

Vojenský technický ústav, s.p.

The certified quality system according to ČSN EN ISO 9001



Technology Testing Section – Testing
Laboratory No. 1103 accredited by CIA according to
CSN EN ISO/IEC 17025:2018

**ELECTRICAL SAFETY TESTING
LABORATORY**

Task/Order No.:
22-19-5-93-3075/42

Test Report No.:
194400-061/2022

Copy No.: 1

No. of Pages: 8

Annex: 1 / 10

TEST REPORT

ON DEGREE OF PROTECTION PROVIDED BY ENCLOSURE IP68

Name and Address of Submitter (Customer):

Český metrologický institut, Okružní 31; Brno 638 00

Identification: Water meter WMP

Type: WMP

Serial Number: -

Producer: ADD Production, str. Dragomirna 36; Chicinau; MD2008; Republic of Moldova

Technical Documentation: See page 2 of this report

Date of Entrance to Test:

9. 9. 2022

Test Method:

ČSN EN 60529: 1993 + A1: 2001

Date and Place of Test:

27.-27. 9. 2022 (IPX8)

Diving Technology Test Site

Test Leader:

Testing Laboratory Manager Zbyněk Plch

27.-29. 9. 2022 (IP6X)

Electrical Safety Testing Laboratory

Test Carried out by:

Testing Laboratory Manager Zbyněk Plch

Testing Engineer Ondřej Ešler

Date of Issue:

4. 10. 2022

Authorized by Testing Laboratory Manager:

Zbyněk Plch

Test results:

*Partial tests results are listed on the following pages of this report.
The expanded measurement uncertainties are a product of a measurement standard uncertainty and a coverage factor $K=2$, this corresponds to a coverage probability of 95 % for a normal distribution.*

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odštěpný závod VTÚPV
Úsek zkoušení techniky
Víta Nejedlého 691
682 01 VYŠKOV

Notes:

The standard used (see Test Method) is Czech version of European standard:
EN 60529: 1991 + EN 60529/A1: 2000

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This document is an English translation of the original Czech version. If there are any ambiguities, please regard the Czech original as valid!

The test results relate only to the tested item as received. This report shall not be reproduced except in full and only with written approval of the testing laboratory. The testing laboratory is not responsible for the data and information supplied by the submitter, affecting the validity of the results.

List of measurement instruments used

Instrument	Metrological number
Data logger ALMEMO 5690-2	44b-61393
Electronic stopwatch QUARTZ	61d-60839
Tape measure	11g-60008
Pressure gauge (part of the dust chamber)	24b-60362
Gas flowmeter (part of the dust chamber)	14g-61400

The following uncalibrated devices/instruments were used for the tests:

Instrument	Inventory number
Dust chamber VST 1260 GV ¹⁾	30 061

Note:

- 1) The dust test is performed in a dust chamber, the main principle of which corresponds to Figure 2 of the standard ČSN EN 60529. Its circulating pump keeps talcum dust in a state of suspension in the chamber. Talcum powder is used in a given amount corresponding to the requirements of the relevant standard. In case that the enclosure is included in the category 1 (according to the definition of ČSN EN 60529) the calibrated measurement instruments (pressure gauge, gas flowmeter, stopwatch) are used to measure the pressure and air flow.

Documentation supplied for tests

- Technical specification WMP
- Drawing documentation

Tests evaluation

The evaluation of the tests is specified in the "Evaluation" column".

Not Applied	NA
Pass	P
Fail	F

The product is considered as meeting the requirements if the measured values of the relevant monitored electrical (eventually other) quantities for which maximum limit values are set, increased by the measurement uncertainty, are lower or equal to the limit values of these quantities specified in the relevant technical standard; or if the measured values of the relevant monitored electrical (eventually other) quantities for which minimum limit values are set, decreased by the measurement uncertainty, are higher or equal to the limit values of these quantities specified in the relevant technical standard. In other cases, the test result is evaluated as not meeting the requirements.

Tests outside the scope of the accreditation

Information on the clause of the standard, by which the equipment was tested outside the scope of the accreditation, is specified in the "Clause No" column.

Outside the scope of the accreditation	N
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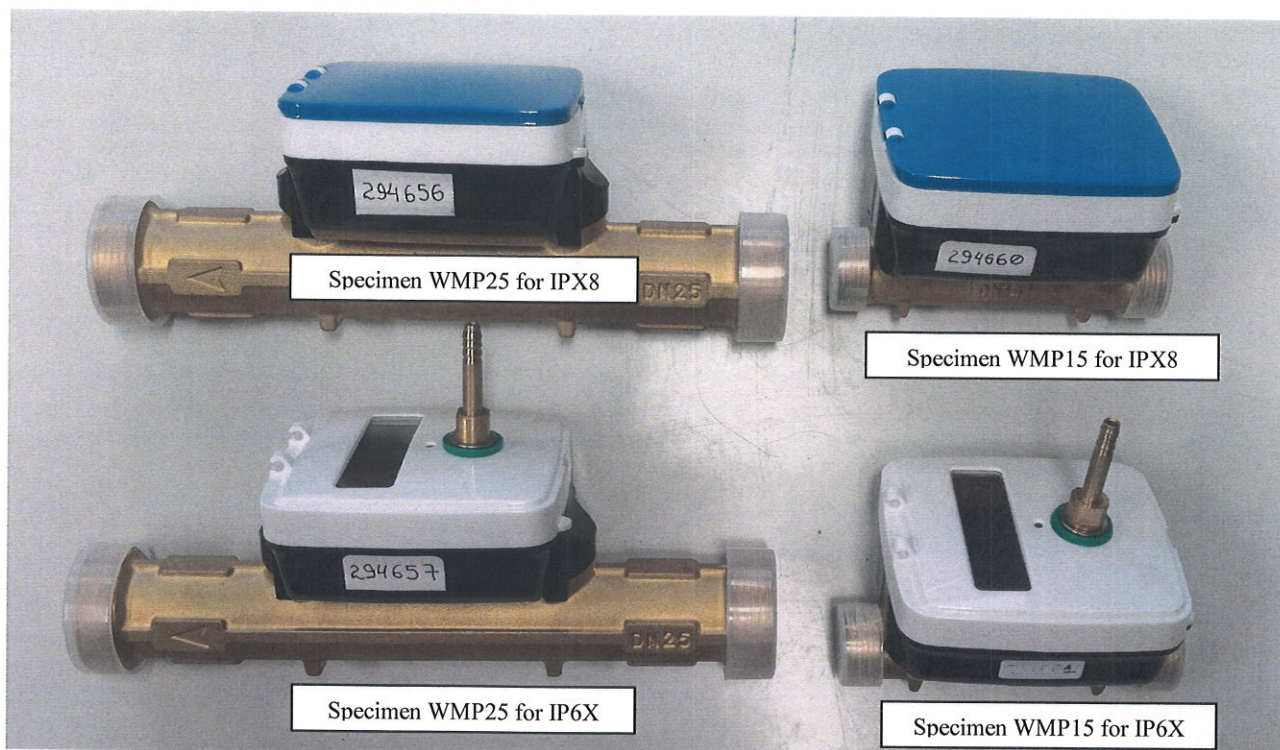
Limit values and conditions of approval

Limit values and conditions of approval for tests are specified in the relevant clauses of standard ČSN EN 60 529: 1993.



