



EU-TYPE EXAMINATION CERTIFICATE

Number: TCM 142/20 - 5700

Addition 2

This addition replaces all previous versions of this certificate in full wording.

Page 1 from 12 pages

In accordance: with Directive 2014/32/EU of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments (implemented in Czech Republic by Government Order No. 120/2016 Coll.).

Manufacturer: MADDALENA S.p.A.
Via G.B. Maddalena 2/4
33040 Povoletto (UD)
Italy

For: water meter - single jet, dry dial
Type: SJ; SJ Plus; SJ Evo; Electro SJ

Accuracy class: 2
Temperature class: T30, T50 or T30/90

Valid until: 13 January 2030

Document No: 0511-CS-A001-20

Description: Essential characteristics, approved conditions and special conditions, if any, are described in this certificate.

Date of issue: 20 January 2022

Certificate approved by:




RNDr. Pavel Klenovský

1 Characteristics of instrument

The water meters type SJ; SJ Plus, SJ Evo and Electro SJ are designed to measure, memorise and display the volume at metering conditions of water passing through the measurement transducer in the sense of the Directive 2014/32/EU of the European Parliament and of the Council of the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments (implemented in Czech Republic by Government Order No. 120/2016 Coll.), as amended.

The single jet water meters types SJ; SJ Plus, SJ Evo and Electro SJ consist of a brass body with connecting threads and an inlet filter, a wet measuring part included a plastic rotary turbine, stainless steel shafts, a magnetic coupling, sapphire stone bearings, an O-ring and spacer ring, a pressure plate and a threaded ring, a dry indicating device inside plastic cover, plastic seal ring connecting the indicating device to the body.

The indicating device is dry and mechanical (types SJ; SJ Plus, SJ Evo) or electronic (type Electro SJ). The mechanical one is formed by numbered rollers with five black drums displaying volume in cubic meters and three red drums and one red rotary pointer displaying smaller submultiples of cubic meters. There is star wheel with six arms which can be used for rapid testing in mechanical indicating device.

Adjustment is enabled by the angular orientation of the pressure plate. The lower side of the pressure plate is divided into sectors. The separating plate is secured by the seal ring.

The water meters type SJ Plus can be equipped by a pulse emitter and type SJ Evo can be equipped by a radio emitter or others optionally or both pre-equipped for a further installation. This emitter are not part of this certification.

The water meters type SJ; SJ Plus, SJ Evo and Electro SJ shall be installed to operate in horizontal position with the indicating device at the top or on side or in vertical position with flow from bottom to top and flow from top to bottom, in according to the technical information below.

2 Main characteristics

Basic technical data of water meters type SJ; SJ Plus and SJ Evo:

Nominal diameter:		15		20	
Q_1 [m³/h]:		flowrates are shown in Table <i>Basic metrological data (flowrates)</i>			
Q_2 [m³/h]:					
Q_3 [m³/h]:					
Q_4 [m³/h]:					
Q_3 [m³/h]:		1.6	2.5	2.5	4.0
Q_3/Q_1 :	for horizontal position with the indicating device at top (H↑):	100, 80; 63; 50; 40	160, 125, 100, 80; 63; 50; 40	100, 80; 63; 50; 40; 40	160, 125, 100, 80; 63; 50; 40
	for horizontal position with the indicating device at side (H→):	50; 40	80; 63; 50; 40	50; 40	80; 63; 50; 40
	for vertical position with flow from bottom to top (V↑):	40	63; 50; 40	40	63; 50; 40
	for vertical position with flow from top to bottom (V↓):	50; 40	80; 63; 50; 40	50; 40	80; 63; 50; 40
Q_2/Q_1 :		1.6			
Q_3/Q_4 :		1.25			
Accuracy class:		2			
Maximum permissible error for the lower flowrate zone (MPE _l):		±5%			
Maximum permissible error for the upper flowrate zone (MPE _u):		±2% for water having a temperature ≤ 30 °C ±3% for water having a temperature > 30 °C			
Temperature class:		T30, T50 or T30/90			
Water pressure class:		MAP 16			
Pressure loss class:		Δp 63			
Indicating range [m³]:		99 999			
Resolution of the indicating device [dm³]:		0.05			
Resolution of the device for rapid testing [Pulses/L]:		223.2		126.0	
Connection type (screw thread):		G¾ / G¾ or G¾ or G1		G1B or G3/4B	

