(UK/0126/0088) MI-001

NATIONAL WEIGHTS AND MEASURES LABORATORY

United Kingdom of Great Britain and Northern Ireland

Certificate of EC type-examination of a measuring instrument
Number: UK/0126/0088 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
United Kingdom

in respect of a family of cold-water meters utilising a common, volumetric measuring element, with a nominal capacity of 25 revs/litre and having a rated permanent flowrate Q_3 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.

This Revision replaces previous versions of this certificate.

Signatory: P R Dixon
for Chief Executive
National Weights & Measures Laboratory
(part of the National Measurement Office)
Department for Business, Innovation & Skills
Stanton Avenue
Teddington
Middlesex TW11 0JZ
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Issue Date: 3 February 2011
Valid Until: 19 July 2020
Reference No: TS02/0002

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 25 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 V150 Concentric Meter

The V150 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 to a simple, mechanical non-resettable totalising register, a non-resettable totalising display incorporating an absolute encoder model register or a lithium cell powered electronic non-resettable totalising register. The electronic register features either an internal antenna, external antenna or externally wired serial or pulse output. Registers are 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. A cross section diagram is shown in Figure 2.

2.2 V150 Inline Meter

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

3 TECHNICAL DATA

3.1 Flow designation

3.1.1 Meters with $Q_3 = 2.5\ m^3/h$

Table 1 Permitted flow designations by model

Model Name	Q_3/Q_1 (R)						
	400	315	250	200	160	100	80
V150	✓	✓	✓	✓	✓	✓	✓

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
Q_1 Minimum flowrate (m^3/h)	0.00625	0.00794	0.01000	0.01250	0.01563	0.02500	0.03125
Q_2 Transitional flowrate (m^3/h)	0.01000	0.01270	0.01600	0.02000	0.02500	0.04000	0.05000
Q_3 Permanent flowrate (m^3/h)	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Q_4 Overload flowrate (m^3/h)	3.125	3.125	3.125	3.125	3.125	3.125	3.125

3.1.2 Meters with $Q_3 = 1.6\ m^3/h$

Table 3 Permitted flow designations by model

Model Name	Q_3/Q_1 (R)				
	250	**200**	**160**	**100**	**80**
V150	✓	✓	✓	✓	✓

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
Q_1 Minimum flowrate (m^3/h)	0.00640	0.00800	0.01000	0.01600	0.02000
Q_2 Transitional flowrate (m^3/h)	0.01024	0.01280	0.01600	0.02560	0.03200
Q_3 Permanent flowrate (m^3/h)	1.6	1.6	1.6	1.6	1.6
Q_4 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)
V150	Standard	0.001	0.00002	99999.99998
	Encoder	0.001	0.00002	9999.99998
	Electronic 6+5	0.00001	0.00001	999999.99999

3.3 Meter dimensions

Model Name	Register Variant	Overall Meter Diameter (mm)	Overall Meter Height (mm)	Overall Meter Length (mm)	Meter Connection
V150 Concentric	Standard	100	130	n/a	G1½"A
	Encoder		145		
	Electronic		135		
V150 Inline	Standard	100	120	105, 110, 134, 165, 170	G3/4”A
	Encoder		140		
	Electronic		135		

3.4 Other designations

Temperature class:	T30 (0.1°C – 30°C)
Orientation requirements:	None
Revs/litre of measuring chamber	25
Maximum admissible pressure (MAP)	16 bar
Pressure Loss at Q_3	0.63 bar max
Climatic environment:	-10°C to +55°C
Humidity	Condensing / non-condensing.
Mechanical environment:	M1
Electromagnetic environment:	E1
Location:	Open/closed.
Reverse Flow:	Permitted but not measured
Software Version	V02Txx where: Vxx: Controlled Metrological Code. Txx: Uncontrolled Non Metrological Code partly dependant on the output options.

4 PERIPHERAL DEVICES AND INTERFACES

4.1 Inductive pointer and sensor unit

A mechanical meter register is equipped with a metallic plated pointer (Figure 8) 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 Figures 6 & 7. A pulse is generated when the metallic pointer passes the inductive field of the sensor that may be transmitted by wire to a remote counting device. The manufacturers name Elster is on the housing of the inductive sensor as well as the dial face.