Generally to tests

The following pieces of equipment were delivered to the tests as representatives of the WMP water meter type series: 2 pcs WMP15 (nominal diameter DN15) and 2 pcs WMP25 (nominal diameter DN25).



For the purpose of the IP6X tests, a special opening was created by the submitter in the equipment enclosure for connection to the suction hole of the pump.

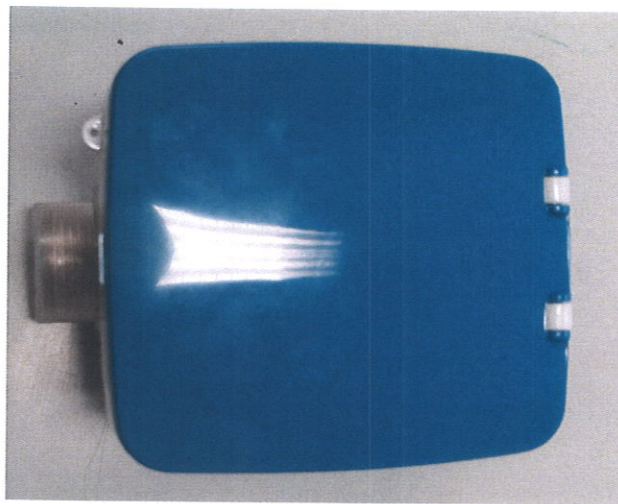
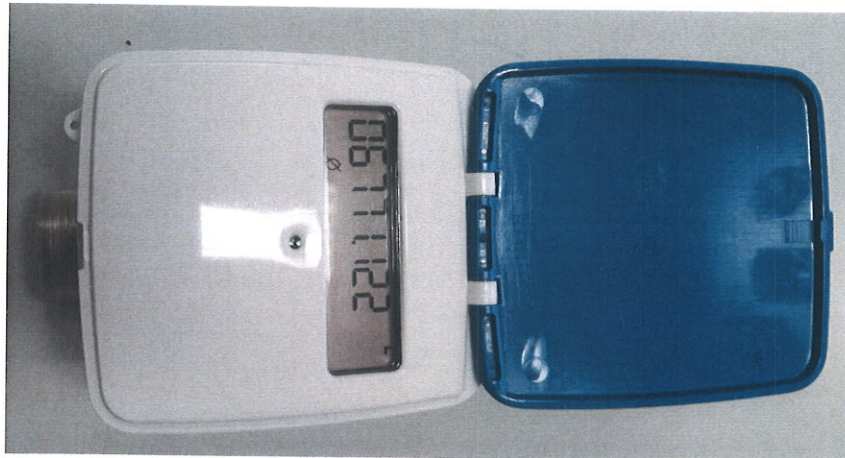
The individual conditions for the IPX8 test were stated by the submitter (customer):

- The lowest point of the enclosure is immersed at a depth of 4 m below the water surface.
- Test duration: 48 hours.

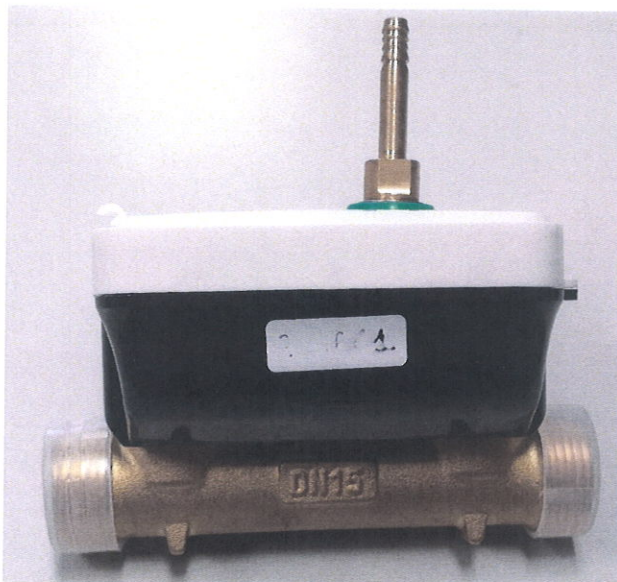
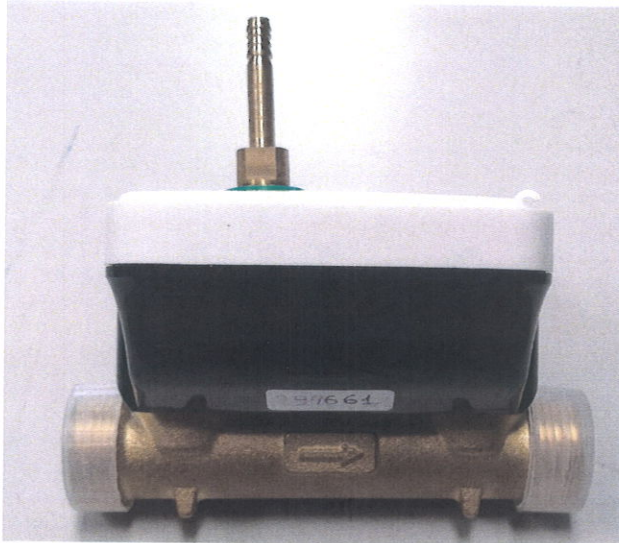
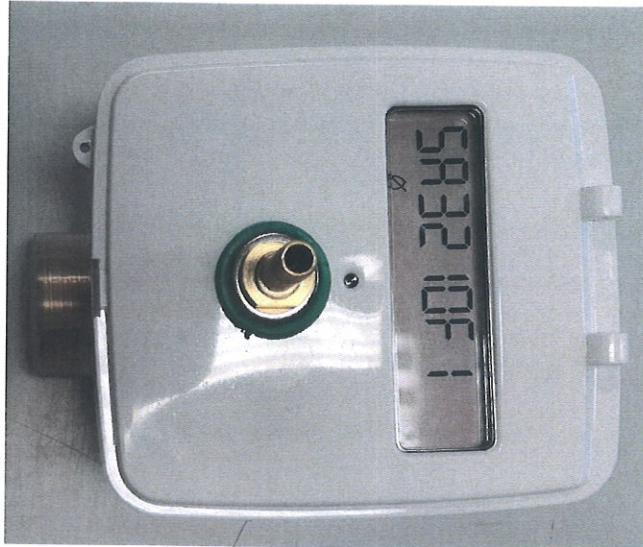


