

(UK/0126/0045)



MI-001

United Kingdom of Great Britain and Northern Ireland

Certificate of EC type-examination of a measuring instrument

Number: UK/0126/0045 Revision 2

issued by the Secretary of State for Business, Innovation & Skills
Notified Body Number 0126

In accordance with the requirements of the Measuring Instruments (Cold-water Meters) Regulations 2006 (SI 2006/1268) and the Measuring Instruments (Non-Prescribed Instruments) Regulations 2006 which implement, in the United Kingdom, Council Directive 2004/22/EC, this certificate of EC type-examination has been issued to:

**Elster Metering Limited
130 Camford Way
Sundon Park
Luton, Bedfordshire
LU3 3AN**

in respect of a family of cold-water meters utilising a common, volumetric measuring element, with a nominal capacity of 13.2 revs/litre and having a rated permanent flowrate Q3 of 6.3m³/h.

The necessary data (principal characteristics, alterations, securing, functioning etc.) for identification purposes and conditions (when applicable) are set out in the descriptive annex to this certificate.

Signatory: G Stones
for Chief Executive
National Weights & Measures Laboratory
(part of the National Measurement Office)
Department for Business, Innovation & Skills
Stanton Avenue
Teddington
Middlesex TW11 0JZ
United Kingdom

Issue Date: 21 October 2009
Valid Until: 23 November 2018
Reference No: T1132/0021

Descriptive Annex

1 INTRODUCTION

This pattern of a liquid measuring instrument is for measuring the volume of cold water which has passed through it. It relates to models of a semi-positive displacement cold-water meter having a Q3 (permanent flowrate) of 6.3 cubic metre per hour. It is based on a 13.2 revolutions per litre measuring chamber with model variations described in Section 2.

2 FUNCTIONAL DESCRIPTION

2.1 V200 meter

The V200 meter incorporates a semi-positive displacement rotary piston measuring assembly that is fitted into a brass alloy body, for in-line connection into the water pipe via two British pipe thread A male threaded connectors (Figure 1). The rotary piston drives a magnet that couples either G1¼"A to a simple, non-resettable totalising register, or a non-resettable totalising display incorporating an absolute encoder model register. Either register model is positioned on the top of the measurement chamber housing and secured to the meter by the thermoplastic snap-shut register shroud. A cross section diagram is shown in Figure 4.

2.2 V100 meter

Having the 13.2 rev/l measuring chamber and counter assembly mounted in a brass alloy body for connection into the water pipe via two G1¼"A male threaded connectors (Figure 2). The axis of the measuring chamber is positioned in such a way as to be parallel with the axis of the pipe. The register is of a roller wheel type, with a series of number wheels with printed digits showing whole measurement units and decimal places. The register has five number wheels showing whole cubic meters and three number wheels showing the decimal places. A cross section diagram is shown in Figure 5.

2.3 V110 meter

Having the meter arranged as described in Section 2.2, but the two body halves are a thermoplastic injection moulding (Figure 3).

2.4 V210

The V210 meter incorporates a semi-positive displacement rotary piston measuring assembly that is fitted into either a brass alloy, (Figure 12), or injection moulded thermoplastic body, (Figure 13), for connection to a manifold in any orientation. The rotary piston drives a magnet that couples either to a simple, non-resettable totalising register, or a non-resettable totalising display incorporating an absolute encoder model register. Either register model is positioned on the top of the measurement chamber housing and secured to the meter by the thermoplastic snap-shut register shroud. The connection to the manifold is arranged via a British Pipe Thread G1½"A male threaded co-axial inlet/outlet at the base of the meter body. Cross section diagrams of each body variant are shown in Figures 14 and 15.

3 TECHNICAL DATA

3.1 Flow Designation

Table 1 shows the permitted Q3/Q1 flow designations by model, with Table 2 showing the resultant flowrates, relating to each designation.

| Model Name | Q3/Q1 (R) | | | |
|------------|-----------|-----|-----|-----|
| | 315 | 250 | 200 | 160 |
| V100 | ✓ | ✓ | ✓ | ✓ |
| V110 | ✓ | ✓ | ✓ | ✓ |
| V200 | ✓ | ✓ | ✓ | ✓ |
| V210 | ✓ | ✓ | ✓ | ✓ |

Table 1 - Permitted flow designations by model

| Q3/Q1 (R) | 315 | 250 | 200 | 160 |
|--|-------|---------|--------|----------|
| Q2/Q1 | 1.6 | 1.6 | 1.6 | 1.6 |
| Q1 Minimum flowrate (m ³ /h) | 0.02 | 0.0252 | 0.0315 | 0.039375 |
| Q2 Transitional flowrate (m ³ /h) | 0.032 | 0.04032 | 0.0504 | 0.063 |
| Q3 Permanent flowrate (m ³ /h) | 6.3 | 6.3 | 6.3 | 6.3 |
| Q4 Overload flowrate (m ³ /h) | 7.875 | 7.875 | 7.875 | 7.875 |

