(UK/0126/0012) MI-001

United Kingdom of Great Britain and Northern Ireland

Certificate of EC type-examination of a measuring instrument
Number: UK/0126/0012 Revision 1

issued by the Secretary of State for Innovation, Universities & 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 36 revs/litre and having a rated permanent flowrate Q3 of 1.6m^3/h or 2.5m^3/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: M A Bokota
for Chief Executive
National Weights & Measures Laboratory
Department for Innovation, Universities & Skills
Stanton Avenue
Teddington
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United Kingdom

Issue Date: 16th April 2008
Valid Until: 4 October 2017
Reference No: T1132/0009

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 1.6 or 2.5 cubic metres per hour. It is based on a 36 revolutions per litre measuring chamber with model variations described in section 2.

2 FUNCTIONAL DESCRIPTION

2.1 V210 meter

The V210 meter incorporates a semi-positive displacement rotary piston measuring assembly that is fitted into either a brass alloy, (Figure 1), or injection moulded thermoplastic body, (Figure 2), 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 7 and 8.

2.2 V200 meter

A meter as described in section 2.1, but with the measuring assembly being arranged in a brass alloy body for in-line connection into the water pipe via two British pipe thread G3/4”A male threaded connectors, (Figure 3). A cross section diagram is shown in Figures 9.

2.3 V230 meter

Having the 36 rev/l measuring and counting assemblies housed in a brass alloy body arranged for in-line connection into the water pipe via two British pipe thread G3/4”A male threaded connectors and using a brass head ring to secure the register, (Figure 4). A cross section diagram is shown in Figures 10.

2.4 V100 meter

Having the 36 rev/l measuring chamber and counter assembly mounted in a brass alloy body for connection into the water pipe via two G3/4”A male threaded connectors, (Figure 5). The axis of the measuring chamber is parallel to the axis of the pipe, as shown in Figure 11. 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 Figures 11.

2.5 V110 meter

Having the meter arranged as described in Section 2.5 but the two body halves are a thermoplastic injection moulding, (Figure 6).

3 TECHNICAL DATA

3.1 Flow designation

3.1.1 Meters with Q3 = 2.5 m^3/h

Table 1 Permitted flow designations by model

Model Name	Q_3/Q_1 (R)						
	400	315	250	200	160	100	80
V100, V110, V200 and V210	✓	✓	✓	✓	✓	✓	✓
V230			✓	✓	✓	✓	✓

Table 2 Related flowrates according to each Q3/Q1 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 (m^3/h)	0.00625	0.00794	0.01000	0.01250	0.01563	0.02500	0.03125
Q2 Transitional flowrate (m^3/h)	0.01000	0.01270	0.01600	0.02000	0.02500	0.04000	0.05000
Q3 Permanent flowrate (m^3/h)	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Q4 Overload flowrate (m^3/h)	3.125	3.125	3.125	3.125	3.125	3.125	3.125

3.1.2 Meters with Q3 = 1.6 m^3/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	✓	✓	✓	✓	✓
V230			✓	✓	✓

Table 4 Related flowrates according to each Q3/Q1 designation

Q_3/Q_1 (R)	250	200	160	100	80
$_2/Q_1$	1.6	1.6	1.6	1.6	1.6
Q1 Minimum flowrate (m^3/h)	0.00640	0.00800	0.01000	0.01600	0.02000
Q2 Transitional flowrate (m^3/h)	0.01024	0.01280	0.01600	0.02560	0.03200
Q3 Permanent flowrate (m^3/h)	1.6	1.6	1.6	1.6	1.6
Q4 Overload flowrate (m^3/h)	2.0	2.0	2.0	2.0	2.0

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 and V110	4x4 register	0.001	0.00001	9999.99999
	5x3 register	0.01	0.0001	99999.9999
V200 and V210	Standard	0.001	0.00002	99999.99998
	Encoder	0.001	0.00002	9999.99998
V230	Standard	0.001	0.00005	99999.99995

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	86	n/a	110, 115, 134, 165, 170, 190	G3/4"A
	5x3 Register				
V110	4x4 Register	99	n/a	110, 115, 134, 165, 170, 190	G3/4"A
	5x3 Register				
V200	Standard	94	113	110, 115, 134, 165, 170, 190	G3/4"A
	Encoder		130		
V210	Standard	94	126	n/a	G1½"A
	Encoder		143		
V230	Standard	83	110	145,165,170,190	G3/4"A
		83	110	105, 165,190,220	G1"A
		83	110	165,175	G1 1/4"A

3.4 Other designations

Temperature class:	T30 (0.1°C – 30°C)
Orientation requirements:	None
Revs/litre of measuring chamber	36
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:	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 (V210 and V200 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 12. The manufacturers name Elster is on the housing of the inductive sensor as well as the dial face.

4.2 Reed switch sensor (V200 and V210 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 13.

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 14.

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 and V210

The serial number and verification markings are permanently etched on the top surface of the shroud as shown in Figures 7 to 9.

6.1.2 V100

The serial number and verification markings are permanently etched on the front face of the plastic securing ring as shown in figure 15.