Picture of tested equipment

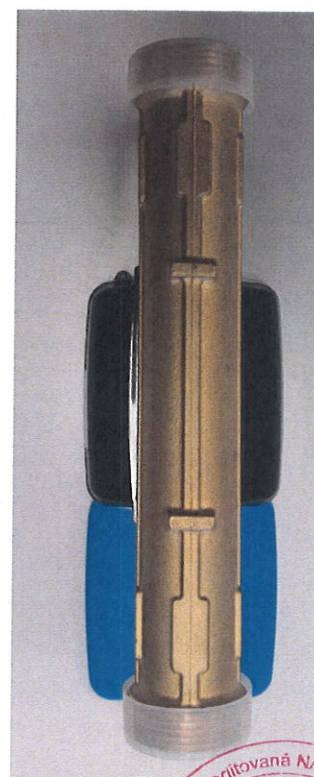
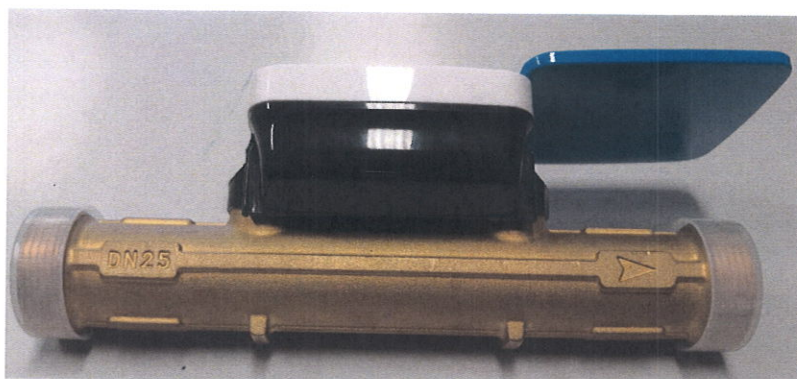
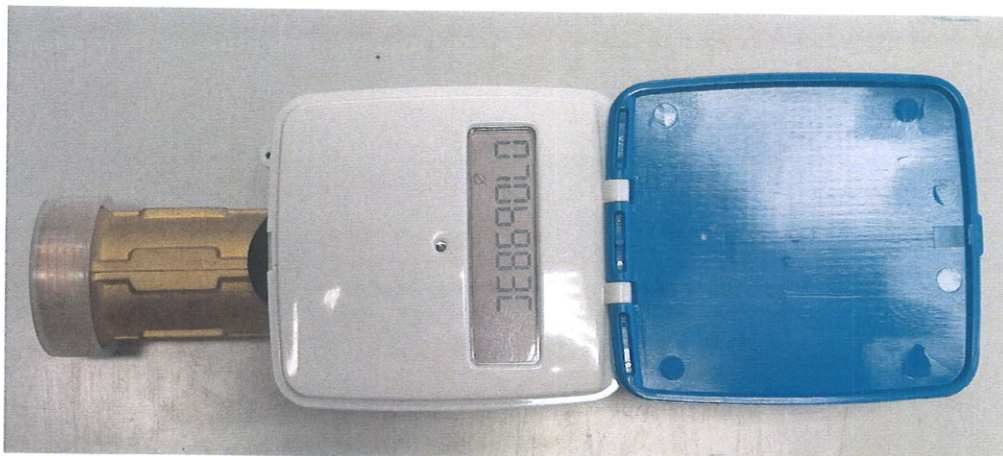
Specimen WMP15 intended for IPX8 test



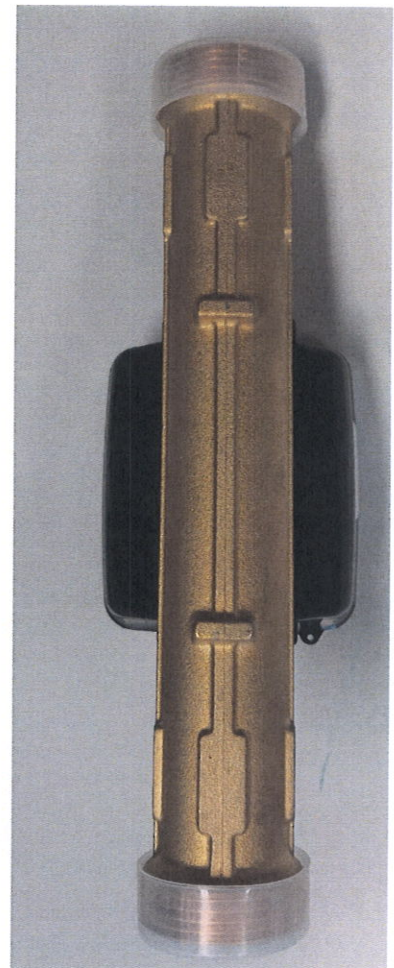
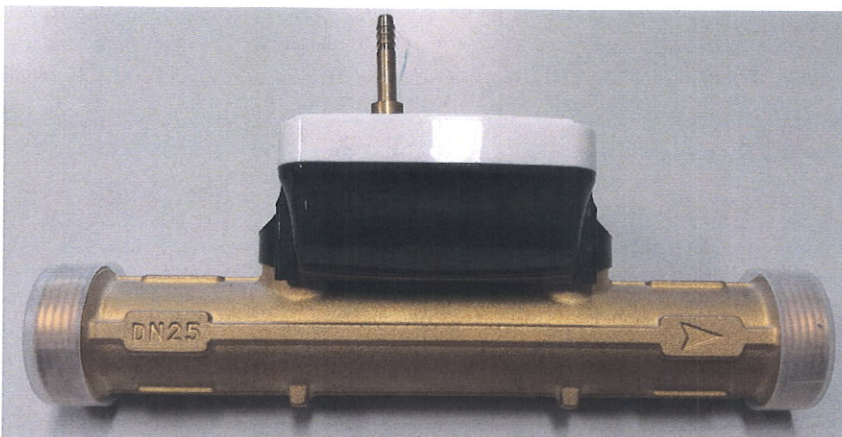
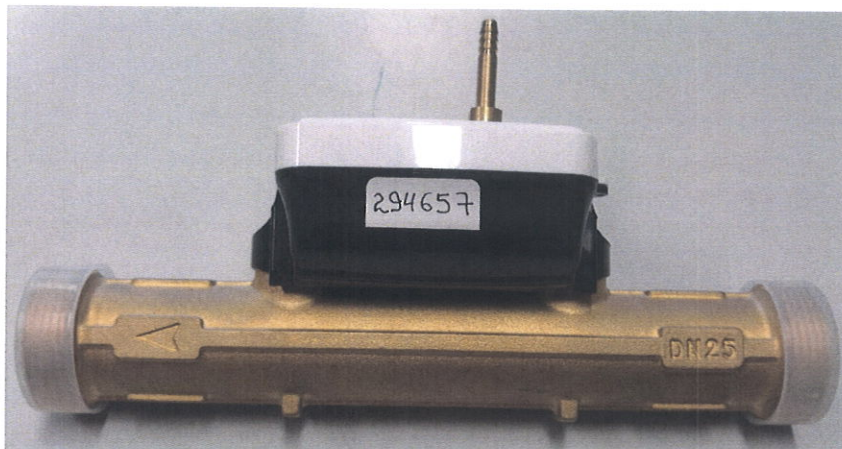
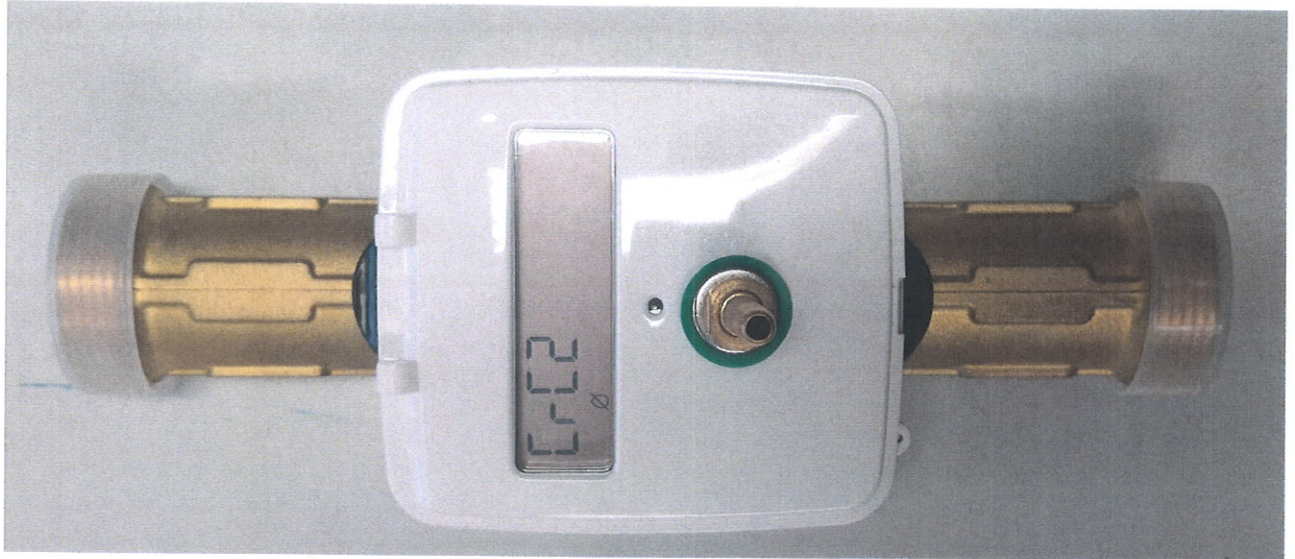
Specimen WMP15 intended for IP6X test