4.2 Reed switch sensor

A mechanical meter register is equipped with a magnetic pointer on the first element of the verification scale. A reed switch sensor may be fitted to the meter shroud, as shown in Figures 10 & 11, its lead connected to a remote pulse counting device. The lead's supply and return lines terminate either side of the normally open reed switch which closes when the magnet is near, triggering a count in the device. The manufacturer's name Elster is on the housing of the reed switch sensor as well as the dial face.

4.3 Electronic register with radio transmitter

An electronic meter register factory fitted with an internal or external antenna for radio transmission of information to a receiving device. The radio may be factory set for operating in one way mode whereby the register transmits at regular intervals or in two way mode whereby the register transmits in response to a request from monitoring equipment.

4.4 Electronic register with encoder output

An electronic meter register will send information via a factory fitted two wire touch readable serial port following the detection of a signal generated by a touch reader.

4.5 Electronic register with pulse output

An electronic meter register equipped with a three wire flying lead comprising a reference ground line and two open drain pulse lines. The pulse scheme (width and weight) are programmed at manufacture.

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
Information in respect of conditions of use (where applicable)

6 LOCATION OF VERIFICATION MARKS AND SEALS

6.1 Location of verification markings

The serial number and verification markings are permanently etched on the top surface of the shroud as shown in Figures 5, 16, 17, 18 and 19 (mechanical registers), 12, 13 and 14 (electronic registers).

6.2 Sealing arrangement

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 attempted.

7 ALTERNATIVES

7.1 Inductive pointer

Having an inductive pointer with a stainless steel insert, as shown in Figure 9.

7.2 Additional copper can spacer clamp ring

Having an additional ring in the standard copper can register as an aid to prevent meter tampering, as shown in Figure 15.

7.3 Alternative register, counter cases and shrouds (MSII)

Having a mechanical register enclosed in a copper can, as shown in Figure 16 or a polymer case, as shown in Figure 17, driven by the same magnetic coupling system described in section 2.1 and secured to the meter by a distinctive new style of shroud. An optional inductive pointer sensor may be fitted, its outline position on a copper can register's shroud is shown in Figure 20 and a sketch of one mounted on the polymer cased register's shroud is shown in Figure 21.

8 ILLUSTRATIONS

9 CERTIFICATE HISTORY

ISSUE NO.	DATE	DESCRIPTION
UK/0126/0088	20 July 2010	Type examination certificate first issued.
UK/0126/0088 Revision 1	22 October 2010	Section 3.4: Size of Measuring Chamber corrected. Added qualification for software version. Section 4. Added Descriptions of Electronic Outputs:- 4.3: Radio; 4.4: Encoder; 4.5: Pulse. Section 7.2 - Added copper can spacer clamp ring. Section 7.3 - Added alternative register in copper can or polymer housing. Figures: Re-organised, added pictures of Pulse Sensors, Electronic Register Shroud Faces & updated Dial Faces. General: Editorial changes.
UK/0126/0088 Revision 2	3 February 2011	Section 6.1 - References to Figures 16-19 added. Section 7.3 - Added details of new style shrouds, associated optional inductive sensor and the name of new style (MSII). Figures: 16 & 17 descriptions: added ‘shroud’ and MSII Added Figures 18-21.