6.1.3 V100 - alternative

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 16.

6.1.4 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 17.

6.1.5 V230

The serial number directly on the head ring or on a plastic shroud mounted over the head ring as shown in figure 18 (marked XXXXX)

6.2 Sealing arrangement

6.2.1 V200 and V210

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

A sealing wire links the two halves of the body and is secured with a lead seal as shown in figure 16 and 17.

6.2.3 V100 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 15).

6.2.4 V230

The meter is sealed with either a plastic or wire and lead seal between the head ring and the blanking screw as shown in figure 19

7 ILLUSTRATIONS

9 CERTIFICATE HISTORY

ISSUE NO.	DATE	DESCRIPTION
UK/0126/0012	5 October 2007	Type examination certificate first issued.
UK/0126/0012 revision 1	16th April 2008	- Addition of alternative Q3 designation, 1. 6m^3/h. Section 3.1 modified to include flow designation of meters with Q3 of 2.5m^3/h in section 3.1.1 and meters with Q3 1. 6m^3/h in section 3.1.2. - Section 3.2, volume values corrected for V100 and V110 meters.

Figure 1 V210 meter with brass alloy housing

Figure 2 V210 meter with thermoplastic body

Figure 3 V200 meter

Figure 4 V230 meter

Figure 5 V100 meter

Figure 6 V110 meter

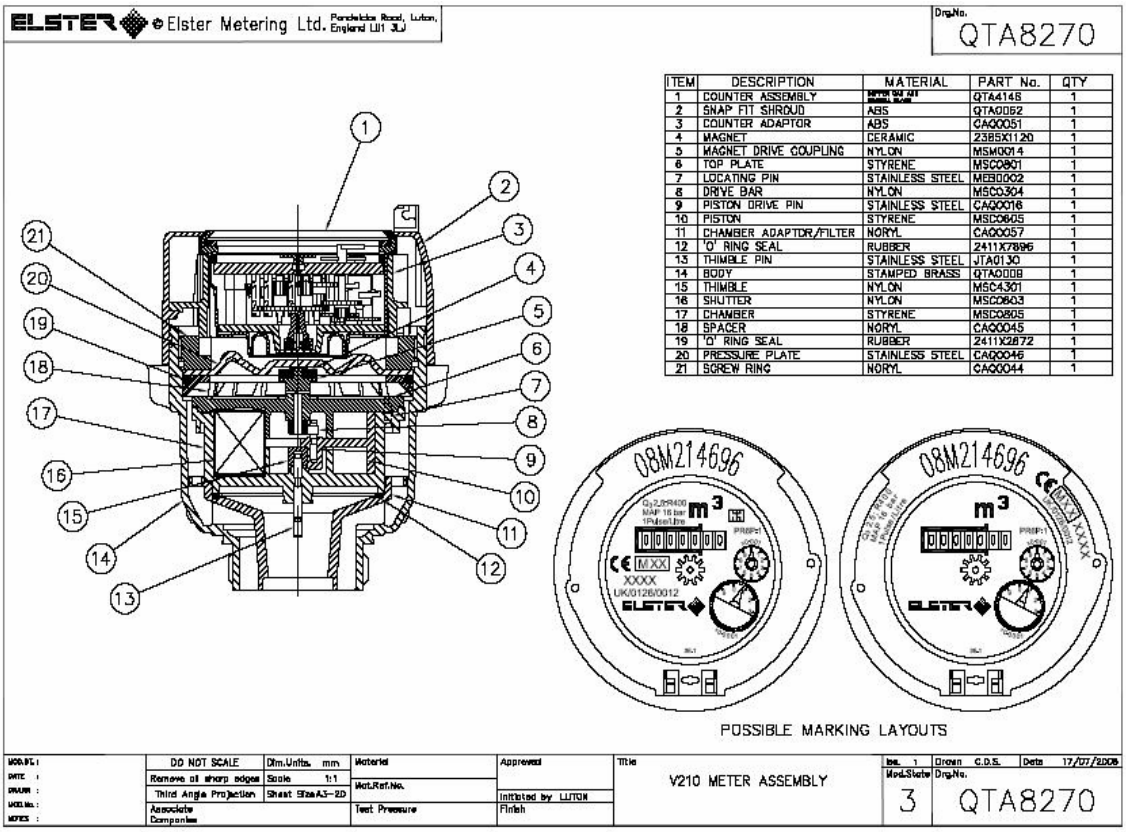


Figure 7 V210 meter assembly with brass alloy body

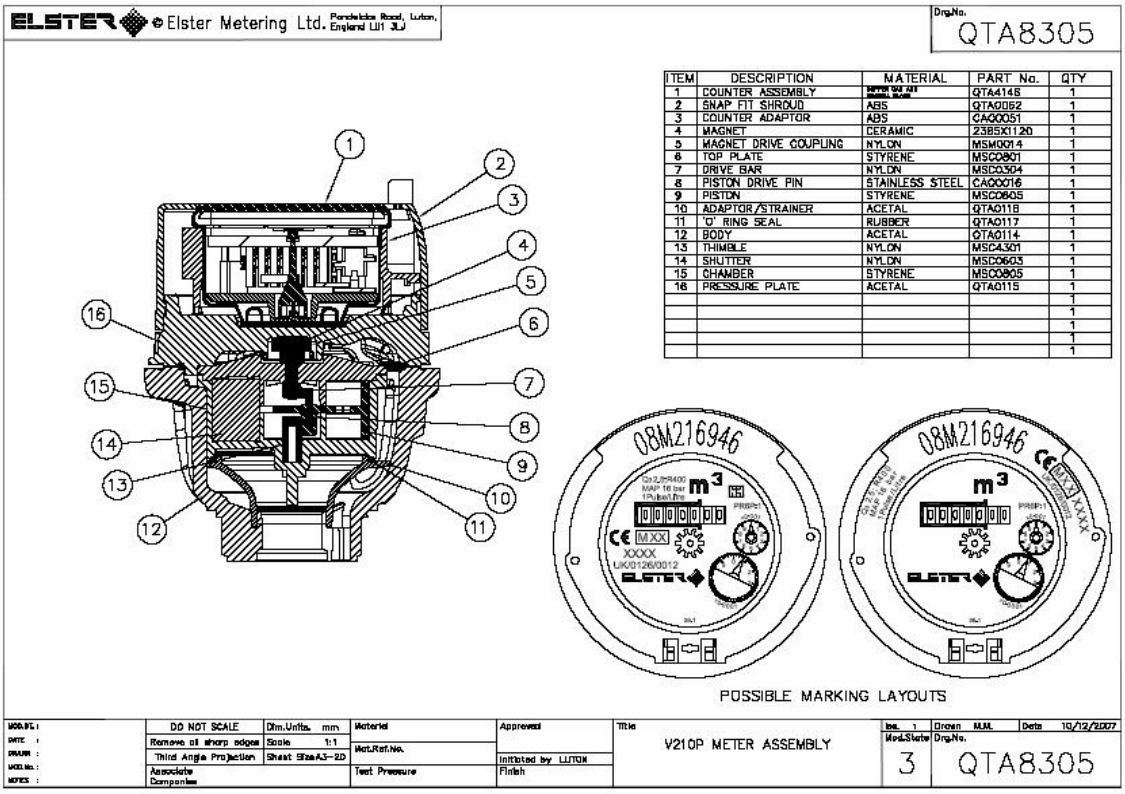
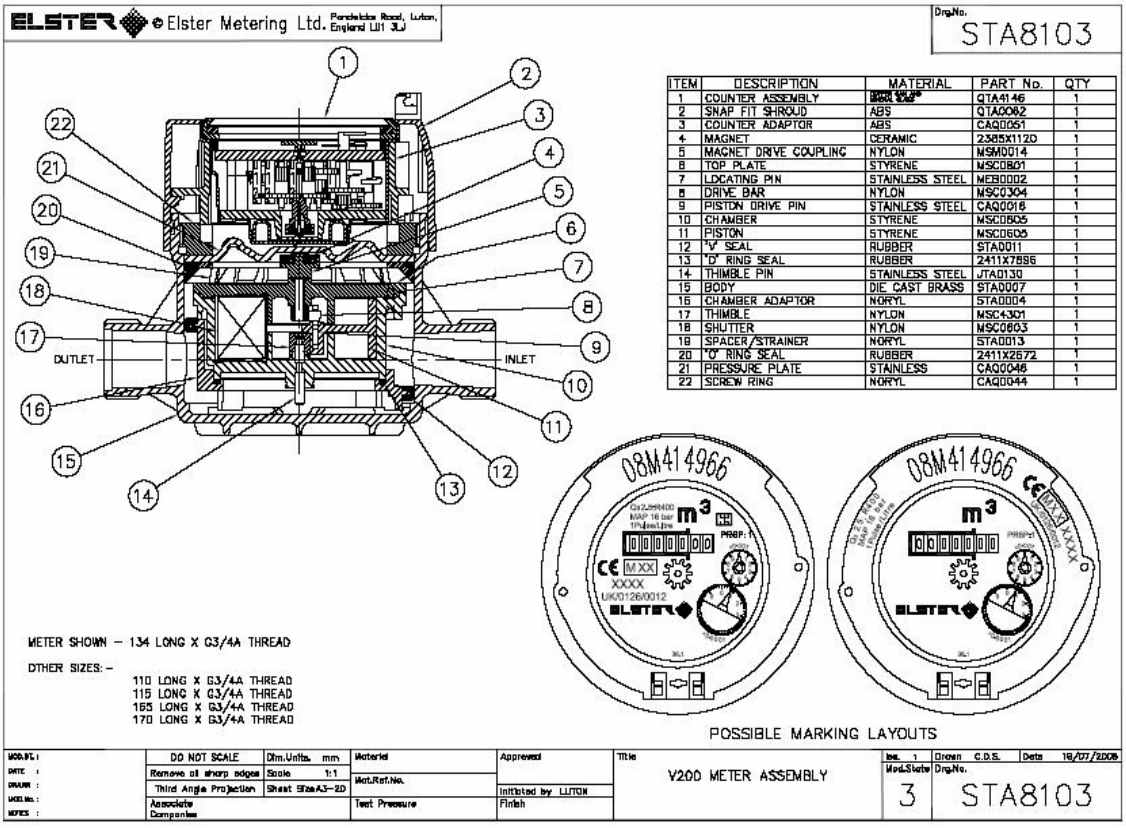


