OIML Member State SLOVAKIA	OIML Certificate No. R49/2013-A-SK1-26.04

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:	**BAYLAN ÖLÇÜ ALETLERİ SAN. VE TİC. A.Ş**
Address:	A.O.S.B 10032. SOKAK NO:16 ÇİĞLİ - Izmir, Turkey

Manufacturer

Name:	**BAYLAN ÖLÇÜ ALETLERİ SAN. VE TİC. A.Ş**
Address:	A.O.S.B 10032. SOKAK NO:16 ÇİĞLİ Izmir, Turkey

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

Water meter type AK-411

Designation of the module *(if applicable)*

Ultrasonic water meter

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: 2

OIML Certificate No.
R49/2013-A-SK1-26.04

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: 2026/CV003/312.15 dated 22nd May 2026 that includes 56 pages
- OIML type evaluation report No. 2026/ER003/SK1 dated 29th May 2026 that includes 16 pages.

The technical documentation relating to the identified type is contained in documentation file name: „Technical documentation file Baylan_AK-411_00" dated 29th May 2026 that includes a sum of documents 63 pages.

OIML Certificate History

Revision No.	**Date**	**Description of the modification**
0	29th May 2026	Certificate first issued

Identification, signature and stamp

The OIML Issuing Authority

……………………………

Dušan Šmigura

Date: 29th May 2026

SLOVAK LEGAL METROLOGY
SLM

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 **AK-411** 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, commercial and light industrial use.
The water meter type AK-411 is compact ultrasonic water meter with electronic indication device. The measurement is based on ultrasonic bidirectional transit-time principle.
The water meter type AK-411 can be installed to operate in horizontal and vertical positions and is not designed to measure the reverse flow.

2. Description

Essential parts of the water meter type AK-411:

Flow sensor:
- cylindrical brass body with inlet and outlet threaded connections;
- inner plastic element with two mirrors (sound path) placed in the cylindrical body;
- two ultrasonic transducers placed on the upside of the cylindrical body.

Calculator and indication device:
- plastic housing of the calculator with indication device directly mounted on the flow sensor;
- PCB with LCD display;
- graphical electronic LCD display with 12 digits and indication range of 999999.999999 m^3. The sub-multiples of a cubic meter are indicated on the display by comma;
- replaceable battery Umax=3,6 V, Umin= 3,0 V, life time 10 years;
- button for scrolling of display.

Non-essential parts of the water meter type AK-411:

- prepayment system with on-off valve and electronic card;
- communication: Mbus, RF, LoRa, MODbus, NB-IoT, GPRS, SMARTcard, optic communication for automatic remote reading system;
- pulse output;
- strainer;
- antenna.

2.1 Metrological functions

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

2.2 Operation and presentation of legal data

The measurement values are presented by means of the electronic LCD display by button:
a) the measured volume consumption (999999,999999 m^3);
b) checksum number;
c) software version number;
d) display test (an “eights” test);
e) display test (a “blanks” test)

Other display options are visible in Fig. 5.

SLOVAK LEGAL METROLOGY SLM

2.3 Software specification

Software versions	Checksum	Remarks
BAYLAN V2.2	0x149CB80B	-

2.4 Accountable alarms

During measurement, the calculator and indicating device will automatically detect whether a fault condition occurs and a warning message will be displayed on the display. Refer to the operating instructions issued by the manufacturer.

3. Technical and metrological data

Table 3.1: Technical and metrological data Q1, Q2, Q3, Q4, R40 to R125

Water meter type		**AK-411**					
Parameter	**Unit**						
Nominal diameter DN	mm	DN20					
Permanent flowrate Q_3	m^3/h	4					
Overload flowrate Q_4	m^3/h	5					
Minimum flowrate Q_1	m^3/h	0,1	0,08	0,0635	0,05	0,04	0,032
Transitional flowrate Q_2	m^3/h	0,16	0,128	0,1015	0,08	0,064	0,0512
Ratio Q_3/Q_1	-	40	50	63	80	100	125
Ratio Q_2/Q_1	-	1,6					