Table 2 - Related flowrates according to each Q3/Q1 designation

3.2 Register Elements

| Model Name | Register Variant | Volume of one revolution of the first display element (m ³) | Verification Scale Interval (m ³) | Indicating Range (m ³) |
|------------|------------------|---|---|------------------------------------|
| V100 | 5x3 Register | 0.001 | 0.00001 | 99999.9999 |
| V110 | 5x3 Register | 0.001 | 0.00001 | 99999.9999 |
| V200 | Standard | 0.001 | 0.00002 | 99999.99998 |
| | Encoder | 0.001 | 0.00002 | 9999.99998 |
| V210 | Standard | 0.001 | 0.00002 | 99999.99998 |
| | Encoder | 0.001 | 0.00002 | 9999.99998 |

3.3 Meter Dimensions

| Model Name | Register Variant | Overall Meter Diameter (mm) | Overall Meter Height (mm) | Overall Meter Length (mm) | Meter Connection |
|------------|------------------|-----------------------------|---------------------------|---------------------------|------------------|
| V100 | 5x3 Register | 105 | n/a | 199 | G1¼"A |
| V110 | 5x3 Register | 115 | n/a | 199 | G1¼"A |
| V200 | Standard | 120 | 130 | 199, 260 | G1¼"A |
| | Encoder | | 150 | | |
| V210 | Standard | 130.2 | 146 | n/a | G1½"A |
| | Encoder | | 164 | | |

3.4 Other Designations

| | |
|-----------------------------------|------------------------------------|
| Temperature class: | T30 (0.1 °C – 30 °C) |
| Orientation requirements: | None |
| Revs/litre of measuring chamber: | 13.2 |
| Maximum admissible pressure (MAP) | |
| V200 and V 100: | 16 bar |
| V110: | 10 bar |
| Pressure Loss at Q3 | 0.63 bar max |
| Climatic environment: | -10 °C to +55 °C |
| | Condensing/non-condensing humidity |
| Mechanical environment: | M1 |
| Electromagnetic environment: | n/a |
| Location: | Open/closed |
| Reverse Flow: | Permitted but not measured |

4 PERIPHERAL DEVICES AND INTERFACES

The meters may be permanently or temporarily fitted with a pulse giving sensor, fitted externally to the register. Pulses from this sensor can be used to transfer a repeat of the indicated volume to an ancillary device. Pulses are generated either by a metallic pointer passing an inductive field or a magnet passing a reed switch.

4.1 Inductive pointer and sensor unit (V200 meter)

The meter register is equipped with a metallic pointer on the first element of the verification scale. Two bosses and two holes on the shroud enable the option of an inductive sensor to be fitted to the meter shroud as shown in Figure 6. The manufacturers name, Elster, is on the housing of the inductive sensor as well as the dial face.

4.2 Reed switch sensor (V200 meter)

The meter register is equipped with a magnetic pointer on the first element of the verification scale. The reed switch sensor is fitted to the meter shroud, as shown in Figure 7.

4.3 Reed switch sensor (V100 and V110 meters)

The meter register is equipped with a magnet on the first element of the verification scale. The reed switch sensor is fitted in a pocket within the meter housing, in close proximity to the magnet, as shown in Figure 8.

5 APPROVAL CONDITIONS

The certificate is issued subject to the following conditions:

5.1 Legends and inscriptions

The instrument bears the following legends:

- 'CE' marking
- Supplementary metrology marking
- Notified body identification number
- Permanent flow rate Q3
- Flowrate range Q3/Q1 (R)
- Serial number
- Manufacturers mark or name
- Certificate number
- Information in respect of conditions of use (where applicable)

6 LOCATION OF VERIFICATION MARKS AND SEALS

6.1 Location of verification markings

6.1.1 V200

The serial number and verification markings are permanently etched on the top surface of the shroud as shown in Figure 9.

6.1.2 V100

The serial number is marked adjacent to the register window of the meter housing and the verification marks are engraved on the central joint face of the meter housing, as shown in figure 10.

6.1.3 V110

The serial number is marked adjacent to the register window of the meter housing and the verification marks are located on the lower, chamber housing, as shown in figure 11.

6.2 Sealing arrangement

6.2.1 V200

The meter is secured by means of the snap fit plastic shroud. The shroud has integrally moulded clips and once fitted to the meter body cannot be removed without showing visible signs of unauthorised entry if attempts are made to remove it.

6.2.2 V100 & V110

A sealing wire links the two halves of the body and is secured with a lead seal as shown in Figures 10 and 11.