Flow profile sensitivity class:	U0 D0	
Mounting:	in-line	
Orientation:	horizontal position with the indicating device at top (H↑) horizontal position with the indicating device at side (H→) vertical position with flow from bottom to top (V↑) vertical position with flow from top to bottom (V↓)	
Length [mm]:	110; 115; 120; 130	115; 130
Informations in the table below not certified		
Reed impulse emitter power supply (U_{max} / I_{max}):	max. 24 V / 0.1 A	
Reed impulse emitter K-factor (impulse / L):	0.1 (SJ Plus)	
	1 (SJ Plus Evo)	
Environmental class	B	
Electromagnetic class	E1	
Mechanical class	M1	

Basic technical data of water meters type SJ; SJ Plus and SJ Evo, L = 80 mm:

Nominal diameter:		15	
Q_1 [m³/h]:		flowrates are shown in Table <i>Basic metrological data (flowrates)</i>	
Q_2 [m³/h]:			
Q_3 [m³/h]:			
Q_4 [m³/h]:			
Q_3 [m³/h]:		1.6	2.5
Q_3/Q_1 :	for horizontal position with the indicating device at top (H↑):	63; 50; 40	100, 80; 63; 50; 40
	for horizontal position with the indicating device at side (H→):	40	63; 50; 40
	for vertical position with flow from bottom to top (V↑):	40	63; 50; 40
	for vertical position with flow from top to bottom (V↓):	40	63; 50; 40
Q_2/Q_1 :		1.6	
Q_3/Q_4 :		1.25	
Accuracy class:		2	
Maximum permissible error for the lower flowrate zone (MPE _l):		±5%	
Maximum permissible error for the upper flowrate zone (MPE _u):		±2% for water having a temperature ≤ 30 °C ±3% for water having a temperature > 30 °C	
Temperature class:		T30, T50 or T30/90	
Water pressure class:		MAP 16	
Pressure loss class:		Δp 63	
Indicating range [m³]:		99 999	
Resolution of the indicating device [dm³]:		0.05	
Resolution of the device for rapid testing [Pulses/L]:		223.2	
Connection type (screw thread):		G¾B	
Flow profile sensitivity class:		U0 D0	
Mounting:		in-line	
Orientation:		horizontal position with the indicating device at top (H↑) horizontal position with the indicating device at side (H→) vertical position with flow from bottom to top (V↑) vertical position with flow from top to bottom (V↓)	
Length [mm]:		80	

Informations in the table below not certified	
Reed impulse emitter power supply (U_{max} / I_{max}):	max. 24 V / 0.1 A
Reed impulse emitter K-factor (impulse / L):	0.1 (SJ Plus)
	1 (SJ Plus Evo)
Environmental class	B
Electromagnetic class	E1
Mechanical class	M1

Basic technical data of water meters type Electro SJ (electronic):

