



OIML Member State
Czech Republic

OIML Certificate No.
R49/2013-A-CZ1-2022.02
Revision 3

OIML CERTIFICATE ISSUED UNDER SCHEME A

OIML Issuing Authority

Name: Czech Metrology Institute
Address: Okružní 31, 638 00 Brno, Czech Republic

Person responsible: Jan Kalandra

Applicant

Name: ISOIL INDUSTRIA SPA
Address: Via F.lli Gracchi, 27; Cinisello Balsamo; 20 099 Italy

Manufacturer

Name: Hemina SPA
Address: Via Piemonte 1, Montagnana – PD; PC: 350 44, Italy

Identification of the certified type *(the detailed characteristics will be defined in the additional pages)*

MS2500 / MV110
MS2500 / MV145

Designation of the module *(if applicable)*

MS2500 / MV110 HV
MS2500 / MV110 LV
MS2500 / MV110 LLV

MS2500 / MV145 HV + lit. battery
MS2500 / MV145 LLV + alk. battery
MS2500 / MV145 LLV + lit. battery

This OIML Certificate attests the conformity of the above identified type (represented by the sample(s) identified in the OIML type evaluation report) with the requirements of the following Recommendation of the International Organization of Legal Metrology (OIML):

OIML R 49

Edition (year): 2013

For accuracy class (if applicable): 1 and 2



This OIML Certificate relates only to metrological and technical characteristics of the type of measuring instrument covered by the relevant OIML Recommendation identified above.

This OIML Certificate does not bestow any form of legal international approval.

The conformity was established by the results of tests and examinations provided in the associated OIML type evaluation report:

- Test report No. 6015-PT-P5009-22 that includes 21 pages including annex 1.
- Test report No. 8551-PT-E0072-22 that includes 15 pages including annexes 1.
- Test report No.6011-PT-SW012-22 that includes 6 pages including annex 1.
- Test report No. 6015-PT-P5001-22 Revision 1 that includes 104 pages including annex 1-4.
- Test report No.6011-PT-SW009-22 that includes 9 pages including annex 1.
- Test report No. 8551-PT-E0041-21 that includes 29 pages including annexes 1.
- Documents concerning type listed in the OIML type evaluation report No. 0511-ER-V053-22 dated 12 August 2022 that includes 209 pages.

No. 0511-ER-V020-23 dated 16th September 2023 that includes 36 pages including annex 1-2.

- Test report No. 6015-PT-P5007-23 that includes 7 pages including annex 1
- Test report No.6011-PT-SW010-23 that includes 6 pages including annex 1

The technical documentation relating to the identified type is contained in documentation file:

0511-UL-V020-23

OIML Certificate History

Revision No.	Date	Description of the modification
Revision 0	26 May 2022	Issuing certificate
Revision 1	13 September 2022	Adding electronics MV145
Revision 2	2 February 2023	Corrected the battery parameters in the electronics MV145 and corrected adding MV145 for DN \geq 200 mm
Revision 3	20 October 2023	Extension up to DN 2000

The OIML Issuing Authority

RNDr. Pavel Klenovský
Head of Certification Body

Date: 20 October 2023



Important note: Apart from the mention of the Certificate's reference number and the name of the OIML Member State in which the Certificate is issued, partial quotation of the Certificate and of the associated OIML type evaluation report(s) is not permitted, although either may be reproduced in full.

Measuring system description

The water meters types MS2500 / MV110 and MS2500 / MV145 are designed to measure, memorise and display the volume at metering conditions of water passing through the measurement transducer.

The water meters type MS2500 / MV110 and MS2500 / MV145 are electromagnetic water meters with an electronic indicating device.

The water meters type MS2500 / MV110 and MS2500 / MV145 consist of sensor and converter water meter in the compact set up or separate version with connecting cable.

The sensor MS2500 of water meter consists of a steel body with connecting flanges, one pair of excitation coils, electrodes and connection to the converter. The sensor can be equipped with several types liners.:

1. with PTFE liner for all sizes DN 25 – DN 2000 to temperature water 90°C
2. with Polypropylene liner for all sizes DN 25 – DN 150 to temperature water 50°C
3. with Rilsan liner for sizes DN 50 – DN 2000 to temperature water 50°C
4. with Ebonite liner for sizes DN 200 – DN 2000 to temperature water 50°C

The converters MV110 or MV145 of water meter consists of the plastic and aluminium body and connection to the sensor. The electronic indicating device is formed by LCD display shown volume and flow. The water meter displays the volume resolution of 0.001 m³ on the digital display. Water meter has three buttons for control water meter. Communication interfaces are with impulse output and current output.