7 ILLUSTRATIONS

| | |
|-----------|---|
| Figure 1 | V200 Meter |
| Figure 2 | V100 Meter |
| Figure 3 | V110 Meter |
| Figure 4 | V200 Meter Assembly |
| Figure 5 | V100 and V110 Meter Assembly |
| Figure 6 | Dial face showing position of inductive sensor (V200) |
| Figure 7 | Dial face showing position of reed switch sensor (V200) |
| Figure 8 | View showing position of reed switch sensor (V100 and V110) |
| Figure 9 | V200 Serial number and verification marks |
| Figure 10 | V100 Serial number, verification marks and securing method |
| Figure 11 | V110 Serial number, verification marks and securing method |
| Figure 12 | V210 meter with brass alloy housing |
| Figure 13 | V210 meter with thermoplastic body |
| Figure 14 | V210 meter assembly with brass alloy body |
| Figure 15 | V210 meter assembly with thermoplastic body |

CERTIFICATE HISTORY

| ISSUE NO. | DATE | DESCRIPTION |
|----------------------------|------------------|---|
| UK/0126/0045 | 24 November 2008 | Type examination certificate first issued. |
| UK/0126/0045 Revision 1 | 19 January 2009 | Section 2.4, V210 meter added, V210 added to tables in section 3. Section 3.1 updated to cover all values of R for each meter model. Figures 12 13, 14 and 15 added. Customer address updated. |
| UK/0126/0045 Revision 2 | 8 October 2009 | Section 3.3 updated to include a meter length of 260 mm for meter model V200. Editorial changes to sections: 2.1, 2.2, 3.2, 3.3, 3.4 & Table 2 |



Figure 1 V200 Meter



Figure 2 V100 Meter



Figure 3 V110 Meter

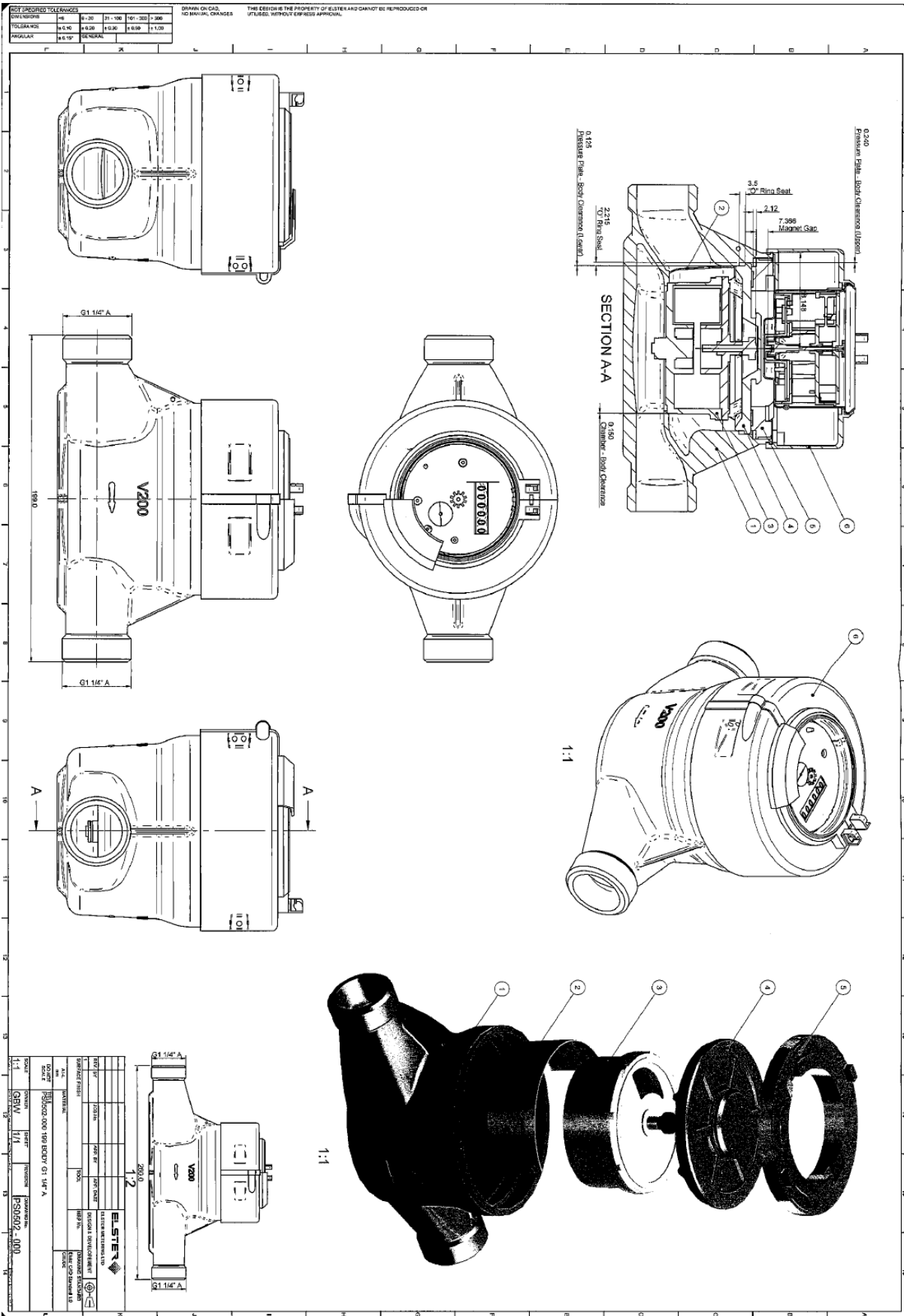
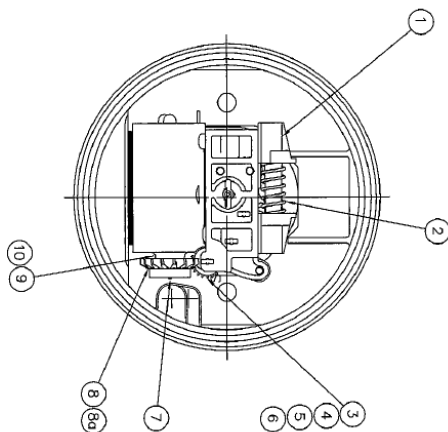
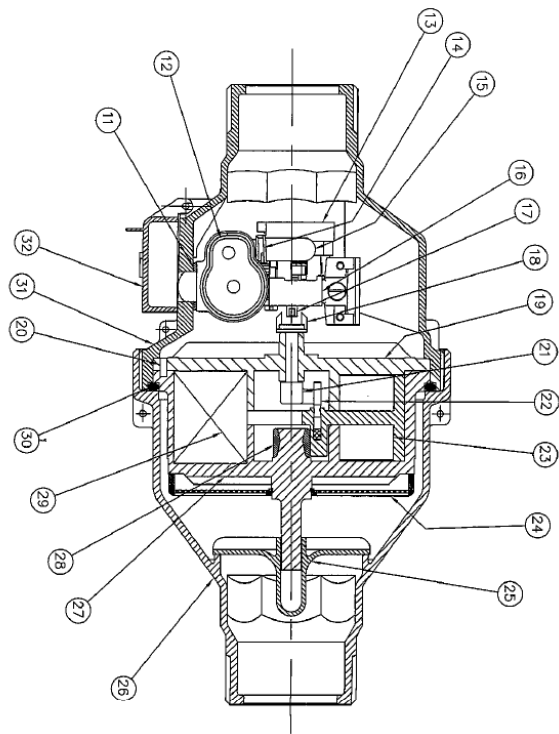