Figure 8 V210 meter assembly with thermoplastic body



ITEM	DESCRIPTION	MATERIAL	PART No.	QTY
1	COUNTER ASSEMBLY	[illegible]	QTA4146	1
2	SNAP FIT SHROUD	ABS	QTA0062	1
3	COUNTER ADAPTOR	ABS	CAQ0051	1
4	MAGNET	CERAMIC	2385X1120	1
5	MAGNET DRIVE COUPLING	NYLON	MSM0014	1
6	TOP PLATE	STYRENE	MSC0601	1
7	LOCATING PIN	STAINLESS STEEL	MEB0002	1
8	DRIVE BAR	NYLON	MSC0304	1
9	PISTON DRIVE PIN	STAINLESS STEEL	CAQ0016	1
10	CHAMBER	STYRENE	MSC0605	1
11	PISTON	STYRENE	MSC0605	1
12	'V' SEAL	RUBBER	STA0011	1
13	'D' RING SEAL	RUBBER	2411X7886	1
14	THIMBLE PIN	STAINLESS STEEL	JTA0130	1
15	BODY	DIE CAST BRASS	STA0007	1
16	CHAMBER ADAPTOR	NORYL	STA0004	1
17	THIMBLE	NYLON	MSC4301	1
18	SHUTTER	NYLON	MSC0603	1
19	SPACER/STRAINER	NORYL	STA0013	1
20	'O' RING SEAL	RUBBER	2411X2672	1
21	PRESSURE PLATE	STAINLESS	CAQ0046	1
22	SCREW RING	NORYL	CAQ0044	1

