

	
OIML Member State SLOVAKIA	OIML Certificate No. R49/2013-A-SK1-25.09
OIML CERTIFICATE ISSUED UNDER SCHEME A	
OIML Issuing Authority Name: Slovak Legal Metrology (SLM) Address: Geologická 9966/1, 821 06 Bratislava-Podunajské Biskupice, Slovakia Product Certification Body Hviezdoslavova 31 974 01 Banská Bystrica, Slovakia Person responsible: Ing. Dušan Šmigura, PhD., Director of PCB	
Applicant Name: Pietro Fiorentini S.p.A. Address: Via E. Fermi, 8/10, 36057 Arcugnano (VI) Italy	
Manufacturer Name: Pietro Fiorentini S.p.A. Address: Via E. Fermi, 8/10, 36057 Arcugnano (VI) Italy	
Identification of the certified type <i>(the detailed characteristics are defined in the additional pages)</i> Water meter type SSM-AQUO	
Designation of the module <i>(if applicable)</i> Ultrasonic water meters with electronic indication device	
<p>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):</p> <p>OIML R 49, Edition (year): 2013 For accuracy class: 2</p>	



**OIML Certificate No.
R49/2013-A-SK1-25.09**

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:

Test report No: 2024/CV045/312.15 dated 10th April 2025 that includes 107 pages

OIML type evaluation report No. 2025/ER045/SK1 dated 23th April 2025 that includes 16 pages.

The technical documentation relating to the identified type is contained in documentation file name:
„Technical documentation file Pietro Fiorentini_SSA-AQUO_00“ dated 23th April 2025 that includes a sum of documents 93 pages.

OIML Certificate History

Revision No.	Date	Description of the modification
0	25 th April 2025	Certificate first issued

Identification, signature and stamp



The OIML Issuing Authority

Dušan Šmigura

Date: 25th April 2025

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.

1. Designation

The ultrasonic water meter type **SSM-AQUO** is designed to measure, memorise and display the volume of water passing through the measurement transducer at metering conditions. The water meter is intended for the measurement of volume of clean water in residential use and is intended for non-resettable measurements between two constant partners.

The water meter type **SSM-AQUO** is compact ultrasonic water meter with electronic indication device. The measurement is based on ultrasonic measurement method, bidirectional transit-time principle. Ultrasonic signal moves along the measuring section many times and the flow downstream between the ultrasonic sensors have to perform transmitter and receiver functions. From the results of time difference the flow rate is calculated and indicated in display.

The water meter type **SSM-AQUO** can be installed to operate in all positions and is not designed to measure the reverse flow.

2. Description

2.1 Parts of the water meter type SSM-AQUO:

Essential parts of the water meter:

- Flow sensor:
 - the hydraulic brass body (DN15 to DN40) and plastic body (DN15 and DN20) with inlet and outlet threaded connections;
 - the plastic insert placed in the body as a conditioner for the dynamic behaviour of the flow and as a support for two stainless steel mirrors;
 - two mirrors set to create an ultrasound path in the flow meter body;
 - two ultrasonic transducers at the upstream and downstream of the measurement channel (pipe section) to transmit and receive ultrasonic signals.
- Calculator and indication device:
 - the plastic housing of the calculator with indication device directly mounted on the flow sensor;
 - two PCB boards:
 - measuring PCB board;
 - main PCB board - 4 version:
 - LoraWan WMBUS – IWM_V2.0
 - LoraWan WMBUS – IWM_V2.4LP
 - LoraWan WMBUS – CS0690T04M00R02
 - Nb-IoT – CS0691T01M00R01
 - electronic LCD display – two versions:
 - A version - 9 digits and indication range of 999999.999 m³. The sub-multiples of the cubic meter smaller sized digits after the decimal point;
 - B version - 9 digits and indication range of 999999.999 m³. The sub-multiples of the cubic meter equal sized and underlined on the plastic cover;
 - non-replaceable lithium battery, with a maximum lifetime of 13 years.

