14/3/7
19 April 2012

Australian Government
National Measurement Institute

Bradfield Road, West Lindfield NSW 2070

Cancellation

Certificate of Approval

No 14/3/7

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that the approval for use for trade granted in respect of the

Severn Trent Model SE250E Water Meter

submitted by Severn Trent Metering Services
Smeckley Wood Close
Chesterfield Trading Estate
Chesterfield S41 9PZ
United Kingdom

has been cancelled in respect of new instruments as from 1 June 2012.

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

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Severn Trent Model SE250E Water Meter

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Smeckley Wood Close
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Chesterfield S41 9PZ
United Kingdom.

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, Part 1: Metrological and Technical Requirements*, July 2004.

CONDITIONS OF APPROVAL

This approval becomes subject to review on 1 February 2010, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked with approval number ‘NMI 14/3/7’ and only by persons authorised by the submittor.

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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.

The National Measurement Institute reserves the right to examine any instrument or component of an instrument purporting to comply with this approval.

DESCRIPTIVE ADVICE

Pattern: approved 27 January 2005

- A Severn Trent model SE250E class 2 fluidic oscillator meter used to measure water for domestic supply for trade.

Variants: approved 27 January 2005

1. Certain other models of the SE250 series.
2. Certain models of the SM150 series.

Technical Schedule No 14/3/7 describes the pattern and variants 1 & 2.

Variants: approved 15 September 2005

3. Model SM250E.
4. Model SM150E with an alternative housing.
5. With dual check valves.

Technical Schedule No 14/3/7 Variation No 1 describes variants 3 to 5.

Variant: approved 16 March 2006

6. With an integral output connector.

Technical Schedule No 14/3/7 Variation No 2 describes variant 6.

Variant: approved 9 May 2007

7. Certain models of the C100 series.

Technical Schedule No 14/3/7 Variation No 3 describes variant 7.

FILING ADVICE

Certificate of Approval No 14/3/7 dated 11 March 2006 is superseded by this Certificate, and may be destroyed. The documentation for this approval now comprises:

Certificate of Approval No 14/3/7 dated 21 November 2007
Technical Schedule No 14/3/7 dated 16 February 2005 (incl. Test Procedure)
Technical Schedule No 14/3/7 Variation No 1 dated 27 September 2005
Technical Schedule No 14/3/7 Variation No 2 dated 17 March 2006
Technical Schedule No 14/3/7 Variation No 3 dated 21 November 2007
Figures 1 to 4 dated 16 February 2005
Figures 5 to 7 dated 27 September 2005
Figure 8 dated 17 March 2006
Figures 9 and 10 dated 21 November 2007

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

TECHNICAL SCHEDULE No 14/3/7

Pattern: Severn Trent Model SE250E Water Meter

Submittor: Severn Trent Metering Services
Smeckley Wood Close
Chesterfield Trading Estate
Chesterfield S41 9PZ United Kingdom

1. Description of Pattern

A Severn Trent model SE250E class 2 fluidic oscillator meter (Figures 1 and 2) used to measure water for domestic supply for trade.

1.1 Field of Operation

The following characteristics determine the field of operation of the measuring system:

- Maximum continuous flow rate, Q_3 4 m^3/h
- Flow rate ratio, Q_3/Q_1 200
- Maximum working temperature 30°C
- Maximum admissible temperature 50°C
- Maximum working pressure 1400 kPa
- Accuracy class 2

1.2 Features/Functions

A fluidic oscillator 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:

- 1 inch BSP threaded end connections.
- A replaceable mechanical digital indicator having a series of nine aligned digits giving a maximum display of 9999.99999 m^3 in 0.00001 m^3 increments.
- Encoded output.
- Meter length of 190 mm.
- Single check valve.

1.3 Verification/Certification Provision

Provision is made for the application of a verification/certification mark.

1.4 Sealing Provision

Figure 2 shows the sealing method for the pattern and variant 1 (SE250 series meters) including using special security bolts provided.

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1.5 Markings

Instruments are marked with the following data, either grouped or distributed on the casing, the indicating device dial, an identification plate or the cover if it is not detachable:

Manufacturer's name or mark	...
Serial number	...
Pattern approval mark	NMI 14/3/7
Numerical value of maximum continuous flow rate, Q_3	...
Flow rate ratio, Q_3/Q_1	...
Unit of measurement	m^3
Direction of flow	→ or similar
Accuracy class	... (#)

(#) Optional for class 2 meters.

2. Description of Variants

2.1 Variant 1

Certain other SE250 series instruments, namely:

- model SE250E with encoded output and a replaceable or a non-replaceable indicator; and
- model SE250P with pulse output and a replaceable or non-replaceable indicator.

2.2 Variant 2

Certain SM150 series instruments, with Q_3 of 2.5 m^3/h, Q_3/Q_1 of 200 or 250, 3/4 inch BSP threaded end connections, and a meter length of 110 mm, namely:

- model SM150E (Figures 3 and 4) with encoded output and a replaceable or non-replaceable battery;
- model SM150P with pulse output and a replaceable or non-replaceable battery; and
- model SM150 with a visual read indicator and a replaceable or non-replaceable battery.

