

## **EU-type examination certificate**

### **UK/0126/0055 Revision 12**

Issued by:

**NMO**

**Notified Body Number 0126**

In accordance with the requirements of the Measuring Instruments Regulations 2016 (S.I. 2016 No. 1153) which implement, in the United Kingdom, Council Directive 2014/32/EU, this EU-type examination certificate has been issued to:

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

In respect of a family of cold-water meters utilising a common, volumetric measuring element, with a nominal capacity of 16.5 revs/litre and having a rated permanent flowrate  $Q_3$  of 1.6 m<sup>3</sup>/h (R100), 2.5 m<sup>3</sup>/h (R250) or 4.0 m<sup>3</sup>/h (R400)

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.

This revision replaces previous versions of the certificate.

**Issue date: 16 May 2019**

**Valid until: 15 May 2029**



**Grégory Glas**  
**Lead Technical Manager**  
*For and on behalf of the Head of Technical Services*



0135

# Descriptive Annex

## 1 INTRODUCTION

This pattern of liquid measuring instrument is for measuring the volume of cold water which has passed through it. It relates to models of semi-positive displacement cold-water meter having a  $Q_3$  (permanent flowrate) of  $2.5\text{m}^3/\text{h}$  (R250) or  $4.0\text{m}^3/\text{h}$  (R400). It is based on a 16.5 revolutions per litre measuring chamber with model variations described in section 2. They are not designed to measure reverse flow.

## 2 FUNCTIONAL DESCRIPTION

### 2.1 V210 meter

The V210 meter incorporates a semi-positive displacement rotary piston measuring assembly that is fitted into a brass alloy body (Figure 1), 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  $G1\frac{1}{2}"A$  male threaded co-axial inlet/outlet at the base of the meter body. A cross section diagram is shown in Figure 2.

### 2.2 V200 meter

A meter as described in section 2.1, but with the measuring assembly being arranged in a brass alloy body (Figure 3), for in-line connection into the water pipe via two British pipe thread  $G1"A$  male threads. A cross section diagram is shown in Figure 4.

### 2.3 V100 meter

Having the 16.5 rev/l measuring chamber and counter assembly mounted in a brass alloy body for connection into the water pipe via either two  $G3/4"A$  or  $G1"A$  male threaded connectors (Figure 9). The axis of the measuring chamber is parallel to the axis of the pipe, as shown in Figure 10. 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 is available in variants having five number wheels showing whole cubic metres and three number wheels showing the decimal places (5x3 register) or four number wheels showing whole cubic metres and four number wheels showing the decimal places (4x4 register). A cross section diagram is shown in Figure 10.

### 2.4 V110 meter

Having the meter arranged as described in Section 2.3 but the two body halves are a thermoplastic injection moulding, (Figure 13). A cross section diagram is shown in Figure 14.

### 2.5 V220 meter

Having the meter as arranged as described in 2.1 but connected to a manifold via a 3" thread (Figure 17). A cross section diagram is shown in Figure 18.

### 3 TECHNICAL DATA

#### 3.1 Flow designation

##### 3.1.1 Meters with $Q_3 = 4.0 \text{ m}^3/\text{h}$

**Table 1 Permitted flow designations by model**

Model Name	Q <sub>3</sub> /Q <sub>1</sub> (R)						
	400	315	250	200	160	100	80
V100, V110, V200 and V210	✓	✓	✓	✓	✓	✓	✓
V220			✓	✓	✓	✓	✓

**Table 2 Related flowrates according to each  $Q_3/Q_1$  designation**

$Q_3/Q_1$ (R)	400	315	250	200	160	100	80
$Q_2/Q_1$	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Q1 Minimum flowrate ( $\text{m}^3/\text{h}$ )	0.01	0.0127	0.016	0.02	0.025	0.04	0.05
Q2 Transitional flowrate ( $\text{m}^3/\text{h}$ )	0.016	0.0203	0.0256	0.032	0.04	0.064	0.08
Q3 Permanent flowrate ( $\text{m}^3/\text{h}$ )	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Q4 Overload flowrate ( $\text{m}^3/\text{h}$ )	5.0	5.0	5.0	5.0	5.0	5.0	5.0

##### 3.1.2 Meters with $Q_3 = 2.5 \text{ m}^3/\text{h}$

**Table 3 Permitted flow designations by model**

Model Name	$Q_3/Q_1$ (R)				
	250	200	160	100	80
V100, V110, V200 and V210	✓	✓	✓	✓	✓
V220			✓	✓	✓

**Table 4 Related flowrates according to each  $Q_3/Q_1$  designation**

$Q_3/Q_1$ (R)	250	200	160	100	80
$Q_2/Q_1$	1.6	1.6	1.6	1.6	1.6
Q1 Minimum flowrate ( $\text{m}^3/\text{h}$ )	0.01	0.0125	0.01562	0.025	0.03125
Q2 Transitional flowrate ( $\text{m}^3/\text{h}$ )	0.016	0.02	0.025	0.04	0.05
Q3 Permanent flowrate ( $\text{m}^3/\text{h}$ )	2.5	2.5	2.5	2.5	2.5
Q4 Overload flowrate ( $\text{m}^3/\text{h}$ )	3.125	3.125	3.125	3.125	3.125