Legally non-relevant part of communication with meter is possible by RS485 output or USB - miniB connected to converter.

Electromagnetic water meter MS2500 / MV110 and MS2500 / MV145 has several security levels by the passwords to entry by bottoms. The user can change the water meter MS2500 / MV110 and MS2500 / MV145 no-legally relevant setting using public passwords write in the manual for water meter MS2500 / MV110 and MS2500 / MV145. Changes to public password assistance settings do not affect to legally relevant software to measure, memorise and display the volume at metering conditions of water passing through the measurement transducer.

The water meters type MS2500 / MV110 have a several modifications according types power supply.

1. The water meter MS2500 / MV110 HV has power supply by main 100 - 240V AC.
2. The water meter MS2500 / MV110 LV has power supply by main 24 – 36V AC/DC.
3. The water meter MS2500 / MV110 LLV has power supply by main 10 – 48V DC.

The water meters type MS2500 / MV145 have a several modifications according types power supply.

1. The water meter MS2500 / MV145 HV + lit. battery has power supply by main 100 – 240V AC with internal backup source 3,7V DC lithium battery.
2. The water meter MS2500 / MV145 LLV + alk. battery has power supply by main 10 – 48V DC with internal backup source 9V DC alk. battery.
3. The water meter MS2500 / MV145 LLV + lit. battery has power supply by main 10 – 48V DC with internal backup source 3.6V DC lithium. Battery Li-SOCI2.

The water meters can be installed to operate in any positions and the internal dimensions of the water meter pipes are always the same for each dimension.

Marking and inscriptions

The water meters types MS2500 / MV110 and MS2500 / MV145 shall be clearly and indelibly marked with the following information:

- Water meter type
- Unit of measurement (m³)
- Numerical value Q₃ in m³/h (Q₃ ×.×) and the ratio Q₃ / Q₁
- OIML certificate of conformity number
- Name of trademark of the manufacturer
- Year of manufacture, two last digits of the year of manufacture, or the month and year of manufacture and 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)
- Serial number (as near as possible to the indicating device)

- Maximum admissible pressure (MAP ××)
- The temperature class (T××)
- The pressure loss class (Δp ××)
- The installation sensitivity class (Ux Dx) – it does not differ from U0 D0
- Power supply
- Environmental classification
- Electromagnetic environmental class
- Software version
- Hardware version
- Accuracy class (Class xx)

These markings shall comply with the requirements of OIML R 49 and shall be visible without dismantling the water meter after the instrument has been placed on the market or put into use.

Characteristics

Basic technical data of water meters types MS2500 / MV110 and MS2500 / MV145, DN 25 to DN 350:

Manufacturer:	Hemina SPA; Via Piemonte 2; Montagnana; 350 44 Italy			
Model number:	MS2500 / MV110; MS2500 / MV145			
Nominal diameter:	25; 32; 40; 50	65; 80;	100; 125; 150;	200; 250; 300; 350
Type details:				
Q_1 [m ³ /h]:	flowrates are shown in Table <i>Basic metrological data (flowrates) for maximum ratio R</i>			
Q_2 [m ³ /h]:				
Q_3 [m ³ /h]:				
Q_4 [m ³ /h]:				
Q_3/Q_1 :	400 for class 2; 250 for class 1			
Q_2/Q_1 :	1.6			
Q_4/Q_3 :	1.25			
Measuring principle:	Electromagnetic water meter			
Accuracy class:	1, 2			
Maximum permissible error for the lower flowrate zone (MPE _l):	±3 % (Class 1) ±5 % (Class 2)			
Maximum permissible error for the upper flowrate zone (MPE _u):	±1 (class 1) ±2 (class 2) % ±2 (class1) ±3 (class 2) %			
Temperature class:	For liner PTFE - T90; T50; T30 For liner Rilsan - T50; T30; from DN50 For liner Ebonite - T50; T30; from DN200 For liner polypropylene - T50; T30			
Water pressure class:	MAP16			
Pressure loss class:	ΔP 40			
Maximum admissible temperature [°C]:	For liners PTFE - 90°C For liner Polypropylen, Rilsan and Ebonite - 50°C			
Maximum admissible pressure [MPa]:	1.6			
Orientation limitation:	any			
Indicating range [m ³]:	99 999	999 999	999 999	9 999 999

