		V 3112

OIML Member State Czech Republic	**OIML Certificate No.** R49/2013-A-CZ1-2022.02 Revision 1

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:

- No. 0511-ER-V053-22 dated 10th August 2022 that includes 381 pages including annexes 1-5.
- 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. 6015-PT-P5001-22 that includes 94 pages including annexes 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.

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

0511-UL-V053-22

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

The OIML Issuing Authority
RNDr. Pavel Klenovský
Head of Certification Body

Date: 13 September 2022

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 DN25 - DN350 to temperature water 90°C
2. with Polypropylene liner for all sizes DN25 – DN150 to temperature water 50°C
3. with Rilsan liner for sizes DN50 - DN350 to temperature water 50°C
4.with Ebonite liner for sizes DN200 - DN350 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 modification 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 modification 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 3.7V DC alka. battery.
3. The water meter MS2500 / MV145 LLV + lit.. battery has power supply by main 10 – 48V DC with internal backup source 3.7V DC lithium. battery.

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 (m^3)
- Numerical value Q_3 in m^3/h (Q_3 ×.×) and the ratio Q_3 / Q_1
- 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:

Manufacturer:	Hemina SPA; Via Piemonte 2; Montagnana; 350 44 Italy					
Model number:	MS2500 / MV110; MS2500 / MV145					
Nominal diameter:	*25*		*32*		*40*	
Type details:						
Q_1 [m³/h]:	0.064	0.040	0.100	0.062	0.160	0.100
Q_2 [m³/h]:	0.102	0.064	0.160	0.100	0.256	0.160
Q_3 [m³/h]:	16.00	16.00	25.00	25.00	40.00	40.00
Q_4 [m³/h]:	20.00	20.00	31.25	31.25	50.00	50.00
Q_3/Q_1:	250	400	250	400	250	400
Q_2/Q_1:	1.6					
Q_4/Q_3:	1.25					
Measuring principle:	Electromagnetic water meter					
Accuracy class:	1	2	1	2	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) % for water having a temperature ≤ 30 °C ±2 (class1) ±3 (class 2) % for water having a temperature > 30 °C					
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:	*Δp40*		*Δp40*		*Δp40*	
Reverse flow:	*designed to measure*					
Environmental class:	*O (-25 to + 55 °C)*					
Electromagnetic environment:	*E1, E2*					
Mechanical class:	*B, O*					

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*	*99 999*	*99 999*
Resolution of the indicating device [m^3]:	*0.000 1*	*0.000 1*	*0.000 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:	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		
Other relevant information:	-		
Length [mm]:	*200*	*200*	*200*
Installation details (electrical):			
Wiring instructions:	-		
Mounting arrangement:	-		
Orientation limitations:	-		
Power supply:			
Information are shown in Table *Power supply and electrical specification*			

Manufacturer:	Hemina SPA; Via Piemonte 2; Montagnana; 350 44 Italy					
Model number:	MS2500 / MV110; MS2500 / MV145					
Nominal diameter:	*50*		*65*		*80*	
Type details:						
Q_1 [m^3/h]:	0.252	0.158	0.400	0.250	0.640	0.400
Q_2 [m^3/h]:	0.403	0.252	0.640	0.400	1.024	0.640
Q_3 [m^3/h]:	63.0	63.0	100	100	160	160
Q_4 [m^3/h]:	73.0	73.0	125	125	200	200
Q_3/Q_1:	250	400	250	400	250	400
Q_2/Q_1:	1.6					
Q_4/Q_3:	1.25					
Measuring principle:	Electromagnetic water meter					
Accuracy class:	1	2	1	2	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) % for water having a temperature ≤ 30 °C ±2 (class1) ±3 (class 2) % for water having a temperature > 30 °C					
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:	*Δp40*		*Δp40*		*Δp40*	
Reverse flow:	*designed to measure*					
Environmental class:	*O (-25 to + 55 °C)*					
Electromagnetic environment:	*E1, E2*					
Mechanical class:	*B, O*					
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*	
Resolution of the indicating device [m^3]:	*0.000 1*		*0.001*		*0.001*	
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:	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		
Other relevant information:	-		
Length [mm]:	*200*	*200*	*200*
Installation details (electrical):			
Wiring instructions:	-		
Mounting arrangement:	-		
Orientation limitations:	-		
Power supply:			
Information are shown in Table *Power supply and electrical specification*			

