EU-type examination certificate

Number **T10713** revision 1
Project number: 16200309

Issued by	NMi Certin B.V., designated and notified by the Netherlands to perform tasks with respect to conformity modules mentioned in article 17 of Directive 2014/32/EU, after having established that the Measuring instrument meets the applicable requirements of Directive 2014/32/EU, to:
Manufacturer	Euromag International S.r.l. Via della Tecnica 20 35035 Mestrino (PD) Italy
Measuring instrument	An electromagntic **water meter**

Type	:	MUT2300 and MUT2200EL with electronic converter MC406M
Measuring range	:	See § 1.2 of the description
Environment classes	:	M1 / E2 / O (installed outdoors)
Temperature range ambient	:	-25 °C / +55 °C
Water temperature class	:	T30 (+0,1 °C / +30 °C)

Further properties are described in the annexes:
– Description T10713 revision 1;
– Documentation folder T10713-2.

Valid until	31 March 2026
Remarks	This revision replaces the earlier version, including its documentation folder.

Issuing Authority **NMi Certin B.V., Notified Body number 0122**
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C. Oosterman
Head Certification Board

NMi Certin B.V.
Hugo de Grootplein 1
3314 EG Dordrecht
The Netherlands
T +31 78 6332332
certin@nmi.n
www.nmi.nl

INSPECTION RvA I 122

1 General information on the water meter

All properties of this water meter, whether mentioned or not, shall not be in conflict with the legislation.

1.1 Essential parts

The cylindrical measuring tube of the measurement sensor can have a reduced bore (type MUT2300) or a full bore (type MUT2200EL).

Description	Documents	Remarks
Measurement sensor	10713/1-01, 10713/1-02	The inside of the cylindrical measuring tube is covered with an insulating liner. Through the liner, the 4 electrodes are in contact with the liquid. The flow sensor is equipped with a magnetic circuit containing 2 electromagnetic coils.
Calculator and indicating device	10713/1-03, 10713/0-03, 10713/0-04	Signal converter and meter reading. Used to drive the magnetic spools and convert the electrode voltage to a flow rate.

1.2 Essential characteristics

1.2.1 Flow characteristics of reduced bore type MUT2300

Meter size	Ø in- and outlet [mm]	Flow rates [m³/h]				Ratio Q3/Q1
		Minimum Q1	Transitional Q2	Permanent Q3	Overload Q4	
DN50	50	0,125	0,2	25	31,25	200
DN65	65	0,2	0,32	40	50	200
DN80	80	0,315	0,504	63	78,75	200
DN100	100	0,5	0,8	100	125	200
DN125	125	0,8	1,28	160	200	200
DN150	150	1,25	2	250	312,5	200
DN200	200	3,15	5,04	630	787,5	200
DN250	250	5	8	1000	1250	200
DN300	300	8	12,5	1000	1250	125

Please note that the flow rates Q1, Q2, Q3 and Q4 can be freely chosen as long as:
- Values mentioned for Q1 and Q2 are minimum values and the ratio Q2/Q1 = 1,6;
- Values mentioned for Q3 and Q4 are maximum values and the ratio Q4/Q3 = 1,25;
- The ratio Q3/Q1 is at least 40.

1.2.2 Flow characteristics of full bore type MUT2200EL

Meter size	Ø in- and outlet [mm]	Flow rates [m³/h]				Ratio Q3/Q1
		Minimum Q1	Transitional Q2	Permanent Q3	Overload Q4	
DN50	50	0,315	0,504	63	78,75	200
DN65	65	0,5	0,8	100	125	200
DN80	80	0,8	1,28	160	200	200
DN100	100	1,25	2	250	312,5	200
DN125	125	2	3,2	400	500	200
DN150	150	3,15	5,04	630	787,5	200
DN200	200	5	8	1000	1250	200
DN250	250	8	12,8	1600	2000	200
DN300	300	10	16	1600	2000	160

Please note that the flow rates Q1, Q2, Q3 and Q4 can be freely chosen as long as:
- Values mentioned for Q1 and Q2 are minimum values and the ratio Q2/Q1 = 1,6;
- Values mentioned for Q3 and Q4 are maximum values and the ratio Q4/Q3 = 1,25;
- The ratio Q3/Q1 is at least 40.

1.2.3 Maximum admissible pressure (MAP)
- 1,6 MPa (16 bar)

1.2.4 Orientation limitation
The sensor can be used in horizontal, vertical or diagonal position.

1.2.5 Flow profile sensitivity class
- U0 and D0 (0 x DN upstream and 0 x DN downstream)

1.2.6 Reverse flow
The water meter is designed to measure reverse flow. The reverse flow is recorded on a separate volume totalization. Also for reverse flow another pulse output is used.

1.2.7 Pressure loss class
- Δp 10 (0,010 MPa or 0,10 bar) for all sizes of full bore type MUT2200EL;
- Δp 25 (0,025 MPa or 0,25 bar) for sizes < DN80 of reduced bore type MUT2300;
- Δp 40 (0,040 MPa or 0,40 bar) for sizes ≥ DN80 of reduced bore type MUT2300.