#### 3.2 Register elements

Model Name	Register Variant	Volume of one revolution of the first display element ( $\text{m}^3$ )	Verification Scale Interval ( $\text{m}^3$ )	Indicating Range ( $\text{m}^3$ )
V100 and V110	4x4 register	0.001	0.00001	9999.99999
	5x3 register	0.01	0.0001	99999.9999
V200, V210 and V220	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	4x4 Register	85	n/a	110, 115, 134, 165, 170, 190	G3/4" A
	5x3 Register				G1" A
	4x4 Register				
	5x3 Register				
V110	4x4 Register	100	n/a	110, 115, 134, 165, 170, 190	G3/4" A
	5x3 Register				G1" A
	4x4 Register				
	5x3 Register				
V200	Standard	95	125	110, 115, 134, 165, 170, 190	G3/4" A
	Encoder		140		
V210	Standard	95	125	n/a	G1½" A
	Encoder		145		
V220	Standard	75	125	n/a	G3" A
	Encoder		149		

### 3.4 Other designations

Temperature class:	T30 (0.1°C – 30°C)
Orientation requirements:	None
Revs/litre of measuring chamber	16.5
Maximum admissible pressure (MAP)	16 bar
Pressure Loss at Q3	0.63 bar max
Climatic environment:	-10°C to +55°C
Mechanical environment:	M1
Electromagnetic environment:	n/a
Location:	Open/closed, condensing/non-condensing
Reverse Flow:	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 for V200, V210 and V220 meters

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 7.

### 4.2 Reed switch sensor unit for V200, V210 and V220 meters

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 8.

### **4.3 Reed switch sensor unit for 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 15.

## **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  $Q_3$
- Flowrate range  $Q_3/Q_1$  (R)
- Serial number
- Manufacturers mark or name
- Certificate number

## **6 LOCATION OF VERIFICATION MARKS AND SEALS**

### **6.1 Location of verification markings**

#### **6.1.1 V200, V210 and V220 meters**

The serial number and verification markings are permanently etched on the top surface of the shroud as shown in Figure 5 and 6.

#### **6.1.2 V100 meter**

The serial number and verification markings are permanently etched on the front face of the plastic securing ring as shown in figure 11.

#### **6.1.3 V100 meter – alternative markings**

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 12.

#### **6.1.4 V110 meter**

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 16.

## **6.2 Sealing arrangement**

### **6.2.1 V200, V210 and V220 meters**

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 and V110 meters**

A sealing wire links the two halves of the body and is secured with a lead seal as shown in Figure 12.

### **6.2.3 V100 meter alternative**

A plastic securing ring with retaining clip is positioned over the join between the two body halves. This cannot be removed without breaking or showing visible signs of tampering (Figure 11).

## **7 ILLUSTRATIONS**

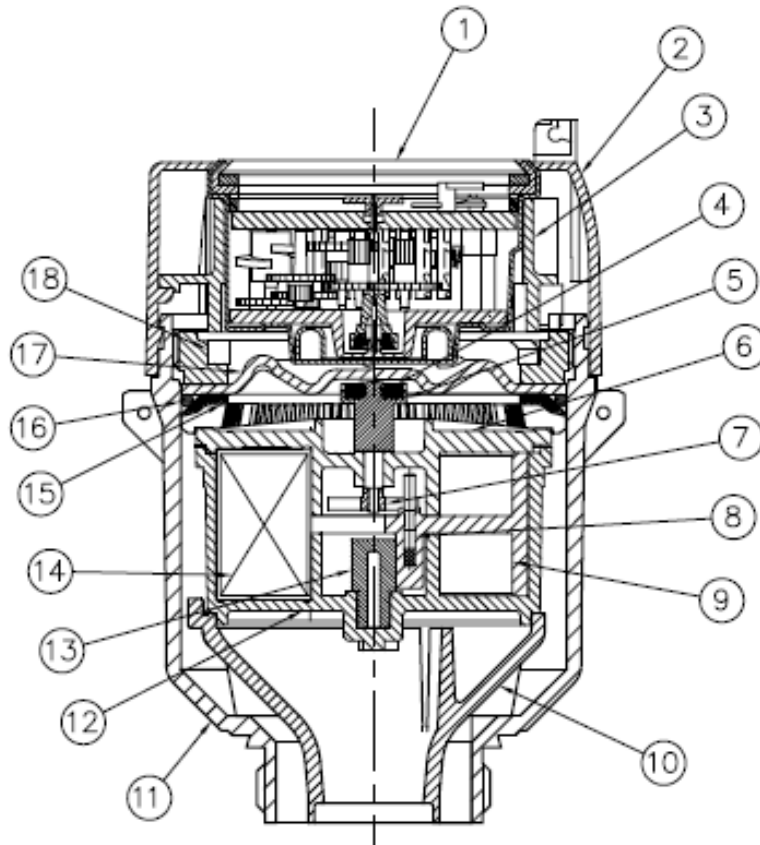
Figure 1	V210 meter
Figure 2	Sectional view of V210 meter
Figure 3	V200 meter
Figure 4	Sectional view of V200 meter
Figure 5	V210 meter dial face and markings
Figure 6	V200 meter dial face and markings
Figure 7	V200 and V210 meter dial face showing position of inductive sensor
Figure 8	V200 and V210 meter dial face showing position of reed switch sensor
Figure 9	V100 meter
Figure 10	Sectional view of V100 meter
Figure 11	V100 meter markings and securing method
Figure 12	Alternative V100 meter markings and securing method
Figure 13	V110 meter
Figure 14	Sectional view of V110 meter
Figure 15	View showing position of reed switch sensor (V100 and V110)
Figure 16	V110 meter serial number, verification marks and securing method
Figure 17	V220 meter
Figure 18	Sectional view of V220 meter