Manufacturer:		Maddalena S.p.A.			
Model number:		Electo SJ			
Nominal diameter:		15		20	
Type details:					
Q_1 [m³/h]:		flowrates are shown in Table <i>Basic metrological data (flowrates)</i>			
Q_2 [m³/h]:					
Q_3 [m³/h]:		1.6	2.5	2.5	4.0
Q_4 [m³/h]:		2.0	3.13	3.13	5.0
Q_3/Q_1 :	H↑	100, 80; 63; 50; 40	160, 125, 100, 80; 63; 50; 40	100, 80; 63; 50; 40	160, 125, 100, 80; 63; 50; 40
	H→	50; 40	80; 63; 50; 40	50; 40	80; 63; 50; 40
	V↑	40	63; 50; 40	40	63; 50; 40
	V↓	50; 40	80; 63; 50; 40	50; 40	80; 63; 50; 40
Q_2/Q_1 :		1.6			
Q_4/Q_3 :		1.25			
Measuring principle:		single jet			
Accuracy class:		2			
Maximum permissible error for the lower flowrate zone (MPE_l):		±5 %			
Maximum permissible error for the upper flowrate zone (MPE_u):		±2 % for water having a temperature ≤ 30 °C ±3 % for water having a temperature > 30 °C			
Temperature class:		T30, T50 or T30/90			
Water pressure class:		MAP 16			
Pressure loss class:		ΔP 63			
Reverse flow:		Not designed to measure			
Environmental class:		O			
Electromagnetic environment:		E2			
Mechanical class:		M1			
Maximum admissible temperature [°C]:		90			
Maximum admissible pressure [MPa]:		1.6			
Orientation limitation:		horizontal position with the indicating device at top (H↑) horizontal position with the indicating device at side (H→) vertical position with flow from bottom to top (V↑) vertical position with flow from top to bottom (V↓)			
Indicating range [m³]:		99 999			
Resolution of the indicating device [m³]:		0.007 (in testing mode)		0.012 (in testing mode)	
Resolution of the device for rapid testing [m³]:		148.8		84.0	

EUT testing requirements (OIML R 49-2:2013, 8.1.8):		
Category:	Positive displacement meters and turbine meters	
Case:	B	
Installation details:		
Connection type (screw thread):	G $\frac{3}{4}$ / G $\frac{7}{8}$ or G $\frac{3}{4}$ or G1	G $\frac{3}{4}$ or G1
Minimum straight length of inlet pipe [mm]:	0	
Minimum straight length of outlet pipe [mm]:	0	
Flow profile sensitivity class:	U0D0	
Flow conditioner (details if required):	No	
Mounting:	in line meter	
Orientation:	horizontal position with the indicating device at top (H↑) horizontal position with the indicating device at side (H→) vertical position with flow from bottom to top (V↑) vertical position with flow from top to bottom (V↓)	
Other relevant information:	-	
Length [mm]:	110; 115; 120; 130	115; 130
Installation details (electrical):		
Wiring instructions:	-	
Mounting arrangement:	-	
Orientation limitations:	-	
Power supply:		
Type (battery, mains AC, mains DC):	battery	
U_{\max} (V):	3.7	
U_{\min} (V):	2.6	
Frequency:	-	
Minimum battery life time [years]:	7 or 13 (optionally)	
Software version (of legally relevant SW):	01.27F	
CRC checksum (of legally relevant SW):	d7Ab21C4	
Other specification of software:		
Specific requirements for embedded software for built-for-purpose measuring instrument (type P)		
Extension I1: Water meters		
Extension S: Software separation		

Table Basic metrological data (flowrates)

Nominal diameter:	15	15	20	20	15	15	20	20	15	15	20	20
Q_1 [m ³ /h]:	-	0.0156	-	0.025	-	0.020	-	0.032	0.016	0.025	0.025	0.040
Q_2 [m ³ /h]:	-	0.025	-	0.040	-	0.032	-	0.0512	0.0256	0.040	0.040	0.064
Q_3 [m ³ /h]:	-	2.5	-	4.0	-	2.5	-	4.0	1.6	2.5	2.5	4.0
Q_4 [m ³ /h]:	-	3.125	-	5.0	-	3.125	-	5.0	2.0	3.125	3.125	5.0
Q_3/Q_1 :	160				125				100			

Nominal diameter:	15	15	20	20	15	15	20	20	15	15	20	20
Q_1 [m ³ /h]:	0.020	0.0313	0.0313	0.050	0.0254	0.0397	0.0397	0.063	0.032	0.050	0.050	0.080
Q_2 [m ³ /h]:	0.032	0.050	0.050	0.080	0.0406	0.0635	0.0635	0.102	0.0512	0.080	0.080	0.128
Q_3 [m ³ /h]:	1.6	2.5	2.5	4.0	1.6	2.5	2.5	4.0	1.6	2.5	2.5	4.0
Q_4 [m ³ /h]:	2.0	3.125	3.125	5.0	2.0	3.125	3.125	5.0	2.0	3.125	3.125	5.0
Q_3/Q_1 :	80				63				50			