1.2.8 Measuring principle
The magnetic field, generated through the 2 magnetic coils, induces a voltage across the flowing (conductive) liquid (Faraday's law for conductors moving through a magnetic field).
This induced voltage is measured with the 2 electrodes and is directly proportional to the flow speed. By taking into account the pipe dimensions the flow rate can be calculated, displayed and outputted. By integrating over time the total measured volume can be calculated and displayed.
The other 2 electrodes are used to detect empty pipe and to fix the voltage reference to ground.

1.2.9 Operation and presentation of legal data

The meter is equipped with an electronic LCD display and can be operated using the four push buttons. The display has two lines which can be used for visualization of the totalizer and other options by using the button P3 and P4. See documentation number for operation 10713/0-01.

The display register is built up as followed, where the volume amount in whole cubic meters are presented at the first line and the decimals of the cubic meters (after the comma) are presented at the second line.

Display of reduced bore type MUT2300:

Meter size	Indicating range [m³]	Verification scale interval [m³]
DN50	9 999 999	0,0001
DN65, DN80, DN100, DN125, DN150	9 999 999	0,001
DN200, DN250, DN300	9 999 999	0,01

Display of full bore type MUT2200EL:

Meter size	Indicating range [m³]	Verification scale interval [m³]
DN50, DN65, DN80, DN100	9 999 999	0,001
DN125, DN150, DN200, DN250, DN300	9 999 999	0,01

The following volume totalizers are used (herewith the partial totalizer is resetable):
- Total positive totalizer (T+)
- Total negative totalizer (T-)
- Partial positive totalizer (P+)
- Partial negative totalizer (P-)

1.2.10 Accountable alarms

During the measuring process the calculator and indicating device detects automatically if a fault condition occours and eventually stops the measurement reporting an alarm indication on the display. See documentation number 10713/0-01.

1.2.11 Software specification (refer to WELMEC guide 7.2):

- Software type P;
- Risk Class C;
- Extension D, while extensions L, T and S are not applicable.

Indentification	Software versions	CRC Checksum	Remarks
Bootloader	01.00	63A2EDED	Dated 29/01/2016

Indentification	Software versions	CRC Checksum	Remarks
Legally relevant firmware	01.05	CAA8A4C7	Dated 19/02/2016

With the user interface it is possible to display:
- the firmware version and the CRC value by pressing together P1 and P4 buttons. The firmware version and the CRC value will be showed after the display test.
- the download records by pressing together P1 and P3 buttons and step through the download entries using P3 and P4 buttons.

1.3 Essential shapes

1.3.1 Markings

See documentation number 10713/1-04 for an example. The following inscriptions shall be clearly marked on the water meter:
- The CE-marking and the supplementary metrological marking (M + last two digits of the year in which the instrument has been placed on the market);
- Identification number of the notified body responsible for placing on the market (MID conformity assessment modules D or F);
- This EU-type examination certificate number: T10713;
- Manufacturers name or trade mark;
- Manufacturers postal address;
- Type;
- Year of manufacture and a serial number;
- The permanent flow rate Q3;
- The ratio between Q3 and Q1. This may be indicated as R followed by the ratio;
- The maximum working pressure, indicated as MAP followed by the max. pressure;
- Maximum water temperature, indicated as T30;
- Environmental classification;
- Electromagnetic environmental classification;
- The latest date by which the water meter has to be replaced.

1.3.2 Further inscriptions
- An arrow indication the positive direction of the water flow is placed on the measurement sensor.
- For clarification of the totalizers, the following is stated on the name plate:
  - T = Non-resettable
  - P = Resettable

1.3.3 EMI protection measures
- Grounding of the measurement sensor;
- Shielded cables of the I/O cables;
- Grounding of the shielded I/O cables at the receiving side.

1.4 Conditional parts

1.4.1 Power supply

The water meter is powered by means of a replaceable battery of 3,6 V (operating range: 2,9 - 3,7 V).

1.4.2 Housing
The housing of the calculator and indicating device is made of plastic. Optionally an utility or installation seal may be used for securing housing against opening and access to the battery and cable connections. See documentation number 10713/1-01, 10713/1-02 and 10713/1-03.

1.5 Conditional characteristics

1.5.1 Programming
All parameters that influence the determination of the results of measurements are protected on the EEPROM. These can only be changed if the hardware switch located inside the electronics unit is set to open.

1.6 Conditional shapes

1.6.1 Cylindrical pipe
The cylindrical pipe is constructed so that the combination of material and wall thickness is such that the influence due to changing liquid pressure is negligible.

1.7 Non essential parts

- Pulse output cable can be used for forward and reverse flow.

2 Seals

The following seals are applied:
- The data plate is fixed to the water meter and secured against removal by seal or it will be destroyed when removed.
- The hardware switch located inside the electronics unit is sealed against activation and changing the parameters on the EEPROM. See documentation number 10713/0-06.
- Optionally an utility or installation seal may be used for securing housing against opening and access to the battery and cable connections. See documentation number 10713/1-01 and 10713/1-02.

3 Conditions for Conformity Assessment

- At the initial verification the performance of the water meter has to be determined at least at Q1, Q2 and Q3.
- Bi-directional flow measurement
  During conformity assessment it is sufficient to verify a bi-directional meter only in one direction.
- The correct parameters shall be set by the manufacturer, including the pulse value (if used) suitable for the application and not exceeding the maximum frequency of 100 Hz.