## **8 CERTIFICATE HISTORY**

<b>ISSUE NO.</b>	<b>DATE</b>	<b>DESCRIPTION</b>
UK/0126/0055	05 June 2009	Type examination certificate first issued.
UK/0126/0055 Revision 1	20 October 2009	Addition of section 2.5 – V220 meter, reference to V220 meter added to the relevant parts of sections 3, 4 and 6.  Figures 17 and 18 added.  Figures 11 and 12 corrected.



Figure 1 V210 meter



ITEM	DESCRIPTION
1	COUNTER ASSEMBLY
2	SNAP FIT SHROUD
3	COUNTER ADAPTOR
4	MAGNET
5	MAGNET DRIVE COUPLING
6	TOP PLATE
7	DRIVE BAR
8	PISTON PIN
9	PISTON
10	CHAMBER ADAPTOR
11	BODY
12	CHAMBER
13	THIMBLE
14	SHUTTER
15	SPACER/STRAINER
16	'O' RING SEAL
17	PRESSURE PLATE
18	SCREW RING

Figure 2 Sectional view of V210 meter



Figure 3 V200 meter

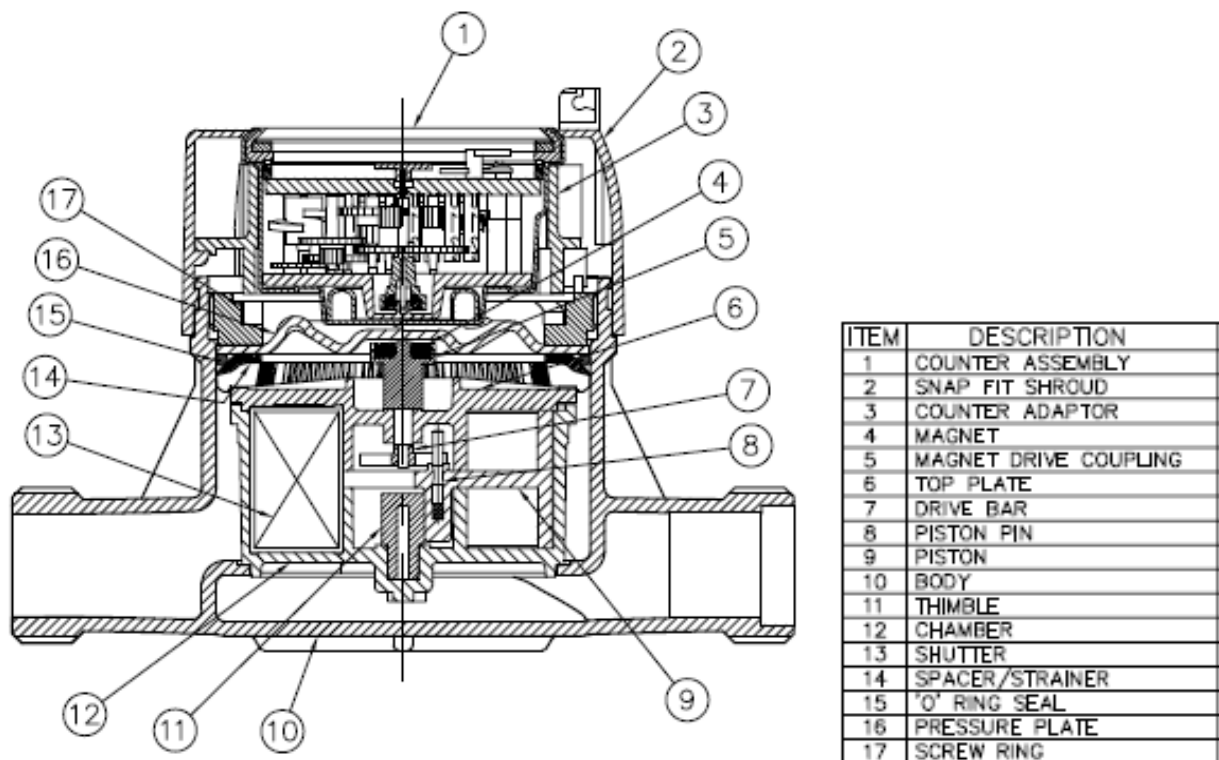


Figure 4 Sectional view of V200 meter