Non-essential parts of the water meter:

- filter;
- NFC antenna;
- optionally interfaces and compatibility conditions: integrated radio transmission M-Bus wireless, LoRaWAN, NB-IoT.

2.2 Metrological functions

- measuring, memorizing and displaying the volume of water passing through the water meter.

2.3 Operation and presentation of legal data

LCD scrolling displays in normal mode:

- test display - Blank Screen;
- test display – Full Screen model;
- accumulated volume (m³);
- software Version;
- LR Checksum;
- NLR Checksum.

LCD display in testing mode:

- accumulated volume (0,001 L);
Is available by the program (using the application listed on Android Play Store / Apple Store named *AQUO AppSUITE*).

2.4 Software specification

Software versions	Checksum	Remarks
000.002	h5b7Cd9F2	LR Checksum
	H6680b9EE	NLR Checksum

The software version is indicated on the display in the form:

Fu 000.002 - first 3 digits before the comma identifies the Legally relevant software version

















The checksum is indicated on the display in the forms:

Fu h5b7Cd9F2

Fu H6680b9EE

2.5 Accountable errors

During the measuring process the calculator and indication device detects automatically if a fault condition occurs and eventually stops the measurement reporting an errors indication on the display. See tables below.

11. METER DISPLAY ERRORS		11. METER DISPLAY ERRORS	
	No water in the meter or partially empty pipe		No water in the meter or partially empty pipe
	Leak detected, continuous flow		Leak detected, continuous flow
	Broken pipe, sudden passage at high flow rate		Broken pipe, sudden passage at high flow rate
	Meter installed in the wrong direction		Meter installed in the wrong direction
	Reverse flow detection		Reverse flow detection
	Flow detection above maximum flow rate		Flow detection above maximum flow rate
	Attempted fraud		Attempted fraud
	Low battery		Low battery

A version of display

B version of display

3. Technical and metrological data

Type /model		SSM-AQUO				
Accuracy class	-	2				
Nominal diameter DN	mm	15	20	25	32	40
Permanent flowrate Q_3	m ³ /h	2,5	4	6,3	10	16
Minimum flowrate Q_1	m ³ /h	0,005	0,008	0,0126	0,020	0,031
Transitional flowrate Q_2	m ³ /h	0,008	0,0128	0,0202	0,032	0,0512
Overload flowrate Q_4	m ³ /h	3,125	5	7,875	12,5	20
Ratio Q_3/Q_1	-	500				
Ratio Q_2/Q_1	-	1,6				
Connection thread	-	G ¾ 1" G or 7/8" G	G1	G1 ¼	G1 1/2	G2
Construction length L	mm	≥110 ≤190	brass ≥130 ≤220 composite ≥190 ≤220	≥260 ≤300	≥260 ≤300	≥300 ≤350
Installation position	-	All positions				
Water temperature range	°C	0,1 to 50				
Meter temperature class	-	T30, T50				
Maximum working pressure MAP	bar	16				
Pressure loss class ΔP	-	63	63	40	40	40
Maximum permissible error in upper flowrates range $Q_2 \leq Q \leq Q_4$	%	± 2 (at $\theta \leq 30^\circ\text{C}$) ± 3 (at $\theta > 30^\circ\text{C}$)				
Maximum permissible error in lower flowrates ranges $Q_1 \leq Q < Q_2$	%	± 5				
Scale interval	m ³	0,001				
Scale interval in test mode	L	0,001				
Capacity of calculator -normal mode	m ³	999999,999				
Capacity of calculator -testing mode	m ³	999,999999				
Mechanical class	-	M1				
Climatic class	°C	-25 to +55				
Electromagnetic class	-	E1				
Environmental classification	-	B/O				
Flow profile sensitivity class	-	U0D0				
Battery	-	li-battery 3,6 V, maximum lifetime 13 years				



4. Marking and inscriptions

The following data shall be marked on the water meter:

- a) name or trademark of the manufacturer;
- b) type name of the water meter;
- c) unit of measurement m^3 ;
- d) year of manufacture, the last two digits of the year of manufacture, or the month and year of manufacture;
- e) serial number (as near as possible to the indicating device);
- f) 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);
- g) flowrate Q_3 and ratio Q_3/Q_1 indicated as (R) followed by the ratio value;
- h) maximum admissible pressure (MAP);
- i) temperature class where it differs from T30;
- j) pressure loss class where it differs from Δp 63 (Δp);
- k) the latest date by which the meter shall be replaced (given in the check mode sequence in the display);
- l) environmental classification (can be given on a document supplied separately);
- m) installation sensitivity class (where it differs from U0/D0);
- n) electromagnetic environmental class (can be given on a document supplied separately);
- o) type approval sign according to national regulations.

5. Security measures

The water meter shall be protected against unauthorised manipulation and opening as follows 2 methods (Fig.: 1):

- (A method) grey sticker - that connect the upper cover of the electronic unit and the lower cover of the measuring section;
- (B method) black sticker - that connect the upper cover of the electronic unit and the transparent cover.



6. Figures

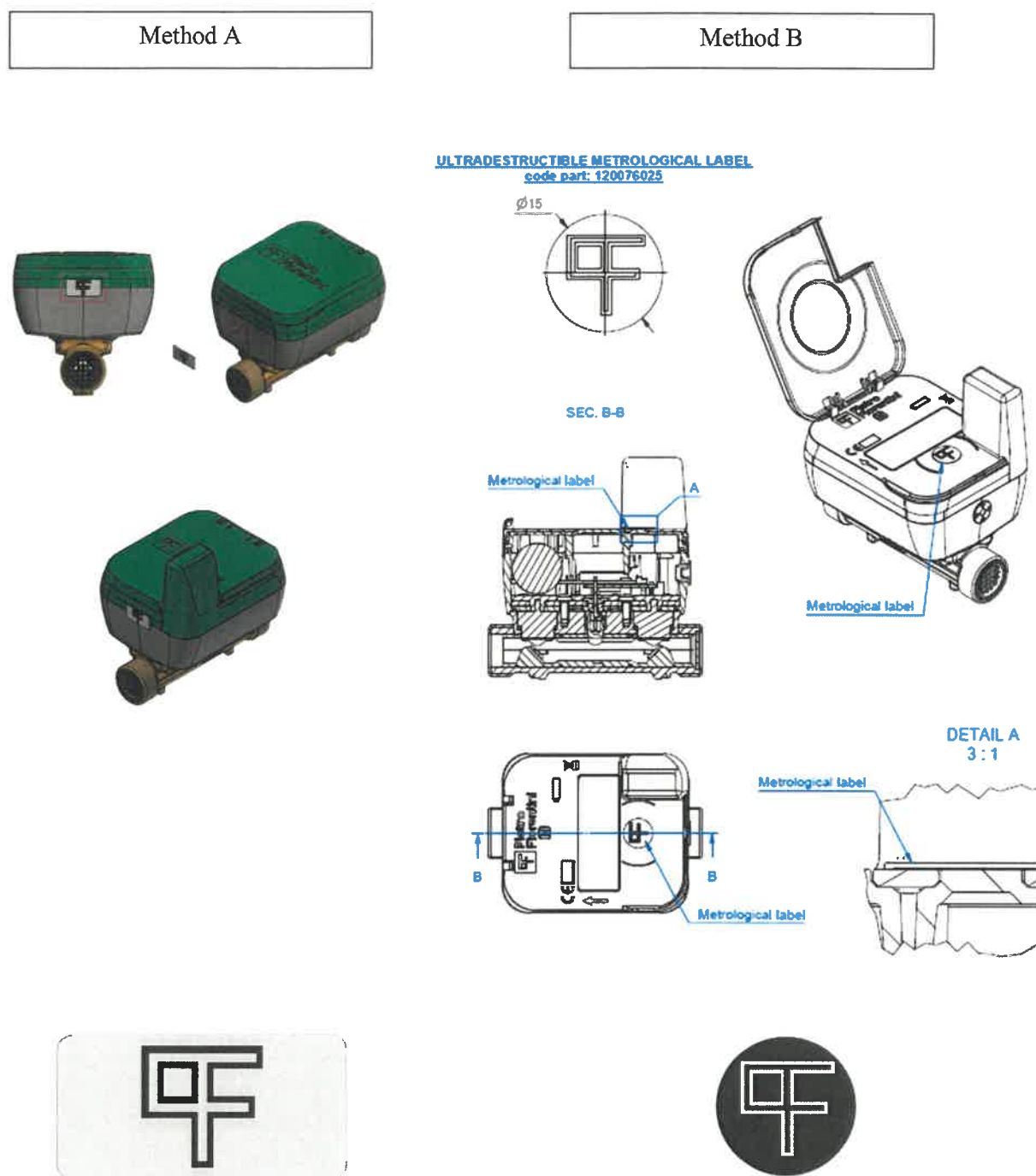


Fig. 1: Sealing of the water meter type SSM-AQUO





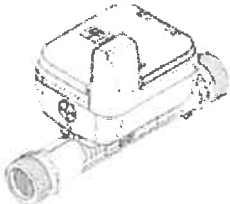


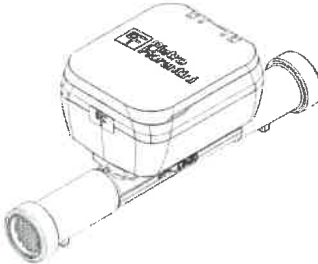
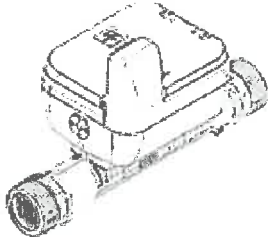
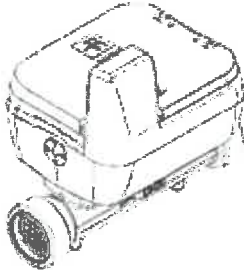
DN15		
	Plastic Pipe - LoRaWAN & Wireless M-BUS	Brass Pipe - LoRaWAN & Wireless M-BUS
		
	Plastic Pipe - LoRaWAN & Wireless M-BUS Nb-IoT	Brass Pipe - LoRaWAN & Wireless M-BUS, Nb-IoT
DN20		
	Plastic Pipe - LoRaWAN & Wireless M-BUS	Brass Pipe - LoRaWAN & Wireless M-BUS
		
	Plastic Pipe - LoRaWAN & Wireless M-BUS Nb-IoT	Brass Pipe - LoRaWAN & Wireless M-BUS , Nb-IoT

Fig. 2a: The water meters DN15 and DN20 with types of communication



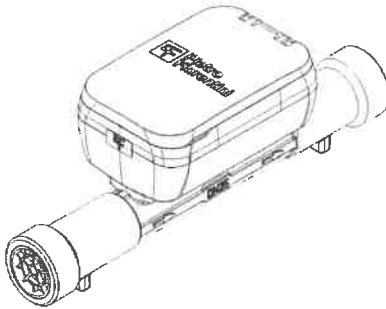
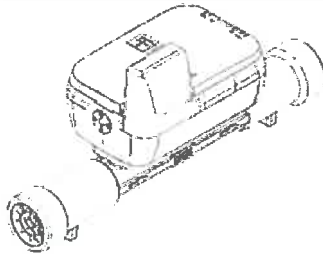
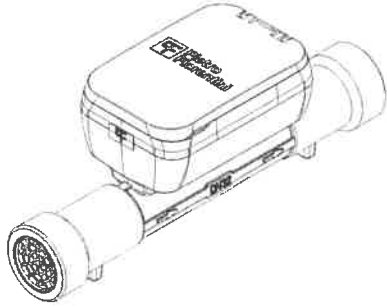
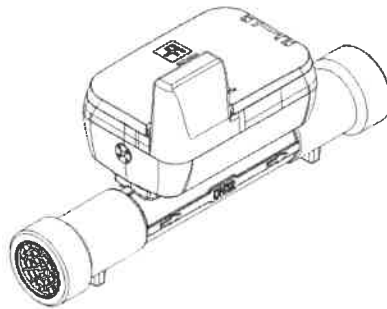
DN25	 <p>Brass Pipe - LoRaWAN & Wireless M-BUS</p>
	 <p>Brass Pipe - LoRaWAN & Wireless M-BUS , Nb-IoT</p>
DN32	 <p>Brass Pipe - LoRaWAN & Wireless M-BUS</p>
	 <p>Brass Pipe - LoRaWAN & Wireless M-BUS , Nb-IoT</p>