<i>Resolution of the indicating device [m³]:</i>	0.000 1	0.001	0.001	0.01
<i>Resolution of the device for rapid testing [m³]:</i>	-			
EUT testing requirements (OIML R 49-2:2013, 8.1.8):				
Category:	Electromagnetic water meter			
Case:	D			
Installation details:				
Connection type (screw thread):	Flanged			
Minimum straight length of inlet pipe [mm]:	0			
Minimum straight length of outlet pipe [mm]:	0			
<i>Flow profile sensitivity class:</i>	U0D0			
Flow conditioner (details if required):	No			
Mounting:				
Orientation:	any			
Length [mm]:	200	200	250/250/300	350/450/500/ 550
<i>Reverse flow:</i>	<i>designed to measure</i>			
Installation details (electrical):				
Wiring instructions:	-			
Mounting arrangement:	-			
Orientation limitations:	-			
<i>Environmental class:</i>	<i>O (-25 to + 55 °C)</i>			
<i>Electromagnetic environment:</i>	<i>E1, E2</i>			
<i>Mechanical class:</i>	<i>B, O</i>			

Basic technical data of water meters types MS2500 / MV110 and MS2500 / MV145, DN 400 to DN 2000:

Manufacturer:	Hemina SPA; Via Piemonte 2; Montagnana; 350 44 Italy			
Model number:	MS2500 / MV110; MS2500 / MV145			
<i>Nominal diameter:</i>	400; 450; 500; 600	700; 800; 900; 1000	1200; 1400; 1600	1800; 2000
Type details:				
Q_1 [m ³ /h]:	flowrates are shown in Table <i>Basic metrological data (flowrates)</i>			
Q_2 [m ³ /h]:				
Q_3 [m ³ /h]:				
Q_4 [m ³ /h]:				
Q_3/Q_1 :	400 for class 2; 250 for class 1	DN 700 – R250; DN 800 - R160; DN 900 - R160; DN 1000 - R100	80	40
Q_2/Q_1 :	1.6			



Q_4/Q_3 :	1.25			
Measuring principle:	Electromagnetic water meter			
Accuracy class:	1 and 2	2	2	2
Maximum permissible error for the lower flowrate zone (MPE _l):	±3 % (Class 1) ±5 % (Class 2)			
Maximum permissible error for the upper flowrate zone (MPE _u):	±1 (class 1) ±2 (class 2) % ±2 (class1) ±3 (class 2) %			
Temperature class:	For liner PTFE - T90; T50; T30 For liner Rilsan - T50; T30; from DN50 For liner Ebonite - T50; T30; from DN200 For liner polypropylene - T50; T30			
Water pressure class:	MAP16			
Pressure loss class:	ΔP 40			
Maximum admissible temperature [°C]:	For liners PTFE - 90°C For liner Polypropylen, Rilsan and Ebonite - 50°C			
Maximum admissible pressure [MPa]:	1.6			
Orientation limitation:	any			
Indicating range [m ³]:	999 999 999			
Resolution of the indicating device [m ³]:	0.01 0.1 (DN 600)	0.1	1	
Resolution of the device for rapid testing [m ³]:	-			
EUT testing requirements (OIML R 49-2:2013, 8.1.8):				
Category:	Electromagnetic water meter			
Case:	D			
Installation details:				
Connection type (screw thread):	Flanged			
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:				
Orientation:	any			
Length [mm]:				
Reverse flow:	designed to measure			
Installation details (electrical):				
Wiring instructions:	-			
Mounting arrangement:	-			
Orientation limitations:	-			
Environmental class:	O (-25 to + 55 °C)			
Electromagnetic environment:	E1, E2			
Mechanical class:	B, O			



Power supply and electrical specification of water meters types MS2500 / MV110-110V and MS2500 / MV145