The SM150 series meters have their casing halves pressed together during manufacture and so no other sealing method is required to prevent unauthorised access.

TEST PROCEDURE

Instruments tested for initial verification shall comply with the Certificate of Approval and Technical Schedule, and the maximum permissible errors for initial and subsequent verifications/certifications at the operating conditions in effect at the time of verification.

All meters shall be tested at flow rates of:

$Q_2(-0, +0.1\ Q_2)$, $0.1\ Q_3(\pm 0.01\ Q_3)$ and $Q_4\ (-0.1\ Q_4, +0)$

in the country of origin in a third party accredited facility which has reference standards traceable to primary national standards of the country of origin.

Each batch of meters and the results of the tests of these meters shall be supplied to the verifying authority. The verifying authority shall draw sample meters from the batch of meters supplied. The drawing of such sample meters shall be in accordance with the relevant National Measurement Institute (NMI) document.

All sample meters drawn shall be tested at flow rates of:

$Q_2(-0, +0.1\ Q_2)$ and $0.1\ Q_3(\pm 0.01\ Q_3)$.

A sample of the sample meters shall be tested at flow rates of:

$Q_1(-0, +0.1\ Q_1)$ and $Q_3(\pm 0.1\ Q_3)$.

The disposition of all meters from which the sample meters were drawn shall be determined in accordance with the relevant NMI document.

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

14/3/7
27 September 2005

TECHNICAL SCHEDULE No 14/3/7

VARIATION No 1

Pattern: Severn Trent Model SE250E Water Meter

Submittor: Severn Trent Metering Services
Smeckley Wood Close
Chesterfield Trading Estate
Chesterfield S41 9PZ United Kingdom

2. Description of Variants

2.1 Variant 3

A Severn Trent model SM250E water meter (Figure 5) which has the same specifications and features as the pattern (model SE250E) but has a different LCD display, a single (rather than dual) internal electronics module (PCB), and is in a different housing.

2.2 Variant 4

The model SM150E (Variant 1) with some structural and housing modifications including the repositioning of the battery compartment (Figure 6).

2.3 Variant 5

Any model of this approval now with dual check valves (Figure 7).

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17 March 2006

TECHNICAL SCHEDULE No 14/3/7

VARIATION No 2

Pattern: Severn Trent Model SE250E Water Meter

Submittor: Severn Trent Metering Services
Smeckley Wood Close
Chesterfield Trading Estate
Chesterfield S41 9PZ United Kingdom

1. Description of Variant 6

Any model of this approval with an integral output connector. Typical examples are shown in Figure 8.

TECHNICAL SCHEDULE No 14/3/7

VARIATION No 3

Pattern: Severn Trent Model SE250E Water Meter

Submittor: Severn Trent Metering Services
Smeckley Wood Close
Chesterfield Trading Estate
Chesterfield S41 9PZ United Kingdom

1. Description of Variant 7

Severn Trent C100 series of concentric meters, which have similar specifications, measurement geometry and features to the SM150 series (variant 2), except that the Maximum Continuous Flow Rate (Q_3) is 1.6 m^3/h and the electronic digital display has five m^3 digits and five sub-multiple digits.

