Slovenský metrologický ústav
Karloveská 63, 842 55 Bratislava 4,
Slovenská republika

SNAS
Reg. No. 101/P-035

CERTIFIKÁT EÚ SKÚŠKY TYPU

EU – type examination certificate

Číslo dokumentu: **SK 19-MI001-SMU056** **Revízia 2**
Document number: Revízia 2 nahrádza certifikát zo dňa 21. októbra 2019 *Revision 2*
Revision 2 replaces the certificate issued by October 21, 2019

V súlade s: prílohou č. 2, Modul B nariadenia vlády Slovenskej republiky č. 145/2016 Z.z. o sprístupňovaní meradiel na trhu v znení nariadenia vlády SR č. 328/2019 Z.z., ktorým sa preberá smernica Európskeho parlamentu a Rady 2014/32/EU o harmonizácii právnych predpisov členských štátov týkajúcich sa sprístupnenia meradiel na trhu
In accordance with: *Government Ordinance of the Slovak Republic No. 145/2016 Coll. relating to the making available on the market of measuring instruments, which implemented the 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*

Žiadateľ/Výrobca: **ITRON**
Issued to (Manufacturer): **9 rue Ampère, 71000, Macon, France**

Druh meradla: **Vodomer (MI-001)**
Type of instrument: *Water meter (MI-001)*

Označenie typu: **X63**
Type designation:

Základné požiadavky: príloha č. 1 a príloha č. 3 Vodomery (MI-001) k nariadeniu vlády SR č. 145/2016 Z. z. v znení nariadenia vlády SR č. 328/2019 Z. z.
Essential requirements: *Annex No. I and Annex No. III Water meters (MI-001) to Government Ordinance of the Slovak Republic No. 145/2016 Coll. as amended by Government Ordinance of the Slovak Republic No. 328/2019 Coll.*

Platnosť do: **11. februára 2029**
Valid until: *February 11, 2029*

Notifikovaná osoba: **Slovenský metrologický ústav** **1781**
Notified body: *Slovak Institute of Metrology* *1781*

Dátum vydania: **20. mája 2024**
Date of issue: *May 20, 2024*

Základné charakteristiky, popis meradla a podmienky schválenia sú uvedené v prílohe, ktorá je súčasťou tohto certifikátu. Certifikát vrátane prílohy má spolu 13 strán.
Essential characteristics, instrument description and approval conditions are set out in the appendix hereto, which forms the part of the certificate. The certificate including the appendix contains 13 pages.

SLOVAK INSTITUTE OF METROLOGY – BRATISLAVA – NB 1781 SMU

Viliam Mazúr
zástupca notifikovanej osoby
representative of notified body

Poznámka: Tento certifikát EÚ skúšky typu môže byť rozmnožovaný len celý a nezmenený. Bez podpisu a odtlačku pečiatky je neplatný.
Note: *This EU-type examination certificate shall not be reproduced except in full. Certificates without signature and stamp are not valid.*

Issue of the Certificate	Date	Modification
SK 19-MI001-SMU056, Revision 0	February 11, 2019	Initial certificate
SK 19-MI001-SMU056, Revision 1	October 21, 2019	Measurement box update
SK 19-MI001-SMU056, Revision 2	May 20, 2024	Update according parallel certificate

1 Instructions and standards used within assessment

1.1 Generally binding instructions

Meter type was examined in terms of request for given type provisions Government Ordinance of the Slovak Republic No. 145/2016 Coll., relating to the making available on the market of measuring instruments as amended by Government Ordinance of the Slovak Republic No. 328/2019 Coll., which implemented the Directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments as later amended (next Government Ordinance).

Requirements are set out in Annex No. 1 and Annex No. 3 Water Meters (MI-001) to Government Ordinance of SR No. 145/2016 Coll. as amended by Government Ordinance of the Slovak Republic No. 328/2019 Coll.