Fig. 2b: The water meters DN25 and DN32 with types of communication



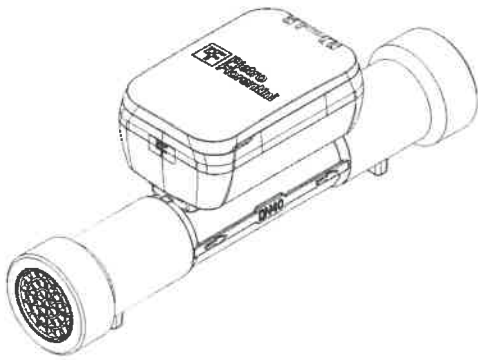
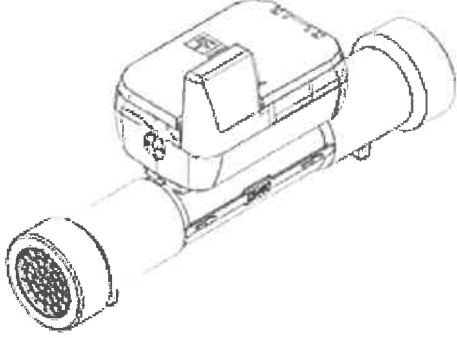
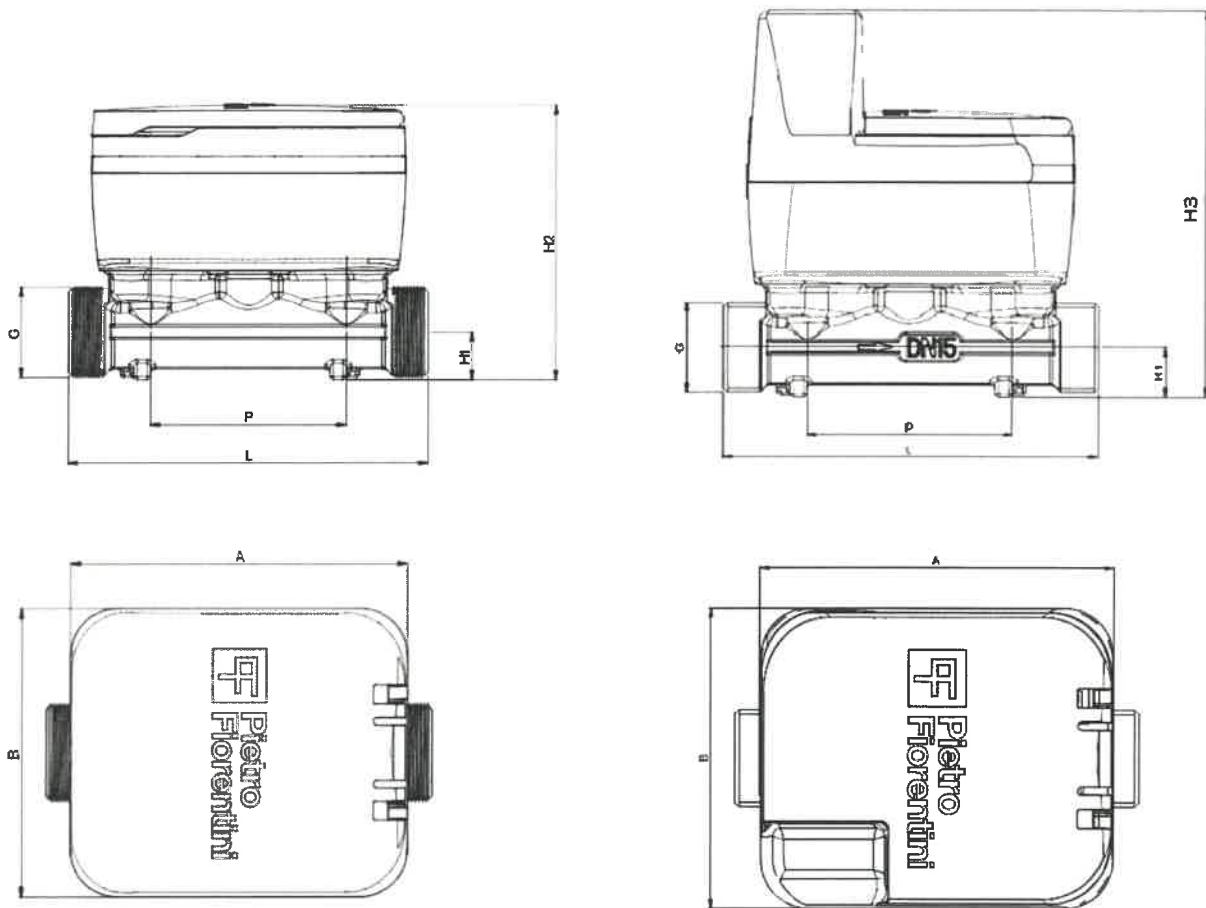
DN40	 <p>Brass Pipe - LoRaWAN & Wireless M-BUS</p>
	 <p>Brass Pipe - LoRaWAN & Wireless M-BUS , Nb-IoT</p>