Power supply and electrical specification			
Manufacturer:	Hemina SPA; Via Piemonte 2; Montagnana; 350 44 Italy		
Model number of electronic:	MS2500 / MV110		
Designation of the module for all nominal diameter	MS2500 / MV110 HV	MS2500 / MV110 LV	MS2500 / MV110 LLV
Type (battery, mains AC, mains DC):	100 – 240 V AC	24 – 36V AC/DC	10 – 48 V DC
Frequency:	45 – 66 Hz	45 – 66 Hz	-
Internal backup source	3,7V DC; 5200mAh; Battery	3,7V DC; 5200mAh; Battery	-
Minimum battery life time [years]:	-	-	-
Software version (of legally relevant SW):	V.1.05.0000.0004		
CRC checksum (of legally relevant SW) CRC-32:	F2476CEF		
Cut-off	0.2 % of Q ₃		
Detection empty pipe	on		
Model number of electronic:	MS2500 / MV145		
Designation of the module for all nominal diameter	MS2500 / MV145 HV + lit. battery rec.	MS2500 / MV145 LLV + alk. battery	MS2500 / MV145 LLV + lit. battery-Li-SOCI2
Type (battery, mains AC, mains DC):	100 – 240 V AC	10 – 48 V DC	10 – 48 V DC
Frequency:	45 – 66 Hz		-
Internal backup source	3.7 V DC; 5200 mAh;	9V DC	3.6V DC;
Minimum battery life time [years]:	-	-	-
Software version (of legally relevant SW):	V.1.06.0000.0005		
CRC checksum (of legally relevant SW)- CRC-32:	EF726D9C		
Cut-off	0.2 %		
Detection empty pipe	on		

Basic metrological data (flowrates) for class 1 and class 2 for maximum ratio R

CLASS 1					
Manufacturer:	Hemina SPA				
Type	MS2500 / MV110				
DN	R	Q ₄ (1,25*Q ₃)	Q ₃	Q ₂ (1,6*Q ₁)	Q ₁ (Q ₃ /R)
	Q_3/Q_1	m^3/h	m^3/h	m^3/h	m^3/h
25	250	20	16	0,10	0,064
32	250	31	25	0,16	0,10
40	250	50	40	0,26	0,16
50	250	78,75	63	0,40	0,25



65	250	125	100	0,64	0,40
80	250	200	160	1,0	0,64
100	250	312,5	250	1,6	1,0
125	250	500	400	2,6	1,6
150	250	787,5	630	4,0	2,5
200	250	1250	1000	6,4	4,0
250	250	2000	1600	10	6,4
300	250	3125	2500	16	10,0
350	250	3125	2500	16	10,0
400	250	5000	4000	26	16
450	250	5000	4000	26	16
500	250	7875	6300	40	25
600	250	12500	10000	64	40

CLASS 2					
Manufacturer:	Hemina SPA				
Type	MS2500 / MV110				
DN	R	Q ₄ (1,25*Q ₃)	Q ₃	Q ₂ (1,6*Q ₁)	Q ₁ (Q ₃ /R)
	<i>Q₃/Q₁</i>	<i>m³/h</i>	<i>m³/h</i>	<i>m³/h</i>	<i>m³/h</i>
25	400	20	16	0,06	0,040
32	400	31	25	0,10	0,063
40	400	50	40	0,16	0,10
50	400	78,75	63	0,25	0,16
65	400	125	100	0,40	0,25
80	400	200	160	0,64	0,40
100	400	312,5	250	1,00	0,63
125	400	500	400	1,60	1,0
150	400	787,5	630	2,52	1,6
200	400	1250	1000	4,00	2,5
250	400	2000	1600	6,40	4,0
300	400	3125	2500	10	6,3
350	400	3125	2500	10	6,3
400	400	5000	4000	16	10
450	400	5000	4000	16	10
500	400	7875	6300	25	16
600	400	12500	10000	40	25
650	400	12500	10000	40	25
700	250	12500	10000	64	40
750	250	12500	10000	64	40
800	160	20000	16000	160	100
900	160	20000	16000	160	100
1000	100	20000	16000	256	160
1200	80	20000	16000	320	200
1400	80	20000	16000	320	200
1600	80	20000	16000	320	200
1800	40	20000	16000	640	400
2000	40	20000	16000	640	400



Securing components and verification marks

The MS2500 / MV110 and MS2500 / MV145 meters have to be sealed according to the design of the water meter compact / separate version.

The converter MV110 and MV145 of water meter compact or separate version have to be sealed by security seal on cover of the mini USB-B and two security seals across the dividing line of the water meter housing on its sides. Installation seals are across the cover of terminal block and housing of convector. The sealing is described in Figure 1.

The compact water meter MS2500 / MV110 and MS2500 / MV145 have to be sealed by security seal on the screw on the bottom of the convector connecting the sensor. The sealing is described in Figure 2.

