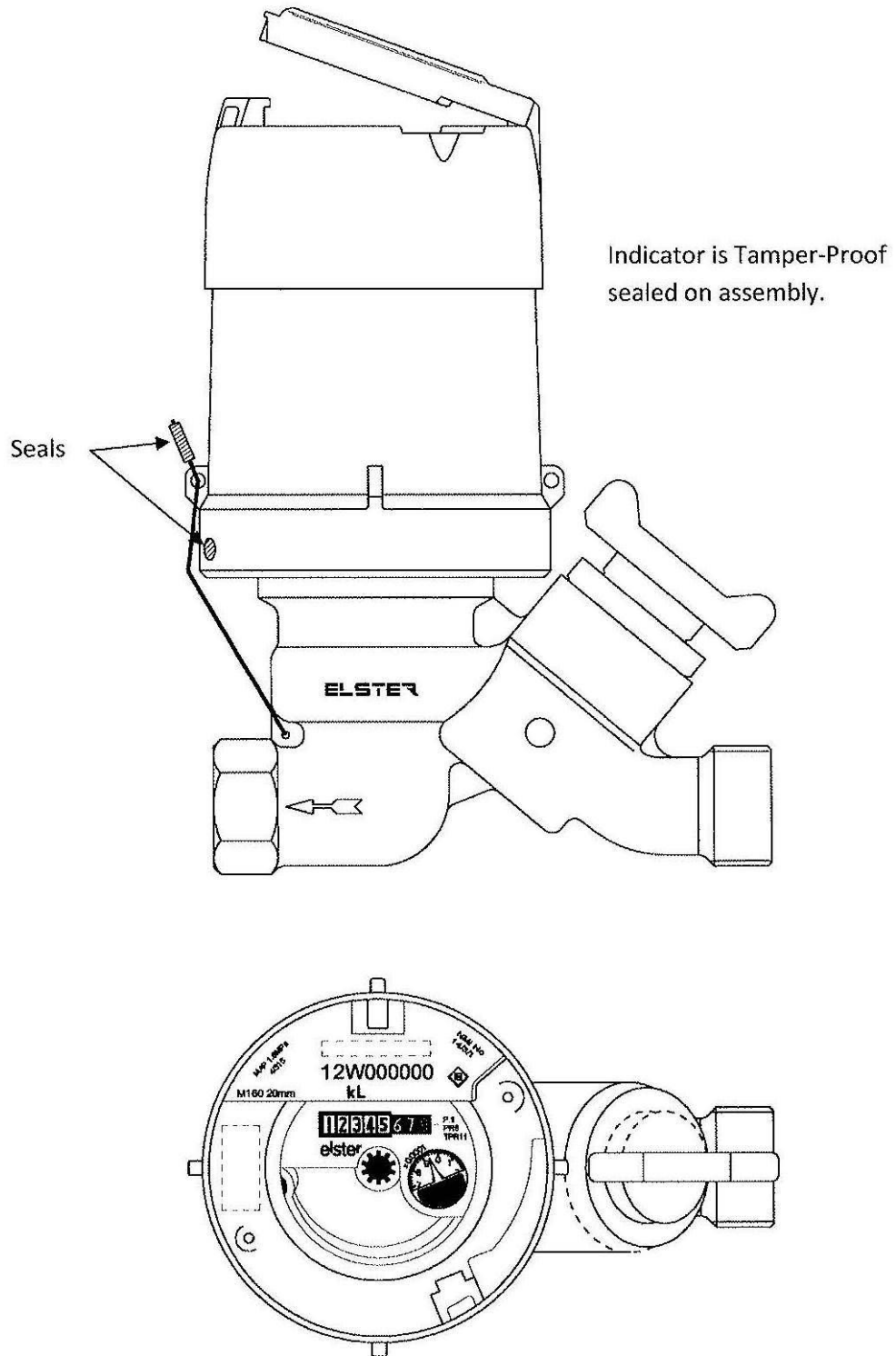
Elster Model V210P 15 mm Water Meter With Polymer Body (variant 4)