Fig. 2c: The water meters DN40 with types of communication



LoRaWAN & Wireless M-BUS version

LoRaWAN & Wireless M-BUS , Nb-IoT version



	DN15	DN20	DN25	DN32	DN40
L (mm)	$\geq 110 \leq 190$	Brass $\geq 130 \leq 220$ Composite $\geq 190 \leq 220$	$\geq 260 \leq 300$	$\geq 260 \leq 300$	$\geq 300 \leq 350$
P (mm)	60	60	85	85	85
H1 (mm)	15	17,5	24	27	33
H2 (mm)	84	88	98	103	112
H3 (mm)	114	118	127	132	141
A (mm)	96	96	121	121	121
B (mm)	82	82	82	82	82
G	$G \frac{3}{4}$ 1" G or 7/8" G	G1	$G1 \frac{1}{4}$	$G1 \frac{1}{2}$	G2
Material of body	Brass CW617N or CW742R Composite PPS +30%GF		Brass CW617N or CW742R		

Fig. 3: Dimension of the water meter type SSM-AQUO











LCD menu display	Description	Note
	Blank Screen	-
	Full Screen model 1	
	Accumulated Volume model 1 (m³)	
	Software Version	SW version composition: LR versione . NLR version
	Checksum presentation display	
	LR Checksum	h5b7Cd9F2
	NLR Checksum	H6680b9EE
	Testing mode (L)	Is available by the program (using the application listed on www, which is provided by the manufacturer upon request).

Fig. 4a: Display version A - display modes



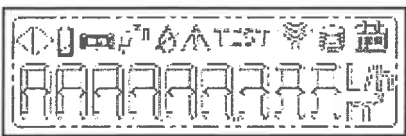





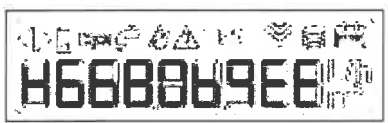

LCD menu display	Description	Note
	Blank Screen	-
	Full Screen model 1	
	Accumulated Volume model 1 (m³)	
	Software Version	SW version composition: LR versione. NLR version
	Checksum presentation display	
	LR Checksum	h5b7Cd9F2
	NLR Checksum	H6680b9EE
	Testing mode (L)	Is available by the program (using the application listed on www, which is provided by the manufacturer upon request).

Fig. 4b: Display version B - display modes