Figure 4 V200 meter assembly



| ITEM | DESCRIPTION | MATERIAL |
|------|------------------------|-----------------|
| 1 | RAMP | ACETAL |
| 2 | RAMP SPRING | STAINLESS STEEL |
| 3 | INTEGRAL GEAR | ACETAL |
| 4 | COMPOUND GEAR | ACETAL |
| 5 | COMPOUND GEAR | ACETAL |
| 6 | INPUT GEAR | STAINLESS STEEL |
| 7 | SPINDLE | ACETAL |
| 8 | SHAFT GEAR | ACETAL |
| 9 | LIP SEAL | RUBBER |
| 10 | LIP SEAL | OROCASS |
| 11 | LIP SEAL | RUBBER |
| 12 | COUNTER CASE & END CAP | OROCASS |
| 13 | BEARING PLATE | NORPL |
| 14 | SAC CLIP | STAINLESS STEEL |
| 15 | SAC | BROMOBUTYL |
| 16 | BEARING BRACKET | NORPL |

| ITEM | DESCRIPTION | MATERIAL |
|------|-----------------|-----------------|
| 17 | DRIVE PIN | ACETAL |
| 18 | DRIVE COUPLING | NYLON |
| 19 | TOP PLATE | STYRENE |
| 20 | LOCATING PIN | STAINLESS STEEL |
| 21 | DRIVE BAR | NYLON |
| 22 | PISTON PIN | STAINLESS STEEL |
| 23 | PISTON | STYRENE |
| 24 | STRAINER | POLYPROPYLENE |
| 25 | CHAMBER HOUSING | DIE CAST BRASS |
| 26 | CHAMBER HOUSING | DIE CAST BRASS |
| 27 | THIMBLE | STYRENE |
| 28 | SHUTTER | NYLON |
| 29 | LIP SEAL | NYLON |
| 30 | COUNTER HOUSING | DIE CAST BRASS |
| 31 | BEARING BRACKET | RUBBER |
| 32 | LD | POLYPROPYLENE |

Notes:
 Part 1
 Drawn: G.D.S.
 Date: 16/09/2008
 Mod/State
 Proj No. JTA8395

DO NOT SCALE
 Remove all sharp edges
 Third Angle Projection
 Sheet Size: A2-20
 Conventions