Specimen WMP25 intended for IP8X test



Specimen WMP25 intended for IP6X test



Degrees of protection provided by enclosures (IP Code) ČSN EN 60529			
Clause No.	Requirements	Result	Evaluation
12	Tests for protection against access to hazardous parts indicated by the first characteristic numeral		
12.1	Access probes	Not applied, the equipment has no hazardous parts. It is supplied from the internal battery 3.6 V (2x).	NA
12.2	Test conditions		
12.3	Acceptance conditions		
13	Tests for protection against solid foreign objects indicated by the first characteristic numeral		
13.1	Test means	IP6X.	P
13.4	Dust test for first characteristic numerals 5 and 6	See Annex No. 1.	
13.6	Special conditions for first characteristic numeral 6		
14	Tests for protection against water indicated by the second characteristic numeral		
14.1	Test means	IPX8.	P
14.2	Test conditions	The individual conditions for the IPX8 test were stated by the submitter (customer): The lowest point of the enclosure is immersed at a depth of 4 m below the water surface. Test duration: 48 hours. See Annex No. 1.	
14.2.8	Test for second characteristic numeral 8; continuous immersion subject to agreement (IPX8)		
14.3	Acceptance conditions		

Only tests solely concerning the tested equipment are listed in this report.

END OF REPORT



Protection against water
IPX8 according to ČSN EN 60529, cl. 14.2.8

Specimen WMP25**Conditions of IPX8 test:**

The tested equipment was immersed in water so that the lowest point of the enclosure is at a depth of 4000 mm ± 5 mm below the water surface.

Test duration: 48 hours.

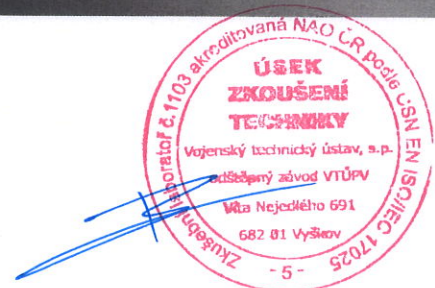
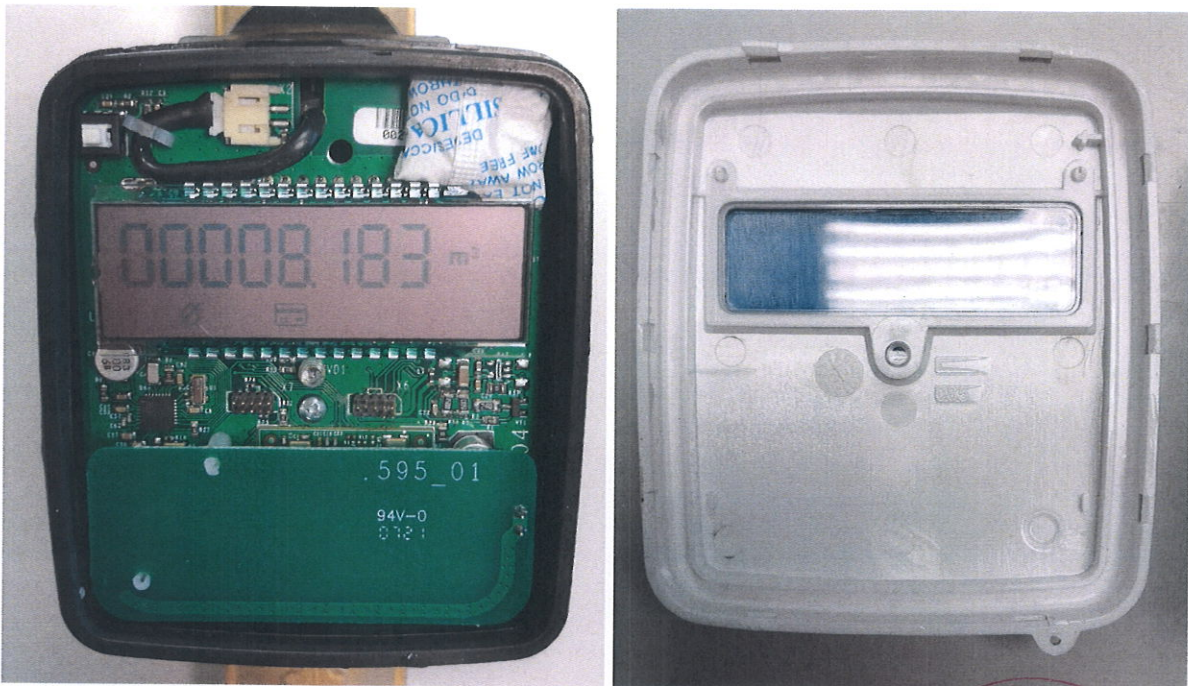
Water temperature: 21.7 °C ± 0.6 °C.