Figure 9 V200 meter assembly

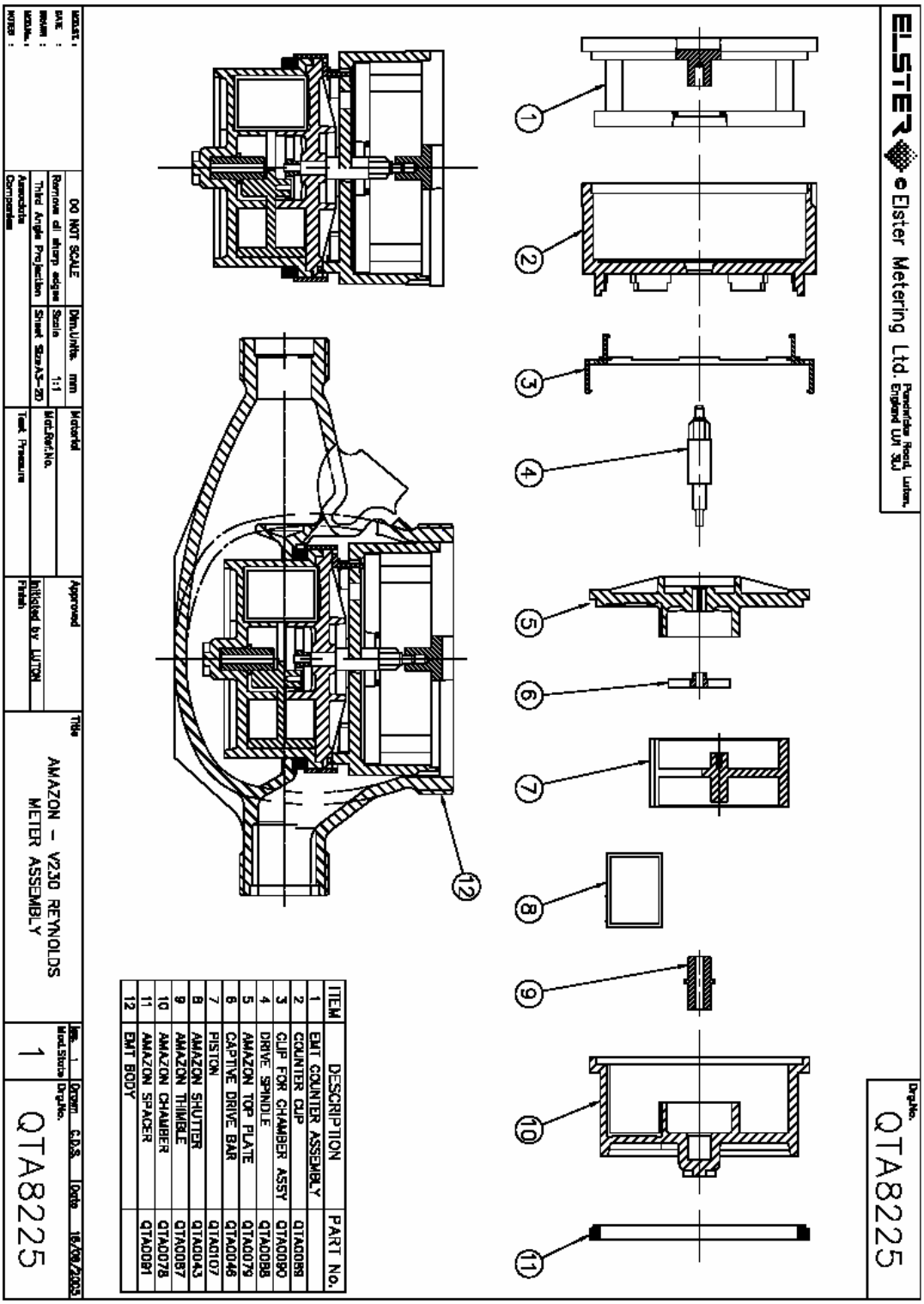
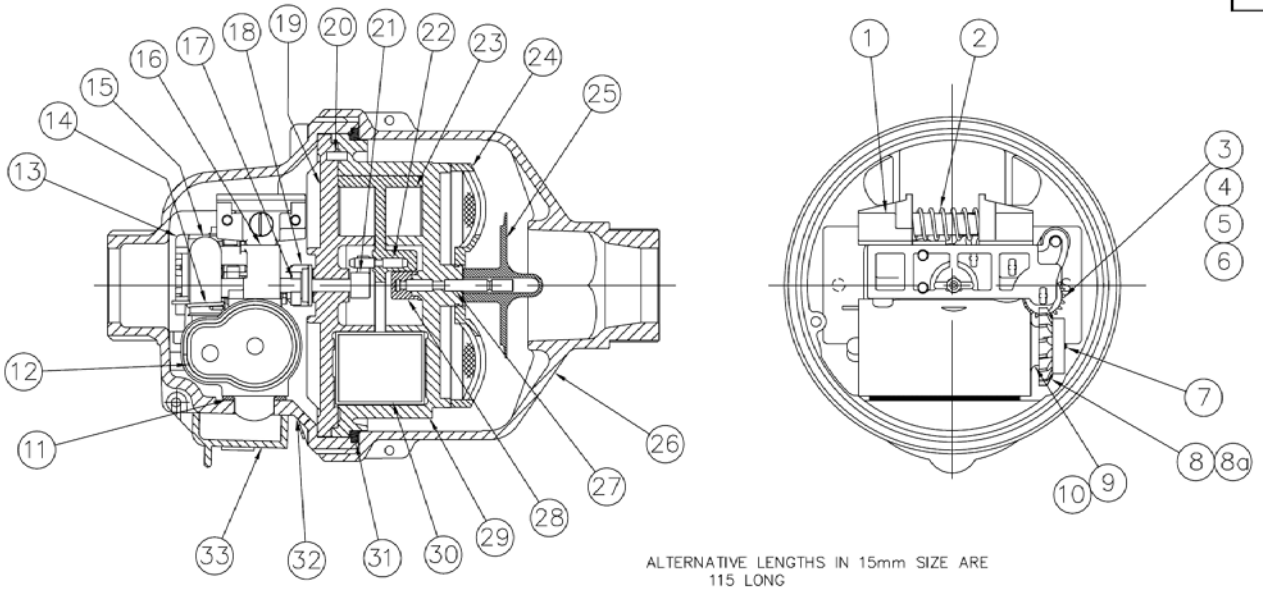


Figure 10 V230 meter assembly

ELSTER © Elster Metering Ltd. Pondwicks Road, Luton, England LU1 3LJ

Drg.No. JTA8309



ALTERNATIVE LENGTHS IN 15mm SIZE ARE
115 LONG
165 LONG

ITEM	DESCRIPTION	MATERIAL	PART No.	QTY
1	RAMP	ACETAL	JTA0253	2
2	RAMP SPRING	STAINLESS STEEL	JTA0215	1
3	INTEGRALGEAR	ACETAL	JTA0193	1
4	COMPOUND GEAR	ACETAL	JTA0186	1
5	COMPOUND GEAR	ACETAL	JTA0177	1
6	INPUT GEAR	ACETAL	JTA0172	1
7	SPINDLE	STAINLESS STEEL	JTA0205	1
8	GLAND GEAR	ACETAL	JTA0199	1
8a	MAGNET	CERAMIC	2385X1085	1
9	LIP SEAL	RUBBER	JTA0001	1
10	LIP SEAL RETAINER	OROGLASS	JTA0030	1
11	'O' RING SEAL	RUBBER	2411X2606	1
12	COUNTER CASE & END CAP	OROGLASS	JTA0209 & MKH0667	1
13	BEARING PLATE	NORYL	JTA0168	1
14	SAC CLIP	STAINLESS STEEL	MKH0006	1
15	SAC	BROMOBUTYL	MKH0107	1
16	BEARING BRACKET	NORYL	JTA0167	1