Material:
 Test Pressure

Approved:
 Initiated by: LUTON

Title:
Z5MM V100 QN3.5 METER ASSY

Part 1 of 1

Drawn: G.D.S.
 Date: 16/09/2008
 Mod/State
 Proj No. JTA8395

Figure 5 V100 and V110 meter assembly

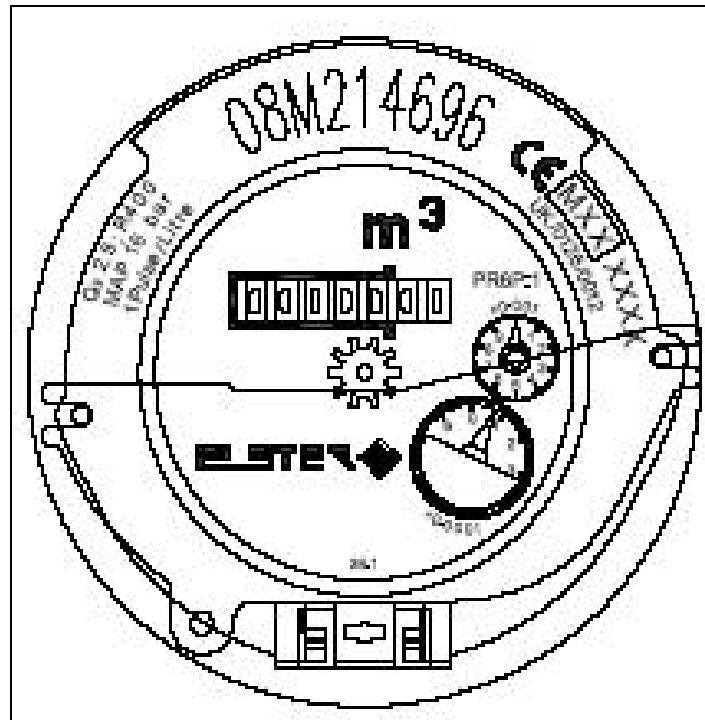


Figure 6 Dial face showing position of inductive sensor (V200)

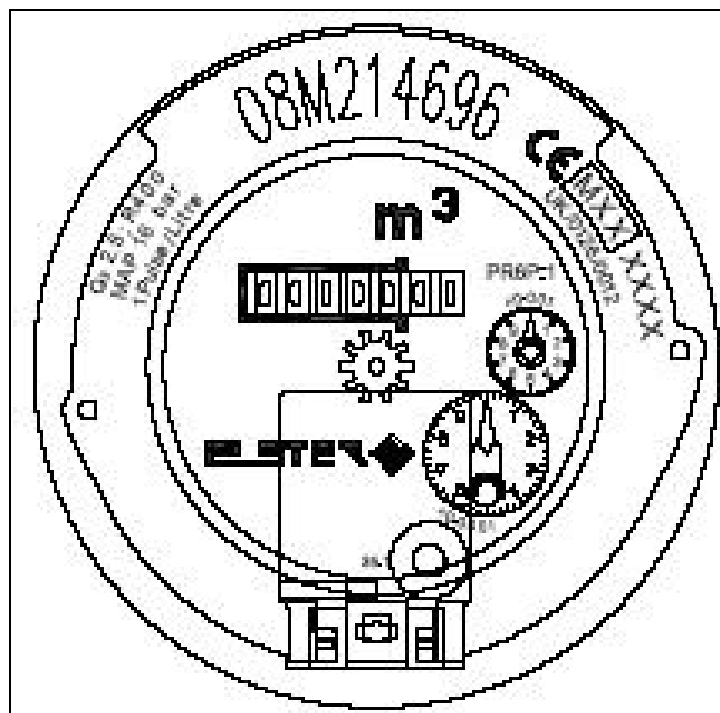


Figure 7 Dial face showing position of reed switch sensor (V200)

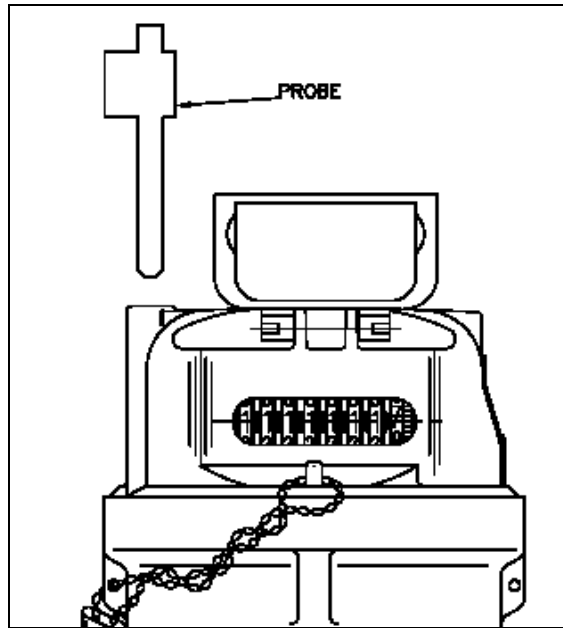


Figure 8 View showing position of reed switch sensor (V100 and V110)

