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Standards and documents applied:

EN ISO 4064-1:2017;
EN ISO 4064-2:2017;
EN ISO 4064-4:2014;
EN ISO 4064-5:2017;
OIML R 49-1:2013;
OIML R 49-2:2013;
WELMEC 7.2:2015.

The measuring instrument must correspond with the following specifications:

1 Design of the instrument

1.1 Construction

Ultrasonic complete water meter CENTINEL consists of a measurement transducer with a primary flow sensor, an electronic calculator and indicating device. Plastic measuring sections with two ultrasonic transducers are installed in the plastic meter body. The meter has an electronic calculator and a LCD indicating device mounted in the same body.

The meter is powered by an non-replaceable 3,6 V DC lithium battery (one or two).

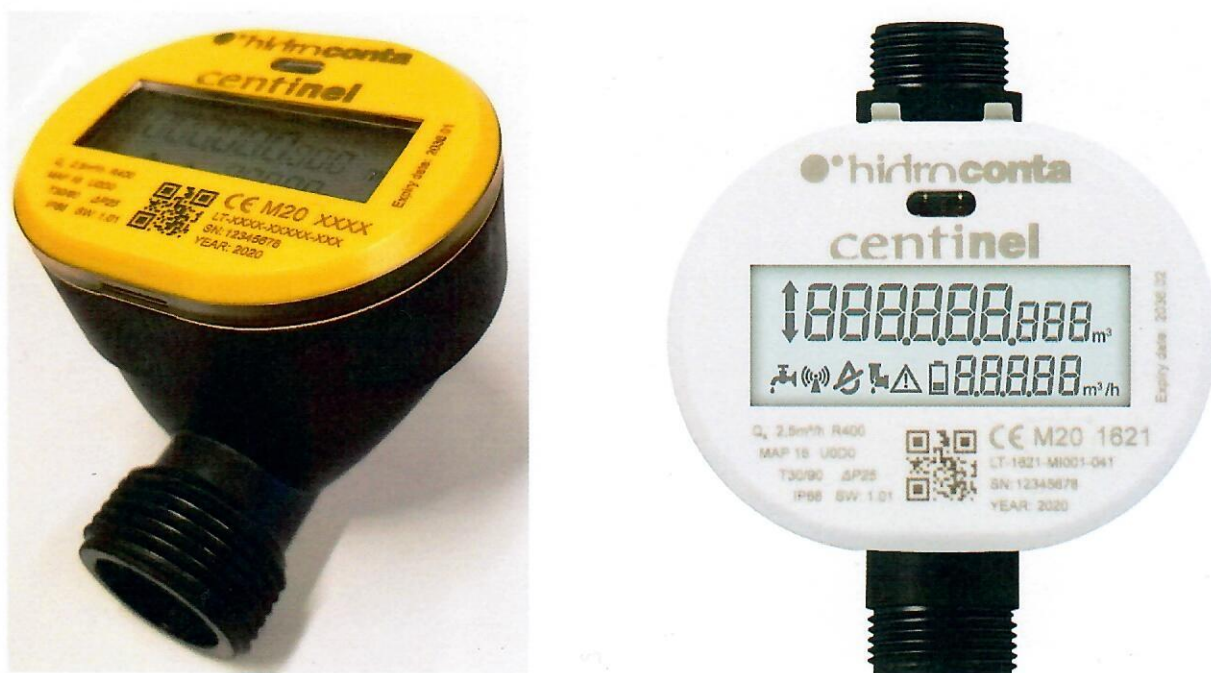


Fig.1. Water meter CENTINEL

1.2 Sensor

Ultrasonic flow sensor.

1.3 Measurement value processing

The flow measurement principle is based on the measurement of ultrasonic signal propagation time on the downstream and upstream of water flow. The difference between the measuring times is proportional to the water flow through the meter, which is calculated by the meter calculator.

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1.4 Indication of the measurement results

Measured volume of water is indicated on the two-line LCD indicating device.

Upper line: 9 columns, intended for volume of water, passing through the meter.

Indications in operating mode: m³, three digits after decimal point.

Indications in TEST mode : m³, six digits after decimal point.

Lower line: 5 columns for displaying current flow in m³/h and information symbols.