ITEM	DESCRIPTION	MATERIAL	PART No.	QTY
17	DRIVE DOG	ACETAL	JTA0169	1
18	DRIVE COUPLING	NYLON	MSC0305	1
19	TOP PLATE	STYRENE	MSC0801	1
20	LOCATING PIN	STAINLESS STEEL	MEB0002	1
21	DRIVE BAR	NYLON	MSC0304	1
22	PISTON PIN	STAINLESS STEEL	CAQ0016	1
23	PISTON	STYRENE	MSC0605	1
24	STRAINER	POLYPROPYLENE	CAJ0089	1
25	RETURN FLOW RESTRICTOR	POLYPROPYLENE	MSC0303	1
26	CHAMBER HOUSING	DIE CAST BRASS	CAJ0047 (VARIOUS)	1
27	THIMBLE PIN	STAINLESS STEEL	JTA0130	1
28	THIMBLE	NYLON	MSC4301	1
29	CHAMBER	STYRENE	MSC0805	1
30	SHUTTER	NYLON	MSC0603	1
31	QUAD SEAL	RUBBER	CAJ0093	1
32	COUNTER HOUSING	DIE CAST BRASS	CAJ0049 (VARIOUS)	1
33	LID	POLYPROPYLENE	MRA0703	1

MOD.ST. :	DO NOT SCALE	Dim.Units. MM	Material	Approved	Title	Iss. 1	Drawn C.D.S. Date 19/07/2006
DATE :	Remove all sharp edges	Scale 1:1	Mat.Ref.No.		V100 METER ASSEMBLY 15MM X 134 LONG	Mod.State 1	Drg.No. JTA8309
DRAWN :	Third Angle Projection	Sheet Size A3-2D		Initiated by LUTON			
MOD.No. :	Associate Companies		Test Pressure	Finish			
NOTES :							

Figure 11 V100 and V110 meter assembly

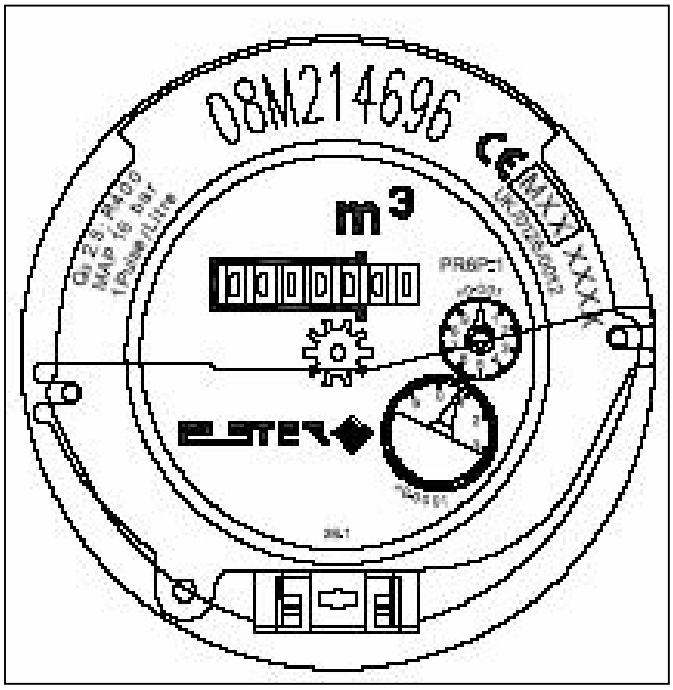


Figure 12 Dial face showing position of inductive sensor (V200 and V210)

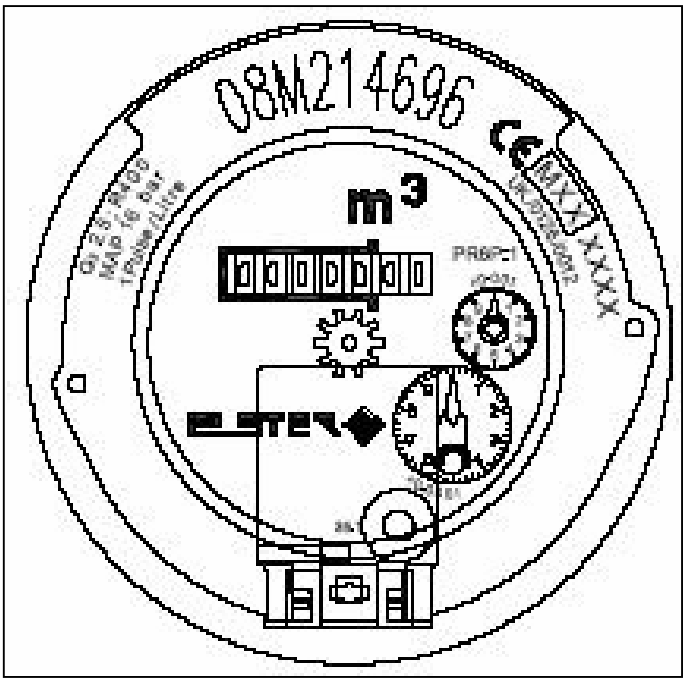


Figure 13 Dial face showing position of reed switch sensor (V200 and V210)