1.2 Technical specification used:

OIML R 49-1:2013	Water meters intended for the metering of cold potable water and hot water. Part 1: Metrological and technical requirements
OIML R 49-2:2013	Water meters intended for the metering of cold potable water and hot water. Part 2: Test methods
OIML R 49-3:2013	Water meters intended for the metering of cold potable water and hot water. Part 3: Test report format
EN ISO 4064-1: 2017	Water meters for cold potable water and hot water. Part 1: Metrological and technical requirements
EN ISO 4064-2: 2017	Water meters for cold potable water and hot water. Part 2: Test methods
EN ISO 4064-3: 2014	Water meters for cold potable water and hot water. Part 3: Test report format
EN ISO 4064-5: 2017	Water meters for cold potable water and hot water. Part 5: Installation requirements

2 Type marking

Ultrasonic water meter – **X63**

Meter is made in following subgroups:

Type of meter	Temperature class	Classes	Nominal Diameter
X63	T30, T50	M1[1)], C[2)], E2[1)]	DN50, DN65, DN80, DN100, DN125, DN150, DN200

[1] according to Government Ordinance of the Slovak Republic, Annex No. 1

[2] according to EN ISO 4064-1:2017 and OIML R 49-2:2013

SLOVAK INSTITUTE OF METROLOGY - Bratislava - NB 1781 SMU

3 Description of measuring instrument

Meter name: Ultrasonic water meter

Type marking: X63

Description of operating principle instrument design:

The X63 is a family of ultrasonic water meters, which has been designed for measuring of flow and delivered water quantity.

Ultrasonic water meter (Picture No. 1) consists of:

- measurement box (IP 68 electronic module composed with two layers of PCB: one is measurement board, which includes an ultrasonic chip; one is for user board, which realizes customized display and advanced communication functions),
- meter body (designed with high hydrodynamic performance, very low-pressure loss with no reduction of diameter and excellent resistance to corrosion),
- transducer (four transducers with 4 MHz frequency specially designed by the manufacturer to have better measurement precision).

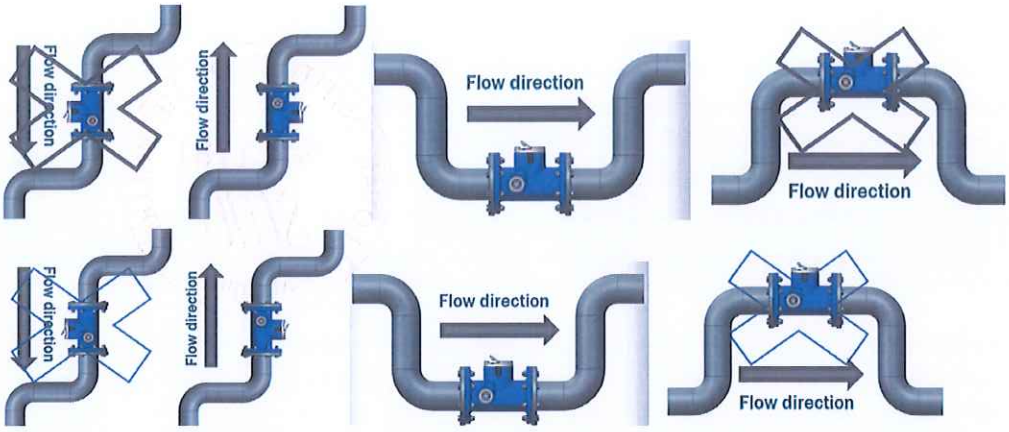
Ultrasonic water meter is intended for measuring reverse flow.

Picture No.1 Ultrasonic water meter X63

ITRON's flow meters can operate in horizontal or vertical position without consequences on accuracy. Pipes must always be filled with water when the device is counting. Follow illustrations below for instructions on mounting the sensor (Picture No. 2).

SLOVAK INSTITUTE OF METROLOGY - Bratislava - NB 1781 SMU

Mounting instructions



Picture No.2 Instructions on mounting the sensor

Special conditions: Water must always be in the sensor when counting. Respect 5-pipe diameters length after the presence of a pump.

3.1 Description of subgroups

Marking: X63

DN: DN50, DN65, DN80, DN100, DN125, DN150, DN200.