Nominal diameter:	15	15	20	20
Q_1 [m ³ /h]:	0.040	0.0625	0.0625	0.100
Q_2 [m ³ /h]:	0.064	0.100	0.100	0.160
Q_3 [m ³ /h]:	1.6	2.5	2.5	4.0
Q_4 [m ³ /h]:	2.0	3.125	3.125	5.0
Q_3/Q_1 :	40			

3 Tests

Technical tests of the water meters type SJ; SJ Plus and SJ Evo were performed in compliance with the International Recommendation OIML R 49 Edition 2013 (E) with conformity to ISO 4064, Test Report No. 6015-PT-P0037-19, No. 6015-PT-P0034-20 20 and Type Evaluation Report No. 0511-ER-V073-21 (with related Test Reports No. 6015-PT-P00xx-21, EMC test report No. 8551-PT-E0300-21 and Software validation Test Report No. 6011-PT-SW025-21 according to WELMEC 7.2, 2020).

4 Conformity marks and inscription

The water meters type SJ; SJ Plus and SJ Evo shall be clearly and indelibly marked with the following information:

- Water meter type (on plastic seal or via laser marking on the dial)
- Unit of measurement (m³)
- Numerical value Q_3 in m³/h ($Q_3 \times \times$) and the ratio Q_3 / Q_1 ,
- EU-type examination certificate number (on plastic seal or via laser marking on the dial)
- Manufacturer's name, registered trade name or registered trade mark
- Post address of manufacturer
- Year of manufacture, two last digits of the year of manufacture, or the month and year of manufacture
- Serial number (as near as possible to the indicating device)
- Direction of flow, by means of an arrow (shown on both sides of the body or on one side only provided the direction of flow arrow is easily visible under all circumstances)
- Maximum admissible pressure (MAP $\times \times$)
- Letter H \uparrow (horizontal position with the indicating device at the top), H \rightarrow (horizontal position with the indicating device at the side), V \uparrow (vertical position with flow from bottom to top), V \downarrow (vertical position with flow from top to bottom)
- The temperature class (T $\times \times$)
- The pressure loss class ($\Delta P \times \times$)
- CE marking and metrology marking in line with the Directive 2014/32/EU

There are additional data required for water meter with the electronic indicating device:

- For a non-replaceable battery: the latest date by which the meter shall be replaced
- Environmental classification (B or O)
- Electromagnetic environmental class (E2)
- Software version / checksum (on digital display)

There are additional data required for water meter equipped with a pulse emitter or a radio emitter, if appropriate:

- Output signals for ancillary devices (type / levels)
- External power supply requirements (voltage – frequency)

These markings shall be visible without dismantling the water meter after the instrument has been placed on the market or put into use. Example is in Figure 2.

5 Additional specifications

The water meters type SJ; SJ Plus, SJ Evo and Electo SJ shall be put onto the market in line with the procedure of conformity assessment according to the Annex D or F of the Directive 2014/32/EU as well as in compliance with the technical description of this report and shall be tested in accordance with the requirements determined in ISO 4064-1:2017, respectively OIML R 49-1:2013.

A metrological test may only be performed by a producer, or a notified body respectively in line with the conformity assessment procedure by the D or F Annexes of the Directive 2014/32/EU, respectively.

6 Ensuring the integrity of the instruments

The water meter type SJ, SJ Plus and SJ Evo is secured by means of a plastic cover with the indicating device fitted to the body by a plastic seal ring, identified by security mark and sealed by sealing ribs. The sealing is described in Figure 1.

If the meter is equipped by the reed impulse transmitter or the inductive sensor the seal of the sensor with the meter is guaranteed with a sticker (Figure 1).

The indicating device of Electo SJ is secured to brass body by means of a white plastic ring according to drawing (Figure 1).