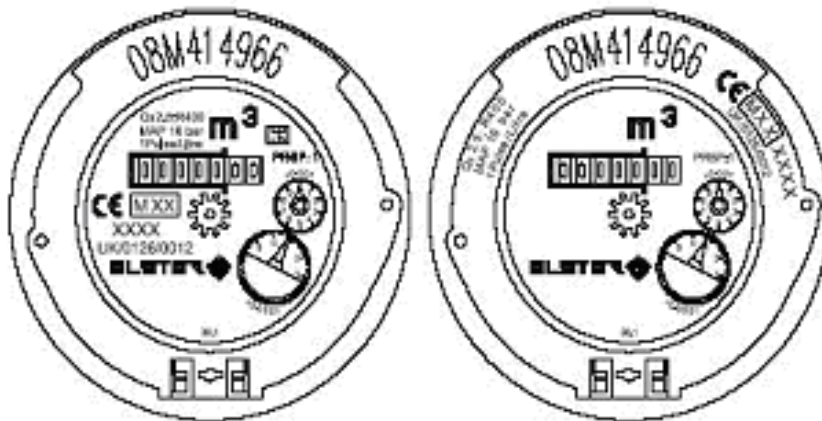


Figure 9 V200 Serial number and verification marks

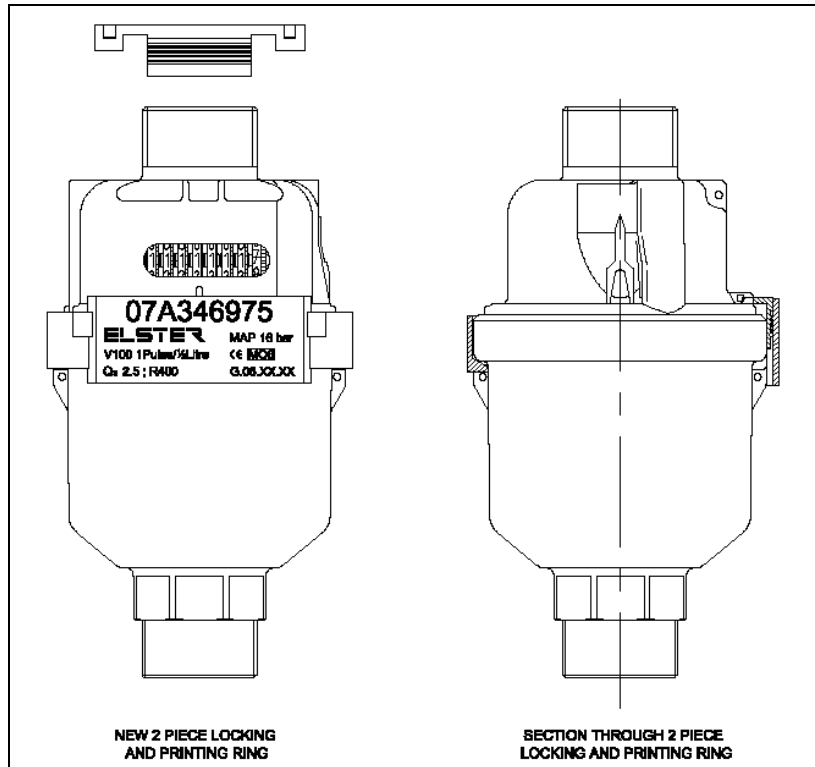


Figure 10 V100 Serial number, verification marks and securing method

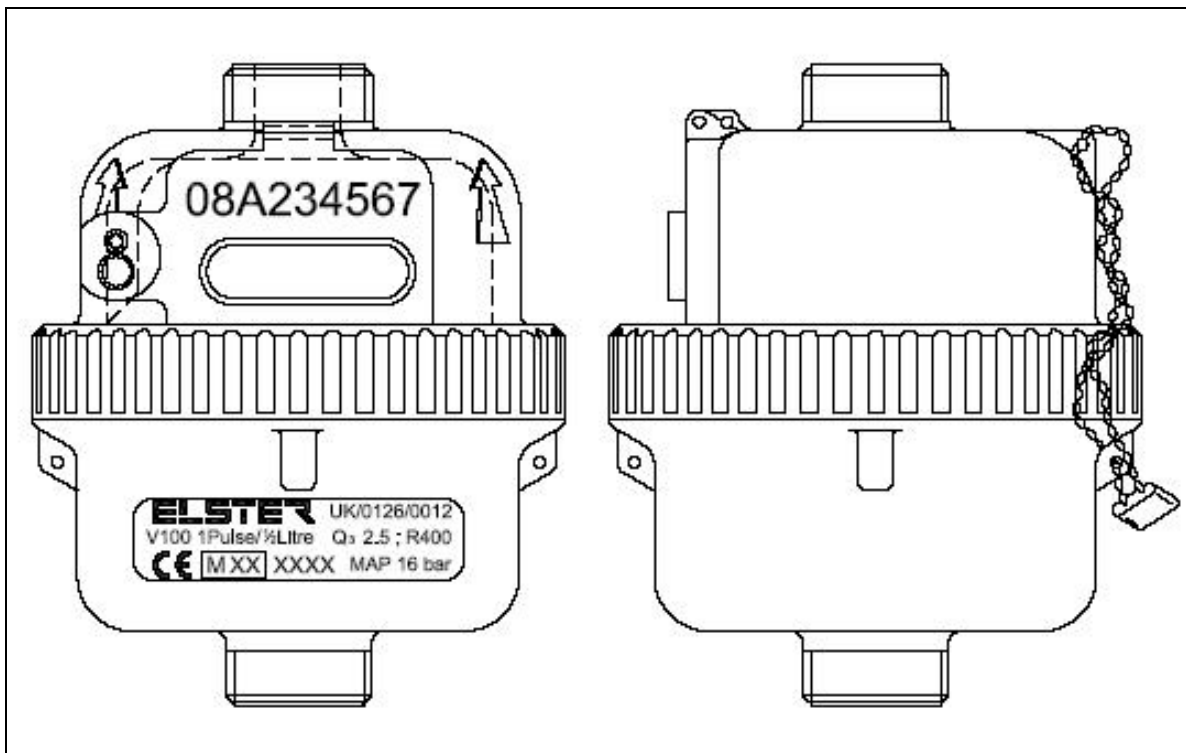