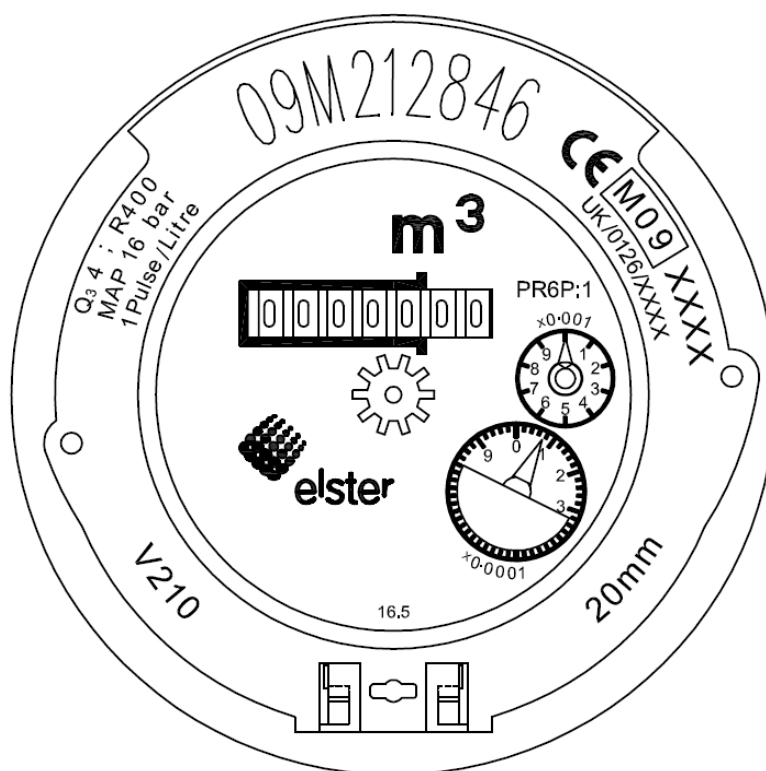


Figure 5 V210 meter dial face and markings

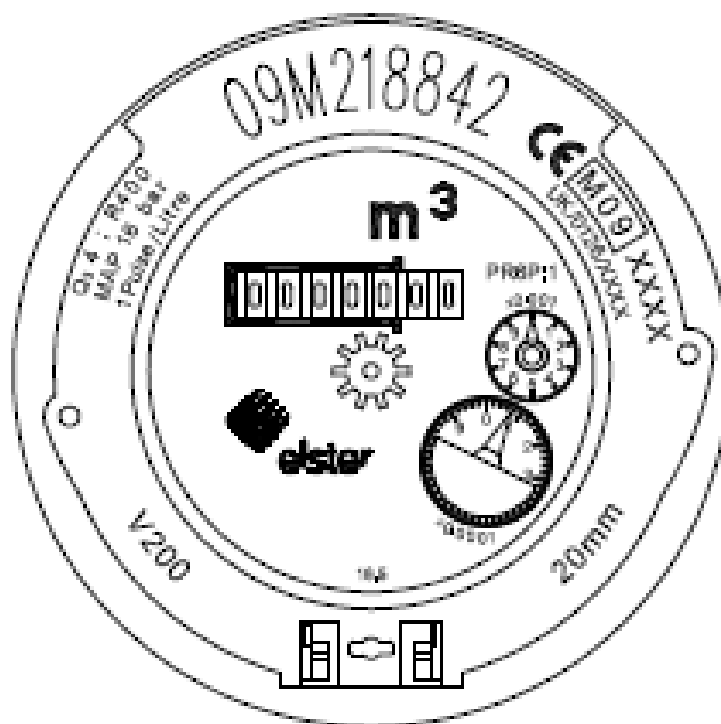
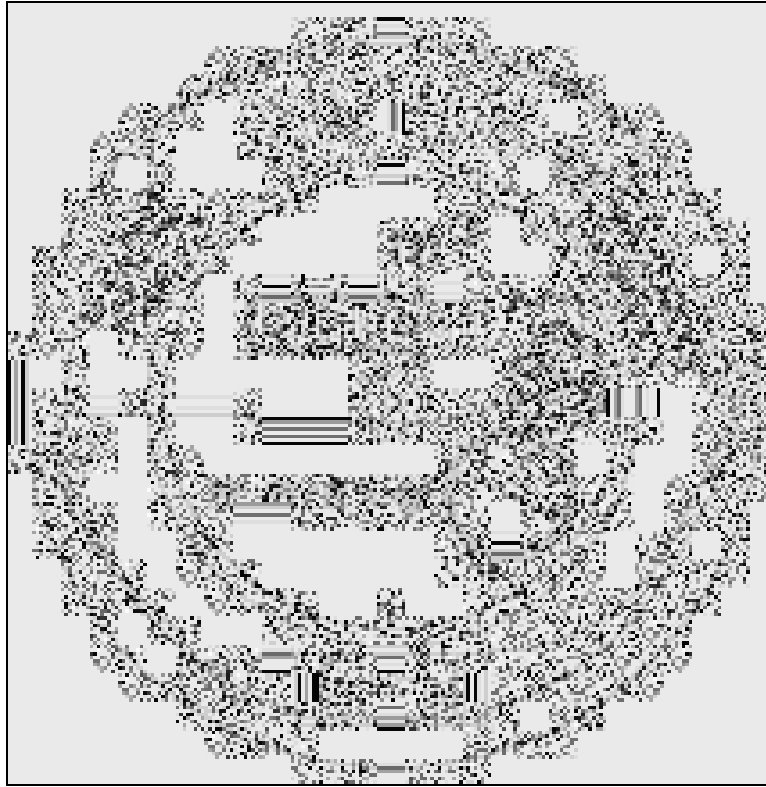
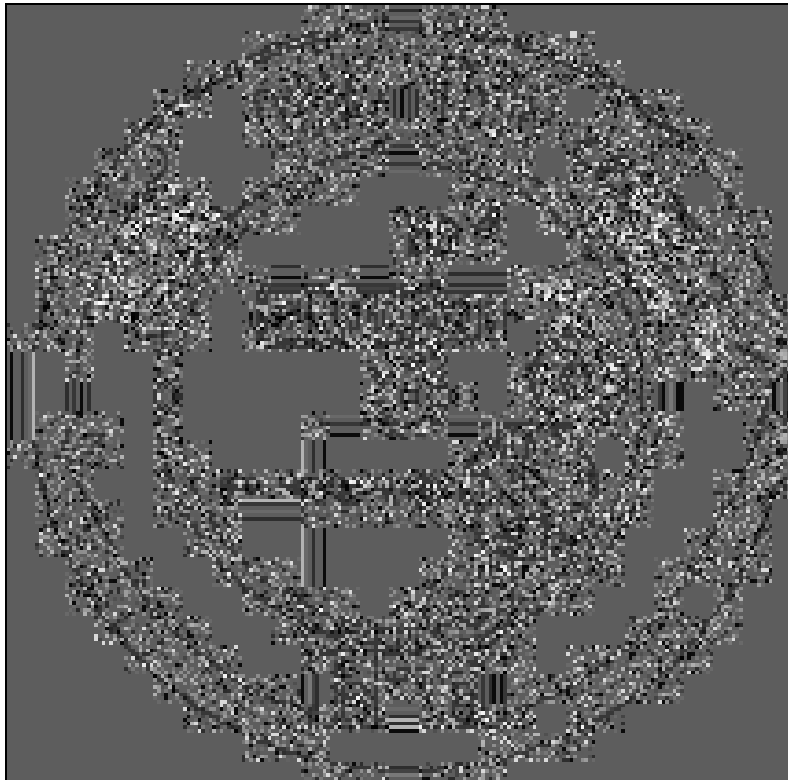


Figure 6 V200 meter dial face and markings



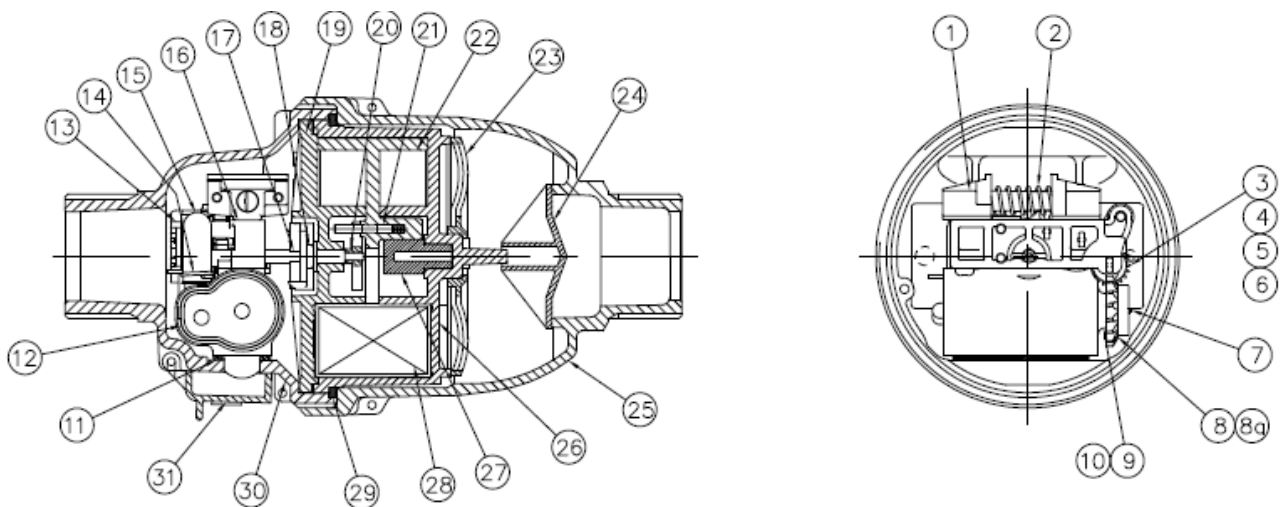
**Figure 7 V200 and V210 meter dial face showing position of inductive sensor**