7 Drawing of the instrument

Water meters type SJ; SJ Plus, SJ Evo and Electo SJ are manufactured according to the technical documentation of manufacturer. Technical documentation contains following drawings:

Document reference	Date	Brief description
22500148	28.10.2019	SJ Plus/Evo DN15 - gears
22500149	28.10.2019	SJ Plus/Evo DN20 - gears
22500154	13.11.2019	SJ Plus/Evo DN20 – exploded view
22500157	5.8.2018	SJ Plus/Evo – external view, sealing
22500179	4.12.2019	SJ – dial plate
22500180	4.9.2019	SJ Plus/Evo DN15 – body L = 80 mm
22500181	4.9.2019	SJ Plus/Evo DN15 – body L = 110 mm
22500182	4.9.2019	SJ Plus/Evo DN15 – body L = 115 mm
22500183	22.11.2019	SJ Plus/Evo DN15 – body L = 115 mm (G7/8" - > G 3/4")
22500184	22.11.2019	SJ Plus/Evo DN20 – body L = 115 mm (G1")
22500185	4.9.2019	SJ Plus/Evo DN15 – body L = 120 mm
22500186	4.12.2019	SJ Plus – dial plate with pulse emitter
22500197	20.12.2019	SJ Plus/Evo DN20 – body L = 130 mm (G3/4")
22500188	22.11.2019	SJ Plus/Evo DN15 – body L = 130 mm
22500190	4.12.2019	SJ Evo – dial plate with radio emitter
22500191	4.9.2019	SJ Evo – sealing M-Bus
22500192	31.7.2019	SJ Evo – sealing radio module
22500199	20.12.2019	SJ Plus/Evo DN15 – exploded view
22500198	20.12.2019	SJ Plus/Evo DN20 – exploded view
22500201	20.12.2019	SJ – sealing M-Bus
22500203	24.6.2020	SJ – cover external
22500219	11.11.2021	Electo SJ – dial plate
22500222	09.12.2021	Electo SJ – external view and sealing
22500223	09.12.2021	Electo SJ – exploded view

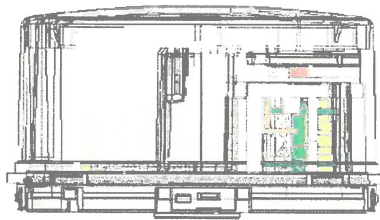
22500233	13.12.2021	Electo SJ – display elements
22600320	10.1.2022	Electo SJ sealing improvement

History of additions

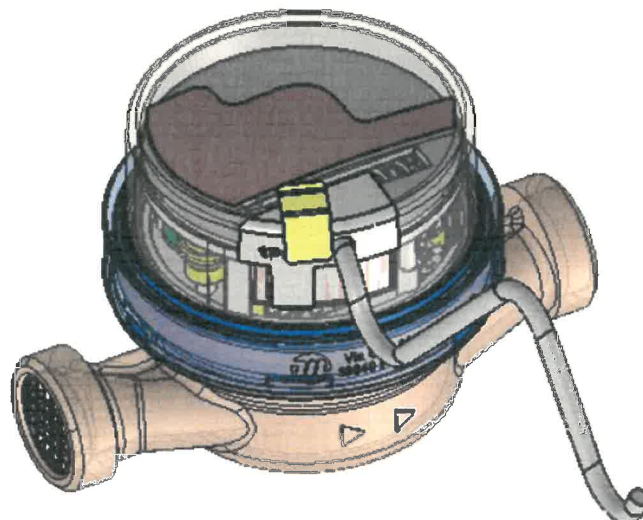
Addition No.	Description
Addition 0	Issuing certificate
Addition 1	Changing UOD0 for DN15 (L = 80 mm) and adding vertical position with flow direction from top to bottom
Addition 2	Adding type Electo SJ with the electronic indicating device

