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Pursuant to article 8 paragraph 2 of the Law on Metrology (Official Gazette of Montenegro 79/08), the Ministry of Economy hereby issues the

RULEBOOK

ON TECHNICAL AND METROLOGICAL CONDITIONS AND THE PROCEDURE OF AUTHORIZATION OF PERSONS FOR PREPARATION OF WATER METERS FOR VERIFICATION

(Official Gazette of Montenegro 44/09 of 10 July 2009, 09/13 of 12 February 2013)

I. BASIC PROVISIONS

Article 1

This rulebook prescribes technical and metrological conditions, necessary expert staff, and the procedure of authorization of a company, i.e. other legal person to perform the activity of preparing cold-water and hot-water meters (hereinafter referred to as water meters) for verification.

Article 2

Preparation of water meters for verification includes visual examination of the water meter, reparation, installing the water meter on the testing device, preparation of the testing device, water meter testing, i.e. checking of the metrological characteristics of the water meter.

A written report shall be made on performed activities referred to in paragraph 1 of this article.

Article 3

An authorized company, i.e. other legal person authorized to perform the activity of preparing water meters for verification can remove the national hallmark from the meter, during the reparation. After the reparation, verification of the water meter shall be performed.

Article 4

Verification of the water meter shall be performed at the workplace of the authorized person referred to in the article 3 of this rulebook.

II. TECHNICAL AND METROLOGICAL CONDITIONS AND NECESSARY EXPERT STAFF

Article 5

The company, i.e. other legal person may get authorization to perform the activity of preparing water meters for verification, if it owns:

- 1) Water meter testing equipment;
- 2) Premises for receipt, reparation, and testing of water meters;
- 3) Required expert staff.

Article 6

Water meter testing equipment consists of:

- 1) Water meter testing device (with corresponding control devices, such as: manometer, thermometer, flow meter, balance, measuring vessel);
- 2) Manometer for measuring pressure at the inlet of the test line, of maximum permissible measurement error $\pm 5\%$;
- 3) Heaters which heat the water to the working temperature of minimum $60\text{ }^{\circ}\text{C}$ (if hot-water meters are being tested);
- 4) Control thermometers for measuring workspace air temperature, measuring range from $0\text{ }^{\circ}\text{C}$ to $35\text{ }^{\circ}\text{C}$, where the lowest scale line shows maximum $1\text{ }^{\circ}\text{C}$.

Article 7

Water meter testing device must have such technical-technological characteristics that it enables water meter testing using volumetric or gravimetric method.

Article 8

Water meter testing using the device referred to in the article 7 of this rulebook, the following errors may be allowed:

- 1) When measuring volume of the water which flows through the meter during the testing, error must not be larger than one fifth (1/5) of the maximum permissible error of the tested meter;
- 2) When measuring water pressure $\pm 5\%$;
- 3) When measuring water pressure drop $\pm 5\%$;
- 4) When measuring water temperature $\pm 1\text{ }^{\circ}\text{C}$.

Article 9

Water meter testing device can be automatized so that:

- 1) The water flow oscillation during the meter testing is not larger than:
 - a) 5% for flows $Q_{\min} \leq Q < Q_t$;
 - b) 10% for flows $Q_t \leq Q \leq Q_{\max}$;
- 2) The water flow oscillation during the meter testing is not larger than:
 - a) 2,5% for flows $Q_{\min} \leq Q \leq Q_t$;
 - b) 5% for flows $Q_t \leq Q \leq Q_{\max}$;
- 3) The water temperature oscillations during the meter testing is not larger than $\pm 5\%$;
- 4) Water temperature during the meter testing is within the limits:
 - a) $20\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ for cold-water meter testing;
 - b) $50\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ for hot-water meter testing;
- 5) The pressure at the inlet of the meter, during the meter testing, is not higher than the permitted working pressure for the tested meter type;
- 6) The pressure at the outlet of the meter, during the meter testing, is not less than 0,03 MPa;
- 7) It enables testing of individual meters or testing of meters in series;
- 8) When testing meters in series:
 - a) Characteristics of each water meter can be determined;
 - b) There is no mutual interference between the meters;
 - c) Water pressure at the outlet of each meter is high enough to prevent cavitation;
- 9) Each testing circuit of the water meter can be individually observed;
- 10) At every moment during the water meter testing it is possible to measure, i.e. control, the inner pressure drop;
- 11) The working conditions, prescribed by the manufacturer of the water meter being tested, are fulfilled at every moment during the water meter testing;
- 12) During the water meter testing, it provides that there is no air in the tested system;
- 13) If the measuring vessel of the water meter testing device is divided into several chambers, partition wall must be solid enough, so that it would be ensured that the chamber volume does not change more than 0,5 %, depending on whether the adjacent chambers are full or empty;
- 14) The test system meets the other technical requirements of the meter manufacturer, which are included in the test system for water meter testing.