3.2 Flow sensor

The structure of flow sensor is shown in the drawings according to item 3.5 of this Annex. Flow sensor consists of measuring tube with 4 inner sensitive transducers. The tube is of cast iron. Connections of flow sensor are flanges.

3.3 Measurement box

The measurement box is the electronic part of the water meter. The main part is the embedded ASIC designed by manufacturer, which generates 4 MHz excitation on transducers, the response is then processed by the converter which is converted to flow on the display of the water meter. Following data are available: Instantaneous flow rate and index. A pulse output is also available.

Calibration parameters for conversion of the flow are stored in read-only memory of the electronics and protected with a seal with a customized logo designed by the manufacturer.

SLOVAK INSTITUTE OF METROLOGY - Bratislava - NB 1781 SMU

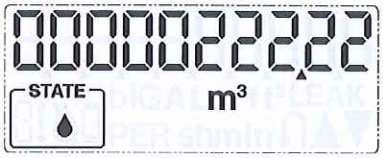
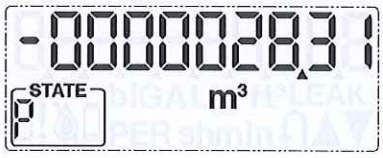
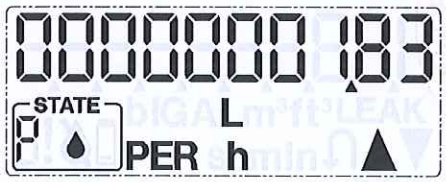
Tab No. 1 LCD V5

Version LCD V5
AA204007-03A

The water meter is fitted with an in-built LCD Display. 10 digits are available for Index display. Units available in European norm or American norm: m3, ft3; L, GAL, m^3, ft^3, L, per hour/minute/second. See Part 4 for available digit settings.

According to EN ISO 4064-1:2017 par. 6.7.2.2, the height of digits should be at least 4 mm and the number of digits should reach 999 999 m3 for 63 < Q3≤ 63 and 99 999 for 6.3 < Q3≤ 63.

For verification purposes the resolution should be able to be equal to 0.5 % of the volume corresponding to 1h30 at the minimum flow rate Q_1.

Example of reading of cumulated index 	Volume displayed in cubic meters.
Reverse volume cumulated index  	*Note: Reverse flow is not available on the pulse output in this software version.* *Reverse flow is showed with a minus on the left.*
Example of instantaneous flow reading  	Presence of water indicated by drop Direction of water indicated by arrow

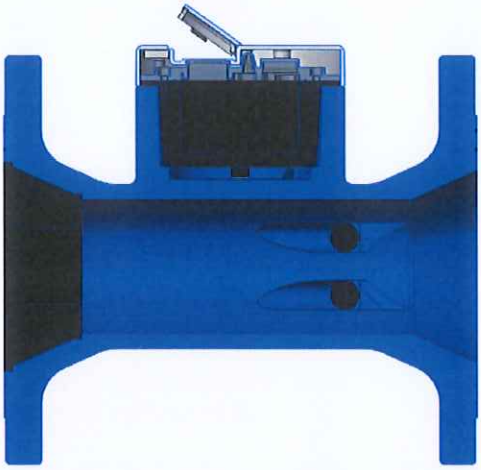
Alarm codes

Full description of Alarms

ALARM CODE	Meaning
E1	Tamper
E2	Air bubbles
E3	Burst
E4	Leak
E5	Frost
E6	Heat
E7	Over temperature
E8	No consumption
E9	Not assigned

3.4 Principle of operation

The ultrasonic water meter uses fours ultrasonic transducers that can both send and receive sound. There are two channels in parallel and each channel has two transducers face to face. The sound is transmitted between the transducers through the water that goes through the meter. The sound propagation time between the transducers is measured in both directions. If there is no fluid motion, the propagation times in two directions are ideally the same. But if there is fluid motion, it will cause the downstream time to decrease and the upstream one to increase. The difference of two propagation time could be used to calculate the flow velocity. Then the flow rate can be calculated thanks to the section of the pipe.