Manufacturer:	Hemina SPA; Via Piemonte 2; Montagnana; 350 44 Italy					
Model number:	MS2500 / MV110; MS2500 / MV145					
Nominal diameter:	*100*		*125*		*150*	
Type details:						
Q_1 [m³/h]:	1.00	0.63	1.60	1.00	2.52	1.60
Q_2 [m³/h]:	1.60	1.00	2.56	1.60	4.03	1.56
Q_3 [m³/h]:	250	250	400	400	630	630
Q_4 [m³/h]:	313	313	500	500	780	780
Q_3/Q_1:	250	400	250	400	250	400
Q_2/Q_1:	1.6					
Q_4/Q_3:	1.25					
Measuring principle:	Electromagnetic water meter					
Accuracy class:	1	2	1	2	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) % for water having a temperature ≤ 30 °C ±2 (class1) ±3 (class 2) % for water having a temperature > 30 °C					
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:	*Δp40*		*Δp40*		*Δp40*	
Reverse flow:	*designed to measure*					
Environmental class:	*O (-25 to + 55 °C)*					
Electromagnetic environment:	*E1, E2*					

Mechanical class:	*B, O*		
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*	*999 999*	*999 999*
Resolution of the indicating device [m^3]:	*0.001*	*0.001*	*0.001*
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:	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		
Other relevant information:	-		
Length [mm]:	*250*	*250*	*300*
Installation details (electrical):			
Wiring instructions:	-		
Mounting arrangement:	-		
Orientation limitations:	-		
Power supply:			
Information are shown in Table *Power supply and electrical specification*			

Manufacturer:	Hemina SPA; Via Piemonte 2; Montagnana; 350 44 Italy					
Model number:	MS2500 / MV110					
Nominal diameter:	*200*		*250*		*300*	
Type details:						
Q_1 [m^3/h]:	4.0	2.5	6.4	4.0	6.4	4.0
Q_2 [m^3/h]:	6.4	4.0	10.2	6.4	10.2	6.4
Q_3 [m^3/h]:	1000	1000	1600	1600	1600	1600
Q_4 [m^3/h]:	1250	1250	2000	2000	2000	2000
Q_3/Q_1:	250	400	250	400	250	400
Q_2/Q_1:	1.6					
Q_4/Q_3:	1.25					
Measuring principle:	Electromagnetic water meter					
Accuracy class:	1	2	1	2	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) % for water having a temperature ≤ 30 °C ±2 (class1) ±3 (class 2) % for water having a temperature > 30 °C					
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:	*Δp40*		*Δp40*		*Δp40*	
Reverse flow:	*designed to measure*					
Environmental class:	*O (-25 to + 55 °C)*					
Electromagnetic environment:	*E1, E2*					
Mechanical class:	*B, O*					
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]:	*9 999 999*		*9 999 999*		*9 999 999*	
Resolution of the indicating device [m^3]:	*0.01*		*0.01*		*0.01*	
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:	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		
Other relevant information:	-		
Length [mm]:	*350*	*450*	*500*
Installation details (electrical):			
Wiring instructions:	-		
Mounting arrangement:	-		
Orientation limitations:	-		
Power supply:			
Information are shown in Table *Power supply and electrical specification*			

Manufacturer:	Hemina SPA; Via Piemonte 2; Montagnana; 350 44 Italy	
Model number:	MS2500 / MV110	
Nominal diameter:	*350*	
Type details:		
Q_1 [m³/h]:	6.4	4.0
Q_2 [m³/h]:	10.2	6.4
Q_3 [m³/h]:	1600	1600
Q_4 [m³/h]:	2000	2000
Q_3/Q_1:	250	400
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) % for water having a temperature ≤ 30 °C ±2 (class1) ±3 (class 2) % for water having a temperature > 30 °C	
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:	*Δp40*	
Reverse flow:	*designed to measure*	
Environmental class:	*O (-25 to + 55 °C)*	

Electromagnetic environment:	*E1, E2*
Mechanical class:	*B, O*
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]:	*9 999 999*
Resolution of the indicating device [m^3]:	*0.01*
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:	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
Other relevant information:	-
Length [mm]:	*550*
Installation details (electrical):	
Wiring instructions:	-
Mounting arrangement:	-
Orientation limitations:	-
Power supply:	
Information are shown in Table *Power supply and electrical specification*	

Power supply and electrical specification			
Type electronic	**MV 110**		
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.1.04.0005.0004		
CRC checksum (of legally relevant SW):	9BA34F3B		
Cut-off	0.2 %		
Detection empty pipe	on		
Type electronic	**MV 145**		
Designation of the module for all nominal diameter	MS2500 / MV145 HV + lit. battery	MS2500 / MV145 LLV + alk. battery	MS2500 / MV145 LLV + lit. battery
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	3.7V DC; 5200mAh; Battery	3.7V DC; 5200mAh; Battery	-
Minimum battery life time [years]:	-	-	-
Software version (of legally relevant SW):	V.1.04.0005.0004 for MV110 V.1.05.0004.0005 for MV145		
CRC checksum (of legally relevant SW):	9BA34F3B for MV110 C96453B1 for MV145		
Cut-off	0.2 %		
Detection empty pipe	on		

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.