**Figure 8 V200 and V210 meter dial face showing position of reed switch sensor**



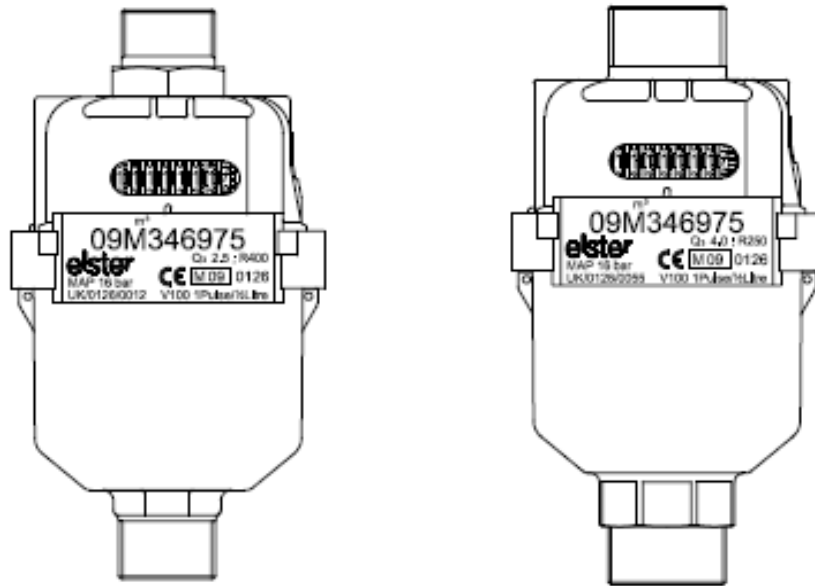
Figure 9 V100 meter



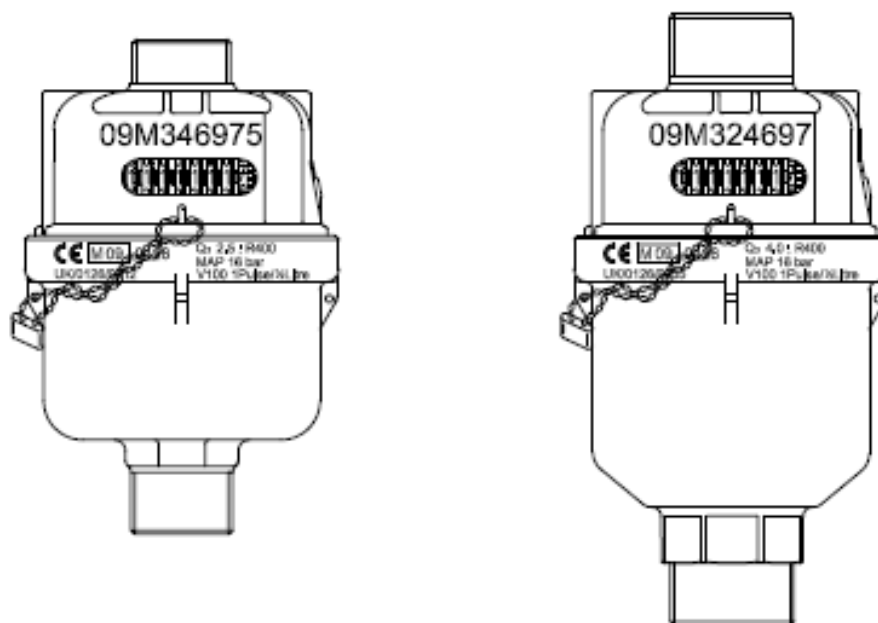
ITEM	DESCRIPTION
1	RAMP
2	RAMP SPRING
3	INTEGRAL GEAR
4	COMPOUND GEAR
5	COMPOUND GEAR
6	INPUT GEAR
7	SPINDLE
8	GLAND GEAR
8a	MAGNET
9	LIP SEAL
10	LIP SEAL RETAINER
11	'O' RING SEAL
12	COUNTER CASE & END CAP
13	BEARING PLATE
14	SAC CLIP
15	SAC
16	BEARING BRACKET

ITEM	DESCRIPTION
17	DRIVE DOG
18	DRIVE COUPLING
19	TOP PLATE
20	DRIVE BAR
21	PISTON PIN
22	PISTON
23	STRAINER
24	RETURN FLOW RESTRICTOR
25	CHAMBER HOUSING
26	CHAMBER
27	THIMBLE
28	SHUTTER
29	QUAD SEAL
30	COUNTER HOUSING
31	UD