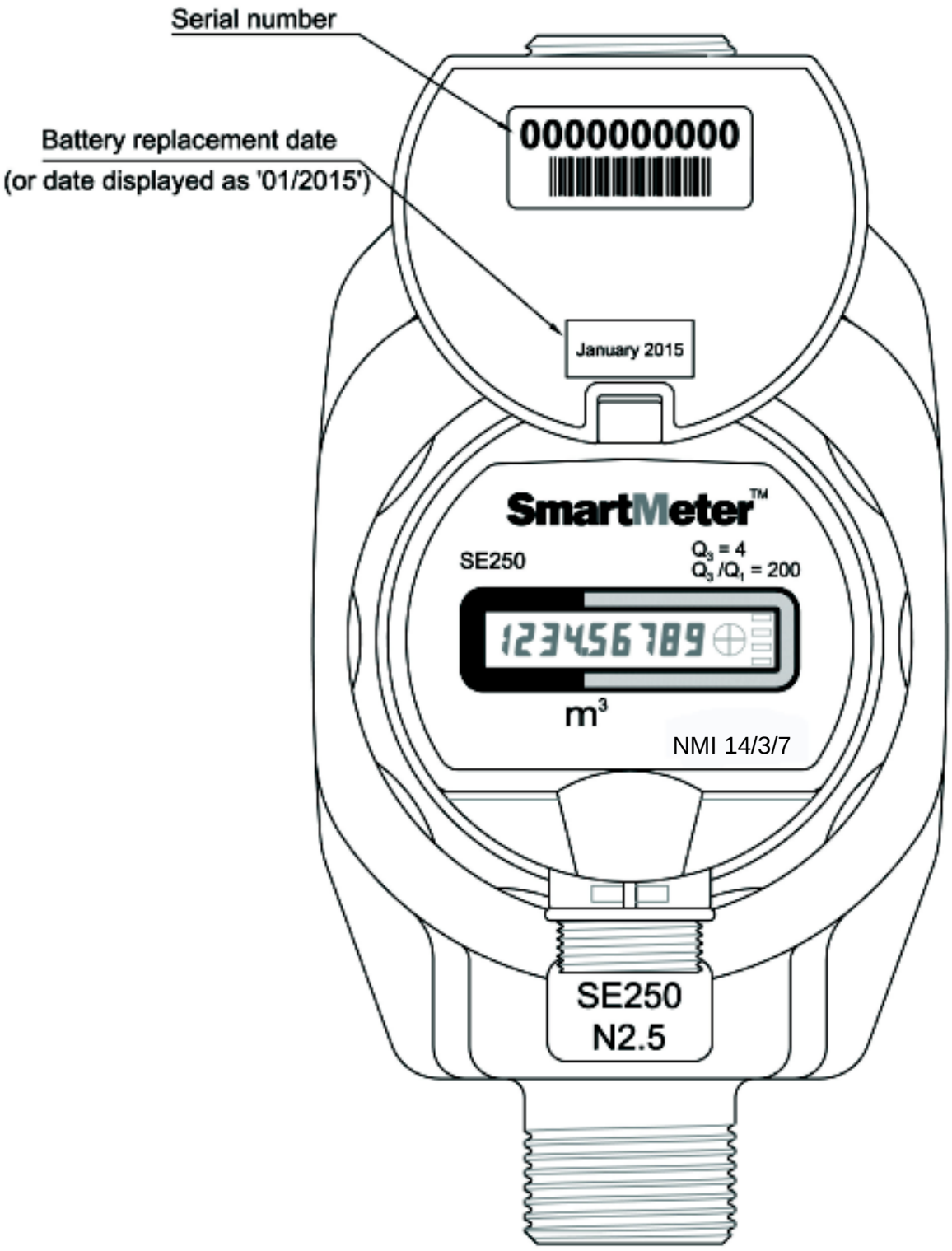
The C100 series of meters have a height of 160 mm, a diameter of 101 mm with G1½B threaded connections, may be fitted with single or dual check valves, and comprise the following models:

(i) C100E encoded output meter (Figure 9);

(ii) C100 direct read (visual) meter (Figure 9); and

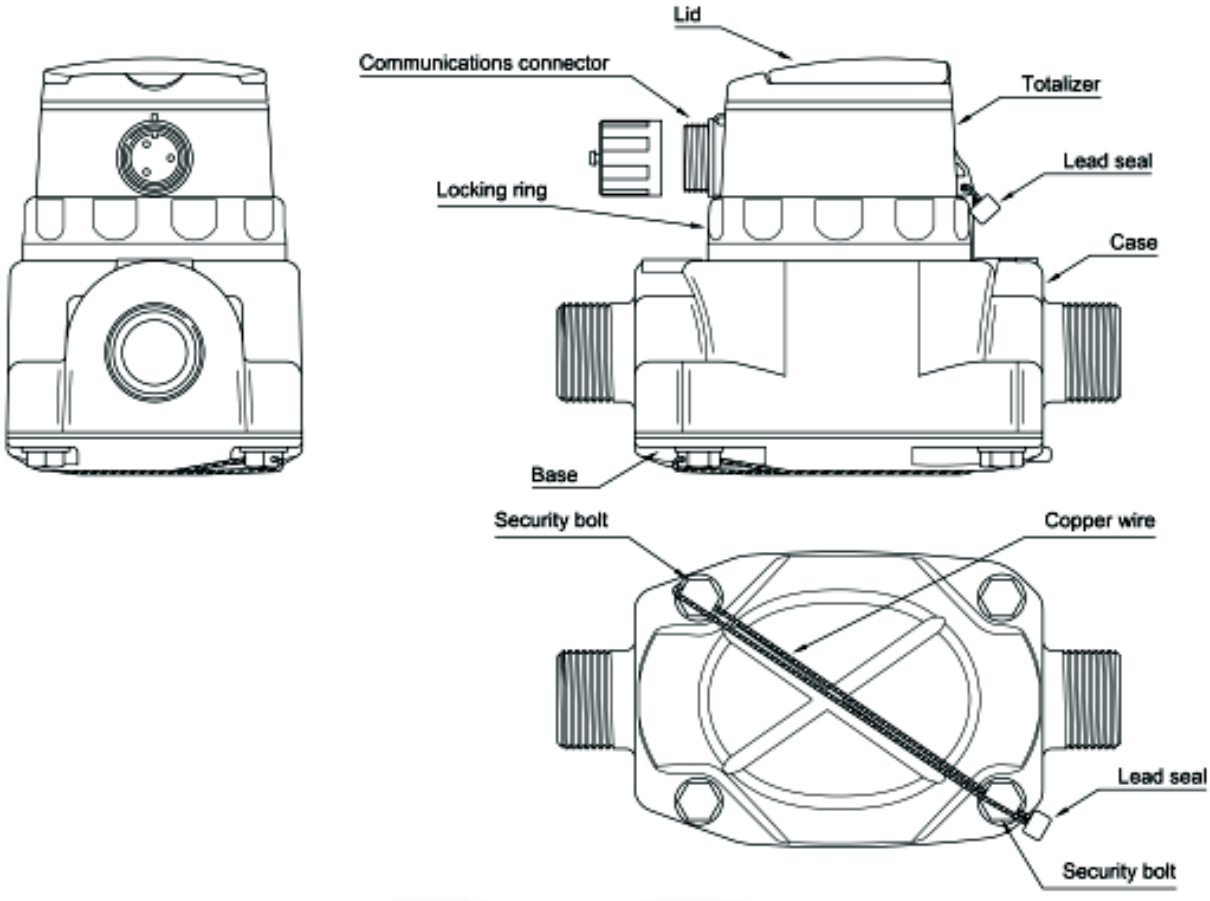
(iii) C100R radio read meter (Figure 10).