Picture No.3 The inner tube showing the transducers

SLOVAK INSTITUTE OF METROLOGY - Bratislava - NB 1781 SMU

3.5 Technical documentation

A number of drawings of technical documentations are listed in the following list:

Drawing Number	Title
AM-020633_04	
ABA101001-16A	X63 DN 50 ISO EN (PN 16)
ABA101001-18A	X63 DN 50 ANSI (Class 150)
ABA101001-17A	X63 DN 50 BS10 (Table D)
ABA101001-19A	X63 DN 50 ISO EN (PN16)
ABA101001-20A	X63 DN 50 BS10 (Table D)
ABA101001-21A	X63 DN 50 ANSI (Class 150)
AM-020634_04	
ABB-101001-13A	X63 DN 65 ISO EN (PN16)
ABB-101001-13B	X63 DN 65 ANSI (Class 150)
AM-020635_03	
ABC101001-16A	X63 DN 80 ISO EN (PN 16)
ABC101001-17A	X63 DN 80 BS10 (Table D)
ABC101001-18A	X63 DN 80 ANSI (Class 150)
AM-020636_05	
ABD101001-16A	X63 DN 100 ISO EN (PN 16)
ABD101001-18A	X63 DN 100 ANSI (Class 150)
ABD101001-17A	X63 DN 100 BS10 (Table D)
AM-020637_02	
ABG101001-10A	X63 DN 125 ISO EN (PN16)
ABG101001-10B	X63 DN 125 ANSI (Class 150)
AM-020638_02	
ABE101001-14A	X63 DN 150 ISO EN (PN16)
ABE101001-16A	X63 DN 150 ANSI (Class 150)
ABE101001-15A	X63 DN 150 BS10 (Table D)
AM-020639_02	
ABH101001-06A	X63 DN 200 ISO EN (PN16)
ABH101001-07A	X63 DN200 ISO EN (PN10)
ABH101001-02A	X63 DN200 ANSI (Class 150)
ABH101001-03A	X63 DN200 BS10 (Table D)

All drawings, schemes and technical documentations used during the conformity assessment are saved in documents No. NO-387/18, NO-421/19 and NO-610/23.

3.1 Peripheral devices and interfaces

Water meter type X63 supports the following communication modules:

Communication type	Communication via	Transmitted data
MB	Cable	Volume, flow, Alerts, ID, RTC
OC	Cable	Volume, flow, Alerts, ID, RTC
Sigfox	RF	Volume, flow, Alerts, ID, RTC
GPS	RF	Position (with Sigfox only)
NFC	RF	RFID tag, used for configuration of the meter only

4 Basic technical characteristics

Type marking		**X63**
Nominal diameter DN	mm	50, 65, 80, 100, 125, 150, 200
Indicating range	m^3	6 integer digits (999 999) or more (programmable)
Resolution of the reading	m^3	From 1 to 0,0001 or (programmable)
Maximum admissible pressure	-	MAP16 for DN50 to DN150 MAP10 or MAP16 for DN200
Working pressure range	bar	from 0,3 to 16 from 0,3 to 10 or 16 for DN200
Pressure loss	-	Δp 16
Temperature class	-	T30, T50
Flow profile sensitivity classes	-	U0 / D0
Position	-	H, V
Climatic and mechanical environments	-	mech. class M1 Storage -25°C to +70°C (max 4 weeks) Operational 1°C to 55°C
Electromagnetic environments	-	E1, E2

4.1 Additional technical characteristics

Weight	from 10 kg to 36 kg
Environmental protection (IP Code)	IP 68
Power source	Lithium Battery, 3.6 V, 10 years lifetime No external AC/DC connection
Outputs	Pulse output, with pulse coefficient to be programmed at order Direction output Sigfox GPS
Modules	OC (Pulse output) OCS (Pulse output + Sigfox) OCSG (Pulse output + Sigfox + GPS) MB (Wired MBus)
Connection	Flanges ISO EN 1092-1, ANSI or BSI
Display	LCD, 10 digits
Software	Type P (Welmec Guide 7.2, 2023)
Software version and checksum	Software with only one ASIC SW 1.04 49D8 (November 2018): New modes - Sleep mode, - Calibration mode, - Testing mode - Automatic signal detection SW 1.06 CRC 1FCF - Security improvement (arithmetic and tables) - Power consumption improvement - Measurement frequency range extended - Estimation of flow disturbance The above CRC is a global CRC for the program (containing display and legal)