Figure 10 Sectional view of V100 meter



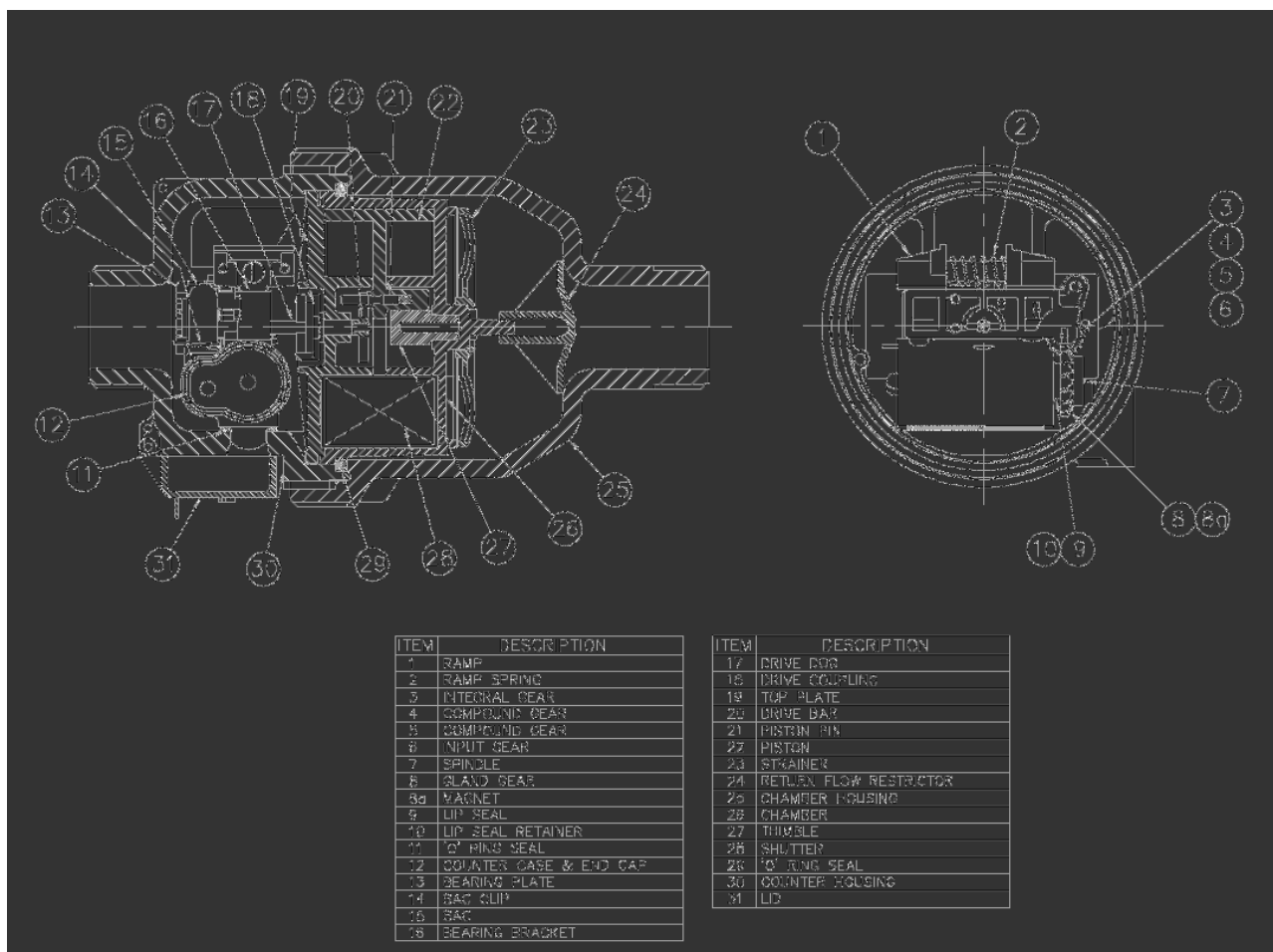
**Figure 11 V100 meter markings and securing method**



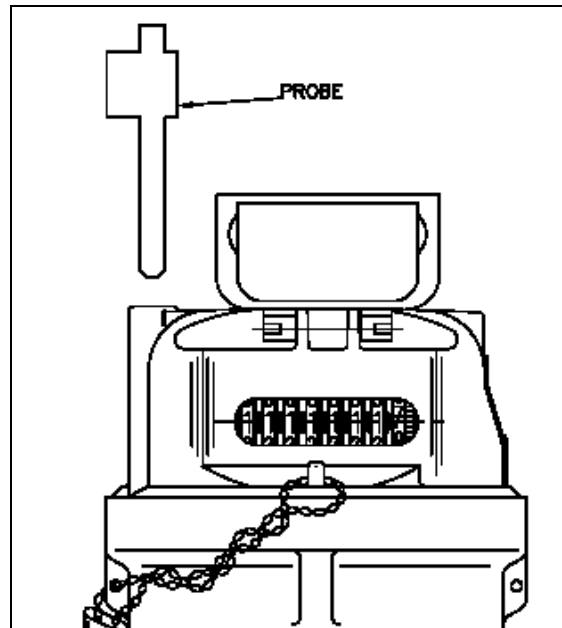
**Figure 12 Alternative V100 meter markings and securing method**