Figure 1: The sealing of the SJ; SJ Plus, SJ Evo and Electo SJ water meter

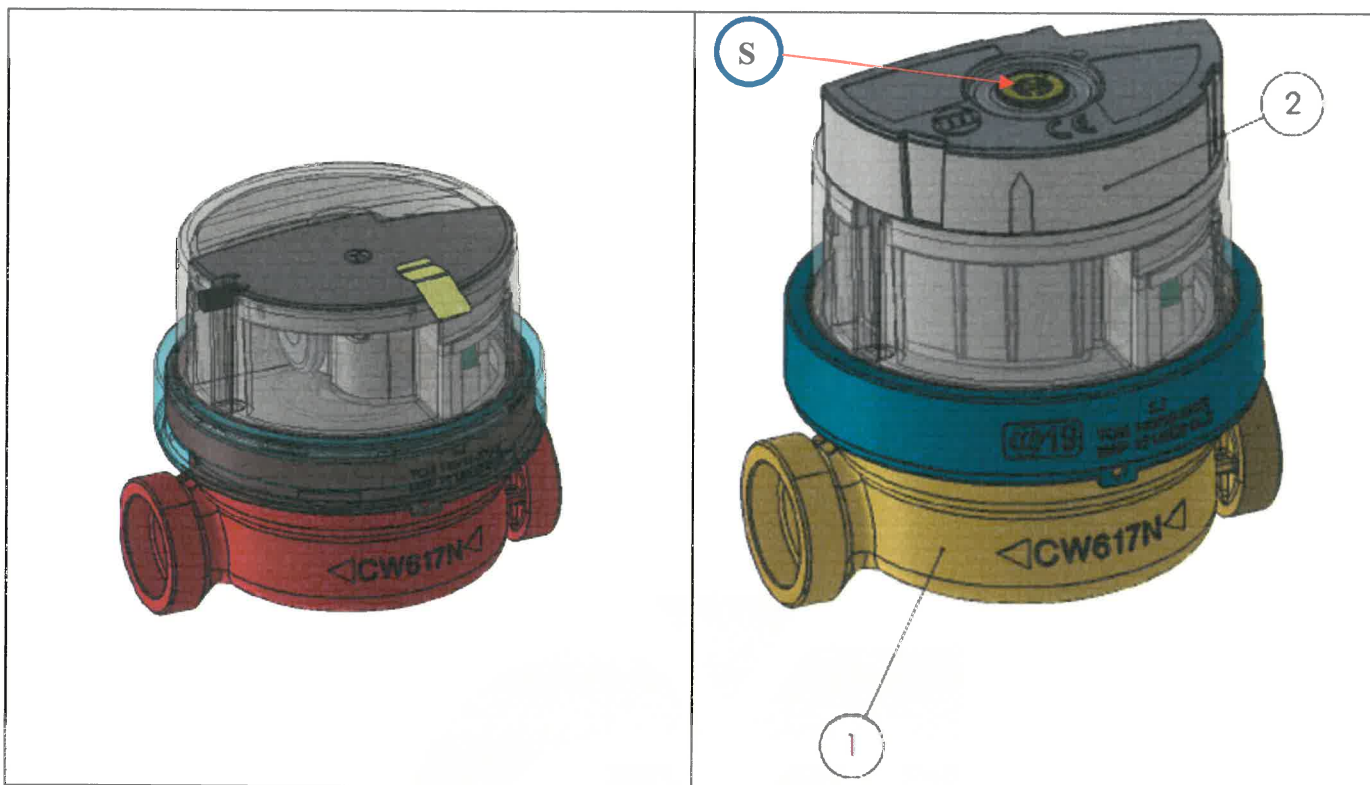
- sealing SJ water meter (Would be can on plastic seal or via laser marking on the dial):



- sealing SJ Plus water meter:



- sealing SJ Evo water meter (detail "S" represent the sticker):