Figure 11 V110 Serial number, verification marks and securing method



Figure 12 V210 meter with brass alloy housing

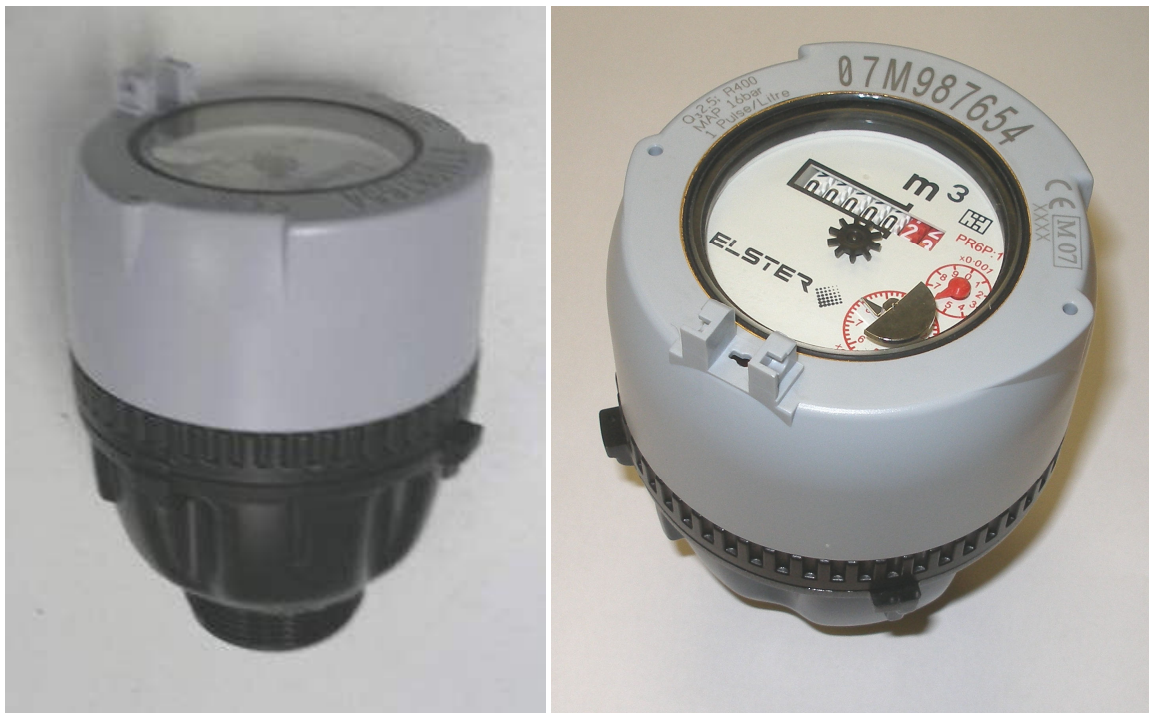
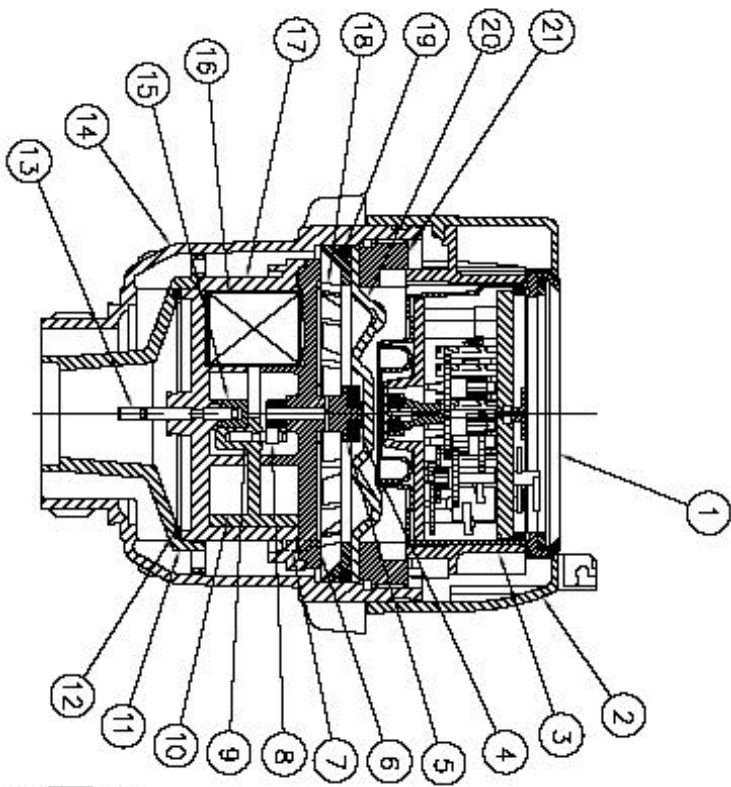
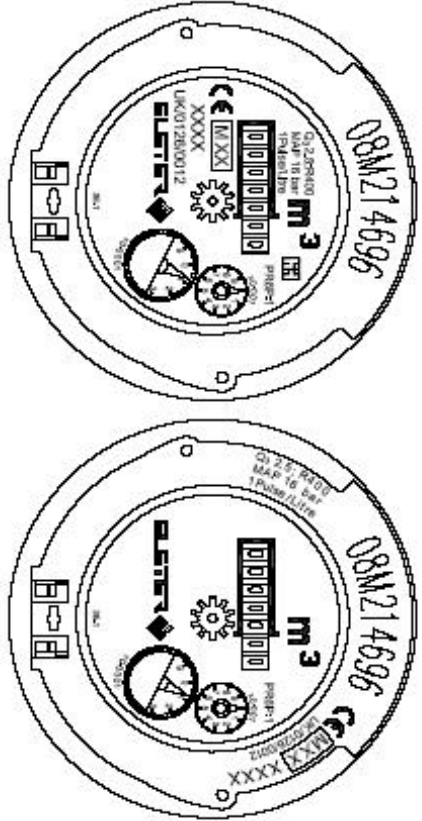


