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

CERTIFIKÁT EÚ SKÚŠKY TYPU

EU – type examination certificate

Číslo dokumentu: *Document number:* **SK 19-MI001-SMU056** **Revízia 1**
Revízia 1 nahrádza certifikát zo dňa 11. februára 2019 *Revision 1*
Revision 1 replaces the certificate issued by February 11, 2019

V súlade s: *In accordance with:* nariadením vlády Slovenskej republiky č. 145/2016 Z. z. o sprístupňovaní meradiel na trhu, ktorým sa preberá smernica Európskeho parlamentu a Rady 2014/32/EU o harmonizácii právnych predpisov členských štátov týkajúcich sa sprístupnenia meradiel na trhu
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: *Issued to (Manufacturer):* **Itron**
9 rue Ampère, 71031, Macon France

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

Označenie typu: *Type designation:* **X63**

Základné požiadavky: *Essential requirements:* príloha č. 1 a príloha č. 3 Vodomery (MI-001) k nariadeniu vlády SR č. 145/2016 Z. z.
Annex No. I and Annex No. III Water meters (MI-001) to Government Ordinance of SR No. 145/2016 Coll.

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

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

Dátum vydania: *Date of issue:* **21. októbra 2019**
October 21, 2019

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.

Emanuel Godál
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.

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, 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.

1.2 Harmonised standards and normative documents used

OIML R 49-1:2006	Water meters intended for the metering of cold potable water and hot water. Part 1: Metrological and technical requirements
OIML R 49-2:2004	Water meters intended for the metering of cold potable water and hot water. Part 2: Test methods
EN 14154-1:2005+A2:2011	Water meters - Part 1: General requirements
EN 14154-2:2005+A2:2011	Water meters - Part 2: Installation and conditions of use
EN 14154-3:2005+A2:2011	Water meters - Part 3: Test methods and equipment

1.3 Other instructions 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 4064-5: 2017	Water meters for cold potable water and hot water. Part 5: Installation requirements

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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 and 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

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:

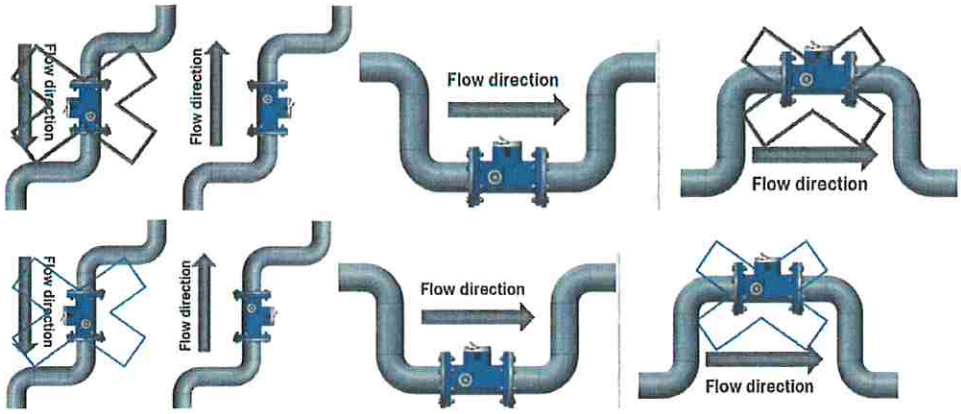
- Measurement box (IP 68 electronic module composed with two layers of PCB: one is measurement board, which includes an ultrasonic chip; one is for user board, which realizes customized display and advanced communication functions),
- meter body (designed with high hydrodynamic performance, very low 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).

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 and 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 are protected with a seal with a customized logo inspired by the manufacturer's logo.

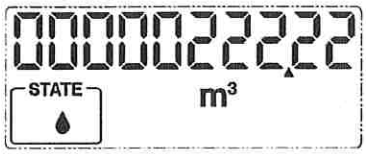
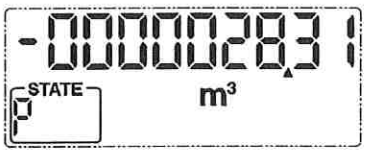
Tab No. 1 LCD V5

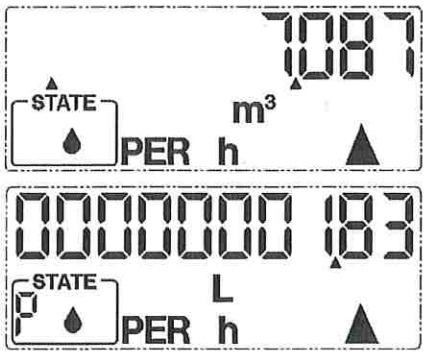
Version LCD V5
AA204007-03A

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 or second.
See Part 4 for available digit settings.

According to EN 14154-1:2005+A2:2011 par. 4.3, 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.

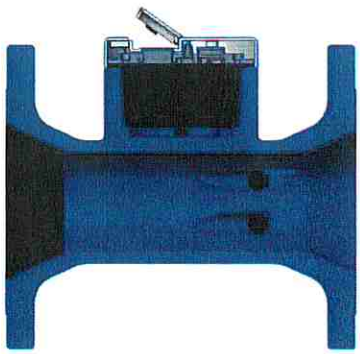
For verification purposes the resolution should be able to be equal to 0.5 % of the volume corresponding to 1h30 at the minimum flow rate Q_1.

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

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 document No. NO-387/18 and NO-421/19.