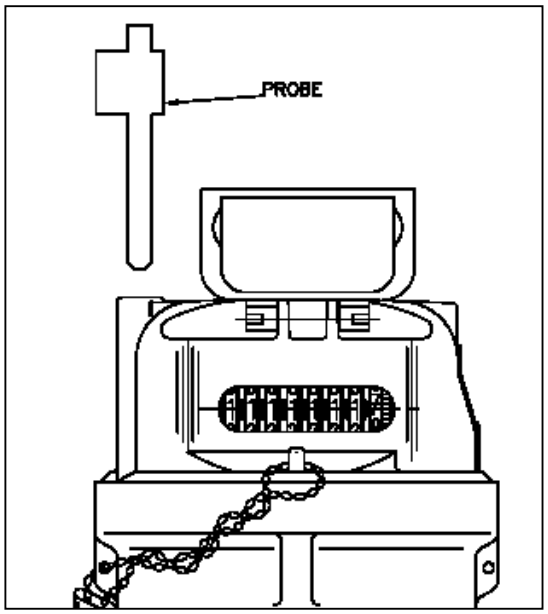


Figure 14 View showing position of reed switch sensor (V100 and V110)

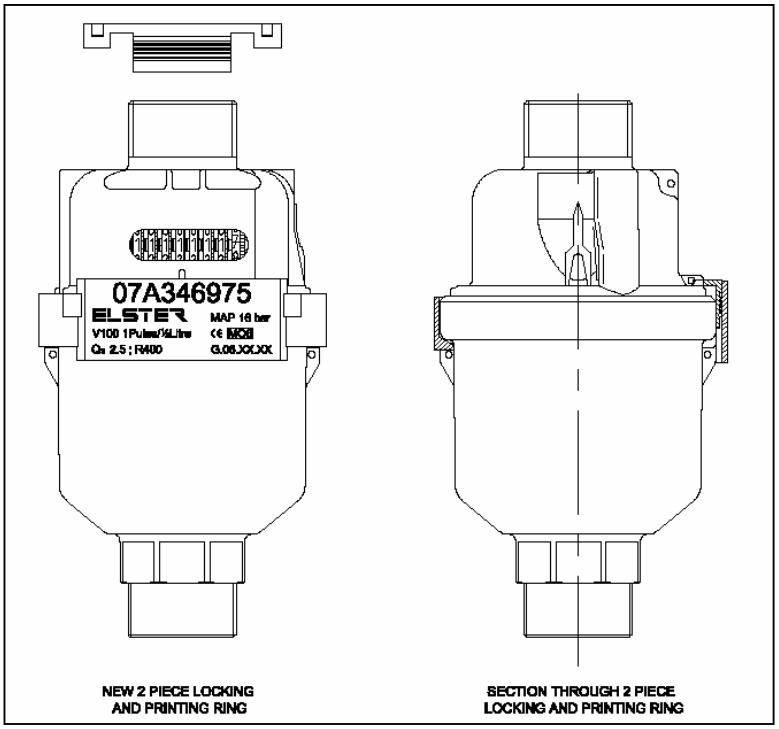


Figure 15 V100 serial number, verification marks and securing method

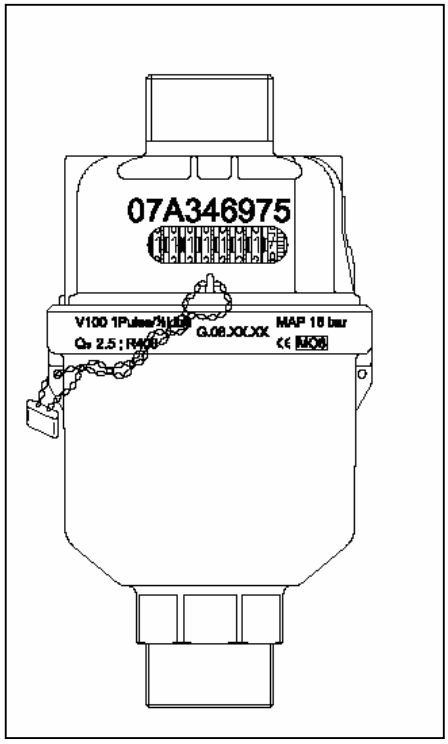


Figure 16 V100 alternative serial number, verification marks and securing method