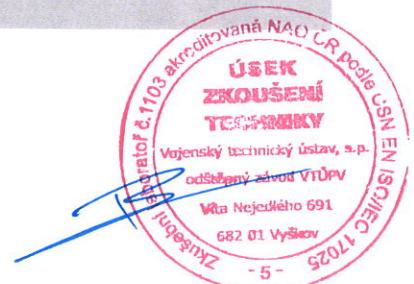
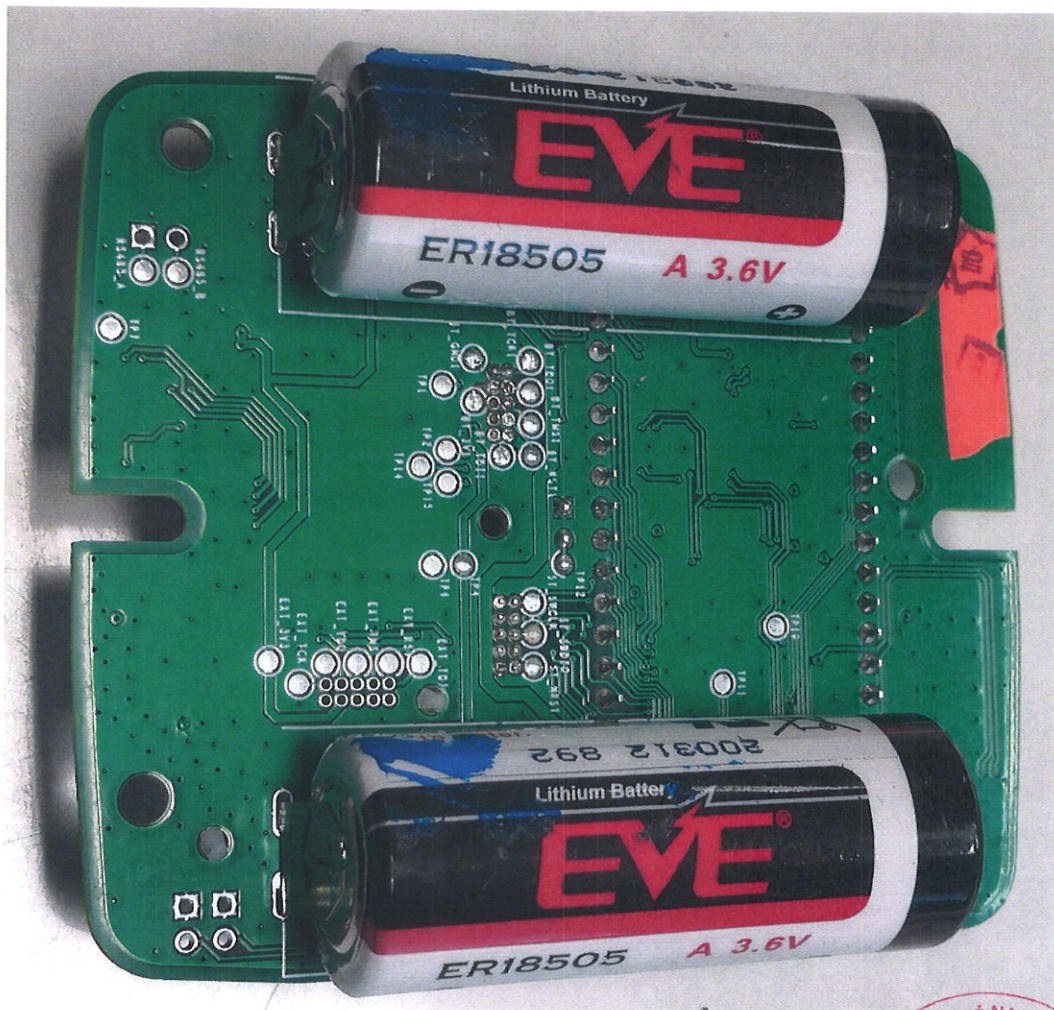
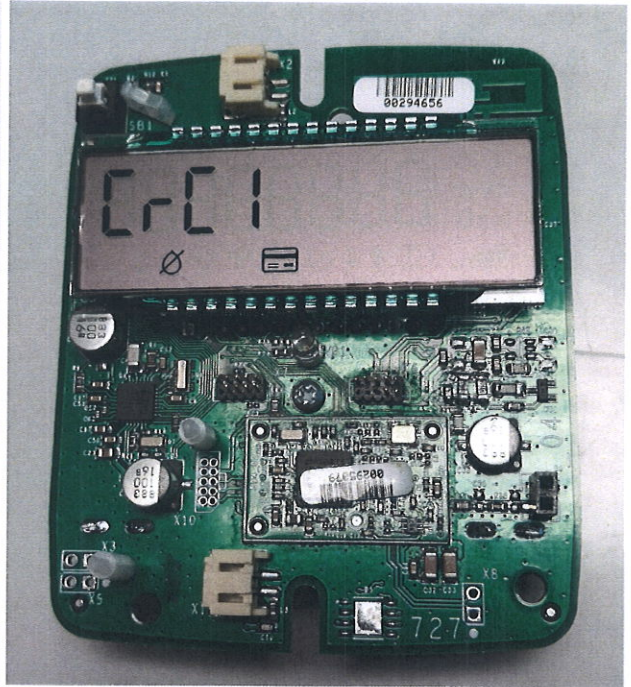
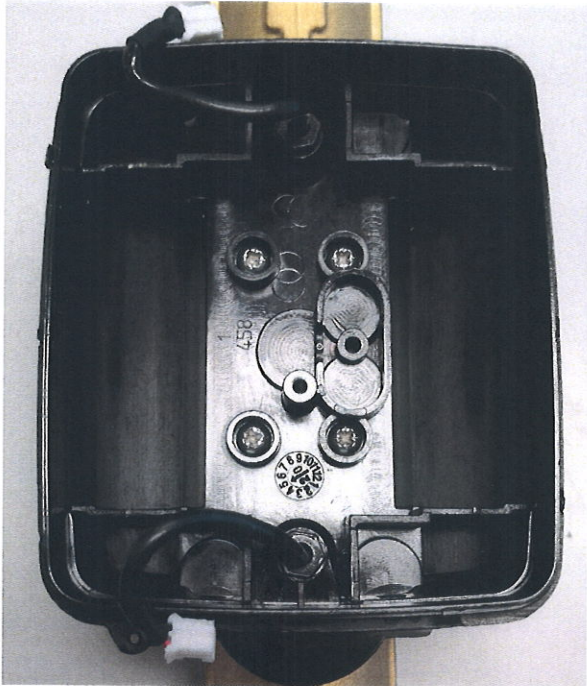
Equipment temperature before immersion: 22.1 °C ± 0.6 °C.

Evaluation:

After the test, the water was wiped off the surface of the equipment and a visual inspection of the specimen interior was performed.

The visual inspection did not reveal any ingress of water into the inner area of the equipment.

Evaluation: P**Photos of the interior of WMP25 sample during the evaluation of IPX8 test:**



Specimen WMP15**Conditions of IPX8 test:**

The tested equipment was immersed in water so that the lowest point of the enclosure is at a depth of 4000 mm \pm 5 mm below the water surface.

Test duration: 48 hours.