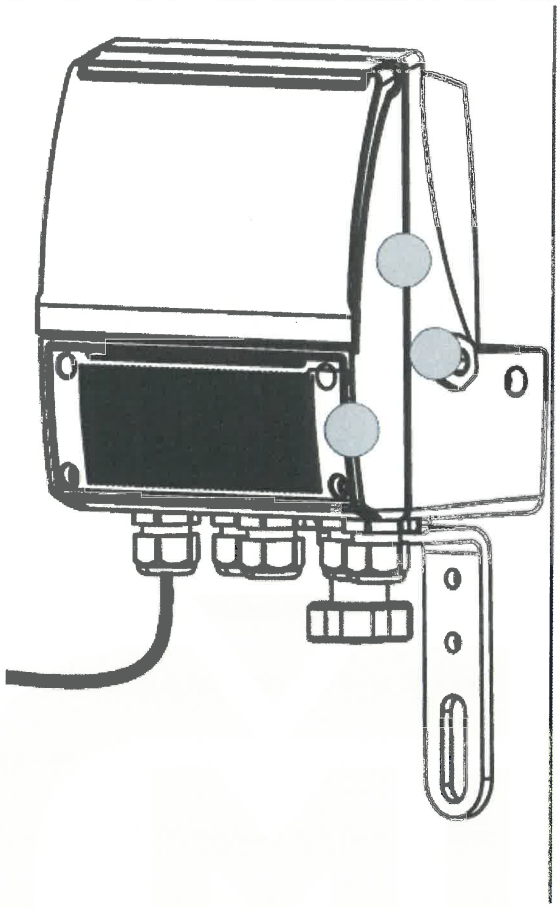


Figure 2: The sealing of the compact water meter MS2500 / MV110 or MS2500 / MV145.

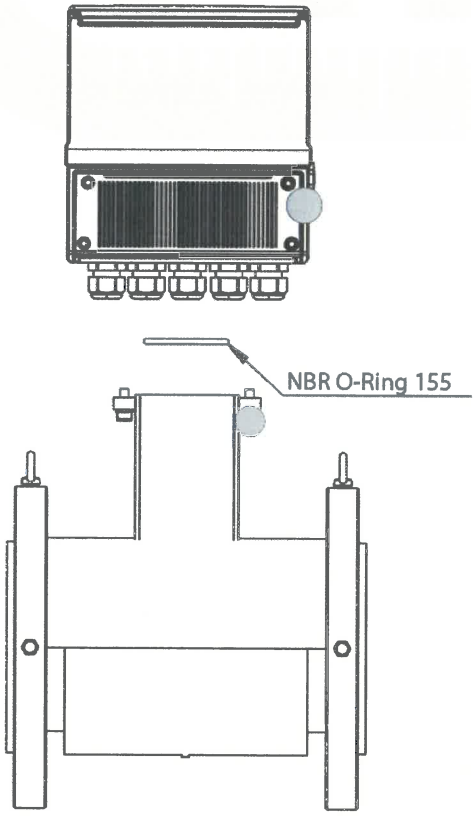


Figure 3: The sealing of the separate water meter MS2500 / MV110 or MS2500 / MV145.