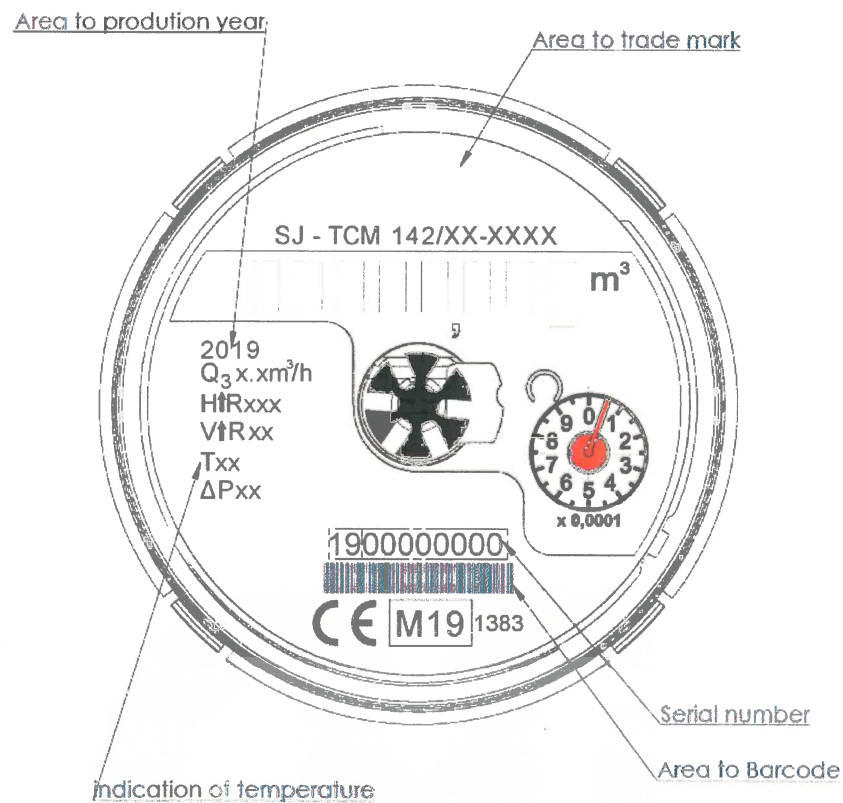


- Electo SJ:

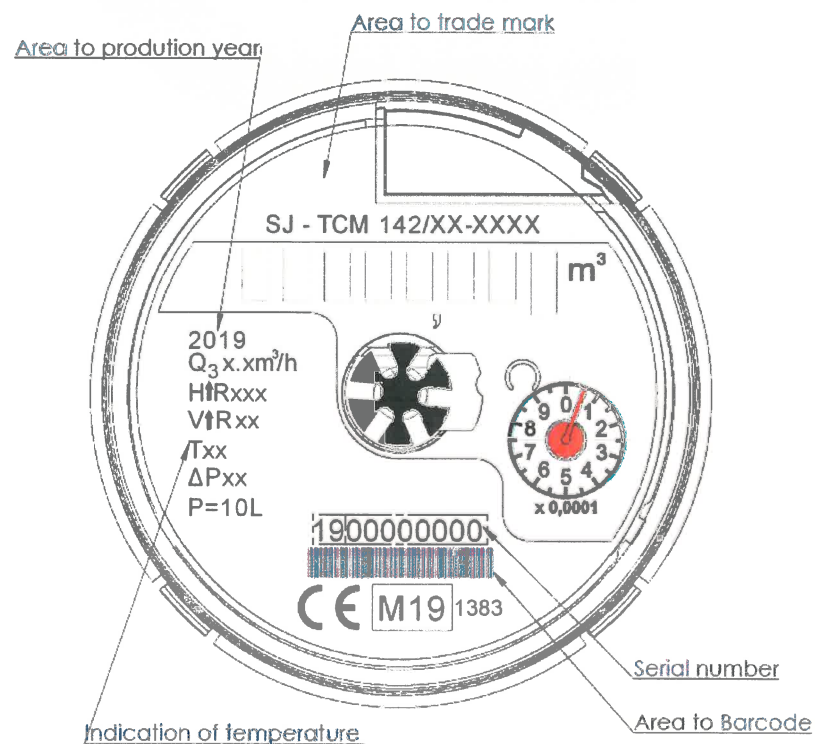


Figure 2: The dial and with the parameters of the SJ; SJ Plus and SJ Evo water meter (Would be can on plastic seal or via laser marking on the dial)