The separate water meter MS2500/ MV110 and MS2500 / MV145 have to be sealed by security seal on the screw on the bottom of the convector connecting the sensor. Installation seal is across the cover of terminal block and housing of sensor. The sealing is described in Figure 3.

The separate MS2500 / MV110 and MS2500 / MV145 water meter is paired using “*COUP*.” numbers, which can be found on the convector and sensor label. The labels are described in Figure 4.

Explanation of the seal:

Security seal – is a seal to ensure the metrological integrity of the instrument.

Installation seal – is a seal applied by the installer to indicate the integrity of the installation.

Figure 1: The sealing of the convector of water meter MS2500 / MV110 or MS2500 / MV145.

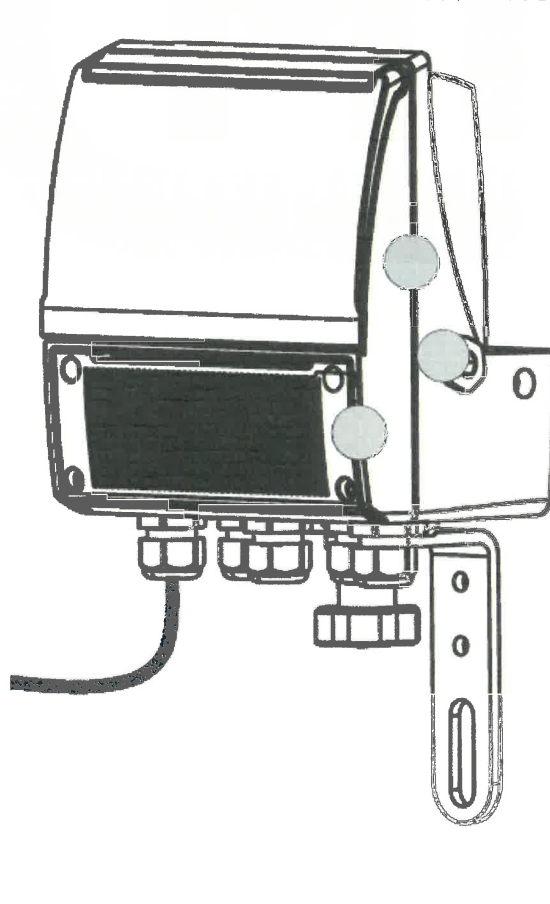


Figure 2: The sealing of the compact water meter MS2500 / MV110 or MS2500 / MV145.

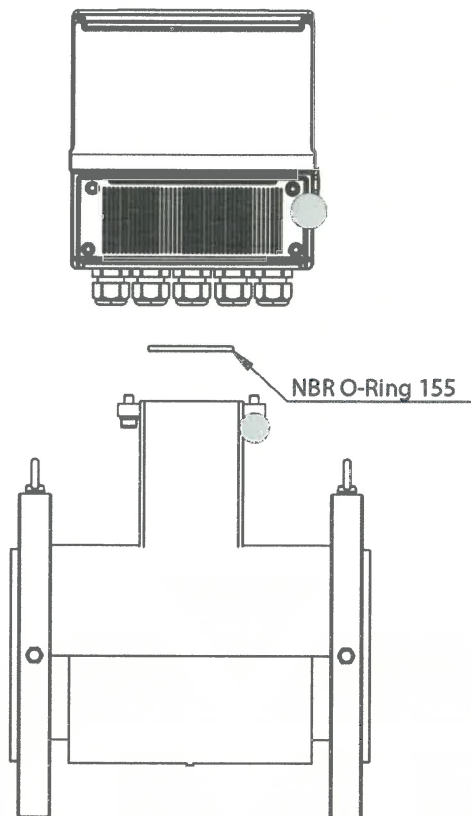


Figure 3: The sealing of the separate water meter MS2500 / MV110 or MS2500 / MV145.