Table 3.2: Technical and metrological data Q1, Q2, Q3, Q4, R160 to R400

Water meter type		**AK-411**				
Parameter	**Unit**					
Nominal diameter DN	mm	DN20				
Permanent flowrate Q_3	m^3/h	4				
Overload flowrate Q_4	m^3/h	5				
Minimum flowrate Q_1	m^3/h	0,025	0,02	0,016	0,0126	0,01
Transitional flowrate Q_2	m^3/h	0,04	0,032	0,0256	0,005	0,016
Ratio Q_3/Q_1	-	160	200	250	315	400
Ratio Q_2/Q_1	-	1,6				

SLOVAK LEGAL METROLOGY
SLM

Table 3.3: Other technical and metrological data

Water meter type		**AK-411**
Parameter	**Unit**	
Nominal diameter DN	mm	DN20
Connection thread	-	G 1 B
Construction length L	mm	190
Installation orientation	-	H/V
Water temperature range	°C	0,1 to 50
Water temperature range class	-	T50
Maximum admissible pressure (MAP)	bar	16
Pressure loss Pressure loss class Δp	bar -	0,63 Δp 63
Ingress Protection (IP) rating	-	IP68
Maximum permissible error in upper flowrates range $Q_2 \leq Q \leq Q_4$	%	± 2 (at $\Theta \leq 30$°C) ± 3 (at $\Theta > 30$°C)
Maximum permissible error in lower flowrates range $Q_1 \leq Q < Q_2$	%	± 5
Scale range	m^3	0,000001
Capacity of calculator	m^3	999999,999999
Accuracy class	-	2
Mechanical class	-	M1
Environmental class	-	O
Electromagnetic class	-	E2
Climatic class	°C	-25 to +55
Flow profile sensitivity class	-	U0D0
Battery	-	replaceable lithium battery, Umin = 3,0 V, Umax = 3,6 V, 10 years battery lifetime

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 (T);
j) pressure loss class *(Δp);*
k) the latest date (year) by which the battery shall be replaced;
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.

SLOVAK LEGAL METROLOGY
SLM

Designation of trademark on the water meter

Manufacturer can used following trademark on its water meters:

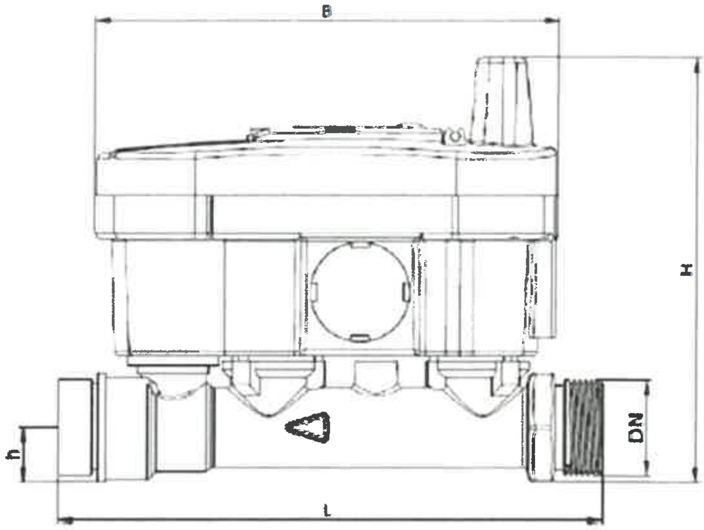
BAYLAN

5. Security measures

The water meter type AK-411 shall be protected against unauthorised manipulation by:
- two the stickers seals that connect the plastic cover of PCB and the plastic water meter cover;
- one the sticker seal that connect the plastic cover of battery with plastic water meter cover (Fig. 3).