FIGURE 14/3/7 – 1



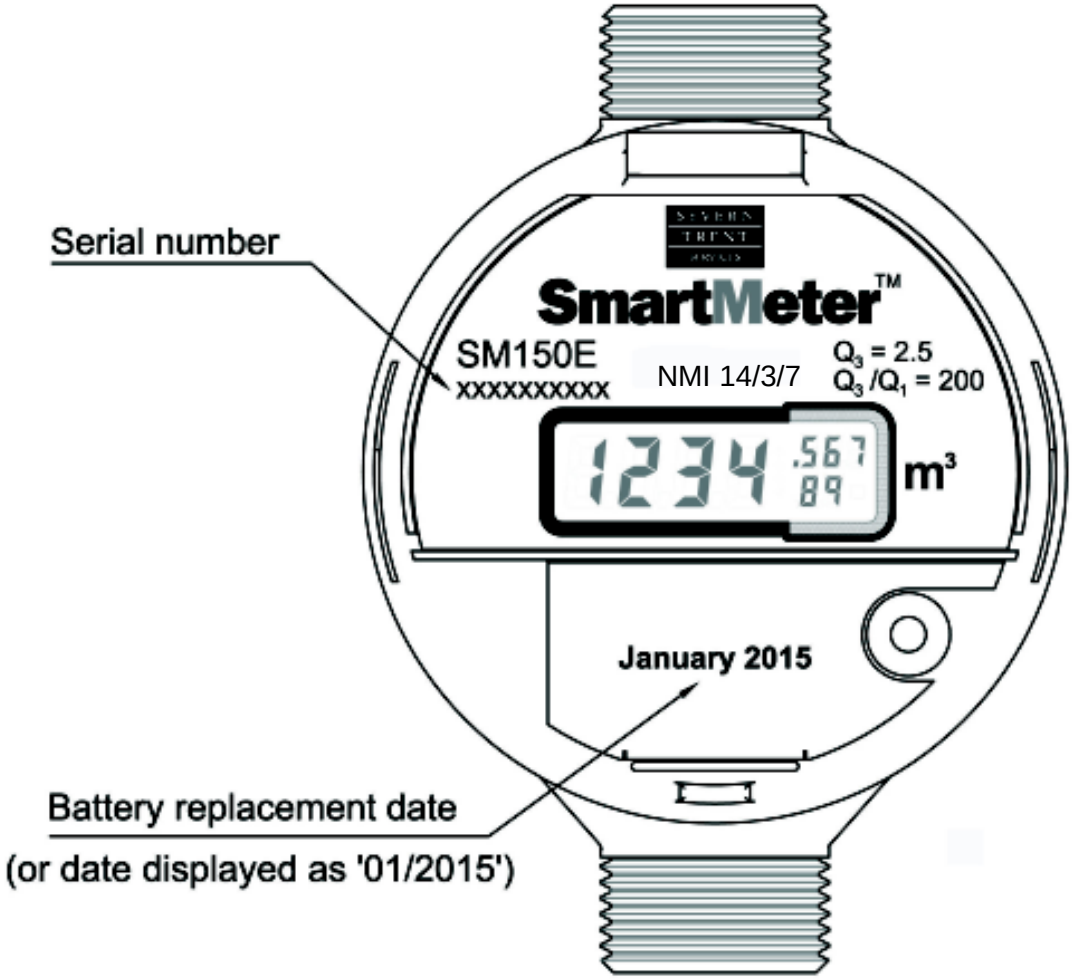
Severn Trent Model SE250E Water Meter

FIGURE 14/3/7 – 2



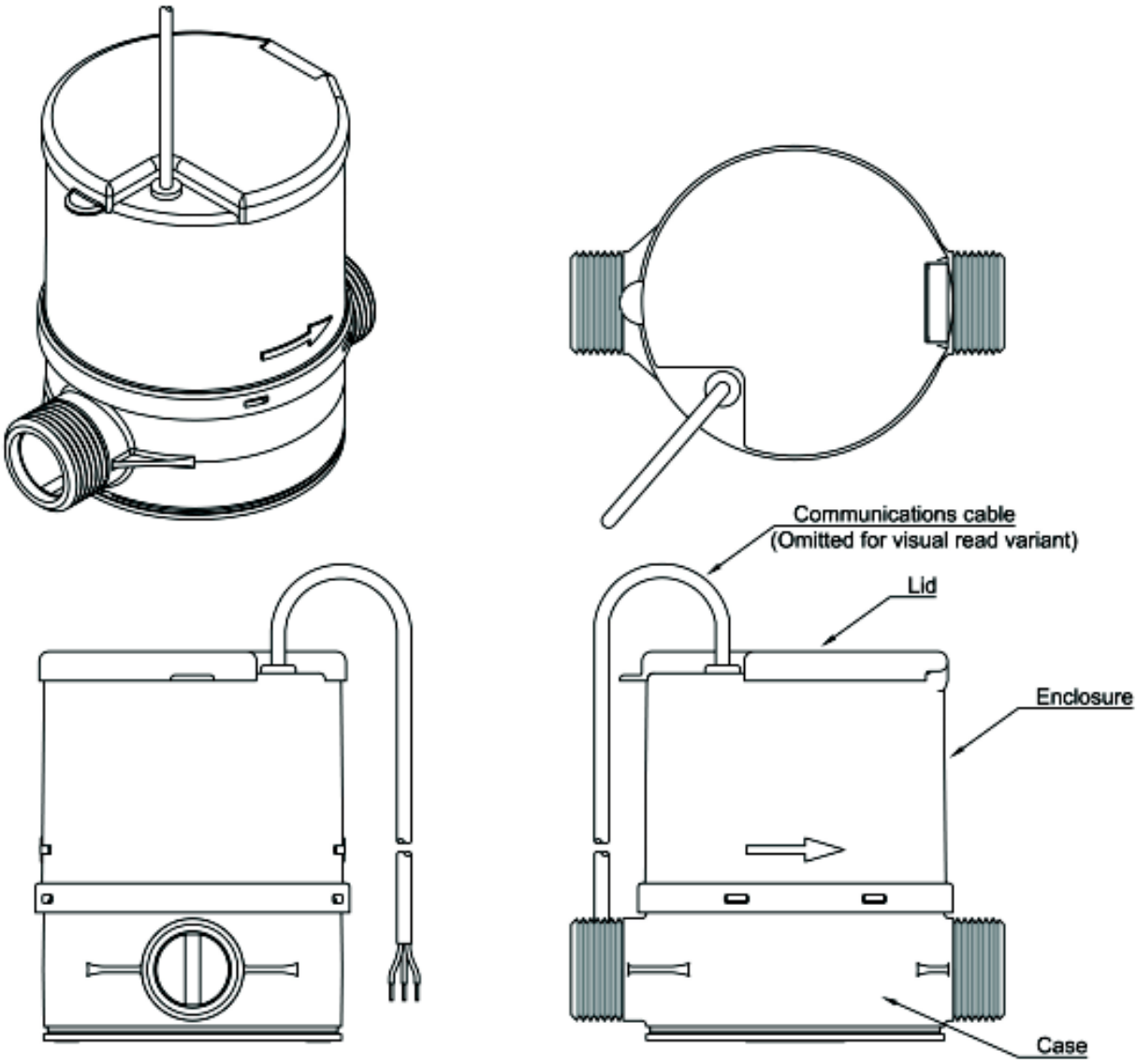
Showing Typical Sealing Details (SE250 Series Meters)