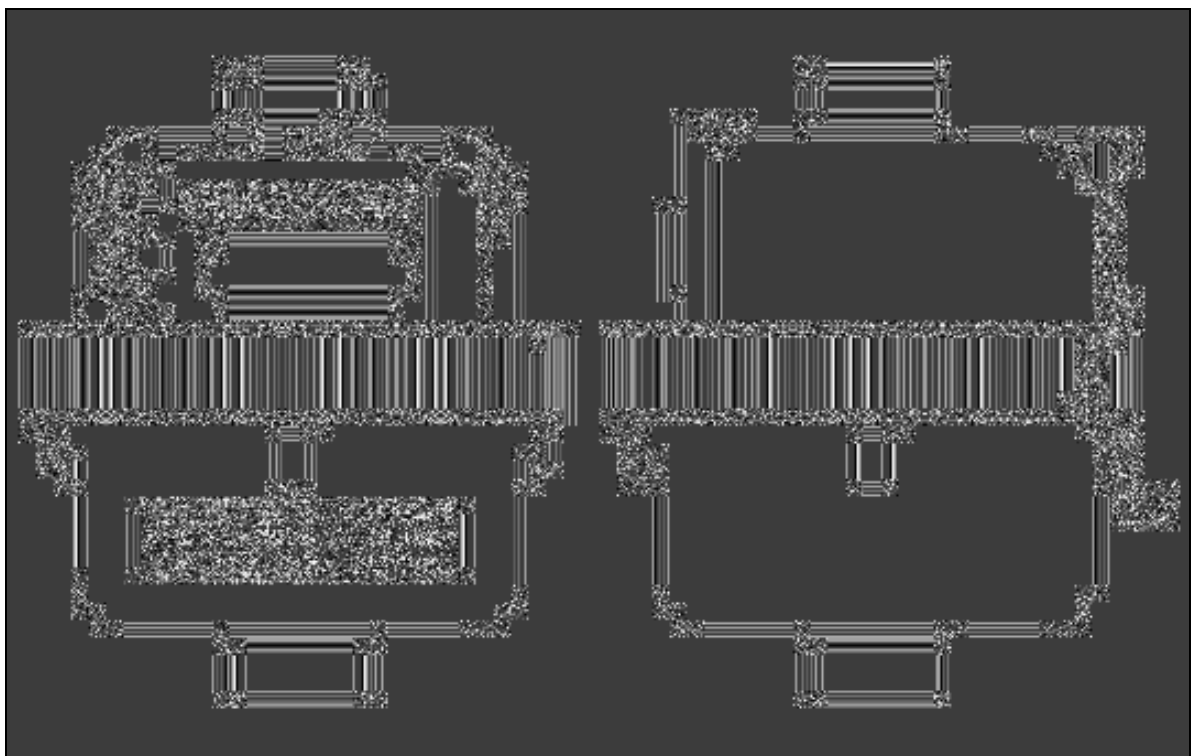
**Figure 13 V110 meter**



**Figure 14 Sectional view of V110 meter**



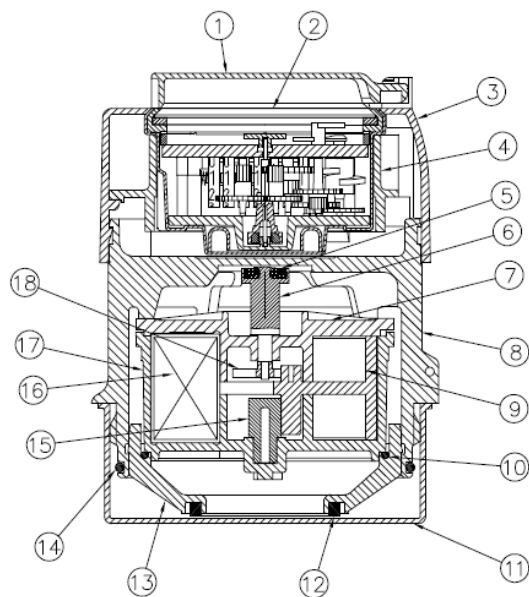
**Figure 15** View showing position of reed switch sensor (V100 and V110)



**Figure 16** V110 meter serial number, verification marks and securing method



**Figure 17 V220 meter**



ITEM	DESCRIPTION	MATERIAL
1	LID	ABS
2	COUNTER ASSEMBLY	COPPER CAN/MINERAL GLASS
3	SHROUD	ABS
4	COUNTER ADAPTOR	ABS
5	MAGNET	CERAMIC
6	MAGNET DRIVE SPINDLE	NYLON
7	TOP PLATE	STYRENE
8	BODY	STAMPED BRASS
9	PISTON	STYRENE
10	'O' RING	RUBBER
11	DUST CAP	POLYETHYLENE
12	FLAT SEAL	RUBBER
13	ADAPTOR/STRAINER	NORYL
14	'O' RING	RUBBER
15	CHAMBER THIMBLE	NYLON
16	SHUTTER	NYLON
17	CHAMBER	STYRENE
18	DRIVE BAR	NYLON

**Figure 18 Sectional view of V220 meter**