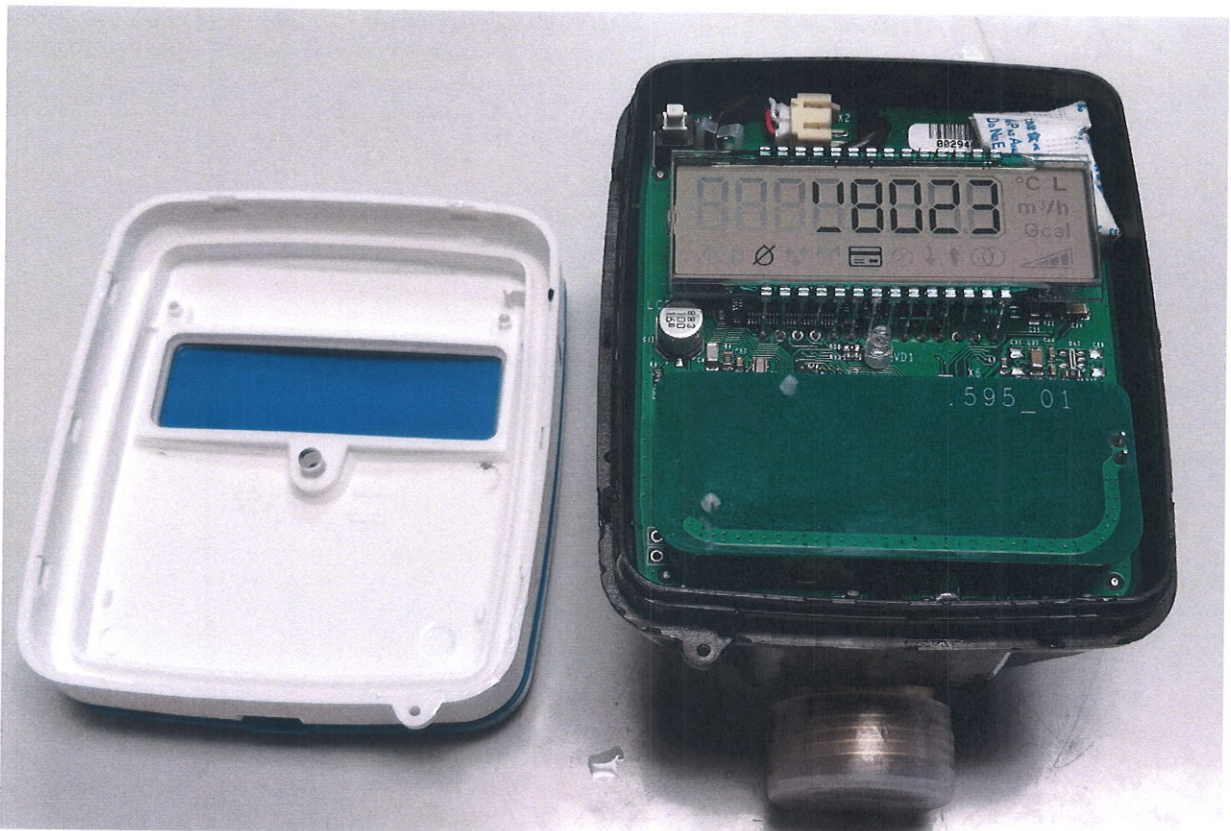
Water temperature: 21.7 °C \pm 0.6 °C.

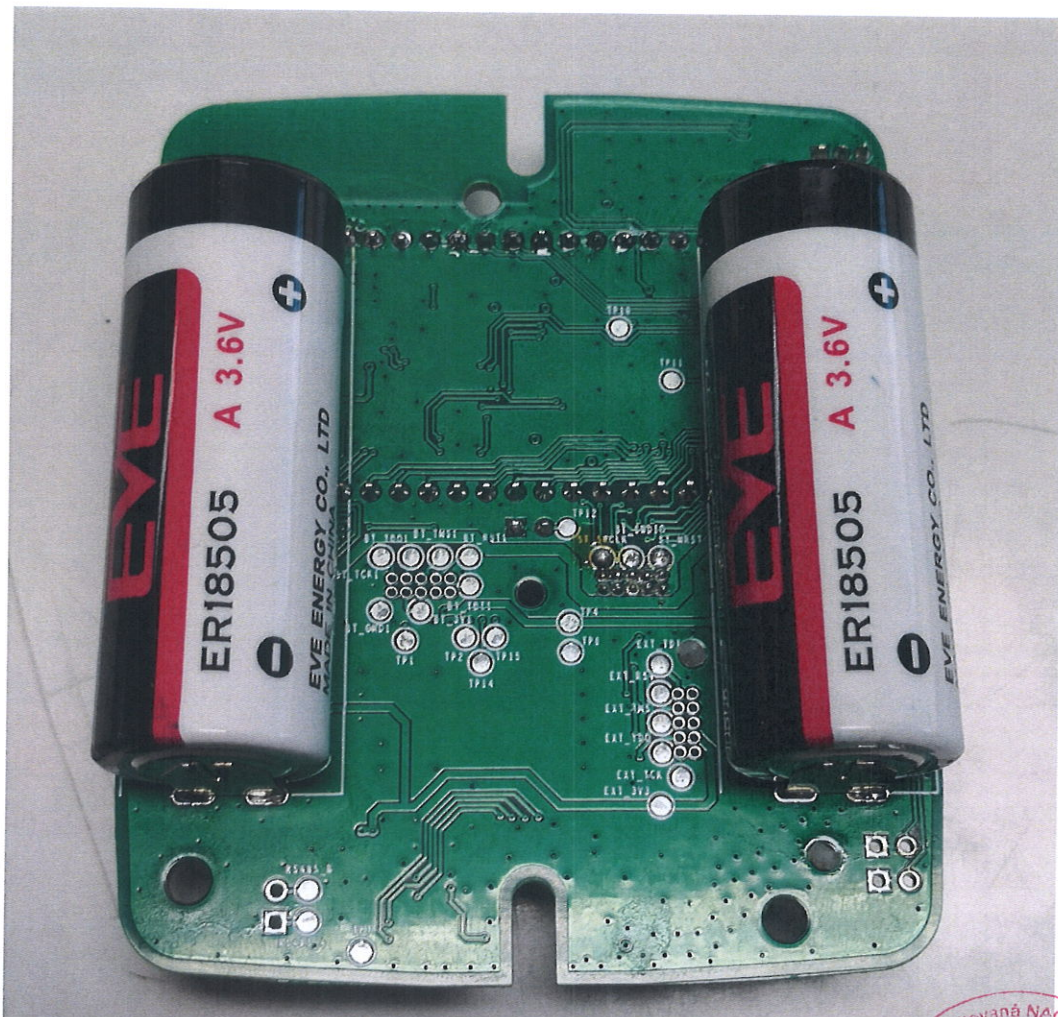
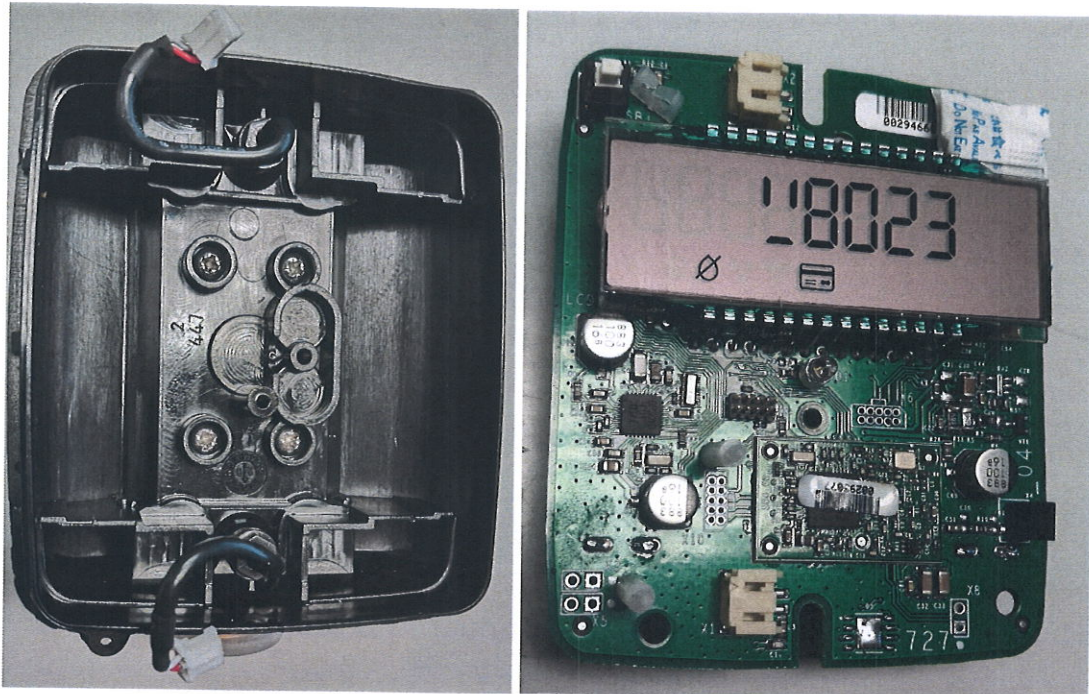
Equipment temperature before immersion: 22.2 °C \pm 0.6 °C.