FIGURE 14/3/7 – 3



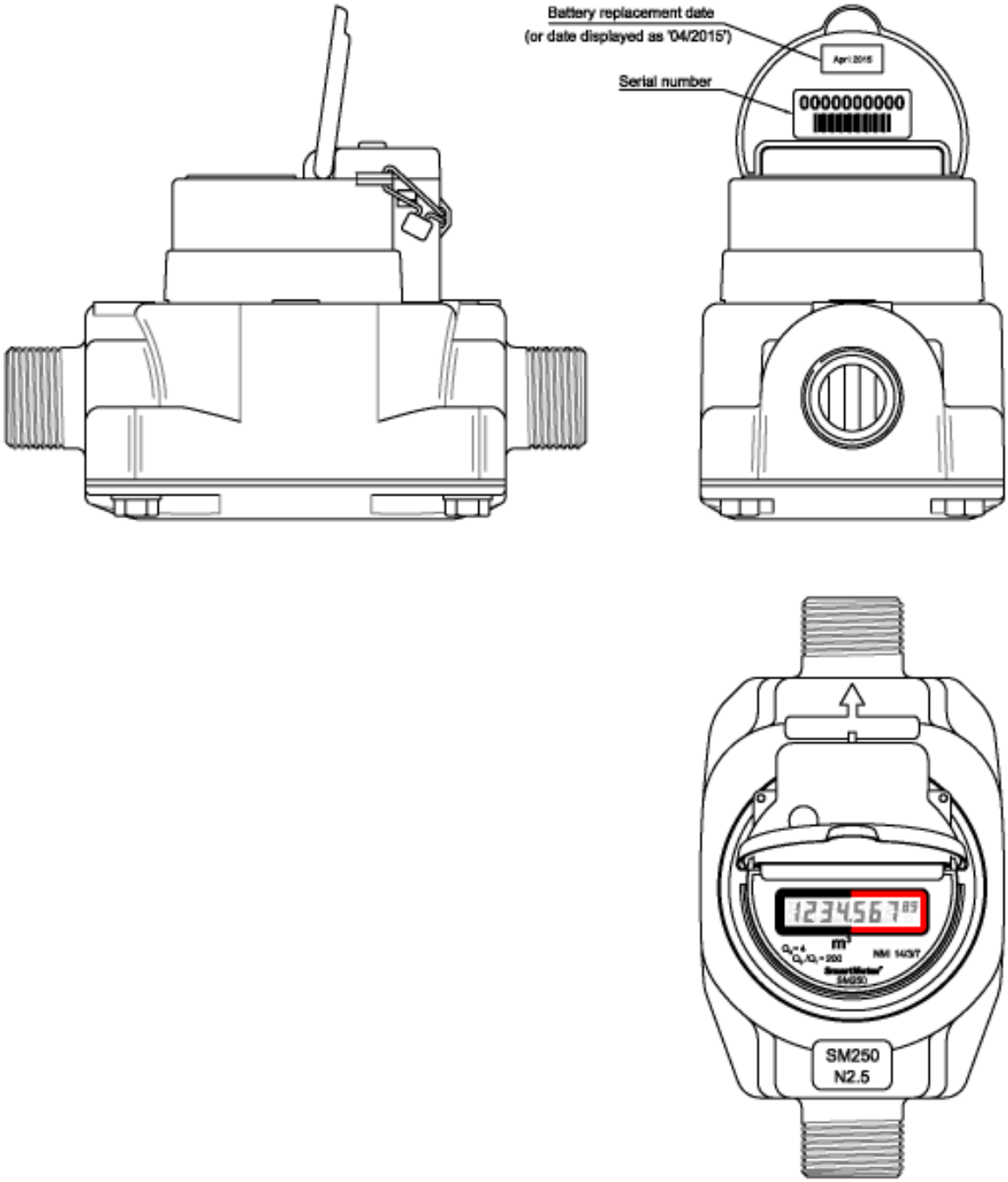
Model SM150E Meter – Lid Removed

FIGURE 14/3/7 – 4



Model SM150E Meter

FIGURE 14/3/7 – 5



SM250 water meter top view (lid open)

Severn Trent Model SM250E Water Meter

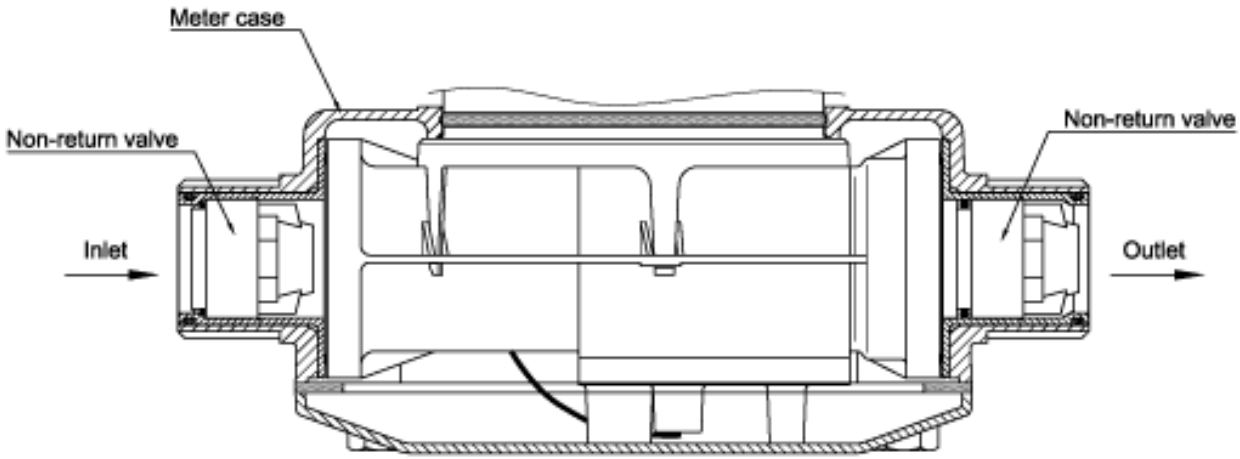
FIGURE 14/3/7 – 6

Previous battery compartment position

New battery compartment position

Showing Alternative Housing (Battery Compartments) – SE150E Series Meters)