6. Figures

Fig. 1: Illustrative views of water meter type AK-411



DN size	L (mm)	B (mm)	H (mm)	h (mm)	connection
DN20	190	102	147	19	G 1 B

Fig. 2: Dimensions of water meter type AK-411

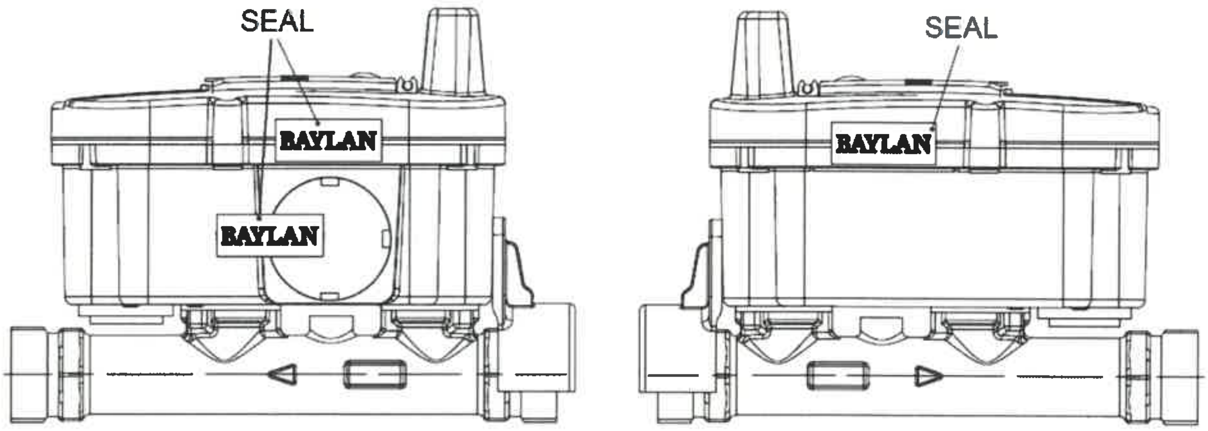


Fig. 3: Sealing of water meter type AK-411

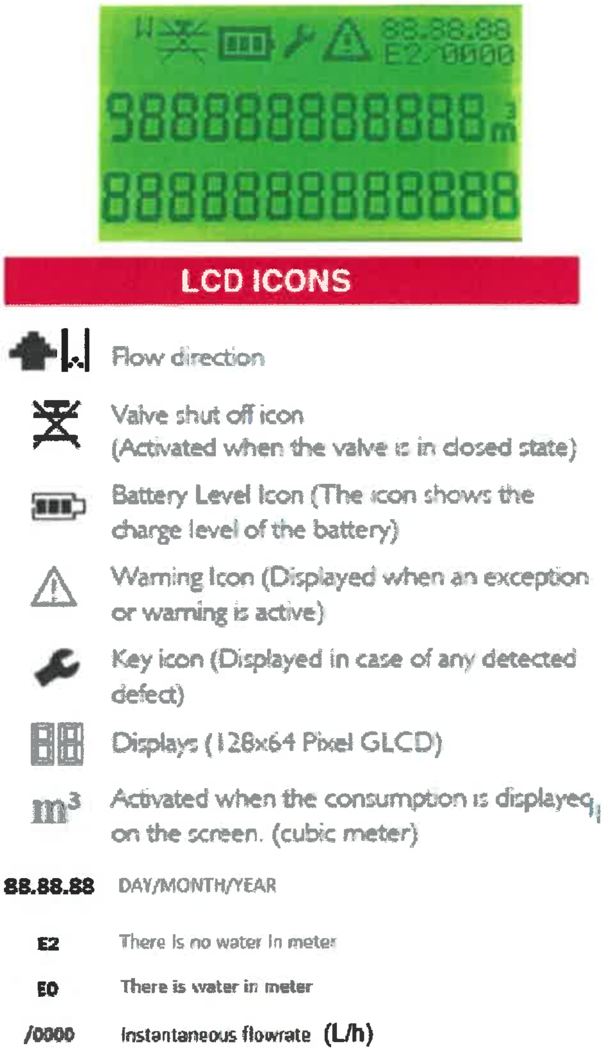


Fig. 4: Display and display description

Menu position	units	Description of menu position
	-	If a card is swiped by the meter, it indicates that it has stored the information on the card in its memory.
	-	It shows that it's not reading any card and the valve is open.
	m^3	Total volume consumption
	m^3	Shows the remaining credit amount

SLOVAK LEGAL METROLOGY SLM

	m^3	Shows the last credit loaded.
	-	In prepaid systems, it shows the tariff rate determined by the water authority.
	-	It shows which tariffs are defined by the water authority.
	-	Menu version, nominal diameter, Hour: minute, ambient temperature
		For postpaid meters, the display shows the date of the bill each month as defined by the water authority.
		LoRa and RF configurations
	m^3	amount of credit spent
	m^3	The total amount of water measured by the reverse flow.
		It shows which water authority the water meter is registered to.
	xxxxxxxx	Serial number
	yyyyyyyyyyy	Consumer number
	-	Checksum 0x149CB80B
	-	Software version BAYLAN V2.2
	-	display test (an “eights” test)
	-	display test (a “blanks” test)

Fig. 5: Menu of display description