SLOVAK INSTITUTE OF METROLOGY - Bratislava - NB 1781 SMU

5 Basic metrological characteristics

The maximum permissible error (accuracy class):

± 5 % ($Q_1 \leq Q < Q_2$)

± 2 % ($Q_2 \leq Q \leq Q_4$) for water temperature (from 0,1 to 30) °C

± 3 % ($Q_2 \leq Q \leq Q_4$) for water temperature greater than 30 °C

Temperature class	-	-	**30, 50**			
Connection	-	mm	50	65	80	100
Minimum flow rate	Q_1	m^3/h	≥ 0,08	≥ 0,126	≥ 0,126	≥ 0,2
Transitional flow rate	Q_2	m^3/h	≥ 0,128	≥ 0,202	≥ 0,202	≥ 0,32
Permanent flow rate	Q_3	m^3/h	**40**	**63**	**63**	**100**
Overload flow rate	Q_4	m^3/h	50	80	80	125
Measuring range R	Q_3/Q_1	-	≤ **500** [3]			
Ratio	Q_2/Q_1	-	1,6			

Temperature class	-	-	**30, 50**		
Connection	-	mm	125	150	200
Minimum flow rate	Q_1	m^3/h	≥ 0,32	≥ 0,5	≥ 0,8
Transitional flow rate	Q_2	m^3/h	≥ 0,512	≥ 0,8	≥ 1,28
Permanent flow rate	Q_3	m^3/h	**160**	**250**	**400**
Overload flow rate	Q_4	m^3/h	200	313	500
Measuring range R	Q_3/Q_1	-	≤ **500** [3]		
Ratio	Q_2/Q_1	-	1,6		

6 Results of conformity assessment

The results of tests, assessments and evaluations given in the evaluation report No. NO-610/24/B/ER dated May 17, 2024 give sufficient evidence, that the technical design of the measuring instrument – Ultrasonic water meter type X63 is in compliance with the technical requirements of the Slovak Republic Governmental Ordinance No. 145/2016 Coll. relating to the making available on the market of measuring instruments as amended by Government Ordinance of the Slovak Republic No. 328/2019 Coll., Annex No. 1 and Annex No. 3 Water Meters and with the requirements determined in EN ISO 4064-1:2017, respectively OIML R49-1:2013, which are relevant for this type of meter.

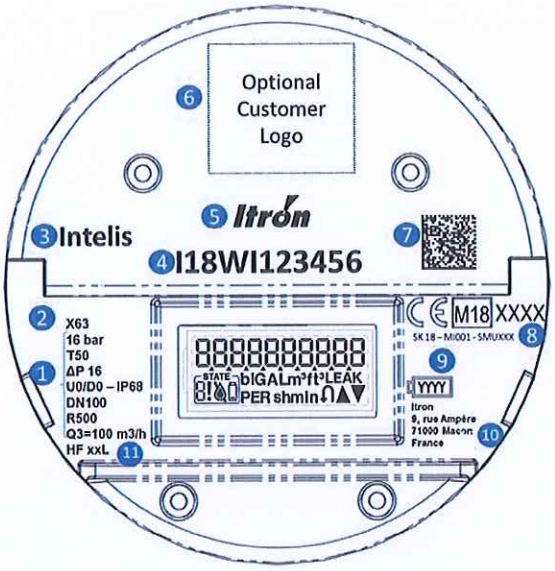
SLOVAK INSTITUTE OF METROLOGY - Bratislava - NB 1781 SMU