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 DN 50 to DN 150 MAP10 or MAP16 for DN 200
Working pressure range	bar	from 0,3 to 16 from 0,3 to 10 or 16 for DN 200
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	-	E2

4.1 Additional technical characteristics

Weight	from 10 kg to 36 kg
Environmental protection (IP Code)	IP68
Power source	Lithium Battery, 3.6 V, 10 years lifetime No external AC/DC connection Max voltage
Outputs	Pulse output, with pulse coefficient to be programmed at order Direction output
Connection	Flanges ISO EN 1092-1, ANSI or BSI
Display	LCD, 10 digits
Software	Type P (Welmec Guide 7.2, Issue 5)
Software version and checksum	Software with only one ASIC SW 1.04 49D8 (checksum CRC16: 0x49D8) New modes - Sleep mode, - Calibration mode, - Testing mode - Automatic signal detection Version correspond to the same Legal Software 49D8. The above CRC is a global CRC for the program (containing display and legal)

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	T	-	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	T	-	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-421/19/B/ER dated October 18, 2019 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, Annex No. 1 and Annex No. 3 Water Meters (MI-001) and the EN 14154-1:2005+A2:2011, EN 14154-2:2005+A2:2011, EN 14154-3:2005+A2:2011 and OIML R49-1:2006, OIML R49-2:2004 (harmonised standards and normative documents) and other instructions EN ISO 4064-1:2017, EN ISO 4064-2:2017 and EN ISO 4064-3:2014 standards, which are relevant for this type of meter.

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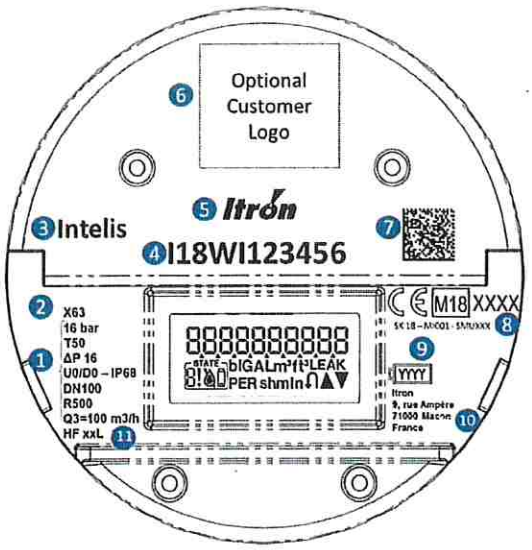
[3] according to EN ISO 4064-1:2017, 4.1.4 Measuring range

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 and ratio Q_3/Q_1
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



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

Picture No.4: Meter Dial

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

Ultrasonic water meter put onto the market in line with 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 STN EN 14154-3:2005+A2 and EN ISO 4064-2:2017 and water at temperature 20 °C ± 5 °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 D or F Modules 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 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.

Picture No.5 Emplacement of seal used for security measures

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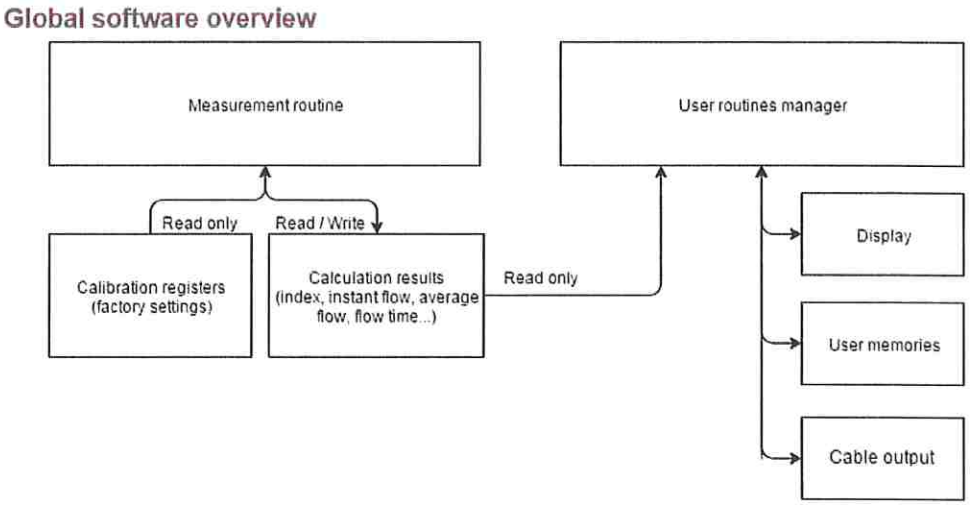
The software is sealed by a password different for each water meter produced. The legal parameters are stored on a read-only memory. The sofware is identified by a CRC-16. There is a CRC for the measurement routine (legal sofware) and a CRC for the user routines manager (Picture No.6).

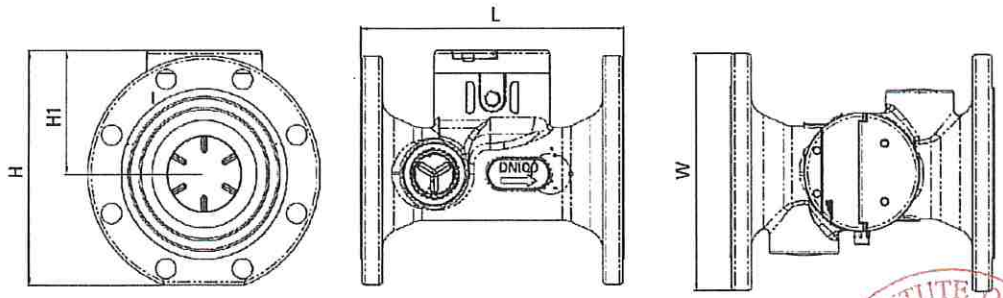


Picture No.6 Global software overview

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 water meter is introduced into the operation by a worker having a certificate for this activity performance. The Ultrasonic water meter is possible to be put into use after a construction in line with this report and in line with the producer instruction by "Instruction of installation and conditions of use of ultrasonic 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: Ing. Viliam Mazúr

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