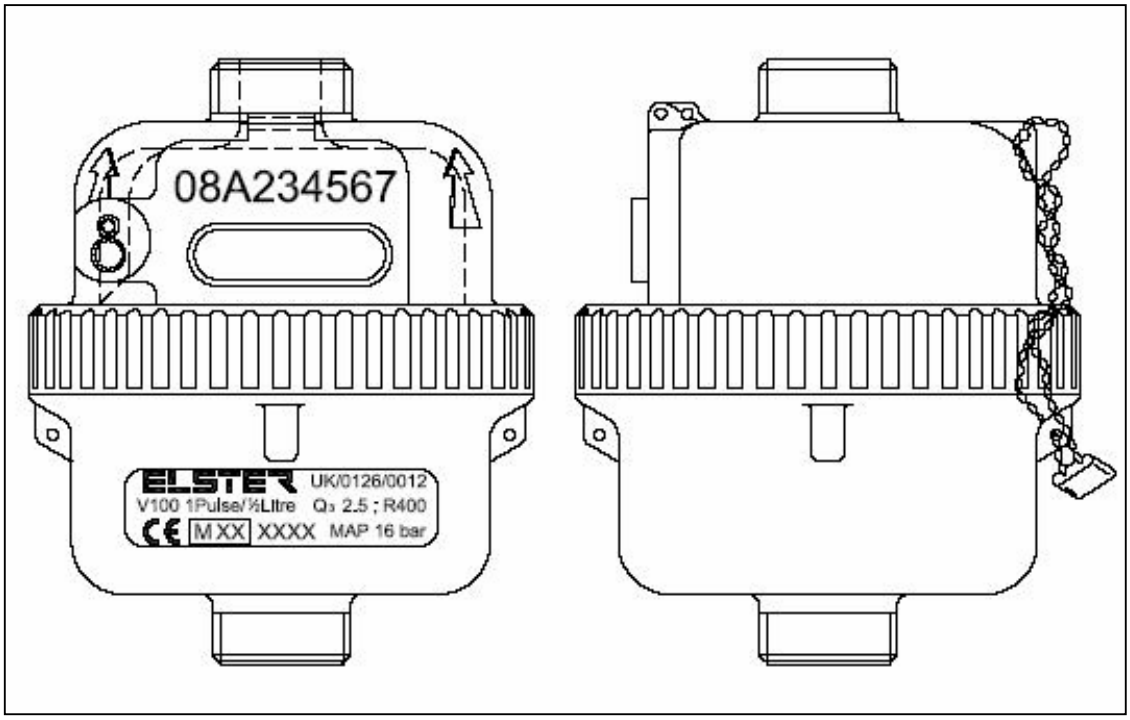


Figure 17 V110 serial number, verification marks and securing method

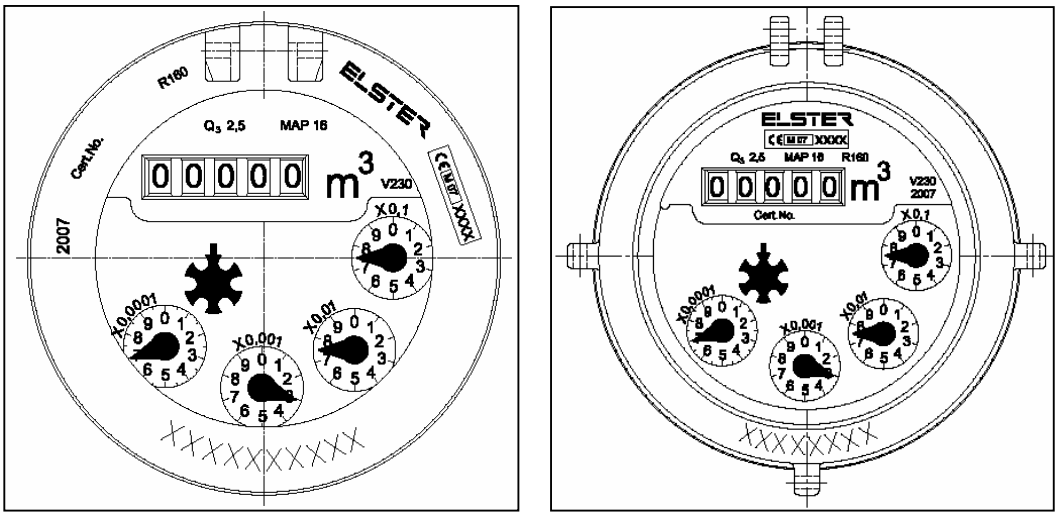


Figure 18 V230 alternative serial number and verification marks

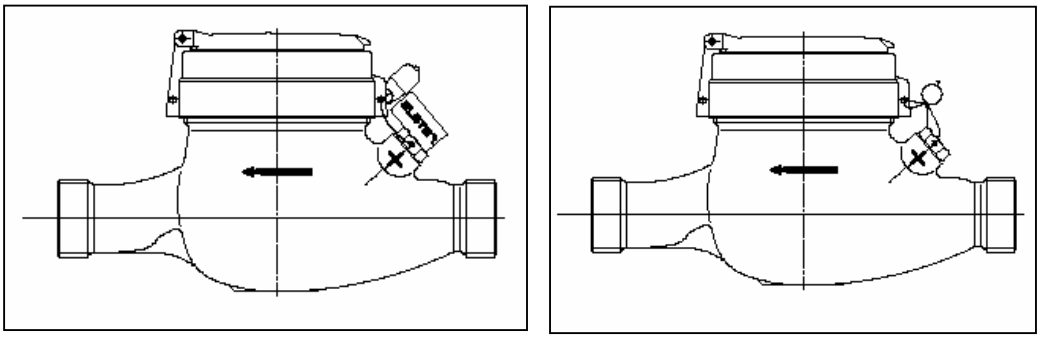


Figure 19 V230 alternative securing methods