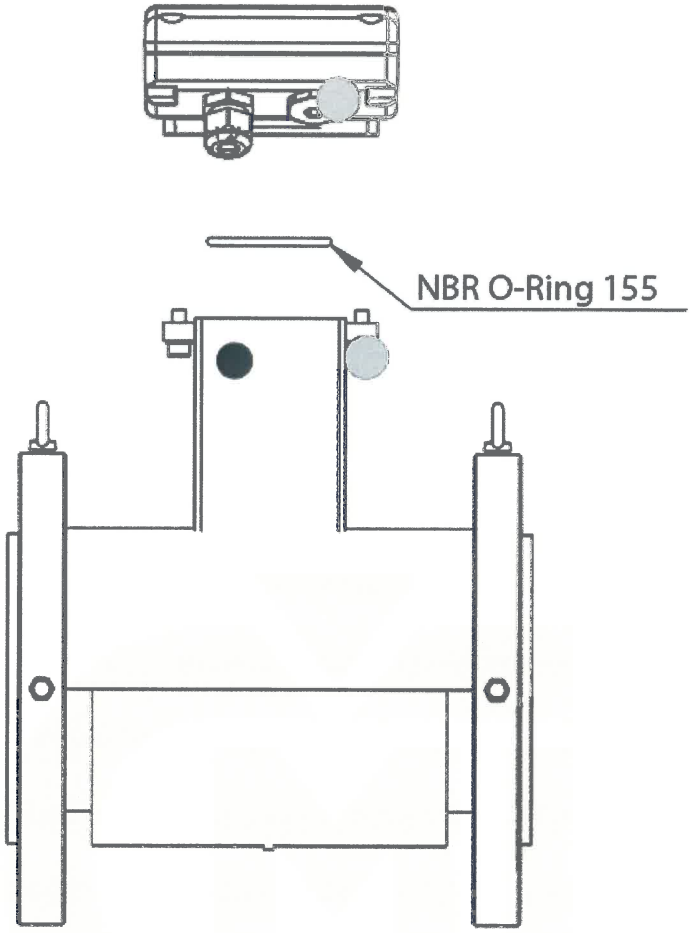
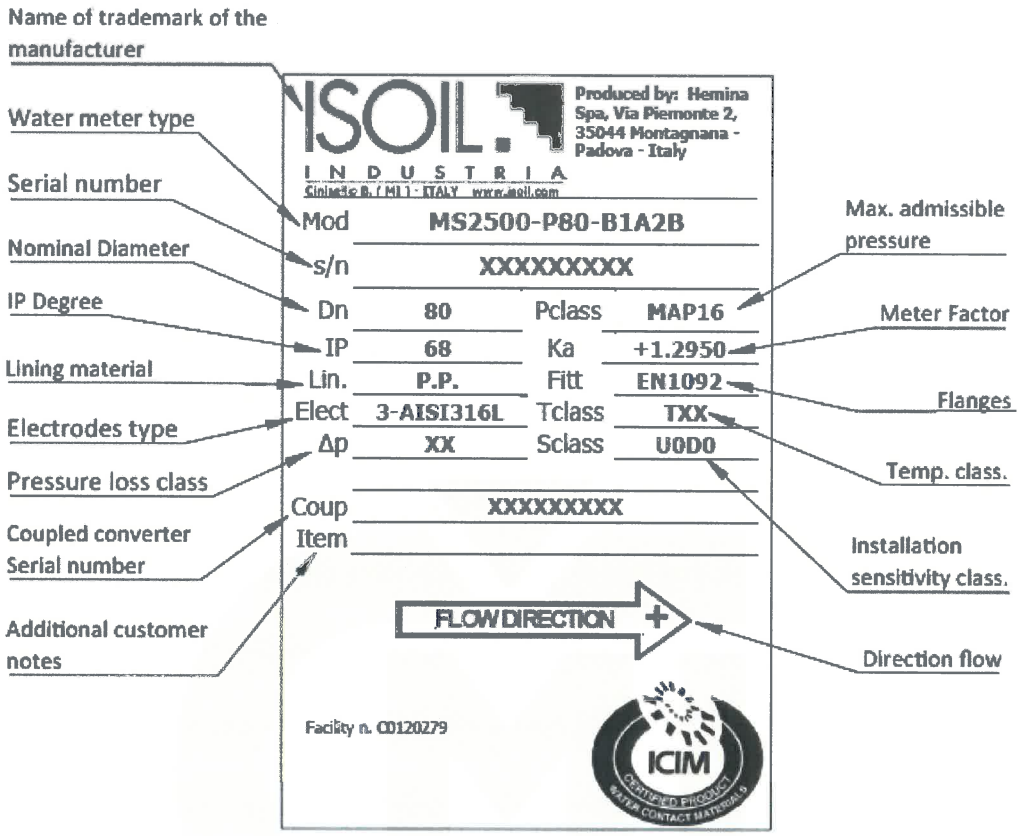


Figure 4: The labels of water meter MS2500 / MV110 or MS2500 / MV145.

MS2500: LABEL DESCRIPTION



MV110: LABEL DESCRIPTION