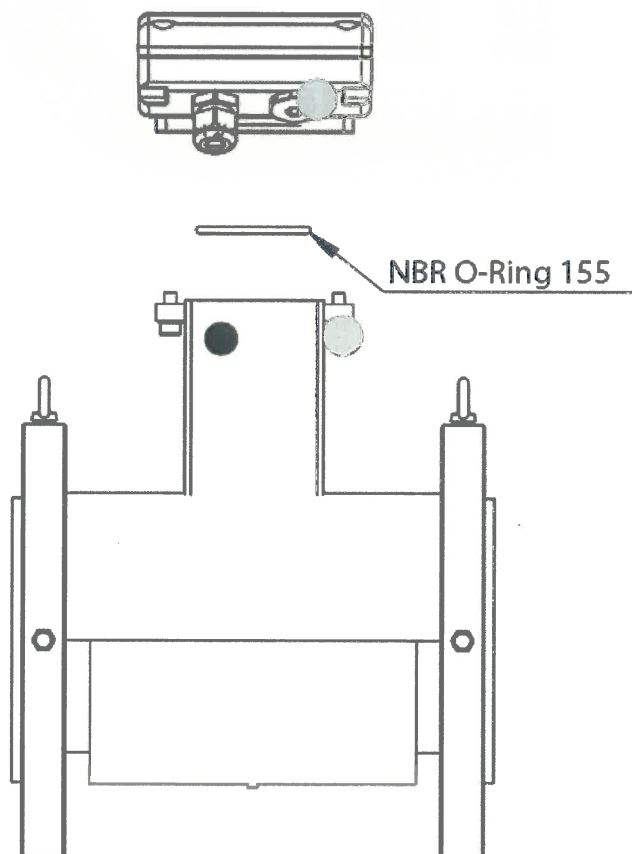
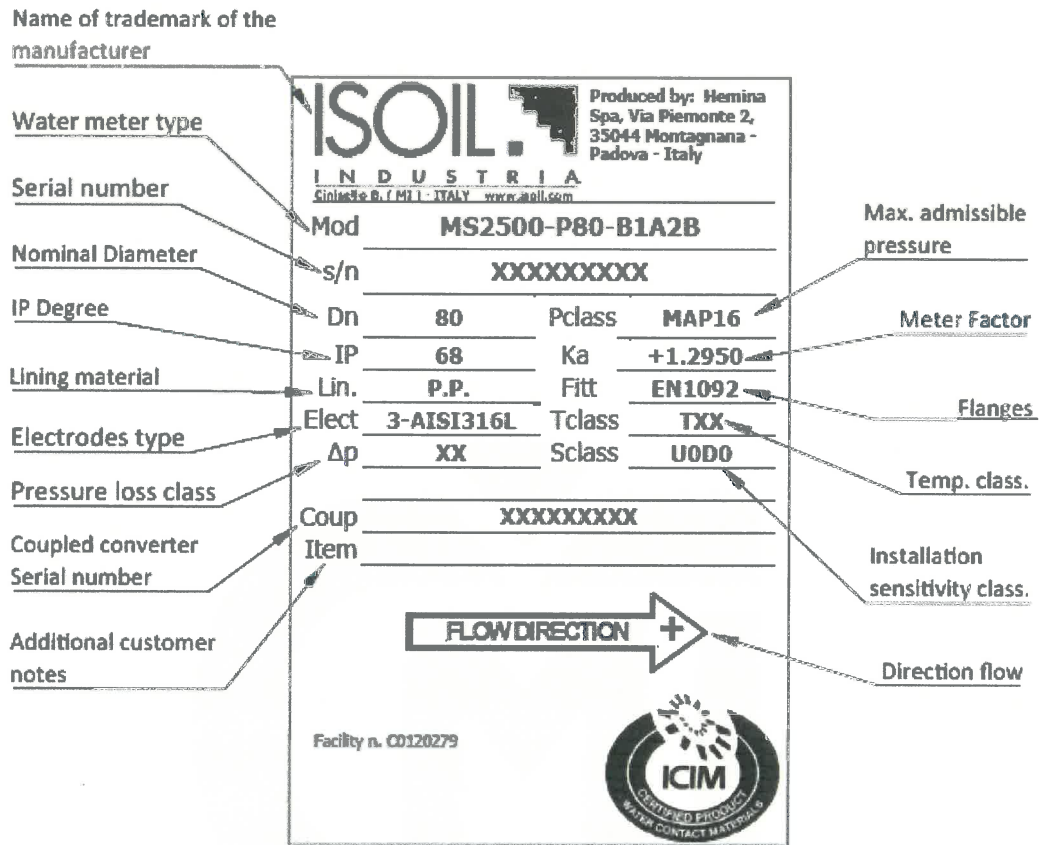


Figure 4: The labels of water meter MS2500 / MV110 or MS2500 / MV145.

MS2500: LABEL DESCRIPTION



MV110: LABEL DESCRIPTION