Figure 1 V150 Concentric Meter

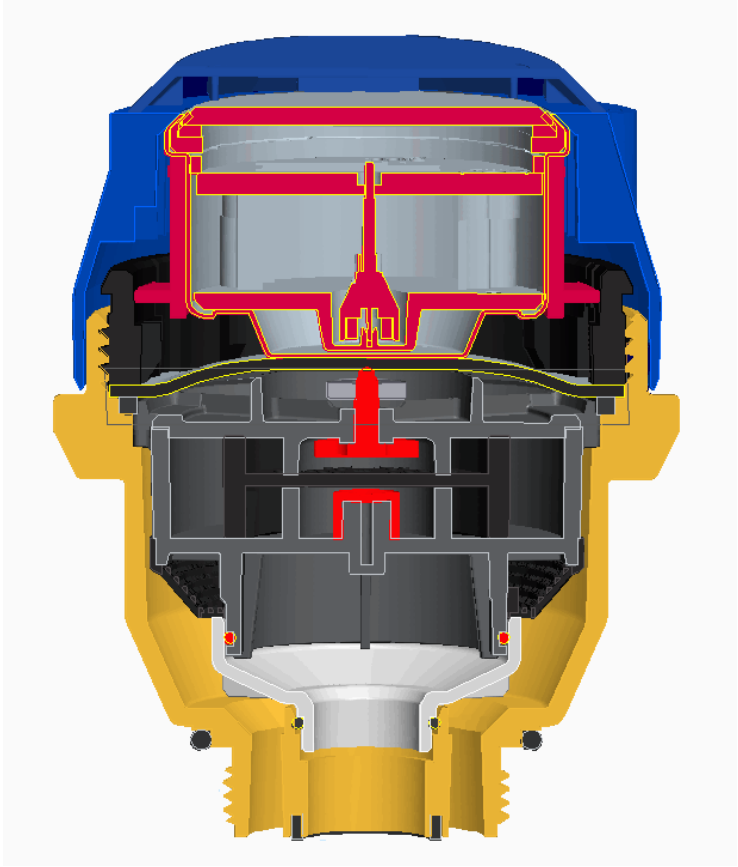


Figure 2 Sectional View of V150 Concentric Meter

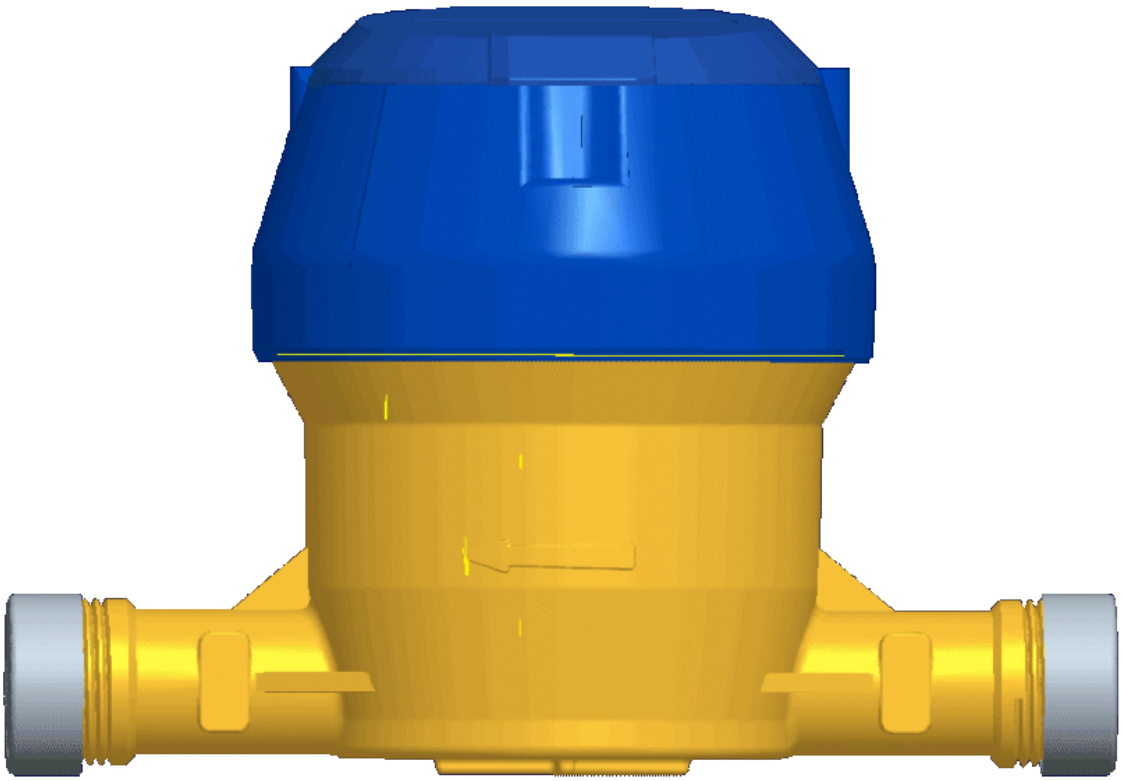


Figure 3 V150 Inline Meter

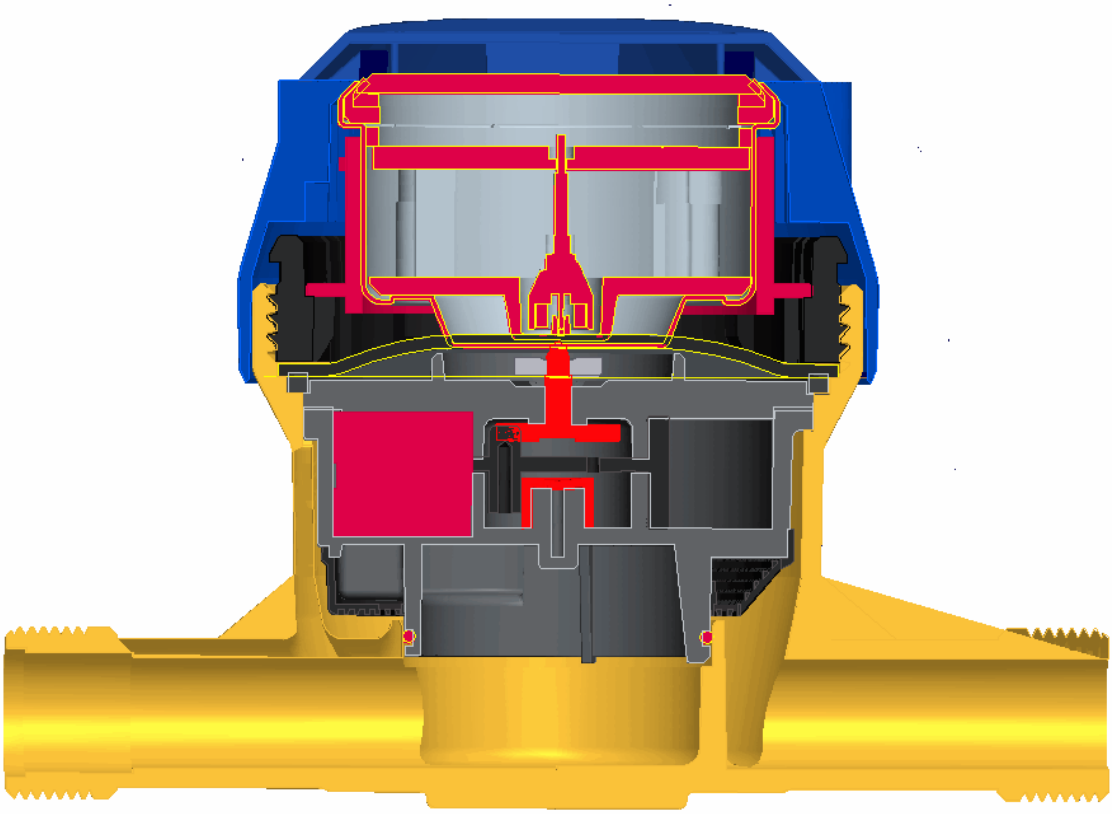


Figure 4 Sectional View of V150 Inline Meter

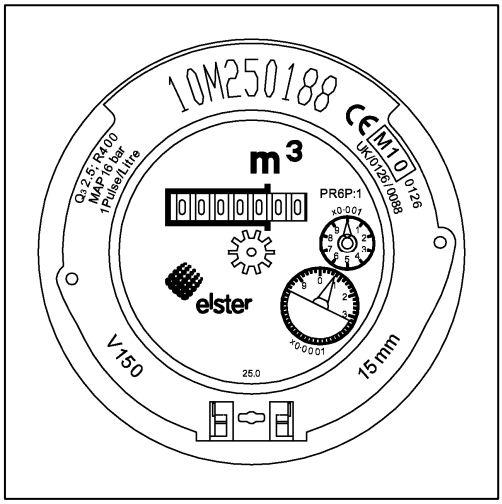