[3] according to EN ISO 4064-1:2017, 4.1.4 Measuring range

7 Data placed on the measuring instrument

On the shroud, the dial of the indicating device or on an identification plate of every water meter or in the product documentation minimum the following data should be marked:

a) producer's name, registered trade name or registered trade mark and contact postal address, at which they can be contacted
b) type of the Ultrasonic water meter
c) measuring unit (m^3)
d) numerical value of Q_3 in m^3/h (Q_3 x,x) and ratio Q_3/Q_1 (Rxxx)
e) production number and the year of production
f) number of EU-type examination certificate and conformity mark
g) the highest admissible pressure if it differs from 1 MPa
h) flow direction
i) the temperature class where it differs from T30
j) class of pressure loss if it differs from Δp63
k) class of climatic and mechanical environment
l) flow profile sensitivity classes
m) class of electromagnetic environment
n) for a replaceable battery: the latest date by which the battery shall be replaced



Picture No.4: Meter Dial

1 Performance markings in compliancy with standards and norms
2 Type marking
3 Product commercial name
4 11 digits serial number according Itron structure: IyyWa123456
I - identifies Itron
yy - identifies year of production
W identifies Intelis family
a - identifies DN size - DN50: F / DN65: G / DN80: H / DN100: I / DN125: J / DN150: K / DN200: L
123456 is a sequential number in a slot booked for Itron products
5 Itron logo
6 Customer logo that would be printable on demand for specific orders
7 2D barcode replicating serial number
8 Number of EU-type examination certificate and conformity mark
9 Battery end of life
10 Itron address as manufacturer
11 Pulse weight for pulse output cable

SLOVAK INSTITUTE OF METROLOGY - Bratislava - NB 1781 SMU

8 Conditions of conformity assessment of measuring instruments produced with type approval

Ultrasonic water meter is put onto the market according to the procedure of conformity assessment according to the Annex No.2 (Module D or F) of the Governmental ordinance, should be in compliance with the technical description by the item 3 of this report and at test should be in compliance with the requirements determined in OIML R 49-1:2013 and EN ISO 4064-1:2017.

Metrological test is performed by testing equipment which should be in compliance with the requirements determined in EN ISO 4064-2:2017 and water at temperature 20 °C ± 10 °C in following point of flowrate:

a) Minimum flowrate $Q_1 \leq Q \leq 1{,}1Q_1$
b) Transitional flowrate $Q_2 \leq Q \leq 1{,}1Q_2$
c) Permanent flowrate $0{,}9Q_3 \leq Q \leq Q_3$

A metrological test may only be performed by a producer, or a notified body respectively in line with the conformity assessment procedure according to the Annex No.2 (Module D or F) of the Governmental ordinance respectively.

9 Measures asked for providing measuring instrument integrity

9.1 Identification

Ultrasonic water meter should be in compliance with the description provided on item 3 of this Annex and should be in compliance with the marking specified the item 7 of this Annex. The number given to the EU-type examination certificate is to be put at each piece of the measuring instrument.

Emplacement of the conformity mark is determined by § 15 of the Governmental ordinance.

9.2 Sealing of the measuring instrument

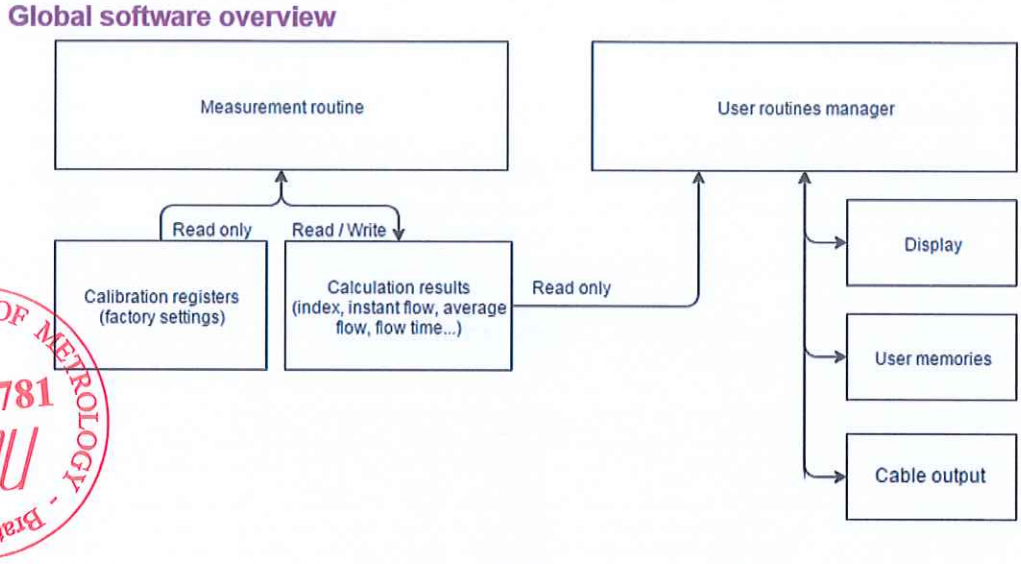
Ultrasonic water meter shall be sealed before the conformity assessment according to the Annex No.2 (Module D or F) of the Governmental ordinance sealed by following sealing marks (Picture No. 5).