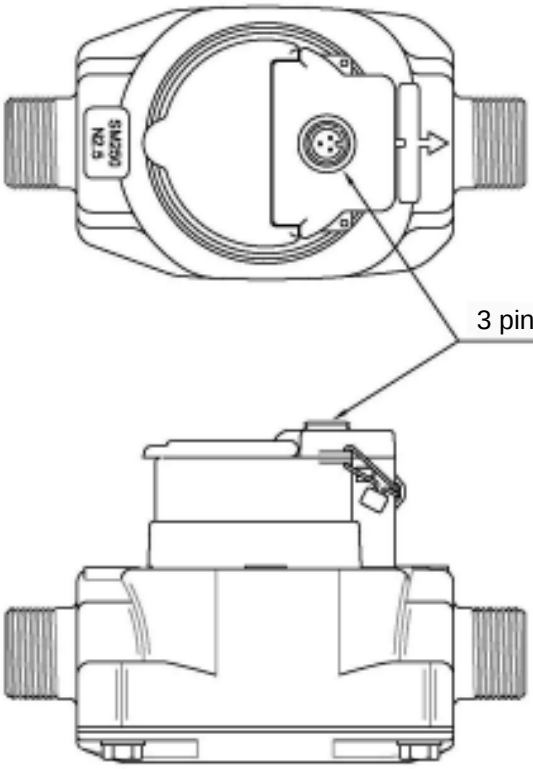
FIGURE 14/3/7 – 7



Meter case cross-section
Two non-return valves

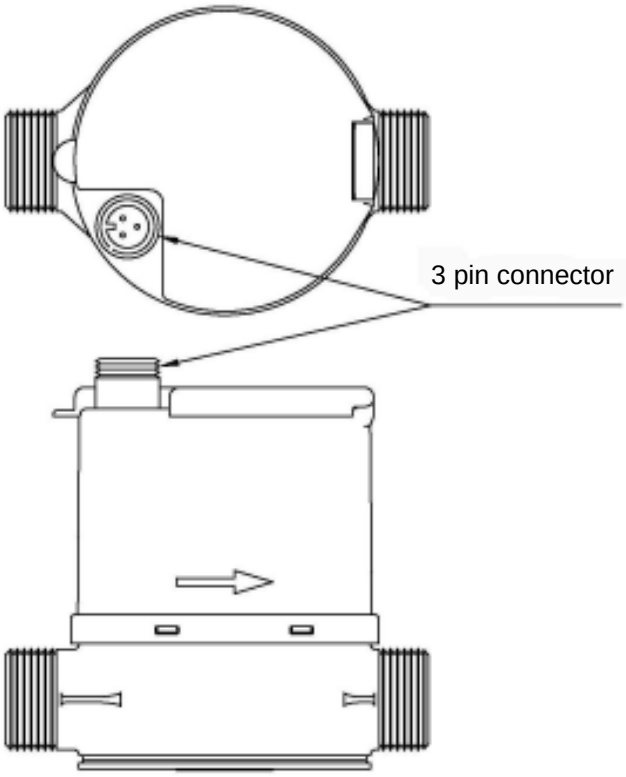
Typical Meter With Dual Check Valves

FIGURE 14/3/7 – 8



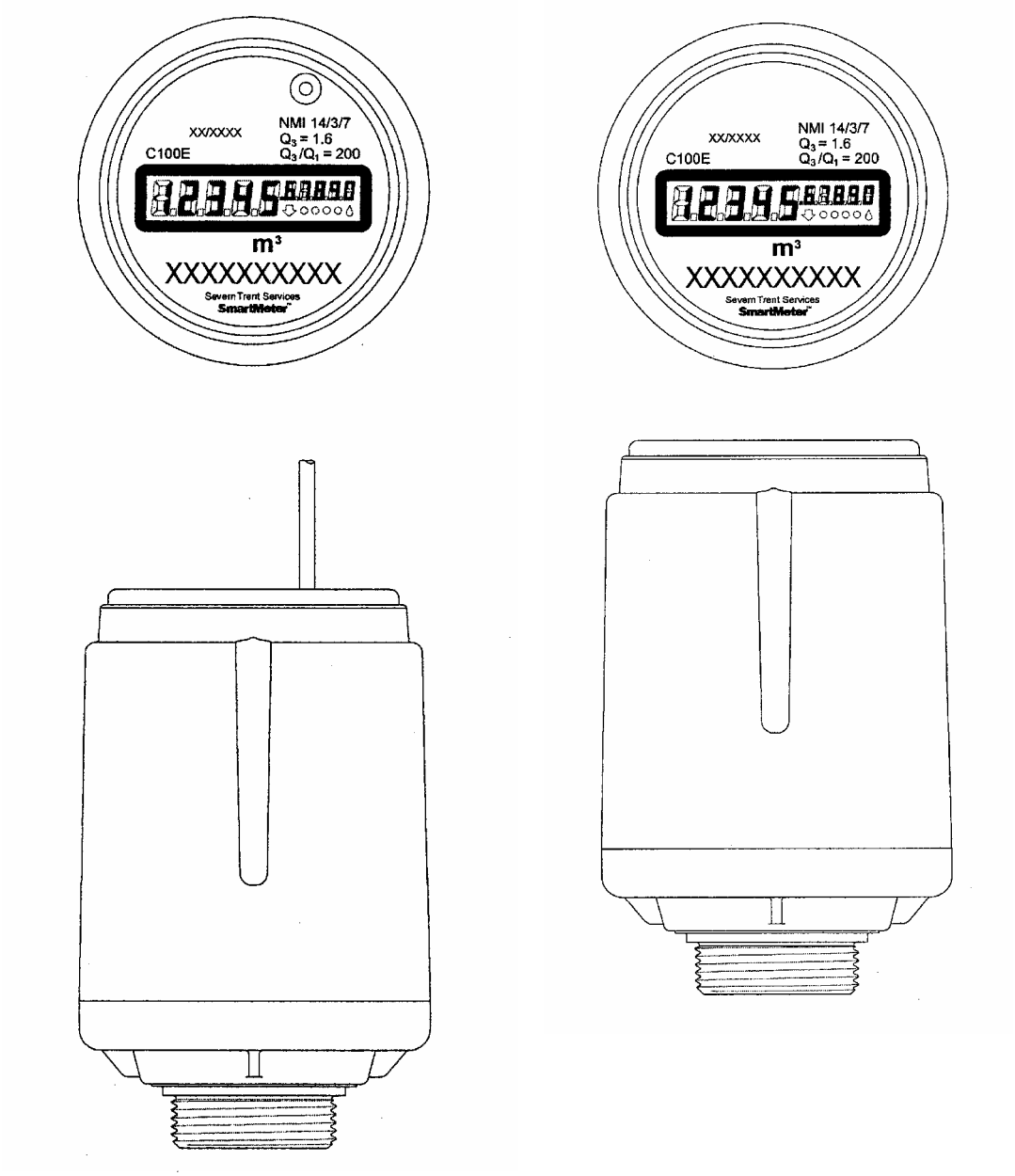