Figure 5 Meter dial markings

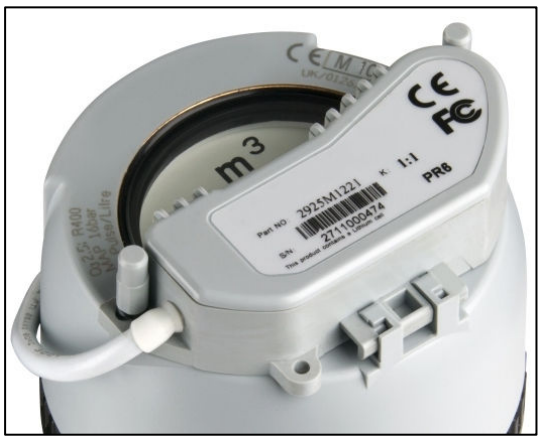


Figure 6 Inductive Sensor

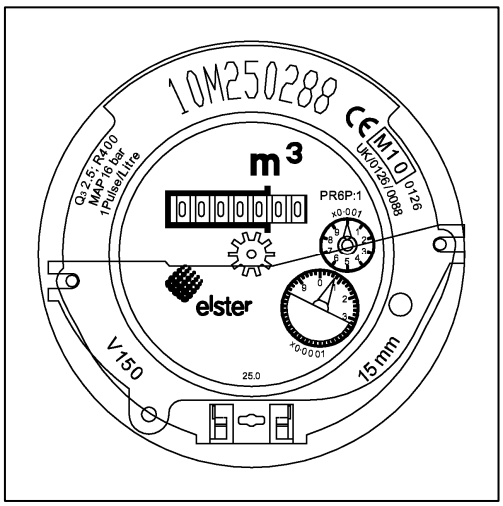


Figure 7 Dial face showing position of Inductive Sensor

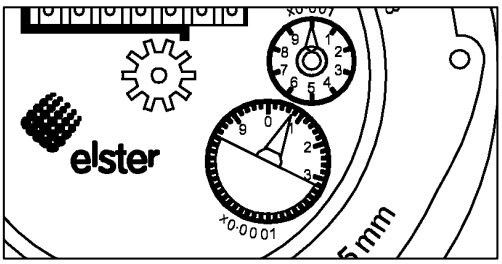


Figure 8 Metallic Plated Inductive Pointer

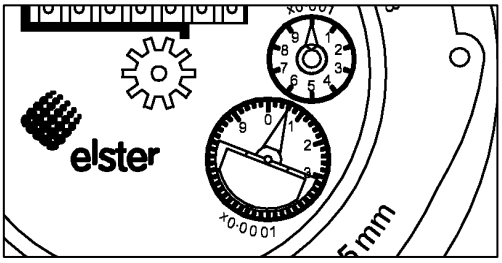