1.5 Optional equipment and functions subject to MID requirements

None.

1.6 Technical documentation

Ultrasonic water meter CENTINEL. Technical description, installation manual and user guide, 11-02-2020.

Other reference documents on which basis this certificate is issued, are stored in a file Nr.LEI-12-MP-101.20.

1.7 Integrated equipment and functions not subject to MID

NFC (near-field communication) interface is integrated in the meter, intended for data reading. The optical interface according to requirements of EN 62056-21 is integrated in the meter, intended for data reading via M-Bus protocol, for meter parameters setting and for optical pulses output.

The meter is equipped with one of the following wireless communication interfaces:

- RF 868 MHz;
- RF 433 MHz;
- RF 915 MHz.

Data via RF communication interfaces may be transmitted using the following protocols:

- W-M-Bus-T1;
- W-M-Bus-S1;
- LORA WAN.

The water meter can be equipped (optional) with one of the following additional wired communication interfaces:

- M-Bus;
- wired pulse output.

2 Technical data

2.1 Rated operating conditions

2.1.1 Measurand

The volume of water passing through the meter, indicated on the LCD indicator.

2.1.2 Measurement range

The measurement range of the water meter CENTINEL and other technical characteristics are presented in table 1:



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Table 1

Permanent Q_3	Flowrate, m ³ /h			The ratio $R, Q_3/Q_1$	End connections	Overall length L , mm	Pressure loss class
	Overload Q_4	Minimum Q_1	Transitional Q_2				
1,6	2,0	0,0064	0,010	250	G 3/4	80	ΔP 25
					G 3/4	105	ΔP 25
					G 3/4	110	ΔP 25
					G 3/4	165	ΔP 25
					G 3/4	170	ΔP 25
1,6	2,0	0,005	0,008	315	G 3/4	80	ΔP 25
					G 3/4	105	ΔP 25
					G 3/4	110	ΔP 25
					G 3/4	165	ΔP 25
					G 3/4	170	ΔP 25
1,6	2,0	0,004	0,0064	400	G 3/4	80	ΔP 25
					G 3/4	105	ΔP 25
					G 3/4	110	ΔP 25
					G 3/4	165	ΔP 25
					G 3/4	170	ΔP 25
2,5	3,125	0,010	0,016	250	G 3/4	80	ΔP 40
					G 3/4	105	ΔP 40
					G 3/4	110	ΔP 40
					G 3/4	165	ΔP 40
					G 3/4	170	ΔP 40
2,5	3,125	0,0063	0,010	400	G 3/4	80	ΔP 40
					G 3/4	105	ΔP 40
					G 3/4	110	ΔP 40
					G 3/4	165	ΔP 40
					G 3/4	170	ΔP 40
2,5	3,125	0,0031	0,005	800	G 3/4	80	ΔP 40
					G 3/4	105	ΔP 40
					G 3/4	110	ΔP 40
					G 3/4	165	ΔP 40
					G 3/4	170	ΔP 40
2,5	3,125	0,010	0,016	250	G 1	105	ΔP 25
					G 1	110	ΔP 25
					G 1	130	ΔP 25
					G 1	165	ΔP 25
					G 1	190	ΔP 25
2,5	3,125	0,0063	0,010	400	G 1	105	ΔP 25
					G 1	110	ΔP 25
					G 1	130	ΔP 25
					G 1	165	ΔP 25
					G 1	190	ΔP 25
4,0	5,0	0,016	0,026	250	G 1	105	ΔP 40
					G 1	110	ΔP 40
					G 1	130	ΔP 40
					G 1	165	ΔP 40
					G 1	190	ΔP 40

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Table 1 continued

Permanent Q_3	Flowrate, m ³ /h			The ratio $R, Q_3/Q_1$	End connections	Overall length L , mm	Pressure loss class
	Overload Q_4	Minimum Q_1	Transitional Q_2				
4,0	5,0	0,010	0,016	400	G 1	105	ΔP 40
					G 1	110	ΔP 40
					G 1	130	ΔP 40
					G 1	165	ΔP 40
					G 1	190	ΔP 40
4,0	5,0	0,005	0,008	800	G 1	105	ΔP 40
					G 1	110	ΔP 40
					G 1	130	ΔP 40
					G 1	165	ΔP 40
					G 1	190	ΔP 40