Evaluation:

After the test, the water was wiped off the surface of the equipment and a visual inspection of the specimen interior was performed.

The visual inspection did not reveal any ingress of water into the inner area of the equipment.

Evaluation: P**Photos of the interior of WMP15 sample during the evaluation of IPX8 test:**

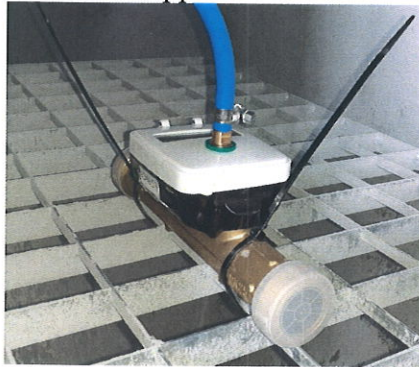


Protection against ingress of solid foreign objects
IP6X according to ČSN EN 60 529, cl. 13.4 and 13.6

Specimen WMP25

Conditions of IP6X test:

- The tested equipment was placed in the working position during the test.
- The suction opening of the pump was connected to the tested enclosure using a suction hose, which was implemented into the equipment for testing purposes through the created opening in the enclosure provided by metal hose nipple.



- Equipment temperature: 22.6 ± 0.6 °C.
- Ambient temperature: 22.7 ± 0.6 °C.
- Enclosure volume: 0.324 l
- Required pumping speed of suction: 40 to 60 times the enclosure volume per hour,
 - i.e. $40 \times 0.324 \text{ l} = 12.96 \text{ l.h}^{-1}$.
 - i.e. $60 \times 0.324 = 19.44 \text{ l.h}^{-1}$.
- Vacuum: 18 mbar (pumping speed: 1.68 l.h^{-1}).
- Test duration: 8 h.

Evaluation:

After removing the tested equipment from the dust chamber and cleaning the surface from dust, the visual inspection of the equipment interior was performed.

The visual inspection did not reveal any dust deposits in the inner area of the equipment.