Figure 9 Stainless Steel Insert Inductive Pointer

Figure 10 Reed Switch Sensor

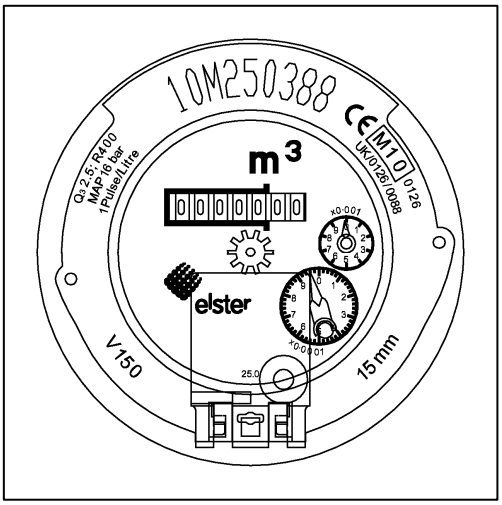
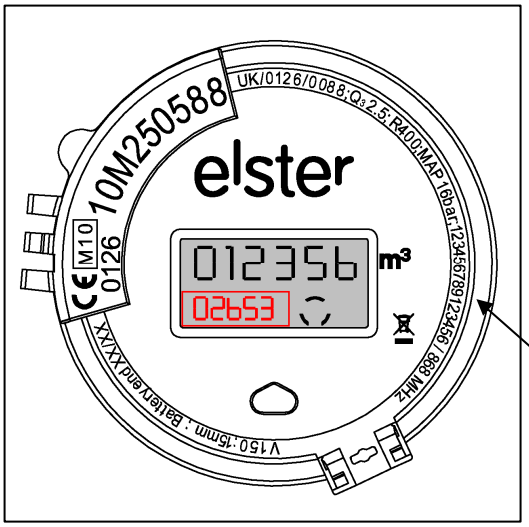


Figure 11 Dial Face showing position of Reed Switch Sensor



Printing of the Radio Address is optional.

Figure 12 Electronic Register with Radio Output.