2.1.3 Meter temperature classes and maximum permissible errors

Meter temperature classes and maximum permissible errors are presented in table 2:

Table 2

Meter temperature class	Water temperature ranges	Maximum permissible errors
T30	between 0,1 °C and 30 °C	$\pm 5\%$ in flow range $Q_1 \leq Q < Q_2$ $\pm 2\%$ in flow range $Q_2 \leq Q \leq Q_4$
T50	between 0,1 °C and 50 °C	$\pm 5\%$ in flow range $Q_1 \leq Q < Q_2$ $\pm 2\%$ in flow range $Q_2 \leq Q \leq Q_4$ (for water temperature between 0,1 °C and 30 °C) $\pm 3\%$ in flow range $Q_2 \leq Q \leq Q_4$ (for water temperature between 30 °C and 50 °C)
T30/90	between 30 °C and 90 °C	$\pm 5\%$ in flow range $Q_1 \leq Q < Q_2$ $\pm 3\%$ in flow range $Q_2 \leq Q \leq Q_4$
T90	between 0,1 °C and 90 °C	$\pm 5\%$ in flow range $Q_1 \leq Q < Q_2$ $\pm 2\%$ in flow range $Q_2 \leq Q \leq Q_4$ (for water temperature between 0,1 °C and 30 °C) $\pm 3\%$ in flow range $Q_2 \leq Q \leq Q_4$ (for water temperature between 30 °C and 90 °C)

2.1.4 Environmental conditions / Influence quantities

Ambient working temperature	:	-15 °C to 70 °C;
Humidity level	:	condensing;
Installations	:	indoor or outdoor;
Electromagnetic environment	:	class E2;
Degree of protection	:	IP68.

2.2 Other operating conditions

2.2.1 Maximum admissible working pressure

The maximum admissible working pressure of water meter is 1,6 MPa (MAP 16).

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2.2.2 Mounting position of the water meter

Water meter can be mounted either horizontally, vertically or inclined.

3 Interfaces and compatibility conditions

The communication interfaces of the meter are described in section 1.7 of this appendix.

4 Requirements on production, putting into use and utilization

4.1 Requirements on production

At the end of the manufacturing and adjustment process the water meters shall be tested according to the requirements of the EN ISO 4064-2, section 10.1. Errors of water meters shall not exceed the maximum permissible errors, described in Annex III (MI-001) of the Directive 2014/32/EU.

The meters shall be tested within each of the following flowrates:

between Q_1 and $1,1Q_1$;

between Q_2 and $1,1Q_2$;

between $0,9Q_3$ and Q_3 .

For meters class T30 and T50: water temperature of tests $20\text{ °C} \pm 10\text{ °C}$.

For meters class T30/90: water temperature of tests is $50\text{ °C} \pm 10\text{ °C}$.

For meters class T90: water temperature of tests $20\text{ °C} \pm 10\text{ °C}$ and $50\text{ °C} \pm 10\text{ °C}$.

4.2 Requirements on putting into use

The water meter CENTINEL must be installed in accordance with the requirements of technical description listed in section 1.6.

The straight pipelines in upstream and downstream the meter is not necessary (flow profile sensitivity class U0 D0).

4.3 Requirements for consistent utilization

No special requirements identified.

5 Control of the measuring process after tasks of the instrument in use

5.1 Documentation of the procedure

None.

5.2 Special equipment or software

- optical reading head according to standard EN 62056-21, with special holder;
- service software **W1 TOOL**.

5.3 Identification of hardware and software

Identification of hardware:

- see Fig.1 of this appendix.

Identification of software: version number of the software is **1.01**. This number shall be marked on the label of the device (SW:1.01).

5.4 Calibration-adjustment procedure

Using an optical head and computer with **W1 TOOL** software the meter verification mode (TEST) is activated. Optical head should be connected to the computer USB interface.

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After placing the optical head on the meter with the special holder and opening the program startup window, computer port number (to which optical head is connected) is entered in the field „**Com Port**“.