- 4 seals are located on the screws of the upper hood, that way the hood cannot be dismounted without breaking it, or drilling the seals. This protects the electronics for measurement and communication and the display.
- 2 plastic seals are located on the transducer location: 1 on each side of the water meter, this prevents access to the sensitive part.

SLOVAK INSTITUTE OF METROLOGY - Bratislava - NB 1781 SMU

Picture No.5 Emplacement of seal used for security measures

The software is sealed by a password different for each water meter produced. The legal parameters are stored on a read-only memory. The sofware is identified by a CRC-16. There is a CRC for the measurement routine (legal sofware) and a CRC for the user routines manager (Picture No.6).

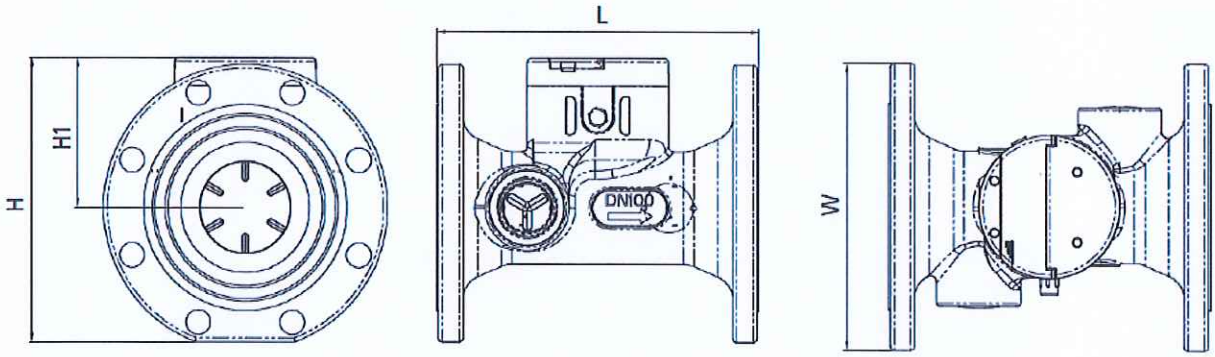


Picture No.6 Global software overview

10 Requirements for installation, especially conditions of usage

10.1 Installation data

Nominal Diameter	50	65	80	100	125	150	200
L (mm)	200	200	225	250	250	300	350
W (mm)	165	185	200	220	250	285	340
H (mm)	182,5	198,5	215,5	233,5	250	275,5	312
H1 (mm)	97	103	108	115	127	134	152
Weight (kg)	10	12	13	15	18	26	36



Picture No. 7 Installation dimensions

10.2 Installation requirements

The Ultrasonic water meter should be introduced into operation by qualified for this activity performance worker. Meter is possible to put into use after a construction in line with this report and in line with "Instruction of installation and conditions of use of water meters". A measuring instrument should be installed in direction of water flow arrow marked on the meter body.

10.3 Conditions of use

The measuring instrument should be used within the recommendations of a producer.

Assessment done by: Maryna Tokarieva

***

SLOVAK INSTITUTE OF METROLOGY - Bratislava - NB 1781 SMU