Figure 13 V210 meter with thermoplastic body



| ITEM | DESCRIPTION | MATERIAL | PART No. | QTY |
|------|------------------------|-----------------|-----------|-----|
| 1 | COUNTER ASSEMBLY | BRASS | QTA8270 | 1 |
| 2 | SNAP FIT SHROUD | ABS | QTA0052 | 1 |
| 3 | COUNTER ADAPTOR | ABS | CA000051 | 1 |
| 4 | MAGNET DRIVE COUPLING | DEBRAMIC | 2385X1120 | 1 |
| 5 | TOP PLATE | NYLON | M5M0004 | 1 |
| 6 | LOCATING PIN | STAINLESS STEEL | M5B0002 | 1 |
| 7 | DRIVE BAR | NYLON | M5C0004 | 1 |
| 8 | PISTON DRIVE PIN | STAINLESS STEEL | CA000016 | 1 |
| 9 | PISTON | STAINLESS STEEL | M5C0005 | 1 |
| 10 | CHAMBER ADAPTOR/FILTER | NYLON | CA000057 | 1 |
| 11 | O RING SEAL | RUBBER | 2411X2896 | 1 |
| 12 | THIMBLE PIN | STAINLESS STEEL | 1TA0130 | 1 |
| 13 | BODY | STAMPED BRASS | QTA0008 | 1 |
| 14 | SHUTTER | NYLON | M5C4301 | 1 |
| 15 | THIMBLE | NYLON | M5C0903 | 1 |
| 16 | CHAMBER | STYRENE | M5C0905 | 1 |
| 17 | SPACER | NYLON | CA000045 | 1 |
| 18 | O RING SEAL | RUBBER | 2411X2872 | 1 |
| 19 | PRESSURE PLATE | STAINLESS STEEL | CA000046 | 1 |
| 20 | SCREW RING | NYLON | CA000044 | 1 |
| 21 | | | | |



POSSIBLE MARKING LAYOUTS

| | | | | | | | | |
|------------------------|------------|----------|---------------|--------------|---------------------|-------|---------|------------|
| DO NOT SCALE | Dim./Units | mm | Material | Approved | Title | Drawn | Checked | Date |
| Remove of sharp edges | Scale | 1:1 | Metals/Alu. | Initiated by | V210 METER ASSEMBLY | 1 | C.D.S. | 17/07/2006 |
| Third Angle Projection | Sheet | STRAK-2D | Test Pressure | Finish | | 3 | | |
| Notes | Comments | | | | | | | |

Figure 14 V210 meter assembly with brass alloy body