FIGURE 14/3/1 – 12



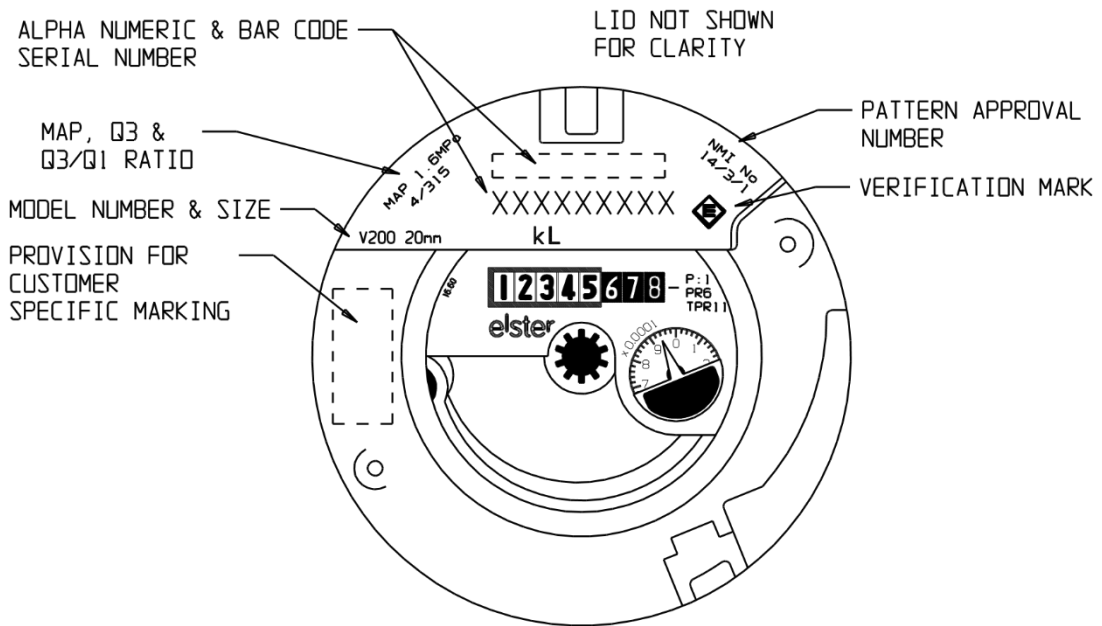
Elster Model M160 Water Meter (variant 5)

FIGURE 14/3/1 – 13



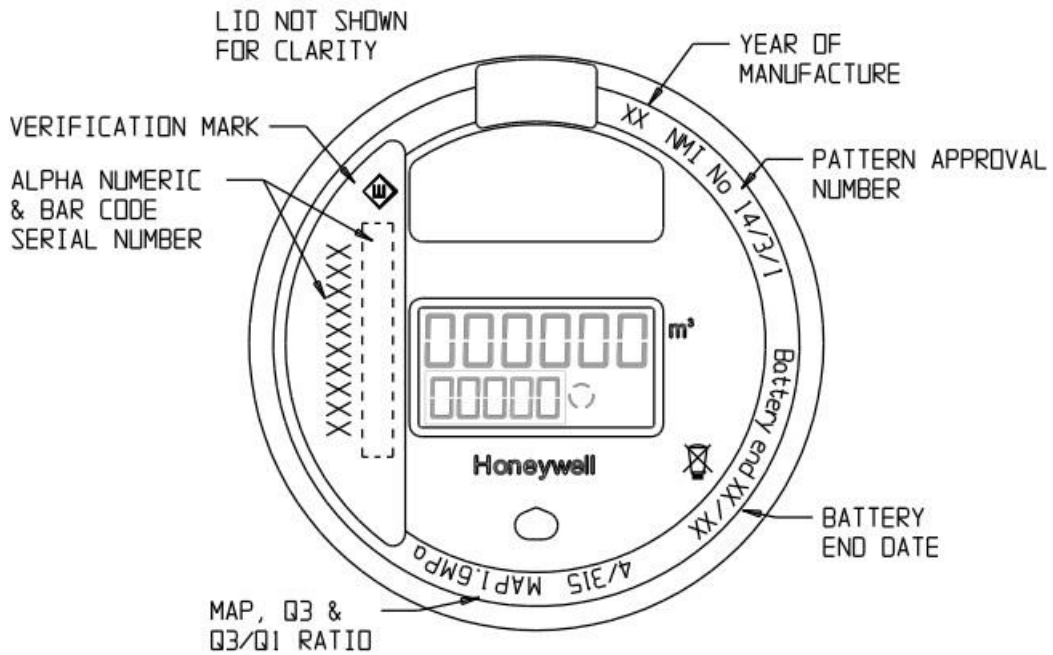
Elster Model M160 20 mm Water Meter With Mechanical Indicator (variant 5)

FIGURE 14/3/1 – 14



Alternative Mechanical Indicator Version 3 (Variant 6)

FIGURE 14/3/1 – 15



Alternative Electronic Indicator Version 2 (Variant 6)

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