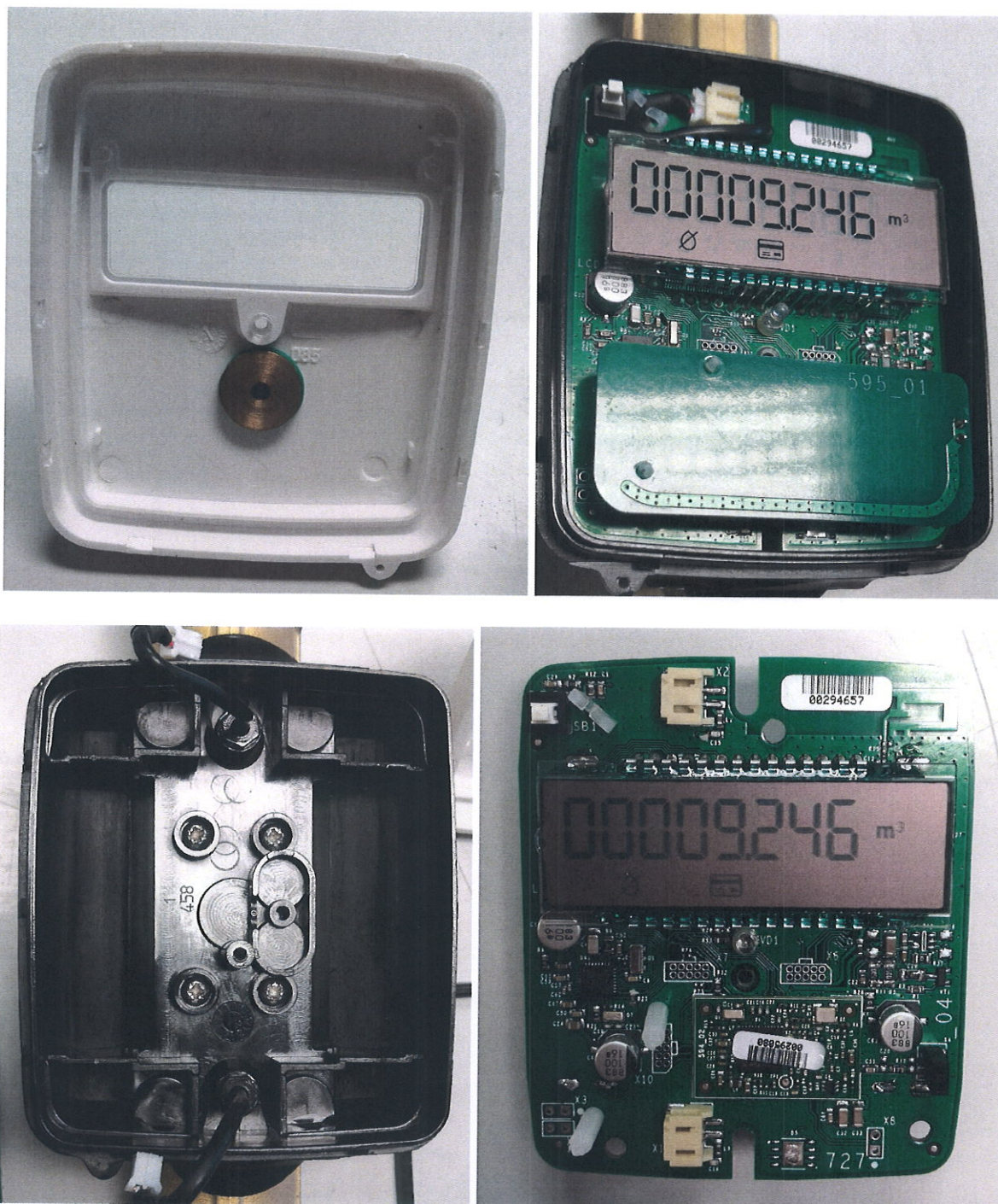
Evaluation: P

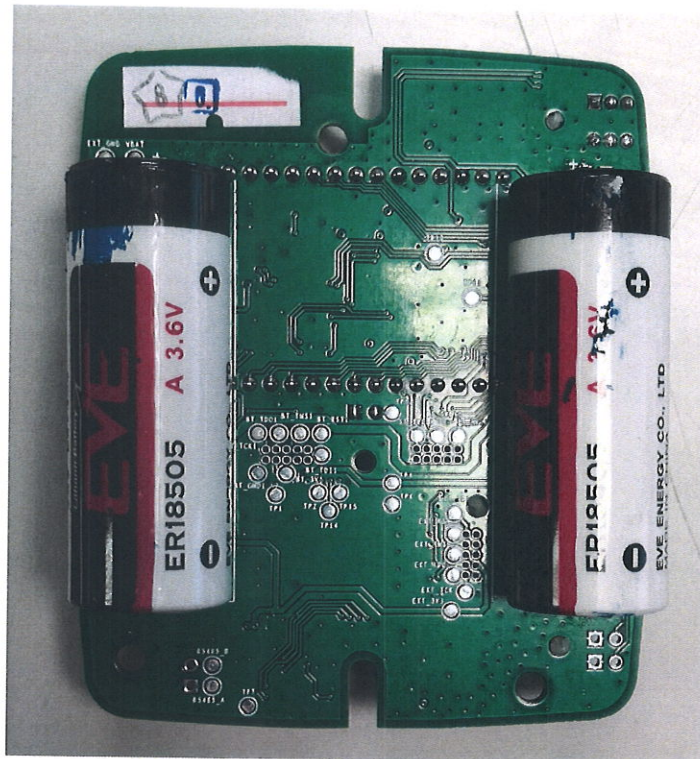


Specimen immediately after the end of IP6X test



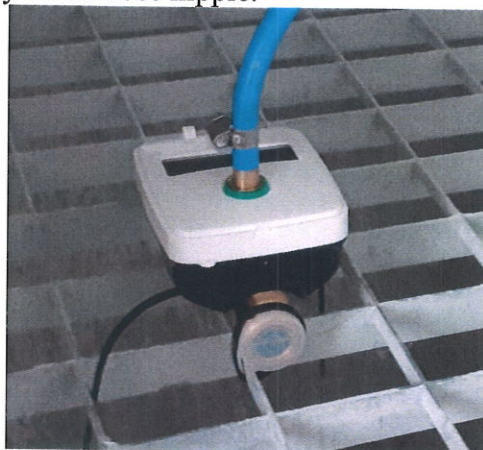
Photos of the interior of WMP25 specimen during the evaluation of IP6X test:





Specimen WMP15**Conditions of IP6X test:**

- The tested equipment was placed in the working position during the test.
- The suction opening of the pump was connected to the tested enclosure using a suction hose, which was implemented into the equipment for testing purposes through the created opening in the enclosure provided by metal hose nipple.

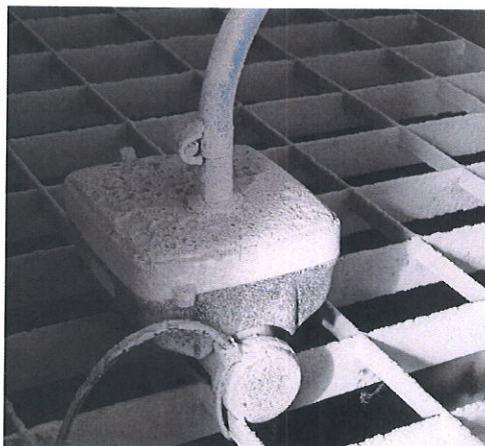


- Equipment temperature: 23.1 ± 0.6 °C.
- Ambient temperature: 23.2 ± 0.6 °C.
- Enclosure volume: 0.324 l
- Required pumping speed of suction: 40 to 60 times the enclosure volume per hour,
 - i.e. $40 \times 0.324 \text{ l} = 12.96 \text{ l.h}^{-1}$.
 - i.e. $60 \times 0.324 = 19.44 \text{ l.h}^{-1}$.
- Vacuum: 18 mbar (pumping speed: 1.80 l.h^{-1}).
- Test duration: 8 h.

Evaluation:

After removing the tested equipment from the dust chamber and cleaning the surface from dust, the visual inspection of the equipment interior was performed.

The visual inspection did not reveal any dust deposits in the inner area of the equipment.

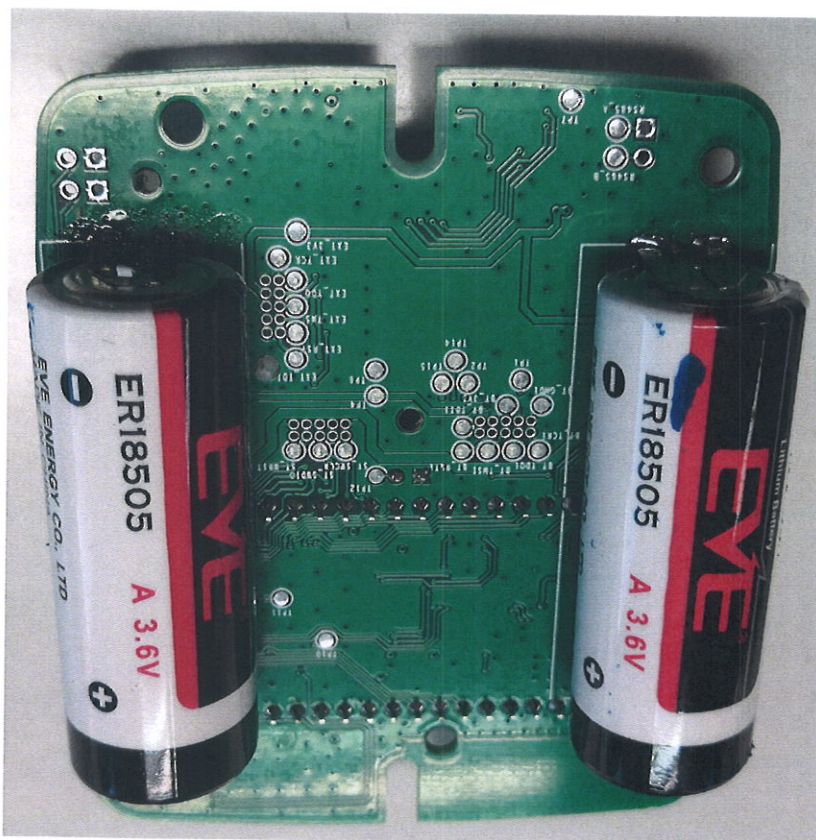
Evaluation: P

Specimen immediately after the end of IP6X test



Photos of the interior of WMP15 specimen during the evaluation of IP6X test:





TECHNICAL COMMENTS

on tests results – Test Report No. 194400-061/2022

Tested equipment: Water meter WMP
Type: WMP

P A S S E D

to meet the applied requirements of the standards

ČSN EN 60529: 1993 + A1: 2001

(EN 60529: 1991 + EN 60529/A1: 2000)

on degree of protection provided by enclosure IP68

Note:

Conditions for IPX8 test:

- The lowest point of the enclosure is immersed at a depth of 4 m below the water surface.
- Test duration: 48 hours.

Comments:

Technical comments on the tests results are of an informatory nature and are outside the scope of the test site accreditation.

In Vyškov: 4. 10. 2022

Person responsible: Zbyněk Plch



Signature