Click „**Wake Up Meter**“ button, then click the „**Enter Test Mode**“ button. When the meter TEST mode is activated, meter readings are displayed with a resolution of 1 ml.

The meter's measurement errors shall be evaluated at the reference flow rates indicated in section 4.1 of this appendix. Optical pulse output of the meter is used or volume indications can be read directly from meter's LCD.

The volume pulse value in TEST mode is presented in table 3.

Table 3

Permanent flowrate Q_3 of the meter, m ³ /h	Volume pulse value in verification mode (TEST), litre/pulse
1,6	0,001
2,5	0,002
4	0,004

Using an optical head and computer with **W1 TOOL** software the meter is returned to the operating mode. After opening the program startup window, click the „**Wake Up Meter**“ button, then click the „**Enter User Mode**“ button, the meter returns to the operating mode.

The meter returns to its operating mode itself, 24 hours after activation of the TEST mode.

6 Security measures

6.1 Sealing

The meter casing is imperceptibly closed. Any unauthorized opening of the housing is impossible without damaging. When the upper sealed cover is opened, the safety button that is installed in the meter body is activated and the error code appears on the meter display, with the first digit „4“.

For the sealing of the meter after installation, there are provided holes in the meter body (Fig. 2).

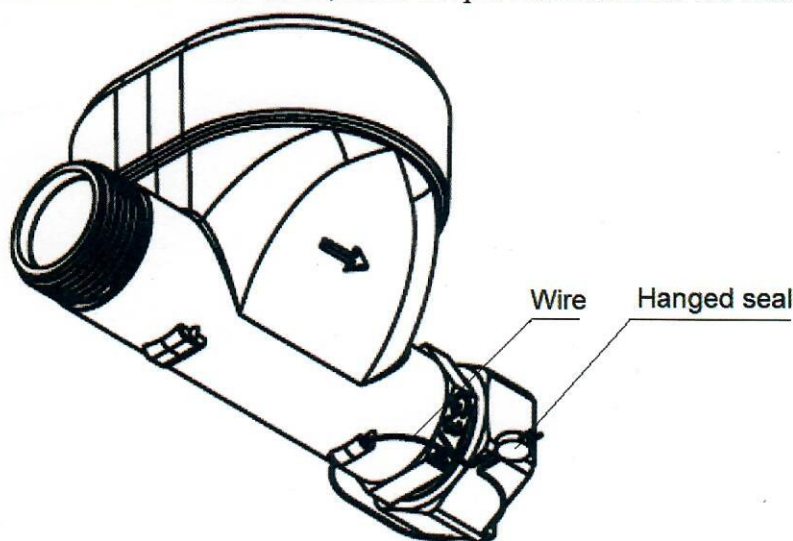


Fig.2. Sealing of the water meter CENTINEL after installation

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7 Marking and inscriptions

7.1 Information to be borne by and to accompany the measuring instrument

The water meter housing cover contains the following information:

- EU-type examination certificate number;
- trade mark of the manufacturer;
- type designation of the meter;
- year of manufacture and serial number;
- unit of measurement: m³ (on LCD display);
- permanent flowrate Q_3 ;
- the ratio Q_3/Q_1 , preceded by „R“;
- the temperature class, where it differs from T30;
- the maximum admissible working pressure (MAP);
- pressure loss class;
- the installation sensitivity class of the meter;
- the latest date by which the meter shall be replaced;
- software version number;
- IP code.

Arrow to indicate the direction of the flow shall appear on flow sensor body.

7.2 Conformity marking

In addition, the label of water meter should contain the following marking:

- „CE” marking;
- supplementary metrology marking, consisting of the capital letter „M” and the last two digits of the year of its affixing, surrounded by a rectangle;
- the number of the notified body that carried out the conformity assessment.

8 List of the drawings attached to the certificate

Drawings are not added.

9 Certificate history

Issue	Date and reference No.	Description
LT-1621-MI001-041	23-01-2020, No. LEI-12-MP-096.20	Type examination certificate first issued
LT-1621-MI001-041 Revision 1	03-03-2020, No. LEI-12-MP-101.20	1. The background of the meter marking label may be yellow or white. 2. Technical description issued on 12-2019, has been replaced by technical description, issued on 11-02-2020.