Article 10

Equipment referred to in article 6 items 1, 2 and 4 of this rulebook, must have a valid hallmark and certificate on verification, i.e. calibration certificate.

Article 11

Premises for water meter testing must be separated from the premises for receipt and reparation of water meters.

Article 12

Premises for water meter testing must:

- 1) Be clean, dry and spacious enough to accommodate the necessary equipment and for undisturbed water meter testing;
- 2) Be protected from direct sunlight;
- 3) Have adequate shelves to accommodate water meters which are being tested;
- 4) Have shelves to accommodate water meters which were verified;
- 5) Have day light and adequate electric lighting;
- 6) Have adequate grounding system;
- 7) Have the possibility of maintaining workspace air temperature conditions within the limits of $20\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$;

8) Have entrance door built in a way that it enables controlled entrance to the premises.
Only equipment used for testing can be accommodated in the premises for water meter testing.
The premises for water meter testing must be protected from quake and vibration sources, which could affect the measuring accuracy.

Article 13

The control thermometer for measuring workspace air temperature must be installed on the wall of the premises for water meter testing, in a way that it is 15 to 20 cm away from the wall, and 1.50 to 1.70 m high from the floor of the room.

Article 14

Walls of the water meter testing room must be coated with ceramic tiles, up to 1.50 m high from the floor of the room.

The floor of the room must be made of concrete and coated with ceramic tiles with a slope towards wastewater drain.

On the floor of the test room, wooden bars or rubber hollow floor mats must be installed around the water meter testing device.

Article 15

Heating sources of the water meter testing room must be at least 1.50 m away from the equipment, i.e. from the place where the water meter testing takes place, and they must provide equal heating of the test room.

Article 16

Water supply system in the water meter testing rooms must be such that it enables simultaneous testing of several water meters, pursuant to conditions referred to in the article 9 of this rulebook.

Water supply must be such that there are no pressure oscillations at the water supply to the testing device.

Water supply to the measuring vessel of the water meter device must be such that it enables minimal water ripple in the measuring vessel.

Water drain must be such that it can accept all water from the measuring vessel at the same time, without clogging or slowing down the draining.

Article 17

The person authorized to perform the activity of preparing water meters for verification must have at least two (2) permanent employees, with at least high school qualification of technical education, and at least three (3) years of work experience in testing, manufacturing, or servicing of water meters.

III. AUTHORIZATION PROCEDURE

Article 18

Authorization of a company, i.e. other legal person to perform the activity of preparing water meters for verification, is done upon application.

Authorization application referred to in the paragraph 1 of this article contains:

- 1) Applicant information (name, registered office, contact, TIN, principal business code, etc.).

The application referred to in the paragraph 1 of this article shall be supported with:

- 1) Technical documentation for the equipment;
- 2) Evidence of fulfillment of conditions which refer to the workplace;
- 3) Evidence on employed expert staff pursuant to conditions referred to in the article 17 of this rulebook.

Article 19

The report referred to in the article 2 paragraph 2 of this rulebook contains the following information:

- 1) On the applicant (name, surname, and ID number or passport number);
- 2) On site and date of water meter testing;
- 3) On water meter (type, model and serial number);
- 4) Metrological and other technical information for verification;
- 5) Water meter testing results;
- 6) On removed hallmarks;
- 7) On the person who performed the water meter testing (name, surname, and signature).

The person authorized to perform the activities of preparing water meters for verification submits testing reports to the Bureau of Metrology every three months and takes part in comparative tests, organized by the Bureau.

The authorized person referred to in the paragraph 2 of this article keeps testing reports of the water meters in printed or electronic form, for at least three (3) years from the date of termination of the certificate period.

IV. FINAL PROVISION

Article 20

This Rulebook shall enter into force on the eighth day following that of its publication in the Official Gazette of Montenegro.

No 0704-300/1

Podgorica, 2 July 2009

Ministry of Economy

Minister,

Branko Vujović, m.p.