Model SM250 Water Meter

Model SM150E Water Meter



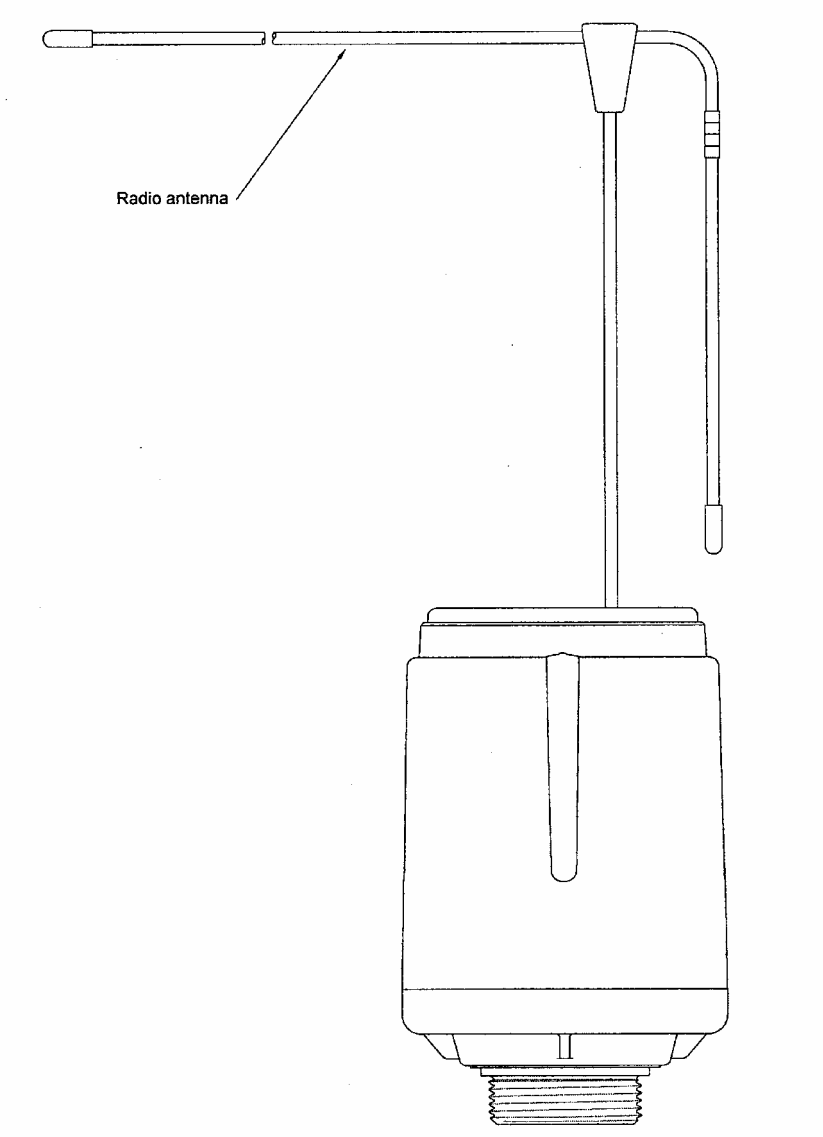
Showing Typical Integral Connector Installations

FIGURE 14/3/7 – 9



Severn Trent Models C100E and C100 Water Meters

FIGURE 14/3/7 – 10



Severn Trent Model C100R Water Meter