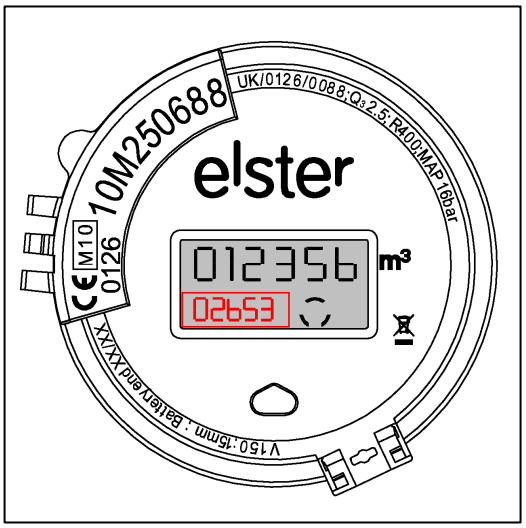
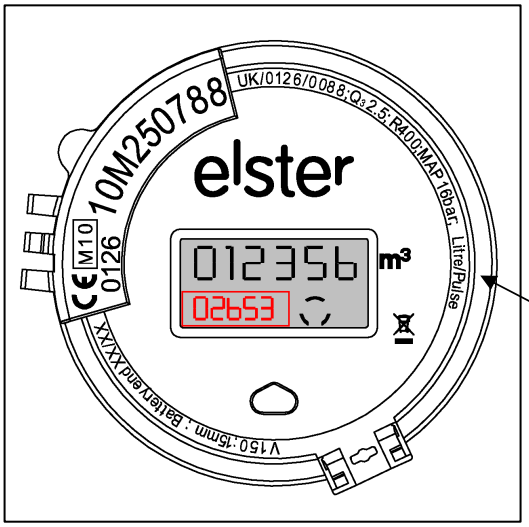


Figure 13 Electronic Register with Encoder Output.



Pulse Weight.

Figure 14 Electronic Register with Pulse Output.

Figure 15 Standard register with additional copper can spacer clamp ring

Figure 16 Alternative register & shroud (MSII - copper can enclosure)

Figure 17 Alternative register & shroud (MSII - polymer enclosure).

Figure 18 Alternative shroud marking for MSII copper can register.

Figure 19 Alternative shroud marking for MSII polymer cased register.

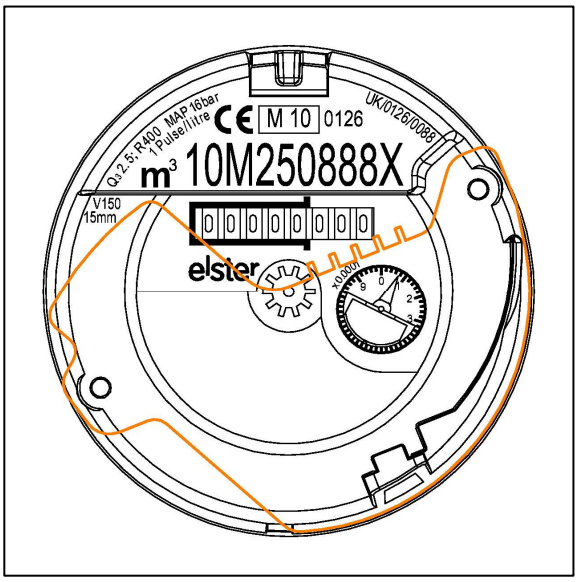


Figure 20 Outline of inductive sensor position on a MSII copper can register's shroud.

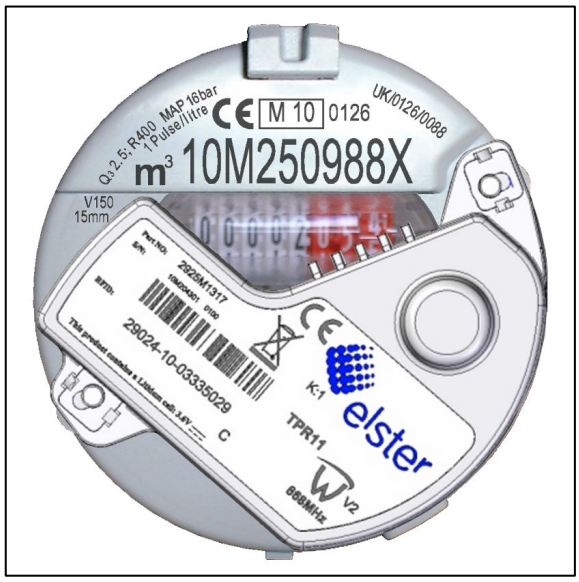


Figure 21 Sketch of inductive sensor mounted on a MSII polymer cased register's shroud.