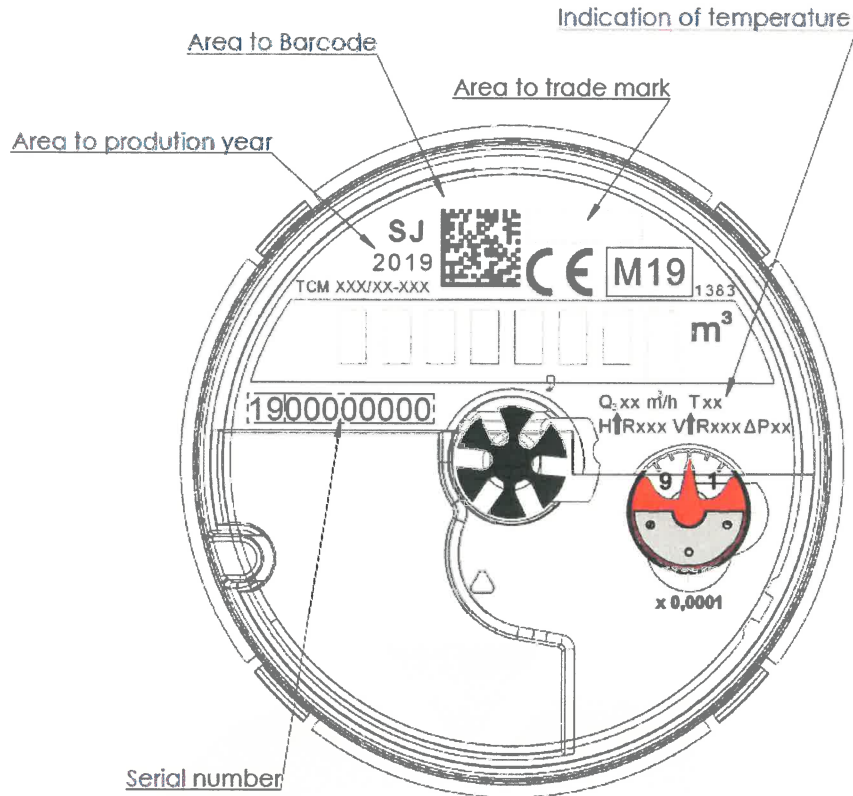
- SJ dial



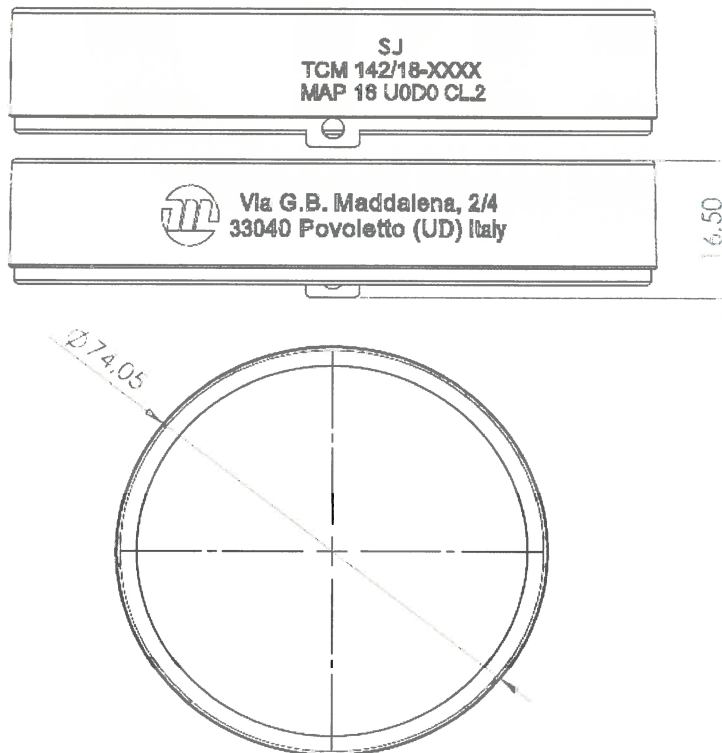
- SJ Plus dial:



- SJ Evo dial:



- the seal ring with marking (the same for all versions):



- Electo SJ (EU-type examination certificate number and post address of manufacturer are shown on the side of cover)

Indications and messages whose meaning can be found in the user manual.

